Biannual Sustainability Report
Projects $5 Million and Over
August 2012

Active Projects

Alice Croker Lloyd Hall Renovation

Project Description

Alice Crocker Lloyd Hall is a 176,000 gross-square-footage residence hall housing approximately 560 students. The renovation will update infrastructure, including: new plumbing, heating, cooling, ventilation, fire detection and suppression systems, wired and wireless high-speed network access, renovated bath facilities and accessibility improvements. New spaces will be created in the vacated dining areas that are no longer needed since the Hill Dining Center became operational. New and reorganized spaces within the facility will revitalize the old residence hall and create much needed spaces for living-learning and academically- related activities, dance practice and multipurpose space, art studio, music practice rooms and spaces for student interaction and community development.

Energy Efficiency Measures

Alice Crocker Lloyd Hall design focuses on maximizing energy efficiency and incorporates numerous energy conservation measures including:

- Insulating all existing exterior walls that are not currently insulated.
- Utilizing the chilled water from the Mechanical Services Building adjacent to Mosher-Jordan Residence Hall as the cooling sources for the resident rooms in lieu of DX units.
- Reducing the lighting power density for the first and second floor common areas.
- Utilizing space occupancy sensors on the first and second floor common spaces to reduce run hours for the central station air handling units.
- Using increased inspections, including infrared scans, during construction to identify missing insulation, gaps in the enclosure, and other wall/roof assembly deficiencies.
- Using an enthalpy wheel in the mechanical system as a means of energy recovery to utilize the lost heat from the toilet room exhaust system.

Other Sustainability Features

- Alice Crocker Lloyd Hall is being renovated on its current site with over 75% of the existing walls, floors, and roof being re-used as well as 50% of the interior non-structural elements are being re-used.
- Access is being improved, thus encouraging the use of UM and public transportation.
- Bike racks will be installed to encourage the use of bicycles for transportation.
- No new parking will be provided on site (to reduce pollution and land development impacts).
- The use of water conserving plumbing fixtures including low flow toilets, urinals and shower heads will reduce water consumption by over 30%.
- Use of regional and local materials used where possible (not less than 10%).
- Use of low VOC materials including adhesives, sealants, paints, coatings, carpet systems, composite wood and agrifiber products.
- During construction, the demolition contractor is separating and recycling metal and brick/block.

Project Data

- Budget: $56 M
- Schedule: Completion scheduled for Summer 2012
- Square Feet: 176,000 gsf

Status as of August 2012

- Project Status: Construction
- Design Complete: 100%
- Construction Complete: 99%

George Granger Brown Memorial Laboratories Mechanical Engineering Addition

Project Description
The 62,500 gross square feet, $46 million addition will house research laboratories and faculty and graduate student offices to support emerging research endeavors such as bio, energy and nano systems, as well as enhance the ability to realize ultra-high-resolution measurements at molecular and atomic scales. This addition will be designed to support interdisciplinary collaboration within the university and with other academic institutions and industry.

LEED Certification: This project will seek LEED Silver-level Certification

Energy Efficiency Measures

- Maximum insulation in foundation walls, exterior walls, under slab, and roof assemblies
- Use of increased inspections, including infrared scans during construction to identify missing insulation, gaps in the enclosure, and other wall/roof assembly deficiencies
- Energy efficient windows/glazing for increased thermal performance
- High efficiency lighting throughout
- Occupancy sensors to control lighting
- Hybrid Lab HVAC System Configuration
- Dual Effect Energy Recovery System
- Lab Lighting Power Density Reductions
- Lighting Control/Space HVAC Setback

Other Sustainability Features

- Use of an Erosion and Sedimentation Control Plan during construction to reduce pollution from construction by controlling soil erosion, waterway sedimentation, and airborne dust generation
- GG Brown Laboratory sited on public and UM bus routes, encouraging use of public transit
- No new parking provided on-site (to reduce pollution and land development impacts)
- Use of water conserving plumbing fixtures
- Energy efficient transformers
- Use of select sustainable materials (e.g., steel structure, terrazzo flooring)
- Use of low-VOC materials (e.g., carpets, paints)
- Use of regional and local materials where possible

Project Data

- Budget: $46 M
- Schedule: Completion scheduled for Summer 2014
- Square Feet: 62,500 gsf

Status as of August 2012

- Project Status: Construction
- Design Complete: 99%
- Construction Complete: 3%

Central Power Plant Distributed Control System Upgrades

Project Description

The Central Power Plant (CPP) provides steam for the heating and cooling of many buildings on Central Campus, and also uses the steam produced to generate electricity. This project will update the power plant's electronic control systems to improve reliability, enhance continuous monitoring of systems, and optimize overall efficiency. As we continue to reduce energy consumption in university buildings, it is important for the CPP systems to be monitored in near real time to minimize the fuel necessary to meet, but not exceed, continuously changing loads for improved energy and environmental performance.

Energy Efficiency Measures

- The project will include upgrades to the power plant's electrical control systems that can be employed to minimize unnecessary steam production and maximize efficiency.

Other Sustainability Features

- The existing control module hardware will be re-cycled.

Project Data

- Budget: $6.75 M
- Schedule: Completion scheduled for Fall 2014

Status as of August 2012

- Project Status: Construction
- Design Complete: 100%
- Construction Complete: 15%

Crisler Arena Expansion

Project Description

Built in 1967, Crisler Arena is a multi-purpose venue used for academic, athletic, and entertainment events. In October 2010, the Board of Regents approved a renovation of the arena's core infrastructure and replacement of spectator seating, with a seating capacity of approximately 12,800. The Department of Intercollegiate Athletics now proposes to further renovate and expand Crisler Arena. New construction of approximately 63,000 gross square feet will create new spectator entrances, retail spaces, ticketing areas and a private club space. Renovation of approximately 54,000 gross square feet will accommodate accessible seats, improve circulation and egress, increase the number of restrooms and concession areas, and add other fan amenities. The scope of this project includes the architectural, mechanical, and electrical work necessary to accomplish these improvements.

LEED Certification: This project will seek LEED Silver-level Certification

Energy Efficiency Measures

The Crisler Arena Expansion design focuses on maximizing energy efficiency and incorporates numerous energy conservation measures, including:

- Maximum insulation in foundation walls, exterior walls, under slab, and roof assemblies
- Use of increased inspections, including infrared scans during construction to identify missing insulation, gaps in the enclosure, and other wall/roof assembly deficiencies
- Energy efficient windows/glazing for increased thermal performance
- High efficiency lighting throughout with daylight sensors for spaces with fenestration
- Occupancy sensors to control lighting
- Demand control ventilation to reduce mechanical loads to low occupancy and empty spaces
- High efficiency air cooled chiller
- Increase thermostat deadbands (the gap between the heating setpoint and cooling setpoint during which no conditioning is provided)
- Increased exhaust air energy recovery
- Automatic static pressure reset

Other Sustainability Features

- Use of an Erosion and Sedimentation Control Plan during construction to reduce pollution from construction by controlling soil erosion, waterway sedimentation, and airborne dust generation
- Reuse of existing Crisler Arena (in lieu of new facility on green-field site)
- Crisler Arena sited on public and UM bus routes, encouraging use of public transit
- No new parking provided on-site (to reduce pollution and land development impacts)
- Use of water conserving plumbing fixtures, including low-flow shower heads low-flow lavatories, and waterless urinals
- Energy efficient transformers
- Use of select sustainable materials (e.g., steel structure, terrazzo flooring)
- Use of low-VOC materials (e.g., carpets, paints)
- Use of regional and local materials where possible (e.g., limestone, brick)

Project Data

- Budget: $53 M
- Schedule: Completion scheduled for Winter 2014
- Square Feet: 63,000 New and 54,000 Renovation

Status as of August 2012

- Project Status: Construction
- Design Complete: 100%
- Construction Complete: 69%

East Quadrangle Renovation

Project Description

East Quadrangle is an approximately 300,000-gross-square-foot residence hall housing approximately 860 students and the Residential College. The renovation will update infrastructure, including: new plumbing, heating, cooling, ventilation, fire detection and suppression systems; wired and wireless high-speed network access; renovated bath facilities; and accessibility improvements. New and reorganized spaces within the facility will revitalize the old residence hall and improve dining facilities. Since its inception in 1967, the Residential College has occupied spaces within East Quadrangle not originally designed for academic use, with offices and administrative functions housed in former bedrooms and most classrooms located in the basement.

