BUILDING FUTURES

Framework for the Contemporary Native School

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ABSTRACT

Building Futures: Framework for the Contemporary Native School

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Building Futures is a response to the social, cultural, and environmental challenges facing Native tribes of the Southwest, with the goal of addressing adverse impacts on Native youth and their schools. The proposal argues for the rejection of a typological “Native American architecture” in school design, in pursuit of an evolutionary response to the current place and time of unique tribal communities. The project seeks to create space for tribes to explore new opportunities and means of expression in their schools. The proposal defines a material and structural system that enables community participation in the construction phase of a project. Additionally, it demonstrates emerging spatial strategies in education that invite community interaction and support long-term flexibility as educational strategies change. The strategic framework is demonstrated in a specific design response, which serves to inspire new thinking and provoke a conversation among tribal members and designers about the future of education on Native reservations. This is a critical moment in which tribes must question existing models and policies, and this research is offered to inspire that process.

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CONTENTS

INTRODUCTION

BACKGROUND

LIFE ON THE RESERVATION

TIMES ARE TOUGH on Native reservations today. Tribes across the U.S. are facing extreme challenges from both cultural and economic perspectives, with conditions in some cases rivaling those of developing nations. Prevalent issues include high poverty and unemployment rates, substandard housing conditions[1] (Figure 1), and innumerable cases of invisible homelessness.[2] The economic prospects on reservations are limited, due to a combination of geographic isolation and poor governmental policy. The list of issues continues with broader conflicts over land use rights, natural resource depletion, and the rising impacts of climate change.

This environment is especially hard on children, who often have unstable conditions at home. Current data points to an epidemic of domestic violence, with rates much higher than any other population in the U.S. Amidst these tumultuous conditions, 51% of Native students graduate high school, compared with the national rate of 81%, and 22% of children suffer from PTSD.[3] Many tribes are seeing a steady loss of their culture, and numerous Native languages are on the verge of extinction.[4]

Figure 1. James Nord. Associated Press. "Pine Ridge Sioux Seeking New Federal Housing Funds."

For many tribes in the Southwest, agriculture and livestock have been the primary means of economic productivity. But due to the impacts of persistent drought, these have become nearly impossible to sustain. Simply obtaining an adequate supply of fresh water is a daily challenge for families who lack basic infrastructure[5] (Figure 2). Despite the challenging circumstances, there are still vibrant communities actively living out their culture together on reservations.

Figure 2. Navajo Water Project. "This man keeps his water in barrels."

NATIVE YOUTH

Mentorship was the traditional model for educating youth in many pre-settlement tribes. Children learned particular skill sets by following the adults in their work. Children were taught in the context of a tribe's daily life, and were expected to grow and develop the capacity to fulfill future roles in the tribe.[6] This suggests a close relationship between the older and younger generations, and a desire to help children become active participants in their community. In many tribes, responsibility for the care and education of children was shared by more than just parents or close mentors, and "everyone in a community was responsible for the safeguarding of young people."[7] The relationship between larger

1. Julian Brave NoiseCat, "13 Issues Facing Native People," *The Huffington Post*, 2015, accessed November 29, 2016, http://www.huffingtonpost.com.

2. Terray Sylvester, "Tribes Struggle to House their 'Invisibly Homeless' Veterans," *High Country News*, 2014, accessed November 29, 2016, http://www.hcn.org.

3. NoiseCat, "13 Issues Facing Native People."

4. George Gumerman, Joëlle Clark, Elmer J. Satala & Ruby Chimerica, "Footprints of the Ancestors: Reengaging Hopi Youth with Their Culture," *Museums & Social Issues* 7, no. 2 (2012): 150-153.

5. Bobby Magill, "The Navajo Nation's Shifting Sands of Climate Change," *Climate Central*, 2014, accessed February 11, 2017, http://www.climatecentral.org.

6. "Life as a Native American Child," *Ducksters*, accessed December 3, 2016, http://www.ducksters.com.

7. Sari Horwitz, "The hard lives — and high suicide rate — of Native American children on reservations," *The Washington Post*, 2014, accessed November 29, 2016, https://www.washingtonpost.com/world/national-security/the-hard-lives--and-high-suicide-rate--of-native-american-children/2014/03/09/6e0ad9b2-9f03-11e3-b8d8-94577ff66b28_story.html?utm_term=.c5fa5579795a.

communities and their schools, and the level of interaction between them, are important factors to see expressed and supported by the physical spaces of a school.

The value of mentorship and community support has been affirmed by today's Native students. Participants from tribes all over the U.S. were interviewed by the Center for Native American Youth, and they collectively expressed the priority of mentorship in their education. Students specifically highlighted an interest in "learning more about their language and culture from elders." The publication also explained that many students view "culture and language as protective factors."[8] The continuity of historic values is evident here, in that learning from elders and becoming embedded in their culture are still important processes to modern students. Sheilah Nicholas finds similar desires in Hopi youth, drawing on a series of interviews to write,

> "Their combined experiences and expressions of "living" Hopi confirm that the traditional identity-formation process continues to influence younger generations of Hopi. Conveyed orally, Hopi traditions communicate the totality of the Hopi way of life, an awareness that spurred a newfound motivation and urgency to learn the Hopi language."[9]

Figure 3. Thaths. Flickr. "Native american youth wearing a mixture of contemporary and traditional clothes."

The sense of urgency identified here points to the centrality of social, spiritual, and personal values in the identities of Native youth. It is critical to explore new ways for the physical realm of schools to encourage the fulfillment of those needs.

Interest in traditional practices remains strong for Native students, and is closely linked to ideas of mentorship and participation. CNAY participants have advocated for "more culturally-based classes or lessons… to supplement their learning," and suggested teaching of traditional food systems and meal preparation as an example.[10]

Strong identification with a tribe's culture and traditions has been shown to bolster the resilience of American Indian children.[11] But modern youth have the additional challenge of adapting to the emerging demands of a globalized society.

Participants with the Center for Native American Youth have described "the need for community members to recognize the possible challenges of living in both a traditional and contemporary manner."[12] This is a critical consideration in the development of Native schools, as the school experience can affect how students manage this bifurcation of lifestyle. Researchers have described the related idea of bicultural competence as having "positive mental health outcomes, especially for urban American Indian youth."[13] In order for Native students to reach some of their educational and professional goals, they will need to navigate the complexity of a technological, global context. Completing a college degree and obtaining professional certifications will necessitate strong technical skills and cultural adaptability, which places a heavy burden on tribal school systems. Research in indigenous identities has found that students "navigate regularly between cultural worlds"[14] (Figure 3). The physical configuration and resources of a school must support this dynamic.

8. Center for Native American Youth, "Voices of Native Youth Report," *Aspen Institute*, 2014.

9. Sheilah Nicholas, "'I Live Hopi, I Just Don't Speak It' - The Critical Intersection of Language, Culture, and Identity in the Lives of Contemporary Hopi Youth," *Journal of Language, Identity, and Education* 8, (2009): 333.

10. CNAY, "Voices of Native Youth Report."

11. Stephen Kulis, et al., "Exploring Indigenous Identities of Urban American Indian Youth," *National Institutes of Health*, 2013.

12. CNAY, "Voices of Native Youth Report."

13. Kulis, et al., "Exploring Indigenous Identities of Urban American Indian Youth."

14. Ibid.

BIE SCHOOLS

Many of the challenges confronting American Indians stem from a long history of injustice and broken promises by the U.S. government. Beginning in 1860, a movement working to assimilate and "civilize" Native Americans began operating boarding schools on tribal lands. The effort soon turned to off-reservation schools, where children were completely removed from their tribes and forced to abandon their cultural practices and identities.[15] Children at these schools experienced sexual and physical abuse, and spent half their days working in various labor trades. Transplantation continued until the early 1970's. These students are now parents and grandparents, and play a significant role in shaping the cultural context of modern reservations. Many are still battling addiction, emotional and mental health issues, and cultural identity problems as a result of their experiences.[16]

By 1934, well after American Indians had gained recognition as citizens of the U.S., the off-reservation education system was abandoned and on-reservation schools were established. These schools introduced teaching of Native culture and history in the curriculum for the first time. Because of the process through which the schools were established, control of the programs and facilities was distributed among multiple government and tribal entities, leading to a lack of accountability and oversight.

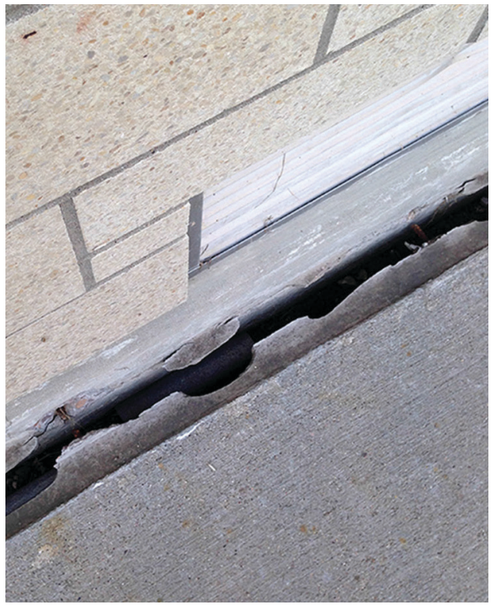


Figure 4. Bureau of Indian Education. " Photo GAO-15-389T."

Management was eventually consolidated to the Bureau of Indian Education, within the Department of the Interior, but has had a persistent lack of funding and has been unable to provide adequate resources to its schools.[17]

The infrastructure of BIE schools is now largely in disrepair (Figure 4, 5), with 78 of the 183 schools rated as "poor" on the facility condition index. Many of the schools are using the original structures

15. Northern Plains Reservation Aid, "Native American History and Culture: Boarding Schools," accessed December 3, 2016, http://www.nrcprograms.org.

