

KANSAS STATE UNIVERSITY  
MOSIER HALL – RESEARCH LABORATORY RENOVATION STUDY

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## 1 PROGRAM STATEMENT

The College of Veterinary Medicine at Kansas State University will convert six residential suites into new research laboratory and support space in Mosier Hall. Two of the suites have been renovated into an office suite as part of another project. The remaining four residence suites and adjoining corridor will be converted into an open research laboratory, three support rooms, and two controlled entry vestibules.

The project is located in the southeast corner on the second floor of Mosier Hall. Mosier Hall was originally constructed in 1974 and has had only minor renovation work completed in this area.

Project Scope: The project will involve a total renovation of the laboratory and support areas including replacement HVAC equipment and ductwork. This project will create a new Biological Safety Laboratory (BSL) Suite capable of Level 2-rated (BSL-2) biological research work. The lab suite will be occupied by one or two bacteriologists, immunologists, virologists or possibly a physiologist, depending on the needs of many research programs. The suite will focus on an open flexible lab, with two isolation rooms for cellular culture and preparation and a small equipment room.

Construction Budget: The budget for this Project is set at approximately \$865,000 for construction. Refer to Section 6 for detailed analysis.

## 2 PROJECT LOCATION & REQUIREMENTS

The Research Lab Suite will be created on the second floor of Mosier Hall, in the southeast corner near the Auditorium. Four vacated residence rooms will be gutted to create the open, flexible laboratory space necessary to advance fields of study for the College of Veterinary Medicine. New walls and doors will be created as shown in the Program Layout diagram in Exhibit C. Finishes in the suite will match those of recently-completed laboratory renovation projects in the building. Two remaining residence rooms have been renovated into supporting offices by Kansas State University as a separate project.

It is planned that the existing corridors immediately adjacent to the residence suites will be absorbed into the project, by creating a vestibule room at the southern corridor and resolving a potential dead-end egress condition. The addition of the corridor area will greatly improve the functional capacities of the Research Lab Suite.

The conversion of residences to laboratories will require a new HVAC system to provide the ventilation required for research. The existing AHU and ductwork will be replaced with a high-volume system; the new elements will fit in the space vacated by the existing system. Existing ceilings between the Research Lab Suite and Mechanical Room Q224 will be removed and replaced during the project.

Existing perimeter walls and interior partitions are concrete masonry, supported by the cast-in-place concrete structure. Ceilings are a combination of suspended gypsum board and acoustical panel systems. Demolition of existing elements will be part of the Project.

Mosier Hall will be an occupied, fully-functional building during the course of the Project. Access to the project area will be through existing corridors, however since the building is only partially-sprinklered, fire-rated construction partitions will be needed to separate the Project area from adjacent occupied spaces. Work to be completed in areas that cannot be separated from occupied spaces, such as overhead work in corridors, must be completed on evenings and/or weekends when there are no occupants or the remaining few can be safely separated.

This Project is of sufficient size to necessarily provide accessibility upgrades to the existing toilet rooms and drinking fountains in this part of the building. Work will be done in the toilets on either the first or second floors to meet accessibility requirements. The number of toilets for women cannot be reduced, as the building is already at the minimal code-required limit. It appears there is an opportunity to add a fixture to the first floor women's restroom.

### 3 PROGRAM SPACES

The composition of the Research Lab Suite is a central open lab space with adjacent support spaces. A brief narrative description of each space follows.

#### **Spaces**

Anteroom - Entrance vestibule for the Lab Suite and associated offices. Researchers will gown up here with lab coats and safety protection (gloves and glasses), before entering the lab.

- Keycard controlled access from corridor.
- Storage for lab coats and safety equipment.

Open Laboratory - Flexible open lab of four modules, with a new door cut through the north wall into the adjacent Graduate Office. Bench islands are ‘split in half’ between fixed casework with upper shelves and owner-provided mobile work surfaces. A dual-compartment lab sink shall be provided in the center bench and a hand-washing sink with hands-free operation shall be located near the Anteroom. Biological Safety Cabinets, Incubators and other support equipment are located on the north and south walls.

