

SENSING THE SACRED:  
DESIGNING AN INTERFAITH CENTER FOR BOZEMAN, MONTANA

by

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A thesis submitted in partial fulfillment  
of the requirements for the degree

of

Master of Architecture

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I firmly believe that any worthwhile undertaking, while resting on the shoulders of the individual, cannot be accomplished without the support of the community. As I rest safely in the arms of my community, I hope that all of us will remember the students that will follow who endeavor to also take on, as an eastern adept once called it, that “trek upward [that] is worth the inconvenience.”

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## ABSTRACT

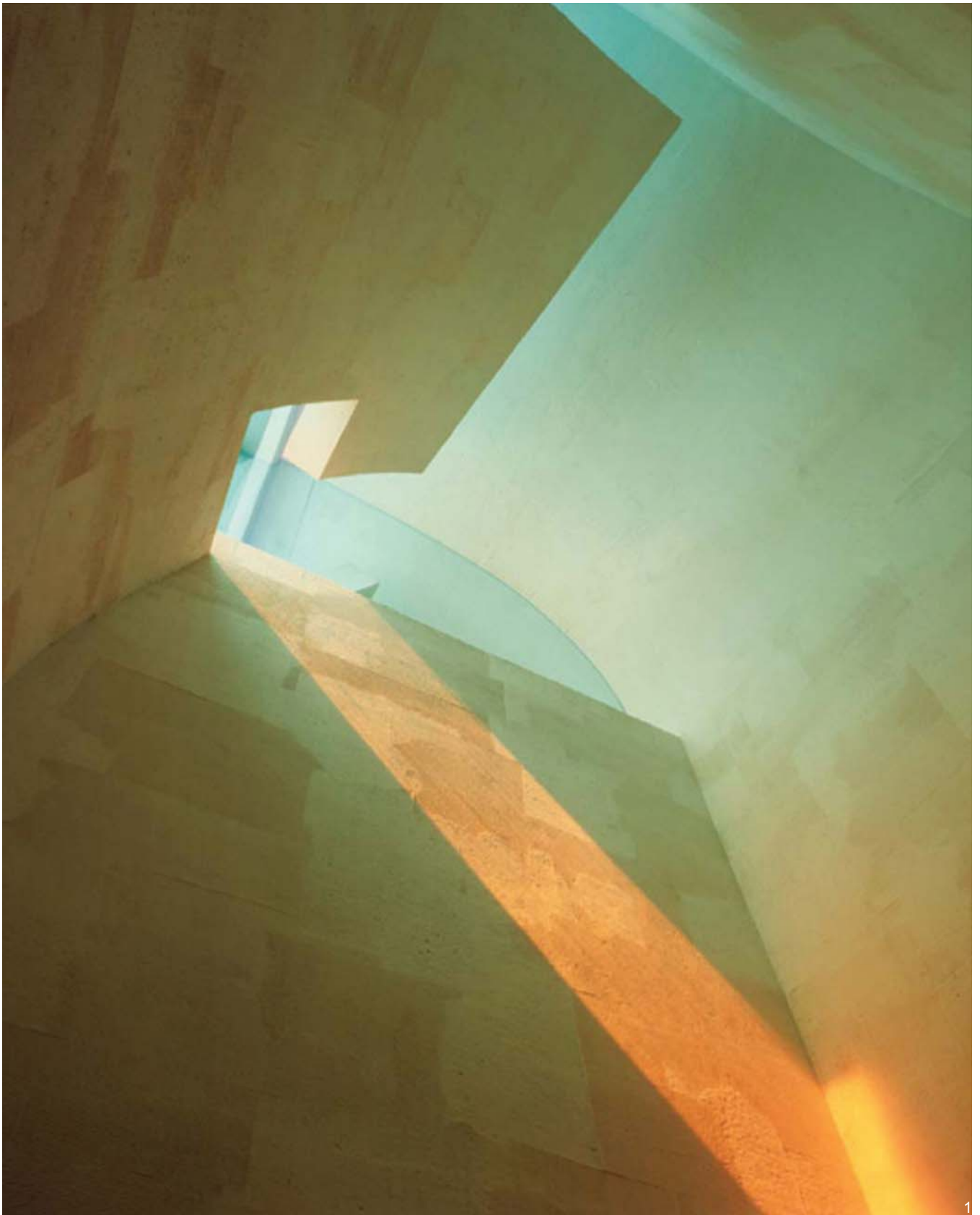
Designing sacred space is not a simple undertaking. Throughout the process one must attempt to understand religious beliefs and needs, often beyond one's own belief system, and translate intangible ideas into practical architectural realities. Designing interfaith sacred space becomes an infinitely more complex problem, complete with conflicting beliefs, values, and architectural practices. Rectifying countless sets of opposing ideas within an architectural space becomes a challenge that few architects have attempted thus far. Yet the value of interfaith sacred space in today's society is enormous because we live in an interfaith world - one striving to achieve peace amidst crisis, conflict, and the "busyness" of everyday life.

Interfaith sacred space is more than a room where people of different faiths gather and share. It can provide the opportunity for individuals to step out of the intensity of the profane into the quietude of the sacred and connect with their inner peace and strength. How does one design a space that can be recognized as sacred to people of multiple religious traditions when those traditions struggle to agree on the basic nature of a higher power, let alone icons, ideologies, and doctrines? Perhaps a common ground exists beyond the realm of religious doctrine. All of humanity, regardless of religious orientation, shares in experiencing life through the five senses. Often spiritual experiences are paired with events that emphasize one or a few of those senses. In fact, religious traditions make use of this connection between the senses and the sacred in order to heighten the spiritual encounters of their followers. Furthermore, individuals that do not even claim to be religious will often equate a spiritual event in their life with a certain awareness of one or more of their senses. Often these experiences, either individual or shared amongst a community, will bring about a sense of peace and tranquility. By engaging the five senses through architectural features that peacefully trigger and place emphasis upon these senses, people of any religious tradition are invited to participate and share as individuals and communities in spiritual experiences in these troubled times.



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Daylight in the Chapel of St. Ignatius, Seattle, Steven Holl

# NOTE OF AUTHOR'S INTENT

The study of religious architecture and sacred space can be, and is for some, a lifelong endeavor. Consequently, it is not practical to cover the breadth and depth of these subjects in a Masters' thesis. This thesis is not meant to comprehensively examine the numerous religious traditions of the world, but instead serves to explore some of the commonalities that exist in humanity's ideas of spirituality. It should also be noted that for the purposes of this project many topics related to these subjects – such as sacred geometry, numerology, cosmology, and feng shui, to name a few – have been only briefly touched upon or omitted entirely. This is not meant to imply that there is a hierarchy of importance in topics that affect and impact religious architecture. On the contrary, the author recognizes that these topics are also important and relevant to the study of sacred architecture and hopes that they will provide avenues for research and reflection in the future.

Through this thesis the author intends to explore sacred architecture, religion, and their associated theories, not exhaustively, but expansively. In the end, the author hopes to develop and foster a greater enthusiasm for religious architecture and interfaith understanding that can be carried beyond this thesis into practice and a life-long exploration. The author views this thesis as the first of many steps that will be taken in the future regarding this exploration. To that end, the final design result is not meant to solve every problem regarding interfaith sacred space. Instead, it is presented in order to stimulate the conversation about the successes and failures of the design as they relate to the written portion of the thesis. In fact, the author aspires to have discovered many more architectural directions to explore at the conclusion of this thesis.

Within the practice of architecture, a large spectrum of implementation exists. At one end is the very strict adherence to the confines of the physical environment, and the rules imposed on that environment by the people that inhabit it. At the other end of the spectrum lies a theoretical world of the imagination, devoid of such rules, allowing individuals to explore, without restriction, those ideas that may one day become a part of physical reality. Most architectural projects lie somewhere in between these two extremes, and often will travel this spectrum from theory into practice, as a project moves through the stages of design. This thesis is no different, and ultimately the author endeavors to explore this spectrum thoroughly, while keeping within the confines of time and practicality. The following pages represent the findings of such an exploration - in theory and in theoretical practice. While the concluding design is rooted in theoretical ideas about the sacred and architectural space, it is hoped that it has the potential to become a physical reality at some unknown date in the future.

Finally, the author, for the sake of this work, embraces the understanding that a higher power or supreme being exists and is a reality for many groups of people in the world. The following thesis is presented for consideration under this assumption. The author's personal beliefs in this regard are irrelevant; it is enough to say that someone somewhere believes in something greater than oneself. It is also for this person(s) that this thesis has been undertaken.

# THEORY

The world is plagued by crisis and chaos. The cataclysmic events of this decade – the tragedies of September 11, 2001, Hurricane Katrina, the Indian Ocean Tsunami, the Iraqi War, unrest in the Middle East, and most recently the global economic downturn – have left no individual untouched. Yet with all of the stress created from these situations, one would hope that society has been able to adapt and develop coping strategies to assist people with their needs. Unfortunately many in the United States of America still function under the premise that efficiency and product creation are more important than a focus on a healthy lifestyle and the processes used to create such products. Society has not yet adapted to meet the needs of its individuals.

One way individuals cope with crisis, chaos, and stress involves pausing in order to bring peace to one's being. (This is certainly much preferred to lashing out in anger and frustration at others.) Individuals also cope by reaching out and becoming part of a community where they feel that they are connected to something bigger than themselves, and are reassured that they are not alone in their strife. However, few architectural spaces exist for these purposes – granting pause to individuals and providing safe gathering spaces for communities. Many of the spaces that do exist for these purposes are religious in nature, however they are exclusive in that they are solely for one religious tradition and thereby often exclude the beliefs and practices of others.

Turning to a higher power in stressful times of need is not uncommon in any culture, and yet it is unfortunate that the religious diversity of the United States of America is also adding to the stress of society. Events such as those of September 11, 2001 have been the catalyst for easing the acceptance of religious diversity, but even the interfaith grassroots movements that they sparked have a long way to go to promote peaceful pluralism in a religiously diverse nation. However, these interfaith movements have proven to be “more important than ever, for the easy tolerant goodwill of civic life is truly tested in times of tension and suspicion.”<sup>1</sup>

With so many examples throughout the ages of sacred space, it is surprising that few attempts have been made to design space that can be recognized as sacred to multiple religious traditions. The site of the Dome of the Rock and the Western Wall in Jerusalem hardly stands as an example of peaceful prayer amongst friendly but disagreeing neighbors. Contemporary architecture lends little assistance to the strife of such diametrically opposed cultures, as well as the individuals plagued by the tension of warring times. Philosopher Mircea Eliade expresses this separation in today's society as an absence of the sacred in lieu of a profane world:

It should be said at once that the *completely* profane world, the wholly desecralized cosmos, is a recent discovery in the history of the human spirit. It does not devolve upon us to show by what historical processes and as the result of what changes in spiritual attitudes and behavior modern man has desecralized his world and assumed a profane existence. For our purpose it is enough to observe that desecralization pervades the entire experience of the nonreligious man of modern societies and that, in consequence, he finds it increasingly difficult to rediscover the existential dimensions of religious man in the archaic societies.<sup>2</sup>

Many “interfaith” sacred spaces are found in some of the most devoid public places on earth: airports and hospitals. These chapels, as they are often called, which are meant to serve people at some of the most critical and tense times in life – health crises, business calamities, or personal stress exacerbated by the busyness of life passing by all too quickly – are often neglected in architectural designs. True they provide a quiet place to sit, but any room could do that. Many examples of interfaith sacred space involve somewhat empty rooms devoid of clues as to their sacredness. Not wanting to offend one tradition over another, the icons that normally identify a space as sacred are removed. What can be done to make these spaces and others more interfaith and less devoid of architectural and human character?

In this societal, yet politically correct, chaos there exists an architectural solution that promotes the need to pause alone, the desire to gather together, and the goal of celebrating religious diversity. Interfaith sacred space, designed for the individual and the community, is a key to bringing peace to the chaos. But how does one design



a space that can be recognized as sacred to people of multiple religious traditions when those traditions struggle to agree on the basic nature of a higher power, let alone icons, ideologies, and doctrines? Perhaps a common ground exists beyond the realm of religious doctrine.

Many can attest to the experience of walking through what is to them a holy space, regardless of its building typology. Perhaps the mood of the light, the sound of silence or a water feature, the feel of the stones under their feet, or the smells of flowers and aromas that can almost be tasted trigger the sense that one is in a space not entirely ordinary. However most of the architecture of today lacks these things that trigger basic impulses to pause. Architect Juhani Pallasmaa, in his book *The Eyes of the Skin*, attributes this inability of contemporary architecture to actively engage humanity's thoughts and feelings to an absence of integration with the senses:

The inhumanity of contemporary architecture and cities can be understood as the consequence of the negligence of the body and the senses, and an imbalance in our sensory system. The growing experiences of alienation, detachment and solitude in the technological world today, for instance, may be related with a certain pathology of the senses...this sense of estrangement and detachment is often evoked by the technologically most advanced settings, such as hospitals and airports.<sup>3</sup>

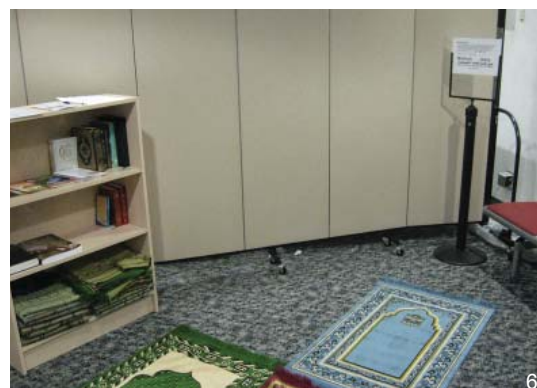
Pallasmaa's comment points to the common ground that could become the foundation of interfaith sacred space. All of humanity, regardless of religious orientation, shares in experiencing life through the five senses. Often spiritual experiences are paired with events that emphasize one or a few of those senses. In fact, religious traditions make use of this connection between the senses and the sacred in order to heighten the spiritual encounters of their followers – through the use of dramatic lighting, incense, silence or music, warmth, etc. Furthermore, individuals that do not even claim to be religious will often equate a spiritual event in their life with a certain awareness of one or more of their senses. Often these experiences, either individual or shared amongst a community, will bring about a sense of peace and tranquility. By engaging the five senses – sight, hearing, smell, taste, and touch – through architectural features that peacefully trigger and place emphasis upon these senses, people of any religious tradition are invited to participate and share as individuals and communities in spiritual experiences of pause, peace, and rest in these troubled times.



A Busy Street in New York City



September 11, 2001



Interfaith Airport Chapels and Signage

# INTERFAITH SACRED SPACE DESIGN CHALLENGES

While the history of religious architecture and sacred space has been focused almost entirely on exclusive spaces, a few attempts have been made in recent decades to begin approaching the challenge of designing interfaith sacred space. Several years ago the Council for a Parliament of the World's Religions (CPWR) and the United Religions Initiative (URI) hosted a design competition for interfaith sacred space in order to encourage designers to explore the possibilities of what could be done in this type of design. Their competition brief included general information on some major world religious traditions, as well as the fundamental requirements for their sacred spaces. The brief helped raise awareness of the plethora of beliefs in the world and exposed competitors to the complications of such a design challenge.<sup>1</sup> As a starting point the brief listed the following "General Factors to consider in Sacred Space" design:

- some groups meet in pews, facing a single direction; others meet in circles.
- some groups prefer to meet indoors; some outdoors. (Note: when weather forces the latter indoors, they prefer as nature-friendly an interior design as possible.)
- some groups require imagery (statues, icons, etc.); some forbid it.
- many groups prefer to orient towards particular directions, need them to be marked or indicated in some way, and require the space to accommodate different orientations.
- most religious traditions incorporate concepts of sacred geometry and number into their sacred spaces, as well as symbolic orientation in both time and space.<sup>2</sup>

This list is suggestive rather than comprehensive. It sheds light on some of the major challenges with designing interfaith sacred space: the lack of commonalities, conflicting dogmas and doctrines, dissimilar ritual types, and issues of orientation and geometry, to name a few. Catering to each and every religious tradition is absurd at best and most likely will result in an empty meeting room that could be adapted for any and every location. But what would separate this space from the profane and identify it as sacred? By attempting to not offend through a lack of anything resembling a religious symbol, it is most likely that the sacred feeling would be lost as well. This begs the question, what can be done?

The answer to this question lies not in the designs of the future, but in the processes and products of the past. Architecture is never created in a vacuum; designs are always informed by the buildings that predate them, especially those of similar building typologies. While few interfaith sacred space precedents exist, exploring sacred architecture designs of the recent past should apprise the designer of interfaith sacred space on appropriate and worthwhile design approaches and strategies.

# DESIGN APPROACHES TO SACRED SPACE

Each architect of sacred space faces the challenge of understanding and interpreting client needs and seamlessly pairing them with the religious traditions of the community. A major component of any building is its occupants, and sacred architecture is certainly no different. The rituals and beliefs of any religious community should always be taken into account, yet are they? Different architects have taken vastly diverse approaches to meet their clients' needs in the design of sacred spaces.

Some design sacred space by simply taking on the design as an artistic, geometric, and structural challenge. Being of no religious inclination themselves and without the desire to learn about their client's religious tradition, they base their designs on their own personal understanding of spirituality and mesh this with what they perceive to be community needs. One such example of this design approach can be seen in the Dominican Monastery of Sainte Marie de la Tourette designed by Le Corbusier and his colleague Jannis Xenkis. Le Corbusier was charged with the task of continuing the work to "revitalize religious art by introducing it to modern aesthetics."<sup>1</sup> As such, Le Corbusier "completely ignored that there could be a deep incompatibility between the presuppositions of modern art and those of the church. Religion was not discussed by either man [Le Corbusier or Xenkis], and neither did the monks touch upon the subject."<sup>2</sup> Instead of working with the Dominican monks that would inhabit the monastery, he ignored their religious beliefs and associated spiritual needs, making the design a problem of "pure geometry."<sup>3</sup> What resulted was a building born out of an "essentially humanist method of designing to a specific use."<sup>4</sup>

The histories of both architect and client provided some insight as to the successes and failures of Sainte Marie de la Tourette. Le Corbusier, originally a student of art in painting and sculpture, was counseled by his father and his art teacher to study architecture.<sup>5</sup> It was not until Le Corbusier saw the monastery in Galluzzo that he was inspired to become an architect:

I saw, in the harmonious countryside of Tuscany, *a modern city* crowning the top of a hill, ... The uninterrupted ring of monks' cells formed the noblest silhouette on the landscape. Each cell overlooks the plain and opens at a lower level into a small enclosed garden. I thought I had never seen such happy living arrangements.<sup>6</sup>

What Le Corbusier observed in this monastery, and ultimately tried to produce in his future communal dwelling designs was a very strict life of solitude. And while it is unlikely that he spoke to anyone at the monastery, it would have been unavoidable for him to quickly grasp the lifestyle of the monks that lived there.

The monks of the monastery in Galluzzo were Carthusians – part of "an ascetic sect that had wandered the wild as beggars for Christ."<sup>7</sup> Founded in the eleventh century, this order of monks spent their lives in quiet communal solitude: "The monk's goal ... was to exhaust himself fully into the delirium of prayer. It was ... a rather rigorous lifestyle."<sup>8</sup> The impact of their monastic ideals upon the young impressionable artist was so strong that Le Corbusier strived for this feeling of isolation in all of his projects. As one author observed of his community buildings, it is as if "the public realm is accessed, if at all, through a screen."<sup>9</sup>

It is obvious then why Le Corbusier designed the Sainte Marie de la Tourette with such austerity. To him, this monastery was to become the epitome of design for monastic life. Of his earlier inspiration, Le Corbusier said: "It was the first time that I had experienced such silence and solitude, but also daily contact with men ... I would like to spend my whole life in what they call their cells."<sup>10</sup> It is this ideal of spirituality that Le Corbusier poured into his design of Sainte Marie de la Tourette.

Had Le Corbusier been designing for a group of Carthusian monks, this might have been an excellent design. However, the Dominican monks that were to inhabit the new monastery were the furthest in ideology from the Carthusian monks as was possible. The Dominicans were as social as the Carthusians were sequestered. In fact the Dominicans were known to be "traditionally the most urban (and evangelical) of monastic disciplines."<sup>11</sup> So while Le Corbusier's design would have been successful for individuals looking to inhibit communal interactions in



## SAINTE MARIE DE LA TOURETTE

LOCATION: Eveux-sur-Arbresle, France

ARCHITECT: Le Corbusier

PERIOD / DATE: Modern / 1957 - 1960

- Concrete stationary louvers and light canons help direct and regulate daylight entering building
- Small “cell” rooms for monks inspire reflection
- Stark daylit hallways are points of momentary pause
- Chapels are dramatically daylit through use of colored light cannons
- Bare concrete walls are reminiscent of a solitary lifestyle



Exterior



Hallway



The Chapter Room



A Cell



The Crypt

lieu of a solitary lifestyle focused inward on self and God,<sup>12</sup> for the Dominican monks the design was an absolute failure. After less than ten years in their new complex, the monks moved to Lille to be closer to people. While the monastery still stands as a monument to Le Corbusier's ideals of life, it is clear that his approach created some calculated errors in the design which rendered it useless to its intended client.

Perhaps if Le Corbusier had been interested in his client and had taken the time to learn about his needs, as opposed to imposing his own ideas of monastic life upon the design, the monastery could have been a huge success for the Dominicans. On the flip side, the Dominican monks could have expressed their lifestyle needs more clearly instead of simply desiring a building that broke away from the dated ornamentation of the past and instead reflected the modern art trends of the times. An attempt at understanding the faith and practice of the religious tradition of the Dominican monks (on the part of the architect) or additional communication (on the part of both parties) could have resulted in a more functional design.

A second design approach to sacred space, then, involves the architect learning about the religious tradition of the client, and through communication, trying to understand their needs for sacred space, ultimately translating those needs into an architectural reality. An example of this type of design work can be seen in Minuro Yamasaki's design of the North Shore Congregation Israel Synagogue in Glencoe, Illinois. Yamasaki worked extensively with Dr. Edgar Siskin, the rabbi of the congregation, in order to learn about the Jewish faith and the synagogue's needs.<sup>13</sup> He then went on to propose a design that he thought would meet the needs of the suburban Jewish community.

What Yamasaki must have learned from Dr. Siskin is that the Ark that holds the Torah is the most important object in a synagogue, because he made this the focus of the large sanctuary space. He also must have been taught that little

else in the way of ornamentation is required, save windows, plenty of light, a focus of the eternal light, and the bimah, or platform upon which the leader of the service stands - all of which he incorporates seamlessly into the design.<sup>14</sup> Jewish faith specifies that Jews should face Jerusalem in prayer (towards the East when in the US), and with the ample site provided, Yamasaki not only orients the sanctuary appropriately, but also provides tinted windows around the front (east) wall that glow with morning sunlight.<sup>15</sup>

Yamasaki must have also understood the needs of this large congregation, in terms of both prayer and education, because his design reflects one who has not simply followed past precedents, but instead meets the needs of the community it serves. On High Holy Days, the sanctuary seating can expand onto both the side platforms and into the large entry and gathering area at the back of the sanctuary. This gathering area also meets the needs of other community functions and provides for flexible space.<sup>16</sup> Other programmatic elements, such as offices and educational spaces, were seamlessly incorporated into the synagogue complex while the natural beauty of the site was maintained.

It is evident from the design that Yamasaki did not blindly follow the instructions of the rabbi and his congregation but instead actively participated in understanding and translating the needs of the community into a functional space for prayer. Of the need for additional seating on High Holy Days, Yamasaki said,

The usual solution for the expansion seating of a synagogue on the High Holy Days is to combine the sanctuary with an auditorium and open the space between the two. This solution is an undesirable one from many standpoints. It makes for an esthetic hodgepodge to combine a spiritual space with a functional one. It poses severe acoustical problems when the two are used separately and simultaneously and it creates hardships. The expansion of this sanctuary is provided through two means. The main sanctuary area is made large by having platforms on either side of the main seating that tie in with the bema platform at the front. The additional space provided by these platforms on the

## NORTH SHORE CONGREGATION ISRAEL

LOCATION: Glencoe, Illinois, USA

ARCHITECT: Minuro Yamasaki

PERIOD / DATE: Modern / 1964

- Tinted daylight enters through the east wall in the morning and the west wall in the evening
- View windows overlooking property inspire contemplation and provide a connection to the natural beauty of the site
- Hallways are slightly larger, becoming informal gathering spaces that help create moments of intimacy for this large community
- Simple materials and design help establish a peaceful environment



Main Sanctuary



Exterior



Stairs in Main Sanctuary



Hallway

sides give a sense of spaciousness to the sanctuary. The lobby is larger than needed for circulation and, as the memorial hall, provides expansion space and makes it suitable for other functions.<sup>17</sup>

The community has certainly embraced this modernist architecture for their sacred space, using the building as Yamasaki intended. However, decline in weekly attendance prompted the construction of another smaller chapel where most of the services throughout the year are currently held. This saves the community much in the way of maintenance and utility bills, yet it is wondered that if Yamasaki had been a part of the community, could he have realized a solution even better suited to its needs? Regardless of these spatial issues, Yamasaki was able to absorb enough about the community and its beliefs in order to design a building complex that for the most part meets its needs and expresses itself as not only Jewish, but an architectural representation of the community itself.

Some may think that designing for one's own religious tradition is an easy endeavor. However, is it really possible to understand the religious beliefs and culture that one is a part of and translate it succinctly into sacred space? Diana Eck, a prominent expert in the field of religious studies, points out that, "It is often the case that the most difficult dialogue is within our own tradition."<sup>18</sup> As with cultural and social issues, it can be hindering to be on the inside of a religious tradition while simultaneously trying to understand it from the vantage point of an objective outside observer. Important factors might be overlooked due to the proximity of the subject. Like other architects placed in this situation, Frank Lloyd Wright had to identify and objectify his own beliefs in order to propose a successful design for the Unitarian congregation of Oak Park, Illinois.

In addition to being a member of the Oak Park congregation, Wright was well qualified for such a commission. As the great-great-grandson of Jenkin Jones, the founder of Unitarianism, Wright's childhood had been influenced strongly by a family intimately familiar with the faith.<sup>19</sup> In his adult years, Wright worked on two other Unitarian projects in the office of Joseph Lyman Silsbee. Despite Wright's professional architectural experience, these designs could not escape the influence of his uncle, a Unitarian minister, who proved to be pivotal in the formation of Wright's ideas about Unitarian architecture:

Wright himself left the Helena Valley in 1886 at the age of nineteen, going to Chicago, where he first worked in the office of Joseph Lyman Silsbee, architect to Wright's uncle the Reverend Jenkin Lloyd Jones. While Wright later attempted to portray himself as an outsider with no connections, making his entrance to the Chicago architectural community solely by way of his talents, in fact his uncle held a powerful position in the city, and had hired Silsbee to design both the All Souls Unitarian Church in Chicago and the Lloyd Jones family's Unity Chapel in the Valley. These two designs, along with Jenkin Lloyd Jones' greatest building project, the Abraham Lincoln Center, were all designed with Wright's involvement, and his experiences while working on these projects were to prove critical to the design of Unity Temple.<sup>20</sup>

It was this integrated combination of personal and professional experiences that prepared Wright for the Oak Park project.

Wright started working on his designs for Unity Temple before he had even received the commission. Only after he had completed his design work did he submit his proposal to the church building committee.<sup>21</sup> Through his design Wright desired to integrate his personal understandings of Unitarianism with an appropriate functional solution for the community's space needs. Having joined the congregation many years before in 1892, Wright embraced the idea "of salvation not as a blissful heavenly afterlife, but as the perfection of human character in the earthly lifetime ... a belief that divinity resided not in a celestial heaven but in souls of human beings."<sup>22</sup> Because of this, Wright never intended for the architecture of Unity Temple to reach to the sky like a soaring Gothic cathedral. Instead Wright felt that the architectural focus of the space should match the spiritual focus of the community – living a spiritual life on earth. Wright uncharacteristically wrote extensively about Unity Temple in an attempt to explain the motivations behind the design. It is here that one finds the extent to which Wright had assimilated his own religious beliefs:

Wright describes in his autobiography, how Unity Temple was based not on the principles of looking towards heaven but on the principles of reinforcing the presentness and heaven on earth. As he said "Why *point* to



heaven?"<sup>23</sup>

Wright also took to heart the comments of his great-great-grandfather about the design and use of sacred space in the Unitarian religious tradition. Instead of designing a deep dark cathedral with "no place to listen, to work, or to think," Wright worked to bring copious amounts of daylight into the sanctuary by using large amber-tinted skylights and clerestories that created a feeling of being bathed in warm sunshine, regardless of the weather conditions outside.<sup>24</sup> Wright also ensured that the focus of the sanctuary was the room's center as opposed to the location of the speaker. This he did by pushing the eye inwards, with pillars and ornamentation.<sup>25</sup> Ultimately, as his great-great-grandfather had desired, Wright made the gaze of the individual rest upon the community itself, allowing for an intimate sharing of sacred experiences. The three levels of pews are positioned strategically within the sanctuary's square plan so that one at all times can see the rest of the congregation, regardless of location, and one is never more than 45 feet from the speaker. Considering the rituals of the Unitarian faith:

This is not only appropriate to the question and discussion format of the Unitarian worship services, but also results in a sense of intimacy and the ability to be heard clearly, as opposed to the excessive scale and resulting relegation of the worshippers to 'silence' of the cathedrals (as they were characterized by Jenkin Lloyd Jones). Unity Temple was described by a worshipper in 1908 as follows: "the grouping of the people about the pulpit brought all within easy reach and gave to all a sense of nearness to preacher and choir, and of intimate and even family relations with one another."<sup>26</sup>

While it is difficult to discern whether or not the success of Unity Temple should be attributed to Wright's talent and skills as an architect or his innate understanding of the Unitarian faith, it is safe to say that Unity Temple is successful as a worship space for the Oak Park congregation. As an architect, Wright sought to hone his skills to perfection, as can be seen in many of his other

## UNITY TEMPLE

LOCATION: Oak Park, Illinois, USA

ARCHITECT: Frank Lloyd Wright

PERIOD / DATE: Modern / 1908

- Massive exterior concrete structure does not suggest warm intimate interior
- Materials, colors, and tinted daylight and light fixtures emphasize comfort within the community
- Although the sanctuary seats many people, one is never very far from the speaker
- Daylight glow gives space a harmonious feel
- Lack of icons suggests that sacredness comes from community rituals



Main Sanctuary



Exterior



Skylights in Main Sanctuary



Exterior Concrete Detail

works, and his successful design of several other religious buildings for different religious traditions suggests that Wright had the capacity to design Unity Temple without a background in Unitarianism. However, it seems that in this case, Wright's intimate knowledge of the faith added a layer of sophistication to the design that he would have been unable to provide otherwise.

Keeping in mind that architecture is always a product of its past, one must wonder what other influences inspired Wright in his design. It is known that Wright began his design work for Unity Temple shortly after returning from his first trip to Japan.<sup>27</sup> Many critics have commented on the influence that Wright's visits to Japan had on his later work. While the influence may not be as evident in Unity Temple, perhaps the principles of space in Japanese culture lent well to the Unitarian ideas of sacred space. Indeed Wright's great-great-grandfather is said to have proclaimed of Unitarian sacred space: "We need indeed a sanctuary, literally a 'clean room,' 'a pure room.' O architect, build it low with humility, and make it warm with human tenderness ... Flood it with sunlight and fill it with pure air."<sup>28</sup> Certainly Japanese architecture and culture also bear these qualities through an absence of furniture or belongings, the use of low clean lines in elevations, the application of simple but warm natural materials, and an integrated use of sunlight and air. With this knowledge, one might find it impossible to believe that Wright did not allow the beauty of Japanese architecture to influence his design. While it seems that this cross-cultural pollination contributed to the success of the design for the community, one must now ask if other architects have pursued similar experiments in the mixing and marrying of different religious traditions in another approach to the design of sacred space.

By setting aside the congruent religious background of the architect as a main factor influencing the design of sacred space, another approach can be observed. Like Wright, other architects have also allowed for the influence of one or several religious traditions to appear in subtle or overt ways throughout the design of a sacred space for a community with an entirely different focus. This may sound outrageous and sacrilegious at first, especially for one immersed in the religious ideas of an exclusivist western world. However, a brief exploration of eastern religious traditions shows that this idea of mixing religious beliefs in architecture and life is not only accepted, but common. Eastern religious traditions have inclusivist ideas – by virtue of believing in the doctrines of one tradition, the others are not discredited. In fact some eastern traditions define a way of living as opposed to professing beliefs in the existence of a specific god or gods. This may explain then how easy it is for a Japanese architect like Tadao Ando to design Christian chapels in Japan that incorporate the ideas of many eastern religious traditions.

Ando, famous for his minimalist style and strong use of concrete, has incorporated eastern religious symbols from Buddhism, Shinto, and Chinese religions into Christian architecture, with surprisingly successful results. His work seems to encompass the idea of resolving dissimilar or even opposing forces. Architectural critic Kenneth Frampton explains:

The fundamental dyad<sup>29</sup> underlying Ando's work comprises the opposition between geometry and nature, although for him nature is as artificial in its mediation as abstract form. This opposition has another level of significance, however, in that Ando regards occidental<sup>30</sup> form-making as irreducibly symmetrical, volumetric, and vertical in contradistinction to the traditional Japanese mode of building which can be seen as natural, horizontal, and spaceless.<sup>31</sup>

Perhaps it is Ando's high level of comfort with manipulating opposing forces that allows him to create bold sacred space without qualms over clashing religious doctrine.

Ando's Church on the Water is a clear example of this type of approach to sacred space design. The influence of religions other than Christianity can be seen from the moment one approaches the church. Unlike the usual direct route up a short set of stairs to an entrance that provides a full view of the church space and altar, one moves toward the church by circling around the top of the site before descending two stories into the chapel.<sup>32</sup> There are many references in Christianity to rising or going up. Often Christian religious architecture will contain at least a few stairs up to the main floor of the sacred space and a choir loft or organ may be accessed by ascending an additional flight of stairs inside. However, Ando reverses these references with a downward entry into a cave-like chapel, more



reminiscent of the Christian catacombs than any other Christian sacred space.

Allowing nature and site to so strongly influence the design is an idea much more rooted in Japanese religious traditions and culture than in Christianity. While Christians over the centuries have proclaimed certain physical locations around the world as sacred, these have typically been associated with holy events that have taken place at those sites. (For instance, Jerusalem and Bethlehem are holy cities for their association with the life of Jesus Christ.) The Japanese, however, see many places and regions in nature as sacred, believing them to be the homes of deity, as opposed to marking sites of sacred events.<sup>33</sup> Ando positions his design within the framework of the water and the land, integrating all three in a way that is uncommon in Christian architecture, yet suggests that it is not just the building that is sacred, but the entire site.

These modifications to Christian architecture are not nearly as startling as the use of crosses in the design. Typically the identifying Christian symbol of the cross is shown once on or above the main altar in the sanctuary. However, Ando takes liberties with this symbol, placing four crosses boldly in a square above the chapel, forming an enterable glass box where one can recall Jesus' story of hanging on the cross with others as part of a Roman execution, while also getting the sense that the deity exists everywhere and not just in one direction of life. Frampton explains:

Since the four crosses are absolutely symmetrical and equal on all their respective axes and since they also almost touch each other at their extremities they thereby deny the traditional orientation of the Christian Church and in so doing imply a totally other idea of the godhead. The resultant spatial figure, voided at the center, insists upon a totally panoramic reading of the landscape.<sup>34</sup>

It is as if the focus has been shifted from the prominent Christian symbol of the cross to the beautiful nature beyond. The four crosses together create such an intense symbol, one must look beyond them into the world of nature.

