SESSION 6 SUMMARY

TRENDING NOW

Prepared by Cyrus Melendez
Hi everyone! My name is Carmen. I’m an architectural designer at Trivers and I’ve been practicing for a little over a year. I received my undergraduate degree in architecture from the Georgia Institute of Technology and graduated from WashU with my MArch in May of 2020. I’ve also been involved with Design as Protest, a collective of BIPOC designers advocating for design justice in the built environment and architectural profession. When I’m not doing either of those things you can probably find me at the Tower Grove Park tennis courts! Looking forward to meeting all of you and being the first class of the STL CKLDP!

ERIK BIGGS, AIA, CDT, LEED AP

Erik is a licensed architect with over 10 years design experience. His projects range from civic and cultural institutions to retail and medical. He holds a Master in Architecture from the University of Kansas and was participant of the Studio 804 program. Erik currently serves on the Board of Directors for AIA St. Louis and as Secretary on the Board of Directors for AIA Missouri. Previously he has served as Director on the Board of Association of Preservation Technology - Central Plains and Chair of Young Architects Forum St. Louis. As a St. Louis City resident, he has a passion for historic St. Louis architecture and preservation. In his free time he volunteers for Rebuilding Together Build Days and as a Speaker Facilitator at TEDx St. Louis.
Agenda

March 4, 2022 - Living Learning Center - Tyson Research Center
6750 Tyson Valley Road
Eureka, MO 63025

12:00 – 12:20
Lunch Reception

12:20 – 12:30
Welcome, Session Overview

12:30 – 1:30
Building Tour | Living Learning Center
Dan Hellmuth - Principal | Hellmuth + Bicknese Architects

1:30 – 1:45
Break

1:45 – 2:45
Presentation | Sustainability
Colin Rohlfing - Director of Sustainability | HDR

2:45 – 3:00
Break

3:00 – 4:00
Presentation | Instabilities and Potentialities
Chandler Ahrens - Principal | Open Source Architecture

4:00 – 5:00
Presentation | STL BEPS & Building Energy Exchange Lab
Cara Spencer - Director | Building Energy Lab

5:00 – 6:00
Session Social | Perennial on Lockwood
216 W Lockwood Ave Unit B
Webster Groves, MO 63119
Carmen Chee and Erik Biggs were the organizers for Session 6: Trending now for the Christopher Kelley Leadership Development Program (CKLDP). This session was held at the Tyson Research Center in Eureka, Missouri. The entire group thought that this was a great location for their given topic, which will be explained later in the following passages. Before we dive-in, we would like to thank our two sponsors, Verve:Design Studio and Trivers making this session possible for the CKLDP. After Carmen and Erik went over the agenda for the day, they asked the entire group an essential question:

What exactly is a trend? Sounds like a simple question, but that did not necessarily mean that it was a straight forward answer.

It turns out, this was actually a two-part question! A trend can be defined as what is currently popular. A fad, or in someway makes something unique in order to stand out. A trend can also be defined as a general course of tendency. In other words, a trend can be a method or practice that we use and trust because it has been used for such a long time that it has just become the form of practice. Another thing to keep in mind is that trends and culture are intertwined. They both work and react to each other in ways that we do not necessarily realize in everyday life.
Dan is the architect of record for the Living Learning Center. Washington University was wanting a new learning center and was given about 4 months to design the facility.

A major goal for the center was to attempt the Living Building Challenge (LBC). This would mean that the building will need to be both net-zero energy, net-zero water and net-zero waste. But why was the Living Building Challenge so important to this project? It was important because the students, professors, and researchers that will be using this facility is a group of ecologists and environmentalists. They wanted the building to embody their ideology. This also meant that the firm had to look at the carbon offsets of materials, compost toilets, potable water systems, and many others to hit the goal of being net-zero.

The center was built in 2009 and is one of the first two buildings in the United States that is qualified as a Living Building. They had many complications with county jurisdictions. Lots of the building codes required buildings to be tied to various systems, but the hardest to overcome was the sewage system. In the end they somehow managed to make a deal with the county that as long as they met the standards of health and safety for building standards, then the county would have leniency in other areas of the building jurisdictions. It was very hard to make the building coders happy, stakeholders happy, and the project financially happy. This is always a problem for architects, but when a project’s goal is the Living Building Challenge, it is even more extreme. It’s all or nothing when it comes to qualifications and is nowhere close to LEED standards. Dan says it is an entirely different animal, and being one of the first in the United States. They were the pioneers.
To be net-zero energy, they went to solar panels for their renewable energy resource. Initially, the photovoltaics solely on the roof, but after an analysis they went and added more panels on a plot of land adjacent to the center to truly reach net-zero energy.

The center also has a 3,000 gallon tank for water collection. Dan had a funny story where when the contractor submerged the tank, they did not know they had to fill the tank with water. So one day, after a heavy rainfall and the tank actually rose above the ground! Lesson learned, if you are submerging a water collector for the first time, be sure to have the tank filled to the recommended level, or else you will be in for a shocker!