- (4) 72” Type II-A2 BSC’s, with gas cylinder tie-down racks.
- (2) tall cabinets for glass storage.
- Emergency station with shower, eyewash, FEC, and marker board.
- Keycard controlled access from vestibule.

Cell Culture Room - Separate lab support room for Tissue Cell Culture and similar procedures. Room shall be directly accessible from the Open Laboratory.

- (1) 72” Type II-A2 BSC.

Prep Room - Separate lab support room for preparation of lab samples, management of media, and handling of chemicals. It will have a steel casework bench along one wall with a dual-compartment sink and overhead shelving. This room shall be directly accessible from the Open Laboratory.

- (1) 72” Chemical Fume Hood.
- Point-of-Use Water Polisher.

Equipment Room - Separate lab support room dedicated to contain the noise and heat generated by large equipment such as freezers. This room shall be directly accessible from the Open Laboratory.

Vestibule - Space created by adding new doors near the existing toilets to prevent a dead-end Corridor that exceeds allowable length. Access through the existing east doors will be

### 3 PROGRAM SPACES

controlled by new keycard devices. Use of the new west doors shall not be controlled, to allow free access to existing Conference Room N202.

#### **Finishes**

Research spaces shall be cleanable with non-porous finishes. Flooring shall be an epoxy resinous coating with integral covered base. Walls shall have epoxy paint on existing CMU and new gypsum board surfaces. Ceilings shall be non-perforated suspended acoustical tiles. Door frames and sidelights shall be hollow-metal with epoxy paint. New doors can be hollow-metal (painted) or solid-core wood veneer (stained). Provide new solid surface window sills at the east windows.

- Anteroom
- Open Laboratory
- Cell Culture
- Prep Room
- Equipment Room

Existing finishes will need to be repaired or replaced where disrupted for new MEP work. This includes ceilings on Level 1 below (new plumbing connection) and Level 2 (new ductwork). New work shall match existing conditions.

Other than the new wall and door, there will be no new finish work associated with Vestibule created southwest of the Lab.

#### **Accessibility Upgrade**

There are no accessible toilets or drinking fountains in the south half of Mosier Hall. As such, the Project can be expected to upgrade existing facilities to meet the requirements of OFPM Path of Travel goals. The actual location of the upgrades shall be coordinated with OFPM.

Men's Toilet - One existing water closet shall be removed to provide space for a new accessible toilet stall. Provide new stall partition, accessories, signage, floor repair, and wall finishes as needed. Adjustment to existing urinal and lavatories may be necessary to be compliant with accessibility guidelines.

Women's Toilet - Room shall be modified to create one fully-accessible water closet, *without reducing the fixture count*. Provide new stall partition, accessories, signage, and patch floor and wall finishes as needed. Adjustment to existing lavatories may be necessary to be compliant with accessibility guidelines. There is potential for adding a fixture to the first floor women's restroom.

### **3 PROGRAM SPACES**

Drinking Fountain - Replace existing drinking fountain with new dual-level unit to provide accessibility-compliant fixture.

## 4 BUILDING SYSTEMS

### **Fire Protection Systems**

Mosier Hall is a partially-sprinklered building with the Project area currently sprinklered. The existing wet sprinkler system shall be modified as needed to provide full coverage per NFPA-13 in the renovated areas.

### **Mechanical Systems**

The Project area is currently served by a multi-zone Air Handling Unit (AHU) located in Mechanical Room Q224, supplying a total of six zones; “Live In” rooms N211, N212, N213, N214, N216, and N217. Branch supply ducts from these zones also serve Corridor CR211; a single duct returns air back to the AHU from these spaces.

The HVAC design precedent at Mosier Hall for BSL-2 laboratories is for 100% outside air systems. The KSU Department of Public Safety has accepted the outside air change rate of 10 AC/hr during occupied periods and 6 AC/hr during unoccupied periods. The existing AHU is inadequate to provide this level of ventilation.

