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Lewis & Clark State Office Building, Jefferson City, MO

PART I

DESIGN, ENGINEERING AND CONSTRUCTION CONSIDERATIONS:

Unusual owner/client requirements

As part of its mission to protect and restore our natural resources, the Missouri Department of Natural Resources commissioned a new 120,000 square foot office facility to set bold new standards for sustainable design in the State of Missouri and beyond. Utilizing the LEED (Leadership in Energy and Environmental Design) rating system as an organizing matrix, the goal was to provide a template for the State, as well as other Missouri organizations, to design and construct buildings in ways that are more respectful of the environment as well as its people. The project team was challenged to design a structure that reached the highest level of sustainable design that could be constructed meeting all the programmatic criteria with no increased cost. This unusual challenge required a high level of partnering between the owner, tenant and design team, and then the contractor once the project was awarded.

This project was successful in setting new state standards in green design that could be replicated on other projects. There are currently no new building projects underway for the State, but there are many aspects of this project, such as new furniture standards and benchmarks for building performance, that will certainly find their way into many projects as this project sends out a ripple effect.

The building was designed to achieve a LEED Gold rating but because of the contractor's precision in the construction process, several additional LEED points were gained, and the team is currently appealing for a LEED Platinum rating. The construction budget was \$145 per square foot, without land cost. This budget was approved by the state legislature prior to setting the sustainability goals for the project, requiring the project team to design and build a high-performance building within a normal budget.

Site planning, parking, landscaping, access

The building is sited high atop a limestone river bluff that is representative of Missouri's resources. After years of neglect and destructive runoff patterns, it became apparent a new level of stewardship should emerge – a thoughtful re-addressing and reclamation of the highly damaged site and a model for preserving our natural resources.

A primary goal of the owner and design team was to be a good neighbor by eliminating stormwater runoff from the site. The roof is sloped to an integral gutter, harvesting rainwater in an underground cistern to be used for flushing the toilets 95% of the time. Restored native plantings, bioswales and other measures designed by the team's ecologists, Conservation Design Forum, use Missouri xeriscape methods for a zero-maintenance site and allow maximum water absorption. In the end, by deconstructing former buildings on the site and removing waste, siting the new structure effectively, restoring native species and utilizing sustainable landscape strategies, the site models the view Lewis and Clark had when they originally passed through the river valley — a highly restored example of our natural resources.

A limited amount of the site was paved for a 55-car lot. The remainder of parking requirement is shared with neighboring buildings. A shuttle service transports employees from these lots to the building. To encourage carpooling among employees, designated spaces are provided (5.5% of occupants). In addition, a fleet of fourteen ethanol vehicles was purchased for employee use. These vehicles are also given preferential parking (3% of the population). The building design includes secured storage for twenty-two bicycles (5% of occupants); changing rooms with showers are provided to encourage bicycle ridership. A bus stop serving five lines is located less than ¼ mile from the site. After walking along a natively landscaped area from the parking area, a visitor enters the building via a pedestrian bridge into the second level of a four-story atrium with grand views of the Missouri River Valley beyond.

Land use planning, zoning, codes, regulations, etc.

In 2001 an executive order was issued directing the placement of Missouri State buildings in downtown districts to improve the economic health of the urban core. As part of this initiative, the team analyzed a number of sites before deciding on the Jefferson City Correctional Center redevelopment site for the Lewis and Clark State Office Building. The land, which housed a former women's prison, was ideally located at the edge of downtown making this facility integral to the success of the area's revitalization.

Inventive use of materials, unusual or new materials

The building team initiated sustainable strategies during the demolition phase of the existing building on the site. Materials recovered during the dismantling of the prison complex were diverted for other uses. In addition, salvaged brick recovered from the site was used in the new building. Due to exceptional efforts by the contractor at the request of the client and design team, 88.6% (11,134.9 cubic yards) of construction waste was diverted from the landfill per the construction waste management plan.

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To minimize transportation costs and energy usage, 75% of the building materials specified came from manufacturers within a 500-mile radius, with Missouri manufacturers given priority consideration. Among them was Drey Pioneer who provided the wood flooring in the atrium, harvested from the only certified sustainable forest in Missouri. The concrete building structure and skin were constructed with 25% fly ash content. To minimize exposure to harmful chemicals and improve indoor air quality, building materials with low VOCs were specified, including carpets, paints, sealants and adhesives. The carpet tiles installed were also made from a high-percentage of recycled PET (plastic) material, such as milk bottles.

A collection system with chutes dedicated for paper and other recyclable products was integrated into the building.

A nearby Missouri prison manufacturing operation provided the office systems furnishings. Through cooperative efforts between the design team and manufacturing representatives, the manufacturing process was retooled to become Green Guard certified, a significant transformation for a standard product, achieved through ingenuity and basic modifications that will dramatically affect this industry.

“Missouri State agencies are required by state statute to purchase all freestanding and systems furniture from the State of Missouri Vocational Enterprises (MVE) prison inmate system.

The department had experienced problems with urea formaldehyde in their systems and freestanding wood furniture. MVE issued a waiver allowing the department to go on the open market to purchase systems furniture. However, the department was more interested in shifting a paradigm in the manufacturing process requiring MVE to construct a product using Medite II, rather than regular resin and glue-laden medium density fiberboard that off gassed urea formaldehyde several years after its original installation. Urea formaldehyde was also present in their freestanding furniture that was also manufactured using medium density fiberboard.

Our design architect developed requirements the department could use to work in partnership with MVE to purchase materials to construct systems furniture that would meet required Greenguard certification. The materials manufacturer, MVE and the project management team worked together to capitalize on the design concept allowing MVE to manufacture a systems furniture that was VOC free, used a clear coat poly-coat paint finish, recycled materials and a medite II wood product that uses less water and electricity in its manufacturing process.”

– Dan Walker, Missouri Department of Natural Resources

While many of the materials were not necessarily new or unusual, they were new to the contractor and their subs. The design team, client and contractor held several partnering sessions due to the integrated design strategies in this facility. The results of these sessions were very successful. The contractor was able to effectively deal with new materials and processes for the first time, such as a raised access floor, recycled products, waterless urinals and construction of a 50,000-gallon internal cistern below the building, by adopting a “can-do” attitude. At each step, the contractor worked willingly with the design team, and with an equal sense of pride, to utilize and showcase such sustainable materials.

Structural engineering issues and solutions

The width of the building was determined by the efficient use of a structural bay with a five-foot overhang in both the north and south directions. The building is only two structural bays wide in order to allow natural daylight penetration into the building, reducing the need for supplemental electric lighting throughout the day.

The type of construction was determined during an early charrette between all the design and owner group members. The location of the project in relationship to natural resources and, most importantly, how the design was to bring in daylight, influenced the structural system and led the team to choose poured-in-place flat slab concrete that could utilize a high amount of fly ash in the concrete mix.

The team also decided the best location of the rainwater collection cistern was underneath the building, so the structural engineer worked with the team to develop the strategy for placing the 50,000 gallon cistern under the building in a way that integrates with the structural systems.

M/E/P innovations, fresh approaches

A whole-building design approach was used. The shape of the building's footprint was optimized through iterative energy and daylighting models calculated by both the MEP Engineer and BNIM's own sustainable design experts to maximize daylighting and natural ventilation. Money budgeted for a perimeter reheat system was instead invested in the building shell, eliminating reheat entirely and reducing gas usage by about 20%.

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The dedicated outside air (OSA) system uses a higher temperature supply air than a standard system, and in combination with the hybrid ventilation air handlers, allows the use of medium-temperature chilled water, 55° F rather than 42° F. The higher temperature chilled water is produced much more efficiently, either mechanically through a high efficiency chiller or evaporatively, using the cooling tower alone when conditions permit. To further extend natural free cooling, a chilled water thermal storage tank is charged by the tower during cool night hours to help carry the load during warm days. Daylighting controls combined with the thermal storage system significantly reduce peak power use and sizing.

The lighting system is automated with occupancy and daylight sensors. Efficient fixtures and localized electric lighting contribute to a building that is designed to be 59% more efficient than a comparable baseline building. Photovoltaic (PV) panels on the roof provide 2.5% of this energy and a solar hot water system is used to help supply domestic hot water. The PV was purchased with the intention to demonstrate other energy methods. For the Department of Natural Resources, it was imperative to show alternative measures. The team reviewed several options including harvesting the energy of the river below and wind power, and decided upon the integrated PV on the roof. The system is set to monitor each wing separately and is demonstrated to the occupants through an educational program.

The air handlers are designed for low face velocity from a 60% reduction in fan power and very quiet operation. Easily housed and serviced in small closets, they are distributed throughout the building minimizing ducting requirements. Total system pressure drop is about 1/3rd a typical system.

By working collaboratively and flexibly, the design team and client were able to define the building's organizational strategy in a way that increases daylight, reduces energy and, through the construction techniques of the contractor (such as use of fly-ash) reduces harm to the environment.

Beyond being utilitarian, the efficient building systems provide opportunities for unique formal expression and articulation throughout the building. The cast-in-place concrete structure creates a layered field that both orders the flexible partitioning of interior space and creates the sunshade and vertical fin design of the envelope's skin. Influenced by the native rock outcroppings upon which the building is sited, these exterior shelves were modeled using energy modeling software and were proven to reflect sunlight deep into the floor plate while producing sufficient shade to reduce both glare and heat gain.

By placing many of the technologies on display and in prominent positions, they are able to provide an educational outreach to visitors — a desire of the client as part of its pedagogical mission to teach sustainability.

Energy/environment breakthroughs

Refer to our response under "M/E/P innovations, fresh approaches".

Sustainable design, green bldg. design, LEED

Interior building materials include reclaimed brick from former facilities on the site as well as low VOC paints, sealants and other finishes. Oak flooring at each atrium level was harvested from a native Missouri, sustainably managed forest.

Equally significant is the client's commitment to educating the public on "how the building works" through exposed building systems and explicit educational signage. It is intended to engender an awareness and stewardship for those who enter and use this facility. The building will, at minimum, receive a LEED Gold rating, but a Platinum rating is under appeal with the USGBC. Certification by the U.S. Green Building Council was a goal of the client and the design team in order to provide validation for the extensive efforts of the entire team — and to prove to others that the highest level of sustainable design is possible within standard budgets. It will also serve as a case study for what is possible in the design of other state buildings that may be constructed in the future.

Craftsmanship, detailing, elegance of execution

"The craftsmanship met, and even exceeded, the expectations of the owner and BNIM Architects. Due to the diligence and hard work of the quality subcontractors that were involved with the project in some of the key crafts, many things stand out. The drywall work and electrical work were two trades that excelled. However, all of the trades were asked to work with new materials and construction techniques and did so by surmounting any obstacles to deliver the best craft possible.

For a project this large, we were very impressed with the level of detail in the contract documents. This accuracy eliminates questions in the field, making work progress smoother and at a faster pace.

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When questions or problems did arise, the team was very aggressive in finding the right solution for all concerned and in a speedy manor. It was a pleasure to work with an architect and owner that understand these issues."

—Alan Vinson, COO, Professional Contractors & Engineers Incorporated (PC&E)

PC&E's attention to detail throughout the construction process was apparent from the beginning. It is most obvious at the main entrance to the building where the primary materials of concrete, copper and wood are each treated with care and craft. At any point in construction, when a detail needed attention, PC&E was ready to provide solutions for the design team's review that solved the problem elegantly. Unseen to the visitor now, is the similar care they used to keep the jobsite well organized, which was critical in their efforts towards exemplary construction waste management. This effort ranged from careful material sorting to maintaining indoor air quality measures during construction that ensured a clean area under the access floor panels and other areas.

Use of innovative technology, methods, tools

Energy modeling was done in VisualDOE, a graphical interface to the DOE2.1E engine. The base case building matches the requirements set for climate zone 4A, which is where the building is located. The model catches most of the features of this building, including detailed exterior lightshelves and fins, precise placement and simulation of daylighting photo-sensor control locations and setpoints, water-side free cooling, and thermal storage. The base case model was run at four orientations and the results averaged to capture the benefits of the building's narrow aspect ratio.

The design team, client team and consultant team shared a philosophy toward design and holistic thinking called "integrated design" that was used in the design of this project. Integrated design is achieved both through organized collaboration between disciplines and through the interweaving and interconnectivity of building systems that allows us to create high-performance buildings.

Overall project functionality

A central atrium lies at the hinge point of the building's two wings and houses all major vertical circulation and public activity spaces. The four-story building is organized using a narrow, linear floor plate extending east and west from the atrium, giving most occupants access to views and daylight. This strategy maximizes south and north glazing opportunities and minimizes east and west exposures, thus maximizing daylighting opportunities and minimizing unwanted glare and solar heat gain. This configuration allows communal and enclosed rooms to be placed at the core of the building, leaving the perimeter spaces for open work zones and circulation.

Cost/budget issues – and evidence of resolution

The project was modified to meet the budget throughout the design process to ensure that the building would come within budget on bid day. During early schematic design, the structural elements on the façade became incorporated into the skin system as much as possible to save cost. Other items, like the underground cistern were at times in jeopardy of being cut from the project. Alternate strategies were recommended, and adopted by the client, such as deleting one complete elevator as part of early budget balancing. The team decided together – the owner, architect and, during construction, the contractor—what was in the owner's best interest based on their early design guidelines.

As with most construction projects, especially on sites that had previously been developed, the team ran into many unforeseen conditions. In each case, the contractor worked closely with their subcontractors to provide reasonable cost assessments associated with the modified work. When a review suggested that they revisit their numbers, they were always willing to re-evaluate and at times propose different cost-saving solutions. The entire team was consistently aware of the project budget and worked hard to stay within the owner's cost parameters as is represented by the fact that the project was delivered within the owner's set construction budget.

Evidence of performance-based design

Throughout construction, it appeared as though PC&E treated every component and system as though it was ultimately based on final performance. When something did not work properly or if particular design intentions were not working in the field as anticipated, they often suggested elegant solutions to resolve the matter. If the matter was in the hands of their subcontractors, they shepherded the process carefully to ensure final resolution that performed well for the owner.

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Overall design & construction quality

“It was obvious from the initial review of the documents that quality was a key concern of the architect and owner. The materials and details are testament to both. It is a very unique building and the design and quality requirements were evident both in the drawings and in the progress of the project.”
– Alan Vinson, COO, Professional Contractors & Engineers Incorporated

“From our initial look at the drawing through the bid process into construction, we have found it to be a very good set of construction documents. One indication of that is usually the variation in bids, both general contractor, subcontractor and suppliers. It was apparent from the subcontractor and supplier bids we received as well as the general contractor bid for the owner, that everyone was looking at a complete and well detailed set of bid documents. In an industry where detail has been suffering due very competitive rates for architect’s services, it is refreshing to know that there are still those firms that do it right.”

—From a letter dated July, 22, 2003 from Alan Vinson, COO, Professional Contractors & Engineers Incorporated

The quality of the construction is exceptional. BNIM had two buildings under construction at the same time using the same raised floor system. PC&E showed exceptional care in the installation, cleanliness, and precision in this installation compared to the other project with the exact same specifications. The owner even noted in a walk-through that PC&E had double-washed the floor to ensure it was clean before finishing the access floor system.

