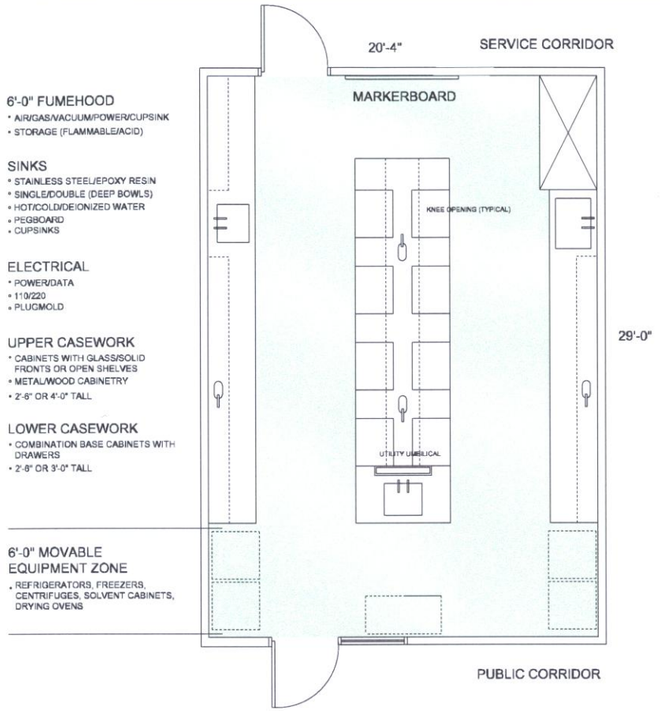
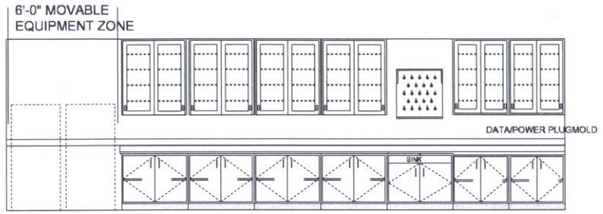
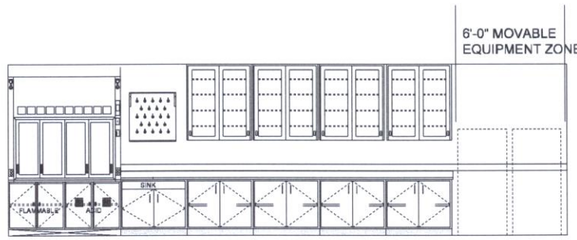


FLOOR PLAN

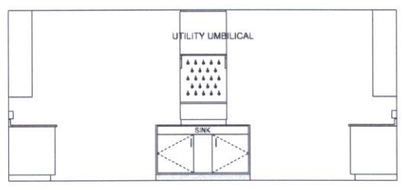


WALL ELEVATION

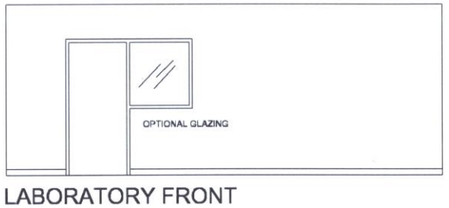


WALL ELEVATION

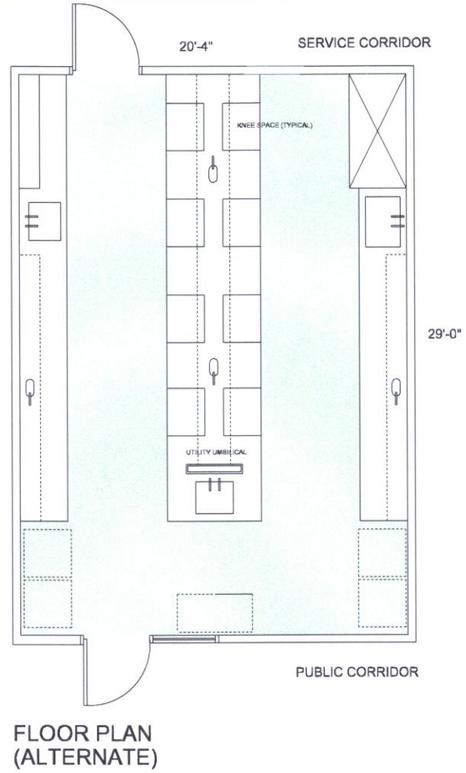
ISLAND ELEVATION



SIDE ELEVATION



LABORATORY FRONT ELEVATION



FLOOR PLAN (ALTERNATE)

Biology Research Laboratories

Laboratory Planning Concepts

Southern Illinois University Edwardsville

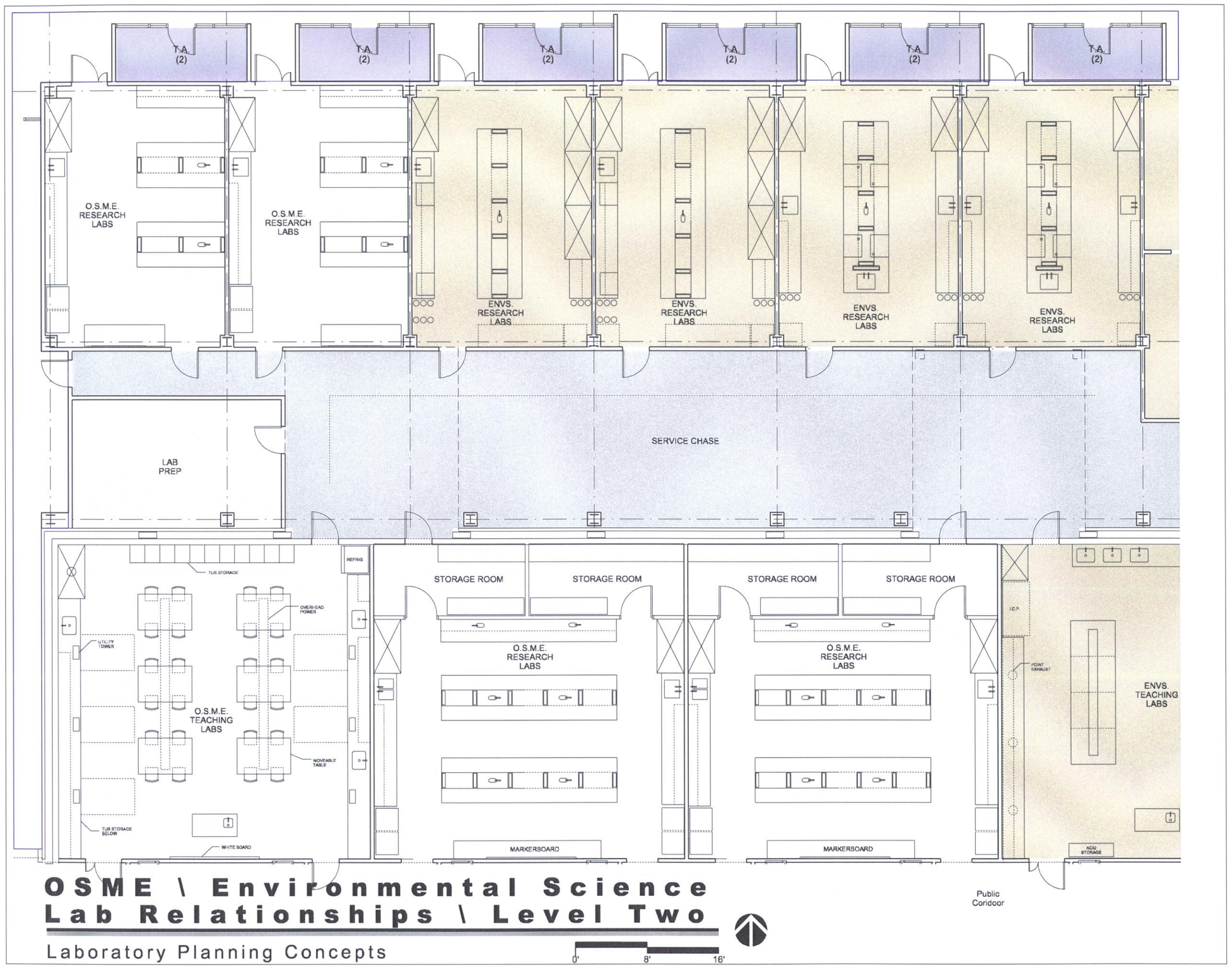
Science Building Renovation

PROGRAMMING & CONCEPT PHASE

Hellmuth, Obata + Kassabaum

St. Louis
Chicago

September 1999



OSME \ Environmental Science Lab Relationships \ Level Two

Laboratory Planning Concepts

Southern Illinois University Edwardsville

Science Building Renovation

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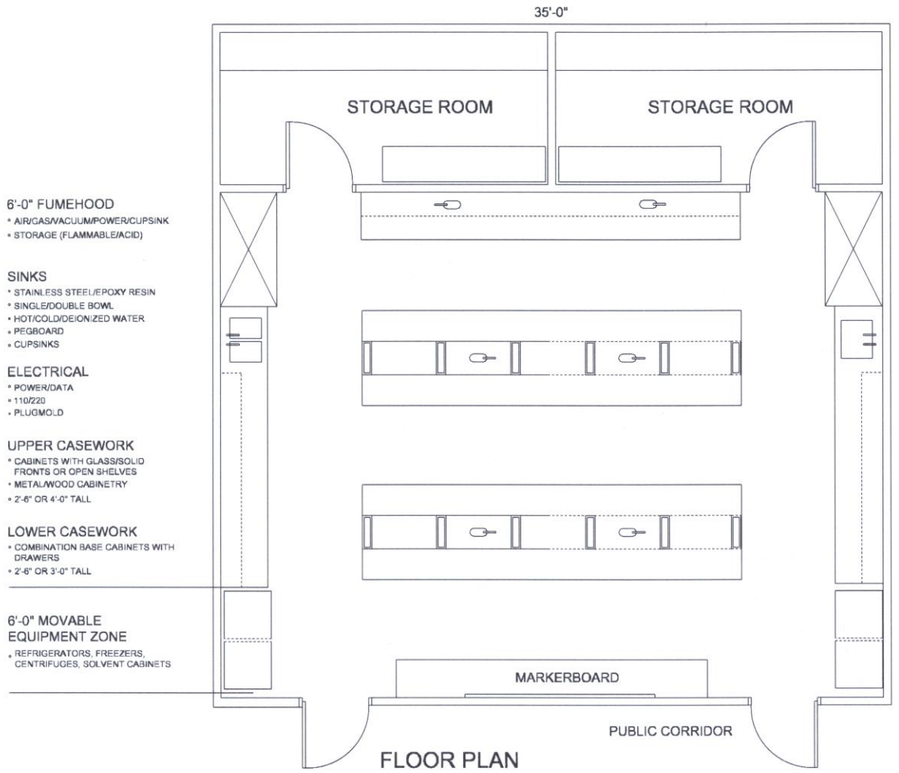

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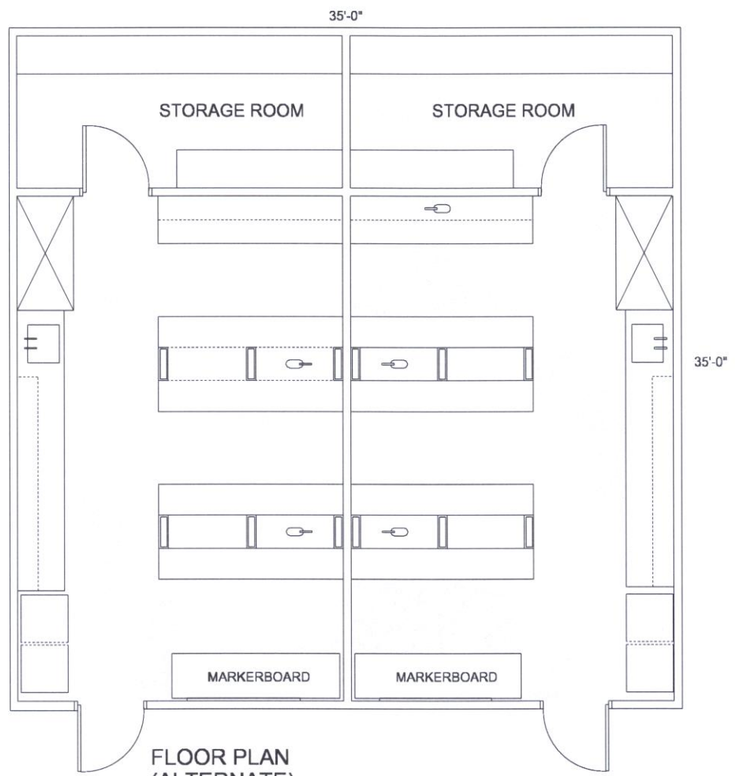
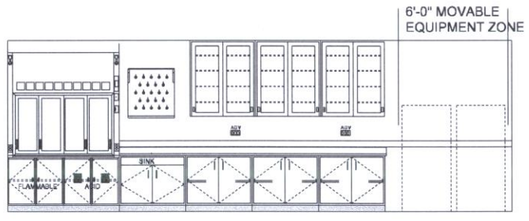


