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Contents

Communicate

While architecture is defined by the ability to communicate design and space to the general public, the use of writing supplements visual media in the process of communication. From the beginning stages of schematic design to the process of final construction, architectural professionals utilize writing to conceptualize, present, and build.

After completing my first year of courses within Ball State University's College of Architecture and Planning, one key idea has forever been branded into my mind—architecture *is* design communication. Professor of Architecture at Ball State University, Janice Shimizu, stated in a personal interview that, "as an architect so much of what we do is trying to communicate to people." This idea of design communication can be defined as the ability to explain and idea to any member of the general public through media such as drawing, photography, computer graphics, and most importantly writing. While drawings and other visual media provide creative communication for the artistic mind, writing is a universal form of communication. Because writing is a universal practice, it can be considered the most useful technique for executing effective design communication. If architecture is the process of communicating space and design to a general public, then writing lies within that space to act as a literary mortar between drawing and building, visual and physical experience, and designer and client.

The superseding importance of writing is to bridge the line between what is considered art and what is considered architecture. To understand the full importance of writing within the architectural field, one must understand the process of how this bridge is constructed to connect art and architecture. Three key uses of writing create the components of the bridge. On one side is the importance of writing to describe the artistic meaning of architecture; in the middle is the importance of writing to place one's mind within the proposed spaces of the architecture; and at the other side stands the importance of writing to explicate construction details of a three dimensional building.

First, writing builds a foundation in the artistic nature of a design. Almost any source for architectural publication includes a written explanation of the design concept behind a

given project. Janice Shimizu mentioned that architectural journals such as *Praxis*, design firms' websites such as *www.Zaha-Hadid.com*, and online architectural publication websites such as *ArchDaily.com* are among the most prevalent of these sources within the architectural community. Each of these sources values the use of writing to further explain the artistic genius behind their publications. Zaha Hadid Architects explain the concept behind the Phaeno Science Center by writing, "Phaeno realizes our continuing vision of creating 'complex, dynamic, and fluid spaces'—from the gently flowing artificial hills and valleys created below the main elevated structure, to the crater-like museum floor ("Phaeno Science Centre")." Upon initial examination of this concrete building, one probably does not see a design that references nature, however this project description dives into its true artistic expression. The poetics of architecture is also released within this writing. While literal poetry is not featured, the writing exposes the building's poetry of interior space as a natural landform. Without this written enlightenment, the artistic purpose of the architecture would easily be overlooked.

Second, writing begins to bridge the gap between art and built architecture by placing the viewer/reader into the proposed spaces of a design. When attempting to do this through writing, an architect will play with the reader's emotions in order to create the most dramatic and realistic experience possible. An article published on *ArchDaily.com* describes the Museum of Modern Art at Gunma by explaining how, "Two reflective marble walls encase the steps and extrude them into infinity... At the far end of the hall lies a marble sculpture resembling a series of steps; however they are too large to climb. As the wall to one's right converges into the distance, the skewed edge and disproportioned size of the sculpture grabs the perspective and throws it back on the viewer (Metcalf)." The extreme experience described in this passage stimulates the senses of sight and even touch with its dramatic narrative of

an infinite and reversed perspective as well as mentioning the use of “reflective marble” and steps that “are too large to climb.” While a fancy image could visually show these aspects, only writing can express them with vivid language that fully engages the mind. As Janice Shimizu mentioned that we as architects use this “’archispeak’… that is trying to be evocative.” Along with arousing the senses, writing dictates the intended experience. The description of the Museum of Modern Art at Gunma tells the reader that upon entering the space they will encounter reflections, a drastic change in scale, and confusing perspectives. Overall, the writing portrays a dynamic experience of vertigo. In this particular article, an image of this space is not provided; therefore, writing is a necessity as the only possible expression of the intense hallway. When pictures are not available, words develop the imagery.

On the opposite side of the bridge lies the importance of writing for the construction process. Janice Shimizu also stated that “the way you start to put together specifications or the text within your drawings end up becoming in some way shaping what gets built.” This idea of writing that is “shaping what gets built” defines the construction documentation phase of a project. For example, writing explains the process of how a wall detail is assembled. Janice goes on to describe a project of her own where research was done on a new wall assembly that involved light passing through a thin material that was cut into strips. This new building assembly had to be expressed and detailed through writing for the construction manager. Details ranging from the materials used to the thickness of the layered system to the types of fasteners that are used must be specified in writing. This information does not always end with the construction process either. Writing for new building assemblies are published in journals such as *Detail*. This specific journal is riddled with wall assemblies, floor plans, and electrical systems that are all intensely described with informative text. From

the artistic design to the construction phase of a project, one now sees how writing is important in communicating the architect's intent to various audiences.

Architectural writing is undoubtedly used for pure communication. While observing the importance of writing in architecture, emphasis is placed on the use of writing for communicating design; however, writing is continually used for communicating within a relationship.