The contractor and subs worked with sustainable products— recycled-content materials, non-formaldehyde based cabinet backing, wood harvested from a Missouri forest—with great care and pride. The quality is exceptional and is not compromised by any of the products or systems used.

Security issues, unusual approaches, results

The building has minimal security issues. Routine measures, including controlled public/private access to the building, security of the floors, and an eventual connection to a walking / hiking path on the lowest level, were considered in the security approach.

Cultural relevance of project and Neighborhood Redevelopment

Prior to the development of this project, the grounds of the nearby historic correctional center were mandated to be redeveloped, as a new state-of-the-art prison would be constructed elsewhere. A masterplanning charrette was held and six recommended uses were developed for areas of the prison: Judicial Center Area, Historic Area, Community Area, Landing Area, Entertainment Area, Office Area and Natural Resource Area. Due to the State’s effort to improve the economic health of the urban core, new construction in Jefferson City will occur in this area adjacent to the city center and State Capitol building for years to come. The Lewis and Clark State Office Building is the first of many projects to be built in this area and is the first to follow guidelines for development of the area. Many are hopeful that this project will continue to spur important redevelopment in the city’s core, and with the recent announcement of a new United State Federal Courthouse to be built on the adjacent land, there is evidence this is happening.

Wayfinding

Educational signage for the building is currently under development in order to educate the public and the building occupants about sustainability. The signs highlight 25 different sustainable features (design strategies) throughout the building including native Missouri images from local photographers. Basic wayfinding and regulatory signage is used throughout the building.

Innovative construction methods, approaches

By developing the project in phases, the design team allowed the owner to start installation of their materials during the last phases of construction rather than waiting until a final turnover date. This phasing also allowed the commissioning and air quality issues to be resolved in specific areas first to allow for owner work to progress uninterrupted.

Construction safety

Construction Safety is a key issue on any project but especially on a multi-story project like this one. We had one OSHA inspection during the course of the construction and no significant issues were found. This was largely due to PC&E working with the Builders Association to have their safety person visit the project frequently to review the safety measures to insure we were meeting all the requirements.

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Construction & demolition waste recycling efforts

The client was integral to both the demolition of the existing buildings and the recycling of construction waste. The existing “women’s prison” was dismantled and State Prison inmates were hired to clean the bricks for reuse on the new project. This was a team effort, with the client providing the resources to have the original bricks cleaned and used.

The client also had a grant, which studied the construction waste process on the job site. They set up a job site video camera, carefully watching the process and reporting the findings. This is one of the areas that the contractor exceeded our expectations in the amount of waste that was salvaged and kept out of the landfill.

Although a new process for PC&E, they were very supportive of these efforts. The design and construction team was able to find and document recycling of steel, aluminum, glass, drywall, wood, cardboard and plastics at recycling businesses in the surrounding areas. The subcontractors did their part to insure that all possible materials were returned to the recycling containers rather than the landfill.

Commissioning results

The initial commissioning was completed by a third-party commissioning agent. According to Gary Short of Sys-tek, “The commissioning process was extremely vital to the operation of the facility.” They will also be completing ongoing measurement and verification for the project, and have already started to review the energy use of the project, currently suggesting that use is right on target with design requirements. Even when functioning as designed, the building will still be studied for an additional year to work through issues that are critical to the long-term fine tuning of the project.

When complete, this measurement will become a great tool for all — the construction and design side of the process, as well as the owner.

Post-occupancy evaluation, metrics of satisfaction

This project underwent a substantial commissioning process, which thoroughly tested all systems prior to occupancy. As noted above, the Building Automation System (BAS) continues to provide on-going monitoring for the owner’s facility management group to troubleshoot new problems quickly, including temperature, humidity, lighting controls, photovoltaic panels collection, solar hot water collection, etc. It is our understanding the owner has a reduced number of comfort complaints from their employees as compared to their prior building.

BNIM Architects has spoken with the client about evaluating the effectiveness of the building systems and components. In the meantime, the design team remains integrally involved in on-going adjustments based on occupancy comments.

Project complexity

From a contractor’s view and design team perspective, it was a very complex project. New technology integration, with energy performance goals from both the electrical and mechanical disciplines, required extra efforts from everyone on the team. The design team and the contractor worked closely to insure that all the components and details worked to provide the owner with a LEED building (within the prescribed budget) that would make all proud.

SUMMARY: Did this project push the envelope? How?

As mentioned above and below in the supporting text, this project pushed the envelope in a number of areas relative to a State-owned Design-Bid-Build project. A few of these, which are further supported in the text, are:

- design process methods such as charrettes, partnering sessions, and energy modeling
- owner expectations for sustainable design in a traditional budget lead to team ingenuity
- building systems integration
- contractor collaborative efforts with team members and attention to detail in the construction process

PART II BUILDING TEAM COLLABORATION + INVOLVEMENT OF COMMUNITY, END USERS, & STAKEHOLDERS

I was very impressed with the level of input that the owner and architect allowed the builder to share when issues of concern or problems arose. It was apparent from the owner and architect that they were after the best product and they sought input from everyone in the team before making final recommendations. These centered on construction techniques and costs. The goal was to find the best solution for the end user that made sense in terms of cost. The owner was actively involved in all these discussions and final decisions.

—Alan Vinson, COO, Professional Contractors & Engineers Incorporated

Evidence of extraordinary efforts to meet owner needs

One of the owner's goals was to build the greenest building for the money outlined in the state budget. Throughout the design process, they requested the design team perform a cost study to take a LEED Gold building to a Platinum level. Several times the number that came back from this cost study was a 250-300 thousand-dollar cost premium, which was clearly out of the question. The client opted for the team to maintain the previous course, staying diligent to achieve points covered by the design intent that was set out. When the points were tallied at the end of construction, the project appeared to be closer to Platinum and only needed one additional point. The client chose to add the measurement and verification point, to gain their own proof that the building is performing and also to define any adjustments that they might need to make.

Beyond simply reaching LEED and sustainability goals, great efforts were made to reach the goals of the client from a functionality standpoint. User comfort, increased indoor air quality and access to daylight were key goals. The building maintains a narrow footprint, with all shared function and cores at the center, so that all users can maintain access from their workstation to both daylight and views, which not only increases user satisfaction, but reduces lighting costs. Other occupied spaces located away from the perimeter (no space is more than 38' away from a window) include openings that not only emphasize the connection to the outdoors, but allow ambient light in as well. HVAC is delivered throughout the building via underfloor plenums. Raised access flooring systems with small floor-mounted diffusers allow individuals to control the comfort level of their own space. Operable windows have been provided on all four building facades to allow occupants access to natural ventilation. A ribbed facade that provides both sidefins for shading and light shelves engineered to harvest daylight forms an integral part of the building shell. Windows near the high ceilings, above the sloped exterior light shelves, work with the interior fabric light shelves to project daylight into the core of the building. An indirect/direct lighting system with fully dimmable electronic ballasts automatically adjusts interior lighting to complement daylight. Low VOC materials and finishes and an extensive flush out procedure prior to occupancy mean less exposure to toxic fumes that cause and complicate asthma symptoms.

Involvement of surrounding community, affected stakeholders, public officials, public agencies

This building and its grounds are the cornerstone of development in the area, which will strengthen the central core of the city and the governmental district. Because the project site is on a redevelopment property, which overlapped with timing for the overall master plan of the area, the project team had greater involvement with city and county planning officials. Currently, the only adjacent facility is the historic prison, but the high profile redevelopment of this area meant that all key government stakeholders were involved as necessary in the development and review of this project.

Charrettes, planning sessions with community, end users, other relevant stakeholders

The team of clients, designers and consultants began the design working together; decisions were made to set goals and set direction. With the budget set, and the challenge of making the building as green as possible for the budget given, each dollar was important and initial decisions were critical.

This team spirit carried through to the construction team, who ultimately gained points for the project by outperforming a few of the original goals set for the project. The tenant worked with their in-house furniture manufacture to change the production of the systems furniture and make it Green Guard certified.

Because the owner (State of Missouri) was required to use a Design-Bid-Build approach on this project, the design team did not have the benefit of the contractor's presence in early charrettes and planning sessions. Despite this, PC&E caught up very quickly on the vision and guiding principles that set the agenda for the building. Throughout construction, regular meetings with the owner group and the design team allowed all to provide the communication needed to provide the owner with the building that they intended.

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From as early as the bid opening when they delivered their Construction Waste Management and Indoor Air Quality Plans, to the numerous tours that they accommodated even towards the end of construction, PC&E has been a team player and instrumental to the success of this project. They have respected and balanced the intent of the designers, the needs of the users, the requirements of the owner every step of the way. This collaboration was consistent with their subcontractors as well. In fact, this project was rather unique in the consistent team building and collaboration that characterized the spirit of the job.

“We appreciate your “Partnering” attitude and it is obvious that you and your firm are part of the construction team. When we have encountered field conditions that are different from the drawings, you have been quick to respond with direction and help to maintain the construction schedule. It is obvious that quality, timeliness, and budgets are at the top of your list of priorities and a key in all our dealings to date.”

—From a letter dated July, 22, 2003 from Alan Vinson, COO, Professional Contractors & Engineers Incorporated

Attention to surrounding environment, historic areas, community sensitivities

The surrounding was once a fragile ecosystem, that had been destroyed over years of irresponsible development. The site is on the edge of the river, high atop a river bluff. As noted earlier, the water run-off alone was degrading the environment, washing away the natural slope that had been intact for many years. A goal of the project was to help to restore this area to a near-native state, and in doing so the team has changed the drainage patterns of the existing runoff and developed a zero runoff project site.

The client’s future goals include continuing a walking/nature trail that follows the river, through the natural areas and connecting with the building. This trail would be available to building users during their lunch hour and to members of the public at any time.

The building took special care to embrace the sweeping views of the river valley as a constant reminder of native natural resources the department is charged to protect. Many areas in the building have views – to the west towards the capitol area, to the east towards a forested area and to the north towards the river and open bluffs.

Attention to environmental issues: wetlands, open space, recreation areas, etc.

A masterplanning charrette for the larger prison redevelopment area was held in 2001 and six recommended uses were developed for areas of the prison grounds: Judicial Center Area, Historic Area, Community Area, Landing Area, Entertainment Area, Office Area and Natural Resource Area. The Missouri Department of Natural Resources’ Lewis and Clark State Office building comprises the office area and the natural resources area, which involved significant site restoration. The site is now self-sustaining, requiring no potable water irrigation or mowing and has almost completely eliminated run-off to adjacent areas.

Unusual “gaming” or innovative tools to assess client or end-user needs

The design team’s early workshop with owner, tenant and an extensive list of key stakeholders (prior to any design work continuing) encouraged early buy-in by many constituents and helped set the tone for the entire project.

Overcoming unanticipated changes in the program

The first significant unanticipated change that occurred on the project included buildings that were going to be moved or deconstructed for the final access road to the building. As it turned out, these buildings were not actually moved, requiring the access road to be realigned to accommodate this existing property. This alignment and other site issue that arose during construction also included some work for the overall property master plan that the team had not anticipated, but was necessary due to timing. The owner, design team and contractor worked closely together to accommodate this significant change in a manner that did not impact project schedule. This collaborative spirit was maintained throughout the project on items large and small.

Another change, significant because it occurred so late in the project included a client request to redesign one half of the fourth floor office layout to accommodate changes within their organizational strategy. Again, all parties worked quickly and collaboratively to minimize additional costs and impact to schedule, including drawing changes, modifications to work already in place, etc.

Unusual solutions to budget restrictions

There were times during the final portions of the project where cost became an issue on some proposed changes in an already tight budget. The final solutions in these instances were typically resolved based on input from the entire team – consultants, designers, client and contractor – as they related to construction budget constraints. Rather than listing all examples of this, suffice it to say that no building component or system remained without scrutiny by the

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team. This often required extra effort and time, but ultimately no decision was made at the expense of the project or the end user.

Unusual solutions to keep project schedule on time

The prime example of this occurred close to substantial completion when it became apparent that schedules for final construction in some areas, owner-furniture installation, building flush out procedures and owner move-in were bumping into each other. The team developed an elaborate plan that allowed each party to accomplish their work in an orderly fashion based dividing the building into nine workable sections: two wings per each of the four floors plus the central atrium. All pieces were completed according to the plan.

Extra effort in hiring women- or minority-owned firms

With the overall goal of 15% for MBE/WBE participation, this project required a significant effort to find and include Women and Minority Owned Businesses in the construction process. We were able to do this by finding sources for material suppliers and subcontract work within the scope of the construction. These businesses included drywall suppliers, roofing material suppliers, mechanical material suppliers, reinforcing steel material and installation, painting subcontract work, tilework subcontract work, site concrete work, door and hardware material and installation, and carpet materials.

Special social or cultural relevance of project

This project rests on a bluff overlooking the Missouri River and its construction coincided with the 200th anniversary of the Lewis and Clark Expedition, which meandered through the very valley this building overlooks. During construction, many reenactments took place in the area in honor of the significance of the two explorers. The building's name was chosen to honor the Lewis and Clark expedition in their spirit of discovery, diplomacy and stewardship and to commemorate the bicentennial of their journey. It is the hope of the Missouri Department of Natural Resources that the Lewis and Clark State Office Building will encourage others to explore the potential that sustainable design offers.

Additional measures of community-related success

The water tower that can be seen on the property in photographs was the back up system for the state prison. During construction of the building, the tower needed to stay intact and not be interrupted during the time the prison was still in operation.

When the new prison was complete and the office building was about finished, the state was deciding what to do with the tower. They were able to notify an organization that advertised the availability of a water tower for anyone who might recycle it. Apparently, a city was looking for the exact design of this tower, of which very few are still left in existence today. The water tower was dismantled for no cost to the owner in order to salvage and reuse the tower in a new home. This was a "win-win" for all involved.

Evidence of performance-based design, engineering, and/or construction

The most comprehensive performance-based criteria of the project was to achieve LEED Gold certification. The fact that the project is now in the appeal process for LEED Platinum is a testament to the entire project team: owner, architect, engineers, contractor and subcontractors.

In another sense, throughout construction the contractor treated every component and system as though it was ultimately based on final performance. When something did not work properly or if a particular design intent was not working in the field as anticipated, they often suggested elegant solutions to resolve the matter. If the matter was in the hands of their subcontractors, the general contractor shepherded the process carefully to ensure final resolution that performed exceptionally well for the owner.

Special aspects related to user-occupant-tenant needs

As described in earlier narratives, the owner and tenant sought to have a building for the occupants that provided excellent indoor air quality, exceptional daylight, provisions for individual comfort controls and a sense of pride in an environmentally responsive building. All of these criteria have been soundly met. Plus, with the on-going monitoring systems, everything is in place to ensure that a high-performance will be achieved for the life of the building for generations to come.

SUMMARY: Did the project perform a public good?

At the beginning of the design phase for this project, the project team representatives from the Missouri Department of Natural Resources expressed great concern that the contractors that would be bidding on this public project would not be inclined to embrace the ideals of sustainable design or the LEED program. They predicted that this would be

BD&C Building Team Awards 2006

one of the biggest obstacles in achieving the goals of the Green Building. They were worried that the attitude would be "what's wrong with the way we've always done things", and that there would be resistance to change.