The Project will include replacement of the existing AHU with a new dual-duct, variable-air-volume (VAV) AHU in Mechanical Room Q224. The new AHU shall be a 100% outside air unit that handles heating, cooling, and humidification of the Project area and adjacent spaces (Rooms N211, N212, and Corridor CR211). Outside air would be provided to the new AHU by tapping the existing outside air plenum at the ceiling of the mechanical room. Modification of existing chilled water piping in Mechanical Room Q224 will be necessary to provide space for the new AHU.

The existing air distribution duct system will be completely replaced with new dual-duct network with VAV boxes provided for each separate space served. The new ducts will be routed in the same space as the removed ductwork.

A new roof-mounted exhaust fan will provide non-recirculated exhaust of the spaces served by the new AHU. The existing roof above the Lab Suite is clear of equipment and intakes that could interfere with placement of the new exhaust fan. A heat recovery run-around coil and pump system will be provided to recuperate energy from the exhaust air stream leaving the building.

A dedicated roof-mounted exhaust fan will serve the new chemical fume hood. The hood shall be provided with an automatic sash closer and VAV controls to maintain a hood face-velocity of 100 feet-per-minute.

The existing Honeywell Direct Digital Control (DDC) system in the building will be expanded to serve the new HVAC equipment in the renovated area.

## 4 BUILDING SYSTEMS

### ***Plumbing Systems***

The existing plumbing supply, waste, and vent systems will be modified to serve new plumbing fixtures and laboratory equipment. Existing systems that are affected include: cold water, hot water and hot water recirculation, reverse osmosis (RO) water, vacuum, compressed air, natural gas, normal waste and vent, and acid waste and vent.

The existing cold, hot, recirculation water, and natural gas piping systems are routed above Corridor CR211. The existing RO water, vacuum, and compressed air piping systems are routed just outside of the Project area above Corridor CR216. This allows for easy connection to these existing systems.

The spaces below the Project area at Level 1 are Pharmacy A119, Prop Storage A101A, and Corridors CR106 and CR122. These spaces will be affected by above-ceiling work for modification of sanitary waste piping systems. Acid waste will be neutralized at the point-of-use within the Laboratory, so the outlet of the point-of-use neutralization tank(s) will be connected to the sanitary waste system.

### ***Electrical Systems***

The existing Federal Pacific 120/208 Volt, 3 phase switchboard located inside electrical room N207 has a spare 200A/3P switch. A new panelboard located in the Anteroom or the Open Lab will be served from this switch.

Standby power for the proposed renovation space will be supplied from the distribution equipment provided by the ICCM/NICKS project at the north end of Level 2. A standby power feeder shall be routed from the north end of Level 2 to a new panelboard located adjacent to the new power panelboard.

General lighting throughout the renovated area will be provided by LED lay-in troffers now standard at Mosier Hall. Laboratory lighting shall be supplemented by under-shelf task lighting. Lights will be controlled by low voltage switches compatible with the factory mounted controller provided in the LED troffers. Controllers will be networked together to provide the ability to run time schedules.

Fire alarm system for the Project will be provided from an existing Honeywell addressable fire alarm control panel located in Mechanical Room Q223. Hardwired devices for the Project will be replaced with new addressable devices. Electronic control of the Lab doors shall be provided through the existing Honeywell access controller.

The existing distributed speaker system will be removed from the renovation space. Telephone and Data conduits and boxes will be routed north to the existing telecommunication closet that

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**4 BUILDING SYSTEMS**

is part of the ICCM/NICKS Project. Devices and installation will be provided by KSU Telecom and are not included in the Project scope.

## 5 PROJECT SCHEDULE & ADMINISTRATION

Schedule - Completion of the Research Lab Suite renovation in a most timely manner is very important to the College of Veterinary Medicine. The spaces are already vacant and available for work to begin as soon as possible. Alternative delivery methods will be considered in order to minimize the time needed to complete the Project.