Professor of Architecture, Andrea Swartz, highlighted in a personal interview the importance of communication between a design professional and a client or contractor. Writing platforms as simple as E-mail has become a major application for prose within the profession. Andrea admitted that, "texting or E-mails... have sabotaged my ability to put care into writing." The thought that writing becomes extremely informal between these relationships is very apparent in the profession. Personally, even I can attest to this. Recently, I was given the opportunity to intern for *ArchDaily.com* as an editor. This position required contacting architecture firms via E-mail in order to request publication information. The E-mails sent were extremely formal and well craft, however every response that I received from an office was extremely informal. Interestingly, educational writing does not seem to obtain the same informality. Andrea stated that her main audiences as an educator are other professors as well as students. She provided the example of writing for "teachers of the year levels that I was writing for, say [for] Introductory Structures it would be people in technology interested in teaching the fundamentals of structures." This type of writing is then explained by Andrea to have a general third person and formal style. The need for a formal writing style within the educational field of architecture spawns from the formal writing formats. Both Janice and Andrea agree that educational writing consists mainly of grant proposals, lectures, prompts,

letters of recommendation, and documentation of their educational work. From these two situations of professional and educational writing, one can concur that writing is used in countless manners from E-mail to grant proposals and both situations utilize informal and formal language as a basis for communication between people.

Communication within the architectural community is, however, not always presented within the previously described formats. Venues for communicating work through publication to the general public are primarily used for networking purposes. Online publication sites such as the aforementioned *ArchDaily.com* are a perfect example as to how architects network by communicating through writing. Each project that is publish on the website is accompanied by comments from viewers at the end of the page. This section allows architects, students, and other readers to apply their input into a project and therefore provides the designer with direct communication to the architectural community (ArchDaily). Other commonly used venues for networking and communicating with the public are journals such as *Praxis: Journal of Writing + Building*—a publication that features state of the art design from around the world. The most recent issue of this journal features conversations with eleven architects (*Praxis*). The conversational setting of this journal is then a perfect opportunity for networking and communicating with other designers. A slightly different example is the SOM Journal. This journal, published by the worldwide architecture firm of Skimore, Owings & Merril, is merely an in print broadcast of their recent work (*SOM Journal*). Journals such as this are generally hand out by firms and schools to students and other visitors. By providing students with information about their work, the businesses are networking themselves to prospective students and interns by communicating with writing.

Finally, writing within the design process is imperative to every point stated above.

The importance of writing to communicate design is rooted in the use of writing to create design. The use of writing for communicating with other professionals and peers generally follows writing used within the process of design. Even the possibility of offices and schools to publish works is a product of writing as a process for design.

When discussing the writing process in architecture, one must understand that it is not concerned with generating an outline for a paper, but rather with becoming, itself, the outline for a design. Writing is therefore used to also communicate our ideas back to ourselves. Recently, I was asked by a professor to write out an answer to the question, "How do I view the world?" After responding, I was then asked to assess how my answer correlated to my design philosophies and more specifically my current work. This process is how architects utilize writing in the process of design, and how it is a tool for self-communication. Janice Shimizu and Andrea Swartz both discussed a general process of research; implementing that research into words; editing those words; and creating a product that's foundation is in those words. Andrea exclaimed that, "if you put more effort into getting that sentence short, sweet, to the point, very effective... word communication of what your intention are, then when you get to the architecture you are going back to 'oh that's what I really want to do.'" This comment is clearly outlining the process of editing a written idea in order to produce a coherent architectural product. Again, the writing is purely for communication purposes—even to the point of communicating an idea back to the mind in which it was conceived.

Via research and personal experience regarding writing in the field of architecture, I have been enlightened with a hard truth—architecture is writing. Observing the broad applications of architectural writing from project descriptions to detailed lists of construction information to the original design process, the need for clear and concise writing is apparent.

Clarity in architectural writing is not only governed by good diction and syntax, but is according to Andrea Swartz embedded in formal language that is clear and concise. Formal tone dictates unambiguous and professional thought, which not only affects writing with regards to clarity, but with regards to networking as well. While formal tone, through communication, advances networking opportunities and therefore affects relationships with peers and future clients, one must understand that informal or conversational language can be equally affective in developing beneficial architectural relationships. The concise nature of formal writing is also a perfect way of collaborating my thoughts during the design process and communicating them back to myself. Overall, one can deduce that from the creative nature to the interpersonal dealings of architecture, the profession is design communication and thus it is writing.

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Recycling + Building Materials

As the desire for sustainability drives architectural design, many strategies are being implemented to achieve “green” recognition. Among those strategies arises the use of recycled materials. Highlighted here are selected projects that illustrate the progressive thinking behind the reuse of building materials.

*Published on ArchDaily.com - 7 August 2011

In today's world "going green" has become a top priority in our society, and sustainable buildings and design are at the forefront of this green revolution. While many designers are focusing on passive and active energy systems, the reuse of recycled materials is beginning to stand out as an innovative, highly effective, and artistic expression of sustainable design. Reusing materials from existing on site and nearby site elements such as trees, structures, and paving is becoming a trend in the built environment, however more unorthodox materials such as soda cans and tires are being discovered as recyclable building materials.