FLOOR PLAN
(ALTERNATE)



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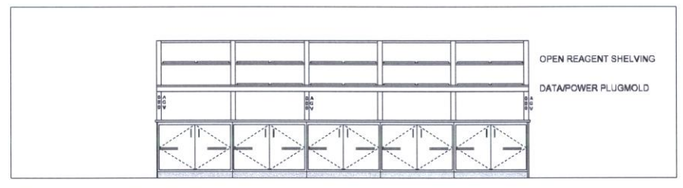
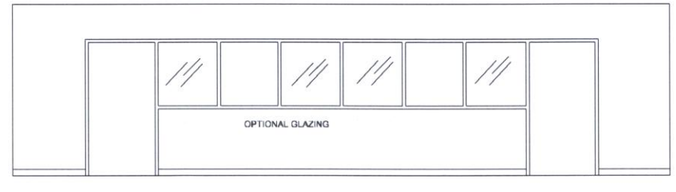


ISLAND ELEVATION



LABORATORY FRONT
ELEVATION

OSME
Research Laboratories

Laboratory Planning Concepts

Southern Illinois University Edwardsville

Science Building Renovation

PROGRAMMING & CONCEPT PHASE

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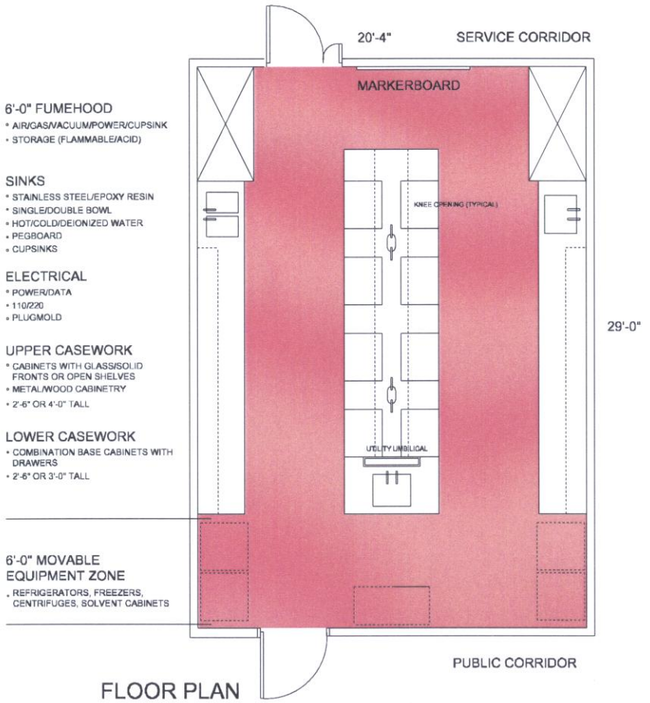
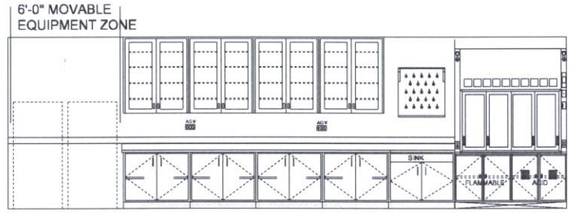


FLOOR PLAN



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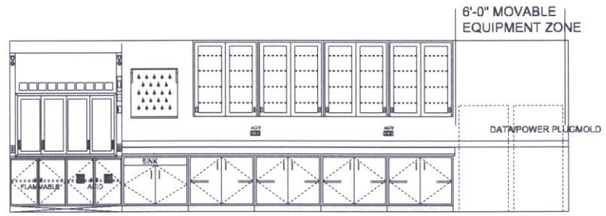

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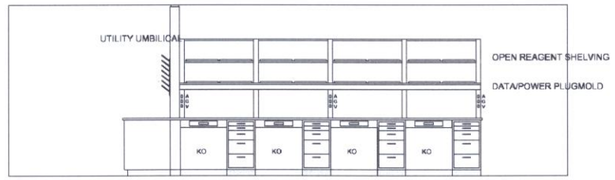
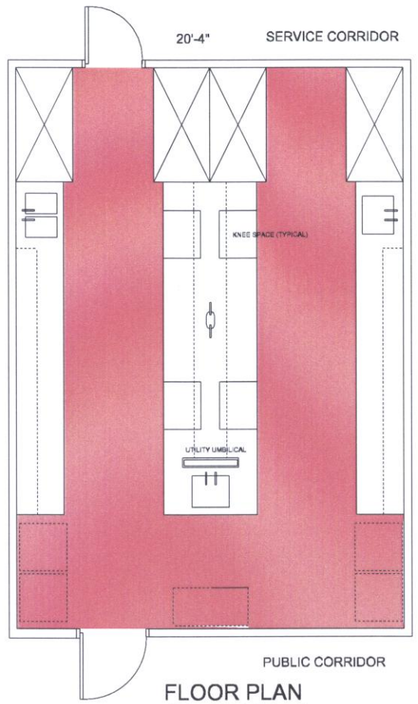
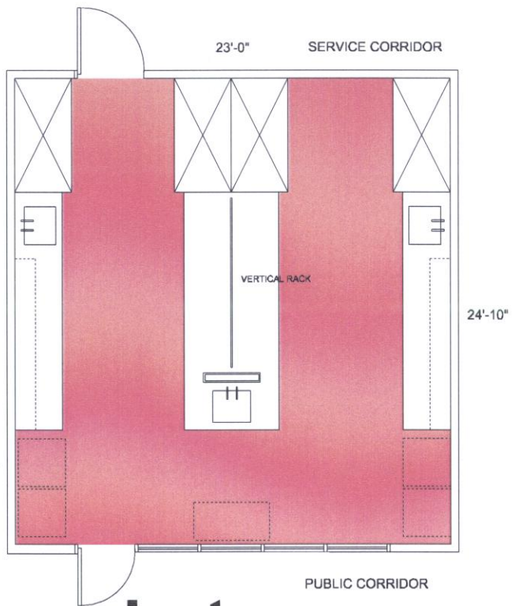


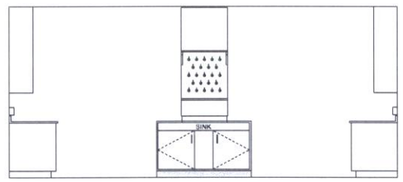
ISLAND ELEVATION



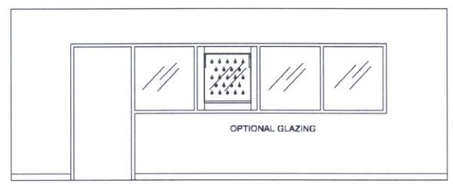
FLOOR PLAN
(ALTERNATE)



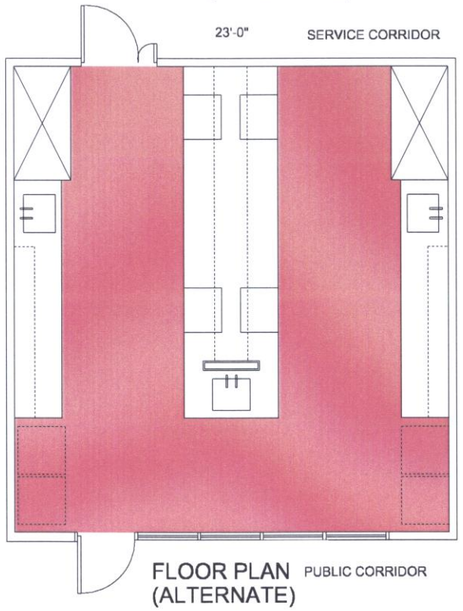
FLOOR PLAN



SIDE ELEVATION



LABORATORY FRONT
ELEVATION



FLOOR PLAN
(ALTERNATE)

Chemistry Research Laboratories

Laboratory Planning Concepts

Southern Illinois University Edwardsville

Science Building Renovation

PROGRAMMING & CONCEPT PHASE

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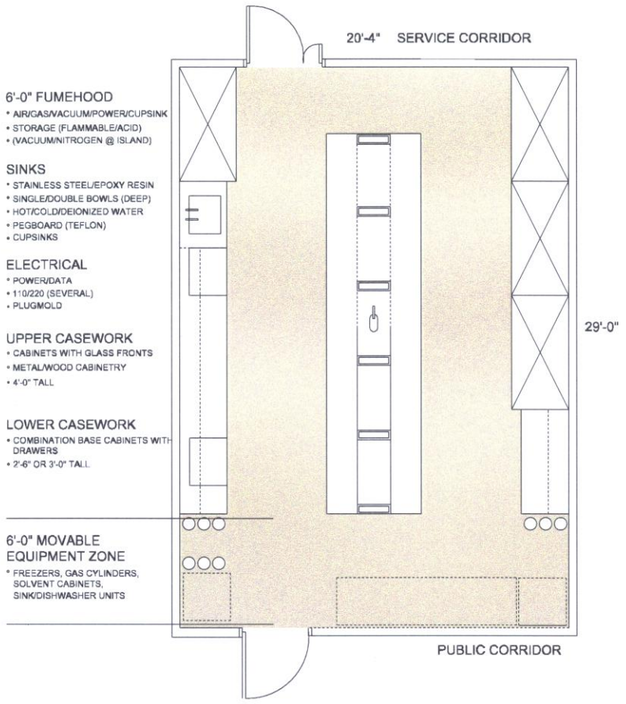
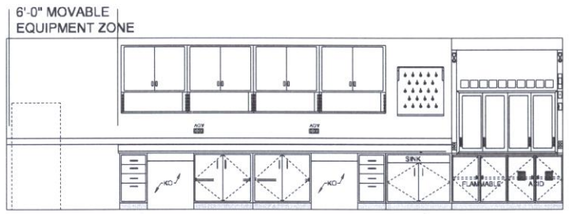
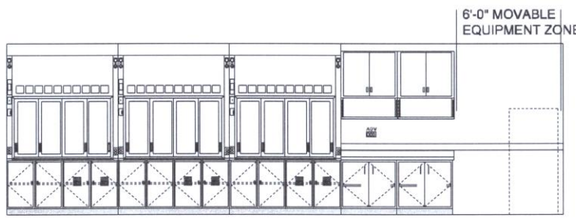