16. Horwitz, "The hard lives... of Native American children on reservations."

17. Maggie Severns, "How Washington Created Some of the Worst Schools in America," *Politico*, 2015, accessed November 29, 2016, http://www.politico.com.

Figure 5. David Joles. Star Tribune. "A length of hose filters out hot, poor quality air."

built in the 1930's. The problems in these buildings include leaks, structural damage, broken heaters, and asbestos.[18] Teachers are difficult to retain in these settings, and many schools have aides teaching classes during the extended search for replacements. Administration is subject to the same high turnover rates. Paired with a lack of funding and resources, these problems produce an ineffective educational environment that cannot provide the best outcomes for its students.

The BIE has a school replacement program with a set of criteria to prioritize those most in need of new construction. Most of the tribes with a "poor" rating have applied for funding without success. On April 8, 2016, 10 schools from various reservations were selected to receive a new round of funding for total replacement of their facilities.[19] The pressure

18. Danika Worthington, "Arizona Schools Make Up Half of Priority List for Tribal School Repairs," *Cronkite News*, 2016, Accessed November 29, 2016, https://cronkitenews.azpbs.org.

19. BIE Media Release, "BIE Announces School Replacement Program Selections," *Native Times*, 2016, accessed December 3, 2016, http://www.nativetimes.com/index.php/life/education/12925-bie-announces-school-replacement-program-selections.

Figure 6. Bureau of Indian Affairs. "Twin Buttes Replacement School."

on BIE to move these types of projects forward is increasing, as awareness continues to grow in both public and political spheres. BIE is recognizing a need to move more quickly and implement new approaches to school-building that will allow them to reach more of the tribes in need.[20]

Projections suggest that replacement of all the schools in poor condition could take more than twenty years. This raises concerns for both the timing and quality of replacement projects. Many schools will not have the option of waiting for BIE funding to continue serving the needs of their students.

20. Star Tribune Editorial Board, “Finally, a new school for high schoolers on Bug-O-Nay-Ge-Shig campus,” *Star Tribune*, 2016, accessed December 3, 2016, http://www.startribune.com/finally-a-new-school-for-high-schoolers-on-bug-o-nay-ge-shig-campus/378485966/.

POLICY - BIA DESIGN GUIDELINES

The BIA has developed a comprehensive set of standards governing new school construction, restricting the methods and materials that can be used in their projects. The rigidity of these requirements eliminates opportunities for innovation that may provide more meaningful and culturally relevant schools. Additionally, space standards reflect an outdated model of schools and education, preventing exploration of emerging trends in 21st century education. The goals expressed in these guidelines are very positive, but recent outcomes do not exemplify these ideals (Figure 6). Architects are encouraged to "develop a cultural focal point for the community" and "arrange classrooms to allow for many ways of

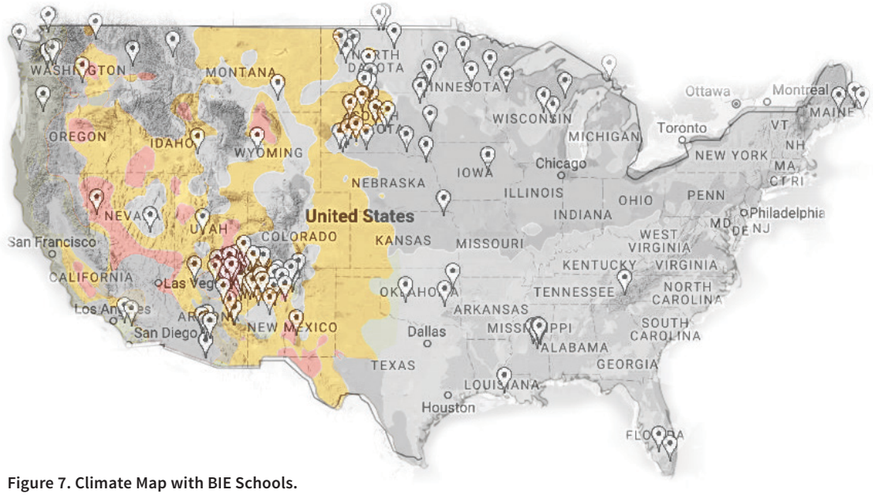


Figure 7. Climate Map with BIE Schools.

teaching children."[21] But the space requirements and construction standards are in apparent conflict with these goals.

SITE CONTEXT

The research presented here narrows its scope to focus on tribes of the Southwest that lie within the predominant cool-arid climate zones. Examining the distribution of BIE schools throughout the U.S. shows the highest concentration in this area (Figure 7). Additionally, a large number of the schools flagged for replacement are located within this region.

The dry climate is characterized by primarily cold conditions offset by brief extremes of summer heat. Heating is the primary operating mode, with the support of abundant solar resources throughout the year. Schools are not likely to be in session during the hottest months, so cooling loads will be minimal with appropriate ventilation.

The existing schools are located in rural environments, with large expanses of raw landscape dotted by homes in varying degrees of organization. Reading these sites from above reveals a general lack of solar response in building orientation, for both houses and schools (Figure 8). The reservations are also without higher levels of order in many examples. The modernization of Native communities and buildings produced a sprawling network of houses without retaining the connectivity of indigenous communities.

21. "BIA School Facilities Design Handbook", 2007, 1030-1.

Figure 8. Google Earth. Hopi Day School, Kykotsmovi Village, AZ.

DECONSTRUCTING THE NATIVE SCHOOL

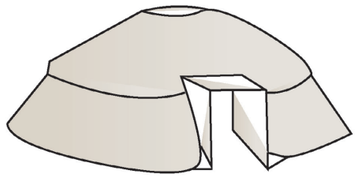


Figure 9. Typologies/Stereotypes of Native Culture

TYPOLOGIES

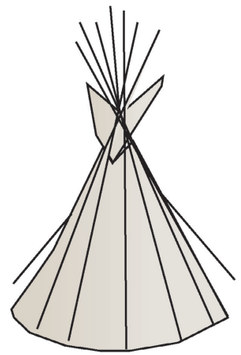
BEFORE beginning a conversation about what to build, there are several ideas and paradigms—counterproductive to the pursuit of innovation—that must first be broken down. One of the first priorities of this study is to reject a typological approach to Native architecture in favor of an evolutionary response to the present needs of distinct tribal communities. The simplest and most common tendency is for architects to take indigenous patterns and colors and apply them as surface treatments. This is a gross reduction of tribal identity, especially when used as the primary gesture towards cultural representation. Also problematic is the replication of traditional forms, which relies solely on a historic past to define a contemporary work of architecture (Figure 9). Joy Malnar, in *New Architecture on Indigenous Lands*, confirms some of these conceptual problems affecting all types of Native architecture:

> "While ascribing worth to indigenous designs, the tendency is to see these building types as frozen in time - static artifacts for unchanging functions. This has tended to discourage - though not eliminate - evolutionary growth in an indigenous architecture responsive to changing building usage."[22]

She confirms the prevalence of unhelpful attitudes toward traditional and vernacular elements, which have overshadowed the dynamic contexts in which Native people are now embedded.

It is especially inappropriate to draw on indigenous *residential* typologies for modern schools.

22. Joy Monice Malnar and Frank Vodvarka, *New Architecture on Indigenous Lands* (Minneapolis: University of Minnesota Press, 2013), 43.



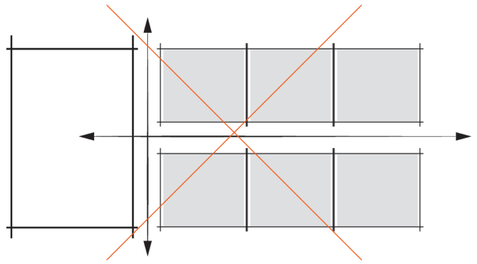


Figure 10. Cells and Bells standard

Those structural forms arose from a genuine response to the tribes' needs, resources, and capabilities at their place and time. It is also misguided to assume that the architectural language of dwellings would be compatible with the school program. The Stone School in British Columbia, designed by Peter Cardew, is an older example of contemporary Native architecture. Following its completion in 1996, it was an award-winning and highly regarded project. But recent examinations have shown a strong dislike among community members. The large skylight, recalling an indigenous pit house, has been attributed to the school's high heating bills.[23] This unfortunate outcome is a clear example of failure caused by a static view of Native culture. The contemporary school must therefore consider the *present* (and future) needs, resources, and capabilities of its tribe.

STANDARDS

The classroom has long been the defining unit of a school, and through the forced adoption of U.S. educational systems tribes have come to rely on this unit as well. Prakash Nair presents a general criticism of the universal "cells and bells" model (Figure 10):

> "It is a philosophy that starts with the assumption that a predetermined number of students will all learn the same thing at the same time from the same person in the same way in the same place for several hours each day."[24]

23. Adele Weder, "Architecture of Hope Revisited," *The Tyee*, 2009, accessed March 16, 2017, https://thetyee.ca/Photo/2009/02/27/ArchHope/.

24. Ibid, 25.

The "cells and bells" standard also lacks the flexibility to accommodate significant changes to educational models. The expense and longevity of a school building means it cannot be transformed or replaced at the same rate as educational reform. Therefore, the typical classroom model should give way to a configuration that allows the school to adapt without straining tribal resources. With extremely low graduation rates on reservations, the existing educational framework must be set aside to create space for emerging goals and strategies.

The policy context created by the BIA for new schools should also be questioned, as recent outcomes fail to maximize the immense opportunity for new schools to impact tribal communities. There is additional danger to pursuing a design based so heavily on specifications imposed from the outside. Prakash Nair asserts that “educational specifications create a school before it is created” and finds that “exemplars look good on paper... but have little to do with the needs of particular communities.”[25] New schools built according to the existing BIA standards are likely to embody this same rigidity and insensitivity towards real tribal needs. The impending wave of reconstruction is a critical opportunity for tribes to redefine the identities of their schools for the first time.