Specific dates for project execution are not yet set, but are anticipated to generally follow this timeline:

Mid - January 2014	Advertise Project
Early - February 2014	Qualification Statement Submittal
Late - February 2014	Selection process for Design Team
Early - March 2014	Begin Final Design and Construction Document Process
Late - April 2014	Issue Construction Documents for bidding
Late - May 2014	Bid Date
Early - June 2014	Begin Demolition
Late - August 2014	Construction Substantially Complete

Administration - The Project is to be awarded, designed, reviewed, approved, and procured per the requirements of the Kansas State Office of Facilities and Property Management (OFPM), as stated in the 2013 OFPM Building Design and Construction Manual.

**6 PROJECT CONSTRUCTION BUDGET**

This Construction Budget was compiled based on the project scope outlined.

1. Demolition (CMU walls, doors, ceilings, etc.)	\$13,500
2. Concrete & Masonry	\$5,700
3. Shell Construction (walls, doors, ceilings, finishes, etc.)	\$79,200
4. Equipment (Markerboards, BSC’s, Fume Hood, etc.)	\$49,200
5. Furnishings (Lab casework & accessories)	\$57,200
6. Fire Suppression (sprinkler modifications)	\$10,800
7. HVAC & Plumbing (AHU & ductwork, exhaust fans, sinks, piping)	\$343,000
8. Electrical & Safety (power, lighting, fire alarm)	\$98,600
9. Toilet Accessibility Upgrades (partitions, wall & plumbing changes)	\$19,300
10. General Conditions & Contractor Fee Allowance	\$94,300
11. Contingency & Escalation Allowance	<u>\$93,900</u>

**Estimated Construction Budget** **\$864,600**

12. Appliances and Equipment Allowance	\$75,000
13. KSU IT / Data Systems	\$5,000
14. A/E Design Fees	\$108,600
15. Bidding / Advertising Services	\$2,000
16. Commissioning	\$8,600
17. State OFPM Limited Services	\$22,300
18. KSU Planning Office	<u>\$19,300</u>