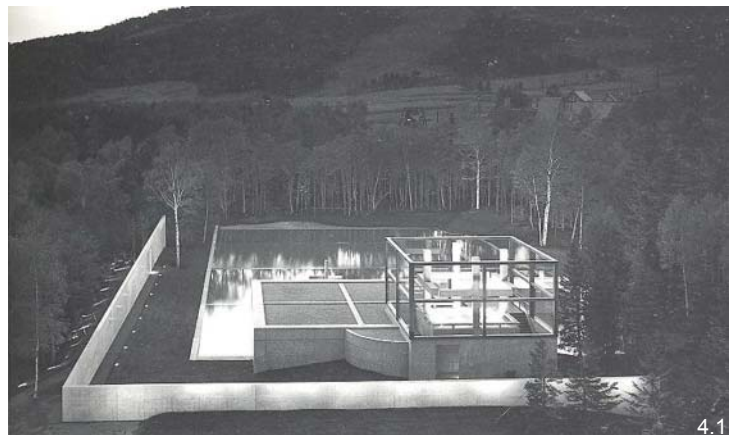
## CHURCH ON THE WATER

LOCATION: Tomamu, Hokkaidō, Japan

ARCHITECT: Tadao Ando

PERIOD / DATE: Modern / 1985 - 1988

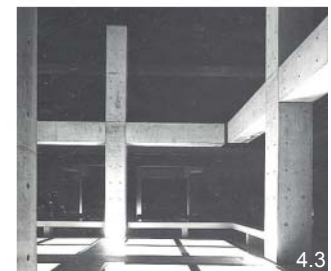
- Visual connections with water and forest emphasize sacredness of nature
- Shifts in scale help reinforce the body in the space and make one aware of one's surroundings
- Placing the sanctuary focal point outside redirects attention from what is presently taking place in the room to what is beyond
- The contrasts in lighting from day to night expose the dynamic nature of the space and its sacredness



Exterior



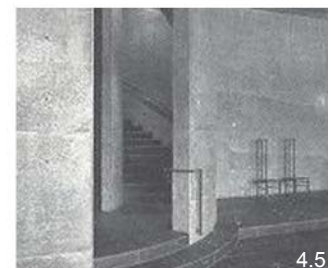
Main Sanctuary during Day



Exterior at Night



Main Sanctuary at Night



Entry Staircase

## CHAPEL OF ST. IGNATIUS

LOCATION: Seattle U., Seattle, Washington, USA

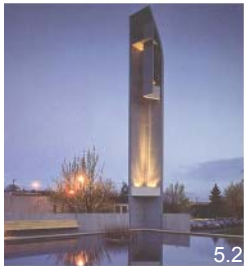
ARCHITECT: Steven Holl

PERIOD / DATE: Contemporary / 1994 - 1997

- Brings controlled colorful daylight into worship spaces, adding a dynamic quality to the architecture
- Incorporates architectural elements from eastern religious traditions
- Uses a datum made up of several features to provide many opportunities to pause and gather while simultaneously leading one into the main sanctuary
- Lack of sanctuary door emphasizes welcoming of all faiths



Exterior



Bell Tower



Main Sanctuary



Ceiling Openings



Concept Drawing

Inside the chapel, one is confronted with a cave-like space devoid of altars and icons. The focal point of the space is actually outside the building. Looking through a glass wall out onto a small lake, one sees a large cross. During the day this cross almost blends into the forest background beyond, but at night dramatic lighting gives the cross an ominous feel. The lake itself is reminiscent of a Zen reflecting pool, bringing to mind yet another eastern religious symbol. The glazing wall through which this cross is viewed can actually be slid to the side, allowing the entire chapel to be opened up to the fresh air. This wall hints at yet another Japanese architectural symbol, the sliding screen.<sup>35</sup>

While this mix of eastern and western symbols may be overwhelming to the western observer, Ando has a sense of peace about his work. He says: "I do not believe architecture should speak too much. It should remain silent and let nature in the guise of sunlight and wind speak."<sup>36</sup> As for the impression of others, Stuart Wrede of the Museum of Modern Art seems to have accurately summed up the feelings of many about Ando's work: "The serenity of his spaces and the exquisite play of light and shadow here have created a truly sacred architecture."<sup>37</sup>

Because Ando strives for that initial yet final pure form which he refers to as the "original form of space,"<sup>38</sup> he will not redesign beyond the point where he feels this has been achieved. "Where there is conflict with the client beyond this point Ando will either carry the day through persuasion or abandon the job."<sup>39</sup> From this statement it can be assumed that for his constructed projects, the clients were indeed pleased, and unlike Le Corbusier's monks, did not require an adjustment of the design for it to be functional as their sacred space. Whether the clients themselves were set on the Ando name for their design or they truly appreciated the proposal remains to be seen.

It appears that Ando intended through his design to push the boundaries of religious doctrines and sought to integrate those doctrines as best he could:

Ando has constantly tried to render his work as a subtle interface in which the two civilizations are brought to confront each other. To this end, he has created an object-world in which the value of the one, the proliferating occident, is brought into opposition with the value of the other, the sequestered orient.<sup>40</sup>

If these were Ando's intentions, perhaps others have tried to bridge the gap between eastern and western religious traditions as well. The design of the Chapel of St. Ignatius presented a unique challenge to the world-renowned contemporary architect Steven Holl. Holl was asked to satisfy not just the spiritual needs of the Catholic community on and around the Jesuit Seattle University campus, but also to go beyond this narrow audience and reach out to the other students on campus – those with perhaps differing religious beliefs, and those that may be simply questioning and discovering their own spirituality. In addition to all of this, Holl also had to meet a more secular requirement in that the design needed to become an icon for the city of Seattle.

Holl was an ideal choice for this type of commission. As one article put it:

... he believes that people everywhere, consciously or not, want to commune with the cosmos. And he has spent his career orchestrating effects that bring people closer to a heart-stopping sense of space beyond space. 'I am slightly obsessed with the moment that peace and light and texture and sound come together to give you pause,' he says.<sup>41</sup>

Holl's search for a universal language in sacred architecture allowed him to embrace the challenge of the chapel design and ultimately settle on a universal symbol of the sacred – light. "Light is a powerful metaphor for teaching, as it is for the soul, and for the idea of God in many religions."<sup>42</sup> His core concept for the chapel centered around a box of seven bottles of light, each one representing a significant aspect of Jesuit Catholic spiritual practices.<sup>43</sup> The architectural manifestation of this concept resulted in a concrete unassuming exterior with modern light canons, and a simple interior. Daylight passing through the light canons inherits the colors of the translucent glass panels and is then reflected by walls into the space, adding a rich assortment of colored light to the off-white interior walls and ceiling.

While a simple cross marks the exterior and another unassuming cross adorns the interior, there are not many additional clues that this space is Catholic. Those who are curious will notice the room opposite the chapel entry where the blessed hosts of the Eucharist are stored. A few other features signal to visitors that this is an active Catholic congregation, but overall the feeling of the space is more ambiguous, allowing for anyone to enter the space and feel comfortable pausing for a moment's peace.

The real gem of Holl's design is actually in his well thought-out approach to the chapel interior. Outside the chapel one will notice a reflecting pool and just beyond that a grassy area. By using these two distinct exterior elements, Holl created opportunities for individuals to approach the chapel based on their own level of comfort. One might simply sit or nap on the grass whereas others might pause at the edge of the reflecting pool or by its modern bell tower. Those who wish to approach further simply follow the datum, and enter the chapel through the door. Even then there is a sizeable entry area and a ramp that leads directly into the main sanctuary space. No interior door blocks entry into the space allowing anyone to peer in without intruding on any services that may be taking place at the time. It is this approach of layered spaces that addresses the needs and requirements of the broad audience for which Holl was designing.

A final design approach remains to be discussed – that being the design of sacred space designated specifically for interfaith use. Very few noteworthy examples exist today that truly embrace the spirit of interfaith sacred space, however the design strategies employed by Office dA in their Interfaith Spiritual Center in Boston are worth discussing.

Northeastern University asked Office dA to design a space "where people of different spiritual, religious and cultural orientations may come together under one roof for prayer and reflection as well as constructive dialogue."<sup>44</sup> It should be noted that this approach to designing sacred space moves beyond creating the type of no-man's-land sacred space without denomination or clarification of purpose.<sup>45</sup> To tackle such a challenge Office dA started with



## INTERFAITH SPIRITUAL CENTER

LOCATION: Northeastern U., Boston, Massachusetts, USA

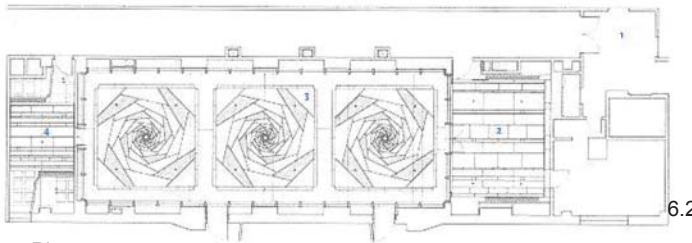
ARCHITECT: Office dA

PERIOD / DATE: Contemporary / 1998

- One main gathering space can be used for multiple types of worship and prayer
- Orientation within the space is changed by adjusting wall louvers that regulate light
- Emphasizes light and warm materiality, creating a space that feels welcoming
- Two additional rooms (one at each end of main space) can be used for additional ritual needs, or can serve as added meeting space



Main Space



Floor Plan



Interior Finishes



Main Space with Muslim Prayer Rugs

an empty rectangular room and proceeded to fill it with light and materiality, thereby generating a dynamic space for gathering. To address the needs of various groups and orientations for prayer, Office dA developed a system of translucent glass panels that are lit from behind. The lights for different walls can be turned on and off as needed.<sup>46</sup> This creates a simple but strong emphasis on the direction of prayer necessary for different groups.

The materiality in this space emphasizes how dynamic and rich shared interfaith sacred space can be. While it may not initially strike one as a sacred space, it gives the impression that something sacred could happen here.

Office dA sought to address the different support needs of various religious traditions by adding two small meeting rooms to the building, one on each end of the main space, allowing for access from one of them into the main space if necessary. They become preparatory rooms or serve smaller group gathering functions.<sup>47</sup> Although the main focus is in the large gathering space, the entire project is meant to function as a unit with the capacity to meet the needs of a wide variety of users and their events.

# A UNIVERSAL LANGUAGE OF SACRED SPACE

At first glance, these design approaches to sacred space seem rather straightforward and, with occasional overlaps, very different from each other. However if one looks deeper at the designs themselves, one finds that the approaches that the architects took to create those designs were more alike than they first appear.

Looking first to Office dA's Interfaith Spiritual Center and Steven Holl's Chapel of St. Ignatius, one finds that light was used to help draw people of different faiths together. In reality, all of the designs discussed thus far use light in very deliberate ways. Le Corbusier's monastery at La Tourette is famous for its light cannons that poke out like fingers into the grass above and direct daylight to the chapel below. Yamasaki called his synagogue the Synagogue of Light because of overwhelming use of daylight and its stained glass windows that highlight the eastern and western walls of the sanctuary. Wright flooded the sanctuary of Unity Temple with amber-tinted daylight. Ando's Church on the Water allows natural daylight to penetrate the chapel during the day and then uses dramatic lighting to highlight the crosses at night. It is undeniable that while these architects were considering (or not considering) the needs of the religious communities for which they worked, they were also concerned with the deliberate and dramatic use of light – daylight or otherwise – in their designs.

A quick survey of other religious architecture confirms that light is a distinct and important trait used in sacred space design. The ancient Egyptian worship of the Sun God, the requirements regarding lights and windows in synagogues, the emphasis that many religions place on nature and the sun, the Gothic cathedrals and their dramatic use of daylight, all of these point to this commonality in the design of sacred space, being the controlled use of light, especially daylight. But are there other shared elements in these spaces that comprise a universal language of sacred space design elements?

Again Office dA's Interfaith Spiritual Center holds a key to the answer. Aside from its use of controlled light, one of the most distinctive features of the Interfaith Spiritual Center is its use of materials. Mostly finished with wood and translucent glass panels, the space feels warm and welcoming. It is as if one is embraced by the architecture in a non-threatening way. Certainly an interfaith dialogue could be imagined taking place here. But what about the other spaces that have been discussed? Do they also share this sense of dynamic materiality, appropriate to the community's needs?

Le Corbusier, always particular in his choice of materials, used a rough grey concrete as the primary building material of Sainte Marie de la Tourette. Not a material that one might initially associate with the sacred, it creates an ominous exterior, but a contemplative interior. The plainness of the concrete shifts one's attention from the architecture itself towards something deeper. Ando uses a similar concrete approach. Left in its original form, the overabundance of concrete becomes the backdrop for something more important, which in this case is the surrounding natural beauty of the resort on which the chapel sits. As previously stated, nature itself in Japan can be very sacred. Through the deliberate use of materials, there is a distinct redirection of focus from the materiality of the space towards something more immaterial.

Steven Holl took yet another approach with his material choices. The concrete exterior of the Chapel of St. Ignatius was given a distinct exterior color and quality so as to create a warm yet unassuming feel. There is no overbearing sense of religion from this design choice, and the main wooden doors with their oval windows also do not seem that imposing. The connection between the grass, the reflecting pool, and the building is made not through using the same material repeatedly, but by through several complementary materials. As a site intended for individual spiritual exploration, a variety of materials and surfaces have been presented for consideration; it is the arrangement of this harmonious variety that ties the whole design together.

Wright's and Yamasaki's designs are much more imposing on their sites. Like a pearl hidden in an oyster shell, Wright's use of a strong concrete exterior does not clue the passerby into the sacred space that is safely tucked away



Interfaith Spiritual Center



Chapel of St. Ignatius



La Tourette, Crypt Exterior



La Tourette, Crypt Interior



North Shore Congregation Israel, Yamasaki



Unity Temple, Wright



Church on the Water, Ando

in the interior. Yamasaki's synagogue also tricks the passerby, but in a different way. The building itself sits back from the road beyond a small forest of trees. It is in fact difficult to photograph the entire exterior of the building because as one moves farther away to capture the length of its front, trees begin to block views of parts of the building. It is only at night when the building is lit from the inside that one is able to notice its monumentality.

It is evident that both Wright and Yamasaki deeply considered the materials that would be used in their designs. The deliberate use of tinted glass appears in both designs, accenting different but appropriate portions of the spaces. Both sanctuaries take on a smooth feel from the use of plaster and lightly colored painted walls. This adds to the emphasis on light in the sanctuaries, giving light its own standing as a material in the space, as with Holl's Chapel of St. Ignatius. Wright and Yamasaki also took on other materials. Wright adds deeply colored woodwork to his sanctuary and support spaces, which like the Interfaith Spiritual Center, adds a warmth to the building design. Yamasaki uses nature as part of his material palette, especially in the glass hallways where one feels very little separation from the interior to the exterior. This use of materiality clearly influences how one feels in a space, but are there other factors that contribute to this feeling?

Scale also seems to have an impact on one's experience. In fact, each architect appears to have addressed the spirituality of the individual through the use of scale. Upon walking into North Shore Congregation Israel, one is so profoundly overcome with the height and depth of the space that one wants to sit down and take in the beauty of the architecture. In contrast, entering Unity Temple's sanctuary, one almost feels too large to stand in the sanctuary and must therefore sit in order to participate in the intimacy of the space and focus on the community-centered activities it holds. This is reminiscent of the Interfaith Spiritual Center where the hanging ceiling elements and the lack of view windows seem to direct the focus of the space inward to its occupants and their activities. Not surprisingly, Le Corbusier takes a different approach by creating spaces for individuals that direct the monks away from community – tiny sleeping rooms called cells, small view windows along dark concrete hallways, minimal gathering spaces, etc. – and more towards an individual dialogue with one's maker.

Ando and Holl seem to combine all of these uses of scale. One can imagine wandering around the imposing crosses of the Church on the Water or the large reflecting pool at the Chapel of St. Ignatius, silently content with one's own thoughts, before entering the chapel areas where a more intimate space invites a



community to gather and share a moment of sacredness. Like materiality, scale also seems to determine the nature of the spiritual experience that the architect desires the occupant to have. Nevertheless, is it enough to say that light, materiality, and scale are the only things that make up the architectural palette for designers of sacred space? Or is the distinct manipulation of these elements germane to all architectural designs?

The answer to this question is two-fold. On the one hand, good architects are trained to be able to use these elements like paints on a palette – gracefully or harshly – in whatever way the situation requires. On the other hand, the architects discussed above have designed other buildings that do not seem to quite capture this feeling of sacred. In fact there seems to be something in their designs of sacred spaces that cause one to pause and take note, even for a moment and say, “There is something different here.” Those who want to look deeper and identify what it is exactly will often perceive a transition from the profaneness of the everyday world into a space set apart, a sacred space. If this is true, then what is it exactly that allows architects to set aside this space as sacred?

An obvious clue is the association of the space with some form of sacred ritual. If one goes to a building to participate in some act of the sacred, then one will be more willing to identify the space as sacred. However, there are times when one, performing the most mundane of actions, is suddenly overcome with an emotion. The architectural environment all at once demands one to consider something in the midst of the profane, to feel a passing moment of the sacred.

Clearly, not all buildings provoke this kind of a reaction. While not all buildings are intended to elicit such strong emotion, many architects do distinguish between buildings that merely supply the basic needs of shelter, and architecture that goes beyond these basic physical needs and additionally nourishes the spirit. Le Corbusier wrote:

ARCHITECTURE is a thing of art, a phenomenon of the emotions, lying outside questions of construction and beyond them. The purpose of construction is TO MAKE THINGS HOLD TOGETHER; of architecture TO MOVE US.<sup>1</sup>

It can certainly be agreed that not all architecture evokes the significant feelings about which Le Corbusier is talking. In fact, Le Corbusier would take issue with this, claiming that the buildings that do not “move us” are not to be considered architecture at all. But what if the building environment is triggering emotional responses from its users who are simply deaf to those emotions? What if the thing that differentiates sacred space from the profane



La Tourette



Church on the Water



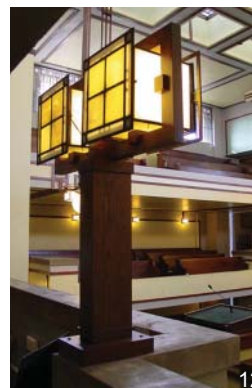
Church of St. Ignatius



Unity Temple



North Shore Congregation Israel



Unity Temple



Interfaith Spiritual Center

world is the ability of that space to move its occupants so much that they have become aware of being moved? Alain De Botton, in his discourse entitled *The Architecture of Happiness*, would seem to suggest that this is the case, at least in the way of inspiring happiness:

Architecture is perplexing, too, in how inconsistent is its capacity to generate the happiness on which its claim to our attention is founded. While an attractive building may on occasion flatter an ascending mood, there will be times when the most congenial of locations will be unable to dislodge our sadness or misanthropy.<sup>2</sup>

Perhaps sacred space has the capacity to do what de Botton says cannot be done – consistently inspire emotion regardless of the consciousness of the individual. If this is true, then what are the common traits amongst sacred spaces that allow for this to happen?

Looking back to the examples of sacred space already presented, a pattern begins to emerge. Each space in its own way appeals to the senses. Architects have gone to great pains to emphasize light, materiality, scale, and more. In fact many aspects of the sensual experience of these buildings have been accounted for in terms of the individual.

De Botton, in his discourse on happiness, identifies a disconcerting trait in humanity, which he claims is exacerbated by most of the built environment:

Our sensitivity to our surroundings may be traced back to a troubling feature of human psychology: to the way we harbour within us many different selves, not all of which feel equally like ‘us,’ so much so that in certain moods, we can complain of having come adrift from what we judge to be our true selves.

Unfortunately, the self we miss at such moments, the elusively authentic, creative and spontaneous side of our character, is not ours to summon at will. Our access to it is, to a humbling extent, determined by the places we happen to be in, by the colour of the bricks, the height of the ceilings and the layout of the streets. In a hotel room strangled by three motorways, or in a waste land of run-down tower blocks, our optimism and sense of purpose are liable to drain away, like water from a punctured container. We may start to forget that we ever had ambitions or reasons to feel spirited and hopeful.<sup>3</sup>

However, sacred space in its capacity to provoke emotions seems to be an antidote to this situation. It entreats one to pause just long enough to bring all of these portions of the self back into balance. It provides for this experience by deliberately relating to the senses. It is in this way that architecture has the capacity to shape the experience of the self.

This connection between sacred and the senses is not a phenomenon strictly related to architecture. Religious traditions themselves appeal to the senses through ritual and activity. Be it prayer, meditation, sharing a meal, or dancing, these activities seem to be “hypersensational” activities that strive to captivate the senses in order to provoke transcendence. However, while this commonality exists among religious traditions, the ways in which it is implemented are vastly different. Whereas some religious traditions require long moments of quiet contemplation, others express their sacredness through loud singing and dancing. Some shy away from the richness of scents and tastes; others thrive on them. It is this broad range of rituals and practices that architects must be prepared to enhance with their architecture.

Just like the sacred and the senses go hand in hand, it seems as if an interest in architecture relates well to a world view of religious traditions. In fact, architects are probably some of the most prepared professionals to face the daunting task of ascertaining the needs of religious traditions completely dissimilar to their own backgrounds. Architecture, as an international field, attracts people from a wide variety of ethnic origins and experiential backgrounds. Furthermore, architecture demands an education in the cultures of the world past and present as these affect and influence the architecture that has been built as well as the architecture that will be built. To be exposed to these cultures without bias allows an architect to learn to appreciate cultural differences alongside their represented architectural differences. In this way architects are trained to successfully design sacred space for the people they serve, regardless of their religious tradition.

In addition to this, many architects seem to have an underlying sense of spirituality regardless of their professed beliefs. They likewise come from a variety of religious perspectives. Yet their understanding of sacred space in design appears to be a universal one. This explains why some can find sacredness in architecture that is independent of religious affiliations. Like any artist, an architect has a story to tell and oftentimes it is one of sacredness or put more simply, something separate from the profanity of the world – something greater than the individual and altogether separate from the mundane activities of everyday life.

With this understanding, the design of interfaith sacred space need not become a battle of contradictory religious needs dictated by conflicting theological doctrines. What this discussion of different approaches to sacred space design has unearthed is the idea that there is a universal architectural language of sacred space which architects can embrace through their training and practice. If they use this language in their designs, they will have an easier time of achieving sacred architecture that is recognized as such by multiple faith traditions. Granted, the design of any sacred space requires significant research, consideration, and communication in order to ascertain client needs and discover how those needs can be met efficiently and satisfactorily. Yet architects must endow their spaces with the feeling of sacred, each through their own process, by using this universal language for sacred architecture that transcends the doctrines of different religious traditions – the language of the senses. That being said, a survey of the architectural language of each of the five senses and their contributions to sacred space would be helpful in refining the definition of this universal architectural language of the sacred.



Seeing



Touching



Hearing



Smelling and Tasting



# SEEING THE SACRED

*Sacred light connects us with a higher order of things, with the essential, with the immutable truth. Sacred light is not tied to revelation of a particular deity, or to a particular religion, or even to a typical religious place, such as a church. Rather sacred light reminds one, whenever one comes into contact with it, that a higher order exists, whatever it may be called. – Marietta Millet<sup>1</sup>*

The idea of seeing the sacred permeates many cultures past and present. In her examination of the connections between architecture and ancient Greek philosophy, Indra McEwen comments on Homer's eyes that "fill with wonder" in two ways: gazing upon a physical scene of beauty as well as viewing something that is not so physical as it is divine.<sup>2</sup> The notion of seeing physical and non-physical things ties directly into the idea of a universal language of sacred architecture. Architects make use of the visual perceptions that our eyes embrace in the physical environment and then provide for the opportunity for those perceptions to be translated into a more ethereal sense of something beyond the physical.

However, one must keep in mind that the sense of sight is probably the easiest of the senses to associate with architecture and the sacred. Pallasmaa points out that "In Western culture, sight has historically been regarded as the noblest of the senses, and thinking itself thought of in terms of seeing."<sup>3</sup> There is a distinct emphasis on vision in today's society as well as in architectural practice. Pallasmaa explains that this focus on vision in architecture is in part due to the training that architects receive, and it has only been in recent years that technology has allowed for a change in focus<sup>4</sup>. Until recently architects have been taught to graphically communicate their ideas in drawings of plans, sections, elevations, and perspectives, as well as physical models. In such a society where great importance has been placed on the ability to see – to read, to watch television and movies, to gaze upon sights of beauty, to peruse the internet – architects have made a way of life for themselves.

Many religious traditions are also visually oriented. Eck, in her study of the Hindu tradition, explains that "*darśan*, 'seeing' the divine image ... is the single most common and significant element of Hindu worship."<sup>5</sup> She goes on to say that through *darśan* not only does the believer see the gods, but they are also seen by the gods.<sup>6</sup> The sight of the physical provokes the sight of the divine.

The Judeo-Christian traditions have emphasized seeing in a different way. In past centuries when not everyone was literate, stained glass windows were used to visually communicate the biblical canon. De Botton comments that much of the intent behind Christian and Islamic architecture was to send a message or teach a lesson to believers in a "non-verbal" way, using basic objects and architecture to do so.<sup>7</sup> In fact he points out that:

A second compelling claim was made for the visual when the early theologians speculated that it might be easier to become a faithful servant of God by *looking* than by *reading*. They argued that mankind could more effectively be shaped by architecture than by scripture. Because we were creatures of sense, spiritual principles stood a better chance of fortifying our souls if we took them in via our eyes rather than via our intellect. We might learn more about humility by gazing at an arrangement of tiles than by studying the Gospels, and more about the nature of kindness in a stained-glass window than in a holy book. Spending time in beautiful spaces, far from a self-indulgent luxury, was deemed to lie at the core of the quest to become an honorable person.<sup>8</sup>

Certainly architects in western society strive to design these "beautiful spaces," becoming enthralled with the visual nature of the built environment. However this unbalanced emphasis on sight has caused some problems. The shift over centuries towards a visually-driven society has ended up estranging the individual from that society. Pallasmaa attributes these problems to the physical way in which we see:

The problems arise from the isolation of the eye outside its natural interaction with other sense modalities, and from the elimination and suppression of other senses, which increasingly reduce and restrict the experience of the world into the sphere of vision. This separation and reduction fragments the innate complexity, comprehensiveness and plasticity of the perceptual system, reinforcing a sense of detachment and alienation.<sup>9</sup>

It is as if one stands inside the body looking through a medium to the outside world.

When one does peer through this portal of the eyes, two types of information are received. Direct vision provides the clearest image of the subject upon which the eye is focused. However additional details are accumulated through peripheral vision. While not intended to provide distinct clarity, this additional visual information contributes to how one feels in a space. Pallasmaa explains how the consideration of peripheral vision in architecture – what one glimpses out of the corner of the eye while walking down the street – not only supplies important information about one's surroundings but also adds a richness to the experience – something he considers to be lacking in the modern cities of the world:<sup>10</sup> "Peripheral vision integrates us with space, while focused vision pushes us out of the space, making us mere spectators."<sup>11</sup> In fact, Pallasmaa considers peripheral vision to be the key to comfort in and integration with one's surroundings.<sup>12</sup> Perhaps a combination of the stimulation of both of these types of sight will explain how seeing sacred can be so important in architecture.

What drives the visual nature of architecture is the use of light. Without light, nothing can be seen. The question then becomes not so much to use or not use light, but more what should the quality of light be in order to enhance a universal seeing of the sacred? The prior discussion of light as an element in sacred architecture showed a variety of uses – controlled daylight, tinted glass, skylights, and the like. Perhaps it should be asked first, what is it that should not be done? Here Pallasmaa seems to have the answer. He says:

An efficient method of mental torture is the use of a constantly high level of illumination that leaves no space for mental withdrawal or privacy; even the dark interiority of self is exposed and violated.<sup>13</sup>

Certainly this is in line with the dramatic changing light of the buildings that have been discussed. Individuals struggle with light that is not dynamic.

## PANTHEON

LOCATION: Rome, Italy

ARCHITECT: unknown

PERIOD / DATE: Ancient Roman / 118 - 126

- Circular plan de-emphasizes hierarchy of focus, and allows for multiple orientations
- Oculus allows daylight to enter, giving the space a dynamic quality
- Walls contain niches of tombs, small altars, and statues
- Monumental space still used for religious rituals
- Emphasis on light and monumentality inspire silence and pause



Oculus in Roof



Exterior



Oculus during Day



Interior Daylight



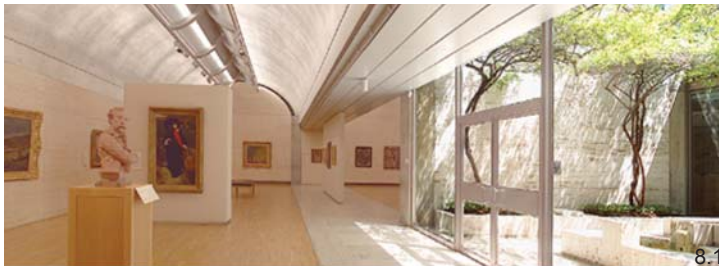
## KIMBELL ART MUSEUM

LOCATION: Fort Worth, Texas, USA

ARCHITECT: Louis Kahn

PERIOD / DATE: Modern / 1967 - 1972

- Daylight is channeled into galleries by aluminum reflectors that have been well-designed into space and serve like light fixtures
- Structure of barrel vaults also directs daylight into space
- Simple open floor plans allow for art to become focus of space, and not architecture
- Museum has been integrated with nature on the site, providing many opportunities to pause in the shade or stand in the sun



Southeast Galleries



North Portico and Reflecting Pool



South Center Gallery



Exterior

The human body is physiologically designed to react to the movement of the sun throughout the day, and the length of the days throughout the year. Just as animals hibernate all winter in the cold dark weather, people have a tendency to enter a more reflective quiet mode in the winter, when the hours of daylight are fewer, than in the summer when longer days extend the invitation to be out in the sunshine playing.

Two spaces that make excellent use of controlled daylight are the Pantheon in Rome, Italy and the Kimbell Art Museum in Fort Worth, Texas. Their use of light enhances the visual experience so that one feels as if they are seeing sacred. Architectural historian Talbot Hamlin comments on the Pantheon's impressive light quality:

The magnificent quality of the resultant simple vertical light, which seems to bathe the whole interior so evenly and yet to emphasize so forcefully the shadowed recesses of the shrines and the niches, is something no photograph or drawing can reproduce.<sup>14</sup>

This light that Hamlin is discussing enters through one large round opening in the very center of the large dome roof. Throughout the day, the light moves across the inside of the dome and the space, reminding one of the passage of time, and connecting one with the outside world. Perhaps it is this provision for reintegration with the outside world that causes the Pantheon to be seen in many ways as sacred. The simplicity in design and use of daylight create a compelling sacred space of pause, one which modernist architect Louis Kahn, acknowledged saying:

Sensitive is the Pantheon. This nondirectional room dedicated to all religions has its light only from the oculus above, placed to invest the room with inspired ritual without favoritism. The entrance door is its only impurity. So powerful was this realization of appropriate space that even now the room seems to ask for its release to its original freedom.<sup>15</sup>

As one who could appreciate the use of light in the Pantheon, it should come as no surprise that Kahn, a master of light himself, was the architect of the Kimbell Art Museum, which for him began

as an experiment in silence and light. The one iconic architectural move in the Kimbell is a barrel vaulted ceiling washed with daylight in such a way that the space is naturally lit from above leaving the pieces of art on the walls below untouched by direct sunlight. Other parts of the museum also make deliberate use of daylight; one architectural lighting consultant wrote:

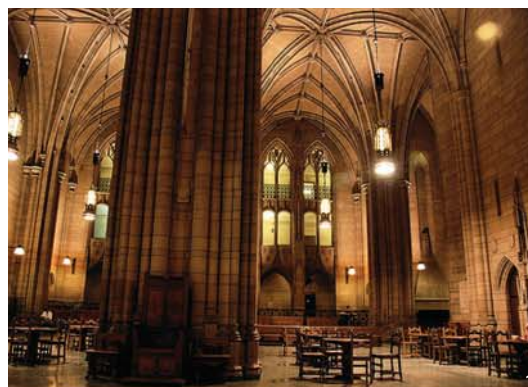
Passing through the doors in the glass wall of the entry lobby, further transition in light quality and quantity takes place. The glass wall on one side of the lobby maintains connection with the light outside, while the interior light, modeled by the building form, begins to assert itself. This light is the sacred light, the light that identifies a special place apart from the everyday world, that connects us to the unmeasurable. The sacred light emerges from the meeting of daylight and structure.<sup>16</sup>

The Pantheon and the Kimbell Art Museum both use daylight to reinforce that one is not disconnected from this visually-driven society, but instead integrated even more with it.

It is obvious then that the light that allows us to see sacred is daylight. As Kahn has asked: “How can anyone think of a building of spaces not in natural light?”<sup>17</sup> Not harsh or overbearing, the daylight should be delicately invited into the space by the architect, and then allowed to pass through the space in order to help anchor the occupants of the space in the continuity of the passage of time. The light should take on a heterogenous dynamic nature, not a strict evenness but a transitional ever-changing quality. Pallasmaa confirms this:

The imagination and daydreaming are stimulated by dim light and shadow. In order to think clearly, the sharpness of vision has to be suppressed, for thoughts travel with an absent-minded and unfocused gaze. Homogenous bright light paralyses the imagination in the same way that homogenization of space weakens the experience of being, and wipes away the sense of place. The human eye is most perfectly tuned for twilight rather than bright daylight.<sup>18</sup>

Here Pallasmaa mentions shadows in conjunction with light. What can be learned then is that the type of dynamic light that is desired in sacred space also comes with shadow; one cannot exist without the other. This is what the architects of the Gothic cathedrals discovered and emphasized in their work, creating niches of dark and light. It is through this pitting of opposites that one sees both and consequently can see both the profane and the sacred.



Cathedral of Learning, Pittsburgh, Charles Klauder



Space for Contemplation, UNESCO, Paris, Tadao Ando



Benaroya Hall, Seattle, LMN Architects



House of Shadows, Musashino, Yumi Kori

# TOUCHING THE SACRED

*I thought then that the first feeling must have been touch. When you think of it, it probably is the first feeling. Our whole sense of procreation has to do with touch. Touch desired to be so much in touch that eyesight came from touch. To see was only to touch more accurately. And then I thought that these forces within us are beautiful things, which you still can feel although they come from the most primordial, unformed kind of existence. It still is retained in you. – Louis Kahn <sup>1</sup>*

Unlike the distancing nature of sight, the sense of touch moves the occupant into an interactive role with the space. Touch becomes a convincing factor for what is visually observed: “The sense of touch has an immediacy to it. If we can touch something, we are persuaded that it is not an illusion or a hallucination but that it is very real – right here and now – like pinching yourself to see if you are dreaming.”<sup>2</sup> Touch can break the barrier between the individual and his surroundings, confirming that one is a part of what one is seeing.

Although the culture of the western world has steadily progressed towards a visually dominated society for many centuries, there is a mounting desire to return to the use of the rest of the senses, especially in the practice of architecture. The out-of-balance nature of society’s perceptions is finally starting to surface as a serious issue to be addressed. Architecture, which visually has the capacity to shape perceptions and feelings, is perhaps not just the antidote that will restore balance to the world’s uneven perceptions, but also the driving force for change:

‘We in the Western world are beginning to discover our neglected senses. This growing awareness represents something of an overdue insurgency against the painful deprivation of sensory experience we have suffered in our technologised world,’ writes the anthropologist Ashley Montagu. ‘This new awareness is forcefully projected by numerous architects around the world today who are attempting to re-sensualise architecture through a strengthened sense of materiality and hapticity, texture and weight, density of space and materialized light.’<sup>3</sup>

Those elements that an architect shapes – the size and shape of volumes, the materials of structure and finishing elements, and the thermal qualities of space – become the tools used to heighten the awareness of the individual’s sense of touch.