BARRIERS

A school is a massive investment of resources and infrastructure that will have to serve a tribe for a very long time. The continuation of these buildings depends heavily on ongoing maintenance by the tribe. A sense of ownership is key in the management of this asset, and the more members of the community take ownership of the school the better its chances of long-term success. Both the construction process and formal qualities of a typical school create barriers between the school and the broader community that preclude a more integrated relationship. The common model of a school establishes the educational environment as separate and/or isolated from its broader context. This project works to break down these perceptual barriers and create opportunity for tribes to explore the interactive potential of a school (Figure 11).

25. Prakash Nair, Randall Fielding, and Jeffery Lackney, *The Language of School Design: Design Patterns for 21st Century Schools* (USA: Designshare.com, 2013), 14.

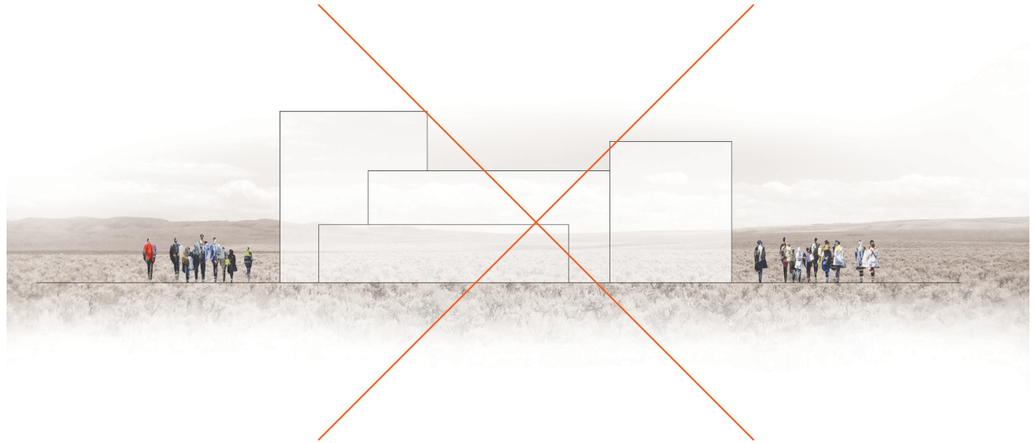


Figure 11a. Community Opposed School

Figure 11b. Community Integrated School

FRAMEWORK

GOALS

EXPRESSION

THE QUESTION of what characterizes a 21st century Native school is one that has scarcely been asked, much less answered, from a research perspective. There is a sense of overgeneralization inherent in posing such a question, which requires qualification. This study makes no effort to homogenize or minimize the distinct boundaries among the sovereign tribes in the U.S. But rather it attempts to recognize shared challenges and potential solutions that could be broadly adapted to serve those specific cultural contexts. This research affirms that schools, and architecture in general, are made truly Native only when they come from a Native tribe. In fact, to answer the question that has been posed is to expand rather than narrow the realm of possibility.

In response to the diversity among tribal communities, one of the most critical goals for these schools to pursue is cultural expression. This project looks beyond matters of visual representation and defines cultural expression as an *outcome of community life*. This means that culture is made visible through the social context of tribal members living life together (Figure 1). The successful school will identify opportunities for that community life to be embedded in its physical environment. It will also leverage the school design to create overlap between the students and the broader community, encouraging dissemination of traditions and values from elders to children.

The visual character of a school is still an important factor in establishing a contextual response, but it is a secondary consideration after the framework for cultural life. The previous

Figure 1. Grand Canyon Trust. "Hopi Tribe member Ruby Chimera teaches traditional food preparation."

criticisms focused on aesthetic extremes of tribal representation. But with the budget constraints of BIE replacement schools, the buildings are just as likely to appear generic and devoid of unique tribal character. Recent examples are nearly indistinguishable from the multitude of uninspired non-native schools found across the U.S. But a truly authentic design response will produce architecture that neither copies the indigenous past nor lacks a unique image. This means that new schools do not have to look “Native American”, but they are free to capture the distinct character of a tribe in new ways. Anna Heringer captures a similar attitude, speaking specifically of developing countries’ response to western culture:

> "Passing them on the inside lane, as it were, and showing them: we’re capable of being in the lead in terms of sustainability, we have our own beautiful way of producing architecture that doesn’t merely copycat the West."[1]

This expression of authenticity is an essential ingredient in the establishment of a new architecture on Native lands. Culturally expressive architecture, both in function and form, will follow from an appropriate response to the tribe’s current place and time.

Craig Howe makes a case for using a spatial language to help tribes “produce new and previously inconceivable architectures... that differentiate tribal communities from each other and from the dominant culture.”[2] His statement affirms the goal of moving beyond the replication of traditional forms and motifs, helping tribes respond to contemporary needs while drawing from their unique language of space and meaning.

Figure 2. Clarke Snell, Mother Earth News. "Making Adobe Blocks"

1. Anna Heringer and Andres Lepik, “Authentic Architecture, or: The Bangladesh Lessons,” *Candide* 6, (2012): 132.

2. Craig Phillip Howe, “Architectural Tribalism in the Native American New World” (dissertation, University of Michigan, 1995), 109.

influence designs, at worst serve as mere tokens with no stake in the encodement process of design or the production phase of architecture.”[3] It is critical that tribal participation be extended to this “production phase” (Figure 2) to deepen the connection between school and tribal community.

The potential impacts of community participation in construction have been demonstrated most clearly in other countries. MASS Design Group has conducted similar projects, such as the Butaro District Hospital in Rwanda, through which they make a case for a “holistic design process” that incorporates community impact. Participants gained valuable skills through the local materials and construction methods, and ultimately showed great pride and value for their work:

> "When the masons completed the first building, wrapping from the first corner all the way back around to the same spot, they had achieved such a high level of precision that they asked if they could knock down the original five meter wall and rebuild with this refined technique."[4]

Not only do these masons have the skills to maintain and build similar structures, but it is clear the project means more to them, as a representation of their work and their community, than if it had been built by outside workers.

ENGAGEMENT

New schools on Native reservations should create opportunities for community participation at every stage of the process, with the goals of increasing the community’s sense of ownership and influence, while strengthening the experience of community support for the students. Craig Howe criticizes the weak inclusion of Native Americans in the architectural process, claiming they “at best

3. Howe, “Architectural Tribalism in the Native American New World,” 56.

4. Michael Murphy and Mallory Taub, “The Problem and Potential of Sustainable Design in Resource Poor Settings: Cases from Rwanda,” *ATDF Journal* 7, (2010): 25.

Research on international development projects has shown that "while participation in the early stages of a project may not be critical, participation in implementation and maintenance is definitely more important for continued... success."[5] With the caveat that findings in international development do not translate directly to the Native context, there is sufficient evidence to show that participation in construction phases provides the best chances for long-term success.

Dr. Theodore Jojola, director of the Indigenous Design and Planning Institute, explains that distinct criteria are used to evaluate the success of buildings in indigenous contexts, focusing more on cultural meaning and social purpose than style and form. In his interpretation, design in a Native American context is "less about the final outcome than it is about the active process used to get there."[6] Jojola provides critical insight into the use of unique priorities and considerations that set design in a tribal context apart from non-Native settings.

Beyond developing a conceptual framework for community participation, there is no evidence of previous research that proposes technical strategies for achieving these ideological outcomes in school construction. Howe's methodology for encoding architecture addresses the planning and design phase, but he does not develop a material or structural language to extend the tribal role into the construction process. Several organizations have conducted design-build projects for single family homes, pursuing similar goals in the residential context. But there are no examples from U.S. reservations that scale the hands-on building process to the size of a school.

The idea of engagement can be taken beyond the building process to imagine a unique role for Native schools in their tribal contexts. Native schools in the 21st century could be developed as community hubs, providing learning opportunities for adults as well as children, and fostering the transmission of wisdom from elders to youth. This can be achieved through creative programming and enhanced opportunities for tribal members to contribute to the life of the school.

PERFORMANCE

The combined impacts of poor infrastructure and limited resources place a heavy burden on the tribal school to provide low operating expenses and maximize the use of passive systems. Daylighting should be developed to its full potential, and sunlight should be leveraged both as passive heat and PV energy. The contemporary Native school must meet strict performance criteria, but *performance* here refers to more than energy efficiency—it also encapsulates principles of adaptability and flexibility (Figure 3). Adaptability is a long-term capacity for change and transformation, while flexibility is a short-term responsiveness to dynamic modes of education. In response to the challenge of Native youth living in "two worlds", it is important to create

5. Kurt Finsterbusch and Warren A. Van Wicklin III, "The Contribution of Beneficiary Participation to Development Project Effectiveness," *Public Administration and Development* 7, (1987): 21.

6. Dr. Theodore Jojola, "A Case for Indigenous Design Education," *Design Intelligence*, 2014, accessed December 4, 2016, http://www.di.net/articles/a_case_indigenous_design_education/.

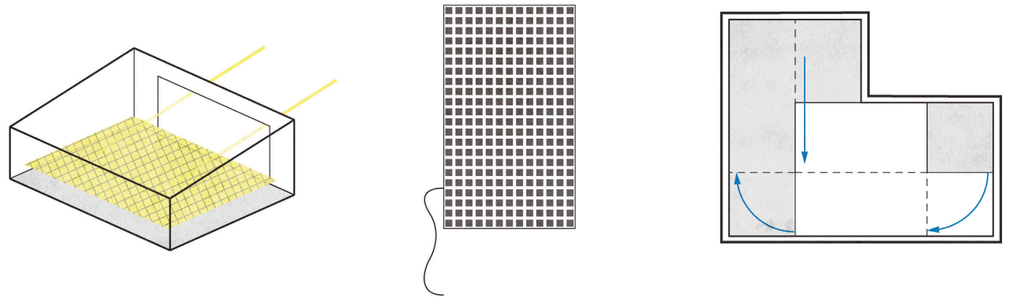


Figure 3. Daylight, Energy, Adaptability

a framework that enables parallel success in a global context. Emerging trends in education and school design can be useful here. Prakash Nair explains that "we are currently experiencing profound change in the manner in which we communicate with each other and disseminate information, which in turn has greatly altered the expectations of learners."[7] The new Native schools must provide the infrastructure to support the systemic transformations that are on the horizon. The physical spaces have to be adaptable to, and even encourage, the revolutionizing of education.

