

Conceptual Project Planning – the Beginning:

The Missouri Department of Natural Resources was identified in the 1996 State Office Space Study and Master Plan, as one of several agencies in inefficient office space in Jefferson City. The high cost of leased space as well as inconvenient access for the public and overcrowded and fragmented operations were the primary reasons for consolidation of space. The goal of the State Office Space Study and Master Plan included cost avoidance by determining the most economic methods for providing future facility needs, increased efficiency in the use of space, identification of and planning for changing future office space needs, and improvement of the delivery of services to the public.

The master plan developed five interdependent strategies for agencies in Jefferson City with the Department of Natural Resources and Department of Elementary and Secondary Education included together in the fourth “package.” The State Office Space Study and Master Plan concluded that the Department of Natural Resources would seek leased space within Jefferson City, away from the central Capitol complex. This strategy would allow growth for the Department of Elementary and Secondary Education in the Jefferson State Office Building (JSOB), and allow relocation and consolidation of other agencies identified in the master plan into the JSOB.

The master plan contained funding options the state could use to construct new office space, including leased space and revenue bonds. A leasing strategy was identified by the Office of Administration (OA) as the means the state would use to plan for new consolidated office space for the department and the OA/Division of Facilities Management was assigned the task of developing specifications for space.

During mid-1997, department administrative staff identified a need to embody the department’s mission into the planning and programming of new space. Sustainable architecture was in its infancy but many state and federal government agencies were beginning to publicize new “green ” buildings throughout the U.S. The OA/Division of Facilities Management was unable to revise standard state leased space specifications, to add sustainable design concepts, due to the unknowns attached the cost of the design and construction of a green building as a speculative strategy for area builders. However, OA was committed to the development to create design specifications that would meet the department’s mission and a decision was made to turn the project into a design-and-build project supervised by the OA/Division of Design and Construction.

In July 1999, revenue bonding authority was requested through the legislative CI budget process. Once approved, appropriated funding for the new building was added to other previously funded design and construction projects for that budget cycle. A budget of \$17.1 million dollars was appropriated for construction and \$2.1 million dollars for design.

In October 1999, department management requested that an existing department employee pollution prevention (P2) workgroup develop a list of mission-driven statements the department would ultimately use to develop conceptual strategies for the sustainable design of a new office building. The P2 work group added additional members and was comprised of employees involved in energy, environmental and state parks program planning functions. There was a primary adjunct between environmental and energy pollution prevention policy development and long term parks conceptual planning where the combined talents and team efforts of staff could be used to develop responsible mission strategies challenging design architects to meet the sustainability goals of the department.

The P2 Work Group Presented the Following Conceptual Mission Statements to Management in July 2000:

Environmental Impact of Construction, Design and Use

The building design, construction, use and deconstruction will minimize impact on the environment.

The design will be integrated with the natural features of the site.

Energy Efficiency, Conservation and Use of Renewables

The building will have an energy-efficiency goal of 50-70 percent above ASHRAE 90.1, with energy costs of 73 cents (or less) per square foot or 46,000 BTU per square foot. Renewables will supply 10 percent or more of the building's energy needs. The design will maximize the use of natural lighting and achieve optimal use of passive solar design.

Demonstration

The building will serve as an example of green building principles, and will be designed so that visitors and occupants can learn from the building itself. The design will facilitate that learning process by, for example, having an area to accommodate guided tours.

Durability and Flexibility

The building will be designed for a life of greater than 50 years. The design will consider future needs for expansion, remodeling and deconstruction.

Life Cycle Considerations

Decisions regarding the building design, construction, use and de-construction will take into account the total life-cycle cost of those decisions. Those non-traditional, environmentally preferable alternatives with a payback of less than 10 years should be adopted. Alternatives with a payback of 10-15 years should be given serious consideration. In general, alternatives with paybacks of over 15 years should be considered for demonstration purposes only.

Employee Health and Safety

The workplace will be continuously free of toxins and allergens to the extent feasible. Workspaces will be flexible and ergonomically designed. The building design will encourage environmentally protective and healthy behaviors.

These mission driven statements would ultimately be used, among other more traditional criteria, to rate design firms and their team's sustainable design presentations during the design architect selection process. The mission statements were also the basis for design and construction charrettes and partnering sessions where common goals were envisioned by participants as the project continued through the design and construction phases. The building is a testament to those employees who originally met in the P2 work group to develop a vision of our future in the Department of Natural Resources.