Energy Efficiency Measures

East Quad Residence Hall design focuses on maximizing energy efficiency by creating energy conservation measures such as:

- Increased exterior wall insulation
- New roof insulation
- Improved air-conditioning system, which will retire old smaller, inefficient systems
- Reduced lighting density throughout the building
- Utilizing occupancy sensors in all common areas
- Utilizing HVAC occupancy sensors in all common areas
- Increasing thermostat dead band by 2 degrees for offices and classrooms
- Utilizing infrared scans of building during construction
- Inspecting exterior wall and fenestration during construction
- Using an enthalpy wheel in the mechanical system as a means of energy recovery to utilize lost heat from the toilet room exhaust system.

Other Sustainability Features

- East Quad is being renovated at its current location with over 80% of the existing exterior walls, 75% of the existing windows, and a majority of the existing interior walls being refurbished.
- Additional bicycle parking will be provided to encourage bicycle usage.
- Building materials both regional and local will be sought after where possible; project goal is not less than 10%.
- Demolished material will be recycled and/or reused; this includes steel, brick, and block.
- Existing site lighting, poles, lamps, and globes, will be reused
- Heritage trees throughout the site will be maintained and preserved
- Porous pavement materials will be utilized throughout existing courtyard spaces; this will take the place of existing non-porous materials
- Select existing kitchen equipment will be rehabilitated for optimal use
- Composting will be utilized
- Additional light wells and areaways will be constructed to take advantage of direct and barrowed natural light

Project Data

- Budget: $116M
- Schedule: Completion scheduled for Summer 2013
- Square Feet: 300,000 gsf

Status as of August 2012

- Project Status: Construction
- Design Complete: 100%
- Construction Complete: 25%

Institute for Social Research Addition

Project Description

The Institute for Social Research (ISR) is the oldest and largest academic survey and social research organization in the world. Expansion of the ISR's facilities on Thompson Street will increase the capacity of the institute's research facilities to support its large and growing externally-funded research programs. Expansion will also enhance research effectiveness by integrating research programs within a single building complex, and will provide state-of-the-art facilities for communicating with national and international research partners. A four-level addition of approximately 56,600 gross square feet to the existing Institute for Social Research building is proposed. The expansion will create office and research spaces, collaborative meeting spaces, and secure data and bio-specimen storage. The project also involves renovations to approximately 12,800 gross square feet of the existing building where it will connect to the addition.

- **LEED Certification:** This project will seek LEED certification. The Addition is being designed to attain a minimum of LEED "Silver" certification, although LEED "GOLD" is a possibility.

Energy Efficiency Measures

The Institute for Social Research Addition is being designed to consume 30 per cent less energy than allowed by the 2007 edition of American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 90.1.

- Use of hydronic chilled beam terminal induction cooling devices, which transfer cooling through liquid rather than air and which eliminate fan energy for large ductwork. Distribution of cooling within rooms via induction minimizes distribution energy within rooms.
- Installation of an enthalpy energy wheel to recover waste heat.
- Cooling tower will be winterized, to allow "free cooling" when outdoor air temperature is low.
- Use of increased building envelope inspections, including infrared scans during construction to identify missing insulation and gaps in the building enclosure.
- High efficiency lighting throughout.
- Inclusion of an atrium to bring natural daylight into interior of building, which will reduce the need for artificial lighting.
- Occupancy sensors to control lighting.
- High efficiency chiller.
- Increased thermostat dead band (the gap between heating and cooling set points during which no heating/cooling is required).
- Individually controlled window shades, to minimize solar heat gain on sunny days.

Other Sustainability Features

- Installation of a living "green roof" to provide natural conductive roof insulation, to reduce peak storm water run-off, to utilize solar radiation, and to provide thermal inertia for the building (which minimizes peak heating and cooling loads).
- Installation of low flow plumbing fixtures to reduce water consumption 40 percent below the consumption rate of a typical building.
- Utilization of an urban building site that is convenient to UM and public transportation. No installation of parking, to further encourage use of mass transportation.

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- Use of selected sustainable materials, such as terrazzo flooring.
- Use of low-VOC materials, such as carpeting and paint.
- Use of Certified Wood products in the project.
- Use of low emittance furniture in the project.
- At least 20 percent of new materials will be from local/regional sources.
- At least 20 percent of new materials will be recycled content.
- At least 10 percent of nonhazardous construction and demolition debris will be recycled and/or salvaged by implementing a construction waste management plan.
- Consideration of combined chilled water/fire suppression piping to minimize excess piping in the building.
- Consideration of translucent floor panels in the floor of the atrium, to provide natural lighting to occupied basement areas.
- Solar optimization of atrium skylight monitors via energy modeling.
- Installation of new glazing at existing offices that will now front atrium, to provide natural lighting without building envelope heat gain/loss.

Project Data

- Budget: $29 million
- Schedule: Completion scheduled for Winter 2014
- Square Feet: 56,600 gsf addition and 12,800 gsf renovation

Status as of August 2012

- Project Status: Construction
- Design Complete: 100%
- Construction Complete: 0%

Michigan Memorial Phoenix Laboratory Addition and Second Floor Renovation

Project Description
The Michigan Memorial Phoenix Laboratory Addition and Second Floor Renovation project will create modern research laboratory space to support the Michigan Memorial Phoenix Energy Institute. A renovation of approximately 10,000 gross square feet is planned that will create state-of-the-art laboratory spaces for energy-related research, as well as construction of an addition of approximately 10,000 gross square feet for the institute's administrative functions. As part of this project, the building's electrical substation, which has exceeded its useful life, will be replaced.

LEED Certification: This project will seek LEED Silver-level Certification

Energy Efficiency Measures
The Michigan Memorial Phoenix Lab Addition and Renovation design focuses on maximizing energy efficiency and incorporates numerous energy conservation measures including:

- Insulating existing exterior walls impacted by the project that are not currently insulated.
- Utilizing space occupancy sensors on the ground and upper floor common spaces to reduce run hours for the central station air handling units.
- Maximum insulation in foundation walls, exterior walls, under slab, and roof assemblies.
- Use of increased inspections, including infrared scans during construction to identify missing insulation, gaps in the enclosure, and other wall/roof assembly deficiencies.
- Energy efficient windows/glazing for increased thermal performance.
- External shading of curtain wall glazing.
- High efficiency lighting throughout with daylight sensors for spaces with fenestration.
- Occupancy sensors to control lighting in offices, bathrooms, corridors, and conference rooms.
- Increase thermostat deadbands (the gap between the heating setpoint and cooling setpoint during which no conditioning is provided).

