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October 2005
(revised March 2006)
Program and Conceptual Site Study
For the Department of Electrical & Computer Engineering

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Keith Corzine - Associate Professor
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3. LIST OF PROGRAMMED SPACE NEEDS

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APPENDIX
The Department of Electrical and Computer Engineering is experiencing growing pains.

Following a series of internal discussions and forecasts with regard to:

• the expansion of the graduate program in general,
• the rapid increase in the needs of Computer Engineering, and
• the upgrading of facilities to remain competitive among peer institutions,

department leadership projected their requirements for a significant new facility.

To assist the department and the University in understanding the impact of this growth and upgrading on the physical facilities, the Office of Design and Construction for UM-Rolla brought in planning, programming and design expertise from architects familiar with the current Emerson Electric Co. Hall.

The Christner Inc. team led a series of interviews and reviews with key faculty and physical plant personnel in order to gather data and understand physical, budgetary and time constraints. This input was augmented by tours of the facilities and analysis of existing conditions with regard to space utilization.

The programming team tested assumptions for space standards for research and graduate offices, (i.e. area/professor, area/ research dollars, maximum utilization of area / professor and research dollars, etc.) resulting in recommendations reflected in this report.

Following this analysis, an array of space programs of needs was generated. The final space list, which captures the instructional, office and research space necessary to meet the

(con’t)
Executive Summary

institutional goals for competitiveness and leadership, grew from an initial estimate of 25,000 g.s.f., to solidifying and reinforcing the later departmental projection of approximately 47,000 g.s.f.. At a reasonable ratio of net to gross area of 60% the net assignable space is 28,500 s.f.

Sites for the addition to the North, South and West of Emerson Electric Co. Hall were analyzed for suitability. The program was tested at a conceptual level on each of these sites, culminating in six schemes.

The recommended scheme comprises a three story solution located directly north of Emerson Electric Company Hall. It's entry and first level is set below the second and north entry level of the existing building. The second floor of the addition aligns with the top floor of the existing structure allowing for greater floor to floor distances in the new structure. These greater height support more use and systems flexibility.

The space between the old and new structures and enclosed by the two connecting links may be utilized programmatically in various ways.
The programming and site scheme review meetings were conducted with the facility users representing faculty, graduate students and administrative support. They were joined at appropriate junctures by building maintenance personnel, and representatives of the campus design and planning office as well as the office of design and planning from the university system in Columbia, MO.
Bird's eye perspective looking south towards proposed facility addition north of the existing Electrical Engineering building.

View to new north lobby with large classroom block at second level.
This list of recommended spaces is distilled from the discussions, analysis and review of options shared with the programming committee of the Department of Electrical and Computer Engineering.

The list itemizes the needs that exceed the facilities in the current building. The final apportioning and arrangement of spaces within and between the existing and new structures are to be determined as the programming and fundraising process proceeds.

<table>
<thead>
<tr>
<th>SPACES</th>
<th>AREA</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom for 50</td>
<td>1350</td>
<td>min. 1200 sf</td>
</tr>
<tr>
<td>Grad Student Office</td>
<td>1360</td>
<td>10 students per 32' x 34' bays (includes internal circulation space)</td>
</tr>
<tr>
<td>Work &amp; Conference</td>
<td>600</td>
<td>3 locations / 1 per floor</td>
</tr>
<tr>
<td>Student Lounge</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>Instruct. Lab /Computer Engr.</td>
<td>750</td>
<td>600-750 sf</td>
</tr>
<tr>
<td>Instruct. Lab /Computer Engr.</td>
<td>750</td>
<td>600-750 sf</td>
</tr>
<tr>
<td>Vault</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>Loading</td>
<td>181</td>
<td>120 - 200 sf</td>
</tr>
<tr>
<td>Storage</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>Research Labs</td>
<td>6600</td>
<td>add net gains from greater Net / Gross efficiency to research</td>
</tr>
<tr>
<td>Research Labs / (or Thesis Review / Conf.)</td>
<td>1000</td>
<td>(optional)</td>
</tr>
<tr>
<td>Lobby/Mtg</td>
<td>1657</td>
<td></td>
</tr>
<tr>
<td>Relocated Space (min.)</td>
<td>1200</td>
<td>connecting corridors on &quot;wide&quot; side of Emerson Electric Hall times four</td>
</tr>
<tr>
<td>Total Net Assignable</td>
<td>28507</td>
<td></td>
</tr>
<tr>
<td>Total Gross Area</td>
<td>46291</td>
<td></td>
</tr>
</tbody>
</table>