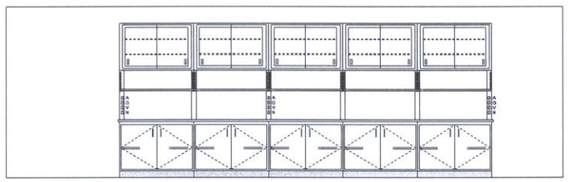
ENVIRONMENTAL CHEMISTRY
FLOOR PLAN



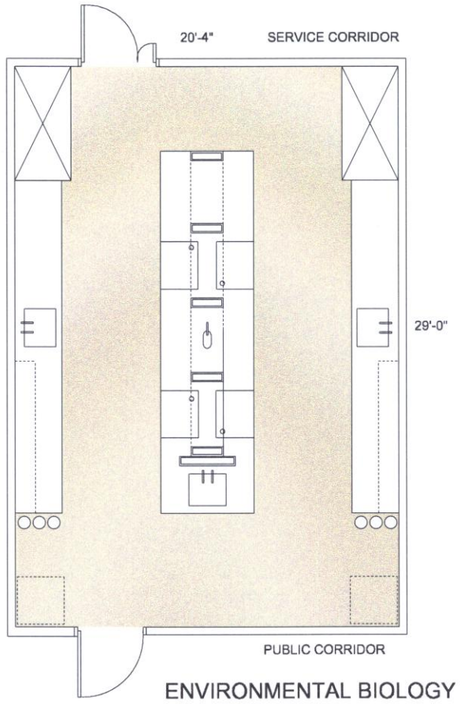
WALL ELEVATION



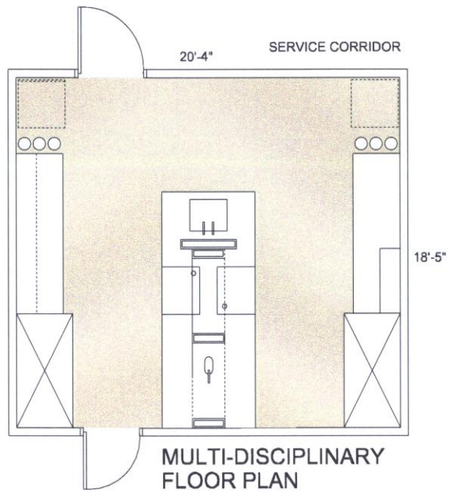
WALL ELEVATION



ISLAND ELEVATION



ENVIRONMENTAL BIOLOGY
FLOOR PLAN



MULTI-DISCIPLINARY
FLOOR PLAN

Environmental Science Research Laboratories

Laboratory Planning Concepts

Southern Illinois University Edwardsville

Science Building Renovation

PROGRAMMING & CONCEPT PHASE

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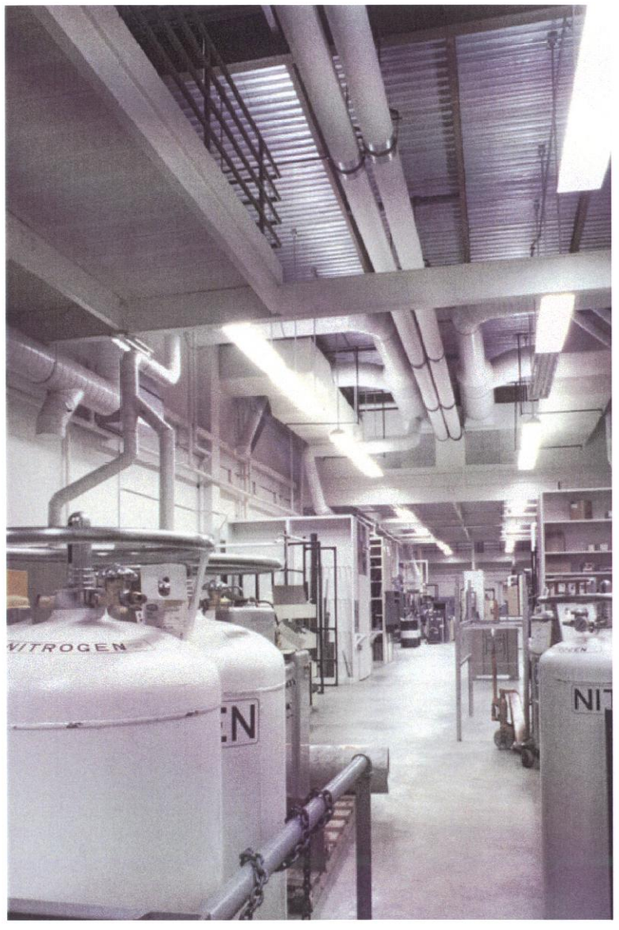

Engineering Systems

A. Existing Building Summary

1. The existing Science Building was constructed in 1966. The building has three levels including a lower level. There are mechanical penthouses located on the roof as well as an animal care facility. The existing building is divided into three components: auditorium, office wing, and laboratory wing. The building is essentially configured in a "L" shape with the laboratory wing to the east, the auditorium to the west, and the office wing is south of the auditorium. The building components are linked with two "core" areas. The restrooms, stairwells and elevators are located within these core areas. Following is a summary of the gross square foot area of the existing building excluding mechanical penthouses:

	GSF
Auditorium	33,700
Core Area (adjacent to Office Wing)	4,800
Office Wing	19,200
Core Area (adjacent to Laboratory Wing)	+10,400
Laboratory Wing	100,500
Lower Level Mechanical Room	3,180
Animal Care Facility (4th Floor)	3,370
Total	175,150

B. Proposed Building Addition:

1. The addition to the building consists of several components. An addition is planned for the north side of the laboratory wing. This addition will be three stories including a lower level mechanical room and will total approximately 40,000 GSF. This addition will primarily be used for offices. Another three-story classroom addition will be located to the north of the auditorium. The classroom addition will have approximately 10,000 GSF. New atriums will be built to the north and south of the center core area to serve as entries to the building. The atriums will be open the full height of the building with perimeter walkways at each level. The footprint of the atriums will be approximately 11,400 GSF. The total new area that will be added to the building will be approximately 61,400 GSF excluding new mechanical penthouses.

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C. Mechanical/Electrical Summary

1. The floor plan in every area and level of the existing facility will be renovated. Along with the renovation work, significant additions will be made to the building. The extent of the renovation work and additions to the building will require major changes to the building mechanical and electrical systems. Much of the equipment is in poor condition and will not have the capacity to serve the new addition and renovation. In addition, the equipment and pipe insulation appears to have asbestos containing material (ACM).

2. The addition to the Science Building will entail rerouting the underground utilities on the north side of the building farther to the north. The utility services to the building will also need to be replaced. A new electrical service will be run into the building and replace the existing one.

3. The existing heating, ventilating, and air conditioning (HVAC) equipment will not have the capacity to handle the Science Building renovation and addition. At present, the existing HVAC equipment does not provide sufficient make-up air to the building, especially in the Laboratory Wing. The building is severely negatively pressurized. Also, it appears that there is insufficient outside air for ventilation within the building. At some point the laboratory wing was retrofitted with new auxiliary make-up air units, but they do not appear to be operational. The majority of the existing mechanical room equipment (i.e., heat exchangers, pumps, air handling units, etc.) is original equipment and well past its expected life. The HVAC systems in the building will be replaced with new central air handling units having high efficiency motors and variable frequency drives to reduce power consumption during reduced load conditions. The new air handling units will be designed to provide outside air ventilation in accordance with current indoor air quality standards. As part of the renovation and addition to the building, the number of fume hoods will more than double. Presently there are approximately 49 fume hoods. These hoods will be replaced with about 118 new fume hoods. The existing fume hoods are in poor condition and lack code required vacuum breakers on the water outlets. The existing fume hoods exhaust a constant volume of air all of the time, night and day, regardless of sash position. This results in a large amount of conditioned air and energy being wasted. There are no fume hood or lab controls to insure that fume hood face velocities are maintained at safe levels and that the laboratories are kept negative with regard to adjacent spaces to prevent the spread of fumes and odors throughout the building. New variable air volume (VAV) fume hoods are proposed which will reduce the quantity of exhaust as the sashes are closed, yet maintain safe face velocities.

4. The existing centrifugal fume hood exhaust fans located inside the four mechanical towers are connected in series with a single exhaust fan located on the roof of each tower. With this arrangement, it is inherently difficult to maintain stable pressures and balanced airflows. Because of the number and type of fume hoods proposed, it will not be feasible to reuse the existing fume hood exhaust fans. All of the existing exhaust fans and associated exhaust ductwork will be removed. The exhaust ducts from the new fume hoods will be routed to four new exhaust systems located on the roof. These exhaust systems will be controlled to maintain sufficient negative static pressure in the exhaust ducts to insure safe fume hood use, while reducing energy costs by minimizing the exhaust of conditioned air from the building.

5. The existing power system does not have the capacity to serve the new addition and renovated building. A new larger electrical service will have to be installed. Installing two unit substations, with one providing service to mechanical equipment loads and lighting, while the other provides service to receptacles and laboratory power. This should help alleviate some of the power dips the current building is experiencing. Each lab will have it own panelboard. Lab panels will be protected by a transient voltage surge suppressors if there is sensitive electronic equipment located within the lab. Existing original light fixtures will be replaced by new light fixtures.

6. The existing emergency diesel generator is not sized large enough to handle the new addition and renovated building. A new diesel generator will be installed and sized large enough to handle the load for equipment and systems requiring emergency power either by code or by request from the using agency.

7. The following existing systems will be replaced or upgraded to a better system: Fire Alarm, Auditorium Sound System, Auditorium Dimming System and Lightning Protection System.

Mechanical/Electrical Summary

Engineering Systems

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Science Building Renovation

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D. Site Utilities

1. Existing:

a. The following underground utilities are routed along, and parallel to, the north side of the building:

1) 6" 350ºF high temperature hot water supply & 5" 320 degrees F hot water return
2) 10" 45ºF chilled water supply & 12" 55ºF chilled water return
3) Telephone
4) 12" domestic water main
5) 8" sanitary sewer
6) 2" 30 psig natural gas

All of the underground utilities listed above, except for the natural gas, fall within the footprint of the new addition and will need to be rerouted farther north.

b. The following lines presently enter the Science Building basement mechanical room:

1) 4" high temperature hot water supply & 4" hot water return
2) 10" chilled water supply & 10" chilled water return
3) 6" domestic water main
4) 8" sanitary sewer
5) 2" 30 psig natural gas

2. Proposed:

a. All of the existing utilities that enter the Science Building noted above will need to be replaced. Some of the lines will need to be increased in size. A new 8" fire protection water line will be routed to the building to serve the fire pump and sprinkler system.

b. The relocation of the utility mains and the replacement of the utility services to the building will need to take place prior to the construction of the new addition on the north side of the building.

c. The new chilled water, high temperature hot water, and domestic water connections to the building will be made in the same general area where the existing services enter the building so that they can be reconnected to the existing systems with minimal downtime. Additional valves will be installed at that time to simplify the changeover from the old chilled water, heating water, and domestic water equipment to the new equipment. Space permitting, the new equipment will be installed prior to the removal of the old equipment to minimize downtime.

d. A new duct bank will be extended from existing electrical manhole #9.1 thru new manhole #9.2 and then to the new 15KV lineup of switchgear located in the basement of the new addition. The existing 15KV cabling from existing electrical manhole #9 to #9.1 will be replaced with cabling sized to match the existing 15KV cabling running back to the electrical substation. The existing Library and Science Building will be kept in operation until the change over to the new service can be accomplished in order to minimize down time.

e. The existing telecommunications ductline will be rerouted outside of the new building addition footprint. New ductline, manholes, copper cabling and fiber optic will be installed as required. Copper cabling and fiber optic cabling may have to be increased for the added telecom outlets in the building renovation and in the new addition. Down time for the phone service will be kept to a minimum.

f. The existing site lighting will be removed where it conflicts with the new building addition footprint. New site lighting will be installed to match the existing light fixtures on campus. The light source will be HID and match the other outdoor HID light sources in the area

Site Utilities

Engineering Systems

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E. HVAC

1. Existing:

a. Laboratory Wing:

1) There are approximately 49 existing fume hoods in the building. The fume hoods are all constant volume (they exhaust a constant volume of air regardless of sash position). These fume hoods are in poor condition and in need of replacement. The majority of the hoods are 5 ft. wide with an assumed exhaust rate of 1000 cfm.

2) According to the drawings, auxiliary make-up air units were added in 1978 to provide tempered air (heating only, no cooling) directly to the existing fume hoods. The auxiliary make-up air units were installed in the mechanical towers. The units take 100% outside air in the winter and temper it to room temperature before delivering it to the fume hoods. In the summer, because the units do not have cooling capability, the air delivered to the fume hoods is the same temperature as the outside air. Air is ducted fromeach unit to as many as five fume hoods. The design exhaust from each fume hood is 1000 cfm with 700 cfm being provided by the auxiliary make-up air unit. The remainder of the air, 300 cfm, comes from the room or adjacent spaces. The exhaust ducts from the fume hoods are routed to fans located on the upper level of the mechanical towers. Each fan serves up to five fume hoods. Multiple fume hood fans located in each mechanical tower are connected in series to a single fan located on the tower roof with a stack to exhaust the contaminated air to the atmosphere. These stacks are visible from ground level. Having fans in series is not desirable because of the inherent difficulty in maintaining air flow balance and pressures between the fans. This arrangement is not recommended and cannot be used for the variable air volume (VAV) fume hood exhaust system proposed.

3) Existing recirculating units provide conditioned air to each lab. The supply air is delivered to the ceiling plenum and diffusers in the ceiling transfer air from the plenum to the space. The air is then returned to the units.

4) There is excessive negative pressure in the Laboratory Wing as indicated by the strong airflow when the doors in the wing are opened. This is attributed to insufficient make-up air to the labs and poor air balancing within the wing.

5) The piping insulation has asbestos containing material (ACM).

b. Auditorium:

1) The second floor mechanical space underneath the auditorium seats will be eliminated with the new floor plans. This will require the removal of the existing HVAC system that is located in the mechanical space which serves the auditorium portion of the building.

c. Office Addition:

1) The ground floor of the office addition has perimeter hot water radiation for heating. There are fan coil units around the perimeter of the upper floors that provide heating and cooling utilizing hot water and chilled water.