Just as vision that can be broken down into two types (direct and peripheral), touch can also be divided into two categories: the implied touch of the body, and the physical touch of the skin. Humans move through space, as opposed to simply observing it. When one thinks about a particular space, one will often associate the actions or events that transpired in the space with the space itself, recalling memories that are beyond visual.<sup>4</sup> There is a feeling of simply being in a space. Standing in a tall space can suggest smallness to the body, even inferiority; moving through a short space emphasizes the volume of the body itself. This is most evident to adults returning to their childhood classrooms. Spaces that seemed so big have now become tiny, causing them to feel almost cramped in rooms that were once spacious. The body “feels” the volume of a space.

Just as there is one organ for seeing, the eyes, there is another organ for touching – the skin. Pallasmaa explains that “The skin reads the texture, weight, density and temperature of matter.”<sup>5</sup> Consequently the skin is able to touch a space by feeling the materials used to cover the space. Walking across a hardwood floor will convey a different sensation to the body than a plush carpet. A coarse concrete wall will act harshly if brushed against, whereas a polished stone face will respond more kindly. Often those objects in the space that become furniture will have the most material interaction with the occupants in the space, and can simultaneously reflect (or refute) the architectural materiality of the space – providing a way for architects to add opportunities for occupants to touch the space.

However, touching the space through solid materials is not the only way the skin perceives architecture. Part of the matter that Pallasmaa is referring to above is air itself. As one interacts with a space, one moves through the air of that space, allowing the skin to perceive its thermal qualities. Exterior spaces, controlled by the whims of nature, have their own, often dynamic, conditions. On the other hand, interior spaces provide occupants with the ability to



control and temper the air of their space to varying degrees. Regardless of location, the skin perceives this physical touch of the air, causing the body to also sense the thermal qualities of that space. Consequently, if one can touch space through the implied touch of the body and the physical touch of the skin, one has the capacity to separate the sacred from the profane through sensing its perceived scale, materiality, and thermal nature.

As has been previously discussed, architects manipulate the scale of spaces depending on the situation and the needs of the occupants in the space. One must keep in mind that touch and vision are linked and that scale is first visually perceived. One looks into a space and determines its height and volumetric dimensions – its scale. However, the reaction of the body to this information is not a visual reaction, but instead one of the sense of touch. Vision helps form the body within the space, as if the architecture itself has reached out to touch the individual. The scale of the design reinforces a perceived size and location within the architecture.

Nineteenth-century author John Ruskin teaches that the eyes are somewhat misleading. They are capable of making relative assumptions about the sizes of things, however:

... the apprehension of the size of natural objects, as well as of architecture, depends more on fortunate excitement of the imagination than on measurements by the eye; and the architect has a peculiar advantage in being able to press close upon the sight such magnitude as he can command.<sup>6</sup>

Architects therefore have the power, through optical illusions, to imply spaces of greater or lesser proportion. Smaller scales often suggest more personal spaces and prompt more private interactions, whereas bigger spaces indicate the opposite – grander interactions with larger groups of people.

Which scale is more appropriate to the design of sacred space? The sacred spaces discussed earlier make use of both large and small scales successfully, which implies that both have a place in sacred architecture. The needs of the space then become the determining factors for architectural scale. Using Yamasaki's synagogue as an example, one religious architectural critic commented:

The size, or anticipated size, of a congregation obviously determines the horizontal space desired. To some extent, the number of people also influences the vertical space, or height, of a church. It is psychologically and therefore spiritually useful to have devotional 'breathing' room, as in this example [North Shore Congregation Israel image shown].<sup>7</sup>

What is interesting is that while Yamasaki certainly made use of vertical scale to satisfy the number of people using the sanctuary, Wright took a completely different approach in his design of Unity Temple, enhancing the spiritual experience of the community by creating a much shorter space that redirected the focus from something above the community to something within the community. Pallasmaa's explanation of gravity and architecture reinforce the appropriateness of Wright's design strategy:

The sense of gravity is the essence of all architectonic structures and great architecture makes us aware of gravity and earth. Architecture strengthens the experience of the vertical dimension of the world. At the same time as making us aware of the depth of the earth, it makes us dream of levitation and flight.<sup>8</sup>

The design of Unity Temple reflects the beliefs of its community. As opposed to dreaming of the heaven of this world, the members of the Unitarian Temple can contemplate the strength of their community on earth.

It is these two opposites in sacred architecture that are most contemplated through the use of scale. Large scale spaces invite the individual to focus on something greater than oneself. That greatness in the religious traditions of the world is often symbolically or physically associated with great heights. Of such grand scale Kahn said, "Monumentality in architecture may be defined as a quality, a spiritual quality inherent in a structure which conveys the feeling of its eternity, that it cannot be added to or changed."<sup>9</sup> In contrast, smaller scales provoke reflections on the ground, the earth and nature, and the depths of the soul – principles also well represented amongst the world's religious traditions. Sacred space, then, separates itself from the profane through the emphasis of great and small scales.

## GARDEN GROVE (CRYSTAL) CATHEDRAL

LOCATION: Grove City, California, USA

ARCHITECT: Philip Johnson

PERIOD / DATE: Modern / 1978 - 1980

- The monumentality of the space reminds one of an old Gothic cathedral, giving this modern church some continuity with sacred spaces of the past
- The combination of glass and white steel trusses provide an excellent building skin that lets in copious amounts of daylight
- The use of lighter steel truss adds a lightweight filigree nature to the space, as if the space itself is weightless



Exterior



Main Sanctuary

A strong example of a community sacred space that embraces Kahn's ideas of spirituality expressed as monumentality is the Garden Grove Cathedral – or Crystal Cathedral as it is often called – in Los Angeles, California. Designed by Philip Johnson in 1978, this massive church seats close to 3,000 people. Its lightweight trusses and sky-revealing glass demand one's attention upward, like the pillars and vaults of cathedrals of old after which the space was inspired. Although the main sanctuary is huge, one is not necessarily uncomfortable in such a large space since it is occupied by an equally large community; the church boasts over 10,000 members.<sup>10</sup> The vision of the church was inspired by ministry leader Dr. Robert H. Schuller who, pondering the new design, said:

I remembered how wonderful it had been at my little drive-in church (where the ministry began in 1955) where there had been no walls or ceiling—it was there I fell in love with the sky! And that's why we built the Crystal Cathedral with walls and a roof of glass-crystal-clear glass that lets the sun and sky sparkle through our wonderful sanctuary.<sup>11</sup>

In Schuller's glass sanctuary, Johnson took examples from a past architectural period and translated them into a modern design. The height of the ceiling, the structure, and miniature appearance of the seats as compared to the space, all hint at its design ancestry in the old cathedrals of Europe. The eyes are forced to drink in the space, whose grand scale cannot but remind its Christian community of their belief in the existence of a higher power.

Not only do the eyes observe the scale of a space, they also take in the materials used to define that space. Materiality has been part of the dialogue of architecture since its inception. In the past the types of materials used for construction and ornamentation were determined by the resources readily available in the surrounding locale. Today the advancements in both transportation and the test tube have exposed the architect to a seemingly endless supply of variety in materials, limited only by the



budget of the client. With such a massive palette of materials with which to work, what are those materials that assist in touching the sacred? First one needs to understand how materiality in a space can contribute to how one touches that space.

The materiality of a space helps bridge the gap between the senses of sight and touch. Unlike scale that is simply viewed, materiality allows both the eyes and the skin to touch and be touched. One can visually observe the texture and color of the materials that make up the space; one can also run a hand along a polished surface or sit in a soft cushioned chair. Although it is easy to separate this information into two categories, the value of this sensory knowledge lies in its related and interconnected nature. One viewing a bumpy surface will also sense bumps by touching it. In fact, when this information does not match up, one often feels tricked by the material. Therefore, any consideration of the materiality of sacred space must address both visual and tactile perceptions of the materials used.

So what materials lend well to the design of sacred space? In a series in *The Architectural Record* in 1928, Wright discussed his thoughts on materials and their uses and meanings in architecture. While his discussion focused primarily on the different ways that materials can be used, highlighting each with examples in art, architecture, furniture design, and the like, the underlying tone of his message is more about the impact that these materials have on the inhabitants of the architecture—the impact physically and spiritually:

Each material has its own message and, to the creative artist, its own song. Listening, he may learn to make two sing together in the service of man or separately as he may choose. A trio? Perhaps. It is easier to use them solo or in duet than manifold. The solo is more easily mastered than the orchestral score. Therefore, it is well to work with a limited palette and more imagination, than it is to work with less imagination and more palette. So—work wherever possible in mono-material, except where the use of sympathetic extra-materials may add the necessary grace or graceful necessity desirable—or unavoidable. Each material *speaks a language* of its own just as line and color speak—or perhaps because they do speak. Each has a story.”<sup>12</sup>

What Wright was attempting to communicate was the sense that a material and its uses are interrelated and that an architect therefore has an opportunity to choose appropriate materials based on the needs and functions of a space. Instead of random selection, architectural materiality demands the intent to select materials that will have the appropriate impact on the human spirit.<sup>13</sup>

Pallasmaa points out that, in order to help individuals become more aware of their surroundings, one must make those surroundings more real – using materials in a form that engages the senses of vision and touch. However, with the advent of “faux” materials, the architecture profession has disagreed about the role of those materials in architecture. Some support their use, asserting that these simulated materials provide many people and spaces with an elegance that would otherwise be beyond financial reach. Others, in staunch resistance to this, advocate a “truthful” architecture. Pallasmaa for instance says, “Natural materials – stone, brick and wood – allow our vision to penetrate their surfaces and enable us to become convinced of the veracity of matter.”<sup>14</sup> Ruskin also agrees: “Leave your walls as bare as a planed board, or build them of baked mud and chopped straw if need be; but do not rough-cast them with falsehood.”<sup>15</sup> Certainly if this was the belief of every architect and builder, the world would be devoid of faux materials. On the contrary, many buildings, including religious spaces, embrace these materials in order to convey richness, luxury, or some other quality that would be unobtainable otherwise due to money and means.

What materials, then, is a designer of sacred space to choose? In the world of religious architecture, as with all architecture, there exists a plethora of examples of materials and their uses, often the selections of which were dependent on client preference, architect methodology, programmatic needs, construction feasibility, and cost. Perhaps then the focus should not be so much about which materials should be used to assist in touching the sacred, but instead about how those materials provide occupants to touch the sacred.

In many instances, architects anticipate that their buildings will be physically touched and explored by the skin as well as the eyes. Through this tactile expression the architect can provide a more complete experience to its occupant. One does not simply walk into a cathedral, but is drawn to embrace it physically – to sit in a pew, or to

## VIETNAM VETERANS MEMORIAL

LOCATION: Washington DC, USA

ARCHITECT: Maya Lin

PERIOD / DATE: Modern / 1982

- Engraved black stone invites one to touch it; it gains its spiritual nature from the names listed on it
- Example of a space where people can pass by or pause because it has been designed with both in mind – the walkway is wide enough to accommodate people stopped in thought and those walking past simultaneously
- Uses changes in walkway textures
- Placing the memorial on axis with the Washington Monument reinforces its significance and its connection to American history



Aerial View



Making a Rubbing



The Names



Memorial at Night

reach out and touch its pillars, as if they too have something to say. Pallasmaa clearly articulates this urge to embrace architecture through the sense of touch: “When entering the magnificent outdoor space of Louis Kahn’s Salk Institute in La Jolla, California, I felt an irresistible temptation to walk directly to the concrete wall and touch the velvety smoothness and temperature of its skin.”<sup>16</sup> Many buildings, through their materiality, have the opportunity to inspire not just a visual observation but a tactile encounter.

One such exterior space that begs this sort of tactile connection is the Vietnam Veterans Memorial in Washington DC, designed by Maya Lin. The highly polished dark stone panels engraved with the names of American soldiers invite visitors to not simply view, but touch their names and all at once become a part of their death, and their life. The memorial takes on a sacred feeling by provoking this sort of pause. One is almost overpowered by its meaning, expressed in its simple design and materiality – one long walkway along one long black stone – which one connects to through physical touch.

Another example of a space that provokes both a visual and a tactile interaction is the Kresge (MIT) Chapel. Its simple brick exterior looks ominous and uninviting, and the main entrance consists of a simple small foyer with a low ceiling. Yet if one is able to move past these features into the main sanctuary, the eye is instantly greeted with a tall captivating sight. Undulating brick walls with some bricks offset from their courses convey the impression not of smoothness, but of a gentle roughness. A hanging sculpture under the light well above the altar mimics the pattern in the walls by using small rectangular pieces of metal to reflect sunlight into the sanctuary, giving the light itself a tangible waterfall-like quality. A smooth wooden bench lines the edges of the walls, adding a third material to the space.<sup>17</sup> One desires to reach out and touch the space, however, the architecture, through its vivid use of materials has already reached out to touch the individual. It is as if by seeing the space, one can

already feel it – assured that if one were to touch the space, the sense of touch would confirm what the eyes have beheld.

Some see touch as only being associated with the materiality of the space. Touch also has to do with the air that passes across the skin, and the qualities that it bares: temperature, humidity, etc. In her book entitled *Thermal Delight in Architecture*, Lisa Heschong relates a startling but true fact: “Life exists within a small range of temperatures.”<sup>18</sup> With society’s advancements in clothing, building materials, and mechanical systems, one rarely considers how much effort has been placed into maintaining this temperature range for human life in a wide variety of climates throughout the world. Yet the human body can die if its internal temperature changes even a few degrees. It is therefore important to consider the internal temperature of any building. Is there a thermal quality of a space that increases the ability of its occupants to touch the sacred?

Perhaps something can be learned from the body’s reactions to temperature. Heschong explains that:

When we get cold, our muscles tense up, trying to generate more heat, and capillaries at the skin’s surface constrict. These physiological responses leave us feeling tense and numb. Places that seem warm offer an antidote to the tension and numbness with things that are comforting and soothing: a soft, flowing light; the deep plush of a velvet chair; or the low, resonant notes of a blues song.<sup>19</sup>

Often the term cold can also be used to describe one’s personality, referring to a distant unwelcoming presence, like the uninviting nature of a cold room. Touching the sacred often requires the ability to open up, even if it is simply to oneself. However, as Heschong points out, some climates are too warm, which also provoke negative physiological reactions:

When we are overheated we often need the opposite antidote. The heat makes us lethargic and slow-witted. Any action requires too much effort. There is delight, then, to be had in things that provide a little liveliness for us, like the splashing of a fountain... A hot day, however, can also be stressful because

## KRESGE (MIT) CHAPEL

LOCATION: MIT, Cambridge, Massachusetts, USA

ARCHITECT: Eero Saarinen

PERIOD / DATE: Modern / 1955

- Simple materials are used in a dynamic way to create sacred space
- Natural elements, such as light and water, also become dynamic materials in the space
- Variety is not just in materiality but also in the way that the materials are presented to the occupant (texture, layout, etc)
- Architecture has subtle and overt variations: brick can be smooth and define curved walls, yet offset bricks add texture
- Space reaches out to touch occupants



Main Sanctuary



Exterior



Undulating Wall



Hanging Sculpture Detail



it overstimulates. The sun can be too bright, glinting off of every surface, accompanied by an inescapable dry wind that exhausts the nerves. The antidote then is not something that moves and sparkles but a deep, quiet coolness, a place to retreat from the sun and rest in peace.<sup>20</sup>

It is interesting to note that a hot-headed person is often angry, emotionally explosive, and frustrated by the world at large. Sometimes physical heat can aggravate as opposed to comfort. If both extremes can provoke negative reactions, it would stand to reason that a balanced thermal environment would be preferred for sacred space. However, this idea of a balanced climate has already created problems for people:

In America our tendency has been to get away from thermal conditions as a determinant of behavior. Instead, we have used our technology to keep entire living and working complexes at a uniformly comfortable temperature. As a result, our spatial habits have become diffused, and activities that were once localized by thermal conditions have spread out over a whole house or building. We forget, unless the system breaks down, that such wide-ranging use of space is extremely dependent upon the available heating and cooling equipment.<sup>21</sup>

What Heschong means is that function helps determine thermal needs. Spaces that house calm sitting activities, such as offices, will need to be warmer to comfort the sedentary body whereas spaces of high physical activity, like gymnasiums, require a much cooler atmosphere to ensure that occupants do not overheat. So what activities should be anticipated then in the design of sacred space?

Many forms of prayer, worship, and meditation amongst religious traditions are sedentary. People sit in contemplation of their beliefs, or to listen to someone speak. Some religious rituals require more movement, such as a combination of standing, sitting, kneeling, and bowing. All of these activities would probably be satisfied by a similar type of thermal climate, erring on the side of stationary comfort. However, many religious rituals are very active, involving walking, dancing, marching, etc. These activities would be better served by a thermal atmosphere more catered to the needs of active occupants.

Other considerations include the age, sex, and comfort levels generated by the climate of the occupants, as well as their personal preferences. As people get older, it becomes harder for their metabolism to keep them warm. Men and women also have slightly different thermal needs. The environmental climate of the individual also forces the body to adapt and adjust.<sup>22</sup> This is why people living in warm climates get very cold when visiting cold environments – much more so than the native inhabitants of those cold climates. Keeping this in mind, one must remember that thermal comfort is biased and relative to the individual. Everyone is different and will prefer a specific and often slightly different thermal experience.

If this is true, how then can the thermal quality of a space assist one in touching the sacred? Heschong explains that shifts in the thermal environment trigger an appreciation for that environment:

One factor that can help us to appreciate the thermal function of a place or object is variability. We are more likely to notice the function of something if there are times when it is not in operation, to notice the significance of something's presence if there are times when it is not there.<sup>23</sup>

In addition to this, she clarifies that changes in the thermal environment of a space need not be extreme to be noticeable because:

... experiments have shown that a person can consistently distinguish not only between such levels as warm versus slightly warm but even such small differences as 4.2 (not entirely comfortable, but definitely not slightly warm) or 4.7 (less than slightly warm, but definitely not comfortable). While every person has his or her own scale, each individual is remarkably consistent. Similarly, studies have shown that people can sense very small gradations in the radiant temperature.<sup>24</sup>

Although this vast range of options for thermal qualities exists, some basic design criteria can be surmised. The thermal qualities of sacred space must help relieve any stress of the surrounding environment – providing warmth from the cold or shelter from the heat – as well as accommodate the activities taking place in the space. In addition to this, sacred space must be prepared to provide a small range of thermal microclimates to allow individuals to



choose the area in which they desire to touch the sacred. As Heschong states:

we tend to cherish the things that have provided us with warmth or coolness just when we needed or wanted it. ... They are rather like old friends who have done us a good turn over and over again.<sup>25</sup>

Space that allows one to touch the sacred should be like this: providing for thermal needs in the way a good friend provides for emotional needs.

A community space that contains this type of thermal comfort is the Salish – Pend d'Oreille Longhouse on the Flathead Reservation in Montana. Upon entering the moderately-sized space on a crisp winter day, one is surprised by its visual and tangible warmth. Even when entirely devoid of people and furniture, one can still imagine a New Year's Jump Dance Celebration or a mourning wake for the community taking place in the calm room. Despite the harsh cold climate, it is a thermally comfortable space, of moderate height and simple materials, the combination of which allow even an outsider to touch for a moment the spiritual nature of the people who regularly use the space.

## SALISH – PEND D'OREILLE LONGHOUSE

LOCATION: Flathead Reservation, St. Ignatius, Montana, USA

ARCHITECT: unknown

PERIOD / DATE: 1988

- Amount of daylight is increased by light-colored materials that bounce daylight from the windows farther into the space
- Contemporary design is partly based on original Salish longhouse, but does not feel like a cheap replica
- Ceiling is higher than a typical house or office to accommodate for the large amounts of people that gather here
- Photographs of deceased tribal members line the walls, inspiring reverence and anchoring connection to community and history



Main Gathering Space



Painting of Tribal Member



Photos of Tribal Members

## HEARING THE SACRED

*Music and silence—how I detest them both! How thankful we should be that ever since Our Father entered Hell—though longer ago than humans, reckoning in light years, could express—no square inch of infernal space and no moment of infernal time has been surrendered to either of those abominable forces, but all has been occupied by Noise—Noise, the grand dynamism, the audible expression of all that is exultant, ruthless and virile—Noise which alone defends us from silly qualms, despairing scruples and impossible desires. We will make the whole universe a noise in the end. We have already made great strides in the direction as regards the Earth. The melodies and silences of Heaven will be shouted down in the end. But I admit we are not yet loud enough, or anything like it. – Uncle Screwtape in The Screwtape Letters<sup>1</sup>*

Unlike seeing and touching, hearing is an inward sense. The medium of air must physically vibrate something inside the ear in order to produce what is recognized as different sounds. This means that sound can be much more intrusive than elements like light and heat. Because of this, hearing the sacred requires a different perception of architecture all together. Pallasmaa explains:

Hearing structures and articulates the experience and understanding of space. We are not normally aware of the significance of hearing in spatial experience, although the sound often provides the temporal continuum in which visual impressions are embedded. When the soundtrack is removed from a film, for instance, the scene loses its plasticity and sense of continuity and life. Silent film, indeed, had to compensate for the lack of sound by a demonstrative manner of overacting.<sup>2</sup>

What Pallasmaa is expressing is that sound provides more information about the spaces one inhabits. Without that sound, even an appropriate silence, one might feel lost. An all-too-quiet street at night, or a calming before the storm both signal that something is amiss. What does this say then about hearing the sacred?

One must first understand that the past several decades have transformed how and what society hears. Whereas centuries ago people were accustomed to silence, radio, television, movies, portable CD players, iPods, and the like all bombard the individual with an almost perpetual sound of music or talking. One becomes accustomed to tuning out sounds as they are everywhere – malls, grocery stores, cars, etc. What is needed is not necessarily more sound or complete silence, but sound and silence with purpose and intent.

As C.S. Lewis points out in the beginning of this section, there are several types of sound; “noise” is simply unwanted sound in a space. While most identify noise as some sort of uncomfortable sound, it can be any sound, even a beautiful one, in an inappropriate place that disturbs the setting and activity. Obviously such sounds as music, speech, and silence are suitable in appropriate instances and consequently, all of these have a place in architecture.

Pallasmaa explains that any sound can fill the volume of a space:

Anyone who has become entranced by the sound of dripping water in the darkness of a ruin can attest to the extraordinary capacity of the ear to carve a volume into the void of darkness. The space traced by the ear in the darkness becomes a cavity sculpted directly in the interior of the mind.<sup>3</sup>

Although it is the responsibility of the architect to mold this cavity, this can be neglected. People do not see sound, nor are they able to directly visualize the impacts of a space on sound. Acoustical engineers are trained to listen and observe as well as use computer programs to determine if the materials, size, and shape of a space will suit the space’s acoustical needs. However these are all things that an architect can and should be aware of early in the design process in order to avoid major problems as the design progresses and is built.

This awareness of architectural acoustics is even more critical in the design of sacred space. Religious spaces are famous for their good acoustics regardless of their size and prominence, but one should keep in mind that they often

must serve a variety of acoustical needs. Since acoustically comfortable spaces are designed according to purpose, a room for a lecturer will have different acoustical properties from those of a symphonic hall or an office space. Speech and music have rather different acoustical requisites, making the design of sacred space not an easy task since many religious traditions require a combination of both in their rituals and practices. This increases the complexity of the acoustical needs of many sacred space designs, depending on the rituals and traditions practiced by the community.

How then does one design sacred space in order to facilitate the hearing of the sacred? First the ways in which people practice rituals, and consequently hear the sacred, should be understood. Some religious communities use singing or chanting for prayer, others hear lecturers or recite prayers, some sit in silence, others dance – all of which require specific acoustical considerations. In addition to this people practice their individual spirituality in an equally large variety of acoustical ways, however the most common is silence. Like Kahn who linked silence and light in architecture, Pallasmaa sees silence as a necessary component of space that provokes pause:

The silence of architecture is a responsive, remembering silence. A powerful architectural experience silences all external noise; it focuses our attention on our very existence, and as with all art, it makes us aware of our fundamental solitude.<sup>4</sup>

If silence is the only sound that inspires this sort of introspection, one might conclude that it is the only sound one should anticipate hearing in sacred space. However, this would not account for the myriad of sacred spaces that have been designed, not for silence, but so that voice and music can be heard in whatever form is necessary for ritual practice. Evidently the sacred can be heard in a wide variety of ways. The acoustical requirements are therefore not based on any particular sound, but on the activities that will take

## LE THORONET ABBEY

LOCATION: Provence, France

PERIOD / DATE: circa 1200

- Designed to be sparse visually, but rich acoustically
- Daylit spaces enhance the dynamic acoustical nature
- Strong scenario for vocal acoustics was created using ancient proportional understanding of geometry and volume
- Daylight entering parts of the abbey also inspires moments of pause and reflection



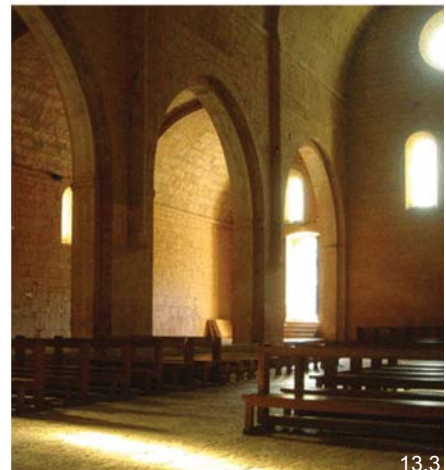
13.1

Exterior



13.2

Walkway



13.3

Main Sanctuary

place in the space.

One architectural example that clearly shows a preference for meeting acoustical needs is the Cistercian Abbey of Le Thoronet in southern France. Although the building itself is rather bare in visual ornamentation, it was acoustically designed for a group of Cistercian monks who had taken vows of silence, only chanting together in prayer a few times a day.<sup>5</sup> The sanctuary and the abbey at large were designed for the sound of the human voice to accommodate the monks' chanting – but how well they were designed! In an article entitled "Geometry at the Service of Prayer: Reflections on Cistercian Mystic Architecture," author Robert Lawlor describes two of his visits to the abbey:

... The eye does not see what causes the intense change of mind and body. But something compels one to listen, and the ear resonates. This enclosure had been constructed upon a precise, almost uncanny acoustical knowledge. Here each sound, even a pin dropped at the end of the nave some 40 meters away, generates a full range of harmonic overtones producing the mysterious character of a heavenly choir.

My second visit ... I attended a concert of madrigal singing. ... As I listened to the music, I understood why St. Bernard, founder of the Cistercian movement, insisted on vaulted chambers built to relatively small scale. Their size undoubtedly had been determined as the perfect acoustical volume to enhance the human voice. A number of abbeys from the period still stand... but the Thoronet Abbey is considered the most typical and purest example of twelfth century Cistercian monastic architecture.<sup>6</sup>

From Lawlor's descriptions it seems as if the abbey was designed almost in anticipation of the moments that the monks would fill it with harmonious chanting. This spiritual focus on hearing the sacred through chanting and silences is fundamental to the principles of the Cistercian monks. St. Bernard, one of the founders of the order, wrote:

... in matters of faith, and in order to know the truth, the hearing is superior to vision... You must know that the Holy Spirit, in order to cause a soul to advance in spirituality... educates the hearing before coming to the vision. *Listen, my child*, he says, *and see*. Why do you strain to see? It is necessary to lend the ear. The hearing, moreover, will restore vision to us, if our attention is pious, faithful and vigilant. Only the hearing attains to truth because it perceives the Verb. And thus one must awaken the hearing and train it to receive the truth.<sup>7</sup>

Unlike Le Corbusier's failure to recognize the social nature of the Dominican monks for which he was designing, the unknown architect of the Le Thoronet Abbey accurately grasped the needs of the Cistercian monks – being primarily acoustical, specifically related to the sound of silence and the human voice:

A Cistercian monk passes most of each day in silence. The times when he does utter acquire extra significance in consequence. The acoustics at Le Thoronet, with its extraordinarily protracted reverberation, dictates a particular style and discipline of singing. Singers must sing slowly and in perfect unison. Comply, and the effect is ethereally beautiful. Deviate only a little in either respect, and the consequence is acoustic chaos.<sup>8</sup>

Lawlor explains that the reason for the abbey's acoustical success lies in its construction based on the golden section and other acoustical geometric proportions, which make the abbey both visually and acoustically pleasing.<sup>9</sup> While the golden section has not been discussed here, this hints at an underlying idea of sacred space – that all of the components work together geometrically in harmony and that there is more to sacred space than the simple placement of four walls, a roof, and a floor. In many cases the design and construction of architecture, especially sacred architecture, was a science as much as it was an art centuries ago.

Lawlor comments that the abbey not only suited all of the monks' acoustical requirements, but also seemed to provide nourishment for their souls:

Every moment of their life was directed by a discipline based not upon self-denial and impoverished austerity for its own sake, but rather aimed at elevating the physical, as well as the mental and emotional life. A highly sensitive psychological state was achieved in which the harmonious chanting would activate the body's chakras, and indeed affect the very cells. Sound thus becomes nutritive; it is objectively 'food,' charging the body with the energy of universal harmonies. This is the purpose of 'sacred space.'<sup>10</sup>



Understanding that the monks ate and slept very little, it is plausible to think that they were indeed “living on” the sound of silence and chanting.

Other architectural spaces generate a similar acoustical awe – concert halls, cathedrals, etc. So once again the question becomes what moves these spaces beyond simply pleasurable hearing to hearing the sacred? Some might say that it is the nature of what is actually heard in the space that generates this feeling of hearing the sacred. Others would argue that the other senses combined with hearing all contribute to sensing the sacred. Certainly context has a lot to do with hearing the sacred – what is one listening to and why – reinforcing that the architect always has a responsibility to design for good acoustics in any space, regardless of its classification as sacred or not. If the space is not designed well acoustically, the sounds of the space can turn into noise that is distracting to the occupants. In sacred space, distractions should be minimized, meaning that the acoustical needs of the activities taking place in the space must be discerned and thoughtfully considered in the design process.



Oriental Arts Center, Shanghai, Paul Andreu



Heinz Chapel, Pittsburgh, Charles Klauder



Organ Pipes



Sacred Bells

# SMELLING THE SACRED

*If fragrance is a vehicle for the divine, then God is a dispenser of essences (and existences), the sacred is scented, and its places are impregnated with odors. Leaving one's body and being transported into the hereafter by a perfume is a positive sign for any culture or religion, whether it be by incense, candles, wreathes of flowers, or the sandalwood branches used for traditional cremations. – Anna Barbara and Anthony Perliss<sup>1</sup>*

While the senses of sight, touch, and hearing can easily be discussed in terms of architectural design, one might struggle to see how the sense of smell – let alone smelling the sacred – connects to building design. It is here that it appears architecture has begun to lose its connection to the senses. Pallasmaa observes that:

There is no doubt that our technological culture has ordered and separated the senses even more distinctly. Vision and hearing are now the privileged sociable senses, whereas the other three are considered as archaic sensory remnants with a merely private function, and they are usually suppressed by the code of culture. Only sensations such as the olfactory enjoyment of a meal, fragrance of flowers and responses to temperature are allowed to draw collective awareness in our ocularcentric and obsessively hygienic code of culture.<sup>2</sup>

As it has been clearly shown with the sense of touch, this is not entirely true. Society does pay less attention to certain senses, but entire industries are still built around the use of those senses. Such is the case with the perfume or culinary industries and our sense of smell.

While architecture may not have an apparent connection to the sense of smell, religious traditions have a long history of using certain scents and odors for particular rituals and purposes. In *Invisible Architecture* Anna Barbara and Anthony Perliss explain:

The history of religious sites is steeped in a mixture of purifying the scents and cadaverous stench, of heaven and earth, of ecstasy and horror, of ascension and inhumation, of sublimation (the upper reaches, heaven, the balsamic) and decomposition (the lower reaches, the grave, the underground, hell). The olfactory compositions of these sacred sites have never been random. We might consider them to be bona fide invisible architectures superimposed forcefully and intentionally over the formal, luminous, and acoustic ones. Their purpose was to serve as an emotional guide for the faithful in order to psychologically condition them and orient their participation.<sup>3</sup>

Pondering this idea of invisible pockets of space, one can begin to see the connections between architecture and smells. Images from the Harvard Design Exhibition entitled “Immaterial/Ultramaterial” help clarify this interrelatedness and how these two seemingly dissimilar subjects work together to impact the individual. Their images show how odors create invisible boundaries in spaces, around humans, and around spaces themselves. They can be mixed, but often when mixed lose their potency and influence on the individual. Pallasmaa explains that an odor will be detected by the olfactory system if eight or more molecules of that scent are present in the air. In addition to this, the physical body has the capacity to distinguish between over 10,000 unique smells.<sup>4</sup> If the sense of smell is so keen, it is curious to note that after time unless an odor is excessively perpetuated, it will fade and blend into the background. One can become desensitized rather quickly to odors, meaning that odors themselves have the most impact when either an individual has entered a space containing a particular scent, or a particular scent is introduced into the space. The exception to this principle is when the odor is so overpowering, one is perpetually smelling it.

While there is a time factor associated with odors, the sense of smell itself is, as Pallasmaa points out, strongly associated with memory. He says that:

A particular smell makes us unknowingly re-enter a space completely forgotten by the retinal memory; the nostrils awaken a forgotten image, and we are enticed to enter a vivid daydream.<sup>5</sup>

Like the acoustics of a space, the smells of a space often go unseen. However they have a capacity to remind us of

events and places from the past, regardless of the amount of time that has transpired since those events. This means that certain smells can move one into modes of pause and reflection. The question then becomes: are there particular smells that remind one of the sacred?

When pondering the smells associated with religious traditions, one that immediately comes to mind is incense. Common in both eastern and western religious traditions, incense is often associated with ideas of purification. Barbara and Perliss explain the origins of the word “perfume” and its uses, connecting it with fumigation. “Fumigate” they say, “was a synonym for ‘purify’, both in religious and in the hygienic sense of the word, and this practice soon expanded from the temples into the homes.”<sup>6</sup> Not all smells were pleasant ones, and in some religious traditions, bad smells were associated with evil, as in the Christian religious tradition.<sup>7</sup> The use of incense became a way of cleansing bad places and replacing “evil” smells with “holy” ones.

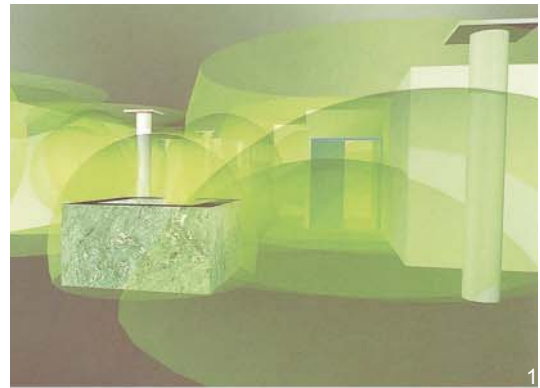
Some scents have become connected with ideas of humanity and the earth, while others are associated with a spiritual nature and the divine. In religious architecture, smells of dirt and dust, or dampness call to mind images of crypts and tombs, whereas flowers and scented candles might remind one of a religious service or ritual to celebrate life. Even the odors of certain foods may remind one of a celebratory meal shared at a religious event. Each religious tradition is different and consequently has a unique set of scents associated with it. If, like materiality, there is such a plethora of scents associated with the sacred, what can architects do to assist in the facilitation of smelling the sacred?

