Gateway Plaza
Wilmington, DE
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Structural Option
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Technical Report 2:
Pro-Con Structural Study of Alternate Floor Systems

EXECUTIVE SUMMARY

The goal of this report was to determine if any other floor systems should have been considered in the design of Gateway Plaza. Five different framing schemes were studied and analyzed to determine whether they could have been used.

- Modified existing bays
- Composite steel joists
- One-way concrete slab with beams & girders
- Concrete pan Joists
- Pre-cast, pre-stressed double tees

In order to study these floor systems, a typical bay from a typical office floor was designed according to the loads set forth in Technical Report 1. In order to implement a few of the alternate schemes, alterations had to be made to the existing column layout. Several desi gn aides were referenced to speed the design process. These preliminary designs were further checked in RAM models for accuracy. Designs are discussed at further length in the main body of the report, and design calculations can be found in the appropriate Appendices. The following chart summarizes their designs.

System	Slab	Beams	Girders
Modified existing bays	3.25” LW concrete on 3” composite deck	W14x26 [15]	W33x116 [118]
Composite steel joists	3.25” LW concrete on 2” composite deck	24VC	
One-way concrete slab	6” NW concrete	16x24	16x24
Concrete pan joists	4.5” NW concrete	30” pan, 6”x20” rib	30x24.5
Pre-stressed double tees	2” NW concrete topping	12DT32	24IT32

Finally, a comparison chart lists the advantages and disadvantages of each system to determine whether their implementation should be seriously considered. This chart is based on cost, constructability, local availability, and architectural impact. According to this chart, the only systems which warrant further investigation are the composite steel joist and the pre-cast, pre-stressed double tees.