This project required a Partnering Session that included the design team, the various owner groups, the general contractor, and most of the subcontractors. During this daylong session, BNIM offered a one-hour presentation on the reasoning behind sustainable architecture, the purpose of the LEED rating system, and the various strategies contained within the LEED system that were incorporated into the building design. Most of the contractors had never heard of LEED before and, with the exception of the requirements that they may have seen as part of the specifications, this was totally new material. Issues such as required documentation on the VOC content of building materials were explained. It was easier to have buy-in from the whole team when they understood that this was for protection from harmful material off-gassing. We explained exactly what was required of them as part of the LEED program. At the end of the session, the platform was opened up for questions and answers. The feedback from the contractors was true excitement and understanding. By sharing the reasons for green design, the user groups were able to embrace the process. At the end, they all expressed great pride to be part of this project and questioned why this was not done more often.

At the end of the day, the same representatives from DNR that had expressed concern at the beginning of the project expressed relief and delight at the outcome. One of DNR's goals from the beginning had been to change the thinking of Missouri builders and contractors. By embracing the spirit of partnering, the team's pride was boosted as well as the workmanship of the builders. Additionally, the goal of DNR to promote transformation in the local marketplace began.

While this may seem like a small thing, sustainable design is very much a process of small successes that cumulatively come together to achieve greater energy performance and lessen negative impact on the environment and natural resources. Through education, we can hope that all involved with this project – from users, to builders, to craftsmen, to clients, designers and visitors – will carry these lessons forward and impact the industry in a positive way.

Building Design & Construction – 9th Annual Building Team Awards 2006 – Entry Form



9th Annual Building Team Awards
Entry Deadline: February 20, 2006

Project Information Sheet

Project Name and Location

Lewis & Clark State Office Building, Jefferson City, Missouri

Name of Firm Submitting This Entry

BNIM Architects

Principal Member Firms of the Building Team (required information)

Architect or Architect/Engineer

BNIM Architects
Steve McDowell, FAIA
106 West 14th Street, Suite 200
Kansas City, MO 64105
816-783-1500
smcdowell@bnim.com

Mechanical Engineer

Smith & Boucher
Mike Wagner, Mechanical
8620 West 110th Street
Overland Park, KS 66210
913-345-2127
mwagner@smithboucher.com

Architect of Record (if different from above)

NA

Electrical Engineer

FSC, Inc.
Hasu Doshi
3100 S. 24th Street
Kansas City, KS 66106
913-722-3473
hdoshi@fsc-inc.com

Interior Architect

NA

Plumbing Engineer

FSC, Inc.
Hasu Doshi
3100 S. 24th Street
Kansas City, KS 66106
913-722-3473
hdoshi@fsc-inc.com

Interior Designer

BNIM Architects
Steve McDowell, FAIA
106 West 14th Street, Suite 200
Kansas City, MO 64105
816-783-1500
smcdowell@bnim.com

Structural Engineer

Structural Engineering Assoc.
Kelley Gipple
101 West 11th St., Suite 200
Kansas City, MO 64105
816-421-1042
kgipple@seassociates.com

General Contractor

Professional Contractors and Engineers Inc.
Alan Vinson, PE
5900-C North Tower Drive
PO Box 7509
Columbia, MO 65205
573-442-1113
avinson@pce-mo.com

Building Design & Construction – 9th Annual Building Team Awards 2006 – Entry Form

Construction or Program Manager

State of Missouri
OA / Division of Design
and Construction
Greg Wack
Truman State Office Building
301 West High Street
Jefferson City, MO 65102
573-526.6704
wackg@mail.oa.state.mo.us

Key Subcontractors or Consultants

Civil Engineer:

SK Design Group, Inc.
Sassan Mahobian
4600 College Blvd. Suite 100
Overland Park, KS 66211
913-451-1818
smahobian@skdesigngroup.net

Mechanical Systems Design

Rumsey Engineers
Peter Rumsey
99 Linden St
Oakland, CA 94607
510-663-2070
prumsey@rumseyengineers.com

Lighting Design:

Clanton Engineering
Nancy Clanton
4699 Nautilus Court South
Suite 102
Boulder, CO 80301
303-530-7229
nancy@clantonassociates.com

Civil Consultant:

Conservation Design Forum
David Yocca
375 W. First Street
Elmhurst, IL 60126
630.-559-2000
dyocca@cdfinc.com

Daylight Design / Energy Strategies

ENSAR Group
Greg Franta
2305 Broadway
Boulder, CO 80304
303-449-5226
greg@ensargroup.com

Cost Estimator:

Construction Cost Systems, Inc.
Clive Bransby
200 West 22nd Street
Suite 209
Lombard, IL 60148
800-443-8607
630-916-7500
cbransby@ccsos.com

Commissioning Agent

Sys-Tek
Dan Pigotti
2801 NW State Route 7
Blue Springs, MO 64014
816-229-9009
dpigotti@PTTEng.com

Codes:

F P & C Consultants
Tony Meister
One Ward Parkway, Suite 200
Kansas City, MO 64112
816-913-3377
tmeister@fpc-consultants.com

Building Design & Construction – 9th Annual Building Team Awards 2006 – Entry Form

Photography Rights (required information)

Name of Photographer **Mike Sinclair**

Photographer's Firm **Mike Sinclair Photographer**

Street **3335 Baltimore Avenue**

City **Kansas City** State **MO** Zip **64111**

Phone **816-842-1499** Email mike@mikesinclair.com

Who owns the rights to the photography you are submitting with your entry?

Submitting firm owns all rights to photography (editorial use, marketing, advertising, Internet)

Submitting firm owns only rights to editorial use of photography; photographer owns all other rights.

Photographer owns all rights.

Submitting firm not sure what photography rights it owns.

Building Design & Construction – 9th Annual Building Team Awards 2006 – Entry Form

Project Suppliers (required information)

Please supply the brand names of building products used in each category; DO NOT list the installer or dealer. If not applicable, state “n/a.” Entries that do not include this information will be returned.

Exterior

- Curtain wall - **Kawneer / Bradys**
- Exterior cladding – **Hardy Plank, Northfield Block, Trex**
- Windows - **Kawneer / Bradys**
- Doors - **VT Industries, Inc., Curries**
- Lighting - **AAL, KIM, Sistemalux, Hydrel, Peerless, Niedhardt, Lithonia, Williams, Zumtobel, Edison Price, Columbia, Focal Point, Prudentail, Cole, Elliptipar, Dialight, LSI, Alkco, Gardco, Karlin**
- Exterior glazing - **Viracon**
- Exterior architectural coating - **NA**
- EIFS - **NA**
- Ornamental metal - **Matthews Manufacturing Inc**
- Roofing system, insulation - **Berridge**
- Space frames, skylights - **Huvco, LLC (light pipes)**
- Wall insulation - **Bonded Logic, Inc, International Cellulose Corp.**
- Other - **Pavestone**

Interior

- Windows
- Elevators and escalators - **Schindler Elevator**
- Ceilings - **Armstrong World Industries (Alan do we have two brands?)**
- Doors, door hardware - **VT Industries, Inc., Best, LCN, Pemko, Rixon**
- Lighting - **AAL, KIM, Sistemalux, Hydrel, Peerless, Niedhardt, Lithonia, Williams, Zumtobel, Edison Price, Columbia, Focal Point, Prudentail, Cole, Elliptipar, Dialight, LSI, Alkco, Gardco, Karlin**
- Interior walls/partitions - **National Gypsum**
- Carpet - **Interface**
- Plumbing fixtures – **Delta, Kalahari, Elkay, Grohe, Chicago Faucets, Moen**
- Resilient flooring - **NA**
- Floor tile - **Terra Green, Floor Gres**
- Furniture and casework – **MVE,**
- Other

Structural

- Structural wood system - **Mississippi Laminators**
- Structural steel - **Doing Steel**
- Other

Controls

- Wires, cables
- Lighting controls - **Lutron**
- Power, communications
- Energy management controls
- Life safety, security systems
- Master Control Systems Fire Pump – **Patterson Pump Company**
- Fire alarm, fire suppression system - **Notifier**
- HVAC - **McQuay**
- HVAC Controls - **Bick with products by Stafefa**
- Control System - **Talon, York, Siemens, Setra, KELE, Veris Industries**

ENTRANT'S STATEMENT

To the best of my knowledge, the information in this submission is true and correct, and according to the contest criteria, the building project is eligible for this competition.

Signature

Date

Deadline

All materials (entry CD, complete entry forms, entry fee) must arrive at *Building Design & Construction* no later than February 20, 2006. (Early Bird Deadline: February 6, 2006)

Entry Fee

\$300 per entry. Please make checks payable to *Building Design & Construction*. Please send entry fee together with entries and forms; do not send under separate cover.

Mail to:

Building Team Awards
Attn: Dave Barista
Building Design & Construction
2000 Clearwater Drive
Oak Brook, IL 60523
630-288-8082
dbarista@reedbusiness.com

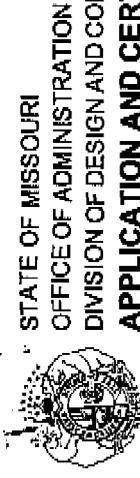
Building Design & Construction – 9th Annual Building Team Awards 2006 – Entry Form
Project Costs

(required information)

For projects of public record, you must supply a detailed breakdown of project costs, either by CSI division or similar detail. For private projects, we prefer to have all financial information, but we provide the exception described in the box below.

You may supply financial information confidentially, if necessary. We understand that certain clients are sensitive about revealing financial details. Although we prefer to have all financial information included in the entry, if you have a situation where the client demands confidentiality, you may write “Confidential at Client Request” in the space above on the Entry Form.

However, to be eligible, you must also send, under separate cover, a single copy of the financial information to: Robert Cassidy, Editor, BD&C, 2000 Clearwater Dr., Oak Brook, IL 60523. As *BD&C's* editor, I promise to keep the details of this information confidential and will only supply “ranges” of information to the judges as needed to help in their deliberations. Should your project win, the financial information will not be published in *BD&C*. This procedure is necessary to ensure that we are fair to all entries and the judges have enough information to do their job.



STATE OF MISSOURI
OFFICE OF ADMINISTRATION
DIVISION OF DESIGN AND CONSTRUCTION
APPLICATION AND CERTIFICATION FOR PAYMENT-27(A)

27(A)

INSTRUCTIONS ON REVERSE SIDE

CONTRACTOR

FIRM
PROFESSIONAL CONTRACTORS & ENGINEERS, INC.

ADDRESS
P.O. BOX 7509
COLUMBIA MO 65205

CONTRACTOR'S APPLICATION FOR PAYMENT

PROJECT NUMBER
X0056-01

PROJECT TITLE
DNR GREEN OFFICE BUILDING

JEFFERSON CITY, MO

APPLICATION NUMBER
26 FROM 04/06/2005 TO 08/09/2005

DESIGN CONSULTANT

FIRM
BERKEBILE, NELSON, IMMENSCHUH, MCDOWELL ARCHITECTS

ADDRESS
106 WEST 14TH STREET, SUITE 200
KANSAS CITY MO 64105

DESIGN CONSULTANT'S CERTIFICATE FOR PAYMENT

Application is made for Payment, as shown below, in connection with the Contract, Continuation Sheets, (if applicable) attached, 27(B) & 27(C).

1. ORIGINAL CONTRACT SUM \$ 17,485,000.00

2. Net by contract change # 1 through 81 \$ 1,088,498.60

3. TOTAL Contract sum to date (Line 1 + 2) \$ 18,573,498.60

4. **TOTAL completed and stored to date \$ 18,573,498.60 (Column G on Sheet 27(B)).

5. Retainage: _____ % of line 4 above or 200% \$ 0.00 of incompletd items

5A. Date Retainage Reduction Approved 08/08/2005

6. Total earned less Retainage \$ 18,573,498.60 (Line 4 less Line 5 total)

7. Less previous certificates for payments \$ 18,416,098.46

8. Current payment due \$ 157,400.14

9. Less liquidated damages (final pay application only) \$ _____

In accordance with the Contract Documents based on site observations and the data comprising the above application, the Design Consultant certifies to the Owner that to the best of the Consultant's knowledge, information and belief the Work has progressed as indicated, the quality of the work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the amount certified.

AMOUNT CERTIFIED \$

(Attach explanation if amount certified differs from application amount)

CERTIFIED: DESIGN CONSULTANT

SIGNATURE _____ DATE _____

APPROVAL RECOMMENDED: OWNER'S CONSTRUCTION ADMINISTRATOR

SIGNATURE _____ DATE _____

APPROVAL RECOMMENDED: CONSTRUCTION SERVICES

SIGNATURE _____ DATE _____

FISCAL AUDIT AND ENTRY COMPLETED

SIGNATURE _____ DATE _____

APPROVED: ASSISTANT DIRECTOR

SIGNATURE _____ DATE _____

The Contractor hereby certifies to the best of the Contractor's knowledge, the Work covered by the Application for Payment has been completed in accordance with the Contract Documents, all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from Owner, current payment shown herein is now due and the Construction Schedule has been updated and accurately reflects the work completed to date for which payment is requested and the remaining work and time required to complete the project.

CONTRACTOR

BY *[Signature]* DATE 08/09/2005



STATE OF MISSOURI
 OFFICE OF ADMINISTRATION
 DIVISION OF DESIGN AND CONSTRUCTION
 APPLICATION & CERTIFICATION OF PAYMENT
 CONTRACT BREAKDOWN AND EXTENSIONS - 27(B)

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	D COMPLETED		E THIS APPLICATION	F MATERIALS PRESENTLY STORED (FROM 27(C))	G TOTAL COMPLETED AND STORED TO DATE + E + F	H BALANCE TO FINISH C-G	I REMARKS
			FROM PREVIOUS APPLICATION D + E	COMPLETED					
1	PCE BOND / INSURANCE	\$ 152,000.00	\$ 152,000.00	\$ -	\$ -	\$ -	\$ 152,000.00	100.00	
2	MOBILIZATION	75,000.00	75,000.00	-	-	-	75,000.00	100.00	
3	DEMOBILIZATION	10,000.00	10,000.00	-	-	-	10,000.00	100.00	
4	GENERAL CONDITIONS	490,000.00	490,000.00	-	-	-	490,000.00	100.00	
5	FIELD OFFICES	23,000.00	23,000.00	-	-	-	23,000.00	100.00	
6	TEMP FENCING	9,000.00	9,000.00	-	-	-	9,000.00	100.00	
7	TESTING	75,000.00	75,000.00	-	-	-	75,000.00	100.00	
8	CRANE/HOISTING	150,000.00	150,000.00	-	-	-	150,000.00	100.00	
9	MOCKUPS	10,000.00	10,000.00	-	-	-	10,000.00	100.00	
10	OFFICE OVERHEAD	100,000.00	100,000.00	-	-	-	100,000.00	100.00	
	EXCAVATION WORK								
11	GENERAL SITE EXCAVATION	312,000.00	312,000.00	-	-	-	312,000.00	100.00	
12	BUILDING EXCAV/BACKFILL	130,000.00	130,000.00	-	-	-	130,000.00	100.00	
13	BIOSWALE/RIPRAP	42,000.00	42,000.00	-	-	-	42,000.00	100.00	
14	FINISH GRADE/TOPSOIL	16,000.00	16,000.00	-	-	-	16,000.00	100.00	
15	STORM SEWER/LEVEL SPREADER	60,000.00	60,000.00	-	-	-	60,000.00	100.00	
16	SANITARY SEWER	50,000.00	50,000.00	-	-	-	50,000.00	100.00	
17	WATER SERVICE	75,000.00	75,000.00	-	-	-	75,000.00	100.00	
18	TERMITE CONTROL	5,000.00	5,000.00	-	-	-	5,000.00	100.00	
19	DRILLED PIERS	331,000.00	331,000.00	-	-	-	331,000.00	100.00	
20	ASPHALT PAVING	78,000.00	78,000.00	-	-	-	78,000.00	100.00	
21	SITE CONCRETE & PAVING	205,000.00	205,000.00	-	-	-	205,000.00	100.00	
22	STREET FURNISHINGS	2,000.00	2,000.00	-	-	-	2,000.00	100.00	
23	UNIT PAVERS	25,000.00	25,000.00	-	-	-	25,000.00	100.00	
24	LAWN & GRASS	51,000.00	45,900.00	5,100.00	-	-	51,000.00	100.00	
25	PLANTINGS	91,000.00	81,900.00	9,100.00	-	-	91,000.00	100.00	
	FORMWORK (CECO)								
26	MOBILIZATION/FORMS	205,000.00	205,000.00	-	-	-	205,000.00	100.00	
	PAGE TOTAL	\$ 2,772,000.00	\$ 2,757,800.00	\$ 14,200.00	\$ 14,200.00	\$ -	\$ 2,772,000.00	\$ -	
	TOTALS	\$ 2,772,000.00	\$ 2,757,800.00	\$ 14,200.00	\$ 14,200.00	\$ -	\$ 2,772,000.00	\$ -	