2) Conditioned air is ducted to each level from an air handling unit located in the penthouse above the adjacent core area. The perimeter areas of the upper levels are provided with a minimum amount of air for ventilation purposes. Fan coil units provide the primary means for heating and cooling for the perimeter spaces. The ground floor and interior areas are provided with a larger quantity of air from the air handling unit to meet the heating and cooling loads of the spaces. There are air valves and hot water reheat coils in the ducts to provide zone temperature control.

3) Because the floor plan will change significantly, it will not be feasible or practical to reuse the existing fan coil units, radiation, or ventilation system. In addition, all of the existing equipment has reached the end of its expected life.

d. Animal Care Facility:

1) The animal care facility is located on the 4th floor (roof) of the Science Building and has an area of 3,400 sq. ft. The original west half of the facility is served by a rooftop unit and the east half is served by a constant volume air handling unit. This unit is located within the space with an accompanying condensing unit located outside on the roof.

2) The existing rooftop unit serving the west half provides approximately 10 air changes per hour (ACH) for each animal room. Over half of the supply air is recirculated, the remaining portion is exhausted. The present HVAC system does not meet current animal care guidelines, which recommend a minimum of 15 ACH and 100% exhaust for animal holding rooms.

HVAC

Engineering Systems

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2. Proposed:

a. Chilled Water System:

1) The campus chilled water will be utilized as the cooling source for the new HVAC systems. The campus loop chilled water supply water temperature is 45 degrees F and the return temperature is 55 degrees F. New underground piping will be routed to the building as described above and will enter the basement mechanical room.

2) New chilled water pumps will be installed in the basement mechanical room to distribute chilled water to the air handling units. A standby pump will be provided for redundancy.

3) SIUE has expressed some concern about having sufficient chilled water capacity to serve the added load of the proposed Science Building renovation, especially combined with the added load of the new Engineering Building, which is presently under construction. A thermal chilled water storage system and other campus chilled water improvements are planned for the campus which will significantly improve the chilled water capacity, but it is unknown when these improvements will be initiated. This report assumes that the campus chilled water system will be adequate to serve the Science Building renovation and addition. The campus chilled water system improvements are not included in this project.

b. Heating Water System:

1) The campus high temperature hot water system will be utilized as the heating source for the new HVAC systems. New piping will be routed to the building as described above and it will enter the basement mechanical room.

2) New heat exchangers located in the basement mechanical room will be used as the source of the 180°F building heating water supply. The heating water distribution throughout the building will be delivered at this temperature.

3) New heating water pumps will be installed in the basement mechanical room to distribute heating water to the air handling units. A standby pump will be provided for redundancy.

4) The University does not anticipate any problems with the heating plant handling the additional heating water loads of the proposed Science Building renovation and the new Engineering Building which is presently under construction.

c. Air Handling Systems

1) The existing building and new addition will be served by two new built-up air handling units, AHU-1 and AHU-2. Two new air handling units are being used because of the size of the building and the different HVAC requirements within the building. Essentially AHU-1 will serve the east half of the facility which contains the laboratories and fume hoods and AHU-2 will serve the west half which is primarily offices and general occupancy areas. The entire building will be heated and air conditioned.

2) Each air handling unit will consist of the following:

a) Double wall insulated metal housing
b) Centrifugal supply fans
c) Chilled water coil bank
d) Integral face & bypass hot water coil bank
e) Air blender to thoroughly mix the return air and unconditioned outside air
f) Filter bank with 30% efficient filters
g) Return air, exhaust air and outside air dampers
h) Centrifugal return fans

Each unit will have two supply and return fans to provide redundancy and reduce the overall fan sizes. The fans will be controlled with variable frequency drives (VFDs). Doors will be installed which will provide access into each section of the air handling units.

3) AHU-1 will be located in the basement of the new north addition. It will serve the entire existing east lab wing and the new addition to the north. This unit will be capable of delivering approximately 250,000 cfm in order to provide conditioned make-up air at the same rate it is exhausted from the fume hoods. The outside air intake for AHU-1 will be located near grade level to minimize the potential for drawing in air that is exhausted from the fume hood fans located on the roof.

Because this unit is being constructed in the new addition, the existing HVAC equipment serving the labs will be able to remain operational for a longer duration during the construction period.

4) AHU-2 will be located inside a new penthouse constructed on the roof of the auditorium. This unit will serve the entire auditorium area, existing south office addition, existing core areas, new classroom addition and the new atriums. AHU-2 will be capable of delivering approximately 150,000 cfm.

This unit will be constructed when the new penthouse over the auditorium area is built so the existing HVAC equipment in the adjacent penthouses will be able to remain in operation for a longer duration during the construction period. The existing HVAC units serve the office addition and the lab wing.

5) The AHU-1 and AHU-2 systems will be variable air volume (VAV) systems. Each zone will be provided with a VAV box and reheat coil to provide temperature control for the space.

6) Ventilation will be designed in accordance with ASHRAE 62-1989, the current standard for ventilation for acceptable indoor air quality.

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d. Animal Care Facility HVAC

1) A new packaged air handling unit (AHU-3) will be installed to serve the animal care area. The unit will be located in an addition that will be made to the animal care facility or space will be allocated within the existing facility for the unit. AHU-3 will be designed to provide 15 to 20 air changes per hour of 100% outside air in the animal rooms in accordance with current animal care guidelines. It will have a DX coil for cooling and hot water coil for heating. The condensing unit serving AHU-3 will be located immediately outside on the existing roof. DX cooling will be used to insure there is cooling capability for the animal rooms regardless of whether the campus chilled water system is operational.

2) All of the animal holding rooms will be exhausted 100%.

3) Each of the animal holding rooms will be provided with humidifiers.

e. Laboratory Fume Hoods & Exhaust System:

1) The quantity, type, and locations of the new fume hoods in the lab wing dictate the size and capacity of the new HVAC system. The quantity of the fume hoods will increase from approximately 49 to 118 which will significantly increase the make-up air and exhaust requirements. That being the case, it will not be practical or feasible to salvage the existing HVAC systems.

2) Approximately 118 new 6 ft. VAV fume hoods will be installed in the lab wing. The VAV fume hoods maintain constant face velocities by varying the exhaust volume in response to changes in sash position. Maximum air is exhausted when the sash is fully open; minimum air is exhausted when the sash is completely closed. A minimum flow of about 20% total exhaust volume is maintained to achieve optimum containment and satisfactory dilution with the sash closed. The VAV fume hoods maximize energy savings and safety. Since only the amount of air needed to maintain the specified face velocity is pulled from the room, significant energy savings can be realized when the sash is in a closed position.

3) The fume hood exhaust will be collected and routed vertically to the roof through the new service corridor and through the existing mechanical towers. The fume hood exhaust ducts will be connected to new fume hood fans located on the roof.

4) The fume hood exhaust duct risers serving each floor will be kept separate and enclosed in two hour rated chases up to roof level as required by code.

5) All of the fume hood exhaust ducts will be constructed of 14 gauge 304L stainless steel. All of the joints and seams in the exhaust system will be welded to provide an airtight enclosure.

6) All rooms with fume hoods will be provided with an exchange rate of 10 air changes per hour (ACH) when occupied and 4 ACH when unoccupied. Lowering the air change rate during unoccupied periods, in conjunction with using VAV fume hoods, will significantly reduce energy costs. The rooms with fume hoods will be exhausted 100%.

7) Each lab with a fume hood will be maintained at a slightly negative pressure with respect to the adjacent corridor to prevent odors and contaminants from accumulating and spreading to other areas. A VAV box will regulate the supply air serving the room and a control damper in the general room exhaust duct will regulate the exhaust flow to maintain negative pressure in the room regardless of fume hood sash positions.

8) The air supplied to all rooms without fume hoods will be returned except for miscellaneous toilet exhaust.

9) The mechanical towers on both sides of the building, where the existing HVAC equipment is located, will be left undisturbed for as long as possible during the construction period in order to provide conditioned air to the occupied labs.

f. Fume Hood Fans:

1) Exhaust fans that are designed specifically for fume hood exhaust applications will be mounted on the roof.

2) The exhaust fans will operate at a fixed rate of airflow to insure high discharge velocities are maintained to keep the discharge plume as high as possible. The fume hood ducts will connect to an air plenum at the base of the fans. Bypass dampers mounted in the sides of the air plenum will allow outside make-up air to be drawn into the plenum and mix with the contaminated air before it enters the fan and is jetted out of the stack to provide good dilution. The exhaust fans will also have a stack design with discharge nozzles/windbands that entrain outside air into the high velocity discharge plume to provide additional dilution.

3) Static pressure sensors located in the fume hood exhaust ducts maintain a constant static pressure in the ducts by modulating the bypass dampers in the plenum. This insures that the fume hoods are safely exhausted with minimal loss of conditioned air.

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4) It is anticipated that four exhaust systems will be required. Two will be located on the north side of the existing roof and two on the south side. Based on the proposed fume hood locations and quantities, the two exhaust systems on the north side will handle approximately 50,000 cfm each. The two exhaust systems on the south side will handle approximately 30,000 cfm.

5) Because of the volume of air to be exhausted, dual fans will be necessary. The dual fan arrangement will also provide some redundancy which is highly recommended for safety reasons. The amount of redundancy desired would be evaluated against the fan costs when the exhaust system design is further developed.

6) The dual fan arrangements have footprints that are approximately 12' X 6' and weigh approximately 7,000 lbs. The dual exhaust stacks would extend 10 ft. minimum above adjacent roof levels to discharge the exhaust stream clear of the roof recirculation region and minimize the potential for downwash.

g. General Exhaust:

1) An exhaust system will be provided for toilet rooms and janitor closets. This exhaust system will be independent from the fume hood and laboratory exhaust system.

h. Control Systems:

1) Presently the Science Building is connected to the campus Johnson Controls Metasys DDC system. This system will be modified as required to accommodate the changes that will be made. The DDC control system will control and monitor the new building HVAC systems to maintain building comfort with proper ventilation and pressurization. The Johnson Controls workstation for the Science Building is located in the adjacent Library building and will remain there.

2) All of the temperature controls, room pressure controls, and fume hood controls in the building will be DDC and connected to the Johnson Controls Metasys system for remote monitoring and control.

i. Atrium Smoke Control System:

1) The smoke control system for the atriums will be designed in accordance with NFPA 92A and NFPA 92B. The smoke control systems will consist of exhaust fans located above the atriums and mechanical and gravity systems to provide low velocity make-up air to the lower level of the atriums.

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F. Plumbing

1. Existing:

a. It is anticipated that the majority of the underground sanitary, acid waste, and storm piping within the building will be reused. It also appears that a portion of the sanitary vent mains, acid waste vent mains, and storm risers within the building may be reused. The risers located in the mechanical towers on the north side of the building will need to be relocated to accommodate the new service corridor. The risers in the south mechanical towers may also have to be relocated in order to install the new fume hood exhaust duct risers.

b. The existing restrooms, associated fixtures, and plumbing piping will remain.

c. The majority of the domestic water piping mains throughout the building, especially in the lab wing, will require replacement to accommodate the new floor plan and new plumbing fixtures.

d. The water supplies inside the existing fume hoods are not protected with backflow devices as required by the Illinois Plumbing Code.

e. The plumbing and utility openings in the floors under the lab tables are not blocked-off or fire sealed.

f. The piping insulation has asbestos containing material (ACM).

2. Proposed:

a. Domestic Water System:

1) A domestic water pressure boosting system may need to be installed to insure sufficient water pressure on the upper levels. The packaged water pressure boosting equipment would be located near the water entrance in the basement mecahnical room.

2) All new domestic water piping will be Type L copper and insulated.

3) Safety shower/eyewash stations will be installed in all labs. Tempered water will be piped to each safety shower/eyewash station in accordance with code requirements. Floor drains will not be installed at the stations.

4) The water distribution piping serving the labs will be separate from the domestic water piping serving other areas of the building. Reduced pressure backflow preventers will be installed at the points where the lab water connects to the domestic water to eliminate the potential for cross-contamination. The lab water and the potable water supplies will be clearly and separately labeled.

5) The existing galvanized domestic water piping will be replaced with copper where possible. The piping serving existing fixtures which is located within walls, plumbing chases, or other inaccessible locations will not be replaced or reinsulated. Dielectric couplings will be installed where it is necessary to connect the new copper piping to the existing galvanized piping.

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b. Domestic Water Heating System:

1) Double wall heat exchangers will be installed to provide domestic hot water. The 180 degrees F hot water system will be used as the heating source for the heat exchangers. A hot water recirculating system will be installed to insure the available of hot water at remote fixtures. An separate water heating system, identical to the one noted above, will provide hot water to the laboratories.

c. Sanitary Waste & Vent System:

1) For the most part, the existing building sanitary and vent mains will not be affected by the new work and will be reused. New waste and vent piping will be added to accommodate new plumbing fixtures.