**Estimated Soft Cost Budget** **\$160,800**

**Estimated Total Project Cost** **\$1,105,500**

**PROJECT FUNDING**

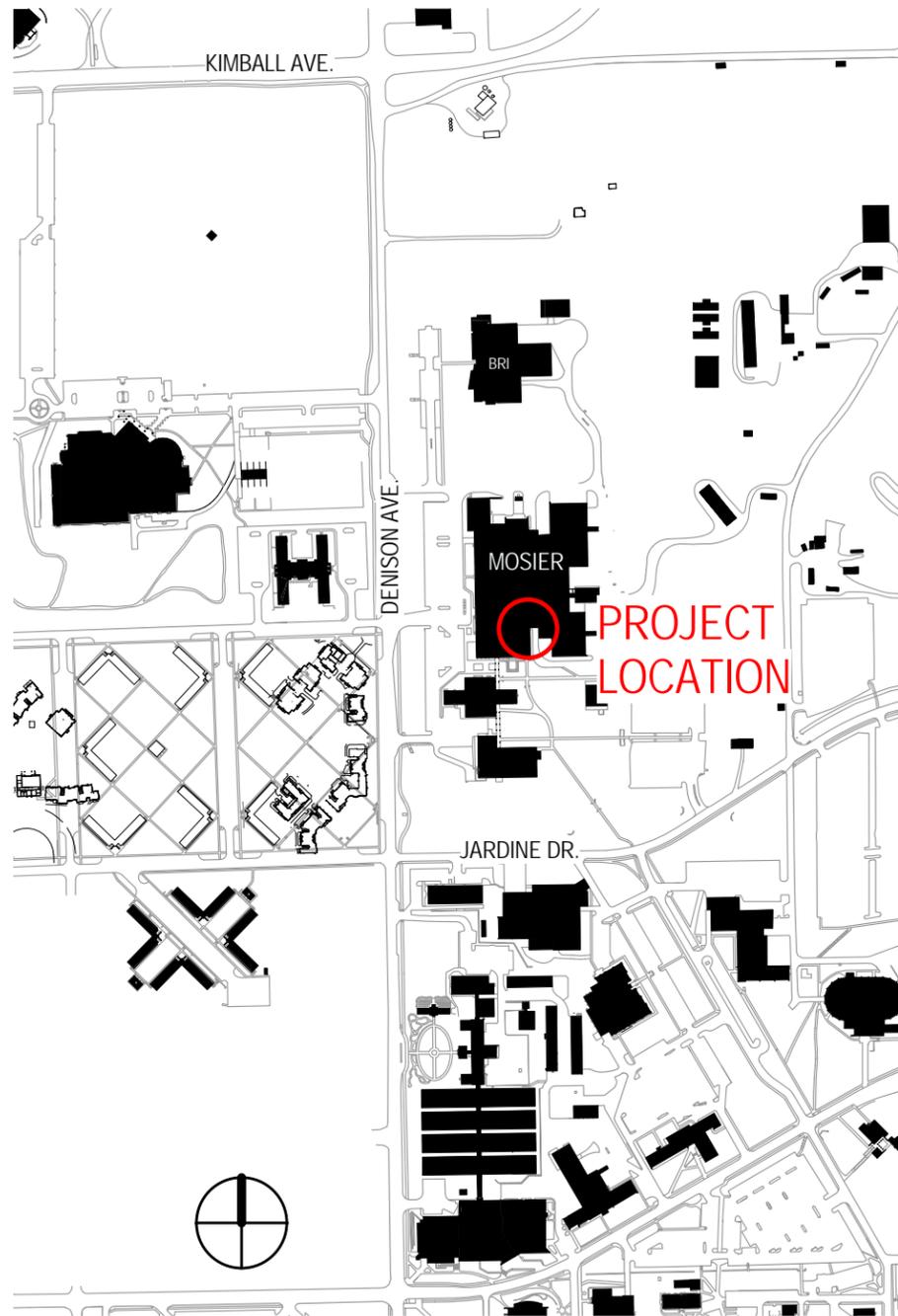
The project will be funded from the College of Veterinary Medicine state general fund or general fee balances.

Concept Budget Estimate				Summary
				2,500 GSF
Division	Description	Subtotal	\$/GSF	Estimate Notes
<b>Construction Costs</b>				
01	General Conditions (7.5%)	\$50,719	\$20.29	
02	Demolition	\$13,515	\$5.41	
03	Concrete	\$4,500	\$1.80	
04	Masonry & Stone	\$1,200	\$0.48	
05	Metals - NOT USED	\$0	\$0.00	Nothing in project scope.
06	Woods & Plastics	\$2,000	\$0.80	
07	Thermal & Moisture Protection	\$9,980	\$3.99	
08	Openings	\$9,700	\$3.88	
09	Finishes	\$66,855	\$26.74	
10	Specialties	\$11,400	\$4.56	
11	Equipment	\$47,000	\$18.80	
12	Furnishings	\$57,170	\$22.87	
13	Special Conditions - NOT USED	\$0	\$0.00	Nothing in project scope.
14	Conveying Equipment - NOT USED	\$0	\$0.00	Nothing in project scope.
21	Fire Suppression Systems	\$10,880	\$4.35	
22	Plumbing Systems	\$0	\$0.00	Included in Division 23 HVAC.
23	HVAC Systems	\$343,410	\$137.36	HVAC is essentially unchanged by options.
26	Electrical Systems	\$98,640	\$39.46	
27	Communication Systems	\$0	\$0.00	Cabling & Install provided by KSU below.
28	Safety & Security Systems	\$0	\$0.00	Fire Alarm included in Division 26 Elec.