*TO BE ATTACHED TO APPLICATION AND CERTIFICATION FOR PAYMENT #27(A). ADAPTED FROM A/A/G-702-1983



STATE OF MISSOURI
 OFFICE OF ADMINISTRATION
 DIVISION OF DESIGN AND CONSTRUCTION
 APPLICATION & CERTIFICATION OF PAYMENT
CONTRACT BREAKDOWN AND EXTENSIONS - 27(B)

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	D COMPLETED		E THIS APPLICATION	F MATERIALS PRESENTLY STORED (FROM 27(C))	G TOTAL COMPLETED AND STORED TO DATE + E + F	H BALANCE TO FINISH C - G	I REMARKS
			FROM PREVIOUS APPLICATION D + E	COMPLETED					
27	WALL FORMS	\$ 325,000.00	\$ 325,000.00	\$ -	\$ -	\$ -	\$ 325,000.00	100.00	\$ -
28	COLUMN FORMS	85,000.00	85,000.00	-	-	-	85,000.00	100.00	-
29	DECK FORM LEVEL 1	116,000.00	116,000.00	-	-	-	116,000.00	100.00	-
30	DECK FORM LEVEL 2	94,000.00	94,000.00	-	-	-	94,000.00	100.00	-
31	DECK FORM LEVEL 3	94,000.00	94,000.00	-	-	-	94,000.00	100.00	-
PCE CONCRETE WORK									
32	GRADE BEAMS	137,000.00	137,000.00	-	-	-	137,000.00	100.00	-
33	WALL CONCRETE	96,000.00	96,000.00	-	-	-	96,000.00	100.00	-
34	CONC @ STAIR/ELEVATOR WALLS	87,000.00	87,000.00	-	-	-	87,000.00	100.00	-
35	COLUMN CONCRETE FLOOR 1	28,000.00	28,000.00	-	-	-	28,000.00	100.00	-
36	COLUMN CONCRETE FLOOR 2	25,000.00	25,000.00	-	-	-	25,000.00	100.00	-
37	COLUMN CONCRETE FLOOR 3	25,000.00	25,000.00	-	-	-	25,000.00	100.00	-
38	COLUMN CONCRETE FLOOR 4	25,000.00	25,000.00	-	-	-	25,000.00	100.00	-
39	SLAB ON GRADE	121,000.00	121,000.00	-	-	-	121,000.00	100.00	-
40	2ND LEVEL CONCRETE	167,000.00	167,000.00	-	-	-	167,000.00	100.00	-
41	3RD LEVEL CONCRETE	167,000.00	167,000.00	-	-	-	167,000.00	100.00	-
42	4TH LEVEL CONCRETE	167,000.00	167,000.00	-	-	-	167,000.00	100.00	-
43	REINFORCING STEEL / PIERS	170,800.00	170,800.00	-	-	-	170,800.00	100.00	-
44	REINFORCING STEEL / WALLS	212,600.00	212,600.00	-	-	-	212,600.00	100.00	-
45	REINF STEEL / COLUMNS	69,300.00	69,300.00	-	-	-	69,300.00	100.00	-
46	REINF STEEL / DECK 2	153,000.00	153,000.00	-	-	-	153,000.00	100.00	-
47	REINF STEEL / DECK 3	147,150.00	147,150.00	-	-	-	147,150.00	100.00	-
48	REINF STEEL / DECK 4	147,150.00	147,150.00	-	-	-	147,150.00	100.00	-
49	PRECAST CONCRETE N ELEV	120,000.00	120,000.00	-	-	-	120,000.00	100.00	-
50	PRECAST CONCRETE S ELEV	210,000.00	210,000.00	-	-	-	210,000.00	100.00	-
51	FLEXICORE PRECAST	20,000.00	20,000.00	-	-	-	20,000.00	100.00	-
52	CAST STONE	6,000.00	6,000.00	-	-	-	6,000.00	100.00	-
PAGE TOTAL		\$ 3,015,000.00	\$ 3,015,000.00	\$ -	\$ -	\$ -	\$ 3,015,000.00		\$ -
TOTALS		\$ 5,787,000.00	\$ 5,772,800.00	\$ 14,200.00	\$ -	\$ -	\$ 5,787,000.00		\$ -

*TO BE ATTACHED TO APPLICATION AND CERTIFICATION FOR PAYMENT #27(A).
 ADAPTED FROM AIA G-702-1983



STATE OF MISSOURI
 OFFICE OF ADMINISTRATION
 DIVISION OF DESIGN AND CONSTRUCTION
 APPLICATION & CERTIFICATION OF PAYMENT
CONTRACT BREAKDOWN AND EXTENSIONS - 27(B)

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	D COMPLETED		E THIS APPLICATION	F MATERIALS PRESENTLY STORED (FROM 27(C))	G TOTAL COMPLETED AND STORED TO DATE + E + F	H BALANCE TO FINISH C-G	I REMARKS
			FROM PREVIOUS APPLICATION D + E	THIS APPLICATION					
53	UNIT MASONRY	\$ 12,000.00	\$ 12,000.00	\$ -	-	\$ -	\$ 12,000.00	100.00	
54	STONE VENEER	127,000.00	127,000.00	-	-	-	127,000.00	100.00	
55	STRUCTURAL STEEL	169,000.00	169,000.00	-	-	-	169,000.00	100.00	
56	STAIRS	95,000.00	95,000.00	-	-	-	95,000.00	100.00	
57	RAILINGS	75,000.00	75,000.00	-	-	-	75,000.00	100.00	
58	MISC STEEL	78,000.00	78,000.00	-	-	-	78,000.00	100.00	
59	STEEL EMBEDS	18,000.00	18,000.00	-	-	-	18,000.00	100.00	
60	FORMED MTL FABRICATIONS	30,000.00	30,000.00	-	-	-	30,000.00	100.00	
61	ORNAMENTAL GLASS RAIL	51,000.00	51,000.00	-	-	-	51,000.00	100.00	
62	ARCH JOINT SYSTEM	52,000.00	52,000.00	-	-	-	52,000.00	100.00	
63	ROUGH CARPENTRY	235,000.00	235,000.00	-	-	-	235,000.00	100.00	
64	GLU LAM BEAMS	550,000.00	550,000.00	-	-	-	550,000.00	100.00	
65	WOOD DECKING	130,000.00	130,000.00	-	-	-	130,000.00	100.00	
66	EXT ARCH MILLWORK	20,000.00	20,000.00	-	-	-	20,000.00	100.00	
67	CASEWORK	177,000.00	177,000.00	-	-	-	177,000.00	100.00	
68	WALL PANELS	158,000.00	158,000.00	-	-	-	158,000.00	100.00	
69	SHEET WATERPROOFING	45,000.00	45,000.00	-	-	-	45,000.00	100.00	
70	COLD APPLIED WATERPROOFING	25,000.00	25,000.00	-	-	-	25,000.00	100.00	
71	WATER REPELLENTS	58,000.00	58,000.00	-	-	-	58,000.00	100.00	
72	SHEET METAL (NATSCH)	145,000.00	145,000.00	-	-	-	145,000.00	100.00	
73	NAIL BASE INSULATION	343,000.00	343,000.00	-	-	-	343,000.00	100.00	
74	METAL ROOFING	26,000.00	26,000.00	-	-	-	26,000.00	100.00	
75	MEMBRANE ROOFING	55,000.00	55,000.00	-	-	-	55,000.00	100.00	
76	SHEET METAL FLASHING/TRIM	22,000.00	22,000.00	-	-	-	22,000.00	100.00	
77	METAL CEILING PANELS	8,000.00	8,000.00	-	-	-	8,000.00	100.00	
78	METAL WALL PANELS	131,000.00	131,000.00	-	-	-	131,000.00	100.00	
	PAGE TOTAL	\$ 2,835,000.00	\$ 2,835,000.00	\$ -	-	\$ -	\$ 2,835,000.00		
	TOTALS	\$ 8,622,000.00	\$ 8,607,800.00	\$ 14,200.00		\$ -	\$ 8,622,000.00		

*TO BE ATTACHED TO APPLICATION AND CERTIFICATION FOR PAYMENT #27(A).

ADAPTED FROM A/A/ G-702-1983

27(B)

PROJECT NUMBER X0056-01
 PAGE 3 OF 11

APPLICATION NO. 26
 DATE 4/07/05 TO 8/09/05



STATE OF MISSOURI
 OFFICE OF ADMINISTRATION
 DIVISION OF DESIGN AND CONSTRUCTION
 APPLICATION & CERTIFICATION OF PAYMENT
 CONTRACT BREAKDOWN AND EXTENSIONS - 27(B)

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	D COMPLETED		E THIS APPLICATION	F MATERIALS PRESENTLY STORED (FROM 27(C))	G TOTAL COMPLETED AND STORED TO DATE +E+F	H BALANCE TO FINISH C-G	I REMARKS
			FROM PREVIOUS APPLICATION D+E	\$					
79	FIRESTOPPING	\$ 21,000.00	\$	21,000.00	\$	-	\$ 21,000.00	100.00	
80	CAULKING	35,000.00		35,000.00		-	35,000.00	100.00	
	GLASS & ALUM (BRADY'S)								
81	ALUM STOREFRONTS	134,000.00		134,000.00		-	134,000.00	100.00	
82	ALUM WINDOWS	109,000.00		109,000.00		-	109,000.00	100.00	
83	GLAZING	240,000.00		240,000.00		-	240,000.00	100.00	
84	MIRROR GLASS	4,000.00		4,000.00		-	4,000.00	100.00	
85	PLASTIC GLAZING	7,000.00		7,000.00		-	7,000.00	100.00	
86	ALUM CURTAINWALL	72,000.00		72,000.00		-	72,000.00	100.00	
87	LIGHT PIPE SKYLIGHTS	4,000.00		4,000.00		-	4,000.00	100.00	
88	OVERHEAD DOOR	2,000.00		2,000.00		-	2,000.00	100.00	
89	ACCESS DOORS	3,000.00		3,000.00		-	3,000.00	100.00	
90	HOLLOW METAL DOOR/FRAME	85,000.00		85,000.00		-	85,000.00	100.00	
91	WOOD DOORS	40,000.00		40,000.00		-	40,000.00	100.00	
92	FINISH HARDWARE	200,000.00		200,000.00		-	200,000.00	100.00	
93	CERAMIC TILE	62,000.00		62,000.00		-	62,000.00	100.00	
	DRYWALL WORK (BRAUN)								
94	EXT METAL STUDS	270,000.00		270,000.00		-	270,000.00	100.00	
95	INT METAL STUDS	148,000.00		148,000.00		-	148,000.00	100.00	
96	EXT DRYWALL WORK	190,000.00		190,000.00		-	190,000.00	100.00	
97	INT PARTITIONS / 1ST FLOOR	124,020.00		124,020.00		-	124,020.00	100.00	
98	INT PARTITIONS / 2ND FLOOR	109,710.00		109,710.00		-	109,710.00	100.00	
99	INT PARTITIONS / 3RD FLOOR	109,710.00		109,710.00		-	109,710.00	100.00	
100	INT PARTITIONS / 4TH FLOOR	133,560.00		133,560.00		-	133,560.00	100.00	
101	EXT PLASTER WORK	10,000.00		10,000.00		-	10,000.00	100.00	
102	EXT INSULATION	90,000.00		90,000.00		-	90,000.00	100.00	
103	INT INSULATION	70,000.00		70,000.00		-	70,000.00	100.00	
104	ACOUST CEILINGS / 1ST FLOOR	15,600.00		15,600.00		-	15,600.00	100.00	
	PAGE TOTAL	\$ 2,288,600.00	\$	2,288,600.00	\$	-	\$ 2,288,600.00		
	TOTALS	\$10,910,600.00	\$	10,896,400.00	\$	14,200.00	\$10,910,600.00		

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ADAPTED FROM A/A/ G-702-1983

27(B)

PROJECT NUMBER
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STATE OF MISSOURI
 OFFICE OF ADMINISTRATION
 DIVISION OF DESIGN AND CONSTRUCTION
 APPLICATION & CERTIFICATION OF PAYMENT
 CONTRACT BREAKDOWN AND EXTENSIONS - 27(B)

