Project Predesign for the
Renovation Construction of the

Malcom Moos Health Center
11th Floor, Department of Surgery

University of Minnesota, Twin Cities Campus
515 Delaware Street Southwest
Minneapolis, MN 55455

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University Project Number 142-07-1113

SEBESTA BLOMBERG
Providing Technical & Business Solutions
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1.0 Project Participants
2.0 Statement of Need

PROJECT ADVISORY COMMITTEE

Primary Members

- Dr. Charles F. Moldow, Medical School
- Lorelee Wederstrom, Academic Health Center
- Ashok K. Saluja, Ph.D., Professor and Vice Chair, Department of Surgery
- James DeGross, Department of Surgery
- Pete Nickel, Capital Planning and Project Management
- Andreas Papanicolaou, AIA, Senior Facilities Planner, Academic Health Center

Adjunct Members

- Mike Austin, Assistant Director, Environmental Health and Safety
- Karen Collins, Associate Administrator, Facility Management Zone 3 – Health Services
- Greg Steinhagen, Manager, Research Animal Resources
- Vivian Baumann, Project Manager, Networking and Telecommunications Services
- Charles Bottemiller, Systems Design Engineer, Classroom Technical Services
- Bob Janoski, Director, Department of Central Security

Predesign Team

- Architects – BWBR Architects, Inc.
- Mechanical/Electrical Engineer – Sebesta Blomberg
- Cost Estimator – M.A. Mortenson Company

STATEMENT OF NEED

The University of Minnesota’s Department of Surgery has a long legacy of leading surgical research, and is currently ranked ninth in acquisition of NIH funds. Faculty efforts have yielded 10 million dollars in support in 2006 from the NIH alone, in addition to approximately 10 million more in non-federal and philanthropic support. In order to maintain the Department’s tradition of excellence in research, it must tirelessly recruit the best and brightest researchers. To do so successfully, the University must offer potential faculty exciting opportunities for study, as well as attractive facilities in which to conduct research. As part of the recruitment needs identified by new Department of Surgery Chairman Selwyn M. Vickers, M.D., and Vice Chairman of Research Ashok K. Saluja, Ph.D., the research space which the Department of Surgery currently occupied on the 11th floor of Moos Tower must be renovated. This space has not been upgraded since Moos Tower was constructed in 1973.

Surgical researchers are most successful when their labs are in close proximity to their teaching and clinical activities. We have considered moving the labs away from the main Medical School campus, and have concluded that such a remove would benefit neither the Department’s clinical nor research missions. The Department of Surgery requires an environment in which researchers and clinicians collaborate on a regular basis, and physically proximate work areas is the only arrangement by which this can be accomplished.

The Department of Surgery recognizes that renovating the 11th floor of Moos Tower is its best option. The space in question, which is already used by the Department as lab and office space, is no longer functional for research. Modern lab design has significantly changed how researchers collaborate and perform research, and the proposed renovation of Moos 11 will provide the Department’s internationally-recognized faculty and staff with the state-of-the-art, highly secure laboratory they need to excel, while the new design will give students ready access to faculty members and the work they do. The space-efficient new design incorporates approximately 25% more research space than exists at present, for a total of 7,500 s.f. This allows for future research recruitment in areas such as cancer, gastrointestinal disease, and diabetes. Also, the remodel will admit natural light into almost all of the laboratory and faculty offices, while none of the labs now have any access to natural light. The proposed open architecture of the lab space will also facilitate close collaboration between research groups, and permit efficient use of resources. Furthermore, it will provide space for new recruits to the Surgery Department, and will allow the Biochemistry Department to reclaim the space that they so generously loaned to us for the year.

The planned full-floor renovation will maximize use of the 11th floor’s footprint. The open and accessible yet secure design will increase efficiency, facilitate productive relationships between faculty, staff, and students, and consequently enhance the reputation of the University of Minnesota.
3.0 Scope of Construction

OVERVIEW
Constructed in 1973, the 11th floor of the Malcom Moos Health Center Tower is very much in its original state of construction today. The aging labs, offices, and building infrastructure will be completely replanned and replaced to provide state-of-the-art research labs, support spaces, and necessary office and collaborative meeting spaces.

Demolition will remove all of the existing interior construction on the floor, including walls, ceilings, built-in furnishings, finishes, electrical devices, and mechanical equipment and services. Existing whole building components such as air handlers, elevators, and stairways are not and will not need to be considered as part of this project. Exterior windows will remain.