Indigenous attitudes toward planning and building demonstrate a high degree of responsibility towards environmental resources and future tribal members. Dr. Jojola points to the seven generations model, an approach to collective ownership "sustained over successive generations in a manner that is informed by the past, is invested in the present and builds a vision toward the future."[8] Applying similar attitudes to the reconstruction of BIE schools offers an opportunity to avoid purely reactionary thinking. While there is an immediate need that must be met, it is in the best interest of the tribe's future to balance this need with long-term vision. The inadequacy of existing facilities, and the fact that some schools are using make-shift structures for classes, affirms the need for long-term, flexible design strategies that will adapt to the challenges of future generations.

Indigenous tribes first modeled a way of living and relating to the land that surpasses today's pursuit of sustainability. While our current rating systems and certifications do move most projects in a positive direction, they are unable to capture the depth of responsibility demonstrated historically by Native peoples. As we strive globally to develop more sustainable practices and performance standards, it is reasonable to believe Native tribes have the capacity to be leaders in the pursuit of holistic sustainability.

7. Nair, et al., 15.

8. Jojola, "A Case for Indigenous Design Education."

STRATEGIES

SPACE AND PROGRAM

THE STANDARDS of formal education that shaped schools of the past century have begun to give way to emerging ideas, such as the Small Learning Community (SLC) (Figure 4). Conceptually, this approach breaks down a school into mixed-function home bases with no more than 150 students. These contain a variety of spaces, covering everything from lectures to group work and play, shared among the teachers and students. The “learning studios” that serve as the primary instructional settings are flexible for different types of activities and teaching methods.[9] SLC's are configured without the typical long hallways, using a large, active common space as the access point for studios or break-out spaces.

Numerous benefits can be achieved for Native students through the implementation of this model. While a substantial policy change would have to precede the full execution of this vision, it is worth exploring the potential impacts of this architectural direction. Malnar finds that "radically revised educational systems will be cast as prime agents of indigenous revival" and "the spatial design of schools will need to take this role into account."[10] The inherent flexibility of a SLC may also allow it to serve existing educational models until more rigorous changes are implemented in the future. The logic of capping the base number of students comes from Dunbar’s number, a product of research proving that 150 is “the cognitive ceiling beyond which our capacity to maintain such individual relationships is seriously hampered.”[11] The implication is that students will be less likely to be overlooked, and can feel more connected to a stable social environment while at school. The mixing of functions in SLC schools can be leveraged for efficient use of space and reductions in overall space requirements. Components like library stacks and computer labs could be absorbed into hybrid spaces throughout the school. There is also more opportunity for the integration of technology and alternative teaching methods to prepare students for success both on and off the reservation.

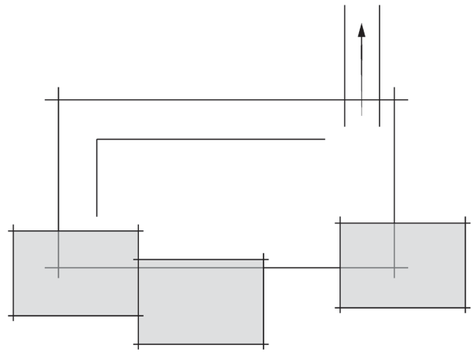


Figure 4. Small Learning Community

This proposal defines four parent categories that represent grouped subsets of a school program: Commons, Studio, Admin, and Forum (Figure 5).

9. Ibid, 33-34.
10. Malnar, 62.
11. Jan de Ruiter, Gavin Weston, and Stephen M. Lyon, “Dunbar’s Number: Group Size and Brain Physiology in Humans Reexamined,” *American Anthropologist* 113, no. 4 (2011): 558.

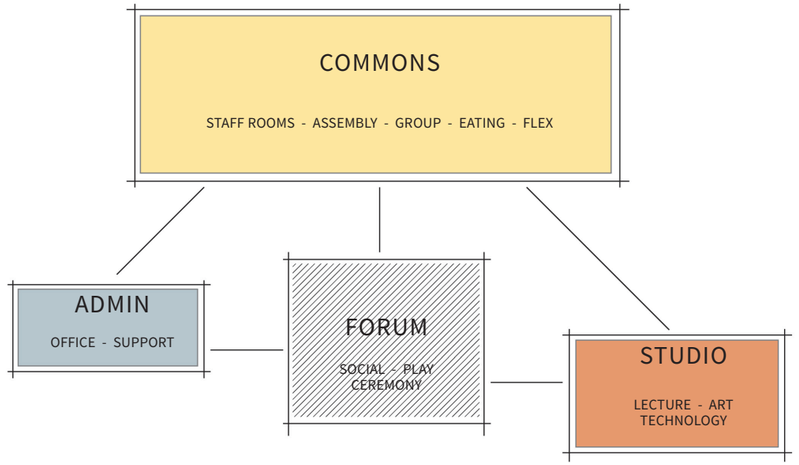


Figure 5. Program Categories

Without knowing the unique needs of a particular school, encouraging the use of these groupings allows for numerous variations on the activities and spaces within this framework. The Commons acts as a "home base" in the SLC, accommodating larger assemblies and group work, flexible dining, and staff workrooms. The kitchen would also fall under this category, but may be alternatively framed as a cafe with potential uses beyond school hours. When students are grouped into their smaller classes, the Commons could be partitioned for use as a classroom or activity space. The Admin program includes the school office and school nurse, but not every SLC would need dedicated admin space. For schools larger than 150 students, which would ideally have two or more SLC's, one administrative hub could serve the entire school. The Learning Studios function as an alternative to the classroom, and can support basic lecture modes as well as independent learning. Art and technology could both be focal points for the studios, eliminating the need for separate art rooms and computer labs.

The Forum is both an extension of the learning environment and a gathering place for the community. It is meant to serve a social purpose and be a catalyst for authentic cultural expression. This space—or series of spaces—should be activated by other programs such as the cafe, to encourage informal social activity among students, parents, and community members. For the students, this is a primary context for play and interaction, as well

as a setting for outdoor learning. Christopher Day advocates for this priority in contemporary schools, stating that "it is widely recognized that outdoor experiences have more significance for children than indoor ones." He continues to describe how this mode of education "lets children investigate things in a more concrete and sense-rich way, so understand and connect with them better."[12] While the forum might be expressed as a principal setting for such activities, part of this framework is to propose outdoor extensions of all learning spaces, such that the boundaries between inside and outside are blurred.

Within each of these program categories is an opportunity to offer adult education or community resources to strengthen the integration of tribal life in the school environment. The Admin component may include a small clinic, or the Commons could make its cafe available to visitors. The Forum might be used for traditional practices or ceremonies, and the studios could host technology-driven adult education classes. Whatever the needs and goals of a particular tribe, this programmatic framework is rich with potential for embedding community and culture in the fabric of the school.

MATERIALS/CONSTRUCTION

In response to the stated goals for contemporary Native schools, the proposed materials offer economy, accessibility, and environmental performance for construction in the Southwest region. This project emphasizes the resources of stone, adobe, and basic elements of timber construction, with a hybrid use of adobe and frame walls according to design intent (Figure 6). Adobe is the focal point in this material palette, as it offers unique opportunities to advance the cause of community engagement in tribal schools.

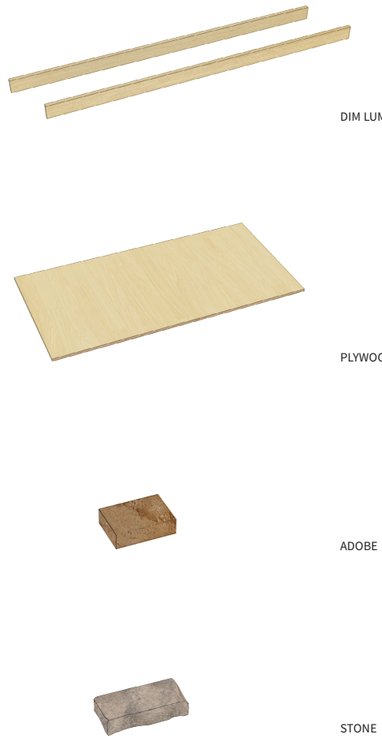


Figure 6. Materials Palette

12. Christopher Day and Anita Midbjer, *Environment and Children: Passive Lessons from the Everyday Environment* (Oxford: Elsevier, 2007), 180.

Figure 7. Wikipedia Commons. Adobe Construction.

Adobe—mud brick—is made from abundant and easily-obtained earth. It provides an accessible construction method for unskilled participants, and its unit scale is easy to manage (Figure 7). Ronald Rael champions a broad range of earth construction techniques for their educational potential:

> "The construction of earth buildings is an illuminating and fun process, and often builders invite guests to construction sites to teach traditional and advanced techniques."[13]

13. Ronald Rael, *Earth Architecture* (New York: Princeton Architectural Press, 2009), 15.

The adobe construction process is very simple, requiring no machinery, which means a safe and accessible construction site that could welcome young children. Its durability and thermal performance has been proven in this region and others, but it is especially appropriate for the dry climate of the Southwest. The thermal mass of earthen walls is also widely understood for its role in passive solar applications. Lowering the school's heating loads is a critical performance criteria that adobe can support. Finishes can be part of this material strategy as well. Earthen plasters are made from local, inexpensive resources, and can be another outlet for participation. They can be polished to varying degrees of reflectivity to support daylighting, and they add thermal mass to the interiors.