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	D COMPLETED		E THIS APPLICATION	F MATERIALS PRESENTLY STORED (FROM 27(C))	G TOTAL COMPLETED AND STORED TO DATE + E + F	H BALANCE TO FINISH C - G	I REMARKS
			FROM PREVIOUS APPLICATION D + E	\$					
105	ACOUST CEILINGS / 2ND FLOOR	\$ 33,600.00	\$	33,600.00	\$	-	33,600.00	100.00	
106	ACOUST CEILINGS / 3RD FLOOR	34,800.00		34,800.00		-	34,800.00	100.00	
107	ACOUST CEILINGS / 4TH FLOOR	36,000.00		36,000.00		-	36,000.00	100.00	
108	WOOD FLOORING	115,000.00		115,000.00		-	115,000.00	100.00	
109	CARPET/RESILIENT FLOOR 1	36,000.00		36,000.00		-	36,000.00	100.00	
110	CARPET/RESILIENT FLOOR 2	68,000.00		68,000.00		-	68,000.00	100.00	
111	CARPET/RESILIENT FLOOR 3	68,000.00		68,000.00		-	68,000.00	100.00	
112	CARPET/RESILIENT FLOOR 4	68,000.00		68,000.00		-	68,000.00	100.00	
113	FABRIC PANELS	3,500.00		3,500.00		-	3,500.00	100.00	
114	PAINTING FLOOR 1	35,000.00		35,000.00		-	35,000.00	100.00	
115	PAINTING FLOOR 2	40,000.00		40,000.00		-	40,000.00	100.00	
116	PAINTING FLOOR 3	40,000.00		40,000.00		-	40,000.00	100.00	
117	PAINTING FLOOR 4	40,000.00		40,000.00		-	40,000.00	100.00	
118	TOILET PARTITIONS	19,000.00		19,000.00		-	19,000.00	100.00	
119	LOUVERS	9,000.00		9,000.00		-	9,000.00	100.00	
120	ACCESS FLOORING / 1ST FLOOR	62,858.00		62,858.00		-	62,858.00	100.00	
121	ACCESS FLOORING / 2ND FLOOR	125,714.00		125,714.00		-	125,714.00	100.00	
122	ACCESS FLOORING / 3RD FLOOR	125,714.00		125,714.00		-	125,714.00	100.00	
123	ACCESS FLOORING / 4TH FLOOR	125,714.00		125,714.00		-	125,714.00	100.00	
124	FLAGPOLES	3,000.00		3,000.00		-	3,000.00	100.00	
125	LIGHT SHELVES	36,000.00		36,000.00		-	36,000.00	100.00	
126	SIGNS	16,000.00		16,000.00		-	16,000.00	100.00	
127	METAL LOCKERS	2,500.00		2,500.00		-	2,500.00	100.00	
128	FIRE EXT/CABINETS	2,000.00		2,000.00		-	2,000.00	100.00	
129	OPERABLE WALL	12,000.00		12,000.00		-	12,000.00	100.00	
130	MOBILE STORAGE UNITS	105,000.00		105,000.00		-	105,000.00	100.00	
	PAGE TOTAL	\$ 1,262,400.00	\$	1,262,400.00	\$	-	\$ 1,262,400.00		
	TOTALS	\$12,173,000.00	\$	12,158,800.00	\$ 14,200.00	\$	\$12,173,000.00		

*TO BE ATTACHED TO APPLICATION AND CERTIFICATION FOR PAYMENT #27(A). ADAPTED FROM A/A/G-702-1983



STATE OF MISSOURI
 OFFICE OF ADMINISTRATION
 DIVISION OF DESIGN AND CONSTRUCTION
 APPLICATION & CERTIFICATION OF PAYMENT
 CONTRACT BREAKDOWN AND EXTENSIONS - 27(B)

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	D COMPLETED		E THIS APPLICATION	F MATERIALS PRESENTLY STORED (FROM 27(C))	G TOTAL COMPLETED AND STORED TO DATE + E + F	H % FINISH C-G	I REMARKS
			FROM PREVIOUS APPLICATION D + E	COMPLETED					
131	TOILET ACCESSORIES	\$ 12,000.00	\$ 12,000.00	\$ -	\$ -	\$ -	\$ 12,000.00	100.00	
132	MAINTENANCE EQUIPMENT	12,500.00	12,500.00	-	-	-	12,500.00	100.00	
133	PROJECTION SCREENS	8,000.00	8,000.00	-	-	-	8,000.00	100.00	
134	DOCK EQUIPMENT	9,000.00	9,000.00	-	-	-	9,000.00	100.00	
135	FOOD SERVICE EQUIP	19,000.00	19,000.00	-	-	-	19,000.00	100.00	
136	FLOOR MAT	2,000.00	2,000.00	-	-	-	2,000.00	100.00	
137	FLOOR GRILLE	9,000.00	9,000.00	-	-	-	9,000.00	100.00	
138	ROLLER SHADES	42,000.00	42,000.00	-	-	-	42,000.00	100.00	
139	ELEVATOR	190,000.00	190,000.00	-	-	-	190,000.00	100.00	
140	CHUTES	8,500.00	8,500.00	-	-	-	8,500.00	100.00	
141	PLUMBING/HVAC (ENV)								
141	MOBILIZATION	22,000.00	22,000.00	-	-	-	22,000.00	100.00	
142	PLUMB/BELW GD/WASTE	102,000.00	102,000.00	-	-	-	102,000.00	100.00	
143	PLUMB/ABOVE GD/WASTE	65,000.00	65,000.00	-	-	-	65,000.00	100.00	
144	INTERIOR DOM WATER	110,000.00	110,000.00	-	-	-	110,000.00	100.00	
145	PLUMBING FIXTURES	132,000.00	132,000.00	-	-	-	132,000.00	100.00	
146	HEAT HOT WATER S/R	186,000.00	186,000.00	-	-	-	186,000.00	100.00	
147	CHILLED WATER S/R	190,000.00	190,000.00	-	-	-	190,000.00	100.00	
148	CONDENSER WATER S/R	82,000.00	82,000.00	-	-	-	82,000.00	100.00	
149	CHILLED WATER TANK S/R	30,000.00	30,000.00	-	-	-	30,000.00	100.00	
150	CLOSED LOOP SYS /CHILLERS	193,000.00	193,000.00	-	-	-	193,000.00	100.00	
151	PUMPS / VFD'S	115,000.00	115,000.00	-	-	-	115,000.00	100.00	
152	COOLING TOWER	56,000.00	56,000.00	-	-	-	56,000.00	100.00	
153	BOILERS	59,000.00	59,000.00	-	-	-	59,000.00	100.00	
154	HEAT EXCHANGERS	28,000.00	28,000.00	-	-	-	28,000.00	100.00	
155	AHU'S	254,000.00	254,000.00	-	-	-	254,000.00	100.00	
156	OAU'S	230,000.00	230,000.00	-	-	-	230,000.00	100.00	
	PAGE TOTAL	\$ 2,166,000.00	\$ 2,166,000.00	\$ -	\$ -	\$ -	\$ 2,166,000.00		
	TOTALS	\$14,339,000.00	\$ 14,324,800.00	\$ 14,200.00	\$ -	\$ -	\$14,339,000.00	100.00	

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 ADAPTED FROM A/A/G-702-1983



STATE OF MISSOURI
 OFFICE OF ADMINISTRATION
 DIVISION OF DESIGN AND CONSTRUCTION
 APPLICATION & CERTIFICATION OF PAYMENT
 CONTRACT BREAKDOWN AND EXTENSIONS - 27(B)

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	D COMPLETED		E THIS APPLICATION	F MATERIALS PRESENTLY STORED (FROM 27(C))	G TOTAL COMPLETED AND STORED TO DATE + E + F	H BALANCE TO FINISH C-G	I REMARKS
			FROM PREVIOUS APPLICATION D + E	COMPLETED					
157	COMPUTER ROOM UNITS	\$ 38,000.00	\$ 38,000.00	\$ -	-	\$ -	\$ 38,000.00	100.00	\$ -
158	DIFFUSERS, FAN, LOUVERS, VENTS	203,000.00	203,000.00	-	-	-	203,000.00	100.00	-
159	EQUIPMENT SETTING	63,000.00	63,000.00	-	-	-	63,000.00	100.00	-
160	PLUMB/MECH INSULATION	103,000.00	103,000.00	-	-	-	103,000.00	100.00	-
161	DUCTWORK / 1ST FLOOR	118,000.00	118,000.00	-	-	-	118,000.00	100.00	-
162	DUCTWORK / 2ND FLOOR	108,000.00	108,000.00	-	-	-	108,000.00	100.00	-
163	DUCTWORK / 3RD FLOOR	108,000.00	108,000.00	-	-	-	108,000.00	100.00	-
164	DUCTWORK / 4TH FLOOR	105,000.00	105,000.00	-	-	-	105,000.00	100.00	-
165	UNDERFLOOR PLENUM	41,000.00	41,000.00	-	-	-	41,000.00	100.00	-
166	GRILLES, REGISTERS, DIFFUSERS	187,000.00	187,000.00	-	-	-	187,000.00	100.00	-
167	TEMPERATURE CONTROLS	128,000.00	128,000.00	-	-	-	128,000.00	100.00	-
168	AH/TERMINAL/SYSTEM CONTROLS	189,000.00	189,000.00	-	-	-	189,000.00	100.00	-
169	PANEL BLDG & WIRE	19,000.00	19,000.00	-	-	-	19,000.00	100.00	-
170	COMMISSIONING / STARTUP	36,000.00	36,000.00	-	-	-	36,000.00	100.00	-
171	FIRE PROT / SHOP DRAWINGS	15,000.00	15,000.00	-	-	-	15,000.00	100.00	-
172	FIRE PROT / 1ST FLOOR	55,000.00	55,000.00	-	-	-	55,000.00	100.00	-
173	FIRE PROT / 2ND FLOOR	40,000.00	40,000.00	-	-	-	40,000.00	100.00	-
174	FIRE PROT / 3RD FLOOR	40,000.00	40,000.00	-	-	-	40,000.00	100.00	-
175	FIRE PROT / 4TH FLOOR	40,000.00	40,000.00	-	-	-	40,000.00	100.00	-
176	ELECTRICAL WORK (HOWERTON)								
176	LIGHT FIXTURES / 1ST FLOOR	118,000.00	118,000.00	-	-	-	118,000.00	100.00	-
177	LIGHT FIXTURES / 2ND FLOOR	118,000.00	118,000.00	-	-	-	118,000.00	100.00	-
178	LIGHT FIXTURES / 3RD FLOOR	118,000.00	118,000.00	-	-	-	118,000.00	100.00	-
179	LIGHT FIXTURES / 4TH FLOOR	118,000.00	118,000.00	-	-	-	118,000.00	100.00	-
180	LIGHTING CONTROLS	131,000.00	131,000.00	-	-	-	131,000.00	100.00	-
181	FIRE ALARM	37,000.00	37,000.00	-	-	-	37,000.00	100.00	-
182	DISTRIBUTION EQUIPMENT	122,000.00	122,000.00	-	-	-	122,000.00	100.00	-
	PAGE TOTAL	\$ 2,398,000.00	\$ 2,398,000.00	\$ -	-	\$ -	\$ 2,398,000.00		\$ -
	TOTALS	\$16,737,000.00	\$ 16,722,800.00	\$ 14,200.00	-	\$ -	\$16,737,000.00	100.00	\$ -

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ADAPTED FROM A/A/ G-702-1983

STATE OF MISSOURI
 OFFICE OF ADMINISTRATION
 DIVISION OF DESIGN AND CONSTRUCTION
 APPLICATION & CERTIFICATION OF PAYMENT
CONTRACT BREAKDOWN AND EXTENSIONS - 27(B)



A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	D COMPLETED		E THIS APPLICATION	F MATERIALS PRESENTLY STORED (FROM 27(C))	G TOTAL COMPLETED AND STORED TO DATE + E + F	H % FINISH C-G	I REMARKS
			FROM PREVIOUS APPLICATION D + E	COMPLETED					
183	GENERATOR	\$ 33,000.00	\$ 33,000.00	\$ -	\$ -	\$ -	\$ 33,000.00	100.00	
184	ELEC ROUGH-IN / 1ST FLOOR	200,000.00	200,000.00	-	-	-	200,000.00	100.00	
185	ELEC ROUGH-IN / 2ND FLOOR	130,000.00	130,000.00	-	-	-	130,000.00	100.00	
186	ELEC ROUGH-IN / 3RD FLOOR	130,000.00	130,000.00	-	-	-	130,000.00	100.00	
187	ELEC ROUGH-IN / 4TH FLOOR	130,000.00	130,000.00	-	-	-	130,000.00	100.00	
188	MISC ELEC FINISH	39,000.00	39,000.00	-	-	-	39,000.00	100.00	
189	EXTERIOR ELEC	86,000.00	86,000.00	-	-	-	86,000.00	100.00	
190	CHANGE ORDER 1	20,105.00	20,105.00	-	-	-	20,105.00	100.00	
191	CHANGE ORDER 2	(30,000.00)	(30,000.00)	-	-	-	(30,000.00)	100.00	
192	CHANGE ORDER 3	5,036.00	5,036.00	-	-	-	5,036.00	100.00	
193	CHANGE ORDER 4	17,848.07	17,848.07	-	-	-	17,848.07	100.00	
194	CHANGE ORDER 5	1,774.00	1,774.00	-	-	-	1,774.00	100.00	
195	CHANGE ORDER 6	14,962.95	14,962.95	-	-	-	14,962.95	100.00	
196	CHANGE ORDER 7	20,842.00	20,842.00	-	-	-	20,842.00	100.00	
197	CHANGE ORDER 8	363.52	363.52	-	-	-	363.52	100.00	
198	CHANGE ORDER 9	(2,462.99)	(2,462.99)	-	-	-	(2,462.99)	100.00	
199	CHANGE ORDER 10	55,126.00	55,126.00	-	-	-	55,126.00	100.00	
200	CHANGE ORDER 11	6,443.94	6,443.94	-	-	-	6,443.94	100.00	
201	CHANGE ORDER 12	97,989.90	97,989.90	-	-	-	97,989.90	100.00	
202	CHANGE ORDER 13	(2,360.00)	(2,360.00)	-	-	-	(2,360.00)	100.00	
203	CHANGE ORDER 14	18,132.85	18,132.85	-	-	-	18,132.85	100.00	
204	CHANGE ORDER 15	3,211.99	3,211.99	-	-	-	3,211.99	100.00	
205	CHANGE ORDER 16	774.89	774.89	-	-	-	774.89	100.00	
206	CHANGE ORDER 17	586.06	586.06	-	-	-	586.06	100.00	
207	CHANGE ORDER 18	2,122.77	2,122.77	-	-	-	2,122.77	100.00	
208	CHANGE ORDER 19	3,508.16	3,508.16	-	-	-	3,508.16	100.00	
	PAGE TOTAL	\$ 982,005.11	\$ 982,005.11	\$ -	\$ -	\$ -	\$ 982,005.11		
	TOTALS	\$17,719,005.11	\$ 17,704,805.11	\$ 14,200.00	\$ -	\$ -	\$17,719,005.11	100.00	

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PROJECT NUMBER
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 26

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27(B)



STATE OF MISSOURI
 OFFICE OF ADMINISTRATION
 DIVISION OF DESIGN AND CONSTRUCTION
 APPLICATION & CERTIFICATION OF PAYMENT
CONTRACT BREAKDOWN AND EXTENSIONS - 27(B)