The floor will remain a ‘B’ occupancy. The Lab is being designed as a BSL-2 level facility. Anticipated number of occupants on the floor is estimated at 30-50 people.

The new construction will encompass entire 11th floor of approximately 12,600 usable square feet. Approximately 10,600 usable square feet will constitute laboratory and office space, while the remainder will be used for required circulation/egress, elevator lobby, new toilets, janitor space, etc.

INTERIOR CONSTRUCTION/FURNISHINGS

Partitions
1. 5/8” gypsum board on steel studs for non, 1-hour, 2-hour, rated construction conditions.

Interior Doors
1. Wood, rate and non-rated with hollow metal frames

Interior Finishes
1. **Office areas/ Meeting Spaces/ Public Circulation**
   Carpet flooring, vinyl base, vinyl wall covering and paint on wall, acoustical ceiling tiles.

2. **Lab Areas**
   Resilient and composition tile (low VOC type) flooring, vinyl base, painted walls, acoustic ceiling tiles.

3. **Toilets**
   Ceramic tile flooring, ceramic tile/ painted walls, acoustical ceiling tiles, solid surface counters.

Casework/Millwork
1. **Lab Areas**
   Lab quality casework/tables, steel shelving, resin countertops.

Furniture
1. **Offices**
   Systems furniture components.

2. **Meeting Spaces**
   Conference chairs/ tables with informal seating components in “Discovery” room.

Lab Benches and Built-In Equipment
1. These shall be furnished and installed by construction contractor as specified in the construction documents.
4.0 Utility & Building Infrastructure Requirements

MECHANICAL NARRATIVE

General

1. Steam and Condensate System
Steam will be supplied at medium pressure from the building’s distribution system. Steam load is limited to the new autoclave.

2. Perimeter Heating and Reheat Water System
The hot water heating system to serve reheat coils will consist of separate systems connected to existing 11th floor takeoffs. Perimeter fintube radiation will remain and be fed from the existing system. The heating water systems will be served by existing equipment located on the 10th floor.

3. Laboratory and Office Air Handling Systems
Two existing air handling units (S-16 & S-17), located on the 10th floor and serving floors 11-14, will be reused to provide cooling and ventilation for the 11th floor. Office areas will have variable air volume reheat terminal units. Laboratory areas will have constant volume reheat terminal units providing constant airflow during occupied hours, and will be able to provide reduced airflow during unoccupied hours in the future.

Air supplied to the laboratories and laboratory support will be exhausted to outdoors. Air supplied to the office areas will be returned. No air from the laboratory or support spaces will be returned to the air handling unit.

4. Laboratory Exhaust
General laboratory exhaust will be provided by existing building general exhaust systems serving the 11th floor (GE-9 & GE-10).

Fume hood exhaust will be provided by existing, individual fume hood exhaust systems serving the 11th floor.

5. Toilet Exhaust System
The building is served by a central toilet exhaust air system. The system will service toilet rooms, janitor closets, and similar spaces. The toilet exhaust system will be constant volume.

6. Building Automation System
The 11th floor will be controlled by a Direct Digital Controller (DDC) system from a vendor approved by the University. The building control system will integrate with the University of Minnesota’s Building Systems Automation Center (BSAC). DDC controllers will utilize distributed architecture and will not rely on any “front-end” or higher level controller to perform required control sequence.

7. Air Flow Controls Systems for Fume Hood and Laboratory
Laboratory controls will be distributed architecture. The open laboratory areas will have dedicated controllers and each laboratory support space will have a stand-alone fume hood and laboratory controller. Each laboratory control system will control the space temperature, fume hood(s), and space pressurization. Pressurization will be controlled by local area differential pressure sensors. Space pressure control override may be required for open laboratory spaces. Each fume hood will have a low flow alarm to indicate when fume hood face velocity falls below a specified level. Fume hood and laboratory air flow control system will be on emergency power.

Piping Systems

1. Storm Drainage
Not applicable.

2. Sanitary Waste and Vent
A sanitary waste and vent system currently exists in the building for all plumbing fixtures and devices that require a drain. Plumbing fixtures drain by gravity through conventional soil, waste, and vent stacks to the municipal sanitary sewer.

