



Building Design Project

Reference e² design episodes:

“Greening the Federal Government”

“The Druk White Lotus School- Ladakh”

“Architecture 2030”

Building Design Project:

- 1) Read the background essay and discussion questions for e² design episodes “Greening the Federal Government,” “The Druk White Lotus School- Ladakh,” and “Architecture 2030”. Watch the episodes and discuss the post-viewing questions.
- 2) Using innovative sustainable design strategies, redesign or create a brand new design for an office building, apartment building, house, library or federal building in any location you choose. In addition to screening the reference episodes, visit the following websites below for ideas, inspiration and specific technology and materials used in sustainable design.
 - Building Green- www.buildinggreen.com
 - U.S. Green Building Council- www.usgbc.org
 - Architecture 2030- www.architecture2030.org
 - Druk White Lotus School- www.dwls.org
- 3) Launch a design competition among your peers who may be designing the same (or a different) building. The building that best exemplifies creative strategies that incorporate green sustainable design wins. Points to keep in mind when evaluating a building:
 - What materials are presented in the design? Do they help reduce greenhouse gas emissions?
 - What types of energy does your building use? At what rate of consumption?
 - Does the building develop on-site renewable energy?
 - Is the design inviting and comfortable for guests? How? Be as specific as possible.
 - Does the building honor the culture of the community? In what ways?
 - Does the design meet the 2030 challenge? (Refer to the episode and background essay for more specific information.)
- 4) Share your work and design competition with your peers and community through a public display. Post an announcement of the event in your school and local newspaper!



5) Optional/Extra Credit: Write a letter to Ed Mazria, architect and founder of “Architecture 2030”, a non-profit organization with a mission to rapidly transform the U.S. and global Building Sector from being the major contributor of greenhouse gas emissions to being a central part of the solution to the global-warming crisis. Invite him to speak at your school. Tell him why you think the 2030 challenge is important or not important to your community specifically. Present him with your design!



e² design “Greening the Federal Government”

Background Essay

Government buildings have not historically been associated with sustainability or beautiful design. Spearheaded under Ed Feiner in the mid-1990s, the U.S. General Services Administration’s (GSA) Design Excellence program is changing this perception. The program was created to elevate government architecture across the country through the hiring of the best architects “of the day”. Since its inception, it has resulted in dramatic improvements in the design of federal buildings in the United States. This episode looks at Pritzker Prize-winning architect Thom Mayne’s San Francisco Federal Building, which aims to redefine the culture of the workplace, create an urban landmark that unites the community, and establish a benchmark for sustainable office building design.

Using 50 years worth of weather data, the designers first examined the environmental conditions of the specific site on 7th and Mission Street in San Francisco. Keeping in mind the wind conditions and the location of the sun, they designed with the specific intention of using those elements for ventilation, heating, cooling, and lighting. Not only does this use of the natural environment make the building more energy efficient, it makes it a healthier, more enjoyable environment for the employees who work there.

The building is designed to maximize the amount of natural light that filters in, but also shade some of that light with scrims to prevent the interior from getting too hot. There are hi-tech sensors that control the natural ventilation by automatically opening and closing the windows based on need. For example, during warmer weather the building takes advantage of the drop in temperature overnight by opening the windows, trapping the cool energy in concrete structures inside and then closing the windows to use that cooling energy for the entire day. The sensors also turn on or dim the lights according to need which has an energy-saving function. The office dynamic has also been shifted quite dramatically by seating top management in the center of the floor (rather than around the perimeter which has been the norm) and their employees around the edges where they can have access to natural light and open and close the windows.

Mayne and his team of designers believe that sustainability can go beyond just energy-efficiency. For a building to be truly sustainable, the people who work within the building and the community outside the building both have to embrace it and feel connected to it. They intend for the building to become an integral part of the community by creating shared spaces, like a café and a day-care facility that can be used by both employees and people from the surrounding area. The hope is that this building will become a model of social engineering, not just structural engineering, not only for other federal buildings but for the private sector as well.



To find out more about Thom Mayne's firm Morphosis, visit www.morphosis.net

To find out more about the GSA's Design Excellence Program, visit www.gsa.gov/designexcellence



e² design “Greening the Federal Government”

PRE-VIEWING QUESTIONS

1. What elements of a building or room influence your comfort the most (e.g., natural light, electric light, temperature, space, organization)? Be specific. What do you enjoy and not enjoy? Do the rooms and buildings where you spend most of your time have these comforts or discomforts?
 2. How does a building interact with the community around it? What makes a building more comfortable for the people inside, whether they're working, going to school or visiting the building?
 3. What is your favorite building (public or private) that you enjoy being in (e.g., federal building, library, museum, home, theatre)? Why? How do you feel when you're in this building? Why do you think you feel that way?
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POST-VIEWING QUESTIONS

1. What specific issues did the designers of the San Francisco Federal Building address when intending for the building to become an integral part of the community?
2. What type of design decisions were made to conserve energy and use elements of the natural environment?
3. How important do you think it is for a building to be aesthetically pleasing from the outside? Why? Does the sustainability level of a building influence your opinion?
4. Does your school feel like it's part of the community around it? Why do you think that is the case?
5. How important do you feel it is for a building to be aesthetically pleasing from the outside? Why? Does the sustainability level of a building influence your opinion?



e² design “The Druk White Lotus School- Ladakh”

Background Essay

Ladakh is one of the most remote places in India with one of the harshest climates on earth and has been long isolated from the modern world. Now caught in the political and cultural cross-fire of neighboring countries and amidst religious strife, His Holiness the 12th Gyalwang Drukpa saw his people and their future at risk. Under increasing pressure to modernize and engage with the 21st century, His Holiness, one of the four core leaders of Tibetan Buddhism, envisioned the Druk White Lotus School. The school was conceived to equip Ladakhi children to function in a modern world while embracing the traditions of Tibetan Buddhism. Guided by the vision of His Holiness, Jonathan Rose and his team of architects and engineers at ARUP London designed a school that utilizes modern technology and knowledge to preserve and respect the Ladakhi culture and environment.