31	Earthwork - NOT USED	\$0	\$0.00	Nothing in project scope.
32	Ext. Improvements - NOT USED	\$0	\$0.00	Nothing in project scope.
33	Utilities - NOT USED	\$0	\$0.00	Nothing in project scope.
x	ADAAG Upgrades to Toilet Rooms	\$19,337	\$7.73	Likely to be required with project
<b>Material Costs Subtotal</b>		<b>\$726,968</b>	<b>\$290.79</b>	
	GC Fee & Overhead (6%)	\$43,618	\$17.45	Contractor's Fee Allowance
	Estimate Contingency (10%)	\$77,059	\$30.82	Estimate Allowance 10% of [Material Subtotal + GC Fee]
	Escalation Contingency - 8 Months	\$16,953	\$6.78	Assumes 2% Escalation 2% of [Material + GC Fee + Conting.]
<b>CONSTRUCTION COST TOTAL</b>		<b>\$864,598</b>	<b>\$345.84</b>	
<b>Soft Costs</b>				
	FFE (Appliances & Equipment Allowance)	\$75,000		Water Polisher, Freezers, Ref's, Incubators
	IT / Data Systems (By KSU)	\$5,000		
Subtotal Construction and Equipment		\$944,598		
	A/ E Professional Fees (11.15% per OFPM Comparitively Complex project	\$108,629		
	Bidding & Advertising Services	\$2,000		
	3rd Party Commissioning	\$8,646		
Subtotal Fees & Services		\$119,275		
	State OFPM office Limited Services Fee (2.58% of Construction)	\$22,307		
	KSU Planning office (2% of Construction & Fees)	\$19,338		
<b>TOTAL PROJECT COST</b>		<b>\$1,105,517</b>	<b>\$442.21</b>	