All fixtures will be trapped and vented to the atmosphere.

3. Laboratory Waste and Vent
Fixtures and devices in laboratories and laboratory support spaces will be provided with a drainage system consisting of corrosion resistant piping separate from the sanitary drainage system. The laboratory waste will drain by gravity and discharge into the existing lab waste system.
4. **Domestic Water**

Domestic water will be provided to all toilet room fixtures, electric water coolers, sinks, emergency shower and eyewash units, as well as any other devices and fixtures that require a domestic water supply. Hot water at 120°F will be provided to all fixtures and equipment requiring hot water. Emergency fixtures (showers and eyewashes) will be supplied with tepid water from the potable water system.

The piping will be sized to limit the velocity in any section of the system to a maximum of 8 fps for cold water systems and 4 fps for hot water systems.

Domestic hot water will be provided by existing building systems water heaters.

The hot water system temperature will be maintained by re-circulating the hot water through a continuous loop via the existing building system.

The hot water system will be insulated in accordance with Code. The cold water system will be insulated to prevent condensation from forming.

Isolation valves will be provided at all riser connections, branch piping run-outs to fixture groups, and at fixtures requiring maintenance.

5. **Non-Potable Water Systems – Lab Water Connections**

Hot and cold water to laboratory and alcove areas will be served from the existing non-potable systems.

The piping will be sized to limit the velocity in any section of the system to a maximum of 8 fps. A reduced pressure backflow preventer will protect the domestic water supply and will be sized for 100% of the design load.

The non-potable water system will be insulated to comply with Code, and to prevent condensation from forming and subsequently damaging adjacent equipment and finishes.

Isolation valves will be provided at all riser connections, branch piping run-outs to fixture groups, and at fixtures requiring maintenance.

6. **DI Water**

Laboratory areas requiring de-ionized water will be connected to the existing building DI system. Point of use water polishers will be installed where required.

7. **Laboratory Compressed Air**

Laboratory grade compressed air will be provided to outlets in each laboratory. Laboratory compressed air will be supplied by the existing building system.

The distribution system will be sized to limit pressure drop across the system to maximum of 10% of pressure regulator outlet pressure.

8. **Laboratory Vacuum**

Laboratory vacuum will be provided to all laboratory areas as required and connected to the existing building laboratory vacuum system.

The distribution system will be sized to limit pressure drop across the system to maximum of 3” of mercury vacuum.

9. **Laboratory CO2**

Laboratory CO2 will be provided to all incubators as required and connected to the existing building CO2 system fed from tanks on the 10th floor.

### Fire Protection Systems

1. **Wet Pipe Sprinkler System**

The 11th floor will be protected by hydraulically calculated sprinkler systems, which except for special protection needs, will be wet pipe systems. All areas of the floor will be protected.

The sprinkler system for the building will be designed and installed in accordance with NFPA 13. All systems will be hydraulically calculated with a computer calculation program using the Hazen-Williams method. Areas designated as Light Hazard Occupancy will be designed for a minimum sprinkler flow of 0.15 gpm per s.f. over a 1,500 s.f. design area. Areas designated as Ordinary Hazard, Group 1 will be designed for a minimum sprinkler flow of 0.15 gpm per s.f. over a 3,000 s.f. design area. Areas designated as Ordinary Hazard, Group 2 will be designed for a minimum sprinkler flow of 0.20 gpm per s.f. The system demand will be based upon the most remote 3000 s.f.
Mechanical rooms shall be designed as Ordinary Hazard, Group 1, and have sprinklers with quick response 286°F heads. Fume hood alcoves and laboratories shall be designed as Ordinary Hazard, Group 2. Offices and general building spaces shall be designed as Ordinary Hazard Group 1.

All sprinklers will be quick response type in light and ordinary hazard locations. The design area shall not be reduced by the use of quick response heads. The “Room Design” method is not acceptable. The type of sprinkler used in a particular area will be selected by the Engineer of Record and the Architect. Areas subjected to high temperatures, such as the cage wash room, will be protected by high temperature type sprinklers. Areas subject to temperatures below 40°F will be protected by freeze-proof sprinklers.

ELECTRICAL SYSTEMS NARRATIVE

General

1. Electrical Service
   The existing electrical service for Moos Tower Building is adequate for the remodeling of the 11th floor. The anticipated demand load for the remodeled 11th floor will not exceed the current demand on the system.