2) All new sanitary and vent piping will be cast iron or DWV copper.

d. Lab Waste System:

1) Where possible, the existing acid waste and vent mains will be reused. New acid waste and vent piping will be added as required for the new fume hoods and lab sinks.

2) The existing neutralization basins will be modified as required to accommodate the new wastewater loads.

e. Storm Water System:

1) The existing storm drains in the existing building will be reused.

2) New storm drain piping will be provided for the new additions to the building. The new piping will be routed underground and discharge to the on-site storm water system to the west of the building where the existing storm sewer discharges.

3) It is our understanding that storm water retention design is not required. The storm discharge to the west of the Science Building eventually enters "Stump Lake" which serves as a retention basin.

4) All of the new storm water piping aboveground will be cast iron; all of the underground storm piping will be cast iron or concrete pipe.

f. Natural Gas:

1) The 2" 30 psig natural gas service to the building will remain. The gas will be reduced from the service pressure of 30 psig to 7" w.c. immediately inside the building. The gas piping within the building will be modified and/or rerouted as required to connect to the new lab equipment and fixtures.

2) All new natural gas piping will be Sch. 40 black steel. All piping 2" and under will have threaded joints; all piping larger than 2" will be welded.

3) Shut-off valves will be provided at all equipment and each lab will have a main shut-off valve located in an accessible location. All of the natural gas piping will be clearly labeled within the building.

g. Special Laboratory Gases:

1) Individual cylinders of gases such as oxygen, nitrogen, helium and argon will be stored in gas storage rooms located near the laboratories and piped to fume hoods and lab equipment as required. The gas storage rooms will be ventilated in accordance with code requirements.

h. Compressed Air:

1) A new central compressed air system complete with air dryers, filters and piping will be provided. The air compressor will be located in the new basement mechanical room. New piping will be routed to laboratories and fume hoods.

2) A main compressed air shut-off valve will be provided in an accessible location for each laboratory.

i. Vacuum System:

1) A new central vacuum system will be provided. The vacuum system will be located in the new basement mechanical room.

2) A main vacuum shut-off valve will be provided in an accessible location for each laboratory.

j. Steam System:

1) Autoclaves and other equipment requiring steam will be provided with steam generators. A central steam system will not be required.

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G. Fire Protection

1. Existing:

a. At present the building is not sprinkled.

b. There is one fire hydrant located to the north and one fire hydrant located to the west of the Science Building.

2. Proposed:

a. The building will be fully wet sprinkled in accordance with NFPA 13.

b. Standpipes will be provided in accordance with NFPA 14

c. A new connection will be made to the existing water main running along the north side of the building and a separate water service will be brought into the new basement mechanical room for the sprinkler system. Making the new connection to the water main will be easily facilitated because the water main will need to be rerouted farther north to accommodate the new building addition.

d. Multiple sprinkler risers will be required because of the size of the building. The risers will be located at the new fire line entrance and mains will be routed from that point to serve the different zones of the building.

e. A fire pump will be required to provide sufficient pressure for the sprinkler system. The fire pump will be installed in accordance with NFPA 20. The fire pump will be electric and located in the new basement mechanical room. The fire pump will be connected to the new emergency generator.

Fire Protection

Engineering Systems

H. Electrical

1. Power:

a. Existing:

1) The Science Building transformer is served from the campus 15KV primary selective system. This transformer provides 277/480 volt, 3 phase, 4 wire service to the main 2500 amp 277/480 volt, 3 phase, 4 wire electrical switchboard. This switchboard, in turn, provides service to step down 3 phase transformers, normal side of the automatic transfer switch for the emergency power system, and distribution panels located throughout the ground floor of the building. These panels provide service to panelboards located on each floor which provide service to the lighting and mechanical equipment requiring 480 volt 3 phase power.

2) The 3 phase transformers fed from the main switchboard step the voltage down from 480 volts 3 phase to 120/208 volts 3 phase, 4 wire on the secondary side of the transformer. The secondary side of the transformer provides service to distribution panels located throughout the ground floor level. These panels, in turn, provide 120/208 volt, 3 phase, 4 wire service to panelboards and 400 ampere plug-in bus ducts located on each floor. The bus ducts provide service to panelboards located near each laboratory. These panelboards provide service to receptacles, lighting and equipment requiring 120 or 208 volt single phase services and equipment requiring 208 volt, 3 phase services.

3) For the most part the electrical distribution equipment is the original equipment installed when the building was built over 30 years ago. The equipment appears to be in good shape but the university has been experiencing some overloading problems in the laboratories. With the renovation of the existing building and the new addition, the existing service will not be large enough to handle the power requirements for the building.

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b. Proposed:

1) A new lineup of 15KV switchgear consisting of two (2) incoming switches, two (2) fused load break switches and one (1) either automatic or manually operated tie switch will be installed. Each fused load break switch will provide service to a unit substation. One unit substation will provide 277/480 volt, 3 phase, 4 wire service to the building and the other unit substation will provide 120/208 volt service to the building.

2) The 277/480 volt unit substation will provide service to mechanical equipment, motor control centers, lab equipment requiring 480 volt, 3 phase service, and lighting panelboards located on each floor. This substation will also provide the normal power service to the emergency power system.

3) The 120/208 volt unit substation will provide service to plug-in bus ducts located on each floor of the laboratory wing of the building, distribution panelboards, and branch panelboards located on each floor in the lab wing. The plug-in bus ducts will provide 120/208 volt, 3 phase, 4 wire service to laboratory panelboards.

4) Each lab will have its own panelboard and be sized to meet the load requirements for that lab. These panelboards will provide service to receptacles and other lab equipment requiring 120 or 208 volt, 1 phase service or 208 volt, 3 phase service.

5) The panelboards located on each floor of the lab wings will provide service to receptacles located in hallways and offices. A distribution panel will be located on each floor of the office and classroom wing. These distribution panels will provide service to panelboards located on the same floor. These panelboards will provide service to receptacles located in the hallways, classrooms and offices. They will also provide service to equipment requiring either 120 or 208 volt 1 phase service or 208 volt 3 phase service. Each computer room will have its own panelboard.

2. Emergency Power:

a. Existing:

1) The emergency power distribution system consists of a diesel powered generator, automatic transfer switch, normal power feed from the main switchboard, and panelboards. This system provides service to egress lighting, exit signs, fire alarm system, animal room air handling unit, hot water pump and one elevator. The generator capacity was increased a few years ago to handle the addition of the animal room. The equipment appears to be in good shape but it does not have the capacity to handle the renovation and new addition.

b. Proposed:

1) A new 277/480 volt, 3 phase, 4 wire diesel powered generator will be installed with capacity to handle the load of the proposed renovation and addition. This generator will provide service to the following two (2) automatic transfer switches:

a) One of the transfer switches will provide service to a distribution panel. This panel will provide service to branch panelboards located on each floor; 120/208 volt, 3 phase, 4 wire panelboards via step down transformers; and motor control centers. These panelboards and motor control centers will provide back up power for egress lighting, exit signs, fire pump, smoke control fans, fume hood collection fans, elevator, fire alarm panel, telecom power, hot water pumps, air handling unit for the animal rooms and sump pumps.

b) The other automatic transfer switch will be a delayed transfer and will switch only after the other transfer switch has switched. This switch will provide service to a 120/208 volt, 3 phase, 4 wire distribution panel via step down transformer. This distribution panel will provide service to a panelboard located on each floor in the laboratory wing. These panelboards will provide service to one receptacle per laboratory and equipment within the laboratory wing deemed necessary by the University to be on emergency power.

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3. Lighting:

a. Existing:

1) The majority of the existing light fixtures in the building are the fluorescent type. The remainder are HID and incandescent type light fixtures. All of the fluorescent fixtures were retrofitted a few years ago with T-8 lamps and electronic ballasts. In addition, most of the incandescent down lights were retrofitted with PL type fluorescent lamps. The light fixtures are in poor condition and near the end of their useful life.

b. Proposed:

1) All lighting will be 277 volts except for incandescent lights at 120 volts and site lighting that will match the existing site lighting voltage. Lighting inside the building for the will be fluorescent type luminaries with T-8 (3500 deg.) lamps with a high color rendering index and electronic ballasts. Compact fluorescent luminaries will be used in areas requiring lower light levels. Incandescent lighting will be used in areas where dimming is needed. High intensity discharge (HID) lighting will be used in high ceiling areas and for site lighting. Exit signs will be the LED type.

2) The design foot candle (FC) levels will be as follows:

a) Laboratories and classrooms	80 FC
b) Offices	50 FC
c) Computer Labs	30 FC
d) Hallways, Lounges, Restrooms, etc.	20 FC

4. Systems:

a. Existing:

1) The systems portion can be divided up into the following systems: Fire Alarm, Telecommunication, Light Dimmer and Sound System in the auditoriums and the TV system.

2) There is both fiber optic and copper telephone cabling routed to the building. There is at least one telecom outlet per office, lecture room and laboratory. This is not enough outlets for a modern day science building. The telecom entrance room can be reused, but the fiber optic and copper entrance cabling will have to be up-sized to accommodate the extra outlets that will be added to the system due to the building renovation and addition.

3) The sound and television systems appear to be the original equipment and in need of replacement.

4) The fire alarm system appears to be a zoned type system and needs to updated to an addressable type system.

b. Proposed:

1) Telecommunications:

a) The existing telecommunications room located in the basement will be reused. The existing building service fiber and copper cabling may have to be increased. New distribution rooms will be provided on the ground floor and third floor of the laboratory wing, office, and classroom wing. Wiring closets will be provided in both wings on the first and second floors.

b) Each laboratory and office will have a minimum of one (1) telephone/data outlet per room. Additional telephone/data outlets will be installed in teaching and computer labs as required.

c) Cable tray will be routed above accessible hallway ceilings to telecom closets or distribution rooms. Telecom closets and distribution rooms will be stacked, where possible, for ease of cable riser installation.

d) Telecom cabling, outlets and terminations will be installed in accordance with University standards.

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2) Fire Alarm:

a) A new fire alarm system will be installed in the building to meet current code and University standards. The existing system will stay in place and remain operational until the new system is completed.

b) A new addressable fire alarm control panel will be installed along with initiation devices (i.e. manual pull stations, smoke detectors, heat detectors, flow switches, etc.) and alarm devices (i.e. horn/strobes, visual lights). Both initiation and alarm devices will be installed in accordance with NFPA 72 and ADA requirements.

3) Transient Voltage Surge Suppression (TVSS):

a) TVSS will be installed in both unit substations, computer lab panelboards and at selected laboratory panelboards that serve sensitive electronic equipment.

4) Dimming System:

a) A new dimming system will be installed in the remaining auditorium. Classroom and conference room dimming will be controlled by manual dimmer switches.

5) Sound System:

a) A new sound system will be installed in the remaining auditorium.

6) Lightning Protection:

a) A complete lightning protection system will be installed on the building and meet current code.

