

Tom,

Thanks for asking for email instead of a phone message, it is a great way to communicate and document communications for sharing, posterity, etc. After the last DAT meeting, and reading the visioning "Design Principles" document, I have a several (nine) items for discussion:

1. During the first DAT meeting at Columbine Elementary, there was some discussion about LEED, CO-CHPS, etc. I am wondering whether any programs as these are targeted at this time.

If not, it might be worthwhile as a group to do a nominal group technique session on a LEED or CHPS list to determine what elements are worth preserving, what our "scorecard" would look like.

Here is the CO-CHPS program: <http://www.chps.net/states/colorado2.htm>

Also, the Architect mentioned that the LEED rating costs more for third party verification. However, studies have shown lifecycle cost reductions attributed to third party verification. Otherwise, to what extent can we rely on the contractors, design professionals and owner representatives to thoroughly review, demonstrate, and document their work?

2. I got this statement form the bond pages ("what is green"):

"Commissioning is planned for all projects. Commissioning is a systematic process of ensuring that all building systems perform interactively according to the contract documents, the design intent and the district's operational needs. No matter how carefully a school is designed, if the building materials, equipment and systems weren't properly installed or aren't operating as intended, the health, productivity, and other benefits of high performance design will not be achieved."

How will this be implemented on Columbine? One thought I have is consideration for Voluntary Parental Commissioning on some systems (edible gardens, smart grid and demand response, etc.). However, with many systems, it might be best to hire a commissioning professional to orchestrate this. Some key systems that are typically targeted for commissioning are:

- HVAC
- Lighting
- Renewable Energy
- Envelope
- Other (irrigation, backup power, etc.)

3. Recommend development of an OPR (owner's project requirement) document. This could incorporate elements from the visioning, as well as the space program, environmental performance criteria (EPC), etc. This might be a nice document to hold our focus at the DAT.

This document is key in the commissioning process and usually is developed in the programming or early design phase. (see ASHRAE guideline 0-2004). The usual process is that the OPR documents the owner's project requirements, this is then answered by the design professional in a Basis of Design (BOD) document. Through verification and testing during the construction, acceptance, and warranty phases, the work is evaluated using the OPR.

It would also be worthwhile for the owner to target a few systems for a formal commissioning process (as in item #2 above). These would be the HVAC, lighting, and renewable energy systems, others to include possibly irrigation, building envelope, edible gardens, etc.

Some other ideas for consideration:

- Smart Grid Technology (Educational Display)
- Enforma fault detection diagnostics: <http://www.enformadiagnostics.com/>
- M&V to verify energy conservation and other goals.
- benchmarking target specific energy (i.e. kW or btu/sf)

It might be worthwhile to consider which systems and how as a team.

I can send documents for EPC and OPR for your consideration upon request.

4. Recommend an overview document of all the programs underway to set goals for the school (program goals, SIT, visioning, DAT, etc.). Please let me know if there is somewhere I can comprehensively review the structure of all these programs, as well as their outcomes.

5. Recommend maintaining humidity levels above ASHRAE 55 thermal comfort standards (which has no minimum humidity for thermal comfort, but is frequently referenced). With Energy recovery wheels, all outside air could recapture humidity and heat leaving the school in the winter and give it to the outside air. However, it may be best to add some humidity at times as well. This could be accomplished with a direct evaporative cooling section. Low humidity causes stress to the immune system by drying out mucous membranes. Recommend a low humidity threshold of 30%. Some studies have shown great results in schools. I can forward some. Consider a direct/indirect evaporative cooling (DIEC) dual-duct variable volume (DDVAV) system (DIECDDVAV).

6. Recommend an emphasis on energy use modeling with a focus on key modeling assumptions to reduce energy use. Will Xcel's Energy Design Assistance, or other energy consultant assist in modeling life cycle energy costs? Does an elementary school need a chiller, or any refrigeration other than indirect or direct evaporative cooling? Consider how the "smart grid" program in Boulder might help verify the model?

7. Consider CFD (computational fluid dynamics) to help show effectiveness of passive ventilation strategies as mentioned in operable windows (guiding principles), and by architects at DAT meeting. Recommend sash sensors to "sense" whether a window is open to allow for appropriate responses (shutting down, etc.) of active systems if any are installed.

8. Consider that function becomes a priority driving form. While many nice pictures were presented at the last DAT, function of these architectural elements was only briefly discussed, with no illustrations, etc.. Recommend making durability, active and passive solar cooling and heating strategies, envelope tightness (insulation, low-e, high shg windows, etc.) a priority that drives the “look” of the facility. Southern facing glass with overhangs and trombe walls, thermal chimneys, wing walls, pagodas, etc. Recommend focus on discussion and illustration of these types of “functions.”

9. I also wrote a list of type of “feeling” or “themes” of the space that the architects requested. Here they are for the team’s consideration:

- a. School as a mini-universe – mind/soul expansion - imagination
- b. Space exploration technology (computer rooms that look like space shuttle interior)
- c. Explore Cultural heritage in Colorado, particularly, but not only, Spanish..
- d. Agriculture/earth connection
- e. Sustainability (convergence of social, economic, and environmental considerations)
- f. Deep sea/high atmosphere type spaces.
- g. Open/empty uncluttered spaces
- h. Spirituality (happy child, etc.)
- i. Transcendental Meditation Spaces (<http://www.schoolofthoughtthemovie.com/>)
- j. Global mountain culture (Himalayas, Andes, Alps, Rockies, Zagros etc.)
- k. Sister cities (Tajikistan, etc.)
- l. Rote memory – multiplication, spelling
- m. Fun with math – imaginary numbers
- n. Allowances for wandering and wonder, supervised, yet self directed play

Thanks for listening. I am eager to help in other ways too, and to listen to what the design professionals are requesting in terms of community design assistance.

John Wood
Neighbor/Parent