In August 2000, BNIM Architects, the firm selected as the building design architects, facilitated a design charrette to complete the process of developing sustainable design concepts. The design charrette provide an interactive forum that encouraged discussion that stretched the envelope of possibilities beyond conventional thinking. It also was an effective means of understanding the complex issues of environmental quality and design and allowed participants to brainstorm and establish goals, visualize design alternatives and gather conceptual ideas.

Charrette attendees represented a broad spectrum of people who were perceived to have interest in sustainable design, those we wanted to share our vision with, would be concerned about design and construction that meets local ordinances, could lend support to the endeavor, would be producing materials or using products used in a sustainably designed facility and would be responsible for managing project design, construction and maintenance of the facility.

The Charette Attendees Represented the Following Groups:

- BNIM Architects and their design partners
- Department of Natural Resources staff
- State agency personnel involved in daily management of building design and construction projects and building management and maintenance
- State agency staff involved with commodities or services relative to purchasing, recycling and furniture manufacturing processes
- Members of the state legislature and/or their designees
- Federal EPA and DOE (Department of Energy) staff
- Local government regulatory staff
- Jefferson City city council members
- Statewide natural resource partners
- Sustainable design professionals
- Business representatives
- Academia from across Missouri

Participation allowed BNIM Architects to draw upon the experience and expertise of more than 100 employees and distinguished guests and gave all the participants an opportunity to be informed and become a strategic partner in the design of the first sustainably designed state office building constructed in Missouri.

The results of the charette added conceptual ideas to those previously developed by the P2 work group and further provided a framework for all future design endeavors by BNIM Architects and their associate designers, architects and subcontractors. Charette work group participants worked for two days in a team setting to develop a vision and establish shared goals allowing consensus buy-in.

The Design Charette Provided the Following Results

Categorized by the Team Groups

Created by

BNIM Architects:

M.E.P. engineering

Lighting:

Goal – Maximum of <1.0W/SF

- Zoned
- Light to satisfy users
- Lighting Quality and Aesthetics
- Daylighting Integration
- Equipment Efficiency

Alternative Sources of Energy:

Goal – Use Alternate Energy Sources for Demonstration/Education Purposes –

Target = 20%

- Solar Hot Water
- PV
- Geothermal
- Wind
- Fuel Cell
- Heat Recovery
- Daylighting/Passive Elements

HVAC (Heating, Ventilation and Air Conditioning)

Goal – Most Efficient Office Building in Missouri

- Set a new standard significantly above current best in Missouri
- Raised Floor
- Heat Recovery
- Passive Systems/Innovative Systems Well Above ASHRAE
- Geothermal (Well, River, etc.)
- Right Sizing
- Definition of Comfort to Exceed OA & “Normal” IAQ Requirements

Operations & Maintenance:

Goal – Simple to Maintain; Performance Does Not Degrade Over Time

- Indicators for Periodic Maintenance
- Database for Systems
- Energy Management Systems
- Good System Design/Layout

M.E.P. – Other:

- “Adaptive,” Flexible, Plan for Expansion
- Maximize LEEDs, Consistent with Repetition
- Teaching Value/Demonstration
- Replicable in Govt. and Private Sector
- Tap Into District Cooling/Heating System
- Commissioning
- Alternates to Atrium

Goal – Environmental Equality

- Low Stress
- Individual Controls
- Desirable Space
- Exceptional Air Quality
- Quality Lighting
- Daylighting
- Electric Lighting
- Acoustics

Water:

Goal – Minimize Water Usage

- Dual system Potable/Nonpotable
- Storm Water Capture
- Fire System Tank
- Water-Efficient Fixtures
- Wastewater Recycle
- Solar Water Heat

Electrical Systems and Telecommunications Systems:

Goal – DNR-Set Guidelines for Lowest Possible Equipment Power Use (W/SF) Target = \$.75/SF/Year

- Cable Management
- Raised Floor
- IEEE Standards
- Minimize Copper
- “Low-E” Office Equipment
- Right-Size Electrical for Equipment
- No Need to Undersize Wiring
- Office Standards
- Minimize EMFs
- Provide Service to All Users
- Better Transformers

Interior Environment:

(Design Issues, Indoor Air Quality, Human Health and Productivity)

Goal – Building to be shaped by the Purposes and Goals of the Interior and Realities of the Site

- Department Program-Specific Oriented
- Team Ethic Configuration
- Public Access and Interpretation
- Building Communicates its Purpose(s)
- Create Communal, Social Spaces

Goal – Setting New Cutting-Edge Office/Interior Standards

- Flexibility Through Time
- Quality of the Environment
- Researched and Tested
- Functional and Efficient
- “Cradle-to-Cradle” Resource Efficiency

Goal – Long-Term Building Use

- Maintenance Systems
- Construction Materials
- Building Management
- Recognizing Initial Goals / Efficiencies
- Empowering the User
- Defining the Limits (Size)
- Occupancy
- Energy

When?