The master plan for the Druk White Lotus School was inspired by the Buddhist tradition in Ladakh. By laying out the school buildings in the traditional form of a mandala, a series of symmetrical geometric shapes with significant spiritual resonance, the design itself honors the culture of the community. The great innovation of the school is that it does not simply transplant Western notions of sustainable building into this remote region of India. ARUP considered the extreme climate of Ladakh and sought to understand local methods of construction, local architecture, and environmental physics in order to create an efficient design that would best address the needs of the school. The designers used construction methods based on the surrounding monasteries, which have survived up to a thousand years in the hostile conditions present. They also made full use of local materials using timber frames to reinforce the walls and roofs of the buildings. Tree plantations flourish in the valleys of Ladakh and trees grow very quickly, making them a sustainable and locally-sourced material.

For the buildings to function and last ARUP also used the natural environment. Buildings were strategically positioned to maximize solar potential according to their specific function. Classrooms face the morning sunlight to naturally heat and light them during the day. Residential buildings are built to absorb solar energy during the day and release the heat at night. These and other considerations allow the school to maintain comfortable temperatures without using money or energy.

The Druk White Lotus School demonstrates that efficient design doesn't necessarily have to be something Western or Western looking. With careful design and consideration local cultures can sustain their way of life while also utilizing technologically advanced methods. Thanks to the vision of His Holiness and the ARUP team, the world has an example to build off of. Where will this model be copied next?



For more information on the Druk White Lotus School, visit www.dwls.org

For more information on the His Holiness the 12th Gyalwang Drukpa, visit www.drukpa.org

For more information on Jonathan Rose and ARUP London, visit www.arup.com



e² design “The Druk White Lotus School- Ladakh”

PRE-VIEWING QUESTIONS

1. How would you define culture? List some key aspects of culture in general. Now list those same aspects of your specific culture.
 2. How do you think building design may or may not honor the culture of a community?
 3. What decisions and concerns do Western designers need to take into consideration when constructing a building in other parts of the world?
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POST-VIEWING QUESTIONS

1. In what ways was the design for the Druk White Lotus School different than the design of buildings in other parts of the world? What factors contributed to these differences?
2. What particular decisions did the designers make in their choices of materials and energy sources to create a sustainable building in this remote location? How did they use the natural environment?
3. Why is it important to preserve culture? How is culture passed on? What aspects of culture, if lost, would be very hard to recover? How did the designers preserve the culture of Ladakh?
4. How can technology and modernization affect culture negatively? Positively? Use specific examples.



e² design “Architecture 2030”

Background Essay

In 2002 architect Edward Mazria established Architecture 2030, a non-profit organization with a mission to rapidly transform the U.S. and global Building Sector from being the major contributor of greenhouse gas emissions to being a central part of the solution to the global-warming crisis. Because the Building Sector is responsible for almost half (48%) of greenhouse gas (GHG) emissions, Mr. Mazria decided to step away from his architecture career and dedicate himself full-time to convincing the Building Sector to change its ways.

The goal of the organization is to dramatically reduce the GHG emissions of the Building Sector by changing the way buildings and developments are planned, designed and constructed. The organization issued a challenge (The 2030 Challenge) to the global architecture and building community asking them to adopt the following targets:

- All new buildings, developments and major renovations shall be designed to meet a fossil fuel, GHG-emitting, energy consumption performance standard of 50% of the regional (or country) average for that building type.
- At a minimum an equal amount of existing building area shall be renovated annually to meet a fossil fuel, GHG-emitting, energy consumption performance standard of 50% of the regional (or country) average for that building type.
- The fossil fuel reduction standard for all new buildings shall be increased to:
 - 60% in 2010
 - 70% in 2015
 - 80% in 2020
 - 90% in 2025
 - Carbon-neutral in 2030 (using no fossil fuel, GHG emitting energy to operate).

It is Ed Mazria's belief that, by using innovative sustainable design strategies, generating on-site renewable energy, or purchasing renewable energy credits, these targets can be met. In fact he believes that they must be met to avert catastrophic climate change.

To find out more about Architecture 2030, visit www.architecture2030.org

To learn more about green buildings, visit www.buildinggreen.com



e² design “Architecture 2030”

PRE-VIEWING QUESTIONS

1. Where do you think most of the CO₂ being released into the atmosphere comes from?
 2. What are some of the effects of climate change that we have already seen?
 3. What do you think the term “green architecture” means? What is a “green building”?
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POST-VIEWING QUESTIONS

1. Why does Ed Mazria compare the 2030 challenge to an insurance policy?
2. What can you do if you’re not an architect to help the 2030 challenge succeed?
3. Ed Mazria talks about three valves: investment, building codes, and education. What are some specific actions that can be taken within each of these values to support the 2030 challenge?