Other Sustainability Features
- No new parking will be provided on site (to reduce pollution and land development impacts).
- The use of water conserving plumbing fixtures including low flow toilets, urinals and shower heads will reduce water consumption by over 20%.
- Daylighting and views will be provided for over 75% of the spaces in the building.
- Use of low VOC materials including adhesives, sealants, paints, coatings, and carpet systems.
- Use of an Erosion and Sedimentation Control Plan during construction to reduce pollution from construction by controlling soil erosion, waterway sedimentation, and airborne dust generation
- The addition is constructed on a previously developed site in lieu of a green field site.
- The project is sited on public and UM bus routes, encouraging use of public transit
- Energy efficient transformers
- Use of select sustainable materials (eg steel structure, terrazzo flooring)
- Use of regional and local materials where possible (eg stone and brick)

Project Data
- Budget: $11.1 M
- Schedule: Completion scheduled for Spring 2013
- Square Feet: 10,000 gsf addition and 10,000 gsf renovation

Status as of August 2012
- Project Status: Construction
- Design Complete: 100%
- Construction Complete: 65%

Northwood Apartments I, II, and III Fire Alarm and Boiler Upgrades

Project Description

Constructed between 1955 and 1958, the Northwood Apartments I, II, and III are an approximately 419,000-gross-square-foot, 58-building complex on North Campus with 686 units housing student families. The existing stand-alone smoke detectors will be upgraded with a new central fire alarm system to meet current life safety standards. The project will also replace the hot water boilers to improve operating efficiency, reduce energy use, and provide increased reliability for the heating system.

Energy Efficiency Measures

The existing heating hot water boilers will be replaced with noticeably more efficient condensing units.

- The expected efficiency improvement will increase from an existing thermal efficiency likely no greater than 75%, to a minimum efficiency of 85; and to values exceeding 95% in the spring and fall when milder outdoor temperatures allow lower HWHS temperatures to be used.
- The new boilers will be furnished with modern controls to perform the lead/lag function automatically. This will insure only the required number of boilers are operating for any given load, ramping up and down seasonally, daily and hourly to reflect the varying outdoor temperatures throughout the year. The new controls will insure that the best combination of boilers are running under any given load, with a continued focus on condensing whenever possible.
- A key control function provided with each boiler group is monitoring of the Outside Air Temperature (OAT) at all times. Milder temperatures result in less heat loss from the buildings. This lower heat demand can be met by circulating lower temperature HWH. Lower HWH temperatures allow the condensing boilers to operate in the highly efficient condensing mode.
- The automatic lead/lag boiler operation, along with the OAT continuous reset of the HWH supply temperature insures that only the required amount of natural gas is used under all of the varying system loads.
- The boiler burner controls will be specified with a 5:1 turndown which allows each boiler to remain in efficient operation down to 20% of full load. Additionally, the design specifies that one of the three boilers will be half the size of the other two. This boiler group configuration creates the ability for each of the five sites to turn down to 10% of full load. The composite 10:1 turndown means that only at seasonal loads less than 10% would require the smallest boiler to go into an on/off cycling mode; saving additional energy.
- The existing heating hot water system distribution pumps will be replaced with units driven by variable speed drives (VSDs), which represents electric power savings, as this feature would allow the system to circulate only the minimum amount of water necessary to meet the load.

Project Data

- Budget: $7.5 M
- Schedule: Completion scheduled for Summer 2013
- Square Feet: 419,000 gsf

Status as of August 2012

- Project Status: Bid-Award
- Design Complete: 100%
- Construction Complete: 75%

The Lawyers' Club Building and John P. Cook Building Renovation

Project Description

The Charles T. Munger Residences in the Lawyers' Club and the John P. Cook Building renovation project is a comprehensive renovation updating key infrastructure in the club wing of The Lawyers' Club Building. The renovation of the dormitory areas, approximately 92,000 gross square feet of space, will address infrastructure needs including new plumbing, heating, ventilation, fire detection and suppression systems, wired and wireless high-speed network access, and accessibility improvements. Although air conditioning will be added, we will target overall energy performance to exceed national energy efficiency standards by more than 30 percent. The renovation will preserve the historic exterior of the buildings, and the existing "townhouse-style" entries to resident rooms will be replaced with an interior connecting corridor within each building that will increase safety, accessibility, and sense of community for the residents. In the club wing of The Lawyers' Club Building, approximately 67,000 gross square feet, we will update key infrastructure items integral with the dormitory wing, including new fire detection and suppression systems, and tuck-pointing of exterior masonry surfaces.

Energy Efficiency Measures

- Water conserving toilets, showers and lavatory faucets.
- Heat recovery devices on air handling units.
- Insulation added to the attic.
- Electronic room thermostats which allow students to put their room in standby heating/cooling mode when they leave.

Other Sustainability Features

- Slate roof replacement will utilize the existing solid slates, reducing the need for new slate.
- Existing structure to remain, eliminating much construction demolition materials from landfill. Also eliminates the need to construct a new building.
- Offsite modular prefabrication of toilet rooms allows for higher quality control, expedites schedule and reduces costs.

Project Data

- Budget: $39 M
- Schedule: Completion scheduled for Summer 2013
- Square Feet: 159,000 gsf

Status as of August 2012

- Project Status: Design Development
- Design Complete: 100%
- Construction Complete: 9%

Glenn E. Schembechler Hall Entrance and Museum Renovation

Project Description

The Glenn E. Schembechler Hall Entrance and Museum Renovation project will create an appropriate new entrance for the home of Michigan football integrating the museum area. The project will add approximately 7,000 gross square feet to Schembechler Hall and renovate approximately 7,000 gross square feet. The scope of this project includes the architectural, mechanical, and electrical work necessary to accomplish these improvements.

Energy Efficiency Measures

- Envelope inspections
- Clerestory glazing
- 18% more efficient thermal barrier than prescribed by ASHRAE 90.1—2007
- Optimized occupancy schedules, HVAC system zoning, and part load HVAC system efficiency
- Improved ventilation efficiencies
- Low air return
- Demand Control Ventilation
- Bi-Polar Ionization which dramatically improves indoor air quality while significantly reducing the requirement for Outside Air thus reducing the energy associated with mechanically conditioning that air
- Very limited use of incandescent lighting and utilization of LED site lighting

Other Sustainability Features

- Adaptive reuse of existing space
- Passive solar glazing strategies
- Tall interior spaces coupled with clerestory glazing to optimize daylight harvesting
- Only low-VOC materials used on interior spaces
- 20% recycled and regional materials
- 75% diversion rate for construction waste
- Indoor Air Quality plan for all construction activities

Project Data

- Budget: $9 M
- Schedule: Completion scheduled for Winter 2014
- Square Feet: 7,000 gsf

Status as of August 2012

- Project Status: Bid-Award
- Design Complete: 38%
- Construction Complete: 0%

University of Michigan Hospitals and Health Centers A. Alfred Taubman Health Care Center Internal Medicine Renovation

Project Description

The A. Alfred Taubman Health Care Center opened in 1986 and houses multi-specialty clinics, diagnostic and treatment services, and offices. The outpatient clinics and administrative areas for Internal Medicine that occupy the third floor of the facility have remained essentially unchanged since 1986. With anticipated continued growth in clinical activity, the University of Michigan Hospitals and Health Centers propose to renovate 27,500 gross square feet of space on the third floor to improve appearance, function, and use for ongoing patient care needs. This project will permit the creation of new and improved patient clinic settings in Gastroenterology, Pulmonary, Renal, Infectious Diseases, Rheumatology, Medical Genetics and General Medicine.

Energy Efficiency Measures

- Within the Renovated Areas, new HVAC and Electrical Systems are designed to optimize efficiency.
- Utilized Variable Air Volume system.
- Use of digital controls for new VAV Boxes.
- Energy Efficient Lighting fixtures
- Provided multi-level switching and dimming of lights.
- Occupancy sensors used to control lighting in offices and other support spaces.

Other Sustainability Features

- Use of low VOC Interior Finishes such as sheet flooring, paints and wall coverings.