Some ancient structures provide a few answers. Barbara and Perliss explain that:

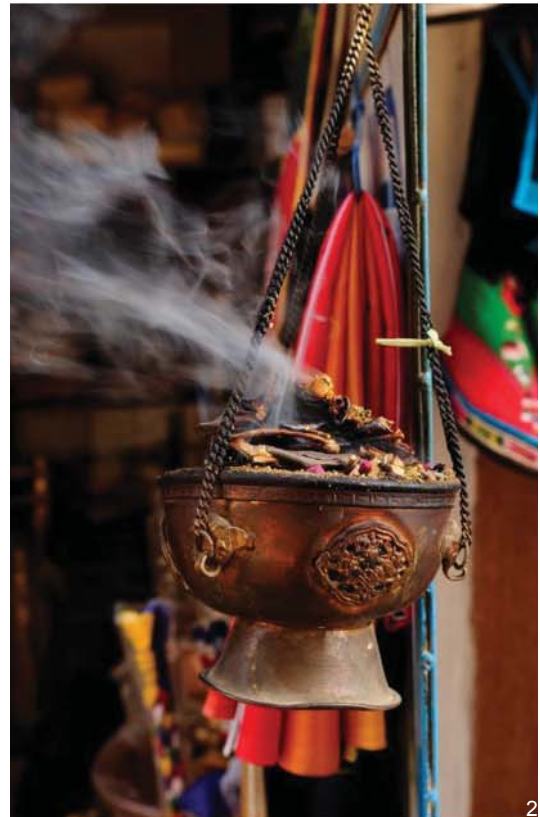
The odor of a place, the odor of a building, derives from a combination of natural, iconic, artificial, and human odors found in the space under consideration. Natural odors are associated with climate, region, orientation, pressure, relative humidity, and air temperature. Iconic odors are those deriving from the materials used, from the typical ingredients of the place. Artificial odors are due to the forced introduction of odorous elements of another nature. Human odors are associated with odors of people, but also with what is done in the place, the odor of the clothing that people wear there.

In addition to the odors released by the materials themselves, odor was incorporated into oils or waxes to embellish and preserve surfaces, and also mixed into construction mortar as in the Babylonian temples and in mosques.<sup>8</sup>

Barbara and Perliss go on to say that other scents were also added in the construction of the buildings so that the odors could



Odors as Pockets of Space



Nepali Incense Burner



Ceremonial Incense



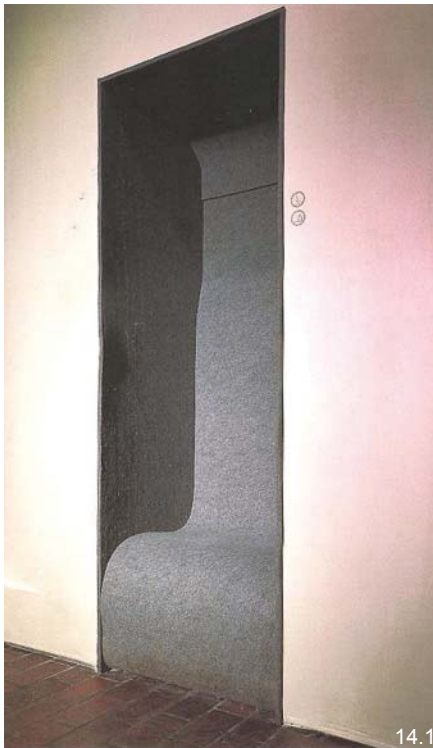
## IMMATERIAL/ULTRAMATERIAL SMELLING

LOCATION: Harvard Design School, Boston, Massachusetts, USA

ARCHITECT: Student Mette Aamodt with Prof. Toshiko Mori

PERIOD / DATE: Contemporary / 2001

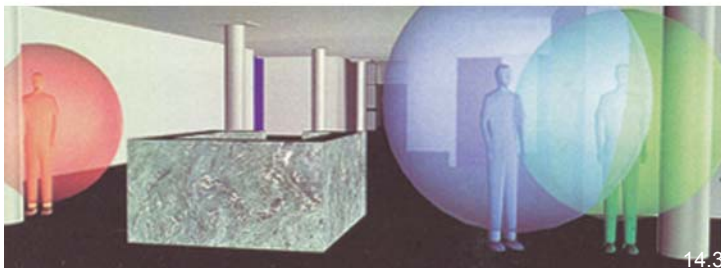
- Student created a calming niche in a wall by adding smell of lilac to the fabric of the cushioned seat and fabric walls
- Soft calming light was also used to enhance the experience
- While the niche might look interesting as an exhibit, it is too exposed along the pathway and consequently lacks sacrality
- Niche appears forced



The Niche



The Experience



Pockets of Odors in Space

be released by the heat of the sun. The mosques of Harar in Ethiopia are an example of this.<sup>9</sup>

However, these Babylonian structures were not the only buildings to make use of scented materials. Sandalwood is also a common building material, well-known for its rich perpetuating smell; one architectural instance – a set of temple doors at the Somnath Temple in India – still has a sandalwood scent after 2,000 years.<sup>10</sup> However, these ancient instances of scented materials are not the only uses of scents in architecture.

In the Harvard School of Design exhibition, “Immaterial/Ultramaterial”, Professor Toshiko Mori and others explored, among other things, the impact of materiality on the senses. Under the premise that our technological virtual world is removing a connection to the senses for us, they worked to find and create materials that not only pushed the boundaries of material properties, but also interacted and integrated with the human senses in an active way.<sup>11</sup> Student Mette Aamodt explored how a physical scenario could impact those who used the space with the power of smell associations. To create such a space, Aamodt made a wall niche in which a chair for pausing and resting was placed. The chair was then scented with lilac oil. The chair and the lighting were designed to enhance the smell of lilacs through odor-absorbing materials and purple light. Aamodt had this to say of the experiment:

The seat provided a resting place where a person could pause and take time to experience the scent in the felt walls of the niche. Some people recognized the smell as lilac, a flower commonly found in New England in the spring, but many could only say what they were reminded of. In this private space, one was free to recall memories and make associations, or, at the very least, relax and be comfortable. The unusual appearance of this smell in late winter, would, I hoped, have the effect of triggering memories that would transport people for an instant—to another place, another time, another season—and collapse the two episodes, giving greater perceptual depth to the space.<sup>12</sup>

Aamodt's experiment suggests that perhaps not even having a specific scent in a sacred



space is as important as simply having one. It is hoped that the scent chosen will suggest to the memory of the individual an instance from the past that was peaceful, calming, and spiritual. The issue arises when a typically calming smell, such as the lilac scent Aamodt used, becomes associated with a horrible memory, such as feeling sick. As is common for many people, sickness and smells can become associated all too quickly. Recognizing that one cannot design sacred space to please all, perhaps some form of space that incorporated a variety of harmonious smells, or even allowed the occupant at the time to choose from a small selection of different scents, would help create opportunities for pausing to smell the sacred. In regards to community rituals, providing for ways to maintain ritual scents, as well as remove the odors at the conclusion of gatherings, is also important.

Another option would be to do as Aamodt did, and add visible signals, such as color and lighting, to alert the occupant, however subtly, that they are approaching an area to pause and smell the sacred. This would be a somewhat revolutionary idea about scents in today's society. Aamodt's discussion of historical references to the sense of smell in the exhibit shows that in the past many have associated smell with an animalistic nature as opposed to a spiritual nature. The Modern Movement attempted to distance itself from these animal associations by using the color white to create spaces that one could associate with a higher mind idea.<sup>13</sup> Perhaps as hospitals have moved towards pastel colors to achieve a calmer atmosphere for their patients, society as a whole can begin to incorporate natural, calming scents into architectural spaces. Aamodt agrees:

Smell can be used to imbue richness to surfaces, to define zones and boundaries, and to create powerful associations that can give greater meaning to spaces and buildings. Babylonian temples smelled sweet from the perfume used in their mortar; why do our concrete monuments only smell of Portland cement?"<sup>14</sup>

Perhaps those spaces that are strongly associated with meaning and memory, especially sacred spaces, can also become associated with scents that help preserve and trigger those memories.



Ritual Candles



The Smell of the Earth



Ceremonial Smoke



Lilacs

# TASTING THE SACRED

*When poets write about food it is usually celebratory. Food as the thing-in-itself, but also the thoughtful preparation of meals, the serving of meals, meals communally shared: a sense of the sacred in the profane. -- Joyce Carol Oates<sup>1</sup>*

Taste is one of the most intimate senses, yet probably one of the hardest senses to associate with architecture. One must literally put something into the body – into the mouth – to activate the sense of taste. Initially, one would hope that the only architectural encounter with the sense of taste would be in the form of a spectacular gingerbread house. However, there are more connections between taste and architecture than one originally might surmise.

When the sense of taste is considered, images of food and drink come to mind accompanied by the circumstances and settings surrounding the food and drink – a family dinner shared at home, a date in an upscale restaurant, a birthday party at a favorite bar. These settings provide the architectural link to the sense of taste. Recalling the architectural spaces of these taste experiences, one will most likely find that they all contain a level of warmth and an alleviation from the concerns of the day. Author Karen Franck, in her book *The Space of Food*, attributes this in part to the calming nature that food seems to have on the surrounding environment:

The presence of food and the anticipation of eating seem to create an atmosphere of comfort and informality, a softening of the situation, encouraging participants to feel more relaxed and to enjoy themselves, even if they are alone. ... perhaps it is for this reason, as well as the sensory stimulation of food, that public places of refreshment serve as places of inspiration.<sup>2</sup>

Similarly, architects in the field of restaurant design strive to spatially create a peaceful environment for eating and sharing. Elements such as accent lighting, materials, colors, and acoustics all play significant roles in restaurant design. Certainly the food that will be served influences the architectural qualities that the designer attempts to achieve as well, and consequently those design decisions influence the taste of the food.

What one may not have considered is that this somewhat symbiotic relationship between architecture and food extends into the very cultural roots of a place. Author Lance Hosey comments on this connection:

Both of these disciplines [architecture and the culinary arts] evolved directly out of local circumstances, and as a result their similarities can demonstrate strong ties between culture and place. Put simply, culture is the elevation of basic human needs. Architecture is to shelter what cuisine is to food: pleasure takes over from necessity as a simple shed transforms into a glorious cathedral, eggs into a soufflé.<sup>3</sup>

The same type of relationship exists between religion and culture. For many centuries, religious beliefs determined cultural practices and vice versa. Just as these two factors have influenced architectural design, food expresses something about the architecture of a place as well:

For hundreds of years in Japan, the Zen emphasis on natural simplicity took on culinary and architectural expression in the studied preparation of both sushi and temples. The opposite of such restraint is the explosive animation of the Bavarian rococo. The desserts that emerged in 18th century Germany were light, swirling confections -- celebratory delicacies -- and the rich ornamentation of rocaille interiors commonly inspires comparisons to such sweets. Likewise, think of Bavarian cream pie as consumable rococo.<sup>4</sup>

Understanding these basic relationships, one might begin to grasp how architecture can enhance the sense of taste, as well as the ability to taste the sacred.

Many religious rituals incorporate some type of food or drink. The Jewish Seder meal, the Christian Eucharistic bread and wine, and the Hindu offerings to the gods all require the presence of food. While some of the food is eaten, some is enjoyed from the standpoint of seeing and smelling. Just as food in profane settings helps ease tensions and prompt community sharing, the food in these settings contributes in some way to a shared sense of

community. What can be done to strengthen the significance of these experiences and allow people to taste the sacred?

The architecture of the space can reinforce sacred ritual in many ways. If a meal is to be shared at a table, the architecture can focus attention towards the table and the event transpiring there, as opposed to outward. Likewise, if the food is meant to be on display in front of a set of statues, lighting can accent and enhance its color. Practical means can be taken as well to provide enough space for the preparation, presentation, cleaning, and storage of food, drinks and dishes.

Considering the relationship between taste and touch, materials used in the space must be appropriate to functional needs, but also can become ways of prompting memories. Pallasmaa explains that:

There is a subtle transference between tactile and taste experiences. Vision becomes transferred to taste as well; certain colours and delicate details evoke oral sensations. A delicately polished stone surface is subliminally sensed by the tongue. ... Deliciously coloured surfaces of *stucco lustro*, a highly polished colour or wood surfaces also present themselves to the appreciation of the tongue.<sup>5</sup>

From this statement one is also reminded of the importance of ensuring that the smells and colors of the food are conveyed accurately to occupants. Lamps with poor color spectrums and ventilation systems that either cling to scents or dispel them too quickly should be avoided. Care should be taken to ensure that the occupants partaking of the food and drink are not plagued with putrid smells or disturbing views – such as garbage cans or rest rooms.

After addressing these basic conditions, an architect can work towards enhancing the peaceful presence that food seems to bring. Some might think that this can occur anywhere:

The presence of food often generates a feeling of intimacy, sometimes for just a short time, and even before we eat: a lunch truck at the side of the road, a picnic spread out on a blanket.<sup>6</sup>

However, it must always be kept in mind that the space will contribute to the experience.

Plonk Wine in downtown Bozeman, Montana is an example of a space where architecture and food combine harmoniously. The experience of each enhances the other. The architecture is reminiscent of a New York City bar. Although unusual for a Bozeman restaurant, it invites one to prepare for an excellent appetizer, meal, dessert, or drink. The dim lighting, low music, and welcoming atmosphere help one focus more on tasting the food and wine as opposed to forcing the other senses to take



Passover Table



Eucharistic Ritual



Altar with Food



Teej Offering



## PLONK WINE

LOCATION: Bozeman, MT, USA

ARCHITECT: Comma Q

PERIOD / DATE: Contemporary / 2003

- Dark visual atmosphere is complimented by dark rich brick walls, dark furniture, and a beautiful hardwood floor
- Daylight only enters through either end of the restaurant meaning that the majority of the lighting is controlled, creating a relaxing mood
- Low-level lighting adds to experience
- Several different seating arrangements and lighting formats provide occupants with opportunity to choose the type of experience that they want to have



Dining Area



Entrance



The Experience

in the experience. Since the food and drinks themselves are very rich and pleasing, one will often remember their tastes more than the feel of the furniture, or the color of the tables.

Even though this is a profane space designed to help individuals relax and have fun through the sense of taste, it hints at the architectural qualities necessary to allow one to focus on tasting the sacred. Such a space would visually fade into a blurred background with dim lighting and dark-colored materials. The space would feel so comfortable that thermal and material qualities would be unnoticeable. The acoustics would also lend well to sounds blurring together in a sea of background music and speech. Scents in the space would compliment the taste, but not overpower it. Overall the emphasis would be on tasting itself. In this setting, personal preferences of taste, coupled with the plethora of religious ritual foods and drinks, would potentially be enough to help one taste the sacred.



## CONCLUSIONS: DESIGNING INTERFAITH SACRED SPACE

*Art is definitely something of that nature. Art is the making of meaningful form. It is very much a part of our life, and is actually the concrete product of religion – feeling at its greatest moment is religion. Not ritualistic religion. I mean religion from which we derive such feelings as nobility – that religion. – Louis Kahn<sup>1</sup>*

As one can see, the engaging of the senses is critical to the design of sacred space. Regardless of religious tradition, sacred spaces all over the world inspire through the senses, allowing people to pass from the profanity of the world into the realm of the sacred. The ways in which each of the senses can be enhanced by architecture have shown that not only is there a universal architectural language of sacred space, but that it is a vast language full of opportunities for variation in experience and adaptation to specific needs.

However, the design of interfaith sacred space is not entirely satisfied by this idea of a universal language. If it was, there would be many more sacred spaces in the world and less fighting between religious traditions about them. One might be tempted to take this knowledge and build small “sacred spaces” all over the world – tiny boxes that exaggerate or enhance the experience of one or more of the senses – in the hopes of providing opportunities for individuals to pause, relax, and gain a measure of peace. Yet it is doubtful these spaces would work as sacred spaces, because something would still be missing.

One must keep in mind that the principles that have been discussed here are universal. They are also theoretical and must be applied in a practical architectural way. The designer must translate them into appropriate solutions based on the culture and climate of the site that is intended to host the sacred space. Without this added factor, the spaces designed would be catchall spaces, falsely projecting a sense of preparedness for everything, when in reality they never truly meet the needs of the people that must inhabit them. The idea of a universal architectural language of sacred space is not meant to become a cookie cutter list for all sacred space designs, but instead is meant to serve as a framework upon which the layers of culture, environment, programmatic functions and needs, and the like can all be overlaid.

One such layer involves the different needs of individuals and groups. Spaces designed specifically for individual experiences can provide for more sensual exaggerations, since individuals usually desire an escape from the ordinary into something that will stimulate their bodies and their spirits. Groups, on the other hand, participate in activities that require a more harmonious sensual experience. Otherwise the architecture would take over the space and the meaning of the activities of the group would be lost to the focus on the architecture. Architecture frames the activities of our lives, and like the frame of a good painting, should not overcome the rightful center of attention – life itself.

Ultimately what can be learned from this idea of a universal architectural language of sacred space? How can this knowledge be applied to the design of interfaith sacred space? Obviously, the factors discussed as they pertain to each individual sense must be kept in the forefront of the mind of the designer. Losing sight of these factors will leave the architect devoid of guidelines. Recall that in the past, the design of interfaith sacred space typically tried to appease and please every religious tradition without offending any of them. However, this new language of principles allows the old list of political and religious correctness to be set aside and a new one to be taken on as a guide:

- Seeing requires consideration for the quantity and quality of light in the space, providing variations where appropriate and avoiding static lighting situations that are too harsh in brightness;
- Touching involves manipulating the scale, materiality, and thermal qualities of the space;
- Hearing necessitates enhancing appropriate sounds or silence, and removing unnecessary noise;
- Smelling triggers the memory, implying that scents should be incorporated to help evoke memories

of calmness, pause, and contemplation; spaces should also be able to accommodate and enhance the scents associated with religious rituals;

- Tasting invites the individual and community to open up in a more comfortable setting when partaking in a ritual, or simply sharing a meal.

Although each of these senses has been isolated individually, one must remember that the experiences of the senses are interrelated. An architect must be cognizant of this, working at times to exaggerate one or a few sensual experiences, or instead bringing them all together to create a balanced harmonious experience. Ultimately every architectural space is observed and experienced by the five senses. It is the responsibility of the architect to recognize this and design spaces that enhance life through the senses, as opposed to distancing the individual from his surroundings, adding to the stress and tension already existent in life.

Additionally an architect will adapt these sensual experiences to meet the cultural and religious needs of the community that is being served. Some cultures value one end of a spectrum, such as small intimate spaces, whereas other cultures might feel uncomfortable in this type of architecture. It is important to overlay this set of guidelines with the practices of the locality for which the building is being designed, simultaneously adapting it to all of its environmental and climatic needs as well.

Ultimately in today's world of crisis and chaos, the architect must recognize that not all will seek solace in a sacred space. Some individuals will want to participate actively and learn to appreciate their own spirituality, as well as the spirituality of their neighbors. Others will never consider approaching a sacred space for any reason, yet these individuals can also be served by interfaith sacred space. Kahn explained this phenomenon in human nature by describing the spaces needed in and around an interfaith chapel:

If I were to describe a chapel for a university, a university as one where there is nothing partisan, nothing denominational. M.I.T. Chapel, for instance, ... I would say that it comes from a kind of personal ritual. If I were a student of architecture and I got a good criticism from my professors – a criticism which gave me a sense of dedication to my work, a good criticism – then I would be happy, really happy, and I would go by the chapel and wink at it. I wouldn't have to go in, it wouldn't be necessary, nor would I wink at the gymnasium – I would wink at the chapel. So what is a chapel really? A chapel, to me, is a space which one can be in, but must have excess of space around it, so that you don't have to go in. That means, it must have an ambulatory, so that you don't have to go into the chapel; and the ambulatory must have an arcade outside, so that you don't have to go into the ambulatory; and the object outside is a garden, so that you don't have to go into the arcade; and the garden has a wall, so that you can be outside of it or inside it.

The essential thing, you see, is that the chapel is a personal ritual, and that it is not a set ritual, and it is from this that you get the form. The form is derived from this, and not from changing, modifying, making modern that which was already set for you as a chapel.<sup>2</sup>

Kahn's notion of layers of sacred space is both poetic and practical in interfaith design. One must be able to get as close as one desires. The layers then become layers of experience, and in the case of interfaith sacred space, layers of sensual experience. As so many architects have discussed, well-designed architecture has the capacity to lift the spirit. This is what interfaith sacred space has the capacity to do: by appealing to the senses and adapting to the needs of the culture and the community, the architecture itself can assist in lifting the spirit of not just one individual, but of individuals and communities around the world.

# INTRODUCTION TO PROCESS

There are many who question the validity of architectural theory absent of practical application. Others, content with their theoretical musings, defend the integrity of their work through writing, images, and models. It is important to recognize that both schools of thought have their place within the field of architecture. To have one without the other would be to incite an imbalance between the desire for exploration and the need for physical buildings. Architectural theory and exploration encourage new ways of defining space. The laws of physics that govern the built environment tame the wild ambitions of theoretical architects, harnessing their creative energy into practical pursuits. Overall, one concludes that theory and practice go hand in hand, and that ultimately both contain a key element common to all architectural design: process.

Every student of architecture is at some point encouraged to develop a process of design – one that assists in arriving at a design that both responds accurately to site and programmatic needs, and reflects the essence of the heart of the project itself, also known as the project concept. Throughout this process of design, many mediums and techniques may be used, depending on the abilities and preferences of the designer. Everything from sketching and modeling, to sculpture, photography, and material tests may be used to help visually describe the essence of a project. Despite the different approaches that may be taken, there are also some basic commonalities that are explored. Every real project has a site with unique conditions that are explored through a documented analysis. The building's program of spaces is often outlined quantitatively and qualitatively. Building and zoning codes that apply to the site and the program are thoroughly researched in order to further define the extents of the design problem. All of this information is then incorporated at various points into the designer's process, resulting in a design project. Initially one would consider this end result to be the most important part of the practice of architecture. However it is through the process of developing such a design solution that one learns much – about the project, the site, the program, the soul of the building, and the designer himself. It is this process of design that compels a designer to go beyond every predecessor, and provokes every emotion from love to hate, that is perhaps the most intriguing part of architecture, and more specifically sacred architecture. For indeed how does one design a sacred space, let alone an interfaith space? The process of the designer not only answers the question of how, but also shows why the design solution arrived at meets every need of the project and the site, while maintaining the true essence of the heart and soul of the project.

The sections that follow present the process used to arrive at the final design solution for the Bozeman Interfaith Center. It should be kept in mind that while the work shown is extensive, it is not all-inclusive of the designer's process. At several points during the process the designer chose to back up and pursue another avenue of design. It should also be noted that while the design process has been broken into several sections – concept, site, program, development, and final design – this was not necessarily the chronological order in which each conclusion was arrived. Ultimately what is shown here is the culmination of the process that helps to tell a story about the design solution in a logical (not chronological) format. Like a good author who emits extraneous details, this story gives the most important highlights along the way to arriving at an appropriate design solution.



Concept Process Image



# CONCEPT: INTERACTION

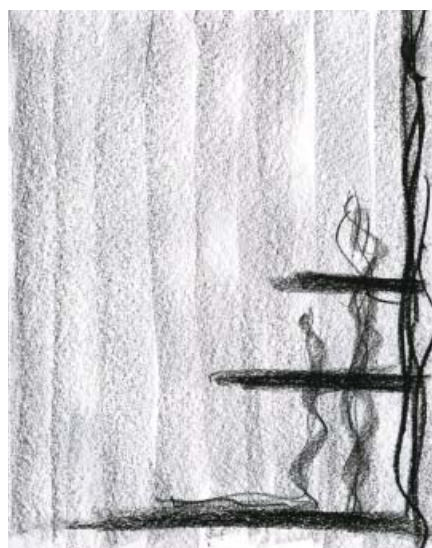
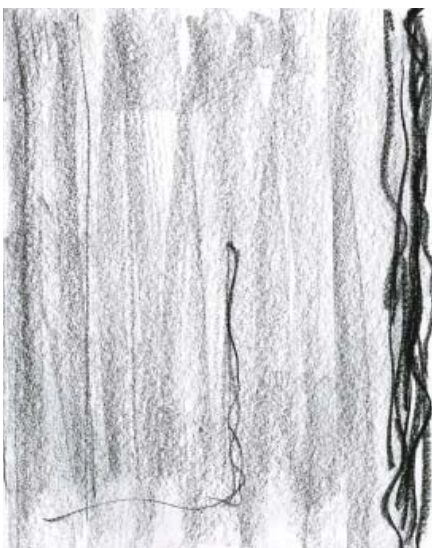
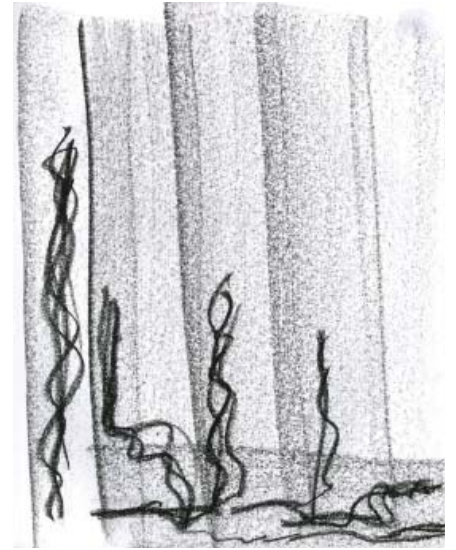
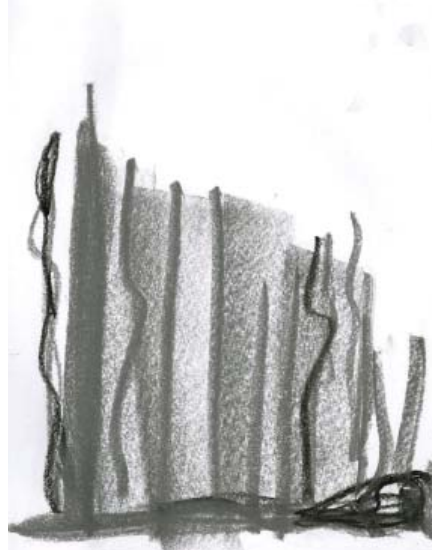
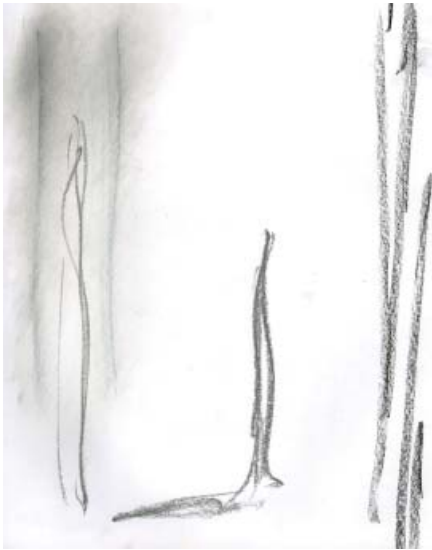
The first portion of the design process entailed developing an architectural concept and language for the project. To do this, a few avenues of thought were explored through chalk pastels, charcoal, and acrylic paints. Several series of images were created to help express the following ideas visually:

- the experience of the individual (the designer) interacting with the sacred, and
- the experience of the individual (the designer) as a part of a group sharing in a sacred experience.

For each series of images, the designer recalled personal experiences of entering and interacting with different sacred spaces, sacred rituals both observed and participatory, and additional elements (such as music, scents, etc.) that suggested the idea of the sacred to the designer. Each series started as a more concrete notion of the sacred. This image was then abstracted through each subsequent image in the series. The last image in the first and second series represents the point at which the designer felt that the idea had been expressed adequately as a visual expression.

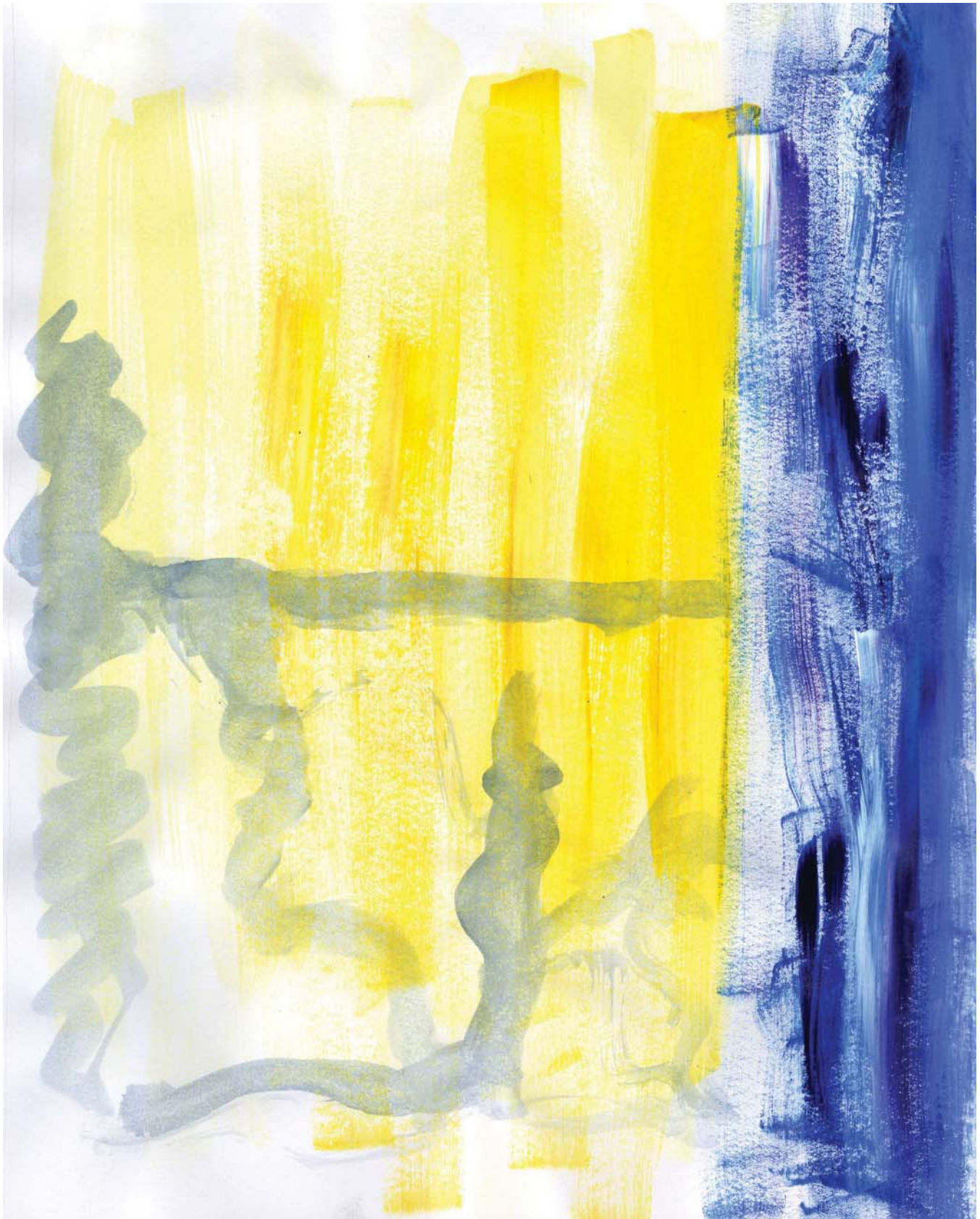
Upon completion of each series, the designer integrated the visual ideas regarding the individual and the community, since the Bozeman Interfaith Center would be designed for both experiences. The image below represents the integration of the final series images, through visual overlays and opacity changes.

Note: It is recognized that this particular approach to process automatically overlays a very personal understanding of the sacred on the design of the project. This particular method of exploration was chosen when other approaches proved to be too stifling to the designer's need to abstract a concept before developing a physical building design.