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	D COMPLETED		E THIS APPLICATION	F MATERIALS PRESENTLY STORED (FROM 27(C))	G TOTAL COMPLETED AND STORED TO DATE + E + F	% G C	H BALANCE TO FINISH C - G	I REMARKS
			FROM PREVIOUS APPLICATION D + E	\$						
209	CHANGE ORDER 20	\$ 8,838.16	\$	8,838.16	\$	-	\$ 8,838.16	100.00	-	
210	CHANGE ORDER 21	7,144.30		7,144.30		-	7,144.30	100.00	-	
211	CHANGE ORDER 22	3,428.00		3,428.00		-	3,428.00	100.00	-	
212	CHANGE ORDER 23	1,889.21		1,889.21		-	1,889.21	100.00	-	
213	CHANGE ORDER 24	1,371.99		1,371.99		-	1,371.99	100.00	-	
214	CHANGE ORDER 25	4,579.38		4,579.38		-	4,579.38	100.00	-	
215	CHANGE ORDER 26	(2,495.00)		(2,495.00)		-	(2,495.00)	100.00	-	
216	CHANGE ORDER 27	279.40		279.40		-	279.40	100.00	-	
217	CHANGE ORDER 28	2,658.85		2,658.85		-	2,658.85	100.00	-	
218	CHANGE ORDER 29	1,332.28		1,332.28		-	1,332.28	100.00	-	
219	CHANGE ORDER 30	59,439.75		59,439.75		-	59,439.75	100.00	-	
220	CHANGE ORDER 31	1,527.59		1,527.59		-	1,527.59	100.00	-	
221	CHANGE ORDER 32	7,204.33		7,204.33		-	7,204.33	100.00	-	
222	CHANGE ORDER 33	921.14		921.14		-	921.14	100.00	-	
223	CHANGE ORDER 34	(1,225.00)		(1,225.00)		-	(1,225.00)	100.00	-	
224	CHANGE ORDER 35	14,594.77		14,594.77		-	14,594.77	100.00	-	
225	CHANGE ORDER 36	2,182.93		2,182.93		-	2,182.93	100.00	-	
226	CHANGE ORDER 37	2,676.12		2,676.12		-	2,676.12	100.00	-	
227	CHANGE ORDER 38	9,028.06		9,028.06		-	9,028.06	100.00	-	
228	CHANGE ORDER 39	1,776.26		1,776.26		-	1,776.26	100.00	-	
229	CHANGE ORDER 40	4,369.18		4,369.18		-	4,369.18	100.00	-	
230	CHANGE ORDER 41	2,121.68		2,121.68		-	2,121.68	100.00	-	
231	CHANGE ORDER 42	6,600.76		6,600.76		-	6,600.76	100.00	-	
232	CHANGE ORDER 43	1,711.00		1,711.00		-	1,711.00	100.00	-	
233	CHANGE ORDER 44	57,706.90		57,706.90		-	57,706.90	100.00	-	
234	CHANGE ORDER 45	2,361.60		2,361.60		-	2,361.60	100.00	-	
	PAGE TOTAL	\$ 202,023.64	\$	202,023.64	\$	-	\$ 202,023.64		\$	
	TOTALS	\$17,921,028.75	\$	17,906,828.75	\$	14,200.00	\$17,921,028.75		\$	

*TO BE ATTACHED TO APPLICATION AND CERTIFICATION FOR PAYMENT #27(A). ADAPTED FROM A/AI G-702-1983



STATE OF MISSOURI
 OFFICE OF ADMINISTRATION
 DIVISION OF DESIGN AND CONSTRUCTION
 APPLICATION & CERTIFICATION OF PAYMENT
 CONTRACT BREAKDOWN AND EXTENSIONS - 27(B)

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	D COMPLETED		E THIS APPLICATION	F MATERIALS PRESENTLY STORED (FROM 27(C))	G TOTAL COMPLETED AND STORED TO DATE +E+F	H BALANCE TO FINISH C-G	I REMARKS
			FROM PREVIOUS APPLICATION D+E	COMPLETED					
235	CHANGE ORDER 46	\$ 6,061.48	\$ 6,061.48	\$ -	-	\$ -	\$ 6,061.48	100.00	
236	CHANGE ORDER 47	3,654.23	3,654.23	-	-	-	3,654.23	100.00	
237	CHANGE ORDER 48	1,995.00	1,995.00	-	-	-	1,995.00	100.00	
238	CHANGE ORDER 49	33,867.79	33,867.79	-	-	-	33,867.79	100.00	
239	CHANGE ORDER 50	314.00	314.00	-	-	-	314.00	100.00	
240	CHANGE ORDER 51	24,091.07	24,091.07	-	-	-	24,091.07	100.00	
241	CHANGE ORDER 52	41,509.13	41,509.13	-	-	-	41,509.13	100.00	
242	CHANGE ORDER 53	1,110.00	1,110.00	-	-	-	1,110.00	100.00	
243	CHANGE ORDER 54	15,049.24	15,049.24	-	-	-	15,049.24	100.00	
244	CHANGE ORDER 55	148,528.00	148,528.00	-	-	-	148,528.00	100.00	
245	CHANGE ORDER 56	10,473.14	10,473.14	-	-	-	10,473.14	100.00	
246	CHANGE ORDER 57	3,371.74	3,371.74	-	-	-	3,371.74	100.00	
247	CHANGE ORDER 58	49,872.93	49,872.93	-	-	-	49,872.93	100.00	
248	CHANGE ORDER 59	5,239.69	5,239.69	-	-	-	5,239.69	100.00	
249	CHANGE ORDER 60	32,168.43	32,168.43	-	-	-	32,168.43	100.00	
250	CHANGE ORDER 61	12,467.20	12,467.20	-	-	-	12,467.20	100.00	
251	CHANGE ORDER 62	(5,570.28)	(5,570.28)	-	-	-	(5,570.28)	100.00	
252	CHANGE ORDER 63	8,748.64	8,748.64	-	-	-	8,748.64	100.00	
253	CHANGE ORDER 64	16,658.30	16,658.30	-	-	-	16,658.30	100.00	
254	CHANGE ORDER 65	7,499.62	7,499.62	-	-	-	7,499.62	100.00	
255	CHANGE ORDER 66	6,727.63	6,727.63	-	-	-	6,727.63	100.00	
256	CHANGE ORDER 67	31,391.00	31,391.00	-	-	-	31,391.00	100.00	
257	CHANGE ORDER 68	108,470.43	108,470.43	-	-	-	108,470.43	100.00	
258	CHANGE ORDER 69	3,198.00	3,198.00	-	-	-	3,198.00	100.00	
259	CHANGE ORDER 70	3,995.00	3,995.00	-	-	-	3,995.00	100.00	
260	CHANGE ORDER 71	-	-	-	-	-	-	100.00	
261	CHANGE ORDER 72	3,075.14	3,075.14	-	-	-	3,075.14	100.00	
262	CHANGE ORDER 73	2,637.76	2,637.76	-	-	-	2,637.76	100.00	
263	CHANGE ORDER 74	(10,663.76)	(10,663.76)	-	-	-	(10,663.76)	100.00	
264	CHANGE ORDER 75	12,617.00	6,308.50	6,308.50	-	-	12,617.00	100.00	
265	CHANGE ORDER 76	7,620.66	7,620.66	-	-	-	7,620.66	100.00	
PAGE TOTAL		\$ 586,178.21	\$ 579,869.71	\$ 6,308.50	\$ -	\$ -	\$ 586,178.21		
TOTALS		\$18,507,206.96	\$ 18,486,698.46	\$ 20,508.50	\$ -	\$ -	\$18,507,206.96	100.00	

*TO BE ATTACHED TO APPLICATION AND CERTIFICATION FOR PAYMENT #27(A).

ADAPTED FROM A/AJ G-702-1983

27(B)



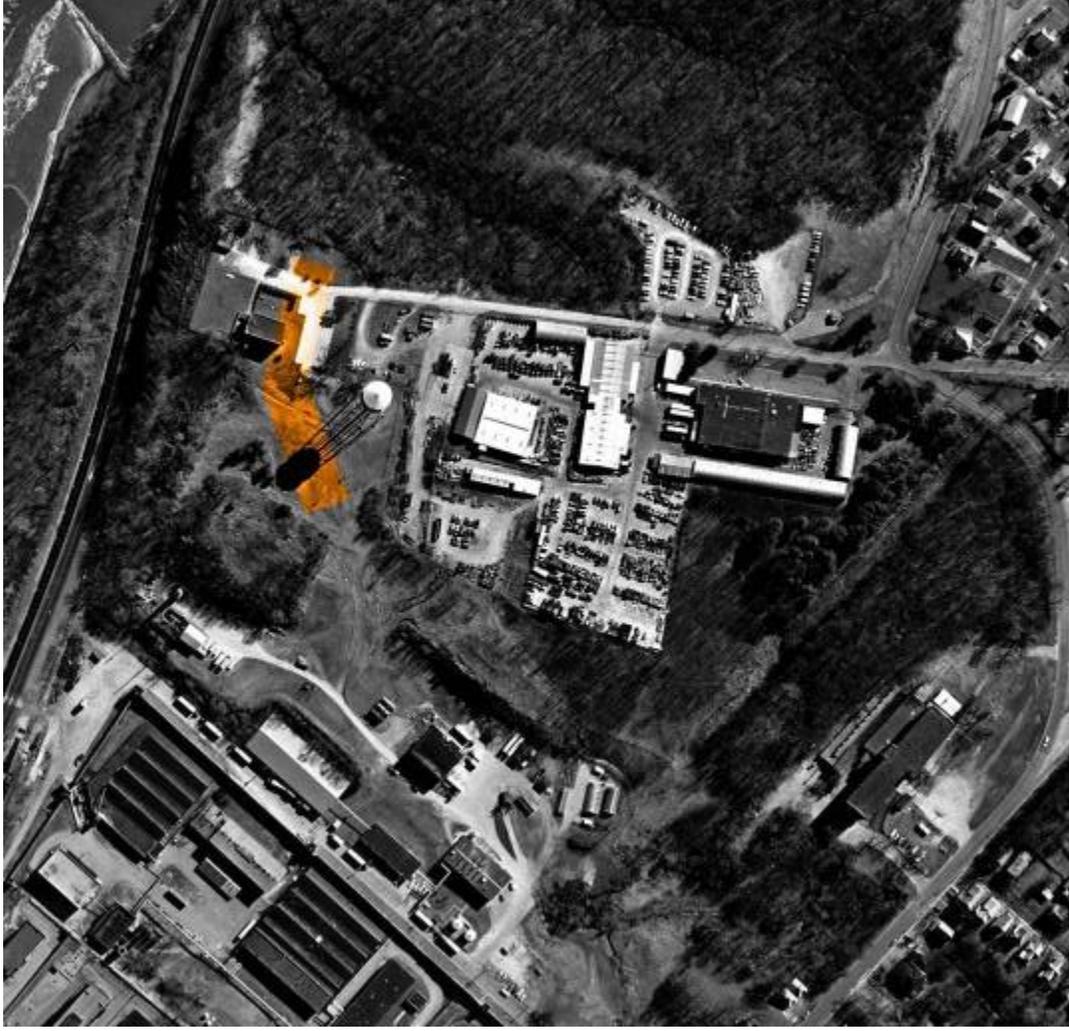
STATE OF MISSOURI
 OFFICE OF ADMINISTRATION
 DIVISION OF DESIGN AND CONSTRUCTION
 APPLICATION & CERTIFICATION OF PAYMENT
CONTRACT BREAKDOWN AND EXTENSIONS - 27(B)

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	D COMPLETED		E THIS APPLICATION	F MATERIALS PRESENTLY STORED (FROM 27(C))	G TOTAL COMPLETED AND STORED TO DATE + E + F	H % FINISH C - G	I REMARKS
			FROM PREVIOUS APPLICATION D + E	COMPLETED					
266	CHANGE ORDER 77	\$ -		\$ -			\$ -	100.00	
267	CHANGE ORDER 78	2,893.00		2,893.00			2,893.00	100.00	
268	CHANGE ORDER 79	2,228.96		2,228.96			2,228.96	100.00	
269	CHANGE ORDER 80	30,415.74		30,415.74			30,415.74	100.00	
270	CHANGE ORDER 81	30,753.94		30,753.94			30,753.94	100.00	
	PAGE TOTAL	\$ 66,291.64	\$ -	\$ 66,291.64	\$ -	\$ -	\$ 66,291.64		
	TOTALS	\$18,573,498.60	\$ 18,486,688.46	\$ 86,800.14	\$ -	\$ -	\$18,573,498.60	100.00	
*TO BE ATTACHED TO APPLICATION AND CERTIFICATION FOR PAYMENT #27(A). ADAPTED FROM AIA/ G-702-1983									

PROJECT NUMBER **X0056-01**
 APPLICATION NO. **26**
 PAGE 11 OF 11
 DATE 4/07/05 TO 8/09/05

27(B)

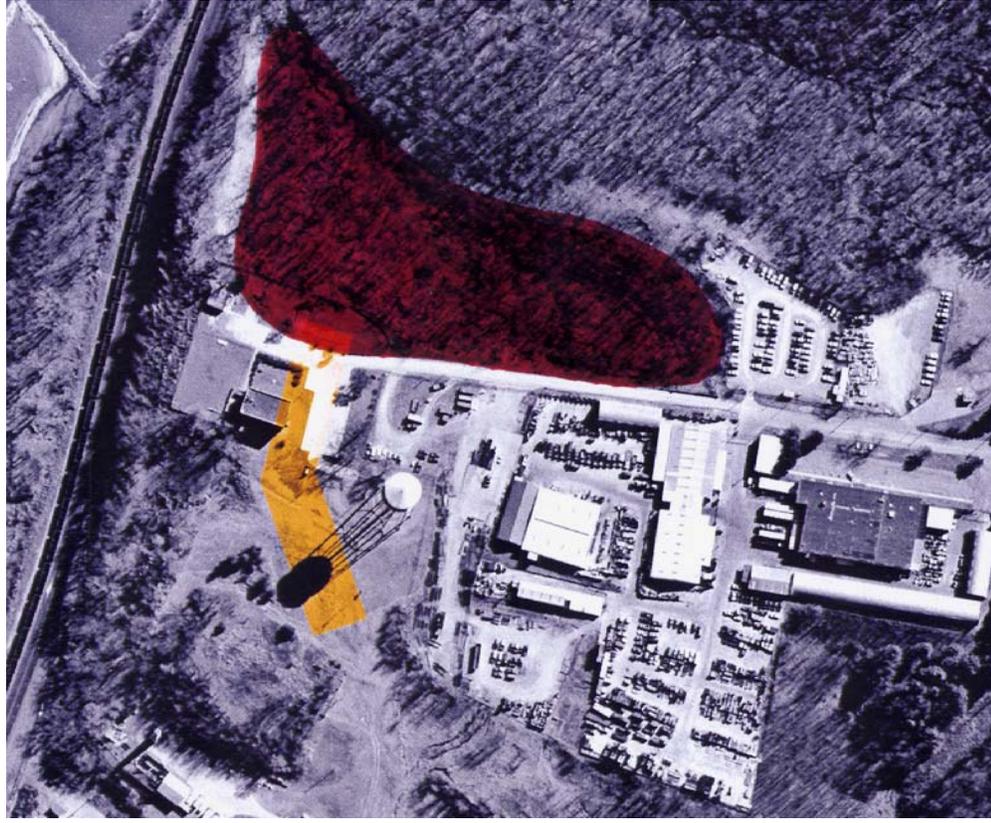
Lewis and Clark State Office Building
Jefferson City, Missouri



existing condition



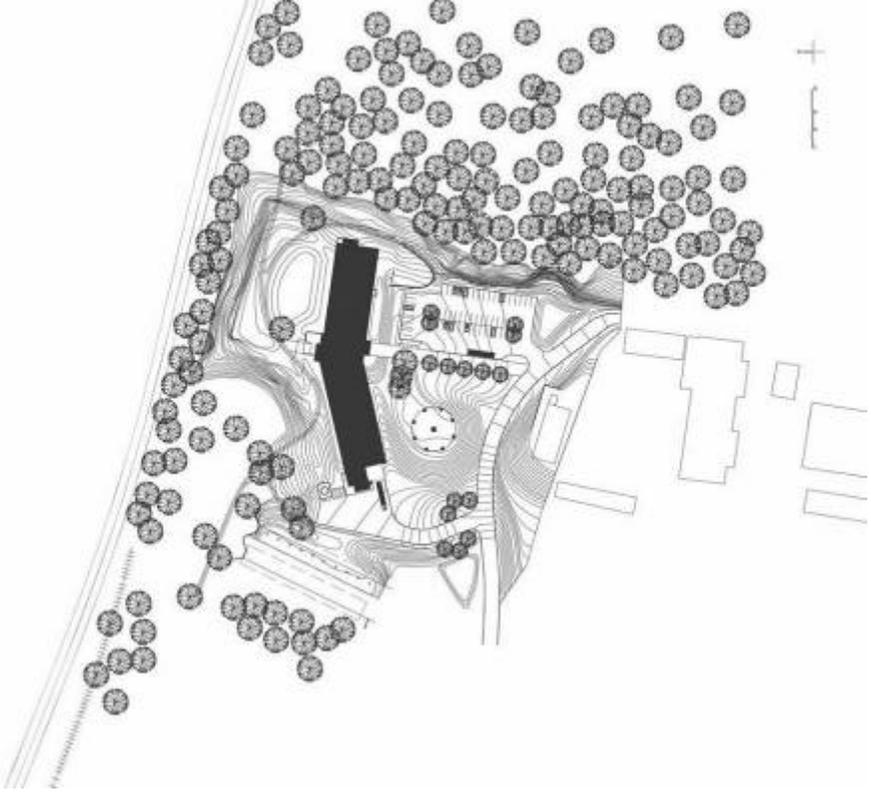
The Missouri Department of Natural Resources (DNR) asked for the “greenest” building possible within their budget, one that would be replicable and could set new standards for state buildings.