The adobe walls should be insulated on the exterior to ensure that stored heat is radiated to the interior. A renderable rigid insulation could be easily affixed and receive a plaster finish without additional sheathing (Figure 8). Using stone for the foundation walls could be an additional benefit for tribes with access to this natural resource. Indigenous communities built with stone in various capacities, so effort should be made to use it in place of concrete when possible. CMU could be used as an inexpensive alternative in a double wythe stem wall, but care should be given to its exterior treatment.

Earth materials in general pair well with wood because of a consistency in the rate of moisture absorption and drying. This allows hybrid construction systems to be used, and adjusted to maintain a balance of speed, cost, and community participation. Because of the complexity in supporting openings in an adobe wall, the stick-built infill walls can host the bulk of the doors and windows. This will also simplify the waterproofing of earthen walls.

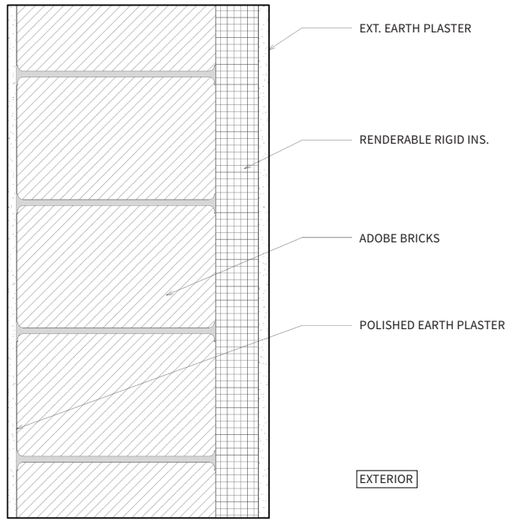


Figure 8. Wall Section.

While community participation is critical to this proposal, many parts of the project will require more technical skill-sets. This project considers a wood roof assembly, supported on frame walls or as a lightweight post-and-beam structure, to be the strongest option. It would be ideal to maximize the structural capacity of adobe walls, but separating the roof structure allows for greater flexibility and a higher tolerance for error in the adobe construction phase. With the accessibility and familiarity of wood frame construction, there are likely to be contractors within most tribes who could manage construction. Additionally, the use of sawn timber has the potential

to support some tribal economies. The 2012 Four Corners Timber Harvest Report shows that the annual harvest was only 0.1% of the sawtimber inventory in Arizona, Utah, Colorado, and New Mexico. It also states that approximately 20% of that harvest came from tribal lands.[14] Assuming sustainable management of these resources, an increase in timber construction on reservations in the Southwest could raise the tribal share of regional harvest and use.

In order to reduce the need for factory-made custom fabrications, structural systems that use built-up members from dimensional lumber should be explored. Non-structural elements, such as shelving and partitions, could also be constructed of the same materials and even offset some of the waste. These considerations simplify the acquisition and transportation of materials, and direct a greater portion of the budget towards supporting local labor.

The framework for participation in adobe construction could be leveraged for impacts beyond the immediate production of new skills. It is conceivable that tribes could incorporate earth construction trades into their economies. One or two schools built using this method could be enough to provide training for tribal members and create new jobs on the reservation. With the high number of schools needing replacement in this region, these skills could be in high demand for a long time, and ultimately strengthen the economic activity among these tribes.

14. Colin B. Sorenson, et al., "The Four Corners Timber Harvest and Forest Products Industry, 2012," U.S. Department of Agriculture - Forest Service, RB-21 (2016): 2.

ENVIRONMENTAL RESPONSE

The sun is an abundant resource for buildings in the Southwest, and controlling it and maximizing its potential has a significant impact on design strategies. The roof plays a crucial role in mediating between solar response and priorities for educational spaces. The three main factors here are passive solar, photovoltaics, and child-centered space (Figure 9). Passive solar design suggests an open gesture towards the south, with the roof sloping down to the north. This allows maximum solar penetration most of the year, and is a strong complement to a heating strategy driven by thermal mass. However, this configuration would eliminate the possibility of adding PV to the roof. Using the roof for a PV array would require either a flat roof or the opposing gesture of sloping down to the south. This form would reduce the area for solar gains on the south and increase the envelope area on the north wall, requiring more robust insulation. Additionally, it would block more sunlight from outdoor spaces to the north of the building. A butterfly roof could be a successful combination of these criteria, but this form creates a harsh interior condition that is in direct conflict with the needs of child-centered environments.

A standard pitched roof, or a single slope, would provide the most sheltering and stimulating interior space. Research has shown that these shapes help focus attention and make children feel more protected. Christopher day finds that "flat ceilings... collide uncompromisingly with walls, negating any planned softness and leaving it feeling contrived and meaningless."[15] A low-slope pitched roof appears to

15. Day, Environment and Children, 193.

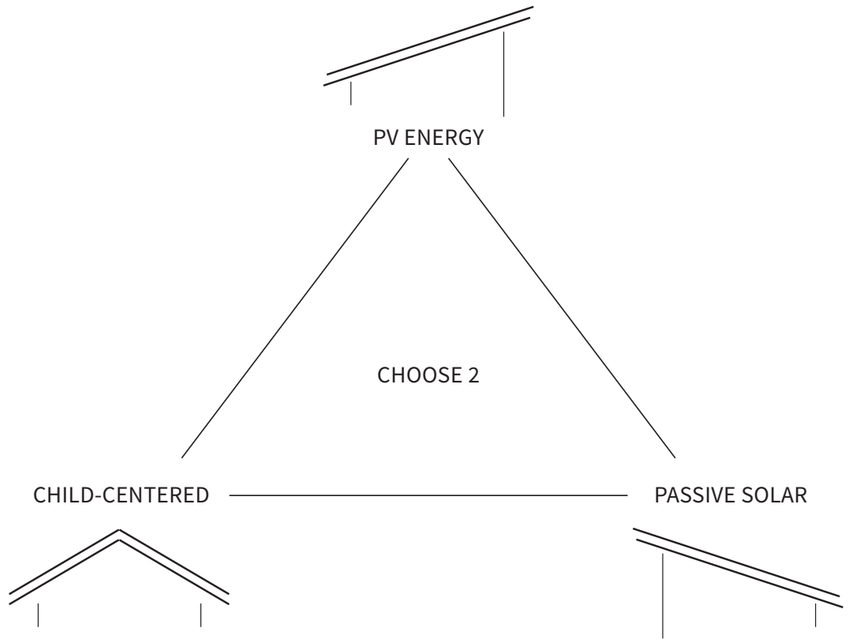


Figure 9. Roof Design Criteria

be the most effective compromise, prioritizing child spaces and PV potential. A low slope would allow the eaves to be used for summer shading without extending so low that they block winter or spring solar gains. Thus a space could still take advantage of passive solar heating.

Daylighting is also of substantial importance to a school's performance, and requires similar management of the region's intense solar resource. Providing high-quality learning environments depends heavily on the distribution of natural daylight at appropriate levels. Illuminance levels at the height of a student desk should fall between 300 and 3000 lux to be effective for most tasks. The needs of passive solar heating can produce overlit spaces with uncomfortable glare, so simulations must be considered to strike a balance. This project proposes ample glazing area on the south, with eaves that extend far enough to shade the windows in July and August, when solar gain is not desirable. Preliminary simulations have shown that interior louvers, light shelves, and blinds can be sufficient to reduce glare while still allowing full solar penetration with the winter's low sun angle.

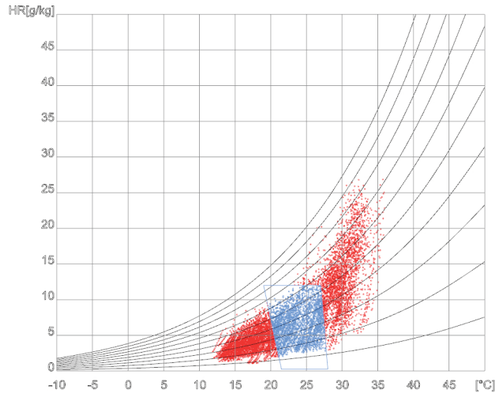


Figure 10a. Winslow, AZ. Interior - No Ventilation

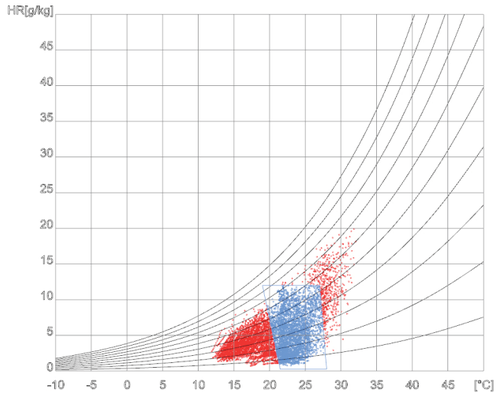


Figure 10b. Winslow, AZ. Interior - Natural Ventilation

Natural Ventilation can provide a large reduction in cooling loads over the course of a school year (Figure 10). The test case that produced this result used vented skylights to achieve buoyancy-driven airflow, but similar results could be achieved with clerestories. In either case, a high degree of operability should be embedded in all learning spaces, so that students and teachers can tune the building's response to varying environmental conditions. Windy conditions arise in the spring, with gusts primarily blowing from the west. Because cooling is not yet necessary at this time of year, it makes sense for the architecture to shelter indoor and outdoor spaces from the west. It would be ideal to incorporate as many innovative systems as possible, such as geothermal heat pumps and composting toilets, but the budget for each project will be a determinant of how far the school can go in its sustainability concept.