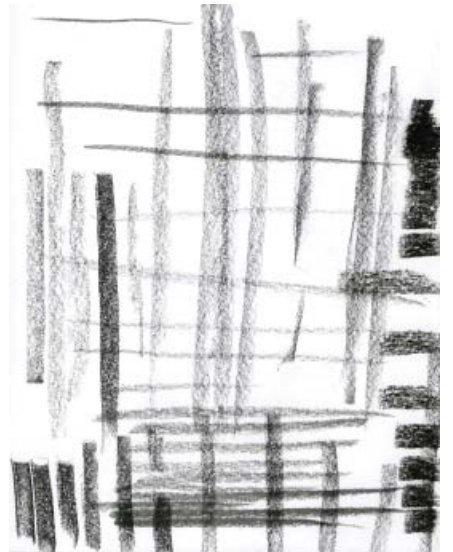
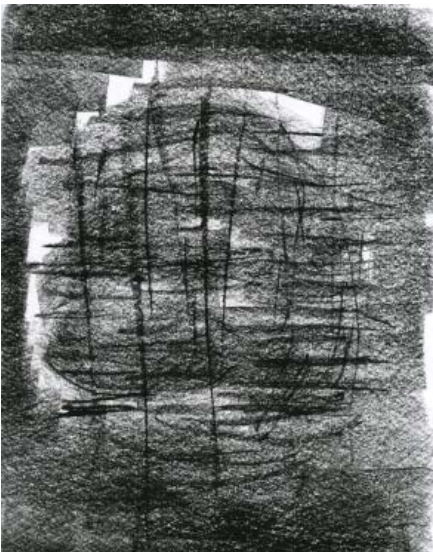
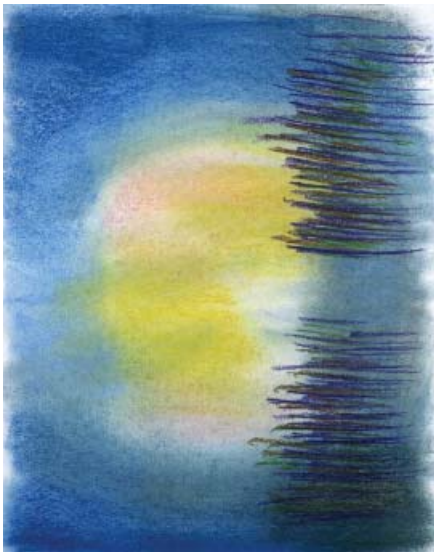
The Individual and the Sacred - Series





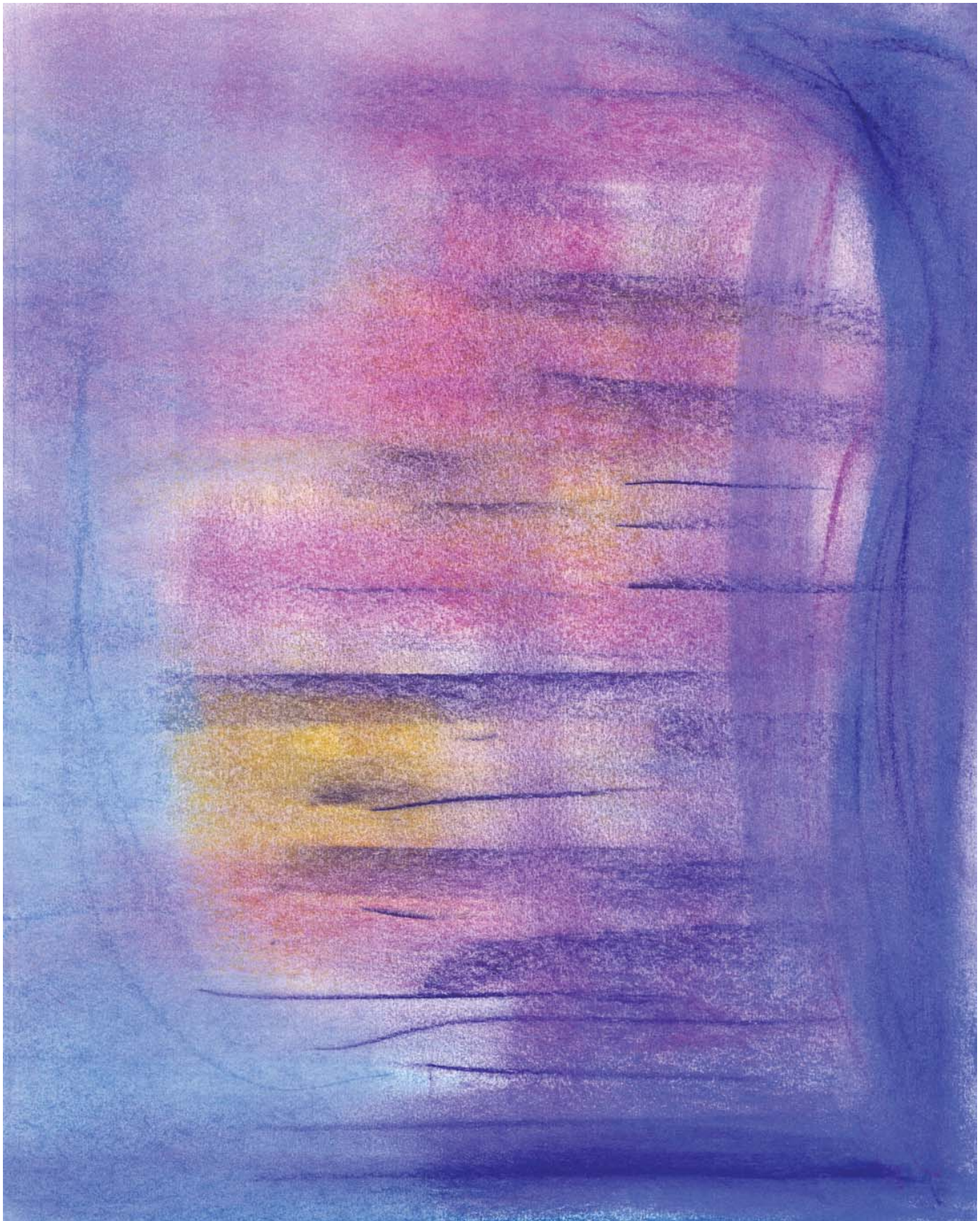
The Individual and the Sacred - Conclusion





Individuals within the Community and the Sacred - Series





Individuals within the Community and the Sacred - Conclusion

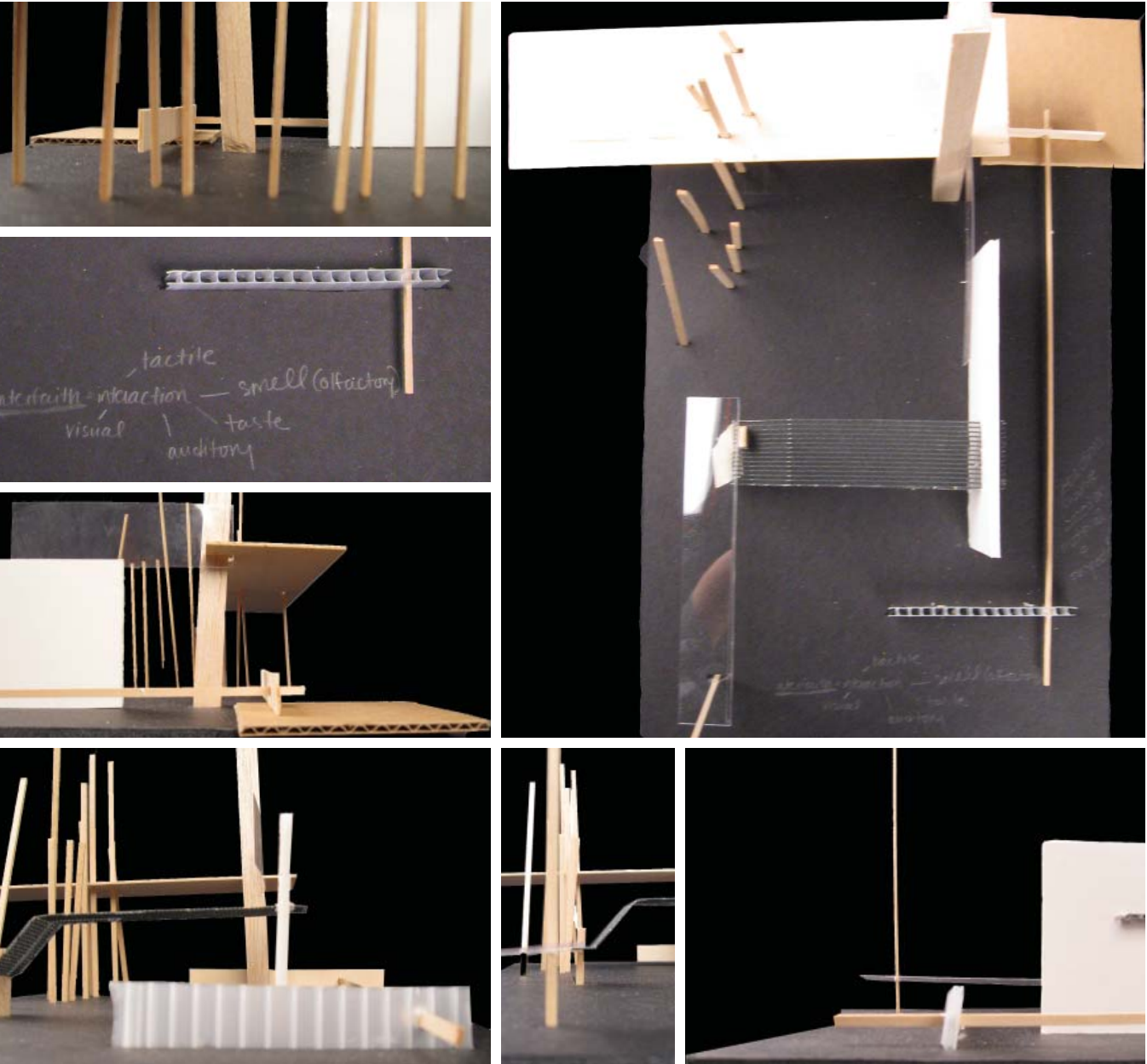




Overlay

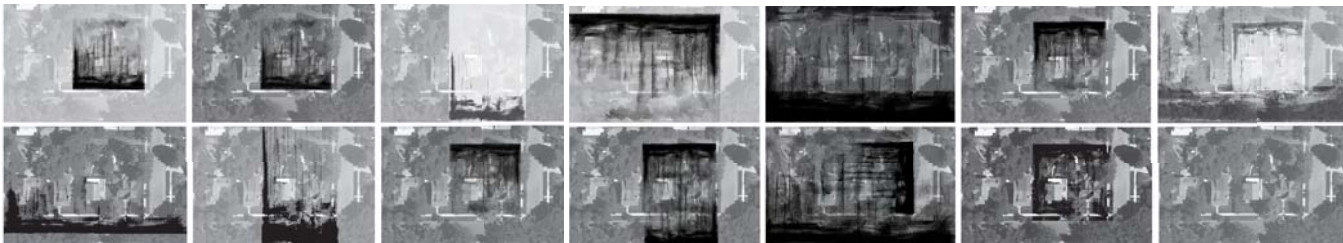
The arrival at a specific concept for a design can happen at any point in a project's process. Sometimes that point will occur towards the end of the process; at other times, the iconic architectural napkin sketch provides the inspiration for an entire project process. The concept for the Bozeman Interfaith Center emerged somewhere in the middle, while building a study model .

The study model below explores the potential for elements of different sizes and materials to work together, or interact. Interaction can imply not just the physical integration of elements, but also the line of sight integration that changes as one moves through or around a space. This interaction represents the essence of this project - the interaction of the individual with the community, the individual through the senses with the sacred, the community with the sacred, etc.





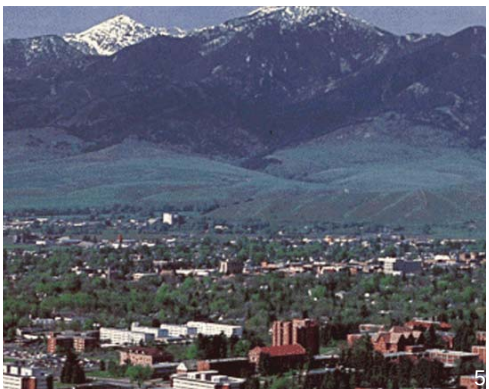
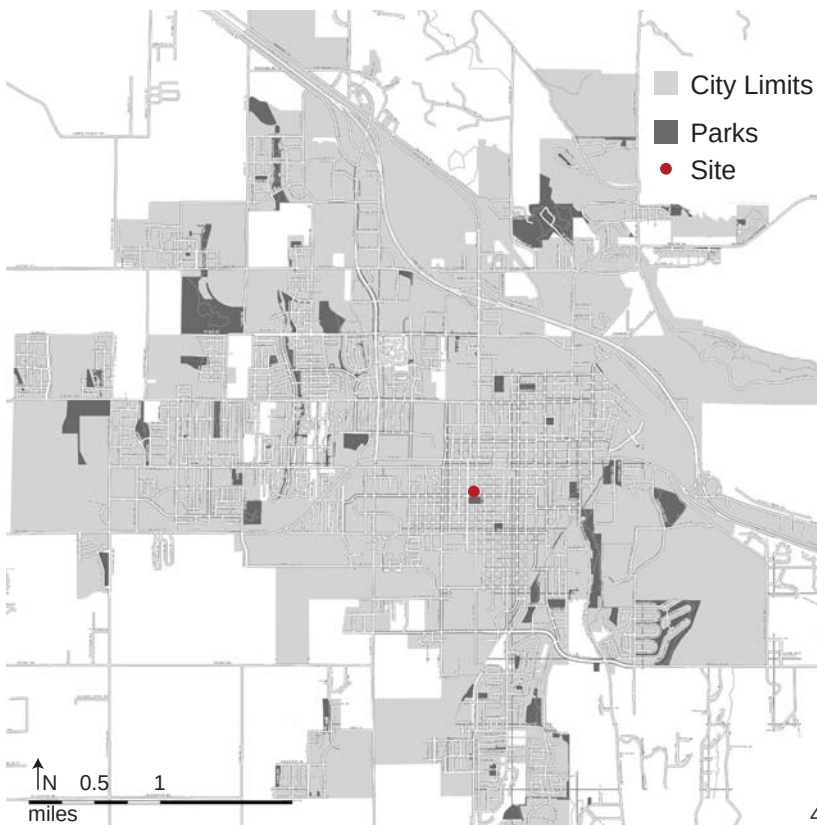
Working with the concept of interaction, further exploration was still needed to arrive at a final visual concept. The large image below shows the final two-dimensional concept image. This was created through additional overlays, which were derived from working over an image of the site. The study models on the next page show the three final concept models from which the building design was ultimately derived.







# SITE: ANALYSIS AND RESPONSE



## Bozeman At A Glance:

- Total Population: 34,836
- Caucasian: 92%; Other: 8%
- MSU Population: 12,000
- MSU Diversity: 85% Caucasian; 33% from another state; 3% international
- Lat. / Long.: 45° 40' 47" N / 111° 2' 16" W
- Elevation: 4,800 feet

Context: Bozeman, Montana, US



The city of Bozeman, Montana is located in the northwestern part of the United States of America (US) and is situated on a plain in the Rocky Mountains. It was founded in 1864 by three men who originally came to the west looking to mine, but turned instead to trail guiding. Many guides, gold diggers, and settlers found a home in Bozeman because of its proximity to the Bozeman Trail. In 1893, Bozeman became the home of the Agricultural College of the State of Montana. Its name was later changed to Montana State University (MSU) in 1965. Consequently Bozeman transformed from a trail settlement into a college town, which it remains to be this day. In fact, about one third of its population are students.

Unlike many of the large cities of the US, Bozeman has not grown very rich in diversity. It is a predominantly Caucasian community with a small mix of other ethnic groups. MSU is the most diverse part of the city because it attracts students from all over the world.

Another prominent feature of Bozeman is its Historic Downtown Main Street, which still partially maintains the look and feel of an older western town. The MSU campus also boasts buildings from the original college establishment, in addition to its newly constructed facilities. The city itself is expanding rapidly in order to accommodate the influx of people to one of America's most livable places. Despite Bozeman's recent expansion, it still maintains its "small-town" feel. People come to Bozeman looking for fresh air and wide open spaces that can be explored summer or winter with fun sports and recreation.



Main Street, Historic Downtown Bozeman



Montana Hall, Montana State University



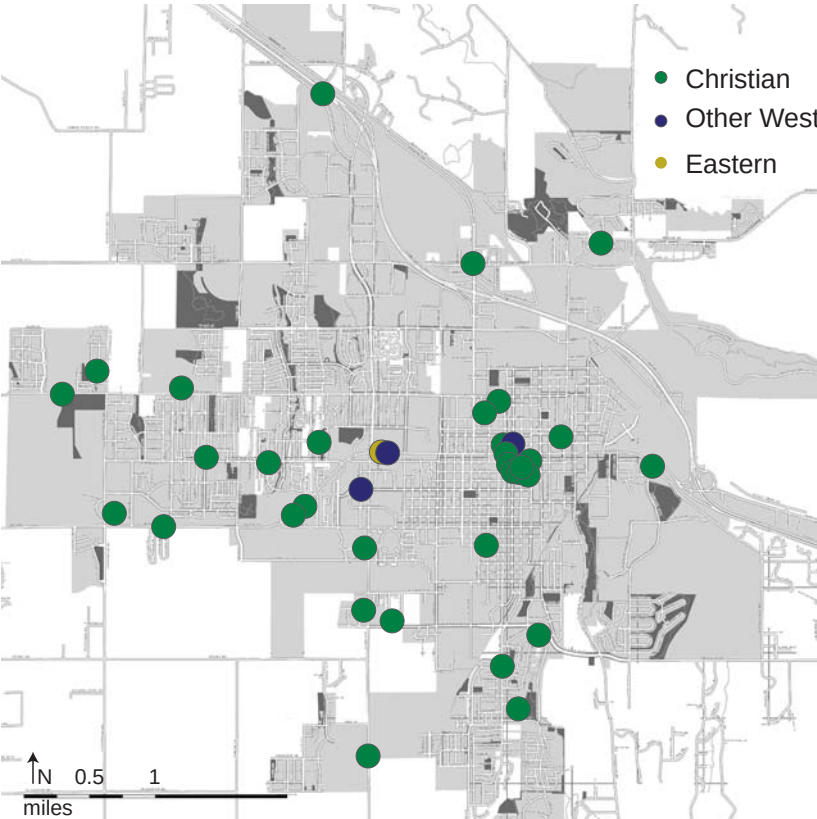
Bridger Mountain Range



Main Street, Bozeman



In designing an Interfaith Center for Bozeman, it is important to consider the existing religious traditions in the area, because they will help inform the designer about the potential occupants of the space. The map below highlights a majority of the religious organizations in Bozeman, separating them into three categories: Christian, Other Western religious traditions (Jewish and Muslim), and Eastern. As one will see, the vast majority of these organizations are Christian. However, the religious traditions of the world seem to be somewhat well represented in the greater Bozeman area.



Religious Organizations in Bozeman



First Baptist Church, Bozeman



Seventh-day Adventist Church, Bozeman



Namdroling Center, Bozeman



Congregation Beth Shalom, Bozeman

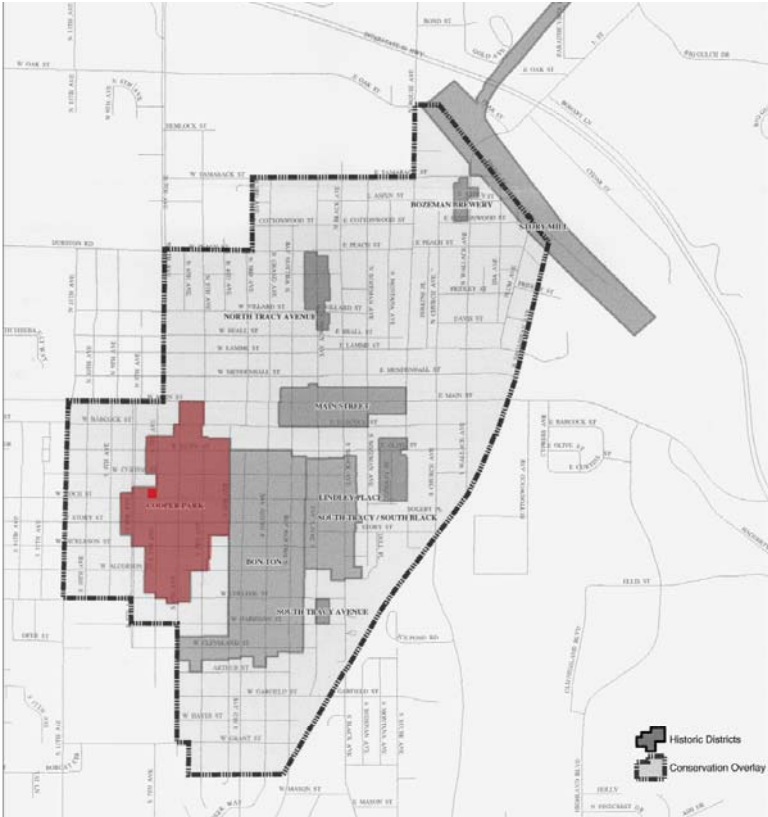


Holy Rosary Catholic Church, Bozeman

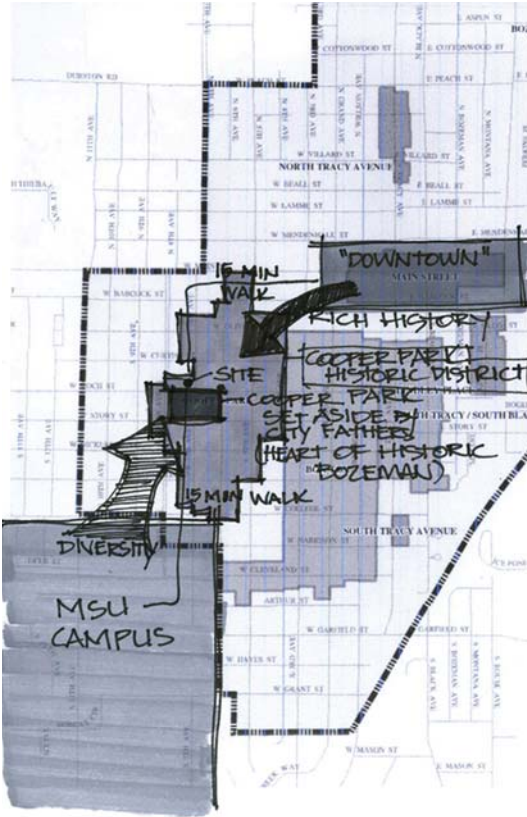
The project site is located within the Cooper Park Historical District. This district sits between Main Street to the north and MSU to the south. When Bozeman was first developed, this area was a large field between these two focal points of the town. The open land was quickly replaced by kit homes that were constructed to house the people that were coming to work in service positions in town and on campus. Cooper Park was set aside as the city park for the neighborhood, and to this day serves as a focal point for the 250+ homes in the district. The diagrams below highlight the influences of MSU and Historic Bozeman on the site.



Cooper Park



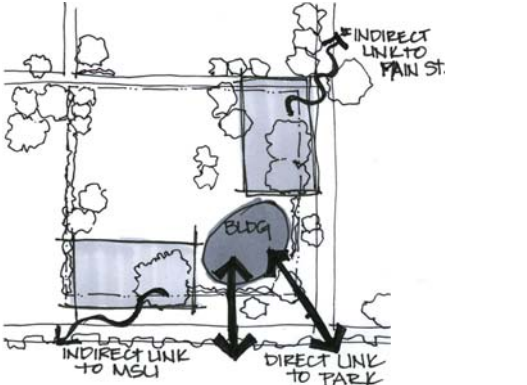
Cooper Park Historic District and Site in Bozeman



Analysis of Bozeman Influences



Cooper Park



Response to Bozeman Influences



The site, the northwest corner of the intersection of South 7th Avenue and West Koch Street, is adjacent to Cooper Park. Walking through the neighborhood, one cannot help but notice the trees on this site. They are so massive that they cause one to pause in their tracks, even just for a moment and observe. The site itself, just out of the way of South 8th Avenue, a main thoroughfare for the neighborhood, also invites one to pause. Its adjacency to Cooper Park, its location on the heavily-used West Koch Street, and its southern exposure, all make it an excellent candidate for an Interfaith Center.

This double-lot site is approximately 17,680 square feet, but due to large setbacks, only has a buildable area of about 10,100 square feet. It is hoped that much of the foliage on the site can be maintained in the design.

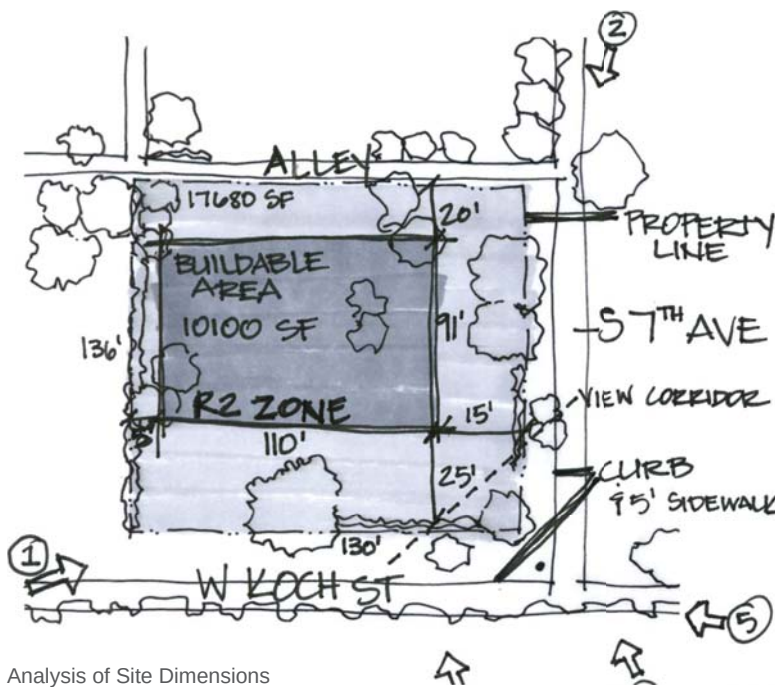


Google Map Highlighting Site



Site with Existing Buildings





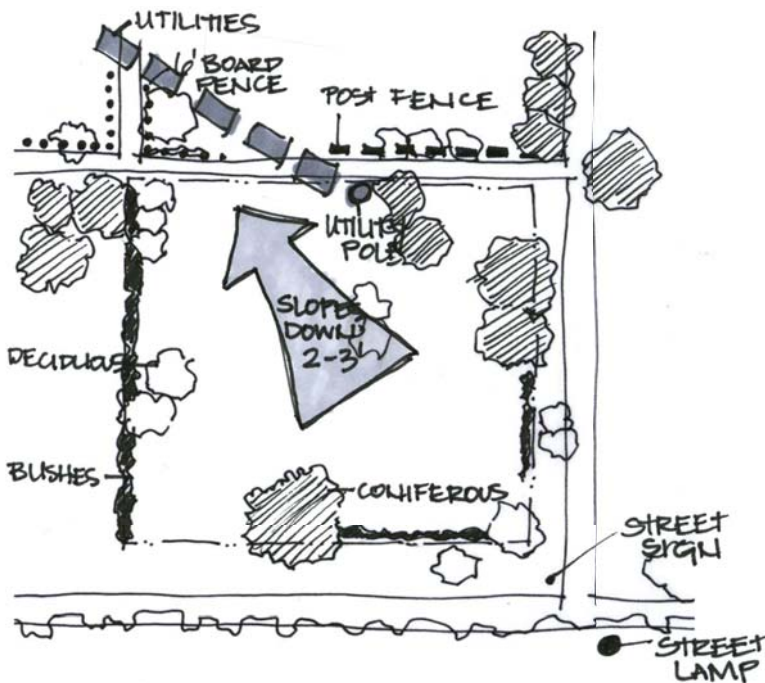
Analysis of Site Dimensions



View of Site from West along 8th Avenue



View of Site from South at Center of Cooper Park



Analysis of Site Features and Landscaping

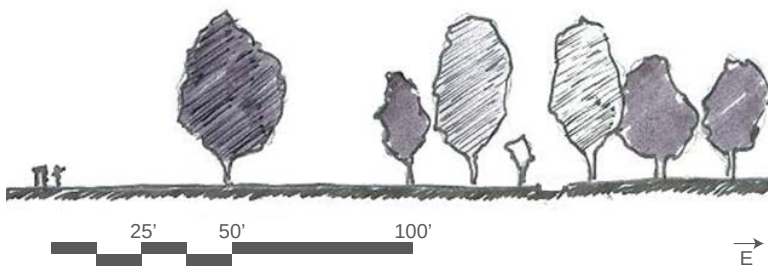


View of Site from East along Koch Street

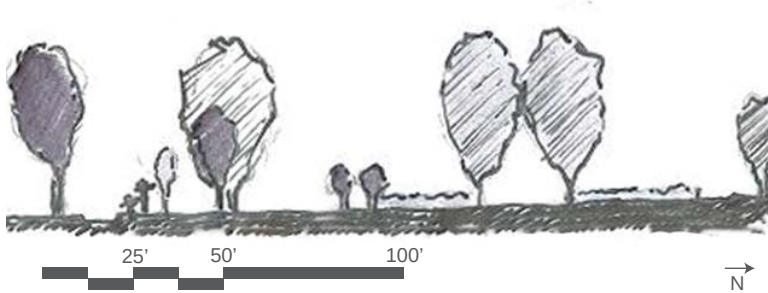


View of Site from North along 7th Avenue





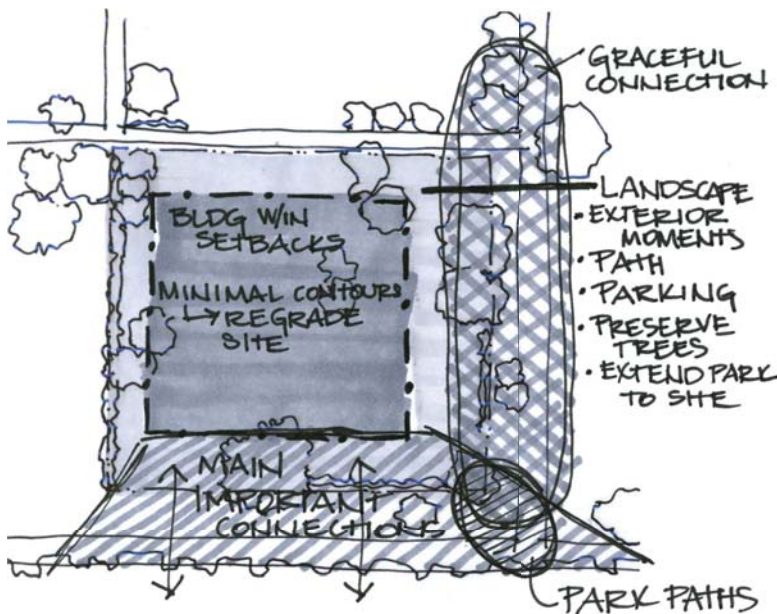
Tree Heights as Viewed from South



Tree Heights as Viewed from East



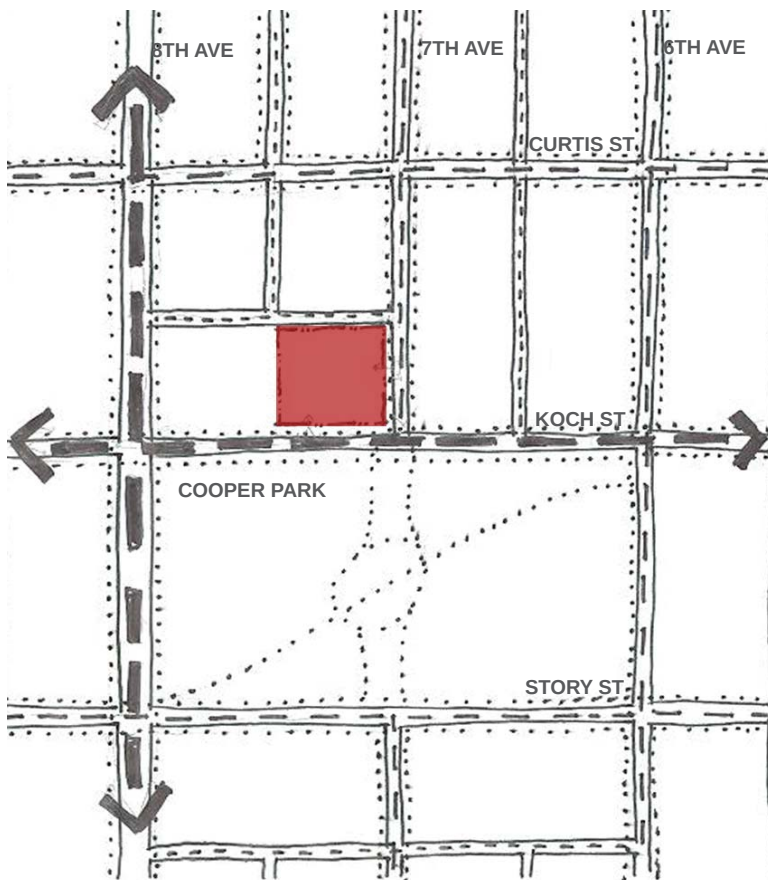
General Heights of Surrounding Buildings



Response to Site Dimensions and Features



One of the most prominent features of the site is its tall coniferous trees that range in height from about 48' to 55'. These trees compliment the trees in the park as well as the trees on surrounding properties. It is hoped that these trees can be maintained and designed into the project.



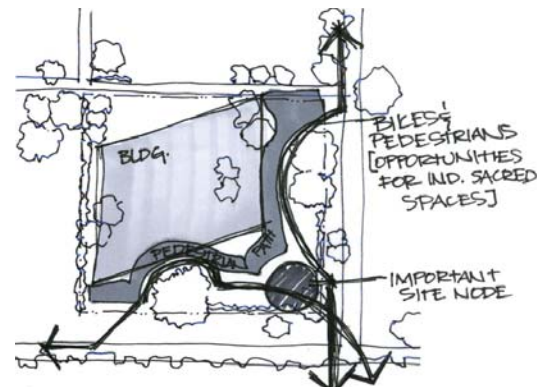
- Heavy Traffic: Main Thoroughfare
- Moderate Traffic: Additional Two-Way Streets
- Light Traffic: Alleys
- Pedestrian Paths



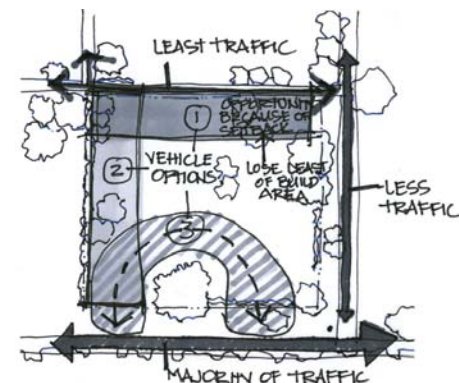
Analysis of Site and Neighborhood Circulation

The site is located just to the east of a major intersection for the neighborhood. Both South 8th Avenue and West Koch Street are main thoroughfares in the area. This will bring a fair amount of automobile traffic past the site along Koch Street, but the Center will not be inundated by cars. As a rather flat neighborhood, many people get around on foot or bicycle, using sidewalks and the connecting streets that have less traffic. It is most likely that the dirt alley to the north of the site receives very little foot traffic as it is a mud puddle during the snow and rainy seasons.

By placing the Center adjacent to Cooper Park, it is hoped that people who are already coming to rest at the park will be interested in exploring the design.



Response to Pedestrian Traffic



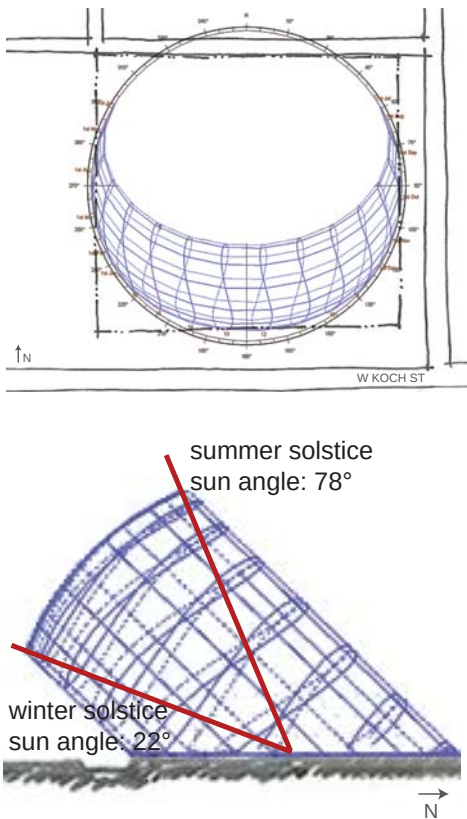
Response to Vehicular Traffic



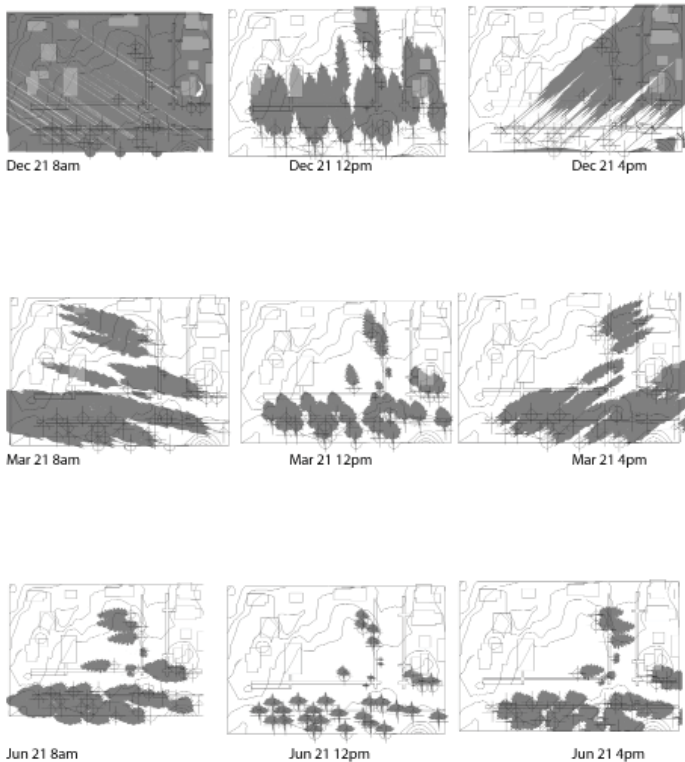
Bozeman sits in a high desert climate. This means that temperatures and weather can fluctuate drastically throughout the course of the day and year. Many sunny days provide warmth during long cold winters. The majority of precipitation occurs in the winter as snow, which the design must accommodate.

The following graphs and charts convey a lot of crucial information about the climate of Bozeman that can be applied to the site. Below, a plan and section of an annual sun bubble show the horizontal and vertical swing angles that the sun moves through during the year. As one can see from the plan, the site has the potential for excellent southern exposure which will help with passive heating and daylighting strategies. Activities requiring more heat and light should be oriented towards the south. The sections tell a slightly different story. During the summer, the sun is at a high enough angle in the sky that it will have no problems providing daylight for the site. The low winter sun, however, will be blocked in part by the high trees in the park across the street for a small period of the year. Fortunately many of these trees are deciduous and do not keep their leaves in their winter. This will give the sun some access to the front of the site. Since the back of the site will be lit consistently in the winter, a design should place spaces that need to be warmer consistently within this line of sight. In general, the trees on the site help create microclimates throughout the site that will need to be considered in the design.

