

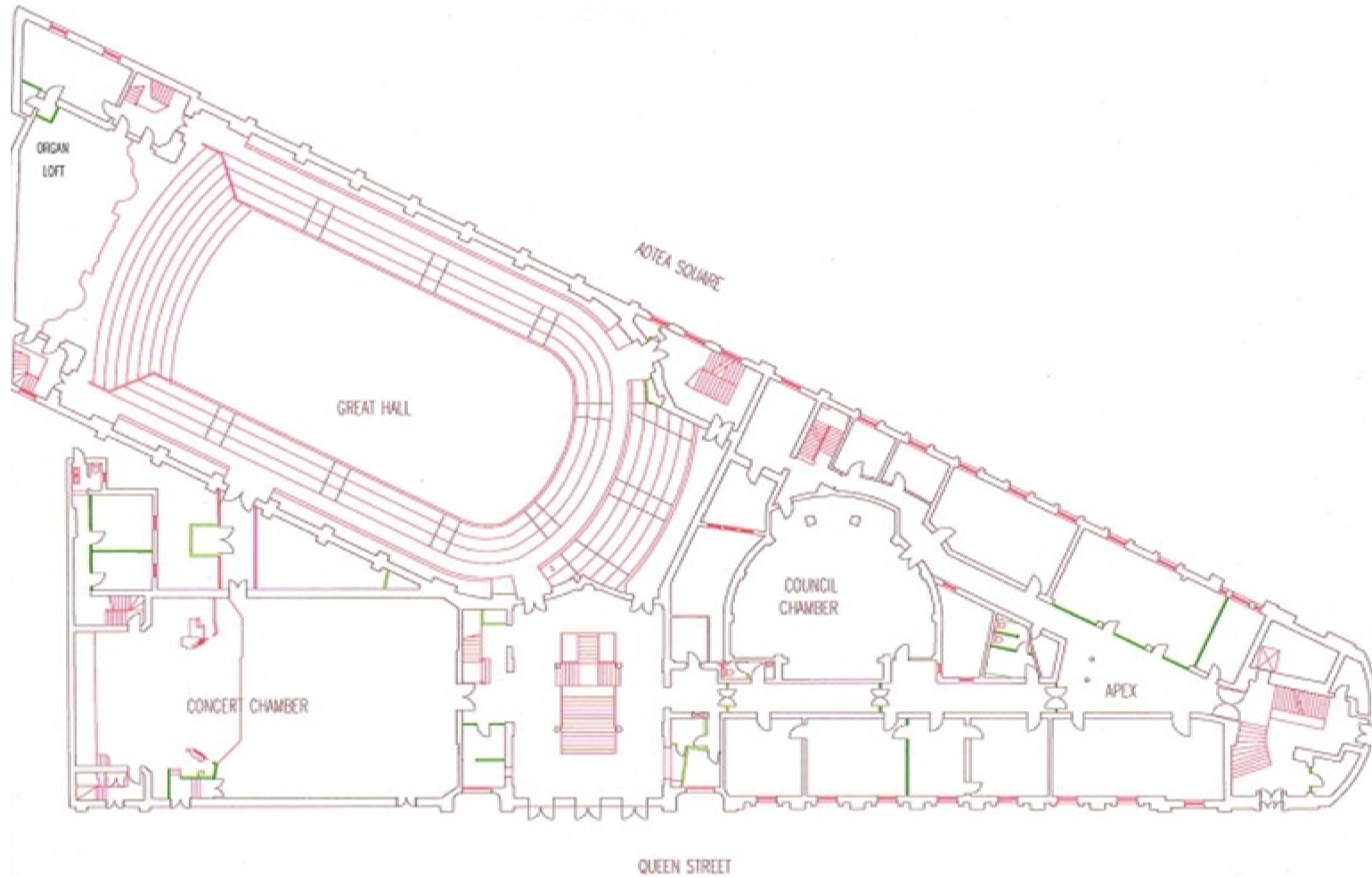
Strengthening of Auckland Town Hall
Trevor Robertson