Project Data

- Budget: $7,500,000
- Schedule: Completion Scheduled Fall 2013
- Square Feet: 27,500 sq. ft.

Status as of August 2012

- Project Status: Bid-Award
- Design Complete: 100%
- Construction Complete: 0%

University of Michigan Hospitals and Health Centers A. Alfred Taubman Health Care Center Levels 1 and 2 Backfill Renovations

Project Description

The opening of the clinics in the C. S. Mott Children's and VonVoigtlander Women's Hospitals resulted in approximately 35,000 square feet of vacated space on the first and second floors of the A. Alfred Taubman Health Care Center. The newly available space has allowed Ambulatory Care to reevaluate the services currently offered onsite and provide the ability to offer multi-specialty services conveniently located for patients. This project will create a multidisciplinary transplant clinic, an outpatient non-cancer infusion center, and a same-day pre-op clinic. Neurology, Neurosurgery, Otolaryngology, and Radiology clinical services will be expanded, and the outpatient pharmacy will be relocated and expanded into a shared retail space with MedEQUIP.

Energy Efficiency Measures

- Within the Renovated Areas, new HVAC and Electrical Systems are designed to optimize efficiency.
- Utilized Variable Air Volume system.
- Use of digital controls for new VAV Boxes.
- Energy Efficient Lighting fixtures.
- Provided multi-level switching and dimming of lights.
- Occupancy sensors used to control lighting in offices and other support spaces.

Other Sustainability Features

- Use of low VOC Interior Finishes such as sheet flooring, paints and wall coverings.

Project Data

- Budget: $13 million
- Schedule: Completion Schedule for Summer 2013
- Square Feet: 35,000 gross sq. ft.

Status as of August 2012

- Project Status: Bid-Award
- Design Complete: 100%
- Construction Complete: 0%

UMHHC Parkview Medical Center and Scott and Amy Prudden Turner Memorial Clinic Building Demolition Project

Project Description

The University of Michigan Hospitals and Health Centers (UMHHC) proposes to demolish the Parkview Medical Center and Scott and Amy Prudden Turner Memorial Clinic buildings. The demolition of these buildings has been in our master plan for several years and is possible because the clinical functions are now housed in the W. K. Kellogg Eye Center and Brehm Tower. The buildings no longer meet the needs of the UMHHC and are not conducive to reuse for clinical or office functions. This project will demolish both buildings, renovate the existing easterly portion of the W. K. Kellogg Eye Center that connects to these buildings, including a new point of entry, and expand the parking lot. The scope of this project includes the architectural, mechanical and electrical work necessary to accomplish these improvements. Although there will be a temporary loss of the spaces in the adjacent parking lot during construction, at project completion there will be a net increase of approximately 75 parking spaces.

Energy Efficiency Measures

- Use of Energy Star products or products listed as Federal Energy Management Program (FEMP) .
- Provision for task lighting to reduce amount of general lighting required.
- Use of occupancy sensors to reduce lighting energy usage when rooms are unoccupied.
- Use of energy saving lamps and electronic ballasts in lighting fixtures with a minimum power factor of .90.
- Photoelectric controls and/or timers for site lighting to control daily illumination hours.
- Use of split system heat pump units for new conference room area.
- All motors larger than 0.75 HP to be 'premium efficient' rating.
- Use of battery powered sensor faucets in toilet rooms.
- A swirl concentration device will be used to improve the quality of the storm water leaving the site. This device will remove more than 80% of the total suspended solids in the storm water runoff.

Demolition Phase Sustainable Features

- Abate asbestos containing materials and proper handling and disposal of lead containing materials.
- Proper disposal of regulated building waste such as; mercury containing articles, batteries, smoke detectors, and electronic waste, among other building articles.
- All non-hazardous contaminates soils are brought to a Class ll landfill.
- Provide Toxicity Characteristic Leaching Procedure (TLCP) testing on select materials to determine whether hazardous chemicals will leach from waste material.
- Material is then disposed as either hazardous or non-hazardous material.
- No vehicular idling allowed on site and all diesel equipment is fueled by biodiesel fuel B-20.
- All diesel equipment utilizes exhaust after treatment devices to reduce emission from diesel engines.
- UM maintenance shops shall have the opportunity to salvage and reuse building components.
- Maintain best practices for soil erosion and sediment control procedures.

Project Data

- Budget: $5M
- Schedule: Completion scheduled for Fall 2012
- Square Feet: 69,000 gsf

Status as of August 2012

- Project Status: Active
- Design Complete: 100%
- Construction Complete: 51%

University Hospital Kitchen Renovations for Room Service Protocol

Project Description

The patient food kitchen on level B2 in University Hospital opened in 1986 and utilizes the "cook-chill-reheat" food production method. This process has been replaced in many hospitals with an on-demand "room service" approach to nutrition that enables patients to have more control of their environment. This process is already in place for pediatric patients in C. S. Mott Children's Hospital and will be utilized in the new C. S. Mott Children's and Von Voigtlander Women's Hospitals currently under construction. This project will renovate approximately 13,000 gross square feet on level B2 of University Hospital to allow the shift of Food and Nutrition Services for adult patients at University Hospital and the Cardiovascular Center from cook-chill-reheat production to the room service method. Food service operations will be relocated to the North Campus Research Complex during construction.

Energy Efficiency Measures

The patient food kitchen renovation focuses on maximizing the energy used by the new kitchen equipment. Other Energy Efficiency Measures include:

- Use occupancy sensors to control lighting in office and other support spaces.
- Use of energy efficient lighting fixtures.
- High efficiency refrigeration coolers and freezers.
- Energy efficient kitchen equipment.
- Premium efficiency motors throughout.

Other Sustainability Features

- Recycling/reuse of construction waste and kitchen equipment.
- Use of selected sustainable materials such as quarry tile flooring.
- Use of Low-VOC materials such as sheet flooring, adhesives, sealants, coatings and paints.
- Use of regional and local materials where possible.
- Enhanced commissioning, construction to improve Indoor Air Quality management and thermal comfort improvements.

Project Data

- Budget: $8.5 M
- Schedule: Completion scheduled for Fall 2012
- Square Feet: 13,000 gsf

Status as of August 2012

- Project Status: Construction
- Design Complete: 100%
- Construction Complete: 93%

Varsity Drive Building and Alexander G. Ruthven Museums Building Museum of Zoology Collection Relocation and Renovations

Project Description

The project will relocate the majority of the Museum of Zoology's "wet" collection and support areas into approximately 46,000 gross square feet of renovated space within the Varsity Drive building, renovate approximately 6,800 gross square feet within Ruthven to create a safe storage compartment for the teaching collection as well as install a new fire alarm system throughout Ruthven.

Energy Efficiency Measures

The portion of the project which deals with renovating Varsity Drive building will comply with ASHRAE Standards 90.1-2007 as required by the University of Michigan design guidelines for projects with construction costs estimated between two and ten million dollars.

- The collection will be stored on a compact storage system to minimize project footprint and associated systems to minimize energy usage.
- The new toilet room was equipped with low flow fixtures and aerators.
- This project replaced some existing un-insulated garage doors with an insulated wall & glazing system.
- Ceilings have been specified within the Varsity Drive collection storage areas to minimize the volume of space which needs to be conditioned.
- Energy recovery within mechanical systems will be provided to save energy and reduce peak loads.
- Additional insulation was added to the exterior wall within the project area which will result in energy savings.

Other Sustainability Features

- Site selection, project renovated existing building instead of building new.
- Utilized construction materials with recycled content.
- Utilized regionally manufactured materials.
- Utilized lighting controls to optimize energy performance.
- Utilized low-emitting material to improve indoor environmental quality.