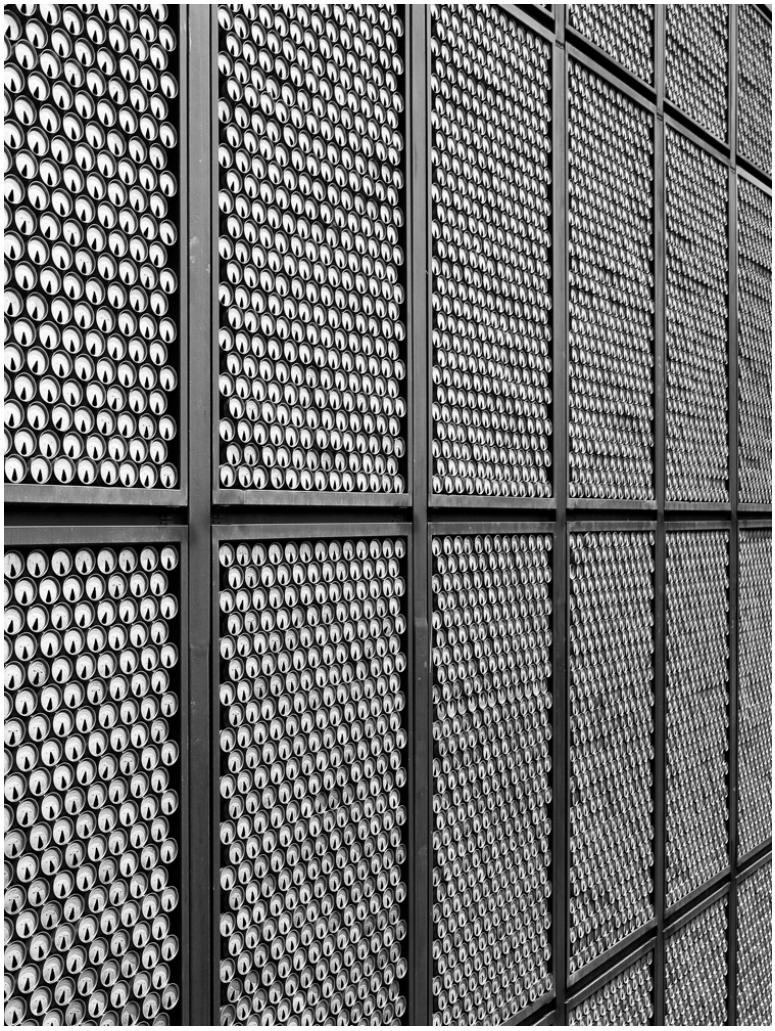
Photograph: © Paula Bailey - http://www.flickr.com/photos/auntiep/

Most common building materials today have recyclable alternatives. Concrete, metals, glass, brick and plastics can all be produced with some form of the previously used material, and this process of production lowers the energy requirement and emissions by up to ninety percent in most cases. Studio Gang Architects' SOS Children's Villages Lavezzorio Community Center utilized the ability to use left over concrete aggregate from construction sites in the surrounding Chicago area. The project features these different types of aggregate in an artistic expression of how and when the concrete was poured during construction.

Architect: Studio Gang Architects - http://www.studiogang.net/
Photograph: © Steve Hall @ Hedrich Blessing - http://www.hedrichblessing.com/stevevision1.html

Another popular trend regarding recycled building materials is the use of site provided materials. As environmental designers, we continually replace natural landscapes with our own built environment, and today our built environment is embellishing the natural environment in a responsible (while still aesthetic) manner. Projects such as the Ann Arbor District Library by inFORM Studio and the Jewish Reconstructionist Congregation Synagogue by Ross Barney Architects are reaping the harvest of their sites. The architects at inFORM researched the site for the Ann Arbor Library to find that ash trees from the surrounding forest were being destroyed by insects and could be salvaged into various surfaces within the building. Ross Barney Architects responded to the more urban site of the Jewish Reconstructionist Congregation Synagogue with a similar tactic by repurposing demolished trees into exterior sheathing, torn up paving and pre-existing structure into gabion walls, and even reusing part of the existing building foundation.

Architects: inFORM Studio - http://www.in-formstudio.com/
Ross Barney Architects - http://www.r-barc.com/
Photograph: © Justin Machonachie Photography - http://www.jmaconochie.com/