CASE STUDY

HESQUIAHT PLACE OF LEARNING

A SMALL SCHOOL in British Columbia, on the west coast of Vancouver Island, has come very close to capturing the full range of priorities proposed in this research (Figure 11). It is worth discussing to see which goals have already proven attainable, and understand how this proposal can go further. The context for the Hesquiaht School is very different from that being considered by this body of research. It was built with the policies and support of another government, and the climate imperatives have little in common with those of the Southwest territories in the U.S. But it accomplishes a goal that is central to this body of research, which is to reimagine the school as a center for community. The successful implementation of this concept is affirmation of its potential for application in BIE schools.

The design was coordinated by Marie-Odile Marceau of McFarland Marceau Architects, who framed the project as community-driven from the start of design through completion.[16] Anita Bedell describes the unique identity of this project:

> "The new Hesquiaht First Nation Place of Learning isn't just a school. It's a community centre, a post-disaster facility and... something that community members built with their own hands, reflecting their own vision, using natural resources from their own traditional territory."[17]

16. Malnar, 70-71.

17. Anita Bedell, "Hesquiaht First Nation Place of Learning: Not Just a School," INAC, 2009, accessed June 6, 2017, https://www.aadnc-aandc.gc.ca/eng/1100100021153/1100100021169.

Figure 11. Yeplife, "A Year at Hesquiaht Place of Learning."

The building includes space for community gatherings that extend beyond school hours, and it serves as a resource to more than just the students. The school also made use of the area's timber resources to overcome economic and geographic barriers in construction. The architects on record explain this meaningful process:

> "To off-set the difficult... logistics of transporting materials to this remote area, the majority of framing, structural and finish material... was harvested from blowdown trees lying in the neighbouring forest. The trees were brought to the community... and milled on-site."[18]

18. "Hesquiaht Community School," McFarland Marceau Architects Ltd., accessed June 6, 2017, http://www.mmal.ca/hesquiaht/description.html.

Building the school in this way allowed them to provide technical training for nearly 50 tribal members (Figure 12) and ensure the expense of labor was paid into the community.[19]

While the Hesquiaht school is a promising example of innovative design for Native schools, it does not achieve everything that this research proposes. It lacks the incorporation of emerging

19. Ibid.

Figure 12. Nick Westover, Marie-Odile Marceau, Leung Chow, "Hesquiaht Community School."

educational models, which is crucial to ensuring the school can adapt to radical transformations in the future. The inclusion of community during construction was successful as an economic catalyst, but it did not provide the degree of accessibility and informality encouraged by this research. And the students themselves were not able to help build their school. Beyond setting a compelling precedent for new Native schools, it has not produced any resources to encourage or enable this design strategy in other settings. There is still need for a framework that addresses the regional issues and opportunities of the Southwest, where so many of the replacement candidates are located. The goal of this research is to make the positive outcomes demonstrated by Hesquiaht available to tribes and jurisdictions that face stronger barriers to this type of innovation.

REBUILDING

HOPI COMMUNITY SCHOOL

Figure 1. Promking, Wikimedia Commons. "Oraibi."

THE HOPI TRIBE

THIS DESIGN INVESTIGATION explores the implementation of the proposed framework in the cultural context of the Hopi Tribe. The Hopi are a federally recognized nation in the deserts of northeast Arizona (Figure 1). The population is approximately 12,000 people, spread out amongst 12 villages and three Hopi Mesas. The Hopi reservation is surrounded on all sides by the much larger Navajo reservation. Traditional livelihoods depended on the challenging practice of farming corn in this hostile climate, and many still maintain this way of life. Most of the ceremonies and stories that define Hopi culture are centered on bringing rain and caring for the land.[1] A team of researchers working with Hopi youth describes the present cultural context as follows:

> "Hopi culture is adversely affected by increasing pressure to change... The elders' knowledge is not being passed on, and the physical activity required of Hopi youth as they farmed the land with their families has been replaced by modern sedentary pastimes. The strong Hopi identity as stewards of the land is slowly being lost."[2]

The construction of new schools is a powerful opportunity to provide a context for the transmission of culture and values, and revive a meaningful connection to the land.

Hopi culture references distant geographic markers—meaningful elements of the natural landscape—that form the boundaries of their cosmogenic territory. At the center of these boundaries is the physical life of the tribe.[3] There is a centripetal orientation within this concept of the Hopi world, which establishes an inward focus on the "center" (Figure 2). This is in contrast to Navajo culture, which bears an outward focus. Alfonso Ortiz provides a small example of this distinction:

> "A Pueblo priest, when setting out a dry painting, will first carefully set out the boundaries, and then work his way inward toward the center. The Navajo Singer, on the other hand, will work outward from the middle."[4]

The concept for this design proposal begins with an analogous inward focus, using the buildings to establish a boundary and frame a community space at the center. Integrating this relationship with the framework of an SLC yields a gesture of pulling apart the school program to create a porous edge and an open center that belongs to the broader community (Figure 3). Extending the buildings into the landscape in this way helps the school relate to the larger

1. Gumerman, et al., "Footprints of the Ancestors: Reengaging Hopi Youth with Their Culture," 151, 164.

2. Ibid., 150.

3. Robert Boissiere, *Meditations with the Hopi* (Santa Fe: Bear & Co., 1986), 12.

4. Alfonso Ortiz, "Ritual Drama and the Pueblo World View," *New Perspectives on the Pueblos* (Albuquerque: University of NM Press, 1972), 142-143.

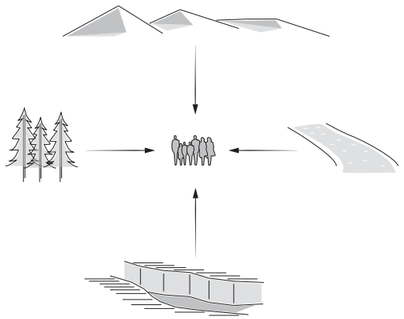


Figure 2. Hopi Cosmogenic Territory.

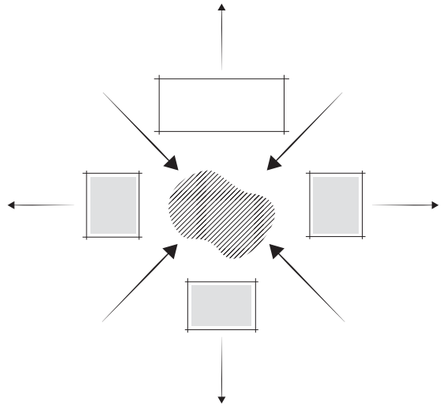


Figure 3. Design Concept.

geographic context while allowing the landscape and people to flow into the heart of the school. This concept also influences the relationship between space and enclosure at a smaller scale. Pulling apart the walls as spatial references, or boundaries, and separating them from the envelope, achieves a related experience of reaching into the landscape and allowing the exterior to become integrated into the primary space (Figure 4).

The design proposal outlined in the following sections is a conceptual response to the research and Hopi context. Due to limitations in the timing and scope of this research, the design was not conducted with the input of actual tribal members. It is crucial that any design for Native schools empower the tribal community to drive and inspire the entire process. This project recognizes its limitations. It does not attempt to define a "solution" to the issues raised, nor does it pretend to address all of the elements of school design and construction. But it serves the important function of provoking a conversation, among tribes as well as architects, about the inadequacy of current trends and policies. The design and its perceived experience is offered to inspire new thinking about how Native schools can bring positive and comprehensive impacts to their communities and cultures.

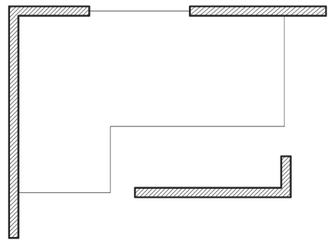


Figure 4. Space + Enclosure.

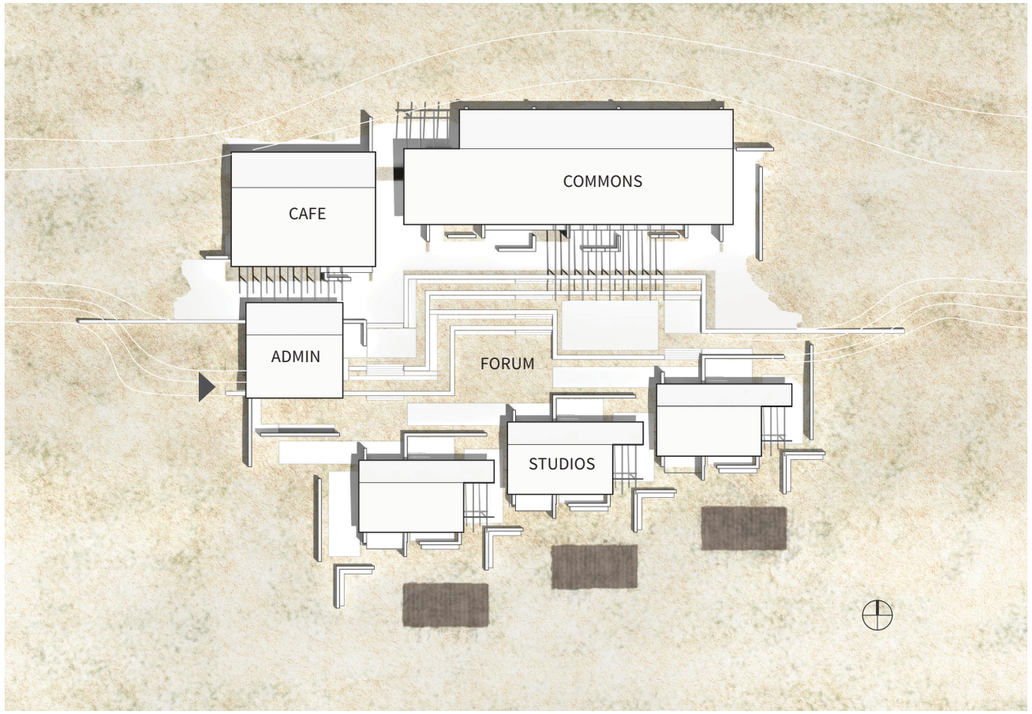


Figure 5. Site Plan.