Project Data

- Budget: $ 20 M
- Schedule: Fall 2012
- Square Feet: 52,800 gsf

Status as of August 2012

- Project Status: Construction
- Design Complete: 100%
- Construction Complete: 99%

Vera Baits II Renewal

Vera Baits II (Ziwet House shown)

Project Description

Constructed in 1967, the approximately 175,000-gross-square-foot, five-building Vera B. Baits II complex (Baits II) provides housing for approximately 550 students. The renovation will update infrastructure, including: new fire detection, alarm, and suppression systems; wireless high-speed network access; new energy-efficient windows and roof systems; and new interior finishes and furnishings. Community spaces will be reorganized or repurposed to create spaces for academic activities, student interaction, and opportunities for creating a sense of community.

Energy Efficiency Measures

- New roofing complying with ASHRAE 90.1-2007 standards, with insulating values between R21 and R40.
- New aluminum windows with 1-inch, double-pane insulated glazing, thermal breaks, and special coatings.
- New energy-efficient light fixtures complying with ASHRAE 90.1-2007 standards, with occupancy sensors.
- New toilet fixtures with water-saving 1.6 gallons-per-flush and dual-action flush valves (0.6 gpf for liquids).
- New plumbing faucets and shower heads with water-saving features.
- New energy-efficient and paper-saving electric hand dryers.
- New energy-efficient kitchen appliances and computers.

Other Sustainability Features

- Use of salvaged existing student furniture from other U-M dormitories instead of new furniture.
- Use of new flooring with recycled content, low-VOC emissions, and regionally-produced material.

Project Data

- Budget: $11.95M
- Schedule: Completion scheduled for Summer 2012. Regent completion is September 30, 2013.
- Square Feet: 175,000 gsf

Status as of August 2012

- Project Status: Construction
- Design Complete: 100%
- Construction Complete: 75%

Wall Street East Parking Structure

Project Description

Construction of the new parking structure will add 530 net vehicle spaces to the university's parking system near the medical campus. The project will provide for an attractive gateway to the Wall Street area and medical center campus with environmentally-sustainable features. We envision an architecturally-detailed façade with open space at each end of the structure that will contain park-like landscaping.

Energy Efficiency Measures

The Wall Street East Parking Structure is being designed to incorporate best sustainability practices for a building of this use type. US Green Building Council project criteria do not allow the Wall Street East Parking Structure to be considered for Leadership in Energy and Environmental Design (LEED) certification.

- Efficient fluorescent and LED light fixtures will be installed throughout.
- Interior light fixtures will be controlled by occupancy sensors and photocells to minimize energy use and to increase security.
- The completed parking structure will consume energy at a rate that is 30% less than established by ASHRAE Standard 90.1-2007.

Other Sustainability Features

- The Wall Street Parking Structure will be designed as an open parking structure, thereby avoiding the need for powered ventilation.
- Infrastructure will be installed for electric vehicle charging stations.
- Native and adapted plant materials that minimize the need for irrigation will be planted.
- Landscaped areas will be maximized and porous pavements will be installed to reduce storm water runoff.
- Storm water will be mechanically and environmentally cleaned on-site prior to discharge.
- An on-site below-ground structured storm water detention system will be incorporated into construction to minimize off-site storm water discharge.
- A large rain garden will be constructed in the east front yard of the parking structure to collect surface storm water runoff and to maximize on-site infiltration. Replenishing ground water on-site minimizes the potential for downstream flooding.
- An integral covered bus stop will encourage park and ride use, minimizing motor vehicles on campus.

Project Data

- Budget: $34 M
- Schedule: Completion scheduled for Winter 2014
- Square Feet: 530 Net Vehicle Spaces

Status as of August 2012

- Project Status: Study-Planning
- Design Complete: 30%
- Construction Complete: 0%

Yost Ice Arena Seating Replacement and Fan Amenities Improvement

Project Description

This project will replace the spectator seating on the east, south and west sides of the rink, improving accessibility as well as emergency egress. The project also includes improvements to the east and west concourses, conversion of the level four west side media balcony into a series of loge boxes, a new level five on the west side for media, as well as new corner and stair platforms for additional seating. Infrastructure improvements will be made, including upgrading the existing fire alarm system, extending the existing fire suppression system to areas which are not currently protected, and replacing the exterior windows.

Energy Efficiency Measures

- The project will comply with ASHRAE Standards 90.1-2007
- Replacing existing single pane window with high performance glazing system
- Where mechanical units are replaced they will be replaced with high efficiency units

Other Sustainability Features

- We are renovating an existing building instead of tearing it down and/or building a new building
- During construction we will be using best management practices to control sedimentation and erosion

Project Data

- Budget: $14 M
- Schedule: Completion scheduled for Fall 2012

Status as of August 2012

- Project Status: Construction
- Design Complete: 100%
- Construction Complete: 65%

Complete Projects

Building Access Control Project

Project Description

Most entrance doors on the Ann Arbor campus are locked and unlocked manually. This project will replace existing lock hardware and install electronic card readers and door monitors on exterior doors. The new system will provide greater security and reliability. The building access system will be able to utilize the new university enterprise directory to manage access rights, and it will be able to be expanded to include additional doors in the future. The technology will enhance campus security by allowing for the potential to lock-down building access during major emergencies and by allowing deletion of individual lost, stolen or terminated cards without the expense and inconvenience of reissuing new building keys to all authorized users. Although there will be additional equipment to maintain, overall productivity enhancements will occur as the technology will eliminate the need for daily manual door locking and unlocking by custodians and other facility occupants. Also included in the project scope are the costs to re-issue all M-Cards to include the new smart card technology.

Energy Efficiency Measures

- Electric strikes utilize low-voltage power (used everywhere possible)
- Minimized high-voltage needs except where design constraints prohibited an alternative

Other Sustainability Features

- Centralized lock/unlock capabilities reduce the need for travel from building to building for keyed locks (typically executed with a single-occupant vehicle)
- Strikes, bollards and exit devices are made from stainless steel which is highly recyclable
- Strikes implemented wherever possible, in lieu of electrified panic devices, to reduce
    - Materials and labor for future replacement if/when necessary
    - Conduit required with high-voltage panic devices
- Reuse of existing exit devices wherever possible, reducing the amount of raw materials used in the project

Project Data

- Budget: $9 M
- Schedule: Completion scheduled for Spring 2011

Status as of July 2011

- Project Status: Active
- Design Complete: 100%
- Construction Complete: 100%

Couzens Hall Renovation

Project Description

Constructed in 1925, with a large addition added in 1956, Couzens Hall is an approximately 180,000-gross-square-foot residence hall housing 526 students. The renovation will repair and update infrastructure, including: new plumbing, heating, ventilation, fire detection and suppression systems, wired and wireless high- speed network access, renovated bath facilities and accessibility improvements. In addition, air-conditioning will be provided throughout the renovated building. New community and program spaces will be created in the dining areas that became vacant with the opening of the Hill Dining Center in the fall of 2008. New and reorganized spaces within the facility will revitalize the old residence hall and create spaces for living-learning and academic initiatives, student interaction, and creation of community. The energy performance of the overall building will be brought up to our current design guidelines by a number of energy conservation measures.

Energy Efficiency Measures

The Couzens Hall Renovation design focuses on maximizing energy efficiency and incorporates numerous energy conservation measures including:

- Insulating all existing exterior walls that are not currently insulated.
- Replacing existing window framing and glazing in the west half (original) of the building and replacing glazing in the east half (newer addition) of the building to increase thermal performance.
- Utilizing the chilled water from the Mechanical Services Building adjacent to Mosher Jordan Residence Hall as the cooling source for the Resident Rooms in lieu of DX units.
- Reducing the lighting power density for the first and second floor common areas.
- Utilizing space occupancy sensors in the resident rooms to reduce lighting power density and reduce run hours for the fan coil units.
- Utilizing space occupancy sensors on the first and second floor common spaces to reduce run hours for the central station air handling units.
- Using increased inspections, including infrared scans during construction to identify missing insulation, gaps in the enclosure and other wall/roof assembly deficiencies.
- Using an enthalpy wheel in the mechanical system as a means of energy recovery to utilize the lost heat from the toilet room exhaust system.