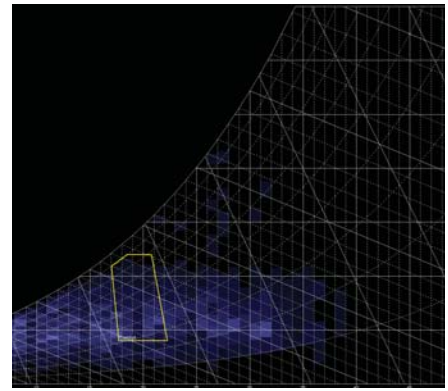
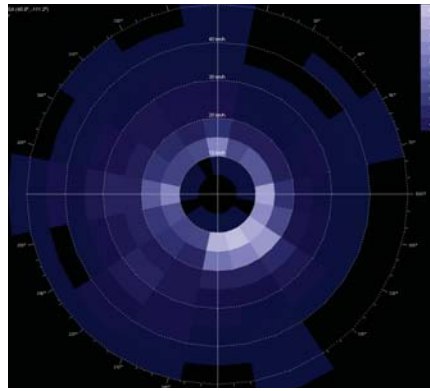
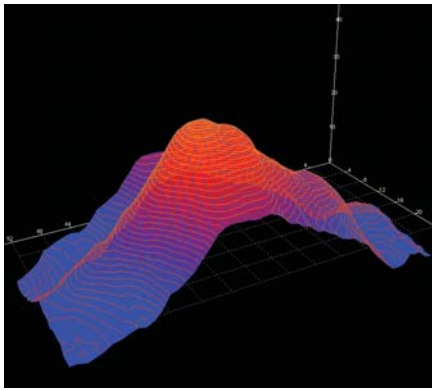
The three-dimensional graph on the top of the facing page shows the average temperatures for Bozeman throughout the year. As one can see, much of the year is spent in a cooler ranger of temperatures, only spiking in heat for a short summer. This fits the profile of a high desert climate. Not only will temperatures move through extremes during the year, they will also do so during the day, producing cold nights and hot days in the summer. Because of this, night flushing is an excellent passive approach to ventilation. The wind rose data (opposite, top center image) also supports this conclusion for natural ventilation. The psychrometric chart to the right reinforces that for the majority of the year, the building will need to be heated.



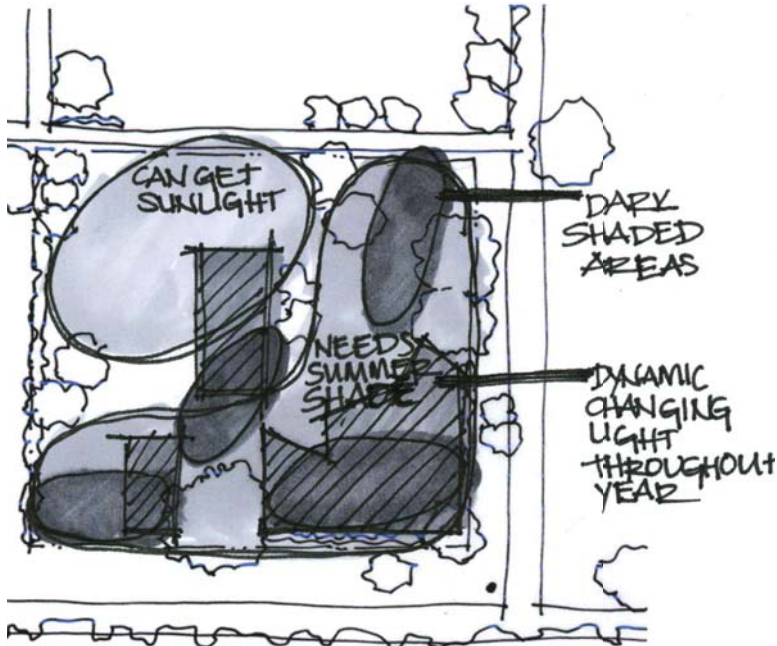
Analysis of Sun Angles at Site



Study of Shading of Trees throughout Year

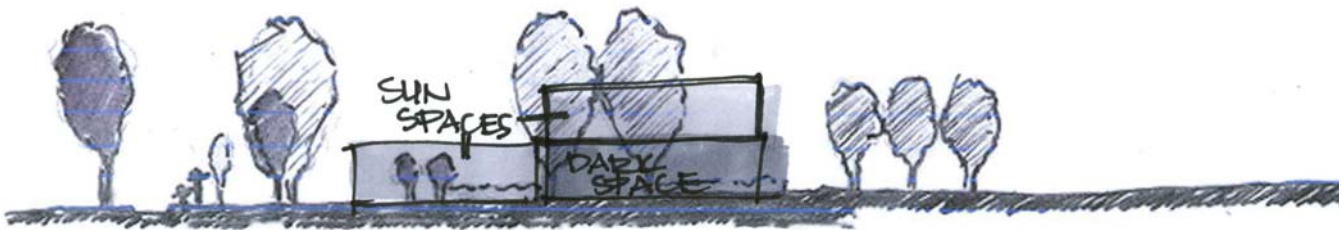


Climate Data for Bozeman, MT - Generated by Autodesk Ecotect Analysis 2010



Response to Solar Analysis

These diagrams further define the design possibilities as they relate to daylighting strategies. The trees on and around the site will shade the site for a large portion of the year, so important areas that require more daylight should be located to those portions of the site where sunlight is more accessible, both in plan and in section.

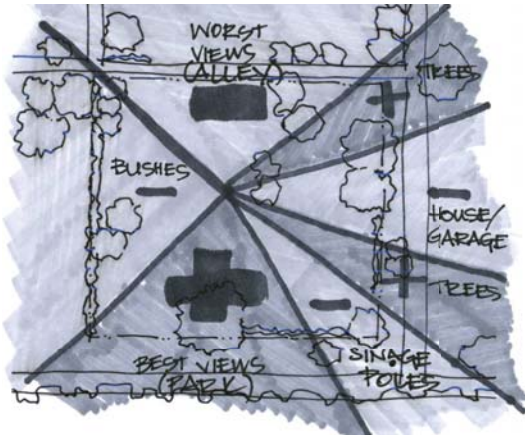


Response to Solar Analysis in Section



Of the five senses, only three -- sight, touch, and hearing -- are directly affected by factors present at the site . In terms of sight, the surrounding neighborhood affords a mixture of beautiful and not so elegant views. The view of Cooper Park to the south is the most stunning, followed by the views to trees to the east of the site. The dirt alley to the north of the site is the worst view. Directly north, however, is a house with a well-kept yard and a wooden post fence. The connection to the park will need to be thought through because the adjacent park entrance paths are somewhat hidden amongst the trees, and not very attractive.

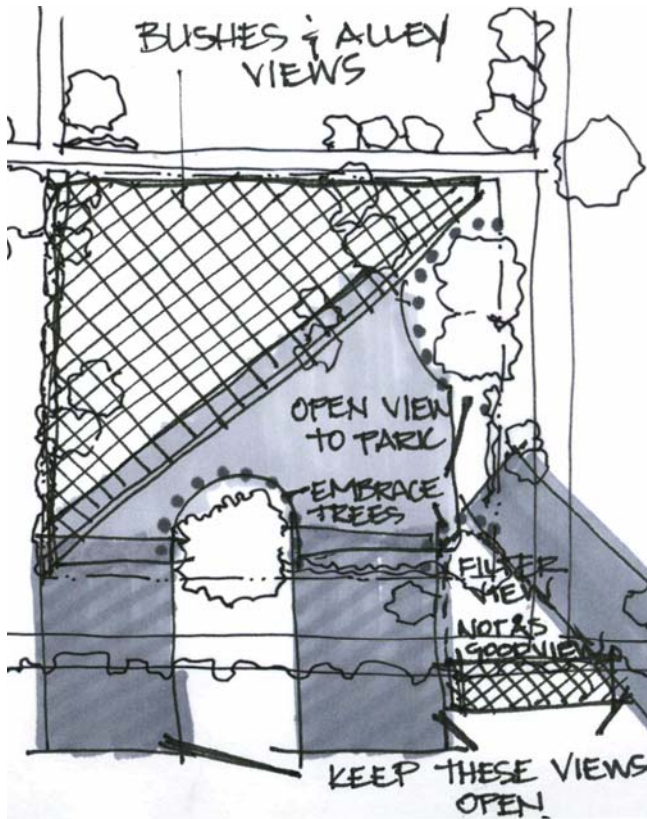
There are several natural textures at the site. These textures all provide opportunities for connections with nature and can be incorporated into the design. Probably the most stunning of all of these are the large coniferous trees, with greenery, bark, and large circles of pine needles under their wide-spread bows. (See next page)



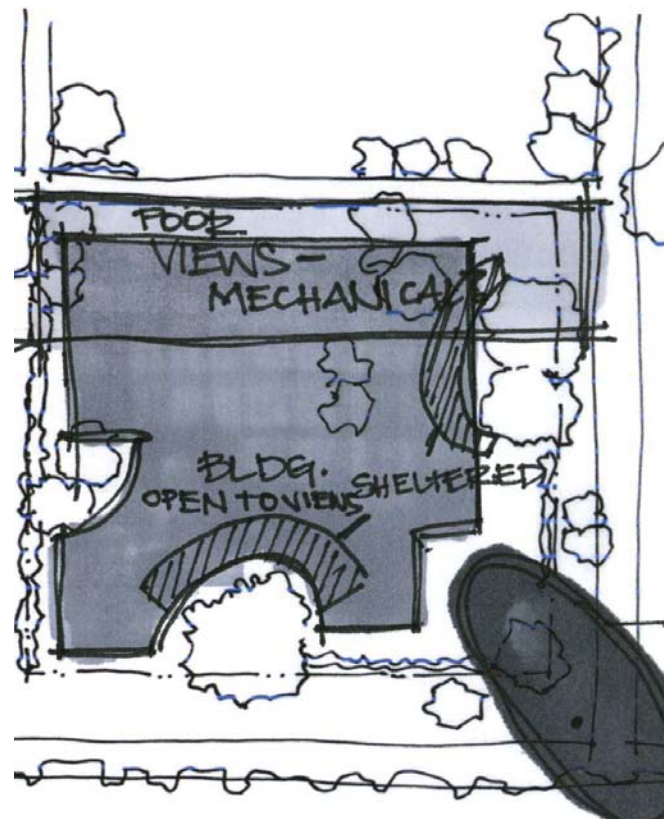
Analysis of Views from Site



View of Cooper Park from Site



Response to Site Views



Response to Site Views





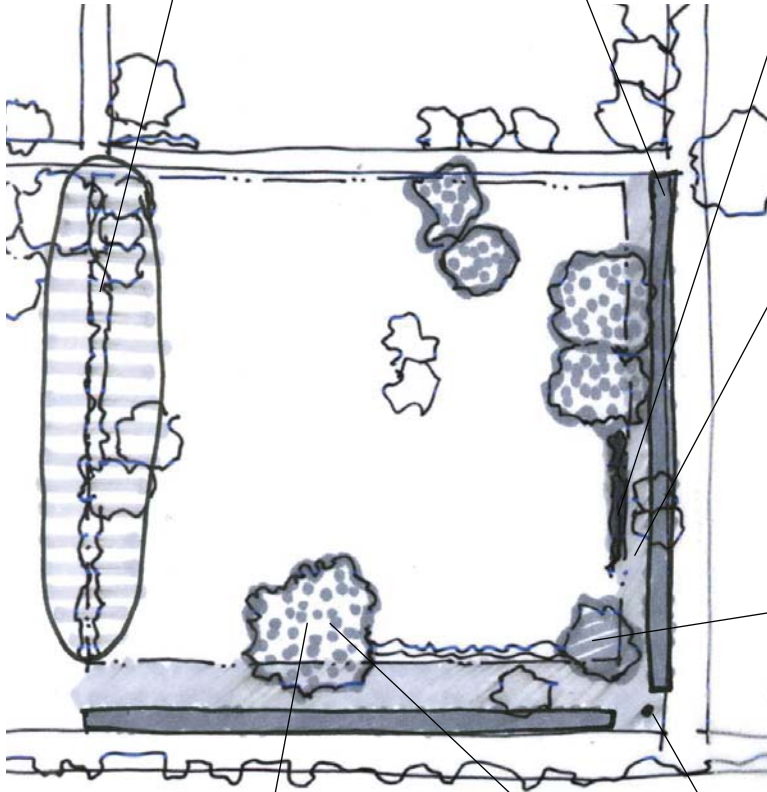
Bushes



Grass



Berries



Analysis of Site Textures



Concrete Sidewalk



Birch Tree



Needles and Cones

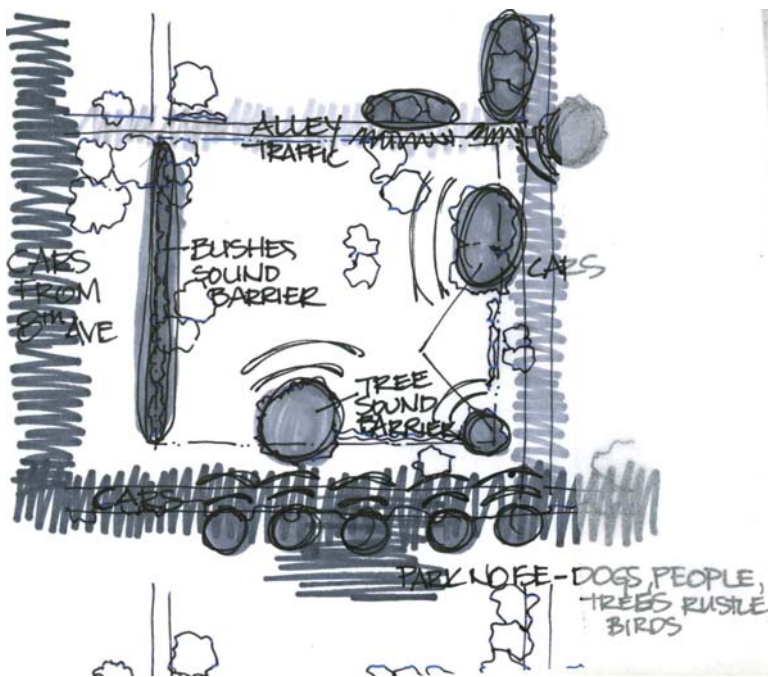


Spruce Tree



Brick Sidewalk Corner

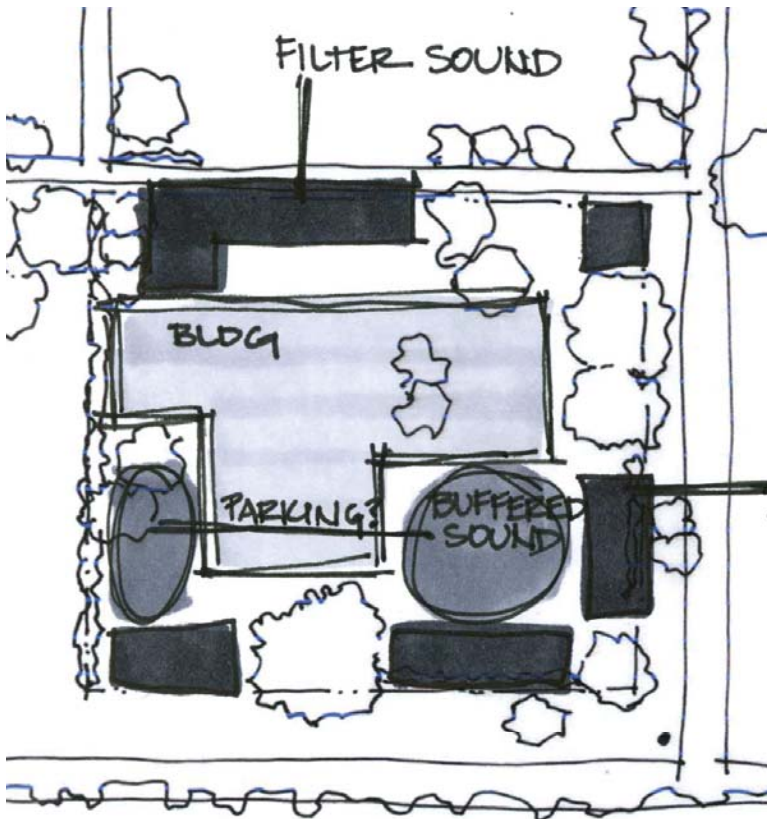




Analysis of Site Noise

Automobile traffic and park noise from dogs and people are the largest acoustical issues for the site. Although South 7th Avenue is not used as heavily as West Koch Street or South 8th Avenue, noise from traffic driving down 8th Avenue can be heard in the alley to the north of the site.

The large trees on and around the site help balance this noise with sounds of the wind rustling the leaves in the summer and birds singing. Additionally a row of tall bushes to the west of the site will provide a minimal sound barrier for the site.



Response to Site Noise

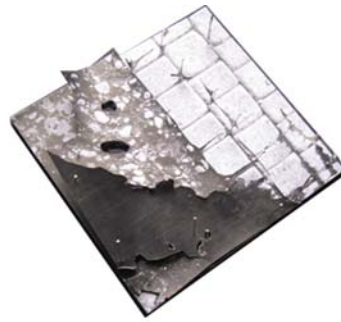


Trees on Site

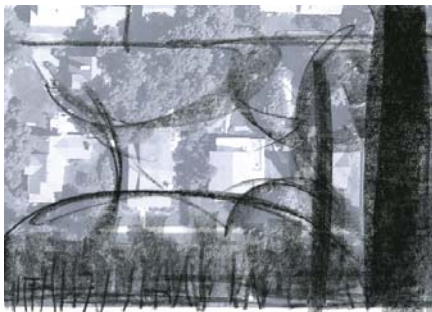


Automobile Traffic

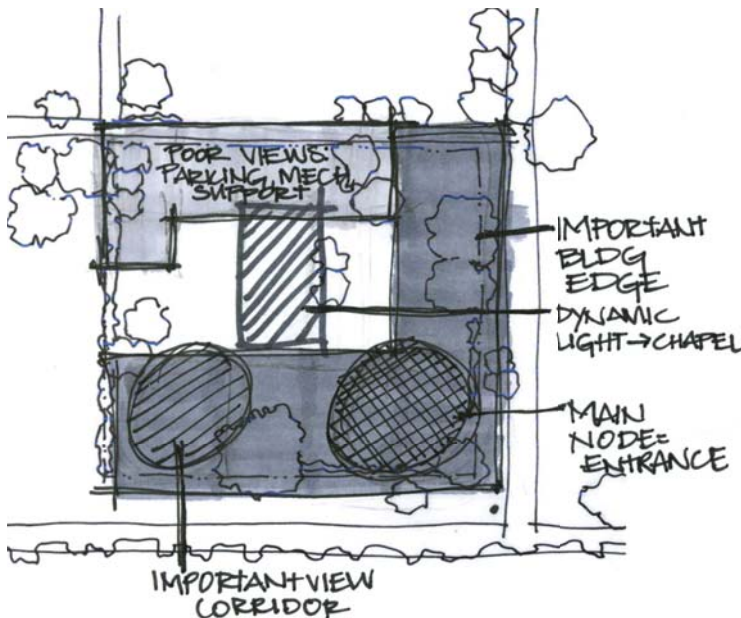




Pin Models of Site and Context



Pastel Site Overlays



Final Site Response Diagram

In addition to the standard site analysis and response work for this project, several additional avenues were explored to help understand the site better. Several pin models were made from photographs of the site and its surrounding context, including historic houses in the neighborhood. These models helped to provide a more intuitive understanding of the site factors. (A few of these models are shown above.)

Several pastel overlays of the site were also made in order to examine the site factors intuitively. The images above were then used to help develop the concept, interaction.

At the conclusion of the site analysis, a final diagram was made to highlight the most important site factors and responses that should be included in the design (see left).



# PROGRAM: THE BOZEMAN INTERFAITH CENTER

*Clearly interdependence is a fact of our global life. Even so, the world is not yet interrelated in the sense of actively and intentionally creating the international, intercultural, and interreligious relationships that will sustain a world in which we depend upon one another as much as we do. We share our communities and our world with men and women who worship in various ways, who base their judgments on differing authorities, who recognize differing relations, who speak of God in strikingly different ways or do not speak of God at all. Our task is to learn to collaborate with one another on issues that none of us can solve alone. The challenge could not have been stated more clearly than it was by the Jewish philosopher Abraham Joshua Heschel: 'In the world of economics, science, and technology, cooperation exists and continues to grow. Even political states, though different in culture and competing with one another, maintain diplomatic relations and strive for coexistence. Only religions are not on speaking terms.'*<sup>1</sup> – Diana Eck

The Bozeman Interfaith Center will embrace Pallasmaa's notion that architecture is more about the actions of its inhabitants rather than about the physical space itself.<sup>2</sup> Therefore the architectural design will engage its users. However this will not be enough. The Bozeman Interfaith Center will also contain interfaith sacred space, in order to provide the opportunity for its users to transcend its physicality and move into spirituality, in whatever way that personally manifests for the individual. It will do this by using the universal language of sacred space that engages the physical senses of those who encounter its architecture. In this way, building and occupant will become enfolded in a dynamic relationship between oneself and one's environment.

Since this sacred space will tie into the basic physical senses of its users, it needs to have removed from it those things that disturb the senses – uncomfortable temperatures, unwanted noise, unpleasant materials, glaring light, putrid smells, etc. – so that individuals and groups feel welcome and are able to move beyond the physical into the intangible sense of something greater than the physical.

As previously stated, individuals and groups experience sacred differently and thus will require different design approaches. The program for the Bozeman Interfaith Center addresses this through the following principles:

## INDIVIDUALS:

- Sacred space designed for individuals will take into account three types of users: those with the intent to pause, those without the intent to pause but pause anyway, and those who are simply passing by the Center.
- Individual sacred spaces will attempt to highlight one or a few sense experiences at once in order to focus the sacred experience.

## GROUPS:

- Group gathering spaces will take into account two types of groups (in varying sizes): groups of one faith gathering together to share in and practice their beliefs, and interfaith groups that gather to share their beliefs and practices with each other.
- Group sacred spaces will attempt to use the experiences of the senses together in balance so that the activities of the groups using the spaces will become the focus.

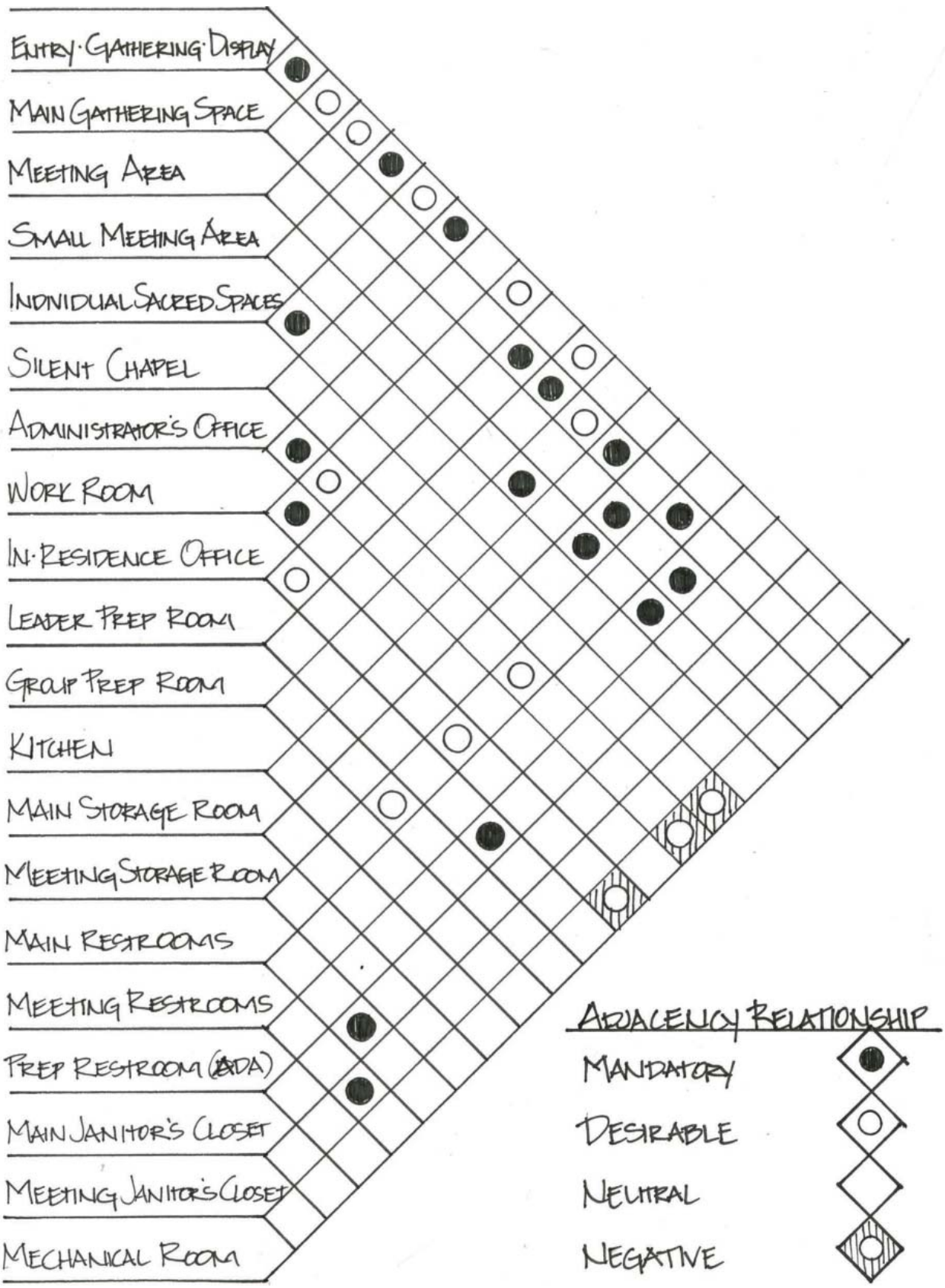
Incorporating Kahn's ideas of layered space that invites individuals to move as close to activities as they feel comfortable, the Bozeman Interfaith Center will incorporate a series of zones, weaving individual, group, and service spaces so that they work together to provide multiple options for interaction by the users of the building.

The programmatic elements below were selected to allow for a balance between individual spaces, group spaces, and support spaces. Their square footages were determined by using guidelines for rooms of particular occupancy types. This list of spaces became the initial starting point for the design of the Bozeman Interfaith Center.

Often as a design develops, programmatic elements will be added, adjusted, or removed in order to accommodate the many factors that influence the project. A good designer uses the information about the concept to help refine the programmatic elements so that they support the intent of the project. The site analysis and response also uncover potential conflicts between site and program, allowing for compromises to be made early on in the design process. Overall, the program must be massaged in order to truly meet the needs of its occupants.

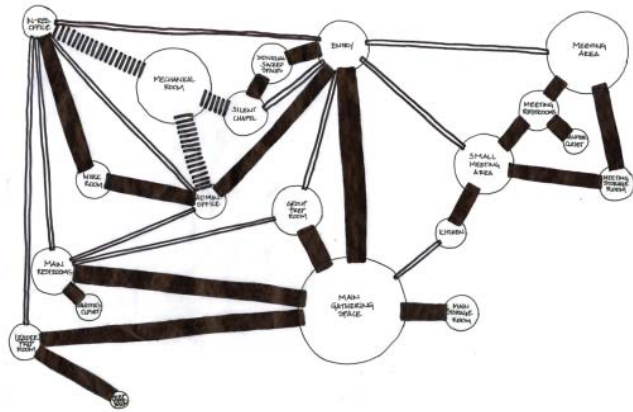
The program for this project required several iterations before it finally embraced the design concept and conformed to the site conditions. In the process, several diagrams were created based on a variation of the initial programmatic elements to help understand each space as it relates to all of the others. The following Matrix diagram and Space Adjacency Analysis diagrams express these relationships and consider the effects of other factors in the design, such as activity types and noise levels. These diagrams were not only influential to the design, but also served as a way for the designer to learn more about the program quickly without having to design the entire building in great detail immediately.

|                                           |                 |
|-------------------------------------------|-----------------|
| Entry – Gathering Area – Display Area     | 500 sf          |
| Main Gathering Space                      | 1800 sf         |
| Meeting Area                              | 1000 sf         |
| Small Meeting Area                        | 550 sf          |
| Individual Sacred Spaces (10)             | 250 sf          |
| Silent Chapel                             | 1000 sf         |
| Administrator's Office                    | 300 sf          |
| Work Room                                 | 300 sf          |
| In-Residence Office                       | 200 sf          |
| Leader Preparation Room                   | 200 sf          |
| Group Preparation Room                    | 400 sf          |
| Kitchen                                   | 300 sf          |
| Storage Room                              | 300 sf          |
| Janitorial Office with Service Sink       | 100 sf          |
| Mechanical Room                           | 1000 sf         |
| Main Rest Rooms and Drinking Fountain     | 350 sf          |
| Preparation Rest Room (ADA)               | 50 sf           |
| <b>SUBTOTAL</b>                           | <b>8600 sf</b>  |
| Building Circulation (30% of SUBTOTAL SF) | 2580 sf         |
| Parking (for 5 cars - 300 sf per car)     | 1500 sf         |
| <b>TOTAL</b>                              | <b>12680 sf</b> |

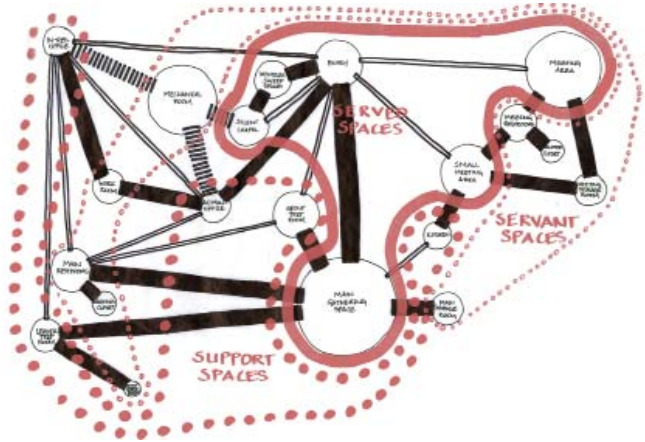


Matrix

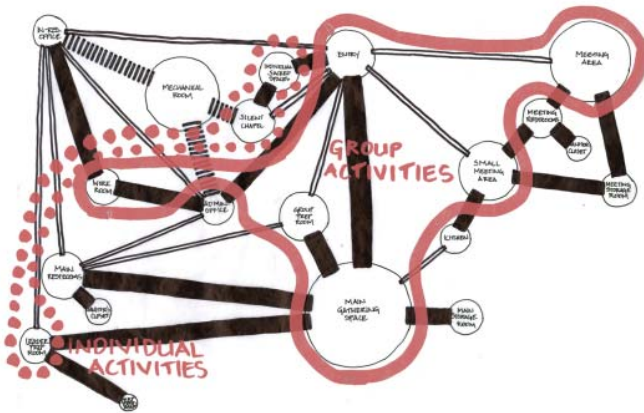




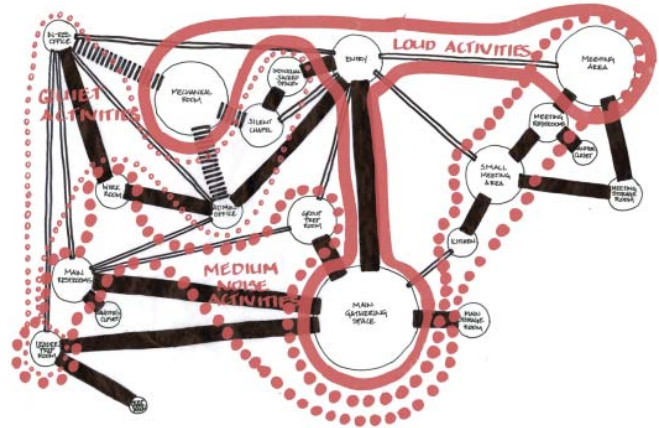
### Space Adjacency Diagram



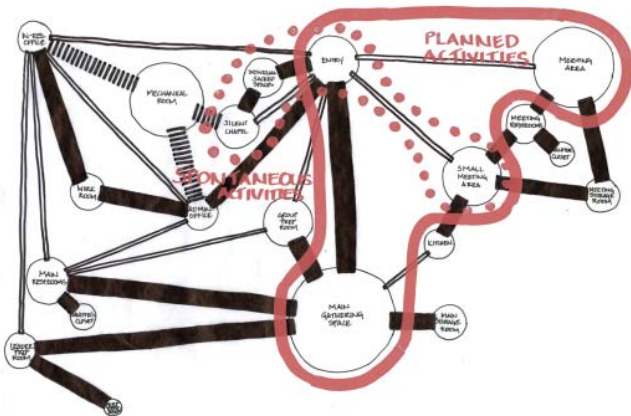
Zoning: Served - Servant - Support Spaces



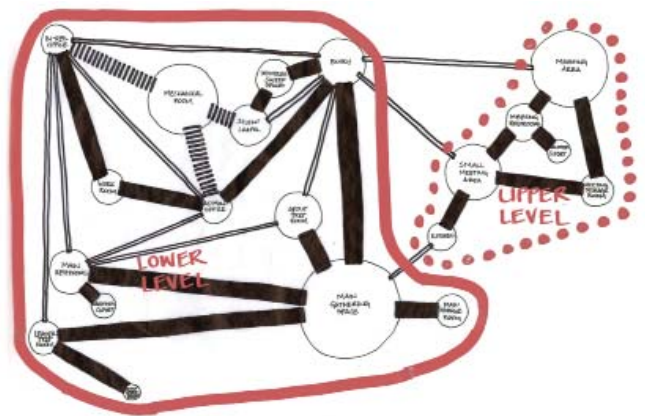
### Zoning: Individual Activities vs. Group Activities



### Zoning: Noise Levels

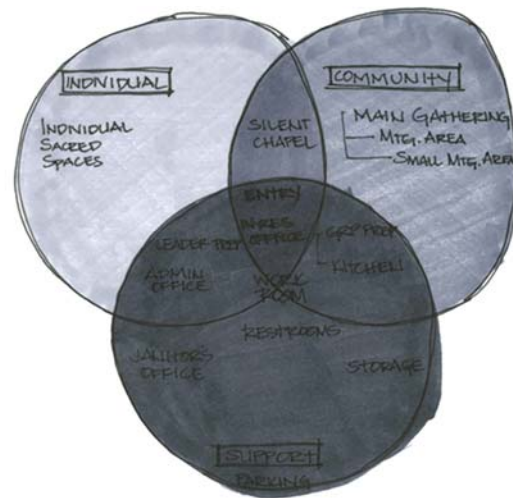


### Zoning: Planned Activities vs. Spontaneous Activities



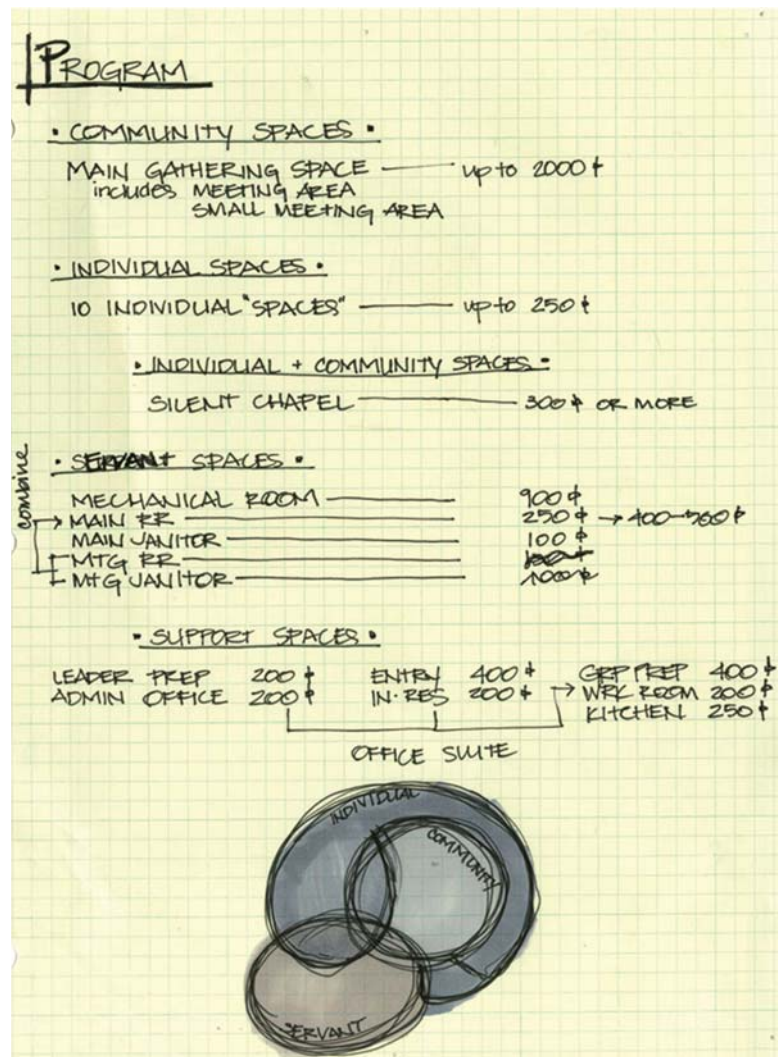
### Zoning: Lower Level vs. Upper Level

Since the preceding diagrams were created before the concept of interaction had been fully explored, it became necessary to revisit the program before moving on to the design of the building. It is important that all aspects of a building project reflect its concept. Reexamination of the program for the Bozeman Interfaith Center showed that many of the spaces could be grouped together based on their use. Some of those uses overlapped, highlighting different types of interactions between the programmatic elements. The diagram to the right demonstrates this idea.



