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Courtesy of Bernard Tschumi Architects

## Thesis Proposal – Executive Summary December 5, 2003

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The largest, most visible structural component of the University of Cincinnati Athletic Center is its perimeter diagrid system. Though the diagrid was certainly a sound and acceptable choice, there are three main issues which are potential drawbacks to the current design. They are:

- 1) The diagrid system is much heavier than typical gravity-only systems. Material costs are high.
- 2) Welded connections at each diagrid node are time and labor intensive. Labor costs are high.
- 3) Temperature differentials due to an exposed structure create additional stresses on the building.

These three issues warrant further investigation into alternative solutions to the perimeter lateral system. As a result, the proposed thesis for the upcoming semester will concentrate on proposing viable options to the possible weaknesses and ultimately determining which option, if any, is most appropriate.

Due to the unusual lateral structural system, it is unlikely that any one option will perform optimally in all performance considerations. Therefore, three distinct solution areas labeled I, II, and III will be investigated and evaluated.

- I) Keep the system in the diagrid configuration while changing member material and/or detailing
- II) Keep the perimeter lateral system while modifying its architectural (and hence structural) geometry
- III) Move the lateral system from the perimeter to within the building

The first two solution areas concurrently address issues 1 and 2 while the third solution area addresses all three issues. The basic procedure for obtaining the solution is threefold. First, the available options will be researched. Second, those options will be designed to find size, cost, efficiency, etc. Finally, one option will be selected above the others in each solution area. Solutions will be evaluated on the criteria of material cost, labor cost, constructability, and schedule. A Construction Management cost-feasibility-site study and a Lighting/Electrical daylighting study will tie in with the structural research as breadth work.

A summarized schedule of work is below.

Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Solution Area I																
Solution Area II									B							
Solution Area III									R							
Breadth Studies									E							
Preparation									A							
Presentation									K							
Review																