Other Sustainability Features

- Couzens Hall is being renovated on its current site with over 95% of the existing walls floors and roof and 50% of the interior non-structural elements being reused.
- Access is being improved thus encouraging the use of UM and public transportation.
- Bike racks will be installed to encourage the use of bicycles for transportation.
- No new parking will be provided on site (to reduce pollution and land development impacts).
- The use of water conserving plumbing fixtures including low flow toilets, urinals and shower heads will reduce water consumption by over 20%.
- Daylighting and views will be provided for over 75% of the spaces in the building.
- Use of regional and local materials used where possible (not less than 10%).
- Use of low VOC materials including adhesives, sealants, paints, coatings, carpet systems, composite wood and agrifiber products.

Project Data

- Budget: $49 M
- Schedule: Completion scheduled for Summer 2011
- Square Feet: 180,000 gsf

Status as of February 2012

- Project Status: Active
- Design Complete: 100%
- Construction Complete: 100%

Crisler Arena Renovation

Project Description

Built in 1967, Crisler Arena is a multi-purpose venue with a seating capacity of approximately 13,800 used for academic, athletic, and entertainment events. The arena has received minor renovations since construction, and we now propose addressing its highest priority infrastructure needs, including life safety, mechanical and electrical. The project will include: replacement of the roof and asbestos abatement as needed; new fire detection, alarm, and suppression systems; a new smoke evacuation system; emergency egress lighting; replacement of the heating and ventilation units; and building electrical system upgrades. The project will also replace the seats in the lower and upper bowl, including the addition of seating meeting the requirements of the Americans with Disabilities Act, as well as relocate and widen aisles and add hand rails to the aisles.

Energy Efficiency Measures

- Increased insulation in the existing roof, in the new exterior walls and under new slabs.
- Energy efficient windows/glazing in new windows for increase thermal performance.
- High efficiency lighting throughout.
- Occupancy sensors to control lighting during unoccupied times.
- Demand control ventilation to reduce amount of outside air being heated/cooled during times of low occupancy.
- Increase thermostat dead bands for heating during unoccupied times.
- Supply air ductwork sized at lower velocities which reduces the static pressure and therefore less fan energy is required.

Other Sustainability Features

- Reuse of the existing Arena, reducing waste from demolition of the existing arena and reducing the impact from constructing an entirely new arena.
- Site is located on public and UM bus routes, encouraging use of public transit.
- No new parking provided on-site (to reduce pollution and land development impacts).
- Use of an Erosion and Sedimentation Control Plan during construction to reduce pollution from construction by controlling soil erosion, waterway sedimentation, and airborne dust generation
- Energy efficient transformers
- Use of low VOC materials for pipe connections.
- Monitoring outside air delivery to ensure during low load conditions that the correct amount of outside air is being delivered.
- Air handling systems will be designed for thermal comfort by the occupants.
- Refrigerant systems will utilize HCFC which have almost zero ozone depletion ratings.
- The new mechanical system will be commissioned.
- Use of low-VOC materials (eg carpets, paints).
- Use of regional and local materials where possible.

Project Data

- Budget: $23 M
- Schedule: Completion scheduled for Winter 2012
- Square Feet: 360,000 gsf

Status as of February 2012

- Project Status: Active
- Design Complete: 100%
- Construction Complete: 100%

Law School Academic Building and Hutchins Hall Student Commons Addition

Project Description

The project includes a new academic building located south of Monroe Street, an addition between Hutchins Hall and the William W. Cook Legal Research Library for a new Law School commons, and renovations within both Hutchins Hall and the Cook Library. The new academic building will be approximately 100,000 gross square feet that will house classrooms, multi-purpose spaces, clinic work spaces, and offices for Law School faculty and administrators. The Law School commons project of approximately 16,000 gross square feet will provide needed student study, interaction, and support spaces. Additionally, the project will include life safety upgrades to Hutchins Hall and the Cook Library and the addition of an electrical substation and chilled water plant. The project will also replace the metal siding on the connection between the Law Quad buildings and the Cook Library stacks wing with a masonry façade.

LEED Certification: This project will seek LEED Silver-level Certification

Energy Efficiency Measures

This project is designed to surpass code required energy efficiency by 30% and some of the examples of the energy conservation measures include:

- Maximum insulation in foundation walls, exterior walls, and roof assemblies
- Energy efficient windows/glazing for increased thermal performance
- Occupancy sensors for the shutdown of VAV boxes
- Increase of “deadband” in the thermostat controls for all academic spaces
- Use of increased inspections, including infrared scans during construction to identify missing insulation, gaps in the enclosure, and other wall/roof assembly deficiencies
- Daylighting controls for perimeter spaces
- Reduction of lighting levels through use of occupancy sensors
- More efficient mechanical cooling achieved with the use of high efficiency chillers
- Domestic hot water reduction by using low flow fixtures
- Mechanical room airflow reduction achieved by ventilating the mechanical room based on occupancy
- Free cooling achieved by using dry coolers and getting energy savings associated with not running the air conditioning unit compressors

Other Sustainability Features

This project will seek LEED Silver-level Certification and examples of some of the additional sustainability measures incorporated into the project include:

- Law School new academic building is situated on a previously developed site instead of a new site and has no threatened or endangered plants or animal species that inhabit this space
- New building is sited on public and UM bus routes, encouraging use of public transit
  Bike racks and shower facilities are provided, encouraging alternative transportation

(continued on next page)

- No new parking provided on the site
- Landscaping is designed to have only native and adaptive plants and no lawns, therefore reducing the need for mowing and using invasive fertilizers
- Storm water management incorporates a detention tank that will significantly reduce the quantity of storm water
- Storm water quality will be controlled with the use of hydrodynamic separators
- Light colored hardscape surfaces will be installed to help the heat island effect
- All plumbing fixtures within the building will be low-flow fixtures and dual flush toilets
- At least 50% of construction waste will be diverted from disposal
- Regional materials are used wherever possible, as well as certified wood
- Use of low-VOC materials (carpets, paints)
- Use of grating mats and exhaust systems with filters to improve indoor chemical and pollutant source control

Project Data

- Budget: $102 M
- Schedule: Completion scheduled for Fall 2011
- Square Feet: 116,000 gsf

Status as of February 2012

- Project Status: Active
- Design Complete: 100%
- Construction Complete: 100%

North Campus Chiller Plant Expansion

Project Description

The North Campus Chiller Plant (NCCP) was completed in 2005 to provide chilled water to North Campus. The NCCP, when compared with individual building chillers, has resulted in energy savings, reduced operation and maintenance costs, increased redundancy and reliability, and reduced proliferation of cooling towers and the associated noise. In fiscal year 2009, the estimated annual operating cost savings due to the NCCP was approximately $200,000, with the majority of savings achieved with increased energy performance. We are now increasing the size of the facility by 8,500 square feet and add two 1,300 ton chillers, increasing the total capacity to 6,500 tons. In addition to the expansion of the NCCP, underground connections will be extended to provide chilled water to the Earl V. Moore Building, Space Research Laboratory, and Naval Architecture and Marine Engineering Building (NAME). The increased overall capacity of the plant will allow the elimination of the existing building chillers at the Francois-Xavier Bagnoud, Electrical Engineering and Computer Science, and George Granger Brown Memorial Laboratories (G. G. Brown) buildings, as well as provide cooling for the planned additions to G. G. Brown and the Michigan Memorial Phoenix Laboratory.