**Cost Opinion**

Cost: 47,000 gsf X 250 dollars per sf = $11,825,000

Incl. Soft Cost (1.35) = $16,000,000

**NOTE:**
1. Site development excluded
2. Does not include any renovation cost to existing building
Recommended Scheme

Characteristics

- Atrium floor at entry level
- With the floor of the atrium located at the second level of the existing building, the space should be assignable such as a computer lab and library.
- Potential for more light to spaces as first floor is not buried
- No need for substantial lightwells on north side to allow light to reach lower levels

KEY
- Orange: Graduate Students
- Pink: Research
- Blue: Lab / Classrooms
- Yellow: Circulation
- Red: Loading Dock
- Gray: Lounge / Lobby
- Green: Conference
- Pink: Atrium

Entry Level (2nd level of existing building)
Site Plan (not to scale)

Figure Ground

Section AA (not to scale)
The appendix comprises working materials, notes and comments used through the process of deriving this program and conceptual design.
Goals

- Accommodate growth in
  - Computer Engr
  - Research Needs
  - Graduate Students

- Consolidate all dept. facilities under one roof

- Encourage interaction + interdisciplinary work
Provide a separate identity (namng opportunity) for the addition of occupancy by Fall 2010.
Size of Faculty to remain steady

20 E.E.
10 Comp.E

30

Assume: There is sufficient space for all faculty + clerical (possible slight increase)

Continue to cluster faculty offices in the "hook"
Provide a **loading dock**

Provide a **new larger service elevator**

Provide **storage space**

- Efficient
- Accessible
- Conditioned
- Regularly purged
Instructional Spaces

Provide 2 New Computer Engr. Teaching Labs
\[ \text{AV} \quad 600-700 \] $\}

Provide 1-2 Lecture Spaces for 60 Students

Consider Flexibility in Arrangement for All Instruction Spaces
Provide:

An Office "Home Base" for Each Graduate Student

# Graduate Students

140 Today (July '03)
200 Sept 2005
300 Sept 2010

Consider:

Central Grouping of Grad. Students

Computers
Communications
Power
EMC
ETC.
The offices module with intra-office circulation included is 60 s.f./person.
Meeting Spaces

- **Consider**: Lobby/atrium sitting/meeting areas
- **Provide**: 2-3 conference spaces
- **Locate**: Conference + lounge/sitting areas @ major spaces

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Provide:

A minimum of 500 ft² of research space per professor (average)

Provide:

Interdisciplinary research space

- new space
- maximum flexibility + infrastructure

Provide:

Flexibility

- moveable furn. + equip.
- multiple elect. service
- ceiling drops for key services
Provide:

Natural Light
Wherever Possible
In Human Occupied Spaces

Consider:
Ways to Express
The Uniqueness of What Lies Within!

Consider:
Sustainable Design
Throughout the Addition
IE Daycounter
Integrated As a Demonstration
ASSUME:

MECHANICAL ROOM CAN BE SHARED* WITH ADDITION *(AND THAT CAPACITIES ARE SUFFICIENT FOR NEW LOADS)

CONSIDER

LOUNGE AREA(S) OPEN TO VIEW + ACTIVITY

ENHANCING

CONNECTION BETWEEN THE BUILDINGS + GREEN SPACES
Consider:

**Planning Module**

For Labs + Classroom

Consider:

Assignable Space

Convertible

Consider:

Planning Module

For

- Grad. Stud.
- Off
- Larger Classroom
- Larger Labs