- Environment – Big Picture of How the Building Relates to it
- DNR – Mission Toward Services to Site
- Overcome Hesitation to do Green Building
- Effect of a Green Building – \$ / Energy Use / Emissions
- Documentate Building’s Performance
- Why it’s Profitable to All Constituents (Taxpayers, Builders, Developers)
 - Evaluation Process – Which Green Components Work – Why and Where
- Bottom Line – \$ / Social / Environmental (Model)
- How to Repeat This Process – Recycle, Construct, Air Quality

What?

- Green Specifications For Suppliers
- How Do You Evaluate What’s Good/Bottom Line? (Social/Environmental/\$)
- Increasing Availability of Green Supplies
- Constraints Are Great Things to Fuel Imagination
- Teach People What They Can Do Individually – “How Can I Apply This?”

Daylight:

Goals: Utilizing Exterior Light Sources, Minimizing Electrical Load; Maximizing Employee Comfort

- All Offices Have Light (Ambient)
- Maintenance of Windows
- Balance of Thermal Comfort / Glazing
- Light Shelves
- Shading as Light Control (Natural)
- Manipulate Structure to Maximize Daylight
- Daylight as Beauty / Theme

Education/Outreach

Who?

- Legislature
- Constituents and Those We Assist With Regulations
- Building Trades – Building Community
- Architects
- Students – Elementary, High School, College, Adult Education
- General public
- DNR Employees
- Local Investors
- OA-Other State Agencies
- Realtors/Chamber/Businesses
- Environmentalists

Materials:

GOALS: Recycled Content; Development of Specifications; Certification and Transportation; Distance From Site

- Maximize Recycled Content (10%)
- Missouri Manufacturers/Materials (75% / 500-Mile Radius)
- Maximize Recovered Materials (10%)
- Fly Ash From Local Sources / Quality?
- All Certified Wood or Recovered
- Develop Standards for Recovered Wood
- Seek Grants For Materials Research / Code Education (Officials)
- Balance Indoor Air Quality With Material Choice
- Use Wastespec as a Baseline
- Recycle >50% of Construct/Demo Waste
- Educational Opportunities for Developers
- Methodology for Costing (Contractors)
- Downstream Market Development
- Packaging Minimization
- Include Materials Selection in Training
- Create New Materials From Mo. Waste Stream Using Those Nearing Acceptance
- Material Choices Based on Life-Cycle Costs Including Replacement/Maintenance
- Low Friable and “Sticky” Materials
- Ozone-Friendly Materials
- Maximize Alternatives to PVC

How?

- Keep Performance Records – Baseline; Ongoing
- Interpretation of Building – Guide
- Create “Public Area” – Atrium / Theater / Meeting Room
- Create “Work Area” – Offices
- Printed Material Available (All DNR Publications)
- Interactive Displays – Real Time; Hands-On
- Flexibility
- Education Starts Today – Involves Whole Process
- Keeps People in the Discussion
- Articles
- TV Advertisements
- Web Site / Video

Envelope Design and Construction Materials

- Heavily Articulated Façade – Awnings, Light Shelves, Trellis
- Demonstrate Glazing / Productive Surfaces
- Set Standard for Acoustical Control
- Flexible Design That Includes Longevity – 100-Year Life
- Operable Windows
- Select Materials That Can Be Reused After Deconstruction
- Explore Alternative Envelope Design;
 - † Double Envelope
 - † R-Walls = >R30
 - † R-Ceiling = >R50 (Roof)
 - † R-Windows = >R-6
- Use of Native Materials As A Showcase
- Use of “Spiritual” Materials; Crafts
- Integration of Art and Local Artisans in Building Materials

The building design integrated many of the strategies, concepts and ideas collected by work groups and charrette participants. The strategies were also used by department employees who met during the construction phase to develop strategies for development of systems furniture manufacturing, utilization of the central filing system, development of building etiquette guidelines and other building amenities including, equipment consolidation, food service, parking and transportation, emergency preparedness, recycling and coordination of the move of staff into the building.

Most of the items developed by work groups and charrette participants were incorporated into the design. BNIM Architects also developed innovative design concepts to meet the strategies that were developed. Up-front premium costs, payback and viability or the prohibitive nature of certain design concepts were the primary focus of the design team. LEED certification requirements were also factored but only as far as the construction budget would allow.



PO Box 176 1101 Riverside Dr. Jefferson City, MO 65102