Energy Efficiency Measures

The North Campus Chiller Plant Expansion design concept in general minimizes energy and operating cost by incorporating the following energy conservation measures:

- Selecting chillers based on lowest life cycle cost, which is largely dictated by highest energy efficiency.
- Turning off the new substation during winter operation and just using the existing substation.
- Reducing the energy usage of general lighting by nearly 50% as a result of utilizing energy efficient High Bay Fluorescent light fixtures in place of less efficient Metal Halide lamped light fixtures.
- Daylight harvesting through the glass curtain wall and lowering energy usage of general lighting in this area.
- Insulating all exterior walls.

Other Sustainability Features

- Salvaging the existing acoustical screen-wall panels on the east end of the building and re-installing them in the same relative location on the new east wall of the NCCP.
- Salvaging the existing glass curtain wall on the east end of the building and re-installing it in the same relative location on the new east wall of the NCCP.
- Underground piping extended to satellite buildings was installed by directional boring piping in select areas, to minimize disruption of trees and other surface elements.
- The bentonite slurry from the directional boring will be mixed with the top soil and compose at the North Campus Grounds Facility to improve moisture retention in lieu of going to a landfill.

Project Data

- Budget: $8.7 M
- Schedule: Completion scheduled for Fall 2011
- Square Feet: 8,500 gsf

Status as of July 2011

- Project Status: Active
- Design Complete: 100%
- Construction Complete: 100%

North Campus Research Complex Building 16 Renovation for Health Services Research

Project Description

A renovation of the North Campus Research Complex Building 16 is planned to co-locate several health service research groups currently dispersed throughout the University. The five above-grade levels will be renovated to promote collaboration amongst groups and consolidate redundant resources to create a more efficient and cost-effective research environment. Conference space and a fitness center located in the below grade level will be renovated for general NCRC use. The project will also update the building's infrastructure, including heating, cooling, technology, code and accessibility improvements.

Energy Efficiency Measures

A primary goal for this project is to reduce energy consumption where possible in those areas being renovated in conjunction with preserving as much of the existing building assets as possible. Several sustainable practices being evaluated and/or implemented as part of this project including:

- The new floor plan design will open up work space to draw natural daylight further into the facility
- Life cycle analysis is being evaluated for converting from existing electric heating panels to a new perimeter hydronic fin tube design solution
- New low flow fixtures will be provided in toilet rooms to reduce water consumption
- The level of renovation was reduced by preserving by reusing and/or repurposing approximately 60% of the current floor plan layout
- Almost all of the existing furniture within the 120,000 gsf facility will be reused in the renovated space
- New energy efficient lighting fixtures with electronic ballasts will be used
- New occupancy sensors are being provided for more energy efficient lighting controls in offices, conference rooms and support spaces
- New timer light switching will be provided in janitor closets and storage rooms that have infrequent use.
- The existing carpeting will be recycled as part of the renovation
- Low VOC and recycled content will be used where possible

Project Data

- Budget: $13,700,000
- Schedule: Substantial Completion Spring 2012
- Square Feet: 120,000 gsf

Status as of August 2012

- Project Status: Construction
- Design Complete: 100%
- Construction Complete: 100%

North Campus Support Facility

Project Description

In order to meet increased demand for research computing and data storage capacity in a cost-effective and efficient manner, the university's Information and Technology Services (ITS) developed a long-term strategic plan to provide that support. Consistent with that plan, ITS now proposes placing a data center on North Campus in the area of the University of Michigan Transportation Research Institute. The project will consist of a modular data center, an approximately 700 gross square foot facility that will provide support space with benches for set-up and repair of equipment, and the necessary mechanical, electrical and data infrastructure. There will be no impact on parking from this project.

Energy Efficiency Measures

- Economizer cycle permits data center cooling with outside air most of the time, as opposed to mechanical refrigeration.
- Tight cold aisle/hot aisle containment prevents energy losses due to short circuiting of cooling air.
- Server rack system allows easy server change-outs without compromising cooling air distribution efficiency.
- Server inlet temperatures maintained at ASHRAE "Recommended" environmental conditions instead of the low air temperatures typically associated with data centers.
- Direct digital controls maintain energy efficient operation.
- Annual Power Utilization Effectiveness estimate at 1.23 compared to conventional data centers which typically have a Power Utilization Effectiveness of 2.00 or more. This means the data center efficiency exceeds 81% versus typical data centers which have an efficiency of 50% or less.

Other Sustainability Features

- The data center is a self-contained structure that avoids the need for a traditional bricks and mortar facility to contain it. This saves resources that would otherwise be required if a building was constructed to house the data center

Project Data

- Budget: $6.2 M
- Schedule: Completion scheduled for Spring 2011
- Square Feet: 700 gsf

Status as of August 2012

- Project Status: Construction
- Design Complete: 100%
- Construction Complete: 100%

Player Development Center for Intercollegiate Basketball

Project Description

The Player Development Center for men's and women's varsity basketball will provide approximately 57,000 gross square feet of support space, including two full basketball practice courts, locker rooms for men's and women's players and coaches, training, and hydrotherapy. The second floor will accommodate men's and women's coaching staff and administrative support functions, as well as film-viewing rooms and strength and conditioning space. The building will also provide a new accessible entry to Crisler Arena and a dramatic Hall of Fame at the entry lobby.

Energy Efficiency Measures

The Player Development Center design focuses on maximizing energy efficiency and incorporates numerous energy conservation measures, including:

- Maximum insulation in foundation walls, exterior walls, under slab, and roof assemblies
- Use of increased inspections, including infrared scans during construction to identify missing insulation, gaps in the enclosure, and other wall/roof assembly deficiencies
- Energy efficient windows/glazing for increased thermal performance
- External shading glazing for Hall of Fame curtain wall
- Use of translucent glazing to add daylighting to practice gym
- High efficiency lighting throughout with daylight sensors for spaces with fenestration
- Occupancy sensors to control lighting in offices, bathrooms, corridors, and conference rooms.
- Demand control ventilation to reduce mechanical loads to low occupancy and empty spaces
- High efficiency air cooled chiller
- Increase thermostat deadbands (the gap between the heating setpoint and cooling setpoint during which no conditioning is provided)
- Increased exhaust air energy recovery
- Automatic static pressure reset

Other Sustainability Features

- Use of an Erosion and Sedimentation Control Plan during construction to reduce pollution from construction by controlling soil erosion, waterway sedimentation, and airborne dust generation
- Player Development Center constructed on a previously developed site between Crisler Arena and the parking lot (in lieu of a greenfield site)
- Player Development Center sited on public and UM bus routes, encouraging use of public transit
- No new parking provided on-site (to reduce pollution and land development impacts)
- Use of water conserving plumbing fixtures, including low-flow shower heads low-flow lavatories, and waterless urinals
- Energy efficient transformers
- Use of select sustainable materials (eg steel structure, terrazzo flooring)
- Use of low-VOC materials (eg carpets, paints)
- Use of regional and local materials where possible (eg limestone, brick)

Project Data

- Budget: $23.2 M
- Schedule: Completion scheduled for Fall 2011
- Square Feet: 57,000 gsf

Status as of February 2012

- Project Status: Complete
- Design Complete: 100%
- Construction Complete: 100%

University Hospitals Central Sterile Supply Expansion

Project Description

Surgical procedure activity in the University Hospital operating rooms has increased by 30 percent since 1995. The volume of instrumentation requiring sterilization has exceeded the capacity of the current processing facilities. To achieve improvements in space, equipment, and work process, an expansion of the central sterile supply area on level B2 of University Hospital is proposed. A renovation of approximately 16,000 gross square feet of space will consolidate surgical instrument processing, assembly, sterilization and storage operations. The scope of the project includes the architectural, mechanical, and electrical work necessary to accomplish these improvements.

