

Living and Sustainability: An Environmental Critique of Design and Building Practices, Locally and Globally

1. Paper / Proposal Title:

Housing Equity and Heat Vulnerability: A Case Study for Indigenous Design and Construction

2. Format:

Verbal presentation & Written paper

3. Author(s) Name:

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4. University or Company Affiliation:

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5. Abstract (300 words):

Many indigenous peoples within the US, and throughout the world, do not have an equitable relationship with basic infrastructure including housing, energy and water. Lack of access stems from the unique interrelationship of economic, legal and geographic influences, which renders typical urbanized solutions ineffective for these communities. There is a need for culturally- and climatically-responsive planning tools and processes to increase equity in infrastructure.

Meanwhile, resiliency in housing stock, or the ability for residents to be protected during climatic extremes, is becoming a critical issue. The Arizona climate experiences temperatures reaching 47 Celsius (118 Fahrenheit) with deadly heat waves. The cases are increasing with 38% more heat-associated deaths in 2015 compared to 2014. The most common place of death was at the residence. Most were not cooled by air conditioning. For those that had air conditioning, the AC was not functioning, not in use, or the house did not have electricity. ¹ This paper will investigate traditional Indigenous architectural strategies as a response to the growing need for equity and climatic resiliency in housing Indigenous building stock.

While we understand impacts associated with heat waves, “less clear is the connection between residential buildings, increased heat waves anticipated in the future and the potential for building and occupant adaptation.” ¹ The study cautioned on the over reliance of mechanical cooling, and looks to building design strategies used in global vernacular architecture including: sub-grade structures, thermal mass, principles of heat buoyancy, evaporative cooling, orientation, shading, and thermal zoning (‘cool retreats’).

The case study we will present, revolves around a partnership that was created with a local indigenous community, Gila River Indian Community, to investigate their traditional construction methodologies as potential solution to climatic and economic resiliency, and heat vulnerability. The intent was a two-way knowledge exchange between academia and indigenous community. On the one hand, increasing tribal capacity in the fields related to infrastructure and the built environment, while also increasing academic understandings of cultural protocol, process and methodology.

6. Author(s) Biography (200 words each):

Wanda Dalla Costa, AIA, LEED A.P. is the 2016 Visiting Eminent Scholar at the School of Sustainable Engineering and the Built Environment at Arizona State University. Dalla Costa is an architect and a member of the Saddle Lake First Nation. She has spent nearly 20 years working with First Peoples (First Nation, Indigenous, Native American)

¹ <https://www.maricopa.gov/publichealth/Services/EPI/pdf/heat/2015annualreport.pdf>

¹ <http://anzasca.net/wp-content/uploads/2014/02/p37.pdf>

communities in North America. Her teaching interests include: affordable, sustainable and culturally appropriate housing; Indigenous planning processes; culturally responsive design methodologies; and Indigenous construction project delivery. Dalla Costa's research interests include: built environments as a teaching tool for traditional knowledge; disaster resiliency and traditional construction methodologies; culturally-responsive (qualitative) metrics in architecture; and the development of Indigenous architectural frameworks. She holds a Master of Design Research (City Design, Planning and Policy) from the Southern California Institute of Architecture (SCI-Arc) and a Master of Architecture from the Faculty of Environmental Design at the University of Calgary. She is the Owner of Redquill Architecture, a firm specializing in working with indigenous communities.