SITE RESPONSE

The program categories from this framework are arranged with the Commons/cafe to the north and Learning Studios extending towards the south. The Admin spaces create a western edge, while the Forum establishes a point of convergence at the center of the site. This configuration offers ample outdoor space for the learning environment to spill out into the natural environment (Figure 5). The Forum can host student or community gatherings with multiple formats and focal points, and is regularly activated by the movement of students across the site. It is a habitat for social exchange, ideally between students and elders, with the benefit of passive supervision from the surrounding class and office spaces.

The site design relies on a moderate slope in topography to integrate a series of terraces that shape the central forum. This focal point is defined

by a combination of steps and 18-inch ledges that enable both circulation and seating. Spaces in the hardscaping throughout the project allow the natural landscape to break through, and provide a sense of its continuity across the site (Figure 6). The tiered approach also reflects the underlying solar response used in early Hopi pueblos. The solar access achieved by these stepped dwellings is reinterpreted here as a landscape strategy, ensuring that both indoor and outdoor spaces have abundant sunlight (Figure 7). The experience created for this school is characterized by openness to the tribal community and integration with the natural landscape (Figure 8). These qualities can encourage participation in the life of the school and support the need for more storytelling and cultural transmission in the educational environment. The permeation of landscape throughout the school serves to revive the value for stewardship of the land.

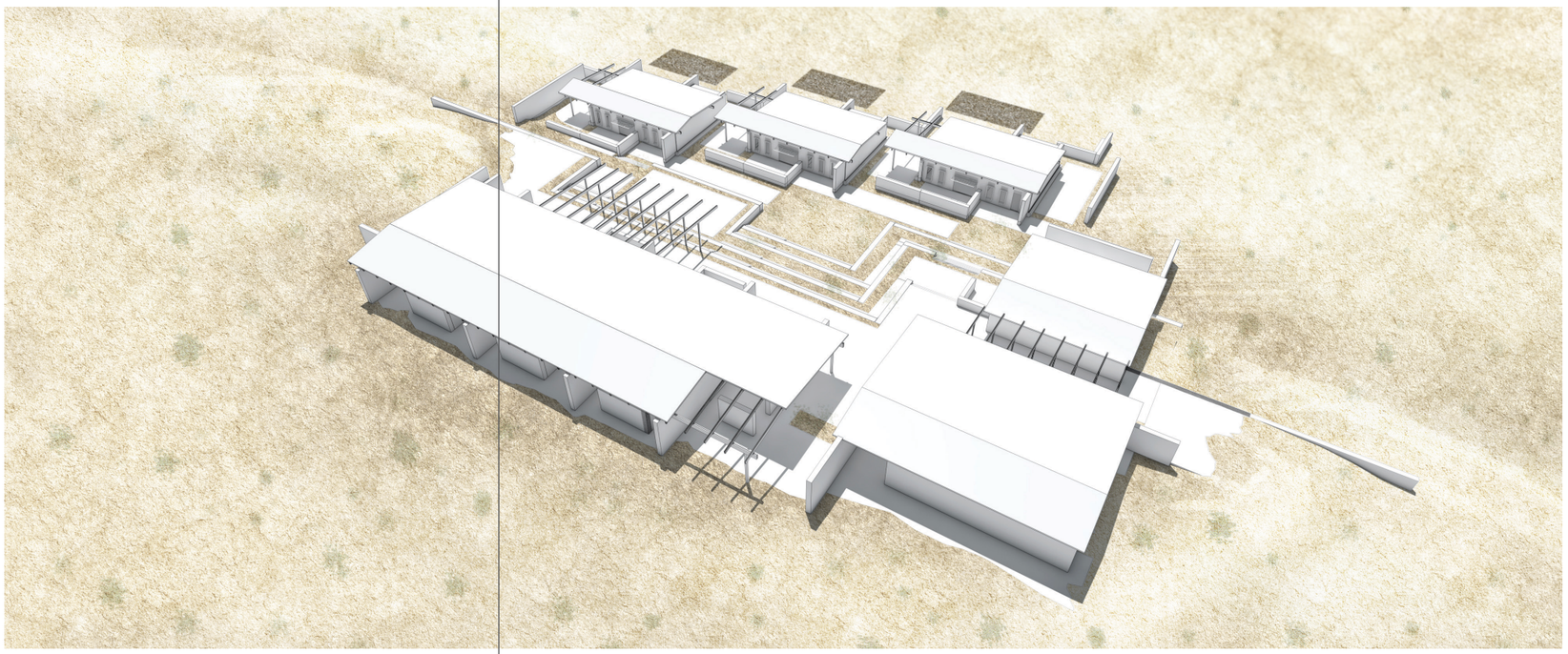


Figure 6. Aerial looking South.

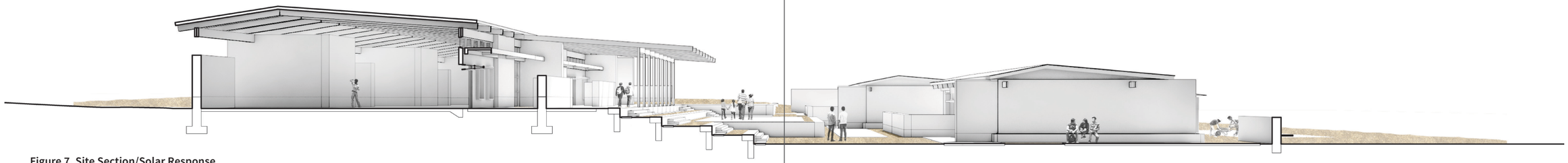


Figure 7. Site Section/Solar Response

Figure 8. Community Access.

CONSTRUCTION

The primary spatial reference in this scheme is created by thick adobe walls that extend beyond the confines of the conditioned spaces and blur the boundaries of the learning environment. This material language is best illustrated in the learning studios, where the full-height adobe walls establish the directionality between landscape and center. Another layer of earthen garden walls capture exterior areas that work as continuation of the studios (Figure 9). In addition to the adobe walls, a column grid supports a timber roof assembly reflecting the low-slope form proposed in the design framework. The priority of using basic dimensional lumber is expressed through the use of built-up rafters, and a large shelving wall constructed with plywood (Figure 10).

The use of adobe creates a phase of construction prior to erecting the roof structure during which both children and adults can participate. This could be a meaningful time for tribal members

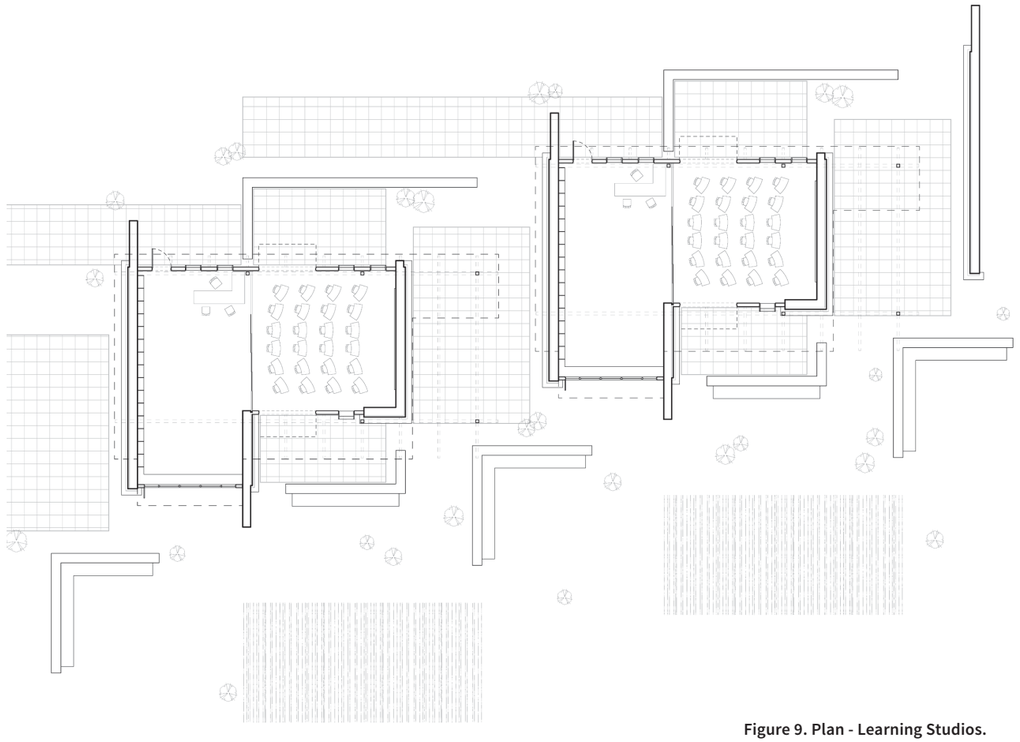


Figure 9. Plan - Learning Studios.