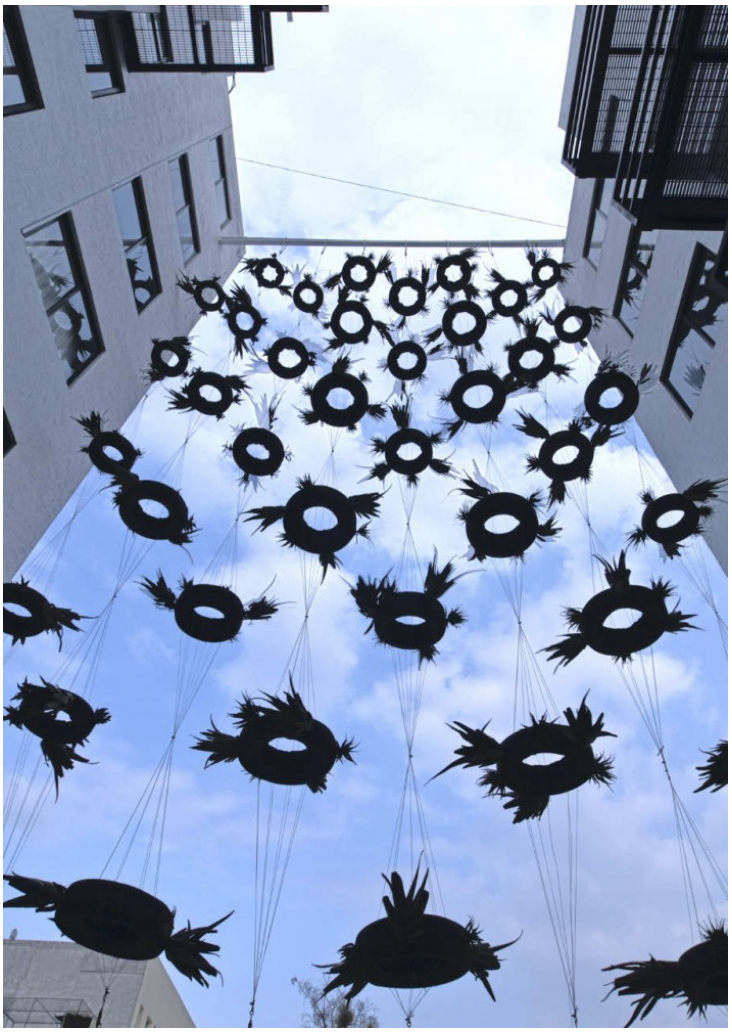


When a site has little to give, designers have begun to search within other demolished environments. Juan Luis Martínez Nahuel has found new uses for building elements from other architectural projects in his Recycled Materials Cottage in Chile. The design revolved around the available materials from demolished buildings including glazing from a previous patio as the main façade; eucalyptus and parquet floors as the primary surface covering; and steel and laminated beams from an exhibit as the main structure for the house.

While these methods of reused building materials have become popular in sustainable, contemporary architecture, other designers are experimenting with more unorthodox materials. Archi Union Architects Inc. have developed a wall system that contains a grid of empty soda cans in their mixed-use project, Can Cube. The can filled façade is even adjustable for daylighting by occupants.

Architect: Juan Luis Martínez Nahuel
Photograph: © Juan Luis Martínez Nahuel

Architect: Archi Union Architects Inc.
Photograph: © Sheng Zhonghai



Alonso de Garay Architects also discovered a new use for an uncommon object in the building system of their Recycled Building in Mexico City. A series of hanging car tires are constructed to possess and grow traditional species of Mexican plants. While creating a sustainable green wall system, the tires also define exterior space within the complex.

Architect: Alonso de Garay Architects - http://alonsodegaray.mx/
Photograph: © Jimena Carranza

As the process of recycling materials continues to increase as a fashionable and sustainable statement in the architectural world, designers are proposing groundbreaking and futuristic methods that push the boundaries of how we think and build. NL Architects submitted an idea for The Silo Competition that transformed the structure of an old sewage treatment silo into a rock climbing facility and mixed-use residential and commercial spaces. This design addresses the structure and form as a reusable material able to contain an extremely efficient program.

Architect: NL Architects - http://www.nlarchitects.nl/www/
Photograph: © NL Architects

AD Classics: Sangath / Balkrishna Doshi

Balkrishna Doshi's studio, Sangath, is a well known classic of architecture due to its breathtaking spaces, forms, and connections to nature as well as India' culture. This article discusses the wonders of Sangath while providing a quick walk through of the site.

*Published on ArchDaily.com - 15 August 2011

Balkrishna Doshi‘s own studio, Sangath, features a series of sunken vaults sheathed in china mosaic as well as a small grassy terraced amphitheater and flowing water details. Having been considered the building that fully describes himself, Sangath is a complete combination of Doshi‘s architectural themes from his previous work including complex interiors and structures, ambiguous edges, vaults and terraces.

References: Curtis, William J. R., and Balkrishna V. Doshi. *Balkrishna Doshi: an Architecture for India*. New York: Rizzoli, 1988. Print.

Upon entering the complex, one immediately sees the silhouette of a vault lingering behind an exterior wall, and a slight view of the interior is present through a small break in the surface. The path turns and forces the occupant off of the north-south axis and alongside the elevated garden walls. Now visible in perspective, the vaults begin to recede into the background above the grassy amphitheater, water channels and gardens in the foreground. As one passes by the reflecting ponds that capture the vaults in still water the entrance is made apparent. It lies at the end of an angled approach to the vaults.

References: Curtis, William J. R., and Balkrishna V. Doshi. *Balkrishna Doshi: an Architecture for India*. New York: Rizzoli, 1988. Print.
Photograph: © Sarvesh Srinivasan - http://www.flickr.com/photos/37218562@N02/

The main entry lowers the visitor a few steps into the a vault and proposes the choice of ascending a flight of stairs in a three story height, or proceeding through a small corridor by Doshi's office and into the main drafting hall. Here the ceiling plane rises as the inhabitant experiences how Doshi interlocks multi height spaces and creates compression and release between them. The underside of the vault in the main drafting room is finished with a textured concrete that dispersed natural light into the space. At the end of the hall lies the opening seen from the site entrance and one regains their sense of place along the main axis.

References: Curtis, William J. R., and Balkrishna V. Doshi. *Balkrishna Doshi: an Architecture for India*. New York: Rizzoli, 1988. Print.

Sangath also expresses Balkrishna Doshi's desire for a connection between nature and the individual. The overall form exaggerates the details of nature with its rolling mounds, cave-like spaces, terraced land, playful water channels, and reflective surfaces. Storm water is funneled through the site by the slick, round vaults and water troughs. The sunken interior spaces are insulated by clay within the structure. Heat from the sun is reduced by grassy mounds and the white reflective china mosaic that covers each vault. Natural light is also filtered into the interior spaces during the day, while the moon is reflected in the ponds and across the china mosaics at night.