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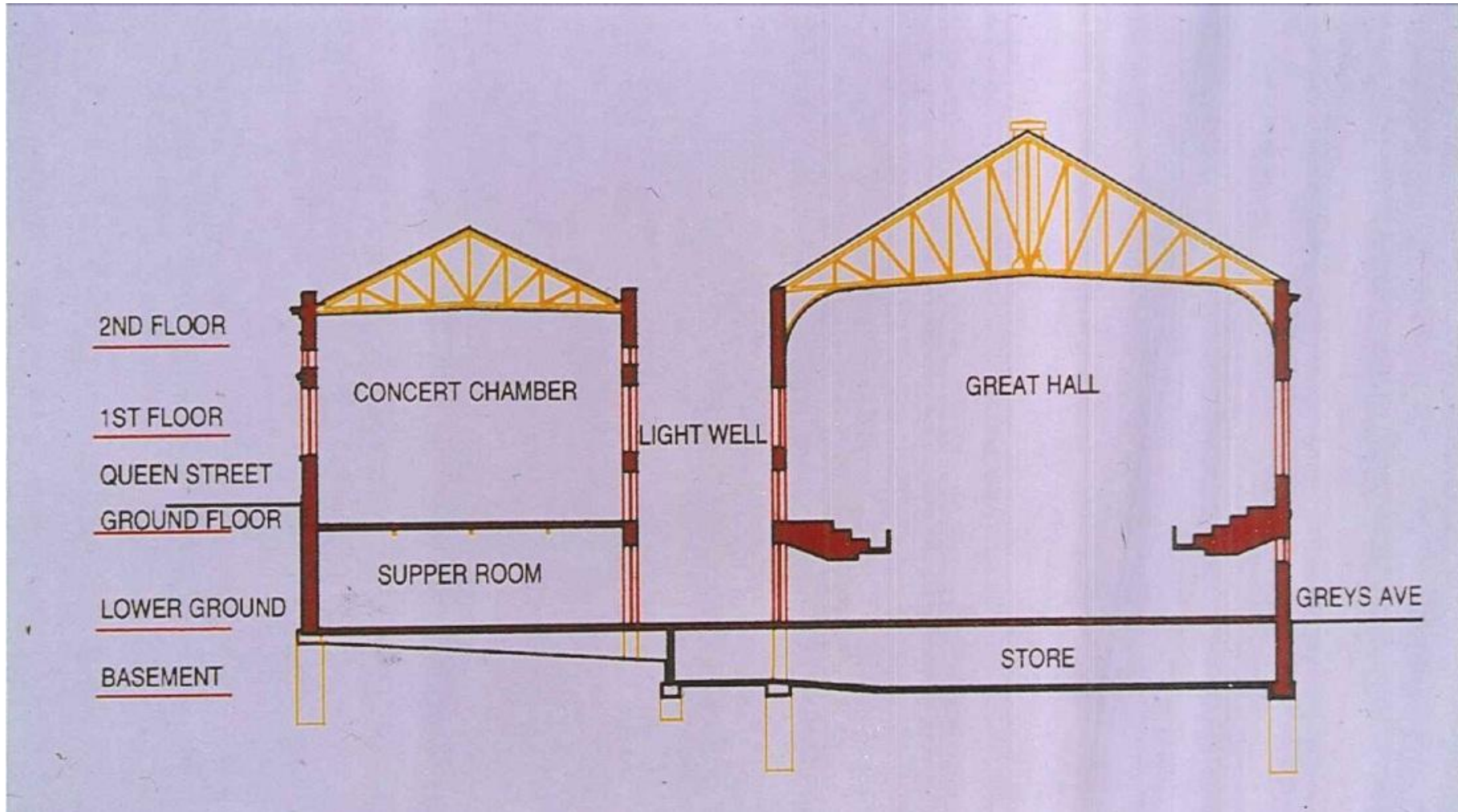
The Building