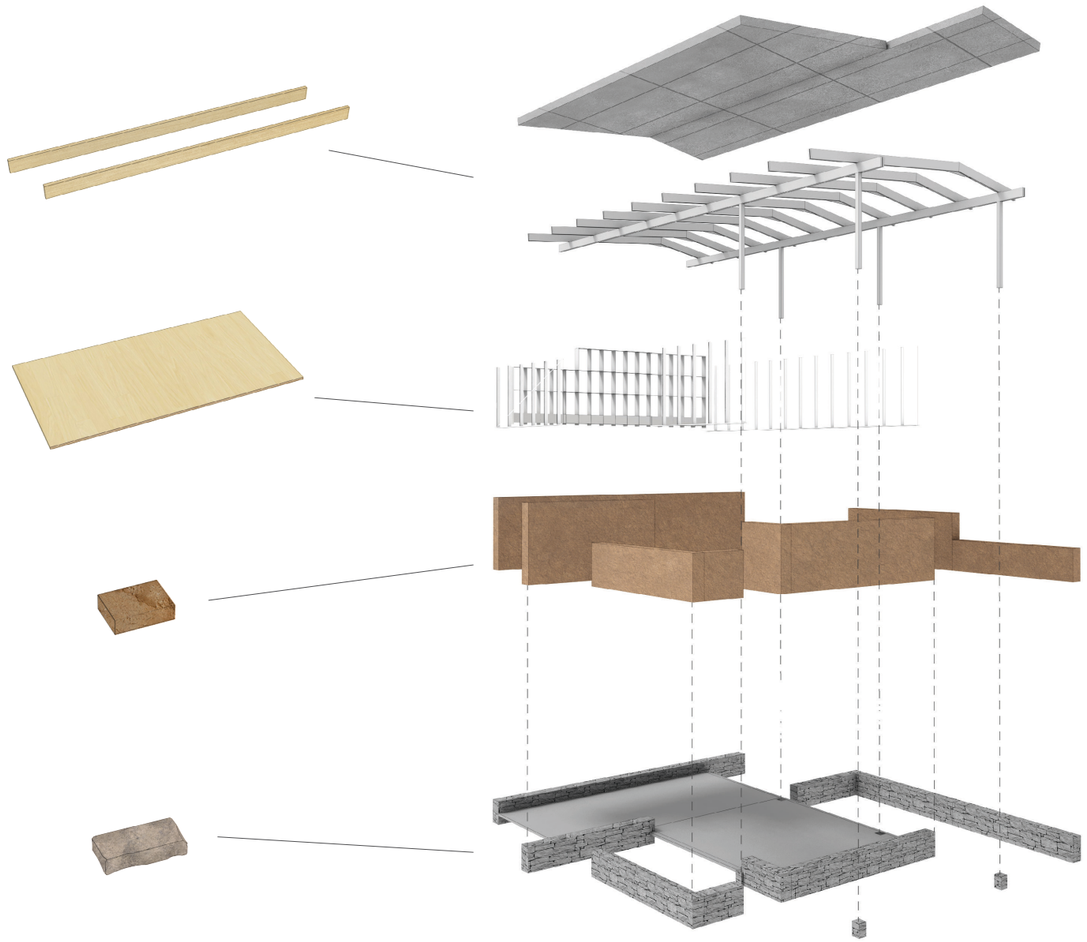


Figure 10. Adobe Construction - Learning Studios.

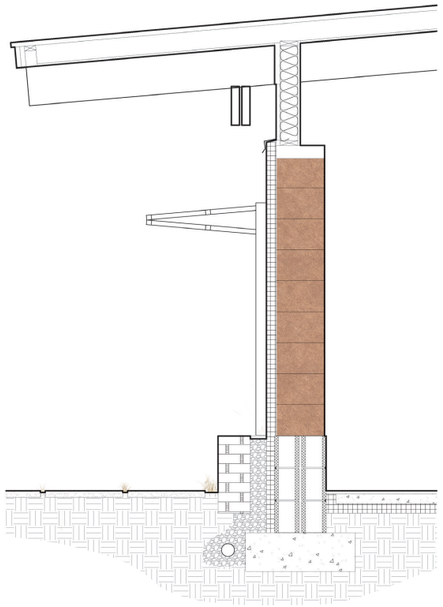


Figure 11. Wall Section - Learning Studio

Figure 12. Learning Studios and Landscape

to make a tangible contribution to their school, and understand more intimately how their natural resources have been used to create it. It would be ideal for this phase to provide technical training with the capacity to create jobs or enable tribal members to use adobe in building their own homes. Near the end of construction, community members can be involved again to apply earth plaster finishes on both the exterior and interior of the adobe walls. Students and teachers can take control of the expression of interior spaces, and all can develop the skills to maintain and protect the earth walls with plaster.

The foundation systems proposed here use a CMU stem wall and continuous concrete footing for the adobe walls (Figure 11). The stem wall helps to keep the base of the adobe wall away from the moisture in the ground. In order to maintain continuity of the exterior insulation and minimize thermal bridges across the stem wall, the insulation extends below grade to the footing. A small stone wall is built in front to protect the base of the wall and prevent the application of plaster near the ground moisture.

Gravel fill provides a drainage field behind the stone wall. This detail has the additional benefit of creating places to sit throughout the exterior spaces of the school.

THE LEARNING ENVIRONMENT

The learning studios form the southern edge of the site, and while they maintain continuity with the center, they express a gesture towards the natural environment and the larger boundaries of Hopi life. Spaces for gardening or farming act as extensions of the learning studios, making the agricultural practices and traditional connection to the land part of the learning experience (Figure 12). Glazed garage doors provide a large operable area to enhance the experience of outdoor space becoming part of the studio (Figure 14). The ample glazing area, coupled with simple overhangs and interior blinds, also produces very strong daylighting in this configuration. Simulations show useful daylight (Useful Daylight Illuminance) of 86% on an annual basis (Figure 13). It is overlit only 4% of the time, which accounts for

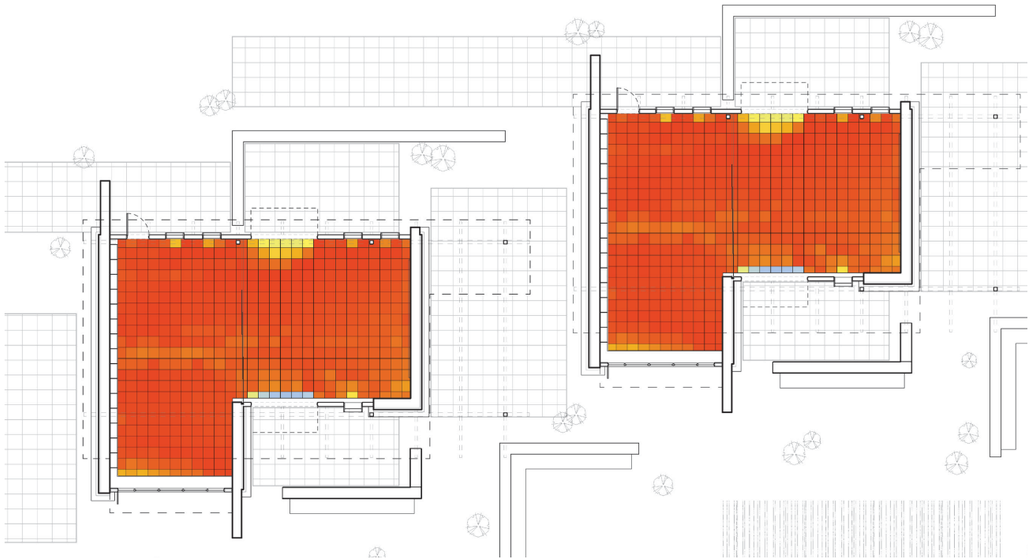


Figure 13. Useful Daylight Illuminance

a small area of glare against the south windows. The underlit portion is just 10%, meaning electric lighting would only be required for about 45 minutes per school day. The implications for student experience and energy savings are both outstanding.

Although these are larger spaces than the typically prescribed classroom, the hybridization of program, such as the use of mobile workstations instead of a computer lab, can reduce the total square footage of the school. The L-shaped room allows for multiple configurations and activities, and the teacher's desk can be positioned to supervise all areas of the studio at once. Sliding panels are in place to partition the room into two spaces when needed (Figure 14). There is sufficient area for the standard classroom lecture, and students have smaller spaces to retreat for quiet study. This kind of environment embraces the fact that students need to learn in different ways at different times, and its inherent flexibility should serve the needs of the school for a very long time. This is a context for education that provides children with abundant access to light and air, and a connection to the community that acts as their overarching support network. The learning environment proposed here is equipped to transform the school experience for Native youth and inspire new, more positive experiences in their educations (Figure 15).

Figure 14. Flexible studio space

Figure 15. Learning Studio

MOVING FORWARD

CRITIQUE

THIS PROPOSAL makes great strides in imagining a transformed context for Native education and the preservation of culture in modernized communities. It demonstrates how methods of community engagement could express themselves in material and architectural character, as well as alternative programming and educational models. But it is both a limited and preliminary exploration, aimed at sparking a conversation that ultimately must be led by the tribes themselves. The critical moment in which this research is focused is about tribes taking ownership of their educational systems and finding freedom to imagine something completely new.

The design itself begins a thoughtful exploration of Hopi cosmology and spatial relationships, but fails to address the layers of this concept at the larger scale of community and geographic context. A particular school and site would need to be selected to consider how a school is embedded in the residential neighborhood of a reservation. Because this project is still sited abstractly, it lacks an understanding of visual relationships, transportation, and scale, which would dramatically affect the design in reality. A real school will also likely require a gym, and other program elements that were not central to this exploration.

A final concern in this investigation, but not necessarily a detriment to the research, is the assumption of community participation in various capacities. Interest and motivation are expected in this body of work, but some tribal members may have no interest in the hands-on opportunities of adobe construction. Hopefully this method proves to be a meaningful opportunity for most, but the framework is meant to create opportunities which can be taken as far as the tribe is willing to go.

RECOMMENDATIONS

The next step in working towards actual outcomes for BIE replacement schools is to build a relationship with one of the tribes and schools. Any solutions that are going to be implemented must start with their goals and willingness to advocate for transformation. The goals defined by this research are usable only if tribes make them their own. The second priority to is carry this discussion to architects and educators who have the potential to impact school design in this region. These designers will be the ones to express the overarching framework in terms of particular cultural needs, and they will be the facilitators in empowering tribal ownership of the design process. Establishing positive directions among tribes and designers will form a basis for advocacy, by which they can work together to transform the outdated policy context governing Native schools.

Many new schools will be built on reservations in the coming years, and this is an opportunity to leverage that momentum for change. Tribal members across the U.S. have to question and challenge the paradigms they have been given, and imagine new ways of educating their youth, in order to ensure the continuity of culture in the generations to come.

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