

Corporate Headquarters

Great Lakes Region, USA



AE Senior Thesis
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Mary Julia Haverty

Structural Option

Advisor H. Sustersic

Corporate Headquarters

- Introduction
- Problem Statement and Solution
- Structural Depth
 - Gravity System
 - Typical Roof Bay
 - Typical Floor Bay
 - Vibration Considerations
 - Lateral System
- Architectural /Landscape Architecture Breadth
- Enclosures Breadth
- Conclusion
- Acknowledgements

Gravity System- Typical Roof Bay

Typical Bay

- 1.5 VLR 18 gauge composite deck
 - 4" normal weight topping
 - Achieves two hour fire rating
- Unshored, 2 span construction
- Same deck type as floor deck for ease of constructability

Joists

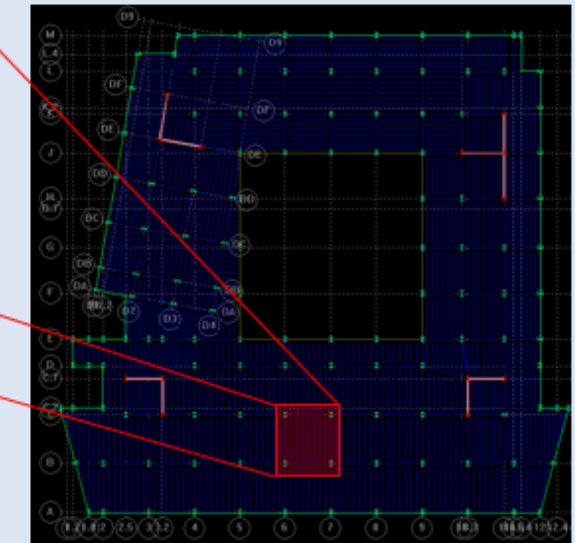
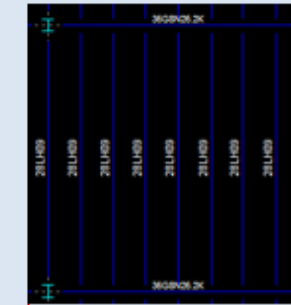
- 28LH10

Joist Girders

- 36G8N26.2K

- Joists and girders to be fire proofed for a two hour fire rating
- Deflection controlled depths

Steel Joist System Roof Redesign



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Gravity System- Typical Floor Bay

Typical Bay

- 1.5 VLR 18 gauge composite deck
 - 3 ¼" lightweight topping
 - Achieves two hour fire rating
 - Unshored, 2 span construction

Joists

- 28LH09

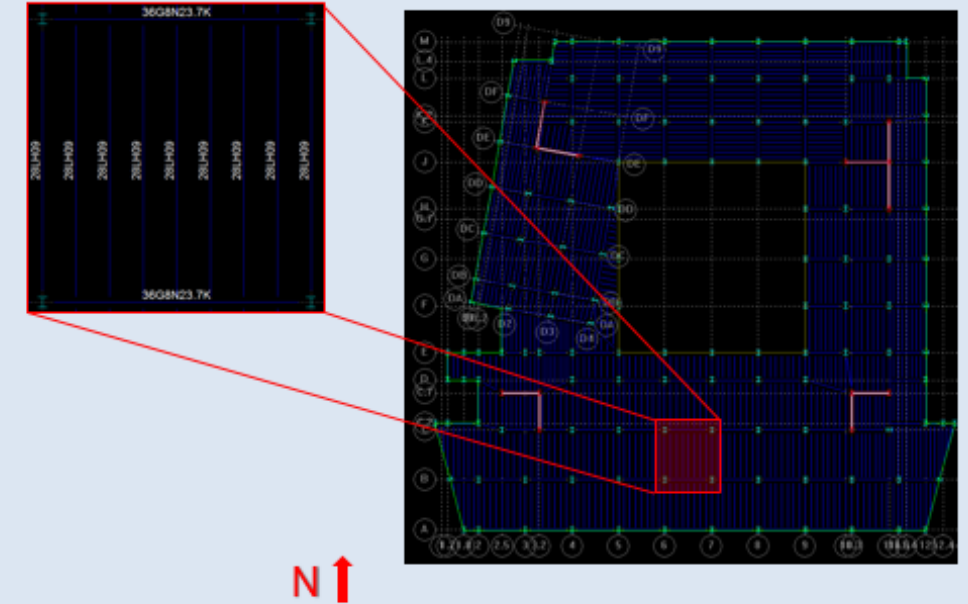
Joist Girders

- 36G8N23.7K

Joists and girders to be fire proofed for a two hour fire rating

Deflection controlled depths

Steel Joist System Floor Redesign



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 - Membrane Comparison
 - Water Testing and Drainage Plan
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Enclosures Breadth

Flood Test- ASTM D5957-98

- Courtyard test
- Performed after membrane installation
- Requires drains to be plugged
- 24-72 hour test

Leakage Test- ASTM D7281-07

- Requires leakage test apparatus
- 7 day test procedure

New Drainage Plan

- one drain per bay
- 16 drains total
- 1520 sq ft of membrane area per drain

Water Testing and Drainage Plan