The shaded area shows the existing site to the East, damaged by water runoff from the developed site.



Plan for new site was a zero water runoff plan, green areas show bioswale filtration areas that BNIM designed under the native plantings to absorb the rainwater into the soil.



To encourage alternative forms of transportation, building parking is for visitors and carpoolers. Consolidated parking for other users is masterplanned nearby. The building is less than 1/4 mile from bus lines and bicycle storage is also available in the building. Landscape plan emphasizes native plants, trees and flowers.

CISTERN VOLUME CALCULATOR

Jefferson City Missouri

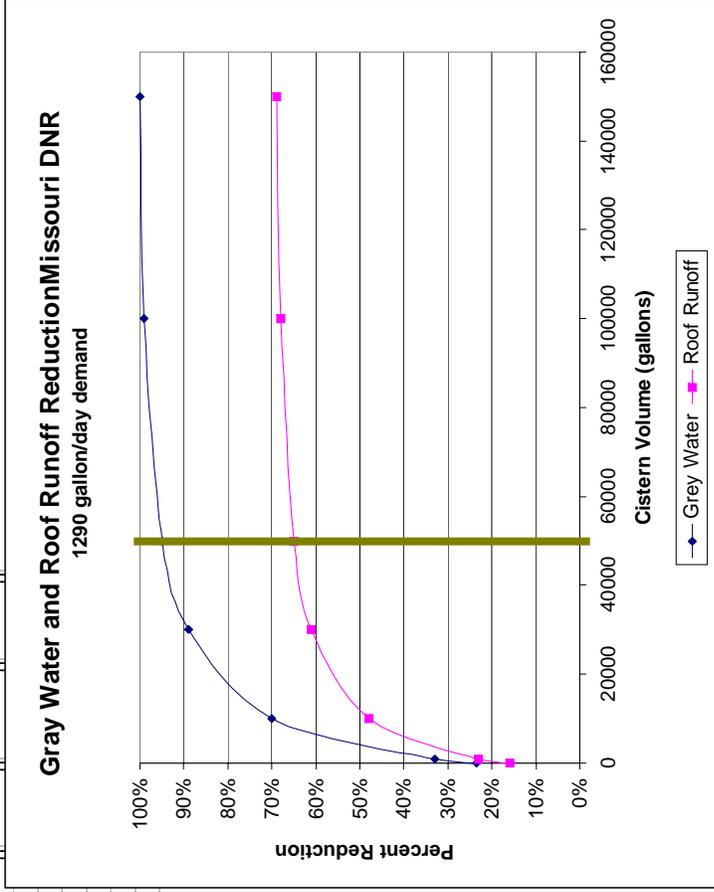
Input information:

Daily Demand (gallons) 2600
 Cistern volume (gallons) 1000000 (>0)
 Contributing Area (Sq ft) Runoff Coefficient
 Area 1 30000 0.9
 Area 2 0 0
 Area 3 0 0

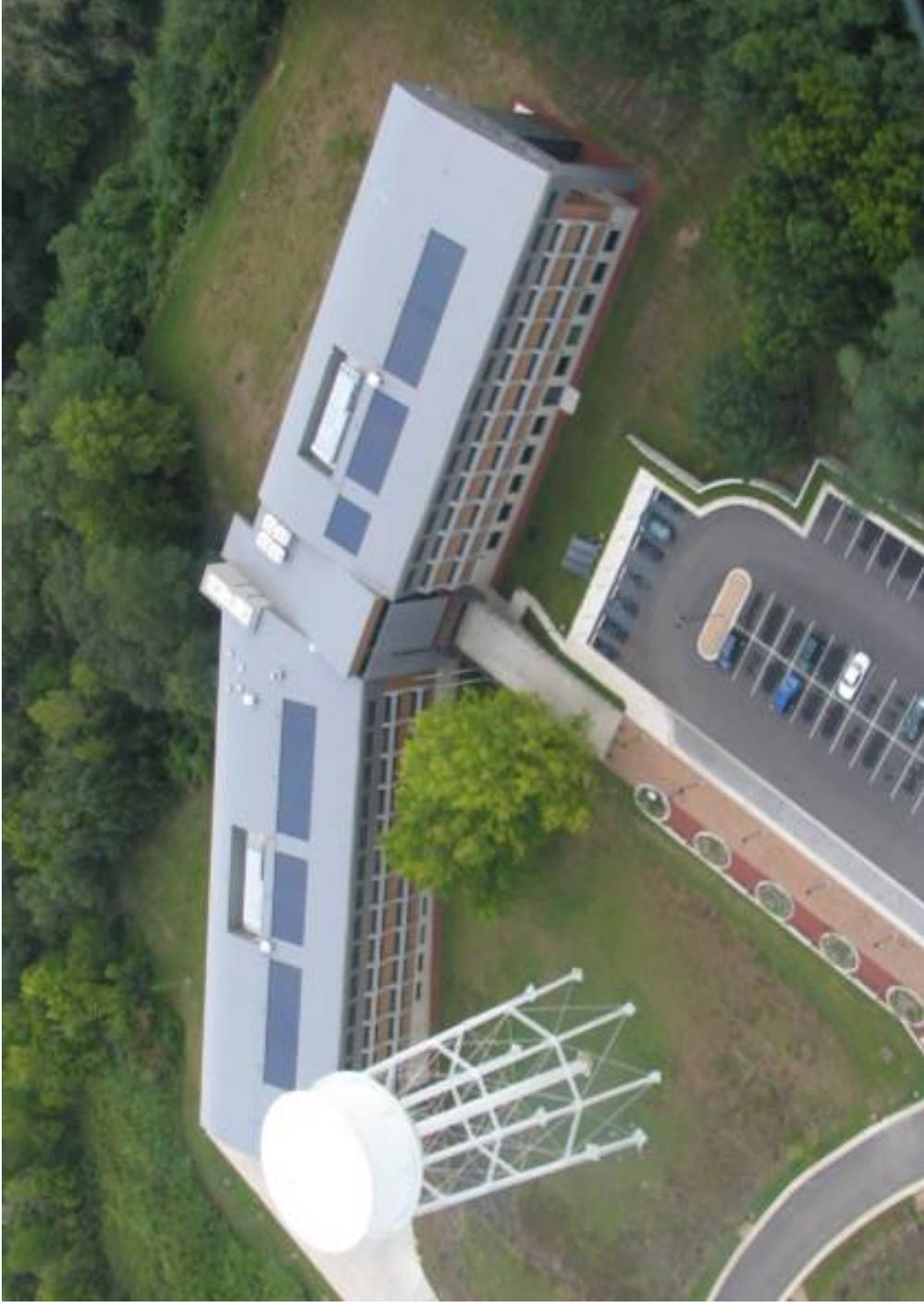
Results:

of shortages 288
 # of shortages/year 11.76
 Avg annual shortage: 227635.6 gallons
 Avg annual shortage: 23.97% of demand
 Avg annual spill: 0 gallons
 Avg annual spill: 0.00% of supply
 # of spills/year 0.00

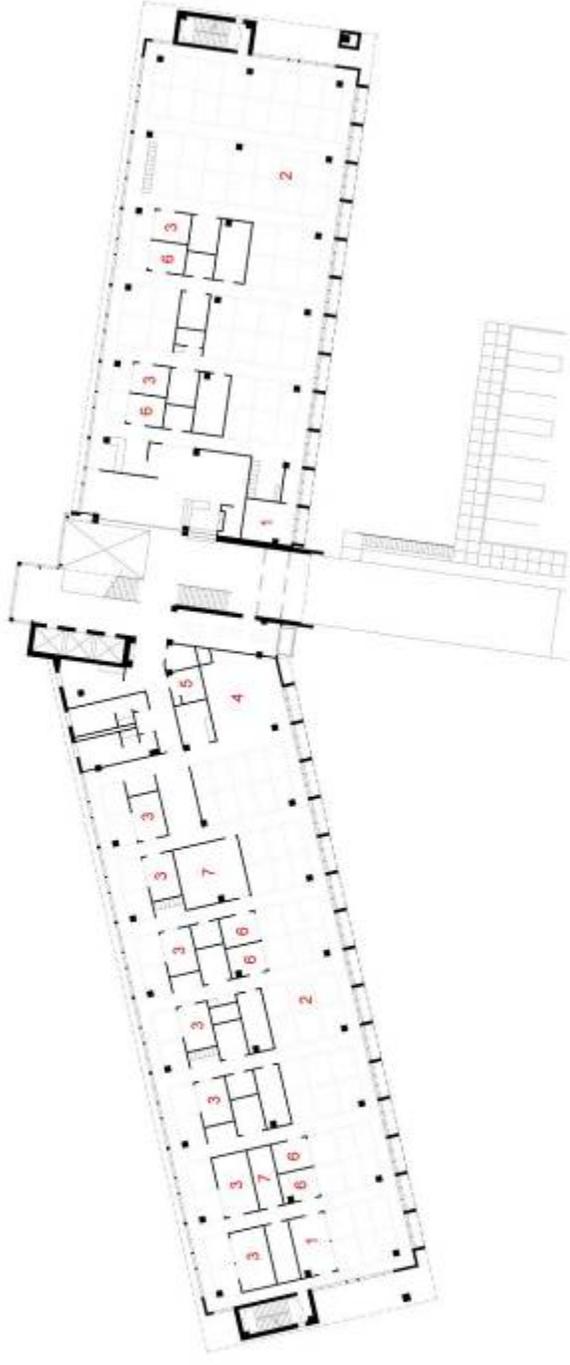
year	month	day	Prcp	Snow	Supply	Demand	Stored Volume	Shortage Volume	Shortage Count	Spill Volume	Spill Count
1977	1	1	0	0	0	2600	997400	0	0	0	0
1977	1	2	0.04	0.5	673.2	2600	995473	0	0	0	0
1977	1	3	0.01	0.3	168.3	2600	993042	0	0	0	0
1977	1	4	0.04	0.7	673.2	2600	991115	0	0	0	0
1977	1	5	0.18	4	3029.4	2600	991544	0	0	0	0
1977	1	6	0.02	0.9	336.6	2600	989281	0	0	0	0
1977	1	7	0.13	2.1	2187.9	2600	988869	0	0	0	0
1977	1	8	0	0	0	2600	986269	0	0	0	0
1977	1	9	0	0	0	2600	983669	0	0	0	0
1977	1	10	0.23	3	3870.9	2600	984940	0	0	0	0
1977	1	11	0	0	0	2600	982340	0	0	0	0
1977	1	12	0	0	0	2600	979740	0	0	0	0



25 years of rainfall was entered into a spreadsheet to help calculate the size of the cistern and the effects this would have on the roof runoff re-education. Based on this information the team used a 50,000 gallon cistern tank.

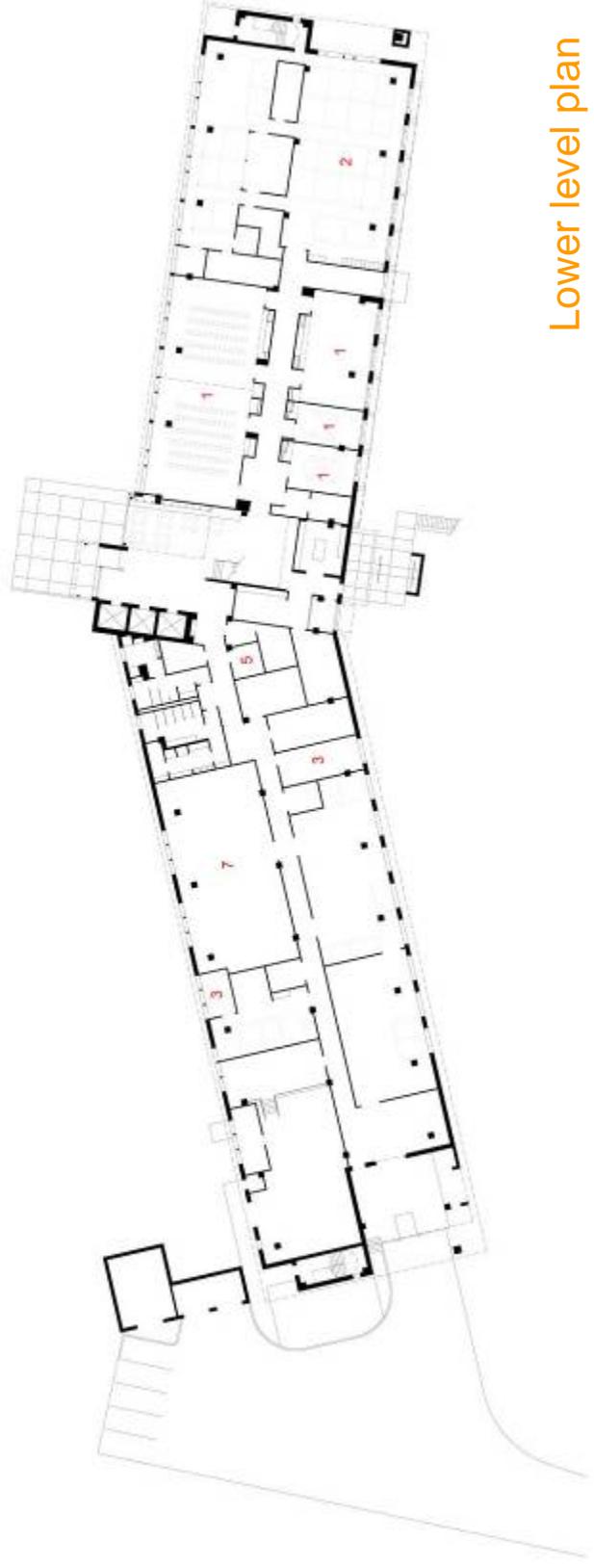


The building has 168 individual photovoltaic roof panels (dark gray areas) rated at 128 watts (21,504 watts total.) Data from Sandia National Labs shows that Columbia, Missouri (20 miles away) receives 4.6 hours of average annual daily sun, allowing 34,251.60 kWh/year output from the panels. The pictured water tower has since been dismantled for reuse.