References: Curtis, William J. R., and Balkrishna V. Doshi. *Balkrishna Doshi: an Architecture for India*. New York: Rizzoli, 1988. Print.

Along with natural connections, Sangath holds connections to India's culture. The layout resembles the way that a temple develops a series of stages into a final platform while the form loosely imitates the boldness of a stupa. Other references to modern styles are also apparent with the Le Corbusier ear shaped pool; amphitheater steps resembling those by Aalto and Wright; Gaudi's broken china mosaic; and a water feature similar to that of Kahn's Salk Institute.

References: Curtis, William J. R., and Balkrishna V. Doshi. *Balkrishna Doshi: an Architecture for India*. New York: Rizzoli, 1988. Print.

Villa

Throughout modern history, architects Le Corbusier, Alvar Alto, Mies van der Rowe, and Frank Lloyd Wright have been praised for their designs of private villas. This short analysis compares and contrasts these architects' most well known villas in terms of their physical and cultural design.

Le Corbusier considered the Villa Savoye a blank canvas that he could paint the five points that he believed should embellish new architecture into. The building is lifted above the ground with reinforced concrete columns; the roof is functional; the structure allows for a free plan; and long, thin windows are able to span the facades because the exterior walls are meant to function purely as a skin. Alvar Aalto saw the design of the Villa Mairea in a similar palette regarding a clean slate that he could use to fuse together all of the themes of his work. With that freedom, Aalto designed the villa as a revision of vernacular architecture with influence from Frank Lloyd Wright's villa, Falling Water. In a similar language to the Villa Savoye, Mies van der Rowe's Villa Tugendhat reflects elements of Le Corbusier's five points. He utilized a free plan through the revolutionary iron structure, and the façade allows for floor to ceiling glazing. The charisma of Frank Lloyd Wright's Falling Water then compares to the Villa Tughendhat and Savoye in terms of experimenting with new structural systems. Wright, however, used reinforced concrete to design daring cantilevers rather than exploring new ways to create a free plan. Along with the five points, Le Corbusier envisioned the Villa Savoye with a utopian ideal. He stacked the program based on his model of modern living with services on the bottom, living on the second floor, and a relation to the celestial world at the top. The concept of a "living machine" then provided a model for the detailed design tied to the utopian ideal; for example, using the turn radius of a car as the form of the garage that embodies itself within the first floor. Also, the curved walls within the main spaces mechanically move people to and from each room. The Villa Tugendhat shares the same vertical layout reflecting a utopian ideal with lower level services, second floor living, and a balcony on the top floor; all flowing into the garden at the bottom as seen in the Villa Savoye. Mies also incorporates seldom curves to create a dynamic living space. While Alto strived for utopian ideals in the

Vila Mairea, he approached them in contrast to Le Corbusier and Mies by utilizing materiality that reflects the natural site, and a randomized structural layout that creates spaces of varied sizes. Similar to other utopian theories, Aalto incorporates a serpentine wall in order to embrace a “religious beauty in life.” Wright, similar to Aalto, focuses on blurring the edge of his building and its natural surrounding primarily through spatial relationships and materiality. He places the villa above the waterfall on the site and builds the structure into the foundation of the land. His use of natural materials brings the softness of nature into the spaces. Long strips of glazing connect to the building seamlessly in order to extend the space with the building into the exterior, and the sounds of the site flow into the spaces to complete the connection of the interior and exterior. Aalto, while using materials in a similar way, frames the surrounding natural elements with smaller instances of glazing that punch through the façade as means of connecting to the exterior. The clustered structural pattern that creates a variety of special sizes also reflects the varied spatial patterns of the outdoors. Le Corbusier uses a similar method of framing the site with his long, thin windows that wrap around the second floor. The Villa Savoye also embellishes an open courtyard on the roof to bring the exterior down into the interior spaces. To complete the Villa Savoye’s connection to nature, Le Corbusier places a garden at the base of the building within the structural system that lifts the building off the ground. Mies combines many of the strategies reflected in the Villa Savoye, Mairea, and Falling Water buy utilizing the free façade as a frame of the outdoors, but also as a seamless transition from the interior spaces into the exterior spaces. The building also flows from top to bottom, planting itself within a garden on the lowest portion of the building.

References: Curtis, William J.R. Modern Architecture since 1900. 3rd ed. London: Phaidon, 1996. Print.

Intense

Maya Lin's Vietnam Memorial and Peter Eisenman's Holocaust Memorial present an equal amount of intensity for their inhabitants, however Maya Lin's extreme success has not been equally reflected in Eisenman's work. This brief analysis of the two projects underlines the key comparisons of their design as well as the contrast in public opinion.

Maya Lin's Vietnam Memorial and Peter Eisenman's Holocaust Memorial share a quality of intense thought and reflection in presence. Both memorials possess the power to silence a large crowd of tourists and force them to be placed in a realm of feeling relating themselves to those the memorial honors; however, no direct metaphors are used in the design of the forms and spaces. The Vietnam Memorial lowers visitors six feet into the ground as the retaining wall that bears the names of the deceased cuts into the earth. As one makes the decent, the timeline progresses and the list of deaths rises. This effect releases remorse and the reality of death to those within the memorial. Eisenman's Holocaust Memorial has a similar effect. By lowering and undulating the walking path; slightly tilting the concrete blocks that define the overpowering grid; and altering the height of every block, Eisenman creates nausea and discomfort comparable to what the inhabitants would assume a prisoner would experience. The Holocaust Memorial imposes on visitors a space that reflects an intense dynamic of cold, solid barriers that confine and move each person; causing occasional collisions in cramped spaces similar to the experience of being transported to a concentration camp. Culturally the memorials differ greatly. Connecting to the hearts of millions, Maya Lin's Vietnam Memorial has been greatly celebrated throughout the design world. However, Eisenman's Holocaust Memorial, while statistically considered a success, was greatly controversial during construction. The same company that developed the lethal gas used during the Holocaust produced the material used to graffiti-proof the concrete forms of the memorial. Critics have expressed disgust about this situation, and regarding the overall project have stated that the memorial is useless to the Jews.