- Unreinforced masonry
- Timber diaphragms
- Wedge shape
- Large volume spaces – hence slender walls
- Four storey equivalent
- Tower at North end
- Asymmetric soil retention across the site
- Mass concrete pier foundations

Queen Street Floor Level



Cross-section Through Halls



Building Features

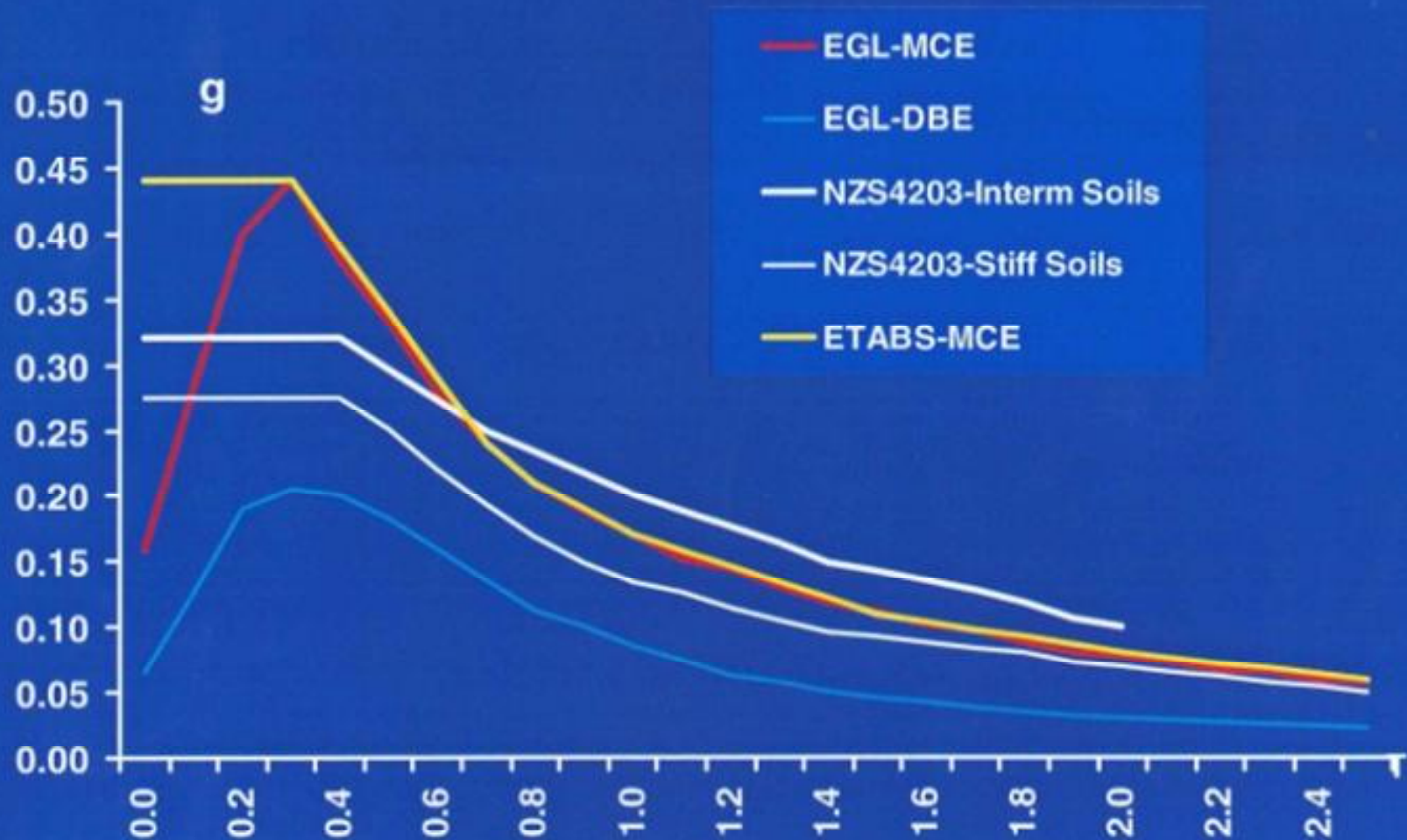