Life Cycle Analysis Materials
In order to be carbon neutral, the majority of the building materials were as local as possible. The center is in the middle of a nature reserve were there were lots of invasive tree species. One was a certain type of cedar that is not local to Missouri. So in order to be ecologically and environmentally friendly they got a local miller to cut down the invasive cedar trees and made it into lumber that the contractor can use. All of the siding on the center is actually cedar. The decking and underside of the soffit is white oak, and this too was milled locally from fallen trees. They originally wanted to use a ZIP panel system, to make a more efficient building envelope, but unfortunately the project was financially tight so they went to the conventional framing method. The building is also not touching the ground. It is on posts. Part of the reason is that a slab on grade is not environmentally friendly, but the other reason is that since the chosen site was a green site, they were required to do as little harm to the surface as possible.
There are two cellars in case of a tornado, but what is really cool is that the cellar was also where the had their composting toilet systems. Dan said they used an Aerobic Septic Tank. The system is able to separate fluids and solids. Their grey water gets pumped to the irrigation system. With this system the concept of waste is non-existent, now waste is seen as nutrients.

All the cabinetry was locally made by Washington University students. All the doors and light fixtures in the center was salvaged. Even the tile floor, over 95% was reused. There is also a storm water garden with plants that are local to the site. One fun thing they also have is a bat cave on the center with the intention that they would be eating insects around the site. It would be really cool if bats are living here, but since it was still daytime I couldn’t see them. I assume they were still sleeping.
Colin sees the word, sustainability, as an out-of-date word. In fact, he does not like the ‘S’ word at all. In his point of view, sustainability has good intentions, but is really just broad strokes of the bigger picture. He personally uses the word to explain his intentions to clients, but sustainability is already old news in his opinion. He wants to go further than sustainability, and that’s why he thinks regenerative design is the future of architecture and not the ‘s’-word.

In order to combat climate change, we need to drastically change our outlook of design, how it relates to the environment, ecology and socially. After nine years of the world finally acknowledging that climate change is real, communities are experiencing the effects of climate change and their way of life and the environment are at stake. We as a society have to accept that nature is not the enemy here. We are actually part of nature and this includes the built environment. We have to accept that we are in a climate crisis and that we need to change.

“Nothing has more strength than dire necessity” - Euripides

The goal now is to have and implement a decarbonization plan. Our democratic oath is to do no harm, yet our built environment has caused nothing but harm to nature and to us. Regenerative design goes beyond sustainability and it goes beyond net-zero. Its goal is to be net-positive in regards to energy, to not only restore nature but to build upon nature. To transcend.
Colin explained to us about the 6 frameworks of regenerative design. About the importance of being net-positive, being flexible for all and any type of program, the necessity and significance of collecting data and being extremely data driven, being able to evolve over time, being able to building upon the existing, and the significance of engaging and involving the community.

All of this information may sound overwhelming at first, but we do not need to reinvent the wheel on building design. If we design in consideration of the site, natural lighting and wind, it is possible to reduce energy usage of a conventional building by 72%. The balance in design is to be conscious of the relationship of nature, materials, mechanical, community and comfort, and how they all co-exist for provide the highest efficiency. If we design knowing about these nested systems and how we can apply natural systems with mechanical systems, we are that much closer to a regenerative system.

One example Colin gave is the transition is cooking. Most professional chefs prefer natural gas for their kitchens. One complaint about electric ovens and cooktops is that they are uneven in their cooking, but electric equipment has actually gone far enough that it is actually more efficient and useful than natural gas. To be more specific, convection ovens and induction cooktops have the highest energy efficiency, reducing energy usage of nearly 70% compared to previous products. How cool is that?!

So how do you convince clients that regenerative is the future?

Same as way as you do with all other projects! The key to pitching any project is being able to show your data and telling a story.
When you draft by hand, every line is intentional. When you run a script of a software, it's able to make hundreds of lines instantaneously. What does that mean? If a program is easily able to draw a line, does that make it less intentional because it was done instantaneously and can easily be erased? In Chandler's presentation he was showing how design process has changed as technology has changed. As technology gets more integrated into our daily lives, one has to ask, do we work with technology or do we work for technology? Who is really in control? You or the program?

The answer really is the in-between space. Customization is where a design gets its character and how it become unique. However, the more custom the design gets, the more complicated and time consuming it becomes. Standardization are basic design methods and layouts that have become a basic source of knowledge and know how. Standards are great for saving time, but if a project has too many standards it loses its character and becomes too generic. There must be a balance between customization and standardization when is comes to design. Customization as in writing and modifying software for a specific situation. Takes more time to process. One can argue is true design. Standardization saves time. It reduces design to shopping. Another term for standardization can be automation. However they work hand-in-hand. Standardization saves time in order for you to have time for exploration and customization. How about artificial intelligence and machine learning? The human is not in complete control of the design, therefore, who is the author? The author IS STILL in control, we are still the navigators when it comes to design.

There are limitations in Revit and there are limitations in Rhino. Both are great but there must be a balance of the two to have a great design, but also to have standardization. You do not want a design to be too complex to where a contractor can not construct it because it is too far gone.
Saint Louis is addressing climate change! Our goal is to drastically advance the building energy performance in our city. Buildings have the biggest impact in regards to carbon and greenhouse gas emissions. In Saint Louis, our building produce almost 80% of greenhouse gasses. That is 6.6 million metric tons of CO2. In the year 2017, St. Louis passed the Climate Action Plan. In 2020, the Building Energy Performance Standards got passed. The goal is to reduce carbon emissions in St. Louis. Buildings that have exceeded the threshold for carbon emissions are required to lower their energy usage incrementally in order to drastically lower greenhouse gas emissions. However, there are some cases where is would be nearly impossible for buildings to meet these requirements, such as high-rise buildings with a building envelope entirely made of glass. Do not worry! There are alternatives for cases such as these. The Building Energy Exchange Lab is designed to help building owners to reduce their emissions, not to punish them. They are here to guide everyone to a greener St. Louis and we are all here to work together on this!