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Sustainability: An Argument

Discussion of sustainability within the architectural profession has become increasing common and increasingly diverse. Opinions range from a large-scale view of cities as a whole down to the small scale of building tectonics. This paper aims to expose the multiple sides of the argument regarding how architecure can address sustainability.

*ENG104 - 2 December 2011

Sustainability affects every bit of our daily lives. Decisions that we make every day such as what food to eat, whether or not to drive or bike to work, and even what clothes to buy are determined by a sustainability factor. While this hot topic is affecting the details of our personal lives, it is also affecting our public lives. The built environment that we experience every day is the leading contributor to carbon emissions each year releasing nearly 40% of the world's greenhouse gasses (Hagan 107). With the ability to counteract this devastating truth, architects and urban designers are using the idea of sustainability as an outline for designing, building, and fixing the built environment. Bike paths, wind turbines, solar panels, natural lighting and ventilation, and reused building materials are only a few of the many design solutions for the multifaceted problems presented by the struggling environment. Two leading fronts that are often addressed in these discussions divide such solutions into argued categories. First, architects are naturally concerned with the building scale or small-scale issues such as building materials and form. Second, architects are addressing the city scale or large-scale concerns including infrastructure and living density. As architects continue to strive for flawless sustainable results in the built environment, they continue to argue the importance and practicality of large-scale and small-scale "design solutions."

Discussion of large-scale or city-scale sustainable solutions begin with the argument between dense urban growth and suburban sprawl. Suburban America was originally created to provide citizens the ability to escape the polluted and crowded lifestyle of the city. This design method is in fact a sustainable solution concerned with the healthy lifestyles of humans rather than being concerned with the common conception that architectural sustainability must address the building as a stand-alone object. A recent example of this style of health related sustainable urban design is the Sprint Nextel Headquarters in Overland Park, Kansas—a suburb of Kansas City. The over two hundred acre complex acts as a "forced wellness program" by manipu-

lating employees to climb stairs, bike or walk between buildings, and enjoy the preserved green spaces of the site (Briskin 14-15). In an analysis of its success, Matthew C. Briskin explains that the trolley is not longer used for transportation on the site because of the employee's improved physical habits (Briskin 15).

While sparse and spread out architecture is being utilized as a feasible large-scale sustainable design method, others argue that density is the most sustainable solution for the built environment. *New Yorker* writer David Owen argues in his book *Green Metropolis* the implementation of the horizontal nature of suburbs with the idea of a vertical structure of circulation throughout a city. He criticizes the Sprint Nextel Headquarters' layout by explaining that the campus houses four million square feet of parking to accommodate its fifteen thousand commuting employees (Owen 214). Allowing such an immense amount of vehicular travel to the site seems to negate any other sustainable features. Owen's critique is then supplemented with the clarification of the sustainable responsibility brought forth by dense urban centers. A series linear diagram represents what Owens calls "embodied efficiency and inefficiency" which defines the efficiency level of a building's infrastructure and relation to its surroundings. The first diagram describes suburban structure with a star (you) centered on a line and surrounded by circles (neighbors), and distant from squares (commercial destinations) at either end of the line. The distance of one inch is provided as the maximum distance willing to be traveled from the star in either direction on the five in span. As Owen then states, "unless you are borrowing sugar from one of your nearest neighbors, almost any trip you take away from your house, including any trip to any store, will require to you use on of your family's cars (Owen 211)." The second diagram then explains the function of a compact city by oscillating the line into a series of loops (high rise buildings), orienting the circles vertically, and placing the squares at the base of each loop. "[Even when] your own apartment is the star near the top of the tallest loop, you can easily see that the

same walkable inch, extending in either direction from the base of your building, will bring you, on foot, within reach of many dozens of likely destinations (Owen 212)." To further his argument against urban sprawl and supplement the meaning of this second diagram, Owen enlightens the reader that vertical movement such as elevators uses less energy with less infrastructure than horizontal movement with automobiles (Owen 208).

Density is one of the most conversed large-scale sustainable issues of an innumerable list of sustainable issues, but the infinitely complex argument of architectural sustainability is also discussed on the small-scale or building-scale. One popular yet controversial small-scale sustainable strategy is the reuse of building materials. This idea generally refers to recycling wood, stone, concrete, glass or other common materials, but can also involve using unconventional recyclables such as soda cans or tires as a building material (Metcalf). Susannah Hagan explains in her article "The Good, the Bad and the Juggled: the New Ethics of Building Materials" that the primary reason for reusing such materials is their minimal embodied energy. Similar to Owen's term embodied efficiency, Hagan defines embodied energy as "a measurement of the energy used for the extraction and preparation – or manufacture – of building materials (Hagan 108)." Hagan goes on to display the relative embodied energy between common building materials refined from raw substance to building blocks. Wood, consuming six hundred and thirty nine kilowatt hours per ton for production, is the lowest. Following is brick consuming four times more energy, glass at fourteen times, steel at twenty four times, and aluminum at one hundred and twenty five times more energy consumed than wood (Hagan 108). When a material is reused, however, this energy is not needed for production, significantly reducing the embodied energy of the product. These statistics clearly show why recycled building materials are sustainably attractive to architects.