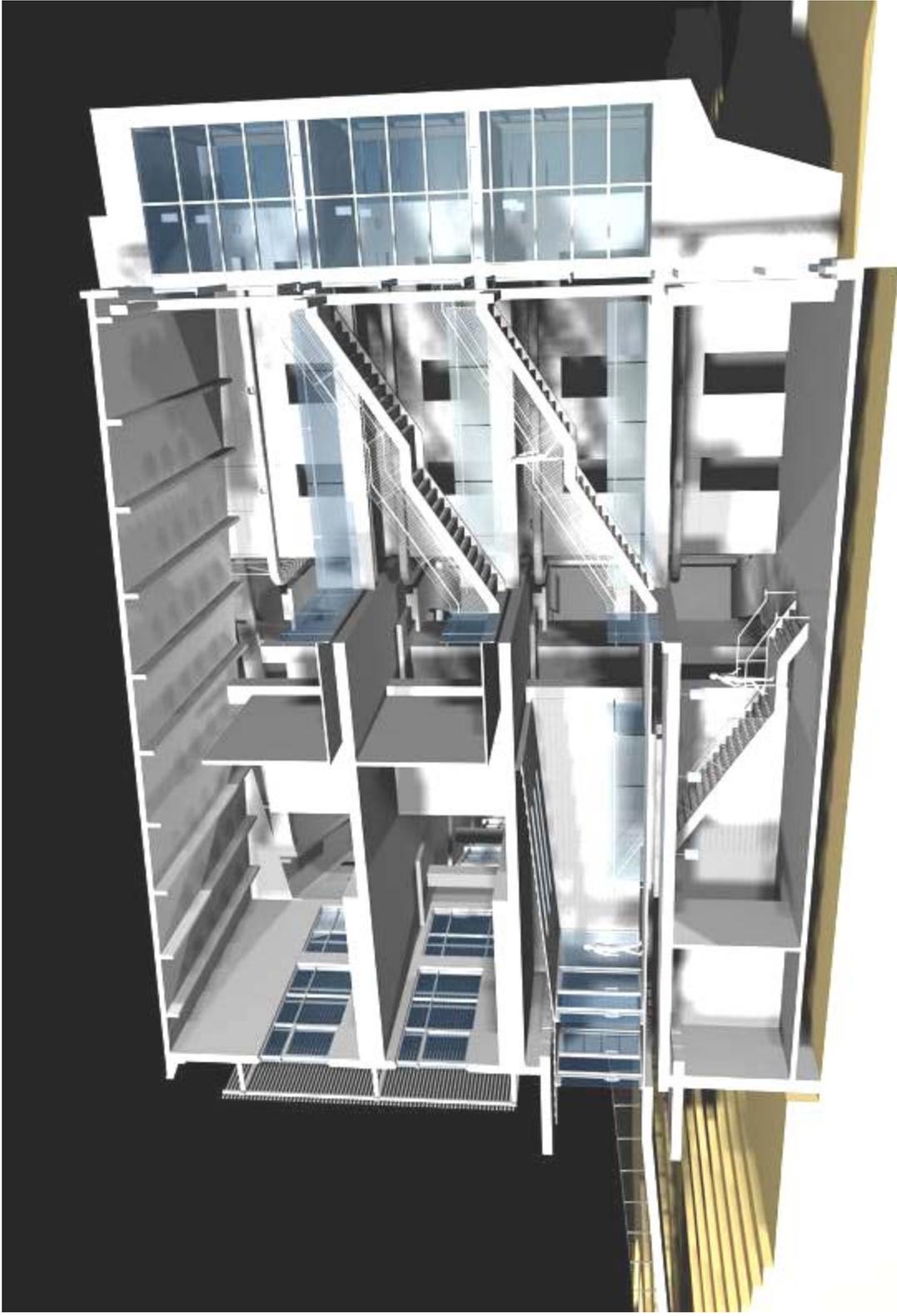


Main entry plan

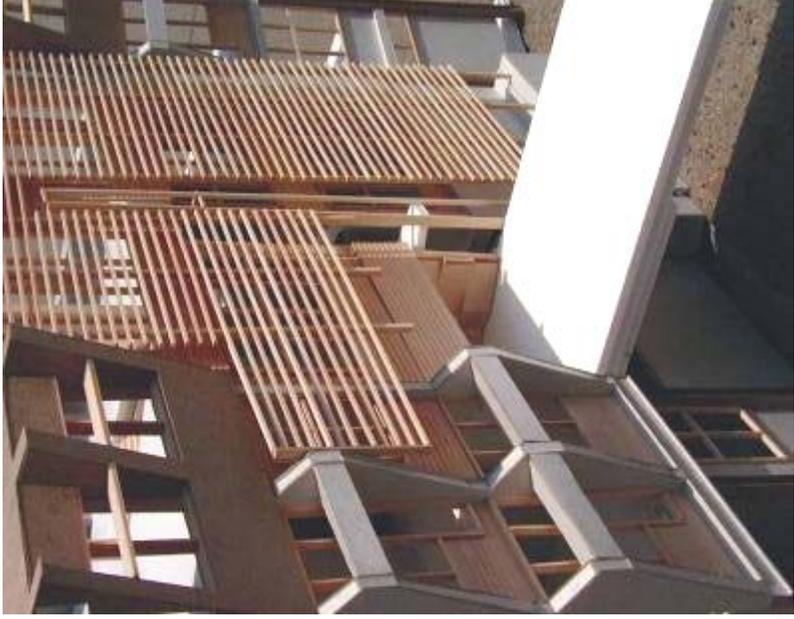
- 1. Conference
- 2. Open Office
- 3. Office
- 4. Teaming Area
- 5. Recycling
- 6. Interview
- 7. File / Storage
- 8. Library



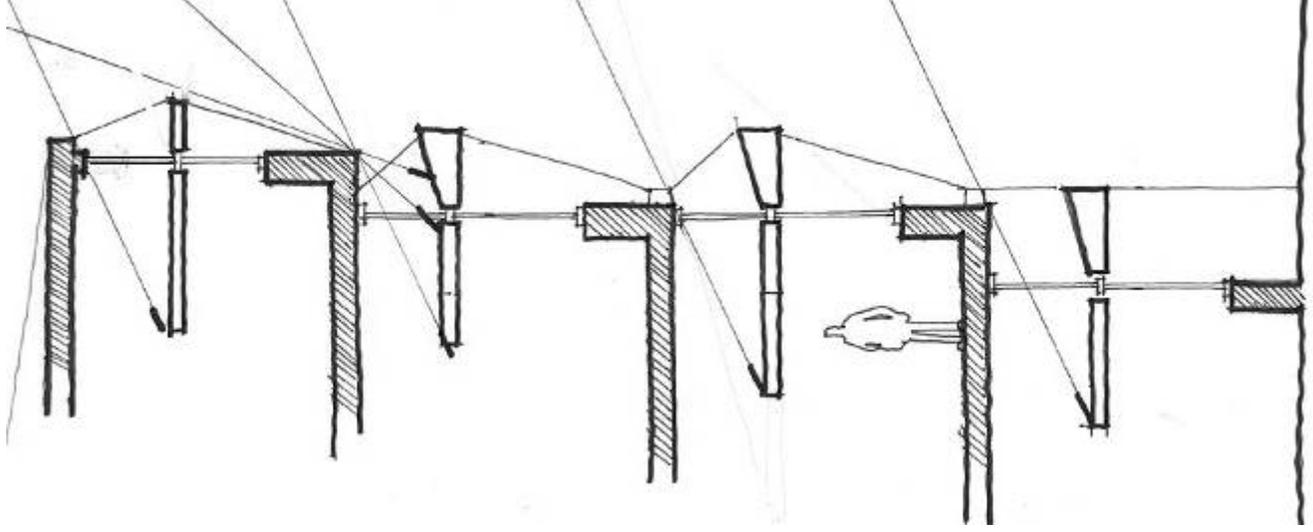
Lower level plan



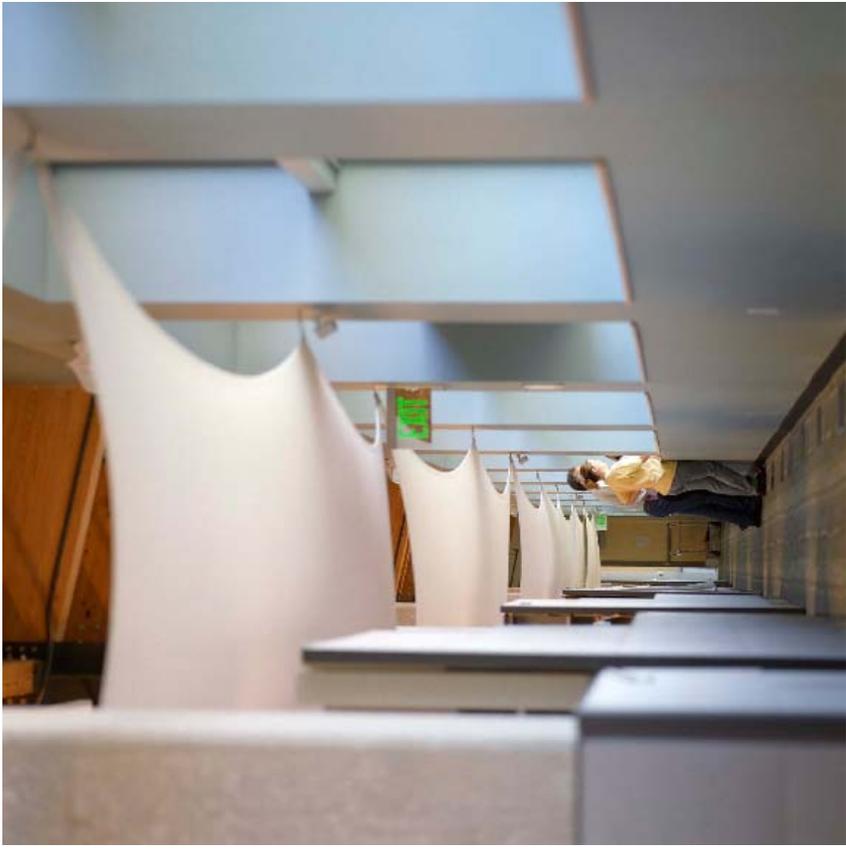
Building depth is 70 feet to allow for daylight penetration through the majority of the space. The main entry is on level two with the main stair in full view to encourage use of the steps.



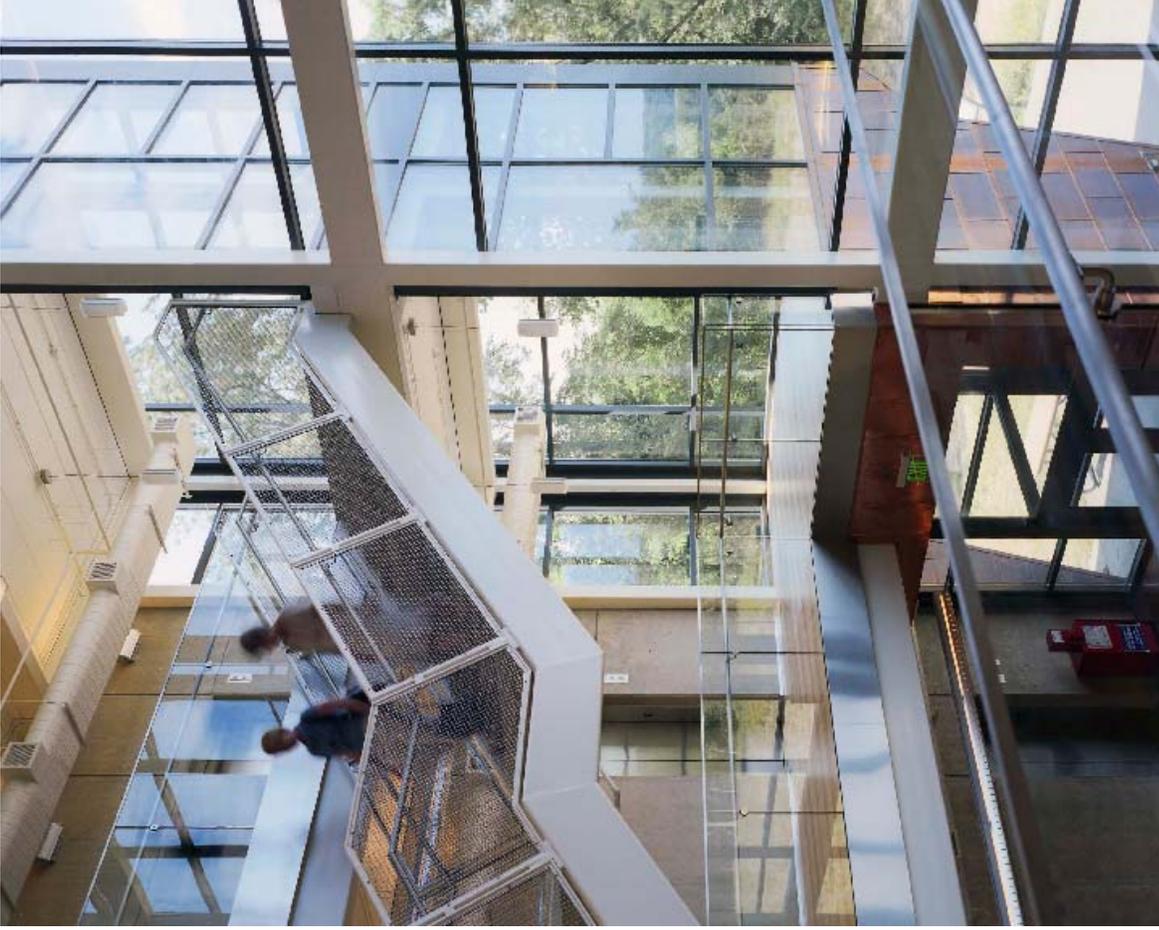
Sun shade system demonstrated at main entry with a 2 x 2 trex patterned screen (pictured at left) helps to reduce interior heat gain and glare.



Horizontal and vertical sun shading systems shade the building on the South. An interior light shelf adds reflective value to the interior light.



Detail of vertical and horizontal sun shades on South façade (left) and interior canvas light shelves (right).



Stair is located for ease of use, directly in front of the elevators.



Atrium space at the heart of the building showcases locally-sourced Missouri wood floors.



South façade showing the building angle which provides self shading.



East and West elevations with minor window penetrations.



North Façade.



View of Missouri River Valley
beyond atrium.



North-facing window walls provides ample daylighting for open work spaces; windows in closed offices at far left allow borrowed light to penetrate further within the building.



The State of Missouri requires Missouri Vocational Enterprises, a furniture production program for inmates, to provide systems furnishings for state-funded buildings. The furniture was retrofitted to meet Green Guard (indoor air quality) standards.



The North-facing atrium allows building users views of the river and also provides a dramatic look inside the building.



509303



509304



509308



509312



511916



atrium4_5



DNR_atrium at dusk4_5



DNR_autumn facade4_5



DNR_landscape closeup8_10



entry at dusk4_5



exterior4_5



Floor Plans



interior shadows8_10



office space4_5



PVs



Section



site plan



woman on bench4_5