Power Distribution

1. Normal Electrical Service Distribution
   The existing normal electrical distribution is distributed on two busways, one at each end of the building. There are two (2) existing 480/277 Volt normal distribution panels with two (2) 480/277 Volt lighting panels, and eight (8) 208/120 Volt distribution panels on the 11th floor. The existing panels will be reused.

   The existing Motor Control Centers (MCCs) that serve the existing mechanical equipment for the 11th floor will remain. No changes are anticipated for the MCCs.

   Point-of-use power connection devices will include specification-grade receptacles (120V, 20A, single phase), power receptacles, and surface mounted raceway. The surface mounted raceway will be divided into two (2) raceway compartments, one (1) for power and one (1) for telecommunications. Emergency power in surface mounted raceways will be separated with a barrier within the raceway.

2. Emergency/Standby Service and Distribution
   The Emergency service for the Moos Tower Building exists already. The existing generator that serves the upper floors of Moos Tower is located on the 10th floor. The existing emergency power demand for the upper floors of Moos Tower was verified with a meter reading on January 3, 2007. Based on the meter reading, there is an estimated 150 Amps available on the existing generator.

   The existing emergency power distribution on 11th floor of Moos Tower is fed from a 400 Amp, 480 Volt bus duct. The 480 Volt bus duct is fed from an existing emergency distribution panel on 10th floor. The existing distribution panel is fed from an existing transfer switch on 10th floor.

   The existing emergency distribution on the 11th floor consists of a 60 Amp bus disconnect at 480 Volts. The disconnect serves an existing 480/277 Volt lighting panel and a 480/208Y/120 Volt distribution transformer. The distribution transformer serves a 208/120 Volt emergency branch circuit panelboard. The existing emergency power distribution of 60 Amps at 480 Volts is adequate to serve the requested equipment and receptacles for the 11th floor remodel.

   The existing emergency panels currently serve both life safety and equipment loads on the 11th floor. The life safety and equipment loads will be separated onto different electrical panels and distribution transformer. Once building infrastructure is updated to accommodate both life safety and equipment transfer switches, the 11th floor will be separated and ready for connection.

   A new 60 Amp bus disconnect at 480 Volts; a new 100 Amp 480/277 Volt lighting panel; a new 45 KVA, 480/208Y/120 Volt distribution transformer; and a new 150 Amp, 208/120 Volt branch circuit panelboard will be installed to separate life safety and equipment emergency loads.
3. **Receptacle Requirements – Normal and Emergency Power**
   Lab Bench (typical): 120V-20A duplex receptacles, 24” on center in surface mounted raceway. Every fourth receptacle on emergency power.

   Lab Alcoves (typical): 120V-20A duplex receptacles, 24” on center in surface mounted raceway. One receptacle on emergency power for each wall. Dedicated receptacles for biohoods and incubators.

   Lab Equipment Walls: Four 120V-20A duplex receptacles (24” on center), each on dedicated circuit and one on emergency. Three 208V-20A single phase receptacles, on dedicated emergency circuits.

   Offices: One double duplex 120V/20A receptacle at desk location and two duplex 120V/20A receptacles on opposite walls.

4. **Circuiting Criteria**
   Convenience receptacles not installed within the laboratories will have a maximum of 6 duplex outlets on a 20A, 1-pole circuit, 120V. Duplex and special purpose receptacles indicated for specific equipment will be on a separate dedicated circuit.

   Ground fault protection will be provided for outlets within 6'–0” of a sink edge and other wet locations. Electrical outlets will be individually ground fault interrupted (GFCI) protected (not at the circuit breaker or first outlet on the circuit).

**Lighting**
1. **Interior Lighting**
   The lighting will consist primarily of energy-efficient fluorescent lighting fixtures. Incandescent lighting will be used only as requested by the Owner or where aesthetics are of prime importance.

   Fluorescent lamps will be high performance 32 watt, T8, 3500K color temperature, 30,000 hr. avg. rated life with a color rendering index of 75 or greater. This will improve the existing lighting energy efficiency of the 11th floor.

   Emergency/night lighting will be provided by unswitched branch circuits. These unswitched branch circuits will be fed from the existing emergency lighting panel. Fluorescent ballasts will be programmed rapid start high-frequency electronic type with less than 10% total harmonic distortion.

   Dimmers will be provided in conference room and break out areas.