While the notion of reusing materials for architectural use appears to be a flawless tech-

nique, strong opposition is still available. Recently, in my own studies, I was able to experience the process of reclaiming wood from an early twentieth century house. Staff members at the Ball State University College of Architecture and Planning's wood shop cautioned me about using machines to alter the wood. Signs also hang around the equipment stressing "new materials only." The reason signs and staff request that repurposed material not be used in their machines is because material may have unseen faults that will ruin equipment. For example, wood frame two by fours commonly have hidden nails within the wood. If that nail is passed through a saw, it will break the blade and possibly cause serious injury. Aside from the concern of personal harm, the embodied energy to produce a single new saw alone negates the purpose of reusing a piece of wood. Because this example happens more frequently than one would expect, designers and builders have become weary of reusing building materials.

Analyzing both large-scale and small-scale solutions to sustainable design portrays two very different facets of the extensive argument regarding architectural sustainability. These different discussions do however interact. Alastair Collins exclaims in his article "Penciling Out Sustainability" that sustainable architecture "tends to address the building as a stand-alone object" and how "a more holistic view of sustainability would tackle a building's impact on infrastructure and transportation (Collins 97)." Collins is calling on small-scale oriented architects to begin to broaden their horizons about how large-scale solutions are more important sustainable design solutions. On the other hand, small-scale design solutions do have the possibility of producing a large-scale effect on the environment. "Unseen Green" an article written by Adam R. Arvidson outlines the design process and intentions of small-scale retrofits in Chicago and Montreal. These projects focus on the redesigning of unused alleys to become not only public green space, but to also serve as a highly efficient and effective wastewater management system for the two dense cities. Simple implementation of permeable pavement, properly sloped terrain, and natural filtra-

tion systems is shown to be able to affect the cities' infrastructure (Arvidson). Such small-scale design does indeed have the potential to create a counter defense for sustainable importance within the architectural field.

As previously stated, the built environment produces about 40% of the world's greenhouse gasses. This realization demands an ethical responsibility from architects and urban designers to not only protect the planet, but to protect our health and the health of future generations. Growing arguments then serve as an ethical response to sustainability by aiding architects in developing an understanding of how to design sustainably. Learning is the key importance to discussing and debating sustainability strategies in architecture. Arup, a multidisciplinary design firm, has developed a list of strategies that they ensue in each project as a response to the sustainability argument. The list includes carbon neutrality, self sufficiency by collecting and using rainwater, building with sustainable materials, addressing climate change, providing a positive contribution to the community and the built environment, and being sustainable in operation (Guthrie 8-15). Arup is learning. Margaret O'Donoghue Castillo, President of the American Institute of Architecture (AIA) New York Chapter, has also recently provided a list of nine actions to benchmark sustainable design (Castillo 11). Communication and learning are the foundation of each action. These examples not only express the ethical responsibility that sustainability requires, but also prove that in order to achieve a working reaction to sustainability in the built environment a collaborative effort is required through discussion and debate.

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The Paradox of Form v. Pattern Regarding Hysteria:
A Critical Analysis of Charlotte Perkins Gilman's "The Yellow Wallpaper"

The built environment continually and heavily influences the minds of its inhabitants, and has been doing so since the construction of the first man-made structure. This critical analysis of "The Yellow Wallpaper" exposes the narrator's condition through the architectural lens and portrays exactly how influential the form and pattern of the built environment are to our seemingly stable minds.

*ENG104 - 23 September 2011

Architectural design revolves around the idea of creating environments for experiencing life. This built environment creates space to be inhabited for functional purposes, while also producing emotional involvement. Charlotte Perkins Gilman describes such an environment in her short story "The Yellow Wallpaper;" portraying a country estate meant for therapeutic purposes that also possesses emotional appeal. The form of this estate reflects its therapeutic purposes, however a certain pattern that lies within the form obtains control of the inhabitant's emotions with the ability to increase an unstable mind. This intense phenomenon of pattern is seen in the story to hide itself from those stable minds, and begins to expand alongside the mind of the insane. As illustrated in the short story "The Yellow Wallpaper," a simplistic form gains attention only from an ordinary mind while the intricacy of pattern demands obsession from the hysterical as a reflection of the mind's own being.

To preface the meaning of form regarding the setting of Gilman's "The Yellow Wallpaper," one must understand the preferred architectural practices for nineteenth century asylum establishments. Architects were given the responsibility of translating the concept of sanity into the design. Spaces were not only meant for others to treat the insane, but to treat mental illness with the space alone (Edginton 377). Nature and "social order" was sought after in asylum architecture as a representation of "a passage to sanity." The insane were believed to have needed complete separation from social life, and a deep connection with country life (Edington 378). Internal treatment of windows to frame beautiful views was therefore a tactic of most importance for connecting a patient with the outdoors (Edginton 380). Barry Edginton quoted in his article "The Well-Ordered Body: The Quest for Sanity through Nineteenth-Century Asylum Architecture" that, "What one saw from one's open window was an exemplary scene, a scene {not only] full of life but of life given shape; the viewer had aided the landscape to be more of itself" (381). Architects also provided wide, open, airy spaces and ample opportunities for outdoor exercise and activity

as other forms of developing sanity through nature (Edginton 383).