Applying Concept to Program

Based on this diagram, another list of spaces was created. This list showed how certain spaces could be combined into larger areas that allowed for a less rigid program, one in which both people and activities could interact, as opposed to simply act. In addition to this, the relationship between the individual and community was further developed to reflect that individuals make up the community, and that the spaces that individuals inhabit should become the outer layer for group activities. The opposite page shows another iteration of the program as well as the final diagram showing the general relationship of individual, community, and servant spaces.



Further Refining Concept Based on Program

The following list of programmatic elements reflects the final list of spaces incorporated into the design of the Bozeman Interfaith Center. The spaces are defined both quantitatively and qualitatively in order to help achieve a solid starting point for the design. The square footages included are approximate and will ultimately change somewhat as the design develops.

## **ENTRY – GATHERING AREA – DISPLAY AREA**

500 sf

### QUALITATIVE

The main entry area will contain a permanent exhibit of the religious and cultural history of Bozeman and Cooper Park Historic District, as well as a rotating exhibit created by different religious traditions. While it is anticipated that the majority of these displays will be two-dimensional, extra square footage has been included to allow for occasional three-dimensional displays. Space for pamphlets and posters about various religious traditions and upcoming events will be provided for as well.

Many religious traditions gather before events to prepare for ritual processional entry or greeting, or after for saying hello, further discussion, and fellowship. Therefore the main entry area will be designed for these gathering activities in mind, providing yet another space in the building for the sharing of interfaith beliefs.

As a group space, this space will be designed by balancing the experiences of the senses, in order to shift the emphasis from the room to the activities taking place there. It will include some seating space, calming light, and acoustical accommodations for multiple small conversations at once.

As the main entrance to the Center, it will provide a space that feels as if one has stepped out of the busyness of life and into a place set apart. It will serve as one of the outer layers, inviting the interested party to progress further into a variety of spaces with subtle cues hinting at what is beyond.

### QUANTITATIVE

- 500 square feet (includes 25 square feet for exterior vestibule)
- Lighting: 15 - 30 footcandles (fc), adjusted for event and time of year
- Temperature and air quality: air should feel like sanctuary from harsh outdoor climate of Bozeman - warmer in winter, cooler in summer; space should be able to float around a larger range of temperatures 65 - 75 degrees F
- Acoustics: should not be able to hear anything from outside due to acoustical barrier; entry should be designed to handle multiple conversations at once by using a balance of reflective and absorptive surfaces
- Material finishes: welcoming materials from surrounding area (wood, stone, etc) and glazing to provide visual connection to outside
- Furnishings and Equipment: 5' x 10' pamphlet display and community announcement board; additional wall and floor space for further displays
- Additional sensory information: harmonious balance of sensory experience



## GATHERING SPACE

2000 sf

### QUALITATIVE

The main gathering space, designed for up to 150 people, is where large presentations and events for the community will be held. The space will provide a balanced experience for the senses and allow for a variety of activities – quiet, loud, lecture-style, interactive (such as dancing), etc. While this will be a multi-use space, it will not lose its integrity as a space that emphasizes its sacredness through the ability of its occupants to experience it with their senses.

### QUANTITATIVE

- 2000 square feet
- Up to 150 people
- Lighting: range of switched settings for various activities - workshops (100 fc), general group activities (50 fc), meditative exercises or cleaning (20 - 30 fc), lectures (15 fc, not including projector)
- Temperature and air quality: should have capacity for sedentary and active events; fresh air and more frequent air changes to accommodate more people and ritualistic smells
- Acoustics: acoustically isolated from rest of building and outside; longer reverberation time for good musical religious events (a little over 1); sound system will accommodate speakers
- Material finishes: hard floor surface for dancing and easy cleaning; walls and ceiling will need to compensate with acoustical materials
- Furnishings and Equipment: adjacent storage room holds chairs and tables for 150 people; potentially small platform or podium for one end of space; altar: 48"-96" x 24"-48" x 40" high; podium: 24"-36" x 16" deep; platform: 4"-6" high
- Additional sensory information: harmonious balance of sensory experience

## GATHERING SPACE STORAGE

300 sf

### QUALITATIVE

The storage room will accommodate chairs, tables, and other furniture and items that the facility uses.

## INDIVIDUAL SACRED SPACES

250 sf

### QUALITATIVE

At least 10 individual sacred spaces (25 square feet each) will be incorporated into the design. Each of these spaces will focus on emphasizing the experience of one or a few senses in combination, and will accommodate a variety of individual pausing styles, such as sitting in a chair, sitting on the floor (cross-legged, or legs stretched out), standing, and lying down. As opposed to being designed like a row of booths, these spaces will be scattered throughout the building, and will typically appear along circulation paths.

### QUANTITATIVE

- 25 square feet each (totalling 250 square feet)
- 10 people
- Lighting: varies from dark 10 fc to bright daylight 100 fc
- Temperature and air quality: some warmer, like in sun; some cooler, like in shade
- Acoustics: 1 or 2 spaces should be silent; a couple of spaces will be near some sort of white noise, like a water feature; other spaces will be exposed to sounds from other parts of the building or outside
- Material finishes: varies depending on which senses are being exaggerated in each space
- Furnishings and Equipment: furniture that accommodates sitting and lying down; most likely built into the building
- Additional sensory information: each space will have a different sensory experience

## SILENT CHAPEL

300 sf

### QUALITATIVE

A silent chapel space, designed to specifically engage the senses, will serve as a space for people to pause, sit, and reflect. It will also be used by groups for silent prayer and meditation. It will be acoustically isolated to provide a silent space set apart from the sounds of the world, but may incorporate some sort of water feature that accents the beauty and richness of the experience.

### QUANTITATIVE

- 1000 square feet
- Up to 30 people
- Lighting: dim 15 - 20 fc
- Temperature and air quality: slightly warmer room due to sedentary activity
- Acoustics: absorptive space and acoustically isolated from rest of building; may include a water feature
- Material finishes: materials soft in color and texture, to invite rest and reflection; view to the outside
- Furnishings and Equipment: Movable chairs, as well as built-in couches lining the walls
- Additional sensory information: low light, warmer, with acoustical separation helps create a silent environment

## OFFICE SUITE

600 sf

### QUALITATIVE

An on-site administrator will coordinate events at the Bozeman Interfaith Center, and serve as a liaison between the Center and the community. In addition to space for basic office furniture, room has been provided for a couple of couches so that the administrator can sit with a few people to discuss and coordinate events. Although a part-time receptionist will be stationed near the main entrance, the administrator's office will also have a direct line of sight to the front door.

WORK ROOM: This room will be used as a work space and staging area by those who are preparing for events taking place at the Center. A large table area, storage space, a computer (and hook-ups for laptop computers), a printer and copy machine, etc. will be provided. This space and its equipment will also be used by the administrator.

This office will be used as temporary office space for a religious leader-in-residence, or for occasional one-on-one meetings or counseling.

### QUANTITATIVE

- 600 square feet
- 1 administrator, 1 in-residence scholar or religious leader, and visitors
- Lighting: general office work (50 fc)
- Temperature and air quality: slightly warmer room due to sedentary activity, but adjustable to suit needs; space with copier and printer will potentially need to be cooled
- Acoustics: conversational acoustics
- Material finishes: office carpet, standard office materials such as gypsum board
- Furnishings and Equipment: desk, chairs, couch, book cases, large 8' - 10' long work table, chairs, 2-3 large storage cupboards; counter space for additional room; somewhere should be electricity and data hookups for 2-3 laptops
- Additional sensory information: view window for connection to outside

## LEADER PREPARATION ROOM

300 sf

### QUALITATIVE

PREP REST ROOM The preparation room, adjacent to the main gathering space, will serve as a changing and preparation area for leaders of large events. Some storage, a counter, and a sink will be provided, as well as adjacency to a rest room so that leaders will not need to travel to the main rest rooms (potentially through a large part of the building). Access will be provided to both the main gathering area and the rest of the building, allowing leaders to choose their point of entry into the main gathering space.

### QUANTITATIVE

- 200 square feet
- 1 - 2 people
- Lighting: 30 fc
- Temperature and air quality: comfortable enough for people to change clothes
- Acoustics: acoustically separated from main sanctuary, so that leaders can talk and prepare without being heard
- Material finishes: office carpet, standard office materials such as gypsum board
- Furnishings and Equipment: two chairs, a set of cupboards with a counter; large closet for hanging vestments, etc.



## GROUP PREPARATION ROOM AND KITCHEN

650 sf

### QUALITATIVE

A small group preparation room adjacent to the primary entrance of the main gathering space will be used for lining up for ritual procession, as well as accommodating those religious traditions that require some sort of washing or ritual purification before prayer or worship. It will have some storage space, as well as access to a water source.

This small kitchen will be used as a prep kitchen for small meals, refreshments for events, etc. Because it is anticipated that most food will be prepared off-site, the kitchen will be primarily for storage and staging.

### QUANTITATIVE

- 650 square feet
- 5 - 20 people
- Lighting: 50 fc
- Temperature and air quality: not kept as warm because not used as heavily
- Acoustics: conversational acoustics, but acoustically separated from main sanctuary
- Material finishes: office carpet, standard office materials such as gypsum board, hard kitchen finishes, such as stainless steel
- Furnishings and Equipment: chairs, built-in storage cupboards, water basin at one end of the room, double sink, large refrigerator / freezer combination, counter space, basic stove and oven
- Additional sensory information: harmonious balance of sensory experience

## MECHANICAL ROOM

80 sf

## MAIN REST ROOMS AND DRINKING FOUNTAIN

500 sf

### QUANTITATIVE

- 3 male water closets
- 6 female water closets
- 3 lavatories per restroom
- 1 drinking fountain
- janitorial closet

**SUBTOTAL 5480 sf**

## BUILDING CIRCULATION (30% OF SUBTOTAL SF)

1644 sf

## PARKING (FOR 5 CARS - 300 SF PER CAR)

1500 sf

---

**TOTAL 8624 sf**

# CODE ANALYSIS

The following code analysis was based on the initial programmatic elements for the design. Since the program was downsized throughout the design process, the certain portions of the design, such as plumbing fixtures, will be better than code.

The building codes that apply to this site in Bozeman, Montana are:

- Bozeman Unified Development Ordinance, February 20, 2009
- International Building Code, 2006
- International Energy Conservation Code, 2003 (which references ASHRAE 90.1 - 2001)

| Space                                        | Square Footage | Occupancy Type | Floor Area per Occupant           | Occupancy Load |
|----------------------------------------------|----------------|----------------|-----------------------------------|----------------|
| <b>Entry – Gathering Area – Display Area</b> | 500            | A3             | 5 sf net (standing space)         | 100            |
| Main Gathering Space                         | 1800           | A3             | 7 sf net (chairs -- concentrated) | 258            |
| Meeting Area                                 | 1000           | B              | 100 sf gross                      | 10             |
| Small Meeting Area                           | 550            | B              | 100 sf gross                      | 6              |
| Individual Sacred Spaces                     | 250            | B              |                                   | 10             |
| Silent Chapel                                | 1000           | A3             | 7 sf net (chairs -- concentrated) | 143            |
| Administrator's Office                       | 300            | B              | 100 sf gross                      | 3              |
| Work Room                                    | 300            | B              | 100 sf gross                      | 3              |
| Temporary Office                             | 200            | B              | 100 sf gross                      | 2              |
| Leader Preparation Room                      | 200            | B              | 100 sf gross                      | 2              |
| Group Preparation Room                       | 400            | B              | 100 sf gross                      | 4              |
| Kitchen                                      | 300            | B              | 100 sf gross                      | 3              |
| Storage Room                                 | 300            | B              | 100 sf gross                      | 3              |
| Janitorial Office with Service Sink          | 100            | B              | 100 sf gross                      | 1              |
| Mechanical Room                              | 400            |                |                                   |                |
| Main Rest Rooms                              | 350            |                |                                   |                |
| Preparation Rest Room                        | 50             |                |                                   |                |
| <b>TOTAL OCCUPANCY LOAD</b>                  |                |                |                                   | <b>558</b>     |

## FROM IBC 2006:

- Construction Type: Type VA – any materials permitted by code; includes sprinkler system
- Fire-Ratings
- Structural Frame: 1

- Bearing Walls (interior and exterior): 1
- Nonbearing walls and partitions (interior): 0
- Floor construction: 1
- Roof construction: 1 (allows for Heavy Timber)
- Allowable Height and Building Areas – 70' high (increased by 20' due to sprinkler system); 3 stories (increased by 1 story due to sprinkler system); 11,500 sq ft area
- There is the possibility for area and frontage increases due to sprinklers and corner lot. [see Section 506]
- "504.3 Roof structures. Towers, spires, steeples and other roof structures shall be constructed of materials consistent with the required type of construction of the building except where other construction is permitted by Section 1509.2.1. Such structures shall not be used for habitation or storage. The structures shall be unlimited in height if of noncombustible materials and shall not extend more than 20 feet (6096mm) above the allowable height if of combustible materials (see Chapter 15 for additional requirements)."

#### Plumbing Requirements:

- Water Closets: male (1 per 150); female (1 per 50)
- Lavatories: 1 per 200
- Drinking Fountains: 1 per 1,000
- 1 service sink
- Two means of egress required.

### **UNIFIED DEVELOPMENT ORDINANCE OF BOZEMAN, MONTANA:**

#### ZONING: R-2

##### 18.16.010 INTENT AND PURPOSE OF RESIDENTIAL ZONING DISTRICTS

C. The intent of the R-2, Residential Two-household, Medium Density district is to provide for one- and two-household residential development at urban densities within the City in areas that present few or no development constraints, and for community facilities to serve such development while respecting the residential quality and nature of the area.

#### BUILDING CLASSIFICATION: COMMUNITY CENTER (CONDITIONAL AUTHORIZED USE)

##### 18.80.620 COMMUNITY CENTER

A building or portion of a building used for nonprofit cultural, educational, recreational, religious or social activities which is open to the public or a designated part of the public, usually owned and operated by a public or nonprofit group or agency. Examples of community centers are schools, churches, Boys and Girls Clubs, and similar uses. Community center does not include fraternities, lodges or similar uses.

##### 18.40.210 COMMUNITY CENTER

A. There shall be public street access on to an arterial or collector standard street within one block of the community center site.

B. There shall be a 20 foot landscaped yard adjacent to any residential property.

C. Each community center site shall provide a minimum of 2 ingress/egress points which comply with Section 18.44.090.

#### AREA REQUIREMENTS

##### 18.16.050 YARDS



A. Minimum yards required for the R-1, R-2, R-3, R-4, R-O and RMH districts are:

1. Front yard:

- a. Adjacent to arterial streets as designated in the Bozeman growth policy - 25 feet
- b. Adjacent to collector streets as designated in the Bozeman growth policy - 20 feet
- c. Adjacent to local streets - 15 feet

2. Rear yard - 20 feet

- a. Adjacent to arterial streets as designated in the Bozeman growth policy - 25 feet

3. Side yard - 5 feet

#### **LOT AREA / FLOOR AREA**

18.16.030 LOT COVERAGE AND FLOOR AREA

A. Maximum lot coverage by principal and accessory buildings shall be:

- 2. Not more than 40 percent of the lot area in the R-1, R-2, R-3 and RMH districts.

#### **BUILDING HEIGHT**

18.16.060 BUILDING HEIGHT

Maximum building height for each residential district shall be as follows:

24 feet roof pitch <3:12;

28 feet roof pitch 3:12 or greater but <6:12;

32 feet roof pitch 6:12 or greater but <9:12;

36 feet roof pitch 9:12 or greater

#### **IMPLICATIONS OF DESIGNING WITHIN AN HISTORIC DISTRICT**

The site for the Bozeman Interfaith Center is located within the Cooper Park Historic District. Consequently it must conform to the design guidelines in the document *Bozeman Guidelines for Historic Preservation & the Neighborhood Conservation Overlay District*, January 17, 2006. The following list explains the general guidelines to which this project must adhere:

- The topography of the design should minimize variation from the standard topography of surrounding buildings and how they sit on the site, paying attention to existing setbacks.
- The alley must be maintained.
- Streetscape design should incorporate the surrounding plant aesthetic, taking into account the variety of trees, plants, and sidewalk locations and the use of grass strips and planters on either side of the sidewalk.
- Any landscaping should incorporate plant life of the area.
- Similar building forms and proportions should be maintained in the design.
- The solid-to-void ratio of surrounding buildings should relate to the design's wall-to-window ratio.
- For the most part selected building materials should reflect the material character of the area or seek to naturally enhance the visual experience of the area.
- The architectural design character should not mimic existing historical structures, but instead provide contemporary solutions that complement the neighborhood.
- The visual impact of parking lots and service areas should be minimized through the use of landscaping and other visual barriers.
- Exterior lighting should be adjusted so as not to penetrate adjacent sites or cause glare issues.
- All utilities and service areas should be designed into the building so that they do not take away from the architectural aesthetics of the design or the area.
- Residential neighborhoods rely on a public-to-private streetscape, which should be maintained according to the

visual language of the area.

- New construction should be of similar mass and scale as compared to existing structures. Larger buildings should be made up of smaller pieces to de-emphasize their scale. Facades should also comply with a similar scale and should not be taller than two stories.
- Roof forms should mimic the traditional roof forms of the area.
- Secondary structures should be of lesser scale and visual hierarchy on the site.
- Fences should also help maintain the visual integrity of the neighborhood, being short and somewhat transparent.

The guidelines also address specific characteristics for Cooper Park Historical District, since this district is still well-preserved architecturally. The guidelines lists the following design characteristics that need to maintained:

- residential neighborhood setting
- similar front yard setback
- simple one-story wood frame residential buildings
- porches address the street
- secondary structures & garages to the rear of the lot
- automobile access is primarily from the alley<sup>2</sup>

Obviously the material palette chosen should reflect the character of the area, especially for buildings around the neighborhood's focal point, Cooper Park.

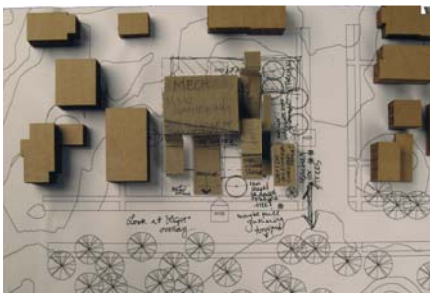
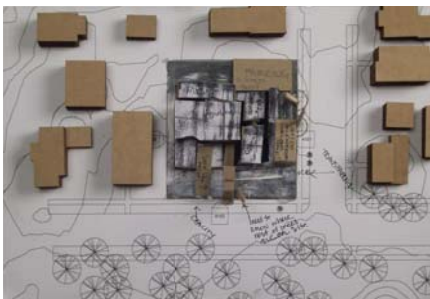
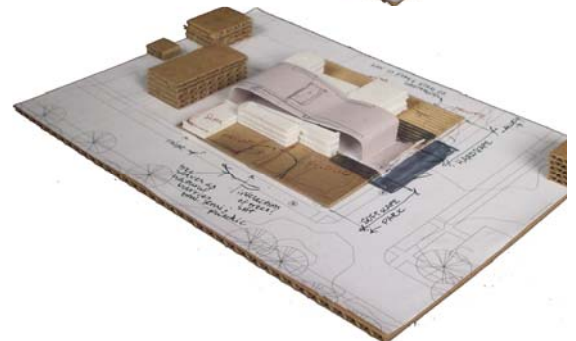
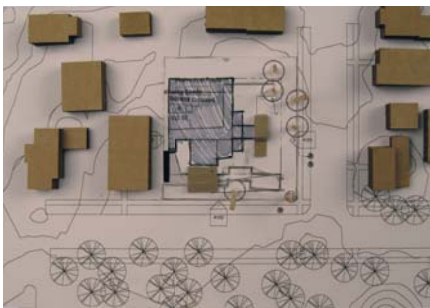
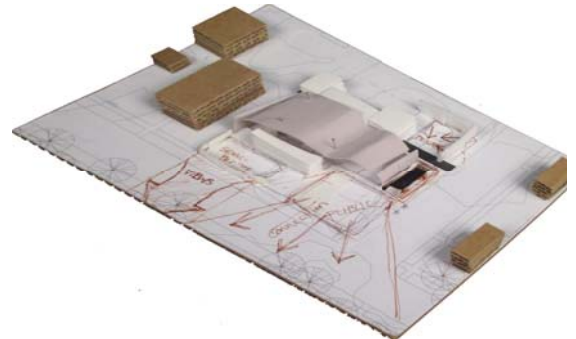
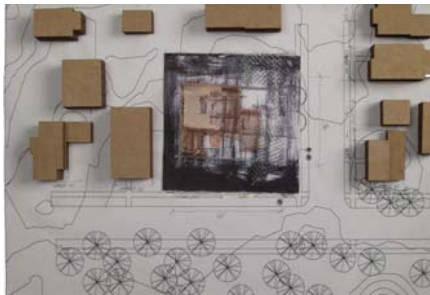
The guide finishes with a discussion of the different period building types throughout the historical districts of Bozeman. Two prominent styles in the Cooper Park Historical District are the Victorian style and the Colonial Revival style, both of which are shown below (images taken from guide).



# CONCEPT AND DESIGN DEVELOPMENT

With the initial concept, site analysis and response, and program and code analysis in place, the concept models could now be developed into a building form. The following models show how the design progressed into the form of a ribbon, and how the landscaping of the site also developed.

Note: While these models make it seem as if this design developed overnight, these models only represent a few highlights of a long journey of form development for this project.



First Model Series

Ribbon and Landscaping Development



Once the Ribbon became the predominant form in the project, the floor plans, sections, and elevations that were already in progress were adapted to this form. Each individual space was then developed more fully. The images below show how the experience of each sense was applied as a layer to each space to help inform the design. The ideas shown on the following notes and sketches were directly implemented into the final design.

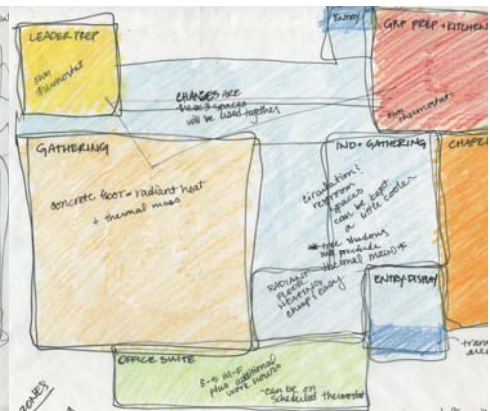
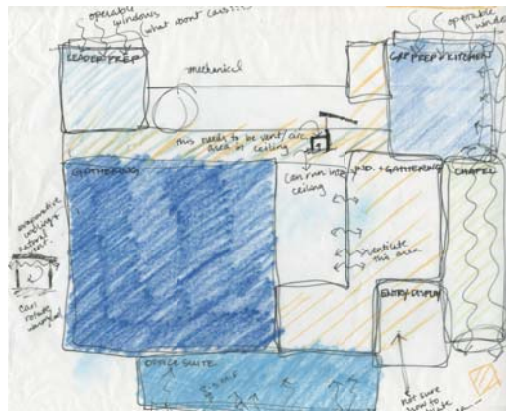
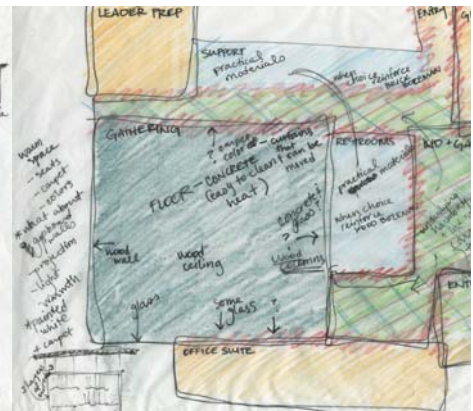
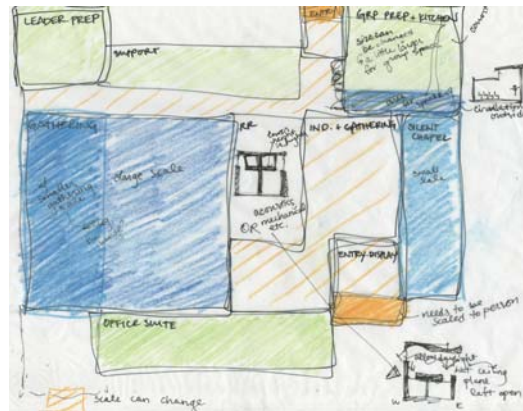
Note: The pastel images included here show another concept series about the five senses that was created during the concept phase. Each image was created to help the designer express visually the understanding of that sense as it relates to the sacred. This visual information, coupled with the prior research regarding the five senses and the sacred, was integral to the success of this design development stage.



Seeing the Sacred

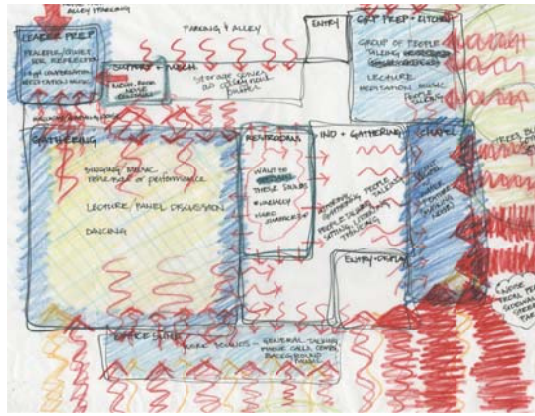


Touching the Sacred

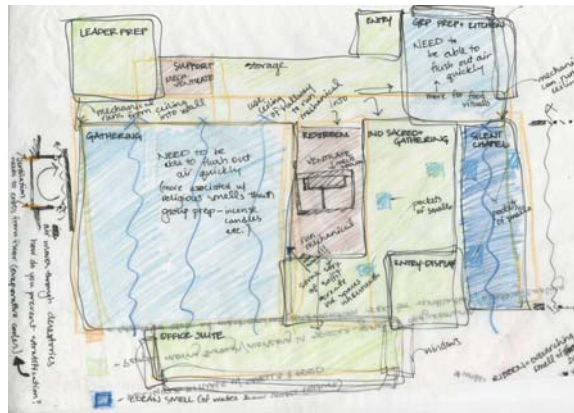




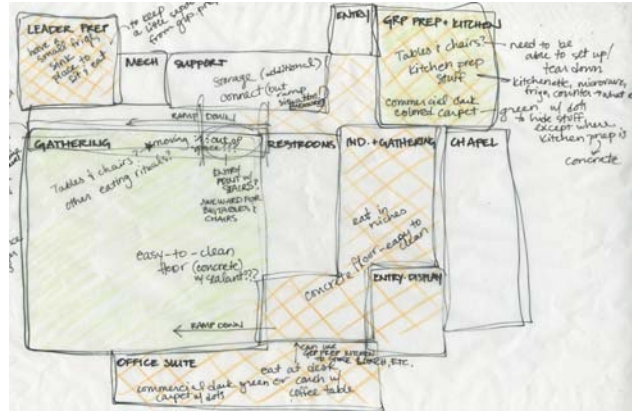
Hearing the Sacred



Smelling the Sacred



Tasting the Sacred



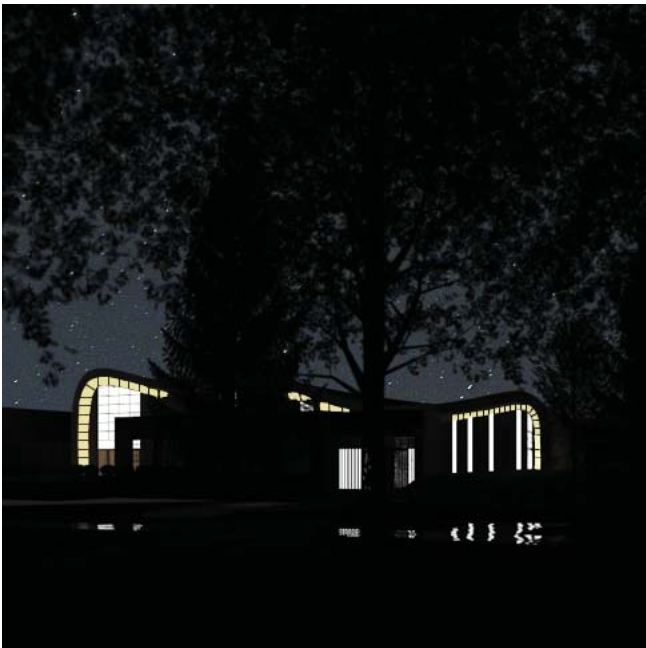


# FINAL DESIGN

The final design solution for the Bozeman Interfaith Center embraces the core of the concept – interaction – and encompasses the theory of a universal sacred space architecture whose common ground is the experience of the five senses. The images that follow express the design in various ways, including perspectives, orthographic drawings, and details.



Bozeman Interfaith Center: View from South 7th Avenue and West Koch Street



View from Cooper Park

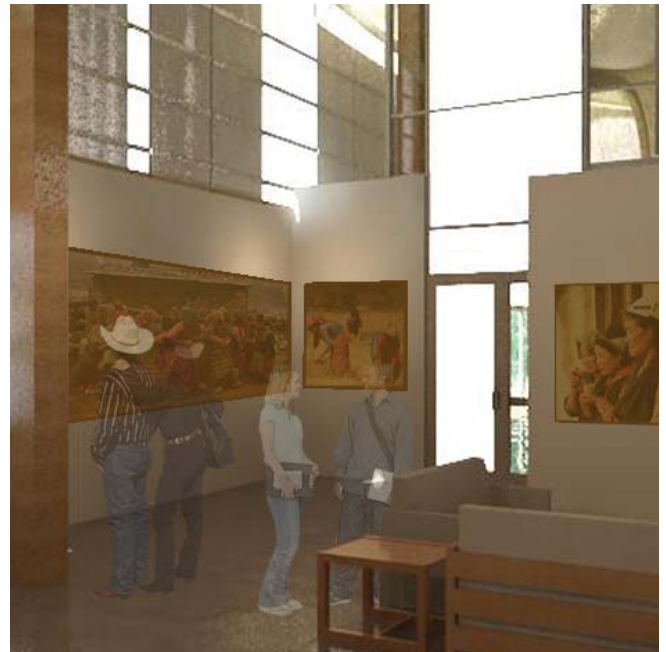


View of Exterior Gathering Space





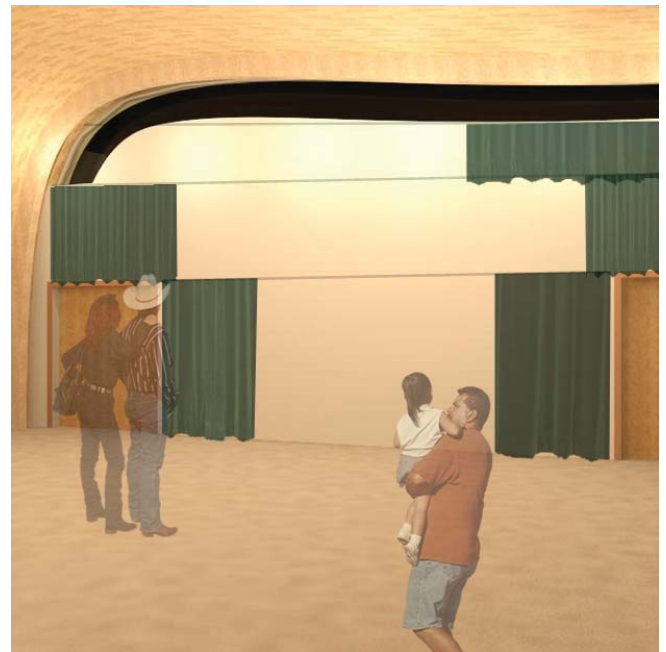
Lobby



Display and Main Gathering Space Entrance



Silent Chapel



Main Gathering Space

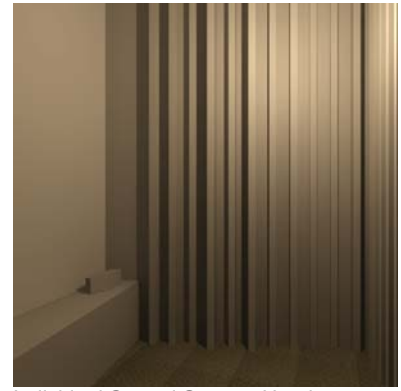
There are many spaces within the Center designed for formal and informal gatherings, as well as places for people to sit and quietly reflect on life. The Lobby, in addition to serving as a gathering space, is a display space for information about the Center, its work, and traveling exhibits about world religions.