**Communication Systems**
1. **Networking and Telecommunications**
   Voice/Data systems will be designed in accordance with the University of Minnesota Networking and Telecommunication Services (NTS) Standards.

   The existing cable tray system on the 11th floor will be reused.

   Information outlets will be provided in surface mounted raceway at lab benches, alcoves, and equipment walls. Offices shall have one quad outlet and one duplex information outlet. Wall phones will be provided as necessary.

   Wireless network access will be installed on the entire floor.

2. **Security System**
   Empty conduit provisions for card access and CCTV systems shall be provided for at least four locations. Empty conduit provisions Closed-Circuit Television (CCTV) system shall be provided to monitor each entry and exit door. Security system provisions shall be provided in accordance with the Construction Design Standards such that wiring and equipment can be installed by the security system vendor.

3. **Video Distribution/Conferencing**
   A Video Distribution/Conferencing System will be installed in the conference room. A conduit raceway system will be provided to support the audio/visual requirements.
4. **Intercom/Paging**

   An Intercom System to allow general paging capabilities and two-way communication between stations or to provide music and paging to speakers at selected portions of the 11th floor is not necessary at this time. If required, a conduit raceway system will be installed to support system requirements.

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**Fire Protection System**

1. **Fire Alarm System**

   The newly updated fire alarm system will be reused for the 11th floor. The existing fire alarm devices will be relocated or reused wherever possible. Audio/visual devices will be installed in all areas of the building in accordance with the NFPA and the ADA guidelines. Smoke detectors shall be installed in the building as required by Code.
5.0 Environmental/Code/Hazardous Materials Analysis

CODE/ENVIRONMENTAL ISSUES/HAZARDOUS MATERIAL ANALYSIS

Building Code
The building is classified as Type-IA Construction. This floor occupancy will be classified as B. The fire resistive ratings relevant to this project include 2-hour shaft enclosures, 2-hour control zone (chemical) partitions, and 1-hour partitions separating the lab space from other uses (as directed by the University Code Division).

The University of Minnesota Building Code Deficiency Survey rates the building as having a code deficiency rating of 0. This is primarily due to lack of an automatic sprinkler system and fire alarm strobes, and deficient alarm horns throughout the building. This 11th floor project will provide full sprinkler construction and fully compliant fire life safety systems.

Applicable Codes
• Mechanical Code: 2004 MN State Mechanical Code
• Plumbing Code: International Plumbing Code and IBC Chapter 29; 2003 MN State Plumbing Code
• Electrical Code: 2005 National Electrical Code
• City Amendments/Code: University of Minnesota (MN State Building Code MN Stat. 16B.59)
• Accessibility Code: ADAAG (MN State Building Code Chapter 1341)
• Energy Code: Minnesota State Building Code Chapters 7670-7678

Special Requirements Based on Use and Occupancy
The Minnesota State Building Code (MSBC) Chapter 1305.0414 Section 414 Hazardous Materials supersedes the IBC for control areas for chemicals in "B" Occupancy buildings. The hazardous materials that will be used in the programmed spaces are required to meet specifications for the maximum quantity of hazardous materials allowed per control area by the MSBC. Tables 307.7(1) and 414.1.1 of the International Building Code will be referenced.

Hazardous Materials
The University has completed a hazardous material survey of existing conditions on the 11th floor. Hazardous materials include tile flooring and adhesive, lab counter undercoatings, miscellaneous pipe insulation and mastic. This material will be removed by the University prior to construction.
6.0 Project Budget  
7.0 Financing Statement  
8.0 Annual Operating Cost Analysis

**PROJECT BUDGET**  
to come

**FINANCING STATEMENT**  
This project is anticipated to be funded through a University of Minnesota internal loan to be repaid over seven years by the Medical School.

**ANNUAL OPERATING COST ANALYSIS**  
The annual operating costs for this area will not significantly change as the result of this renovation. The floor will continue to house both research labs and offices.
## 9.0 Project Schedule

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<td>Construction Bidding</td>
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<td>Move-In</td>
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10.0 Concept Plans/Interior Images

- Lab/Research
- Office/Meeting
- Public Circulation & Support Spaces
- Stairs/Elevators/Ventilation Shafts

11th Floor Renovation Plan

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10.0 Concept Plans/Interior Images

Entry, Looking North

Entry, Looking South