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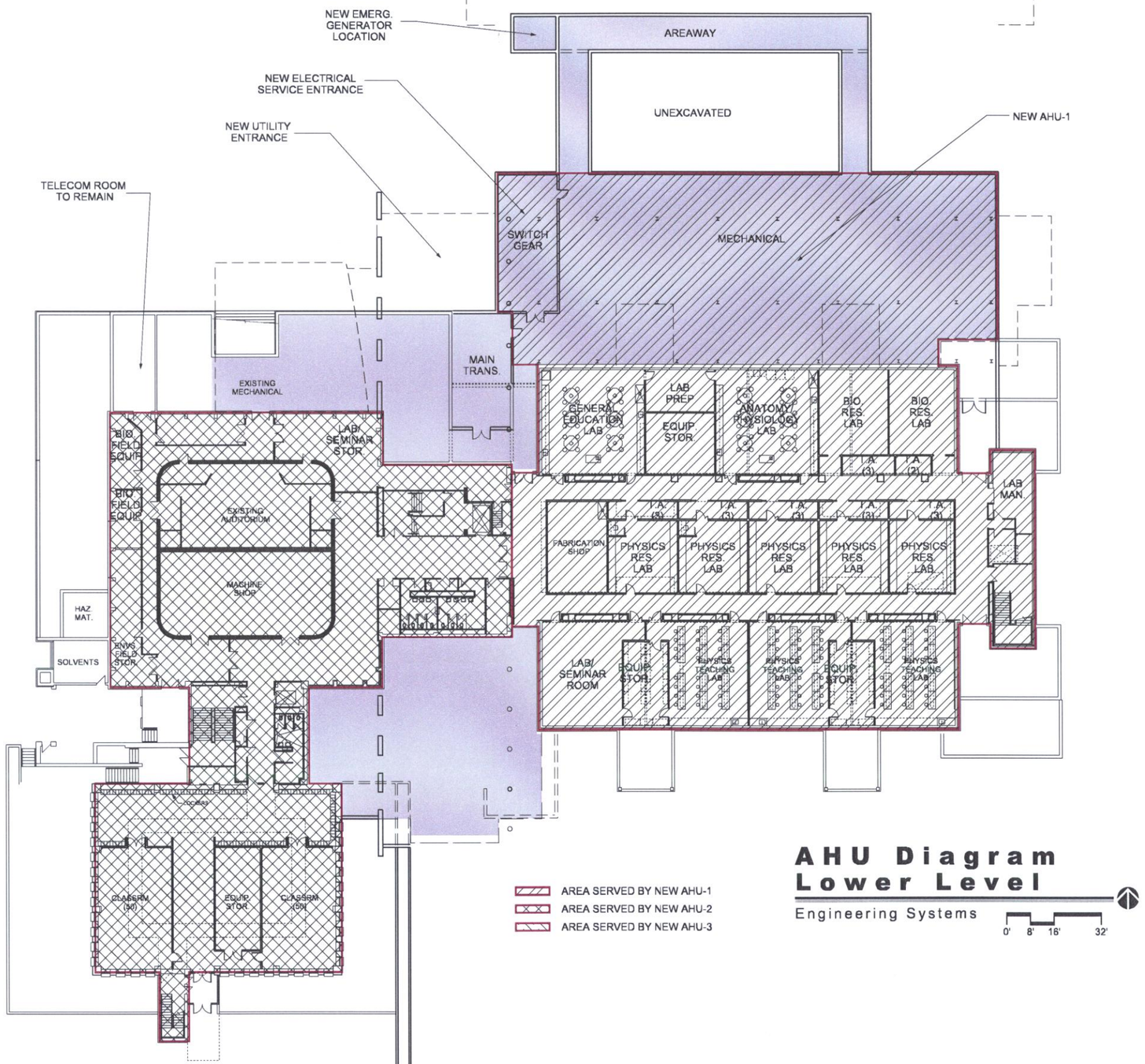

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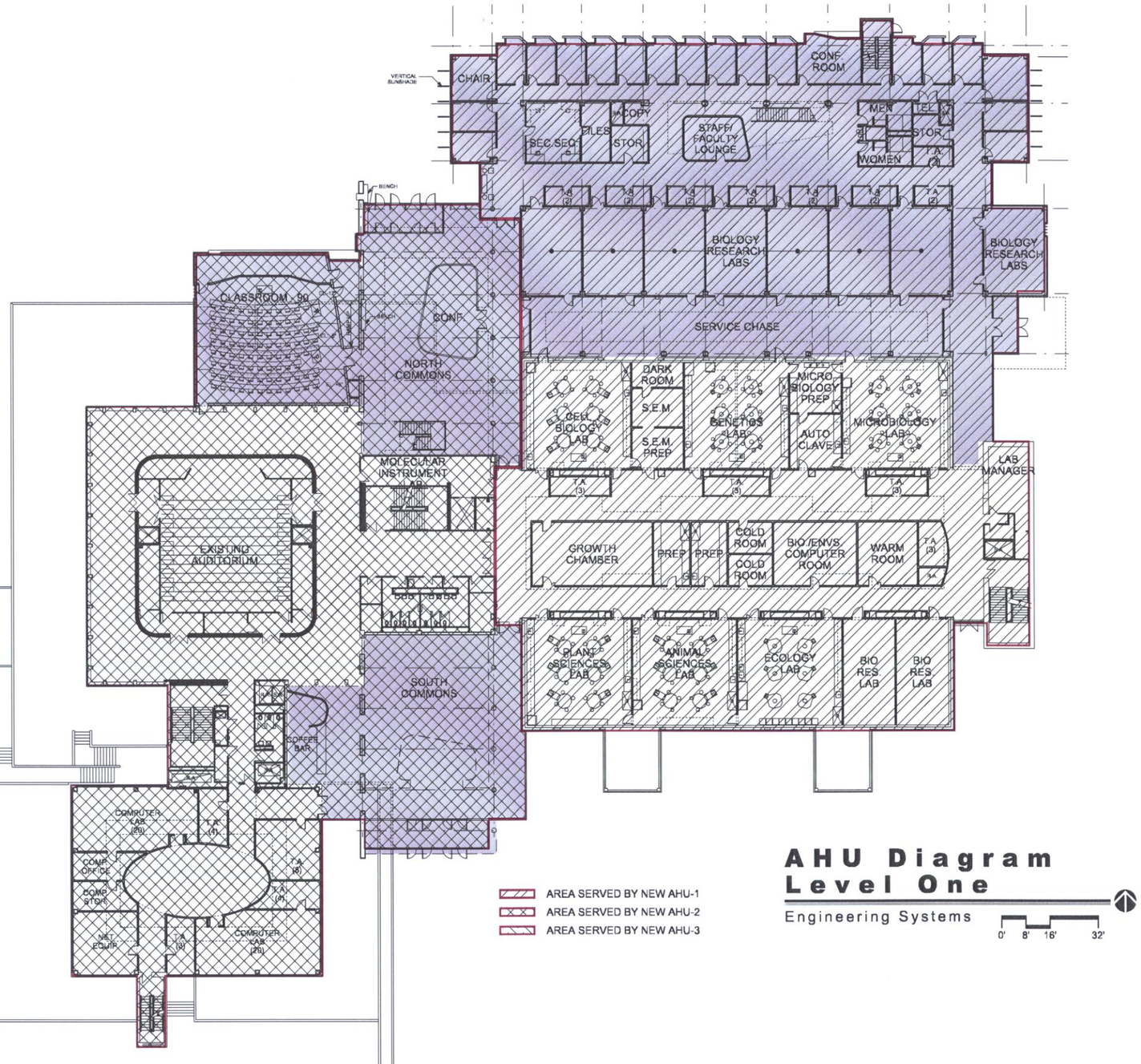

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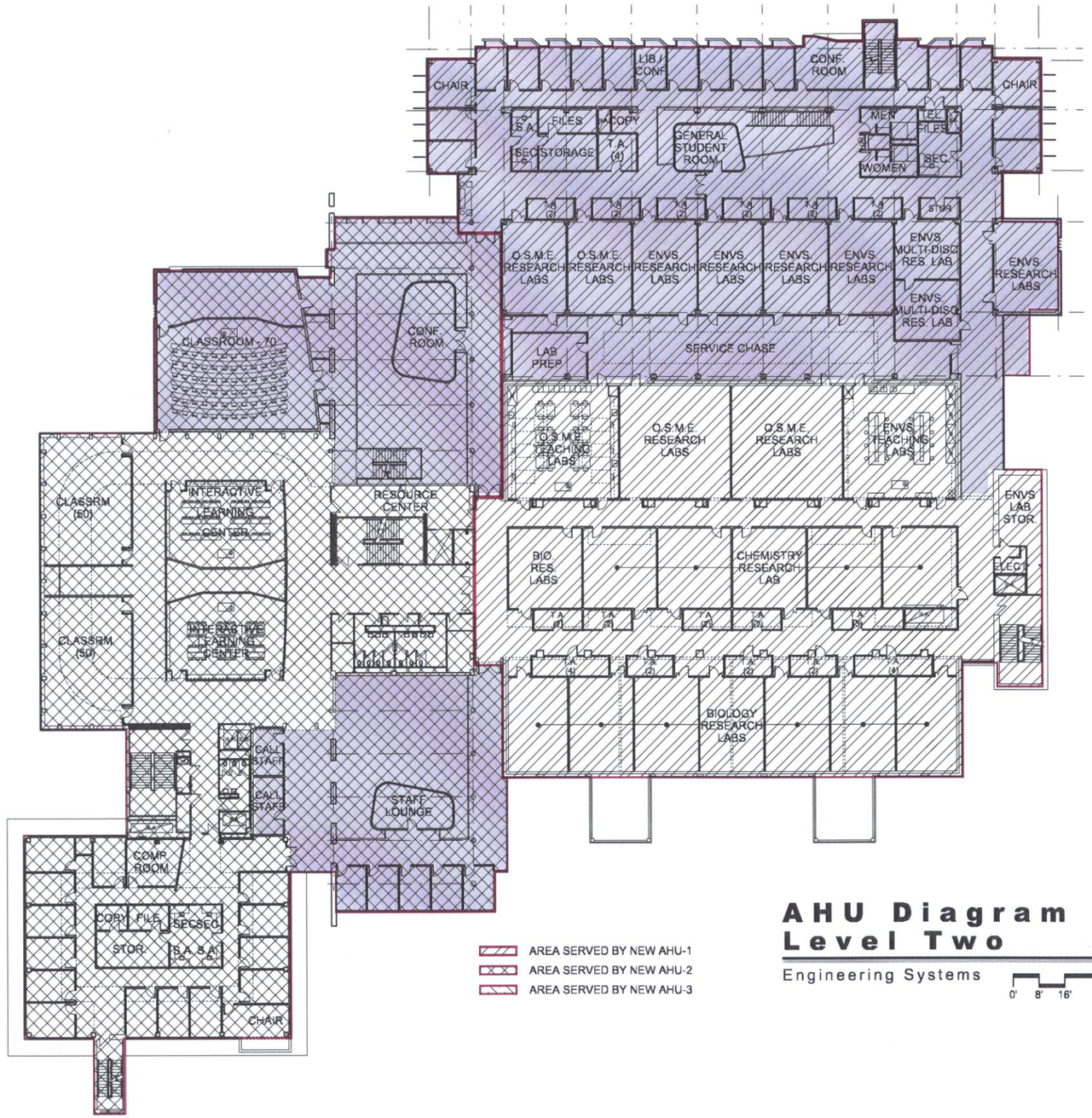

AHU Diagram
Level Two

Engineering Systems

0' 8' 16' 32'

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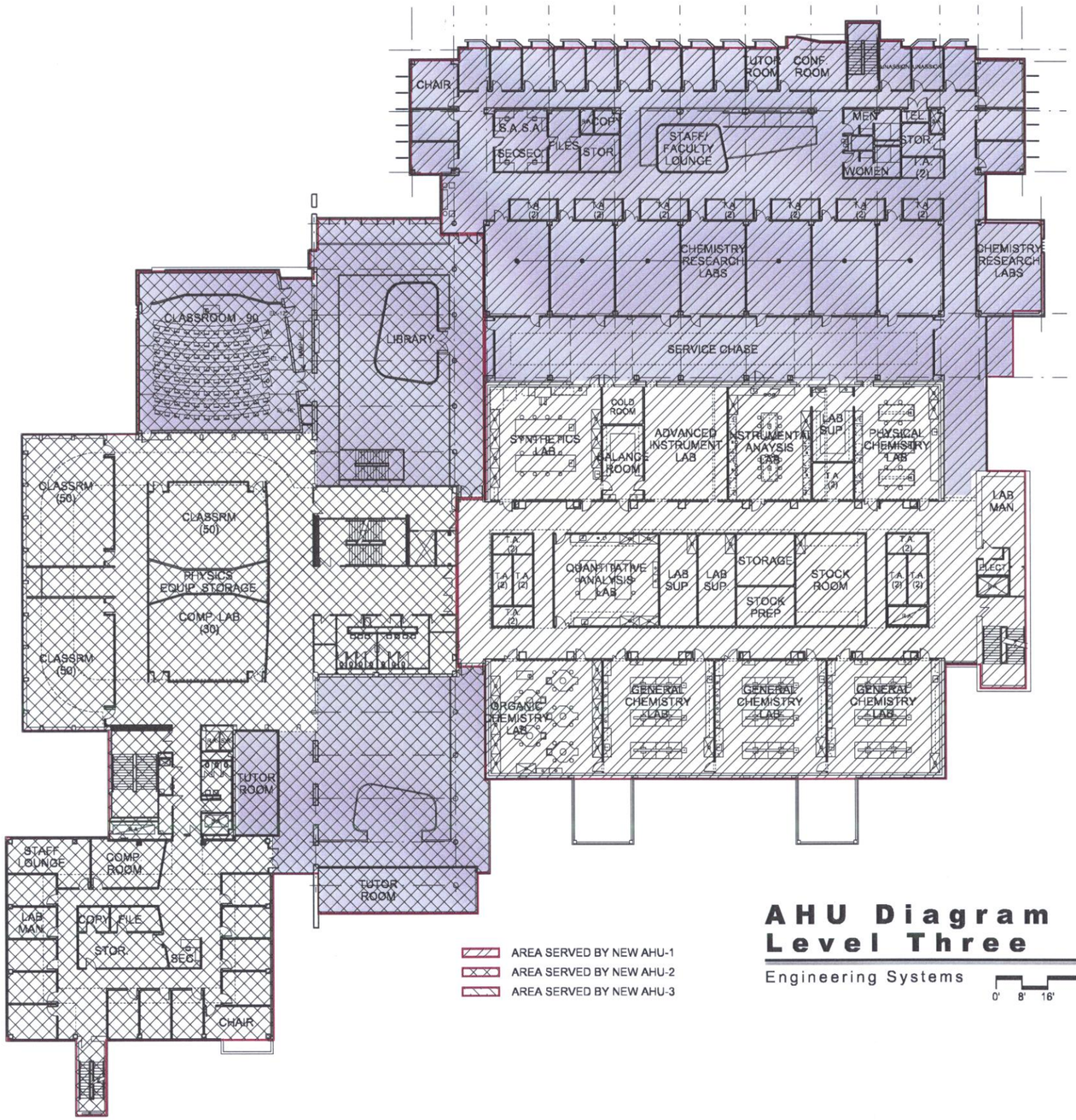