Individual Sacred Space - Seeing



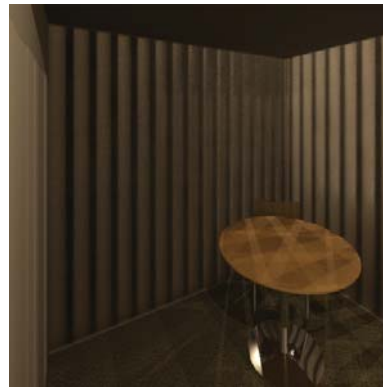
Individual Sacred Space - Touching



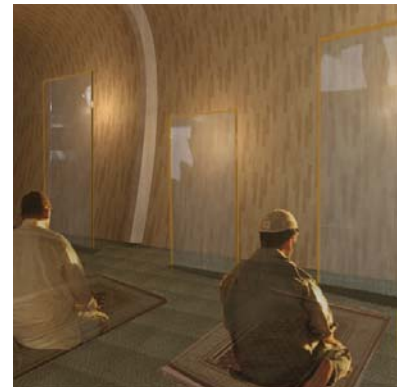
Individual Sacred Space - Hearing



Individual Sacred Space - Smelling



Individual Sacred Space - Tasting



Silent Chapel

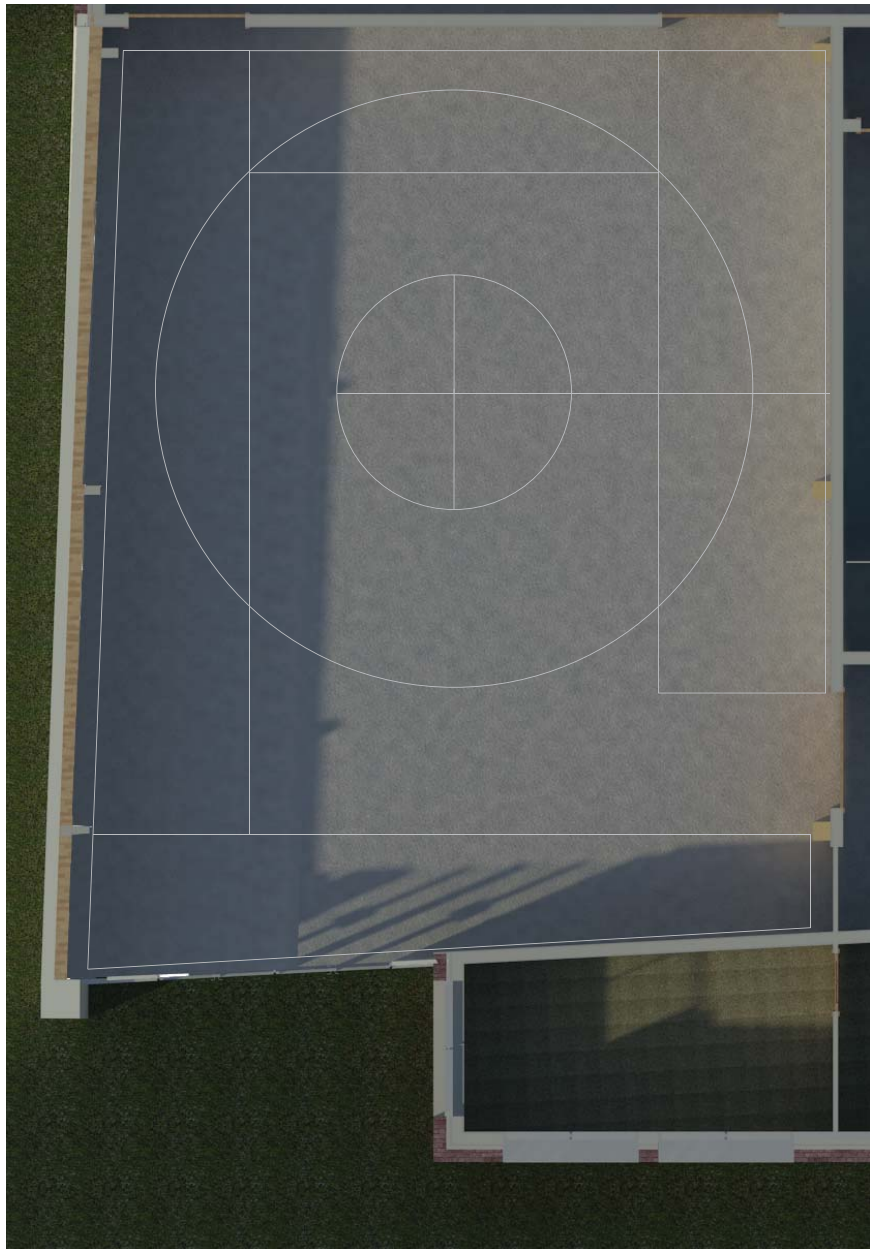
The Bozeman Interfaith Center provides places for individuals in the community looking to pause and experience moments of peace and tranquility. In addition to several niches throughout the site, five spaces have been designed for this purpose, each with their own emphasis on a particular sense:

- The room for seeing focuses on light and contains a skylight through which daylight can dramatically penetrate throughout the year.
- The room for touching has a change in ceiling height and has granite walls that will remind occupants of the natural granite in the area.
- The hearing room, equipped with acoustical separation from the rest of the building, and a set of small speakers for an iPod, is composed of wood panels of various thicknesses and depths to help create a more dynamic sound in a small space.
- The room for smelling has simple furniture made from the same douglas fir wood as the interior of the ribbon, and also contains walls dripped with beeswax at the top to invite a scent of candles.
- The room for tasting has translucent walls that allow for dim light and muffled sound penetration from the lobby, making it a quiet place to eat a meal.

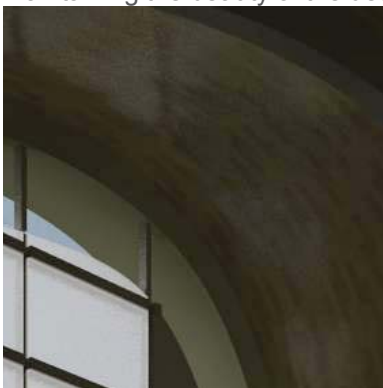
Additionally the Silent Chapel provides a place where individuals can sit and watch the daylight move across water walls along the east wall of the room.

A central feature of the Bozeman Interfaith Center is the Main Gathering Space, designed as a place where individuals of different faith communities can come and share in their spirituality. In order to design a universally sacred space, special attention was paid to room orientation, material selection, lighting quality, and other design decisions. Although the space is evenly daylight by clerestories on the north and the south of the ribbon, joints in the polished concrete floor highlight artificial lighting configurations for the room. The floor itself is easy to clean – a necessity for certain rituals – and contains a radiant floor heating system. One floor joint points to the East Wall, which contains niches that can be used for small altars during rituals. The North Wall is covered in three tiers of green acoustical curtains, colored appropriately to match the carpet in other areas of the building and help extend the greenery of the park through the site and the building. The curtains can be opened and closed based on the acoustical needs of the space.

Ultimately, the Main Gathering Space is a versatile room that can accommodate a variety of group activities and room orientations while maintaining the beauty of the design.



Gathering Space Floor Plan



Wood Paneling and Clerestories



Acoustical Curtains



East Wall Niches





Main Gathering Space - Facing East



Main Gathering Space - Facing West



Main Gathering Space - Facing South



Leader Preparation Spaces

The Leader Preparation Room is a self-contained space within the building designed to provide leaders of rituals and events with a room where they can physically, mentally, emotionally, and spiritually prepare. Some of its features include a restroom, a closet and counter with mirrors and emergency repair supplies, a desk, and comfortable chairs that look out on a private exterior space that is also accessible to the leader.



Group Preparation Spaces

The Group Preparation Room is designed to accommodate a variety of needs. In addition to being a support space for the Main Gathering Space, it can also be used as a smaller gathering space in the building. It contains a kitchen, storage closets, and access to an adjacent private exterior space. Groups that might use this space are choirs, wedding parties, small religious groups, and workshop leaders and participants.



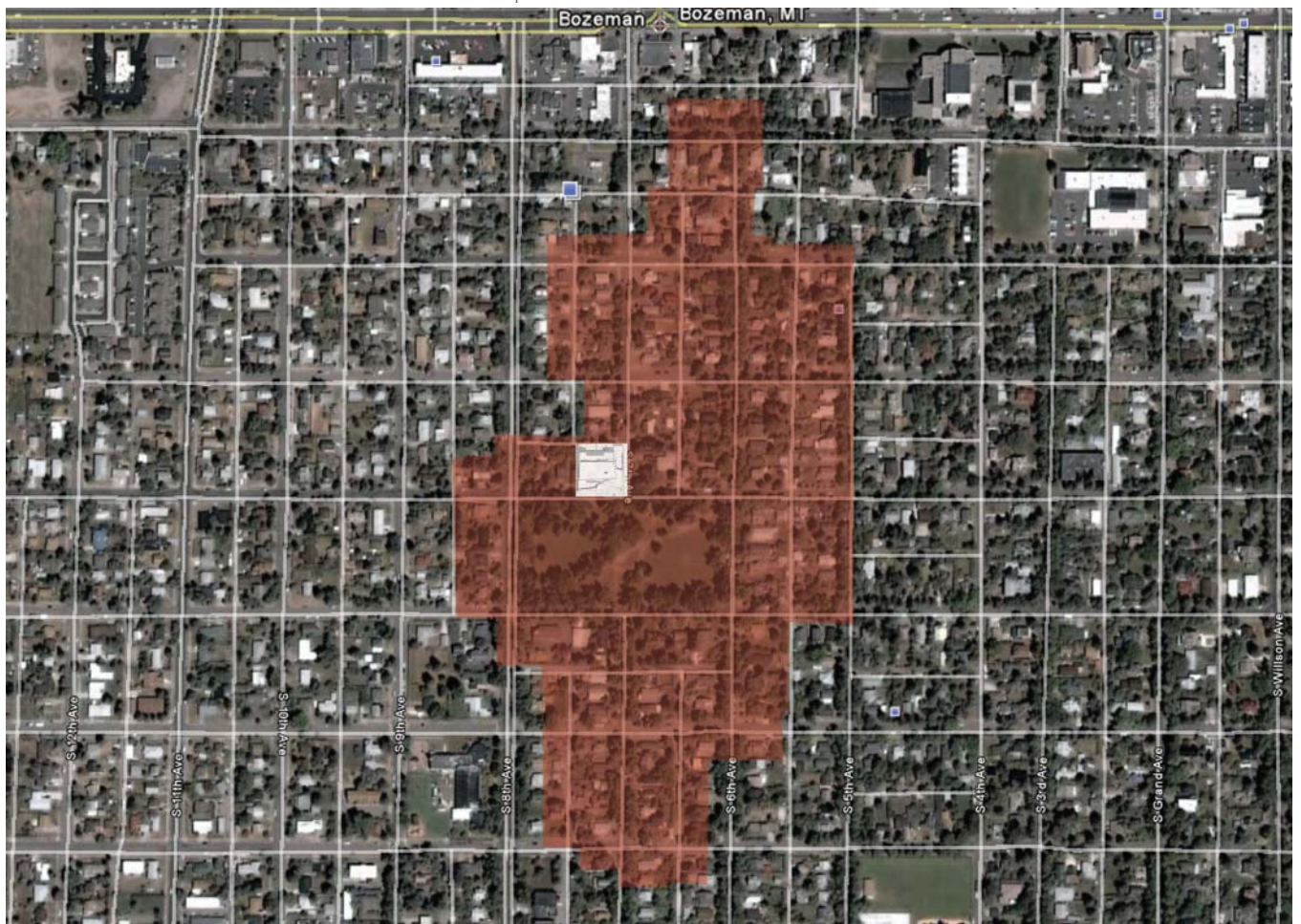
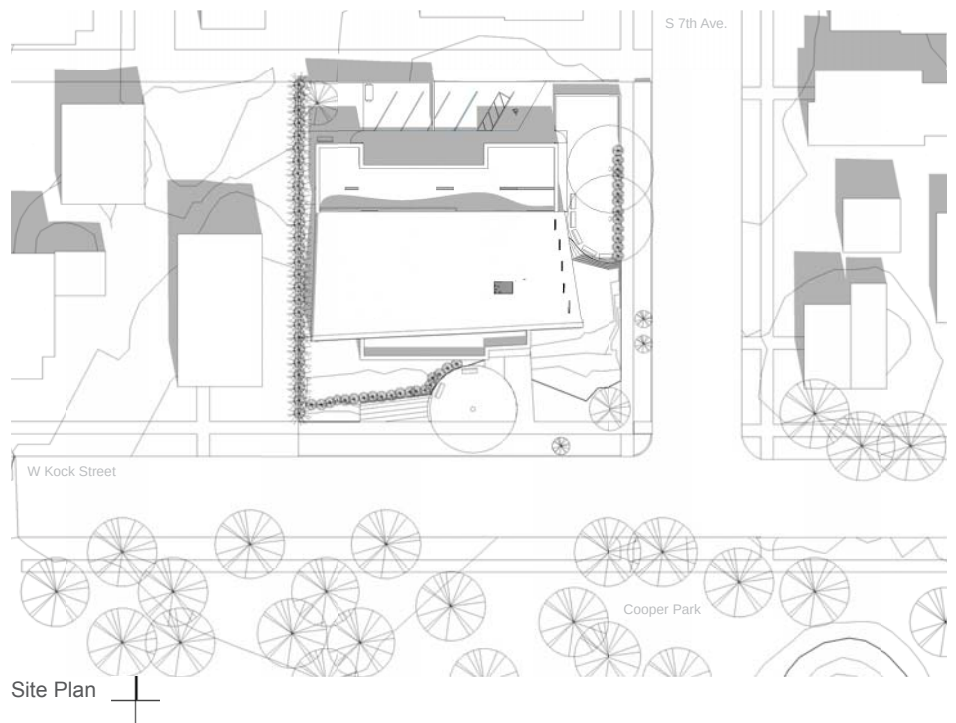
Office Suite

The Office Suite is designed for flexibility to help anticipate the needs of events that the Center will host. In addition to desk space for an administrator, and an In-Residence Office, the suite contains a large work room with tables and chairs that can be rearranged depending on the situation. A copy machine, printer, internet access, and other supplies in this room are also available to groups that come to the Center.



While the renderings on the previous pages have sought to convey the qualitative feel of the project, the drawings that appear on the following pages describe the design solution with greater specificity. They cover everything from final site location to details of key portions of design construction.

Note: Due to issues with reproducibility, the original scale of these drawings has been omitted.



Site Plan in Context (Google Earth Map Underlay)



South Elevation

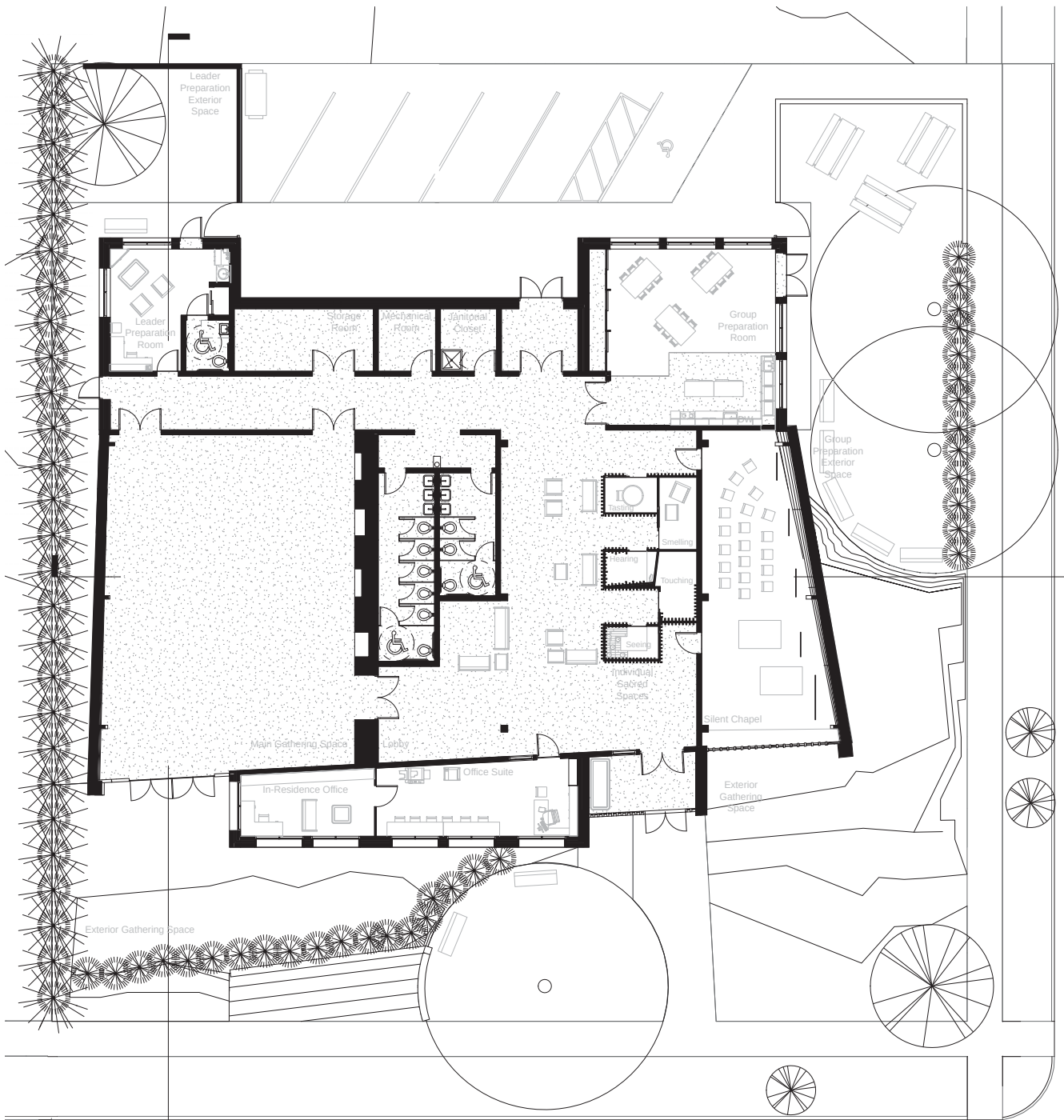


East Elevation

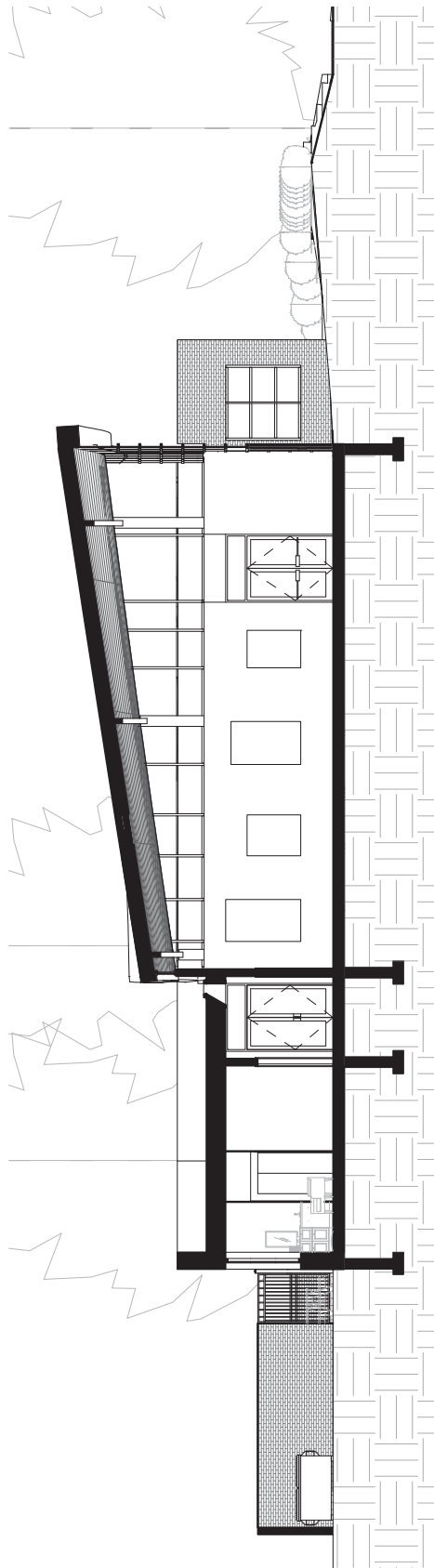


North Elevation





Floor Plan with Landscaping

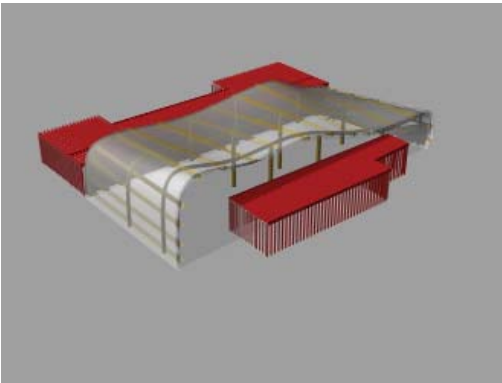


Transverse Section

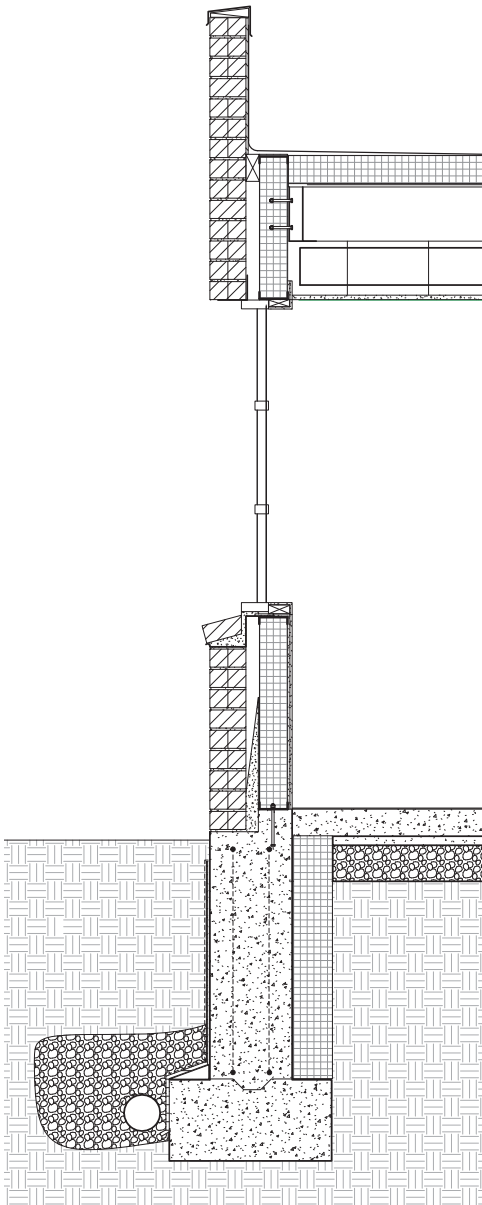


Longitudinal Section

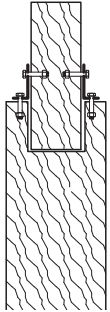
The Center has two structural systems. A metal stud framing system supports the exterior brick veneer walls to the north and south of the ribbon. A glulam arch beam system, supported by douglas fir timber columns, creates the form of the ribbon. The beams are laterally braced with steel beams. The interior of the ribbon is lined with douglas fir paneling, whereas the outside is covered with a pre-weathered zinc metal paneling system.



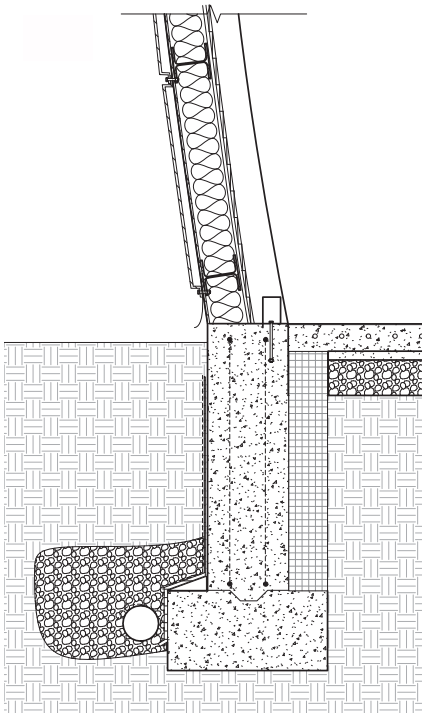
Structural Diagram



Exterior Brick Wall Detail



Column - Beam Connection



Exterior "Ribbon" Wall Detail



# GLOSSARY

For the purpose of this thesis, several terms related to religious architecture and interfaith sacred space need to be defined and clarified. Standard definitions have been taken from the Merriam-Webster Online Dictionary and other significant sources and then enriched.

- **Sacred and Profane:** While the world has taken profane to mean something verbally harsh and unclean, for the purposes of this thesis, it simply refers to the opposite of the sacred, that being the secular nature of everyday life. The term sacred, on the other hand, deals with a connection with a higher power in a religious or ritualistic way.
- **Religious and Spiritual:** Some people distinguish between religious and spiritual, implying that one who is spiritual has a sense of the sacred and that they have a spirit, but is not necessarily connected to a set of beliefs or community devoted to that set of beliefs. Religious, on the other hand, implies a set of faith beliefs, rituals, and traditions that are usually practiced within the confines of a community.
- **Ecumenical, Nondenominational, and Interfaith:** Many people mistake ecumenical and nondenominational for interfaith. However, both ecumenical and nondenominational refer specifically to the Christian religious tradition, implying that an event or a space welcomes all Christians, regardless of association. However this understanding was not always the case. Ecumenical comes from the Greek word for “the whole inhabited earth”<sup>1</sup> In this thesis, the term interfaith is used to describe a religiously inclusive situation or space.
- **Exclusive, Inclusive, Pluralism:** An exclusivist religious tradition holds beliefs that automatically nullify the beliefs of other religious traditions. An inclusivist religious tradition is the opposite. It does not contain fundamental doctrines that are seen as conflicting with other religions. Pluralism then is the notion that while one believes in a body of religious teaching, they do not automatically assume that another person holding a different set of beliefs is automatically wrong. Diana Eck sums up these three terms the best:

The exclusivist insists upon the exclusive and sole truth of one’s own religious tradition, excluding all others. The inclusivist sees one’s own religious tradition as including the other, interpreting the other’s faith in one’s own terms. The pluralist accepts the fact that many voices will speak in the exploration of religious truth, each in its own terms, trusting the encounter of real dialogue to reach a deeper understanding of one another’s faith and of our own.<sup>2</sup>

- **Space and Place:** While space and place have become somewhat interchangeable in the English language, every effort has been made to use space to define a three-dimensional, often architectural, volume, reserving place for specific locations on the map.
- **Iconic and Iconoclastic:** Iconic religious traditions have physical representations of divinity within their beliefs. Iconoclastic religious traditions refrain from making such images, but have other ways of demarcating a space as sacred.
- **Orient and Occident:** These are simply other words for the east (orient) and the west (occident).

# NOTES

## INTRODUCTION

- 1 Diana L. Eck, *A New Religious America: How a "Christian Country" Has Become the World's Most Religiously Diverse Nation* (San Francisco: Harper, 2002) xix.
- 2 Mircea Eliade, *The Sacred and the Profane: The Nature of Religion*, trans. Willard R. Trask (Orlando: Harcourt-Harvest, 1957) 13.
- 3 Juhani Pallasmaa, *The Eyes of the Skin: Architecture and the Senses* (Chichester, England: Wiley, 2005) 19.

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- 1 Donald H. Frew, ed., "Appendix: Basic Briefings on Many of the World's Faith Traditions," Interfaith Sacred Space Design Competition Packet, 2 Sept 2003, Interfaith Center at the Presidio, 30 Apr 2009 <[http://interfaithdesign.org/other/2004\\_Competition\\_Kit.pdf](http://interfaithdesign.org/other/2004_Competition_Kit.pdf)>, 15, 24.
- 2 Frew 24.

## DESIGN APPROACHES TO SACRED SPACE

- 1 Alexander Tzonis, *Le Corbusier: The Poetics of Machine and Metaphor*, (New York: Rizzoli-Universe, 2001) 185.
- 2 Tzonis 186.
- 3 Tzonis 185.
- 4 James Stirling, "Ronchamp: Le Corbusier's Chapel and the Crisis of Rationalism," *The Architectural Review* 191.12 (1992): 62.
- 5 Tess Taylor, "A City on the Hill," *Metropolis* 23.8 (2004): 102.
- 6 qtd. in Taylor 103.
- 7 Taylor 160.
- 8 Taylor 160.
- 9 Taylor 161.
- 10 qtd. in Taylor 160.
- 11 Taylor 161.
- 12 Taylor 160.
- 13 Mary-Lynn Behn, Office Personnel at North Shore Congregation Israel, Personal Interview and Tour, 25 July 2006.
- 14 Uri Kaploun, comp., *The Synagogue, Popular History of Jewish Civilization* (New York: Amiel, 1973) 60-63.
- 15 Behn.
- 16 Behn.
- 17 qtd. in Samuel D. Gruber, *American Synagogues: A Century of Architecture and Jewish Community*, (New York: Rizzoli, 2003) 142.
- 18 Diana L. Eck, *Encountering God: A Spiritual Journey from Bozeman to Banaras*, (Boston: Beacon, 1993) xi.
- 19 Robert McCarter, *Unity Temple: Frank Lloyd Wright*, (London: Phaidon, 1997) 4,7.
- 20 McCarter 7-8.
- 21 McCarter 10.
- 22 qtd. in McCarter 10.
- 23 McCarter 10.
- 24 McCarter 8.
- 25 McCarter 19.
- 26 McCarter 21.

- 27 McCarter 10.
- 28 qtd. in McCarter 10.
- 29 A dyad is defined as a pair of two things; although it also has other meanings, it typically refers to a married couple, where the two things paired are the husband and the wife.
- 30 Occidental refers western ideals and philosophies. The occident, or the west, is the opposite of the orient, or the east.
- 31 Kenneth Frampton, *Tadao Ando*, (New York: Museum of Modern Art, 1991) 21.
- 32 Frampton 42.
- 33 Michael D. Coogan, ed., *The Illustrated Guide to World Religions*. (New York: Oxford UP, 2003) 261.
- 34 Frampton 16.
- 35 Frampton 42.
- 36 Jeffrey Hogrefe, "Divine interventions. (Bellevue Art Museum)," *Interiors* 160.4 (2001): 58.
- 37 qtd. in Frampton 8.
- 38 Qtd. in Frampton 21.
- 39 Frampton 21.
- 40 Frampton 13.
- 41 Hogrefe 58.
- 42 Phyllis Richardson, *New Spiritual Architecture*, (New York: Abbeville P, 2003) 18.
- 43 Richardson 18.
- 44 qtd. Richardson 74.
- 45 Richardson 74.
- 46 Richardson 74-77.
- 47 Richardson 74-77.

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- 1 Le Corbusier, *Towards a New Architecture*, trans. Frederick Etchells (London: Architectural P, 1946) 23.
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- 3 De Botton 106.

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- 1 Marietta S. Millet, *Light Revealing Architecture*, (Hoboken: Wiley, 1996) 160.
- 2 Indra Kagis McEwen, *Socrates' Ancestor: An Essay on Architectural Beginnings*, (Cambridge: MIT P, 1993) 21-22.
- 3 Pallasmaa 15.
- 4 Pallasmaa 29-30.
- 5 Diana L. Eck, *Darśan: Seeing the Divine Image in India*, (Chambersburg: Anima, 1985) 1.
- 6 Eck, Darśan 3.
- 7 De Botton 118.
- 8 De Botton 118.
- 9 Pallasmaa 39.
- 10 Pallasmaa 11.
- 11 Pallasmaa 13.
- 12 Pallasmaa 13.
- 13 Pallasmaa 49.
- 14 Talbot Hamlin, *Architecture Through the Ages*, (New York: Putnam, 1940) 166-167.

- 15 *Louis Kahn, Louis Kahn: Essential Texts*, ed. Robert Twombly (New York: Norton, 2003) 253.
- 16 Millet 161.
- 17 Kahn 231.
- 18 Pallasmaa 46.

## TOUCHING THE SACRED

- 1 Kahn 268-269.
- 2 Lisa Heschong, *Thermal Delight in Architecture*, (Cambridge: MIT P, 1979) 28-29.
- 3 Pallasmaa 37.
- 4 Maire Eithne O'Neill, "Corporeal Experience: A Haptic Way of Knowing," *Journal of Architectural Education*, 55.1 (2001): 8.
- 5 Pallasmaa 56.
- 6 John Ruskin, *The Seven Lamps of Architecture*, (New York: Dover, 1989) 73.
- 7 Bartlett Hayes, *Tradition Becomes Innovation: Modern Religious Architecture in America*, (New York: Pilgrim, 1983) 110.
- 8 Pallasmaa 67.
- 9 Kahn 21.
- 10 "Crystal Cathedral Architecture." Crystal Cathedral Ministries 2009. 29 Apr 2009. <[HTTP://WWW.CRYSTALCATHEDRAL.ORG/ABOUT/ARCHITECTURE.PHP](http://www.crystalcathedral.org/about/architecture.php)>.
- 11 "Crystal Cathedral Architecture."
- 12 Frank Lloyd Wright, *The Essential Frank Lloyd Wright: Critical Writings on Architecture*, ed. Bruce Brooks Pfeiffer. (Princeton: Princeton UP, 2008) 121.
- 13 Wright 121-155.
- 14 Pallasmaa 30-31.
- 15 Ruskin 55.
- 16 Pallasmaa 58.
- 17 "MIT Chapel," Galinsky 2005, 30 Apr 2009 <<http://www.galinsky.com/buildings/mitchapel/index.htm>>.
- 18 Heschong 1.
- 19 Heschong 27.
- 20 Heschong 27-28.
- 21 Heschong 41.
- 22 Heschong 16.
- 23 Heschong 37.
- 24 Heschong 16.
- 25 Heschong 33.

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- 1 C. S. Lewis, *The Screwtape Letters with Screwtape Proposes a Toast*, (New York: Harper-San Francisco, 1996) 119-120.
- 2 Pallasmaa 49.
- 3 Pallasmaa 50.
- 4 Pallasmaa 51-52.
- 5 Robert Lawlor, "Geometry at the Service of Prayer: Reflections on Cistercian Mystic Architecture," *Parabola: Myth and the Quest for Meaning* 3.1 (1978): 19.
- 6 Lawlor 12-13.
- 7 Lawlor 16.
- 8 John Pawson, *Afterward, Architecture of Truth: The Cistercian Abbey of Le Thoronet*, by Lucien Hervé (New York: Phaidon, 2001) 153.
- 9 Lawlor 13.
- 10 Lawlor 19.

## SMELLING THE SACRED

- 1 Anna Barbara and Anthony Perliss, *Invisible Architecture: Experiencing Places through the Sense of Smell* (Milano: Skira, 2006) 54.
- 2 Pallasmaa 16.
- 3 Barbara and Perliss 53-54.
- 4 Pallasmaa 54.
- 5 Pallasmaa 54.
- 6 Barbara and Perliss 64.
- 7 Barbara and Perliss 60.
- 8 Barbara and Perliss 110.
- 9 Barbara and Perliss 64-65.
- 10 Barbara and Perliss 65.
- 11 Toshiko Mori, ed., *Immaterial | Ultramaterial: Architecture, Design, and Materials* (New York: Braziller, Harvard Design School, 2002) vii, 63.
- 12 Aamodt, Mette. "Architecture Smells." *Immaterial | Ultramaterial: Architecture, Design, and Materials* (New York: Braziller, Harvard Design School, 2002) 68.
- 13 Aamodt 66-67.
- 14 Aamodt Mori 68.

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- 2 Karen A. Franck, "The Space of Food," *Architectural Design: Food + Architecture* 72.6 (2002): 12.
- 3 Lance Hosey, "Food for Thought," *In the Cause of Architecture: An Online Journal of Ideas from Architectural Record* 2003. 29 Apr 2009. <<http://archrecord.construction.com/inTheCause/1103food/andArchitecture.asp>>.
- 4 Hosey.
- 5 Pallasmaa 59.
- 6 Franck 5.

## CONCLUSIONS

- 1 Kahn 58.
- 2 Kahn 44.

## PROGRAM: THE BOZEMAN INTERFAITH CENTER

- 1 Eck, *Encountering God* 213.
- 2 Pallasmaa 63-64.
- 3 City of Bozeman, *Bozeman Guidelines for Historic Preservation & the Neighborhood Conservation Overlay District* (Bozeman: Winter, 2005) 85.

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- 1 Eck, *Encountering God*, x.
- 2 Eck, *Encountering God*, xiii.



# IMAGE SOURCES

Unless otherwise indicated, photos and images were created by the author.

\* denotes images modified by author.

## NOTE OF AUTHOR'S INTENT

- 1 Warchol, Paul. "Chapel of St. Ignatius, Seattle, WA." Photo. Meyers, Victoria. *Designing with Light*. New York: Abbeville P, 2006, 2. 15 Sep 2009. <<http://www.abbeville.com/interiors.asp?ISBN=0789208806&CaptionNumber=02>>.

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- 4 "Interfaith Chapel Entrance, Atlanta." *Hartsfield - Jackson News* 2009. 15 Sep 2009. <<http://www.atlanta-airport.com/hjn/2009/06/passenger2.htm>>.
- 5 "Muzaffar Chaudhary Prays in the Interfaith Chapel at Hartsfield Jackson Atlanta International Airport." *Faisal Kutty.com* 2009. 15 Sep 2009. <<http://faisalkutty.com/editors-picks/chapels-mix-faith-with-flying-airports-welcome-worshippers-of-every-denomination/>>.
- 6 "A Prayer Room Furnished by the Airport Chapel in Heathrow Airport, London." *Find Target Reference* 2009. 15 Sep 2009. <<http://reference.findtarget.com/search/chapel/>>.

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