These forms of architecture and being that were used for manipulating an unstable mind into stability are recognized in Gilman's story not only as the setting, but as an aid to the psychological analysis of the narrator and her husband. John, a credible physician, is seen in the story as a stable mind. Due to his medical expertise he seeks architectural form as a means to cure his wife's depression. The couple travels to the previously mentioned country estate featuring "a big, airy room... with windows that look all ways, and air and sunshine galore" (Gilman 3) This form is in every aspect consistent with the current common practice for treating the mentally ill, and the form thus comforts John's ordinary mind. Throughout the development of one's understanding of the narrator, John is seen encouraging her to rest, remain in the open, airy room and therefore remain connected with nature; however a more impressionable element becomes apparent to the narrator as she introduces the antagonist to John's beloved form—pattern.

As the meaning of form in relation to analyzing "The Yellow Wallpaper" was defined, one must also define the purpose of pattern within Gilman's story. Pattern, is intended through art and architecture to inflict emotion and wonder upon a subject. This is done in various ways via repetition, color, and a foreground verses background interaction. Casey Reas and Chandler McWilliams explain in their book *Form + Code* how repetition within a pattern mesmerizes and captures the mind. "Repetition can have a powerful effect on the human body and psyche. One of the most extreme examples is the way rapidly flashing light can trigger a seizure. A more universal example is how the beat of a good song will inspire people to dance along. Ina a similar way, dynamic visual patterns can appear, in subtle ways, to vibrate physically" (Reas 49). This exhibition of the power of repetition within pattern fully explains how pattern can override the form of rehabilitation. The second defining feature of pattern in need of discussion is the effect of color. "Color tends to highlight parts of a building: it can emphasize them, make them invisible

or transparent, or conceal them. Once color is separated from its customary role, it becomes the guiding element of a design" (Bahamon 8). Alejandro Bahamon and Ana Maria Alvarez explain in this excerpt from their book *Light Color Sound* that the role of color pertaining to the "parts of a building," and in this case a pattern. Color has the ability to make things "transparent" to the mind by focusing the mind on itself, and in conjunction with the repetition of pattern, this experience has the ability to be a powerful motivator to any observer. Finally, we dig deep into the core of a pattern in order to reveal its true phenomenon. Ana Araujo describes the concept of foreground and background within pattern in her paper "A Pattern Constellation" by providing the example of mathematics as a pattern. A series or pattern of digits and symbols build a figure to represent mathematics, when behind that figure lies a "hidden logic" (Araujo 11). Something much more brilliant than those digits and symbols is conveyed through the original figure. Visual pattern then works in the same way. On the surface lay figure, yet after close observation, calculation and obsession the exceptional entity is exposed within the background.

As one continues to grasp the concepts of how patterns affect the mind, the narrator's elevation of hysteria due to the yellow wallpaper becomes understood. The forms that John impresses upon her do not take hold, whereas the pattern that reflects her mental state of illness takes control. Upon her first witnessing of the wallpaper, she states that it is "pronounced enough to constantly irritate and provoke study" (Gilman 3). With this comment, the narrator gradually becomes more and more entranced by the repetition of "lame uncertain curves" (3) with interpretations such as "the pattern lolls like a broken neck and two bulbous eyes stare at you upside down" (6) and "the outside pattern is a florid arabesque, reminding one of a fungus" (13). While the narrator does not seem to experience seizures or physically dance as suggested by Reas and McWilliams, she is responding to the wallpaper in similar ways. The pattern induces a metaphorical dance and seizure within her mind and thought process, leading her to insanity. Her reaction

to the color, while seemingly more repulsed, parallels the effect of the accompanying pattern. As Alejandro Bahamon and Ana Maria Alvarez expressed, the color creates invisibility to the building. The narrator sees only the confusing pattern and it's horrid color, disregarding John's intentions of her connecting with nature. These curves, angles and color construct the foreground of the pattern. They fixate the narrator and eventually reveal to her the extraordinary background that reflects her state of mind. "There are things in that paper that nobody knows but me, or ever will... And it is like a woman stooping down and creeping about behind that pattern" (Gilman 10-11). Insanity is discovered behind the pattern, and as the narrator seeks this woman, she seeks a connection to her own hysteria. As she climbs into the pattern at the closing point of the story, one witnesses her complete embracing and becoming of the insanity that she saw within the wallpaper.

Architectural solutions for expressing and affecting the human mind do not rely on a definite application of pre-determined forms, but rely on the expressive patterns of the mind itself. Through the filter of John's ordinary mind, the pattern on the wall appeared ordinary, yet through the lens of the narrator's unstable mind, the pattern became a mirror to expose her mental insanity. As one experiences pattern and form throughout daily life, the effects upon the human body as portrayed in Gilman's story "The Yellow Wallpaper" are constantly at work. Compelling visual, physical, mathematical, and mental patterns lurk around every corner, and understanding their influence upon oneself can divert the mind away from insanity.

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