AHU Diagram
Level Three

Engineering Systems

0' 8' 16' 32'

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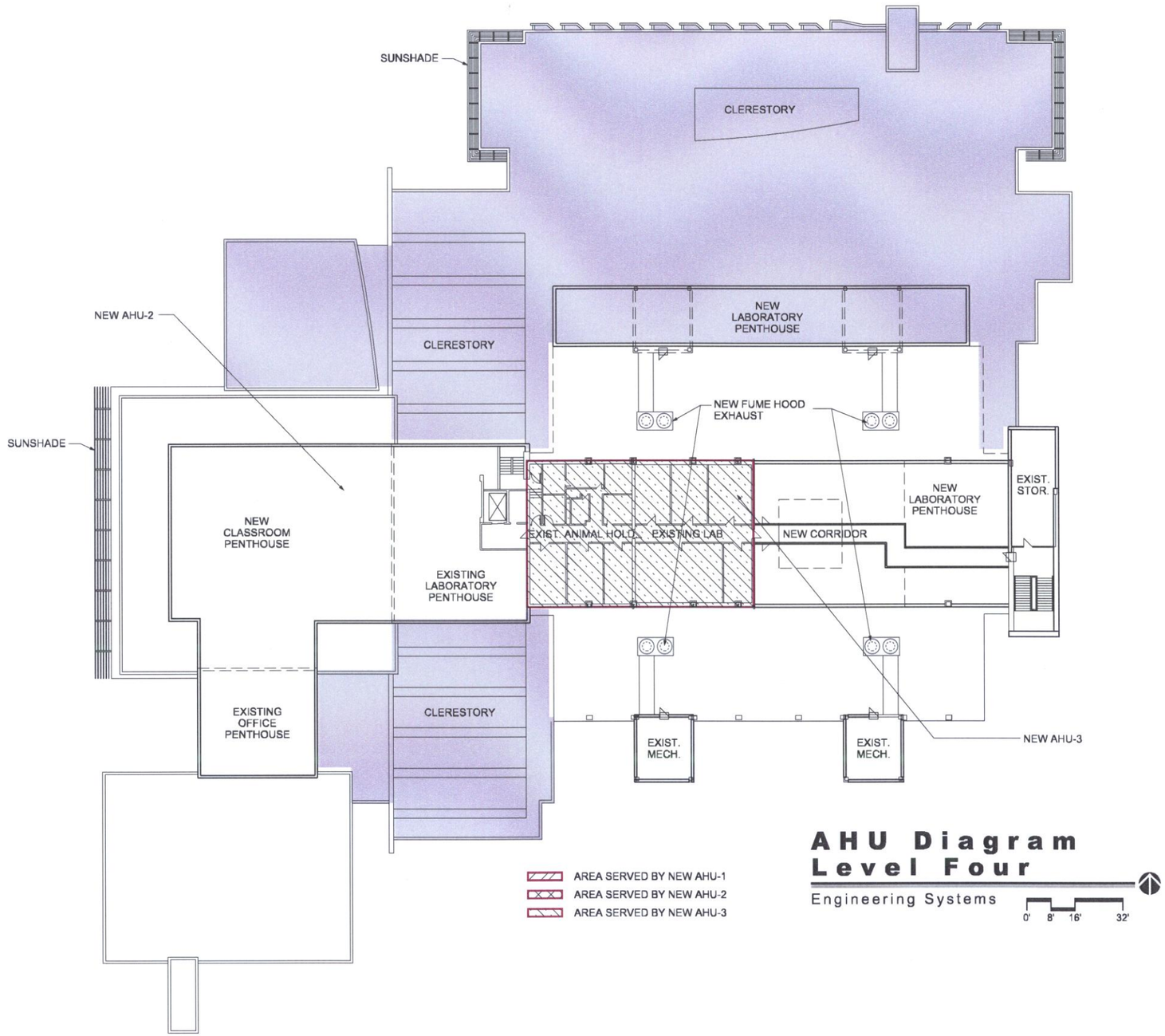

AHU Diagram
Level Four

Engineering Systems

0' 8' 16' 32'

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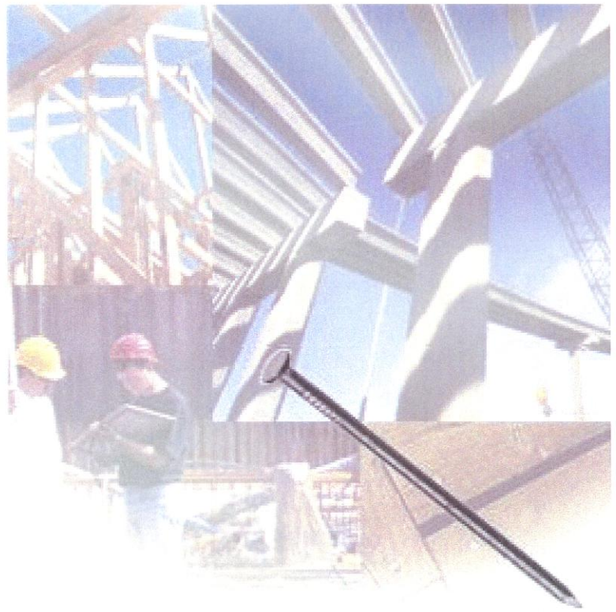

Cost Estimate

Southern Illinois University Edwardsville
Science Building Renovation and Addition — Revision date June 18, 1999
The following unit costs are burdened subcontractor unit costs with the general contractor's profit & overhead added at the end. Mid-construction reference date is July, 2000.

Construction Type	SUMMARY			
	Renovation	$ / SF	Addition	$ / SF
Lobby	-	-	1,357,608	150.85
Office	1,122,477	$ 81.46	4,148,293	$ 122.92
Classroom	4,228,731	$ 83.94	1,616,049	$ 147.72
Laboratory	12,001,168	$ 146.32	5,205,985	$ 222.19
Structural Modifications	1,671,535			
RENO. & ADDITION TOTALS	19,023,912		12,327,935	
Construction Cost			**31,351,847**	
Design Contingency	included above			
Design Fees	2,600,000			
Moveable Equipment	600,000			
Total Project Cost			**34,551,847**	
Asbestos Abatement*	1,900,000			
Total Project Cost + Asbestos			**36,451,847**	

* Cost figure based on information furnished by client

Assumptions:
1. Site development is included in the unit price
2. Contingency for renovation & new construction is 12% and 8 %, respectively and is included
3. Additions will be complete new construction

Exclusions:
4. Owner administration costs, financing, legal fees
5. Special foundations and net soil import/export/replacement for new construction
6. All hazardous material abatement except as noted above
7. Cost premiums for phased work in occupied building and labor overtime premium (nights, weekends)
8. Costs associated with temporary relocation of staff & students

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The following unit costs are burdened subcontractor unit costs with the general contractor's profit & overhead added at the end. Mid-construction reference date is July, 2000.
DISCIPLINE — Revision date June 18, 1999

SYSTEM / Item Description	Quantity	Units	Unit Price	Extension	Cost per Sq Ft
Lobby Addition	**9,000**	**GSF**			
Substructure	9,820	GSF	7.11	69,831	7.76
Superstructure	9,000	GSF	12.89	116,000	12.89
Building Envelope	9,000	GSF	19.00	171,000	19.00
Roof System	8,000	S F	6.67	53,333	5.93
Interior Core Construction	9,000	GSF	12.22	110,000	4.00
Interior Core Finishes	9,000	GSF	15.00	135,000	15.00
Specialties	9,000	GSF	0.67	6,000	1.50
Conveying System	9,000	GSF	1.33	12,000	1.33
Core Plumbing	9,000	GSF	2.67	24,000	3.00
Fire Protection	9,000	GSF	2.44	22,000	2.44
H V A C	9,000	GSF	15.00	135,000	15.00
Electrical (equipment, xfmrs, panels & feeders)	9,000	GSF	18.00	162,000	18.00
Electrical systems, fire alarm, security, etc	9,000	GSF	4.00	36,000	4.00
Equipment	9,000	GSF	1.33	12,000	1.33
Building Direct Cost Subtotal				1,064,164	118.24
Minor site development, utility modifications	5.0%			53,208	
Site Development				53,208	
Construction Direct Cost Subtotal				1,117,373	124.15
General Contractor's OH & Profit	12.5%			139,672	
Construction Cost Subtotal				1,257,044	139.67
Design Contingency	8.0%			100,564	
PROJECT TOTAL				**1,357,608**	**150.85**

Assumptions:
1. Site preparation is based on balanced cut & fill with no requirement for imported fill
2. All utilities have adequate capacity and are conveniently located for connection to new construction
3. Electrical Utility will provide primary transformer
4. Building will be 3 stories tall w/ no basement attached to existing by links on 3 levels

Exclusions:
5. Tenant Fitup, Furnishings and all movable equipment
6. Telephone & data cabling, instruments & equipment, but includes empty raceway
7. Site development excludes surface parking

Southern Illinois University Edwardsville
Science Building Renovation and Addition
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DISCIPLINE — Revision date June 18, 1999

SYSTEM / Item Description	Quantity	Units	Unit Price	Extension	Cost per Sq Ft
Office Renovation	**13,779**	**GSF**			
Demolition, all systems	13,779	GSF	5.00	68,895	5.00
Pointing & Patching Brick, Replace Glazing	13,779	GSF	10.00	137,790	10.00
Roof System	13,779	GSF	3.00	41,337	3.00
Interior Construction	13,779	GSF	10.00	137,790	4.00
Interior Finishes	13,779	GSF	7.50	103,343	7.50
Specialties	13,779	GSF	1.00	13,779	1.50
Conveying System Improvements	13,779	GSF	0.35	4,823	0.35
Core Plumbing	13,779	GSF	1.50	20,669	3.00
Fire Protection	13,779	GSF	0.50	6,890	0.50
H V A C Air Distribution, Control Modifications Only	13,779	GSF	7.50	103,343	7.50
Electrical (equipment, xfmrs, panels & feeders)	13,779	GSF	10.67	147,022	10.67
Electrical systems, fire alarm, security, etc	13,779	GSF	4.00	55,116	4.00
Equipment	13,779	GSF	1.75	24,113	1.75
Building Direct Cost Subtotal				864,908	62.77
Minor site development, utility modifications	3.0%			25,947	
Site Development				25,947	
Construction Direct Cost Subtotal				890,855	64.65
General Contractor's OH & Profit	12.5%			111,357	
Construction Cost Subtotal				1,002,212	72.73
Design Contingency	12.0%			120,265	
PROJECT TOTAL				**1,122,477**	**81.46**

Assumptions:
1. Usable to Gross factor is 0.75.
2. All new fixtures and equipment, water supply, waste & vent salvaged
3. Electrical system will be replaced
4. See structural modifications for scope of structural modifications
5. Telephone & data cabling, instruments & equipment, but includes empty raceway

Exclusions:
6. Tenant Fitup, Furnishings and all movable equipment
7. Site development excludes surface parking
8. Special MEP systems like, emergency generators, excess capacity, redundant or special AC

Renovation

Budget Summary

Southern Illinois University Edwardsville

Science Building Renovation

PROGRAMMING & CONCEPT PHASE

Hellmuth, Obata + Kassabaum

St. Louis
Chicago

September 1999

Southern Illinois University Edwardsville
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SYSTEM / Item Description	Quantity	Units	Unit Price	Extension	Cost per Sq Ft
Classroom Renovation	**50,377**	**GSF**			
Demolition, all systems	50,377	GSF	5.00	251,885	5.00
Pointing & Patching Brick, Replace Glazing	50,377	GSF	10.00	503,770	10.00
Roof System	50,377	GSF	4.00	201,508	4.00
Interior Construction	50,377	GSF	7.50	377,828	4.00
Interior Finishes	50,377	GSF	6.50	327,451	6.50
Specialties	50,377	GSF	1.00	50,377	1.50
Conveying System Improvements	50,377	GSF	0.35	17,632	0.35
Core Plumbing	50,377	GSF	2.00	100,754	3.00
Fire Protection	50,377	GSF	0.50	25,189	0.50
H V A C Air Distribution, Control Modifications Only	50,377	GSF	7.50	377,828	7.50
Electrical (equipment, xfmrs, panels & feeders)	50,377	GSF	13.33	671,525	13.33
Electrical systems, fire alarm, security, etc	50,377	GSF	4.00	201,508	4.00
Equipment	50,377	GSF	3.00	151,131	3.00
Building Direct Cost Subtotal				3,258,384	64.68
Minor site development, utility modifications	3.0%			97,752	
Site Development				97,752	
Construction Direct Cost Subtotal				3,356,136	66.62
General Contractor's OH & Profit	12.5%			419,517	
Construction Cost Subtotal				3,775,653	74.95
Design Contingency	12.0%			453,078	
PROJECT TOTAL				**4,228,731**	**83.94**

Assumptions:
1. Usable to Gross factor is 0.75.
2. Electrical system will be replaced

Exclusions:
3. See structural modifications for scope of structural modifications
4. Telephone & data cabling, instruments & equipment, but includes empty raceway
5. Tenant Fitup, Furnishings and all movable equipment
6. Site development excludes surface parking
7. Special MEP systems like, emergency generators, excess capacity, redundant or special AC beyond what is discussed in the MEP description of work.