EXHIBIT A

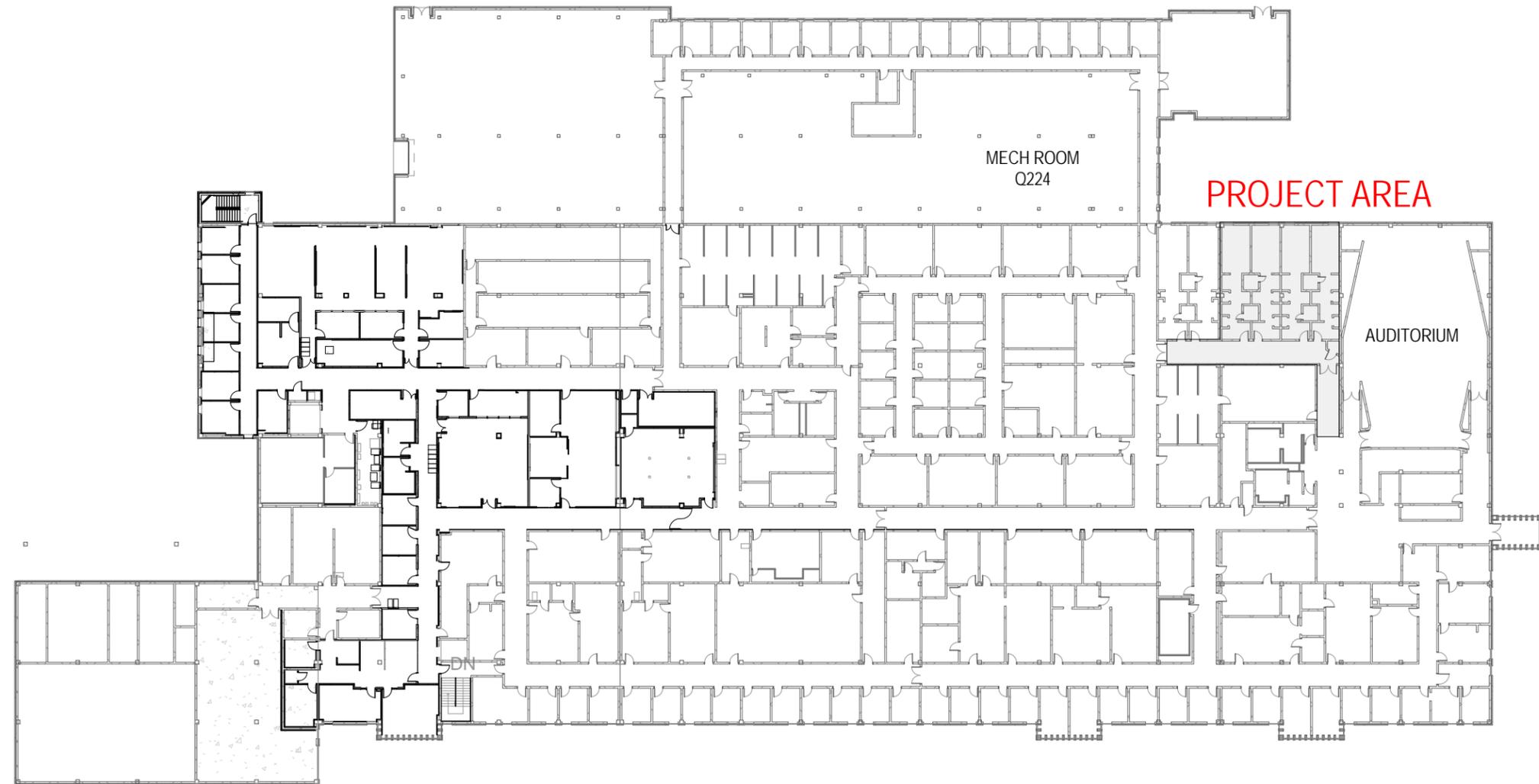
<b>Program Space Table</b>						
Space Description	Possible Occupancy	Unit NSF	Unit Qty.	Area Sq. Feet	Remarks	
<b>A</b>	<b>LAB SUITE</b>	<b>13</b>	<b>TOTAL</b>	<b>2,123</b>	<b>Net SF</b>	
A.1	Open Lab - 4 Modules 10'-6" x 37'-0" ea.	12	389	4	1,554	Flexible BSL-2 biology lab. 3 People per Module.
A.2	Cell Culture Room 11'-0" x 13'-6"	1	149	1	149	Tissue culture & isolation work.
A.3	Lab Preparation 11'-0" x 13'-6"	1	149	1	149	Experiment Prep. Balance, Sink, Bench
A.4	Equipment Room 11'-0" x 13'-6"	1	149	1	149	Freezers & Misc. Equipment
A.5	Anteroom	-	123	1	123	Secured entry vestibule into Lab. Storage of coats, PPE, etc.
A.6	Vestibule	-	203	1	Exis.	Created to resolve corridor dead-end.
<b>PROGRAM AREAS</b>				<b>SUBTOTAL</b>	<b>2,123</b>	<b>Net Square Feet</b>
<b>GROSS AREA (85% efficient)</b>				<b>TOTAL</b>	<b>2,497</b>	<b>Gross Square Feet</b>