Energy Efficiency Measures: within the renovated areas, new HVAC and electrical systems are designed to optimize efficiency.

- Variable air volume control used where there are nonessential air pressure relationships including offices, locker rooms, break room, etc.
- Limited use of incandescent lighting.
- Occupancy sensors used where appropriate.
- Low consumption urinals, lavatory faucets, and shower heads used.
- Premium efficiency motors were used on all new motor driven equipment.

Other Sustainability Features

- NA

Project Data

- Budget: $ 6,900,000 Total
- Scheduled Completion: Winter 2012 (actual completion Fall 2011)
- Square Feet: 16,000 gsf

Status as of February 2012

- Project Status: Construction
- Design Complete: 100%
- Construction Complete: 100%

UMHHC Children's and Women's Hospital Replacement Project and Shell Space Completion Project

Project Description

The key goal for the C. S. Mott Children's Hospital and Von Voigtlander Women's Hospital is to provide a new, state-of-the-art inpatient and outpatient facility for children and women. The 1,100,000 gross square foot facility consists of a clinic building of 9 floors and an inpatient building of 12 floors plus a helipad on the easternmost roof. The building includes inpatient space, clinic and office space, and programmed shelled space. It is connected to the existing Taubman Health Center via a link as well as an elevated walkway to the Simpson Parking Structure. Site Improvements include utility reconfigurations, roadway reconfigurations, landscaping, steam tunnel and ductbank extensions, and storm water detention.

LEED Certification: UMHHC Children's and Women's Hospital Replacement Project will seek LEED Certification

Energy Efficiency Measures

The Children's and Women's design is focused on obtaining LEED certification. Other Energy Efficiency Measures include:

- Designed to ASHRAE Standard 90.1 including building envelop and glazing efficiencies.
- Energy modeling was performed to determine optimum system selections with maximum efficiencies.
- Energy efficient equipment is provided such as chillers, pumps and fans.
- Reduction of lighting power densities through the use of energy efficient compact fluorescent and LED fixtures.
- Reduction of lighting power usage through occupancy sensors throughout the building and daylight harvesting controls for the main lobbies and clinic corridors.
- Sophisticated Building Management System controls to optimize fan speeds and system performance.

Other Sustainability Features

- Vegetative roof to reduce storm water run-off, reduce heat island effect, and create a natural habitat.
- Storm water infrastructure (collection) and management to minimize run-off and avoid impact to neighboring Nichols Arboretum.
- Landscape Plan uses native plants and plant varieties acclimated to the Ann Arbor climate zone.
- Landscaping will be irrigated by 100% non-potable water collected in the underground storage basins.
- Use of Best Management Practices and Erosion and Sedimentation control measures during construction to minimize and prevent pollution, soil erosion, waterway sedimentation, and airborne dust generation.
- Recycling approximately 75% of construction waste.
- Building materials utilizing a high amount of recycled content.
- Very low amount of volatile organic compounds (VOC) utilized in building components.

Project Data

- Budget: $754 M
- Schedule: Completion scheduled for Spring 2012
- Square Feet: 1,100,000 gsf

Status as of February 2012

- Project Status: Complete
- Design Complete: 100%
- Construction Complete: 100%

University Hospitals Emergency Department Expansion

Project Description

A multi-phase renovation of approximately 22,500 gross square feet on level B1 of University Hospital will create 27 treatment bays, 6 triage rooms, 2 family consultation rooms, as well as expanded and improved patient reception areas for the Emergency Department. This renovation also includes the relocation and expansion of the Psychiatry Emergency Service to space adjacent to the Emergency Department. The scope of this project includes the architectural, mechanical and electrical work necessary to accomplish these improvements.

Energy Efficiency Measures: within the renovated areas, new HVAC and electrical systems are designed to optimize efficiency.

- The entry vestibule design is such that direct heating and cooling loses are minimized including insulated panels and glazing.
- Variable air volume control used where there are nonessential air pressure relationships including offices, locker rooms, break room, etc.
- Limited use of incandescent lighting.
- Occupancy sensors used where appropriate.
- Low consumption urinals, lavatory faucets, and shower heads used.
- Premium efficiency motors were used on all new motor driven equipment.

Other Sustainability Features

- NA

Project Data

- Budget: $ 13,900,000
- Scheduled Winter 2012
- Square Feet: 22,500 gsf

Status as of August 2012

- Project Status: Complete
- Design Complete: 100%
- Construction Complete: 100%

University Hospital Medical Procedure Unit Expansion

Project Description

This project will expand the MPU space by approximately 4,000 gross square feet into the exterior courtyard on level 2 adjacent to the MPU, and renovate 2,200 gross square feet of existing space. The expansion will create additional prep/recovery bays, procedure rooms, and storage space, and expand the patient and family reception and waiting room. The project will also include networking upgrades that will accommodate newer technology for endoscopic procedures. The estimated cost of the project is $6,000,000.

Energy Efficiency Measures

The project utilizes existing central HVAC equipment but the goal was to utilize energy efficient methods and strategies for the new construction wherever possible.

- Utilized variable air volume system.
- Installed energy efficient VFD and premium efficiency motors on existing central equipment supply and return fans serving space.
- Revised controls sequence for supply and return fans.
- Provided digital controls for new VAV boxes.
- Incorporated occupancy sensors to automatically shutoff lights where appropriate.
- Used high efficiency fluorescent lighting in all general spaces.
- Use ultra high efficiency LED exit lights, night lights and down lights in procedure rooms.
- Provided multi-level switching and dimming of lights.
- Maximized insulation in new roof assembly, exceeding min energy code requirements.
- Low VOC interior finishes (Paints, Flooring, Wall coverings, etc).

Other Sustainability Features

- High level of air quality in spaces.
- Infill of exterior courtyard, reuse of existing wall construction.

Project Data

- Budget: $6 M
- Schedule: Completion scheduled for Spring 2012
- Square Feet: 4,000 gsf addition and 2,200 gsf renovation

Status as of August 2012

- Project Status: Construction
- Design Complete: 100%
- Construction Complete: 100%

Wolverine Tower Renovations for Business and Finance

Project Description

Constructed in 1973, the eleven-story, approximately 225,000-gross-square-foot Wolverine Tower building was purchased by the University in 1992 and houses administrative units. A renovation of approximately 61,000 gross square feet on seven levels will consolidate units currently spread across several floors, move all staff workstations out of the basement, and accommodate the relocation of MHealthy into Wolverine Tower, resulting in more efficient use of office space and increased cross-departmental sharing of both administrative staff and of common areas, such as conference and training rooms, kitchens and lunch rooms. The project will also address life safety and accessibility concerns and add a common lunch room, wellness area and showers, and a personal room.

Energy Efficiency Measures and Other Sustainability Features

- Installation of new light fixtures which exceed ASHRAE +30%, equating to approximately $36,000 in electrical savings.
- Installation of occupancy sensors and controls in offices and conference rooms.
- Replacement of original variable air volume (VAV) boxes with new energy efficient units which will provide better temperature control as well as offering cost savings.
- The majority of existing office furniture was diverted from a landfill thru reuse or recycling.

Project Data

- Budget: $6.1 M
- Schedule: Completion scheduled for Fall 2011
- Square Feet: 61,000 gsf

Status as of February 2012

- Project Status: Complete
- Design Complete: 100%
- Construction Complete: 100%