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SYSTEM / Item Description	Quantity	Units	Unit Price	Extension	Cost per Sq Ft
Lab Renovation	**82,020**	**GSF**			
Demolition, all systems	82,020	GSF	7.50	615,150	7.50
Pointing & Patching Brick, Replace Glazing	82,020	GSF	6.50	533,130	6.50
Roof System	82,020	GSF	2.00	164,040	2.00
Interior Construction	82,020	GSF	12.50	1,025,250	4.00
Interior Finishes	82,020	GSF	7.50	615,150	7.50
Specialties	82,020	GSF	1.00	82,020	1.50
Conveying System Improvements	82,020	GSF	0.35	28,707	0.35
Core Plumbing	82,020	GSF	11.00	902,220	3.00
Fire Protection	82,020	GSF	0.50	41,010	0.50
H V A C Air Distribution, Exhaust, Control Modifications Only	82,020	GSF	25.00	2,050,500	25.00
Electrical (equipment, xfmrs, panels & feeders)	82,020	GSF	19.00	1,558,380	19.00
Electrical systems, fire alarm, security, etc	82,020	GSF	5.00	410,100	5.00
Equipment	82,020	GSF	16.00	1,312,320	16.00
Building Direct Coet Subtotal				9,337,977	113.85
Minor site development, utility modifications	2.0%			186,760	
Site Development				186,760	
Construction Direct Cost Subtotal				9,524,737	116.13
General Contractor's OH & Profit	12.5%			1,190,592	
Construction Cost Subtotal				10,715,329	130.64
Design Contingency	12.0%			1,285,839	
PROJECT TOTAL				**12,001,168**	**146.32**

Assumptions:
1. Usable to Gross factor is 0.75.
2. All new fixtures and equipment, water supply, waste & vent salvaged
3. Electrical system will be replaced

Exclusions:
4. See structural modifications for scope of structural modifications
5. Telephone & data cabling, instruments & equipment, but includes empty raceway
6. Tenant Fitup, Furnishings and all movable equipment
7. Site development excludes surface parking
8. Special MEP systems like, emergency generators, excess capacity, redundant or special AC beyond what is discussed in the MEP description of work.

Renovation

Budget Summary

Southern Illinois University Edwardsville

Science Building Renovation

PROGRAMMING & CONCEPT PHASE

Hellmuth, Obata + Kassabaum

St. Louis
Chicago

September 1999

Southern Illinois University Edwardsville
Science Building Renovation and Addition
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DISCIPLINE — Revision date June 18, 1999

SYSTEM / Item Description	Quantity	Units	Unit Price	Extension	Cost per Sq Ft
Lab Addition	**23,430**	**GSF**			
Substructure	7,810	S F	11.00	85,910	3.67
Superstructure	23,430	GSF	20.00	468,600	20.00
Building Envelope	23,430	GSF	19.00	445,170	19.00
Roof System	7,810	S F	7.25	56,623	2.42
Interior Core Construction	23,430	GSF	12.50	292,875	4.00
Interior Core Finishes	23,430	GSF	7.50	175,725	7.50
Specialties	23,430	GSF	2.00	46,860	1.50
Conveying System	23,430	GSF	1.33	31,240	1.33
Core Plumbing	23,430	GSF	13.00	304,590	3.00
Fire Protection	23,430	GSF	2.75	64,433	2.75
H V A C	23,430	GSF	50.00	1,171,500	50.00
Electrical (power, lighting & equipment)	23,430	GSF	19.00	445,170	19.00
Electrical systems, fire alarm, security, etc	23,430	GSF	5.00	117,150	5.00
Equipment	23,430	GSF	16.00	374,880	16.00
Building Direct Cost Subtotal				4,080,725	174.17
Minor site development, utility modifications	5.0%			204,036	
Site Development				204,036	
Construction Direct Cost Subtotal				4,284,761	182.88
General Contractor's OH & Profit	12.5%			535,595	
Construction Cost Subtotal				4,820,356	205.73
Design Contingency	8.0%			385,629	
PROJECT TOTAL				**5,205,985**	**222.19**

Assumptions:
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4. Building will be 3 stories tall w/ no basement attached to existing by links on 3 levels

Exclusions:
5. Tenant Fitup, Furnishings and all movable equipment
6. Telephone & data cabling, instruments & equipment, but includes empty raceway
7. Site development excludes surface parking
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Southern Illinois University Edwardsville
Science Building Renovation and Addition
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DISCIPLINE — Preparation date June 18, 1999

SYSTEM / Item Description	Quantity	Units	Unit Price	Extension	Cost per Sq Ft
Structural Modifications					
Lower Level					
Excavate for mech'l chase demo	500	C Y	25.00	12,500	
Demo mech'l chase foundation & basement wl	150	C Y	450.00	67,500	
New concrete basement wall w/ WP	1,770	S F	36.00	63,720	
Loading dock roof & spandrel demolition	270	S F	25.00	6,750	
New loading dock roof & spandrel	270	S F	30.00	8,100	
First Floor	-			-	
Demo mech'l chase wall	1,500	S F	4.00	6,000	
Demo mech'l chase floor structure	646	S F	30.00	19,380	
Terrace finish removal	4,568	S F	6.00	27,408	
New structure at terrace stairs	345	S F	50.00	17,250	
Topping to level terrace	4,568	S F	4.00	18,272	
Circulation penetrations thru exist exterior wall	20	E A	4,000.00	80,000	
Second Floor				-	
Demo mech'l chase wall	1,500	S F	4.00	6,000	
Demo mech'l chase floor structure	646	S F	30.00	19,380	
Demo raked floor in auditorium	3,550	S F	30.00	106,500	
Construct new flat floor str. for classrooms	3,550	S F	25.00	88,750	
Fill in perimeter atrium with new floor str.	910	S F	22.50	20,475	
Circulation penetrations thru exist exterior wall	20	E A	4,000.00	80,000	
Third Floor				-	
Demo mech'l chase wall	1,500	S F	4.00	6,000	
Demo mech'l chase floor structure	646	S F	30.00	19,380	
Construct new flat floor str. for classrooms	8,464	S F	20.00	169,280	
Demo concrete wall supporting roof	180	C Y	375.00	67,500	
Circulation penetrations thru exist exterior wall	20	E A	4,000.00	80,000	
Roof					
Demo mech'l chase roof structure	646	S F	30.00	19,380	
Demo roof & roof structure w/ shoring	8,464	S F	20.00	169,280	
Bar joist & structural steel roof frame	8,464	S F	9.00	76,176	
Metal roof deck	8,464	S F	2.00	16,928	
Spray-on fire proofing	8,464	S F	2.50	21,160	
New roof at new roof structure	8,464	S F	7.50	63,480	
Debris removal for all of the above	1,200	C Y	16.00	19,200	
Building Direct Cost Subtotal				1,375,749	
Construction Direct Cost Subtotal					
General Contractor's OH & Profit	12.5%			171,969	
Construction Cost Subtotal				1,547,718	
Design Contingency	8.0%			123,817	
PROJECT TOTAL				**1,671,535**	

Addition

Budget Summary

Southern Illinois University Edwardsville

Science Building Renovation

PROGRAMMING & CONCEPT PHASE

Hellmuth, Obata + Kassabaum

St. Louis
Chicago

September 1999

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SYSTEM / Item Description	Quantity	Units	Unit Price	Extension	Cost per Sq Ft
Office Addition	**33,747**	**GSF**			
Substructure	11,249	S F	10.00	112,490	3.33
Superstructure	33,747	GSF	12.89	434,961	12.89
Building Envelope	33,747	GSF	19.00	641,193	19.00
Roof System	10,000	S F	12.00	120,000	3.56
Interior Core Construction	33,747	GSF	12.22	412,463	4.00
Interior Core Finishes	33,747	GSF	7.33	247,478	7.33
Specialties	33,747	GSF	0.67	22,498	1.50
Conveying System	33,747	GSF	2.00	67,494	2.00
Core Plumbing	33,747	GSF	2.67	89,992	3.00
Fire Protection	33,747	GSF	2.44	82,493	2.44
H V A C	33,747	GSF	13.33	449,960	13.33
Electrical (power, lighting & equipment)	33,747	GSF	10.67	359,968	10.67
Electrical systems, fire alarm, security, etc	33,747	GSF	4.00	134,988	4.00
Equipment	33,747	GSF	1.33	44,996	1.33
Building Direct Cost Subtotal				3,220,974	95.44
Minor site development, utility modifications	6.0%			193,258	
Site Development				193,258	
Construction Direct Cost Subtotal				3,414,233	101.17
General Contractor's OH & Profit	12.5%			426,779	
Construction Cost Subtotal				3,841,012	113.82
Design Contingency	8.0%			307,281	
PROJECT TOTAL				**4,148,293**	**122.92**

Assumptions:
1. Site preparation is based on balanced cut & fill with no requirement for imported fill or special foundations
2. All utilities have adequate capacity and are conveniently located for connection to new construction
3. Electrical Utility will provide primary transformer
4. Building will be 3 stories tall w/ no basement attached to existing by links on 3 levels

Exclusions:
5. Tenant Fitup, Furnishings and all movable equipment
6. Telephone & data cabling, instruments & equipment, but includes empty raceway
7. Site development excludes surface parking

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SYSTEM / Item Description	Quantity	Units	Unit Price	Extension	Cost per Sq Ft
Classroom Addition	**10,940**	**GSF**			
Substructure	3,647	S F	10.00	36,467	3.33
Superstructure	10,940	GSF	12.89	141,004	12.89
Building Envelope	10,940	GSF	19.00	207,860	19.00
Roof System	15,000	S F	12.00	180,000	16.45
Interior Core Construction	10,940	GSF	11.56	126,418	4.00
Interior Core Finishes	10,940	GSF	10.67	116,693	10.67
Specialties	10,940	GSF	0.80	8,752	1.50
Conveying System	10,940	GSF	2.00	21,880	2.00
Core Plumbing	10,940	GSF	2.67	29,173	3.00
Fire Protection	10,940	GSF	2.44	26,742	2.44
H V A C	10,940	GSF	14.22	155,591	14.22
Electrical (power, lighting & equipment)	10,940	GSF	13.33	145,867	13.33
Electrical systems, fire alarm, security, etc	10,940	GSF	4.00	43,760	4.00
Equipment	10,940	GSF	1.33	14,587	1.33
Building Direct Cost Subtotal				1,254,794	114.70
Minor site development, utility modifications	6.0%			75,288	
Site Development				75,288	
Construction Direct Cost Subtotal				1,330,082	121.58
General Contractor's OH & Profit	12.5%			166,260	
Construction Cost Subtotal				1,496,342	136.78
Design Contingency	8.0%			119,707	
PROJECT TOTAL				**1,616,049**	**147.72**

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Exclusions:
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7. Site development excludes surface parking

Addition

Budget Summary

SIU
Southern Illinois University Edwardsville

Science Building Renovation

PROGRAMMING & CONCEPT PHASE

Hellmuth, Obata + Kassabaum

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Chicago

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