LEVEL 2 RESEARCH LAB STUDY  
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KSU PARTIAL CAMPUS PLAN

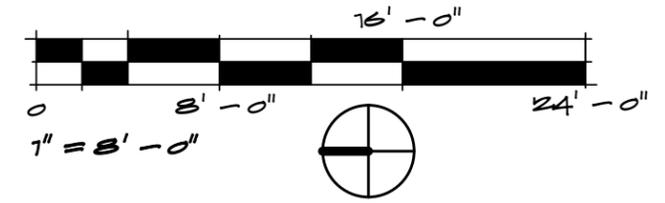
 MOSIER HALL - LEVEL 2



1 - PROJECT AREA  
EXHIBIT B

08/08/13  
53284-00

LEVEL 2 RESEARCH LAB STUDY  
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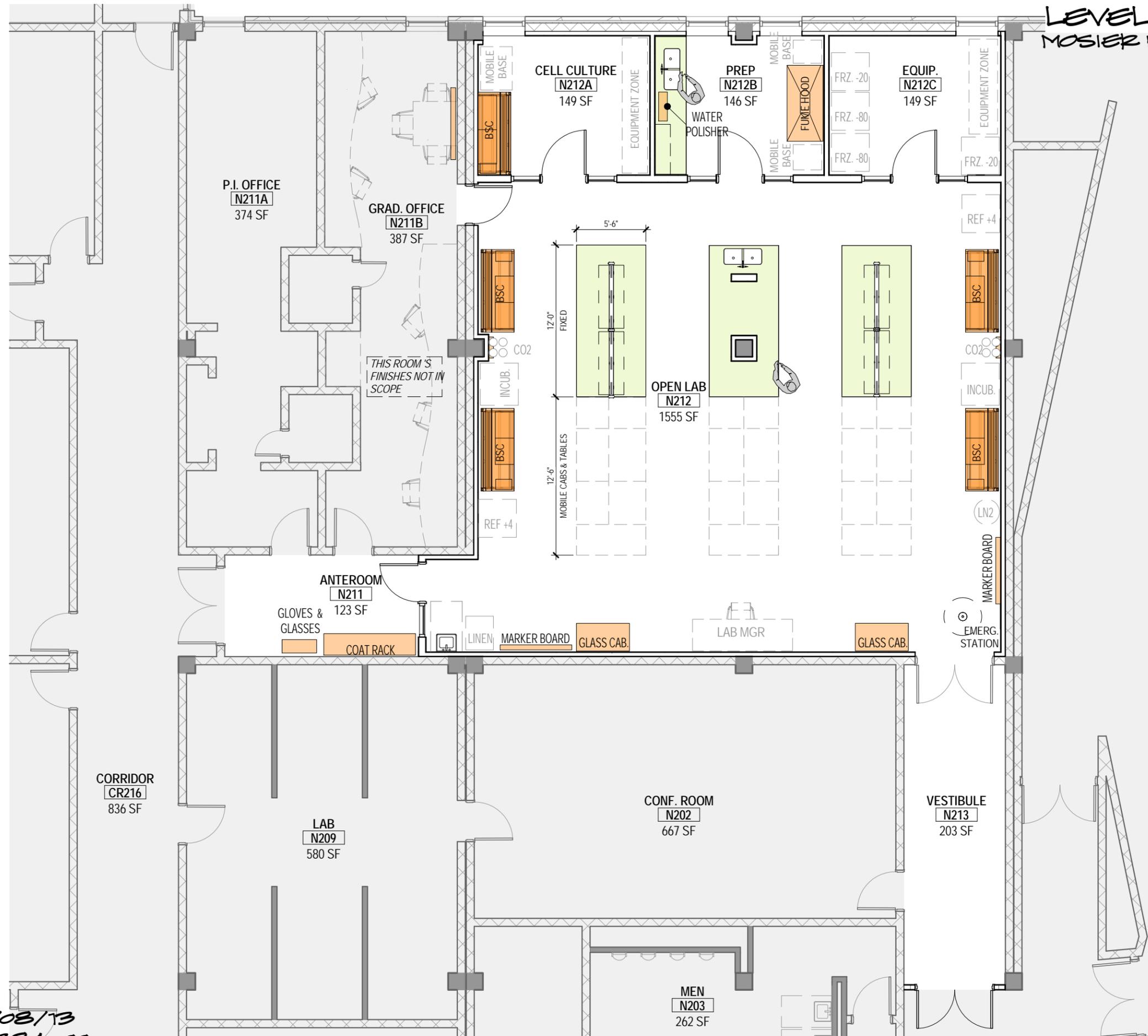
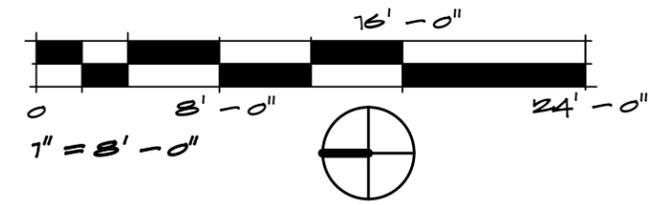
COMPLETE DEMOLITION IN THIS AREA

NO  
DEMOLITION  
IN THIS AREA

08/08/13  
53284-00

2 - DEMOLITION PLAN  
EXHIBIT B

**LEVEL 2 RESEARCH LAB STUDY**  
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 53284-00

**3 - CONCEPT PLAN**  
**EXHIBIT B**