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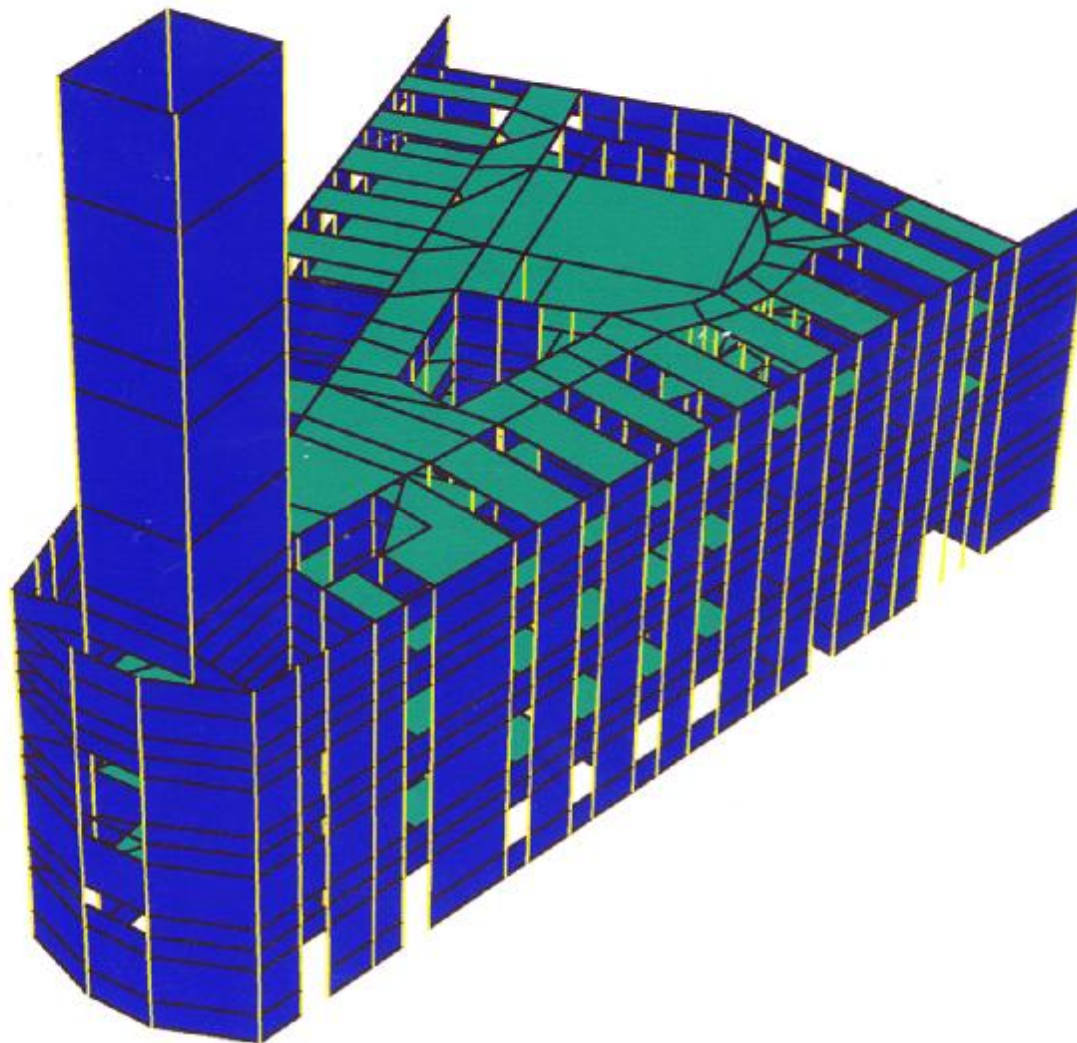
Analysis

- Assessed for life safety at Maximum Credible Earthquake
- Use of ETABS 6.0
- Flexible floor plates
- Subdivided into two models
- Model sub-divided at light well
- Face loading assessed by Prestley method

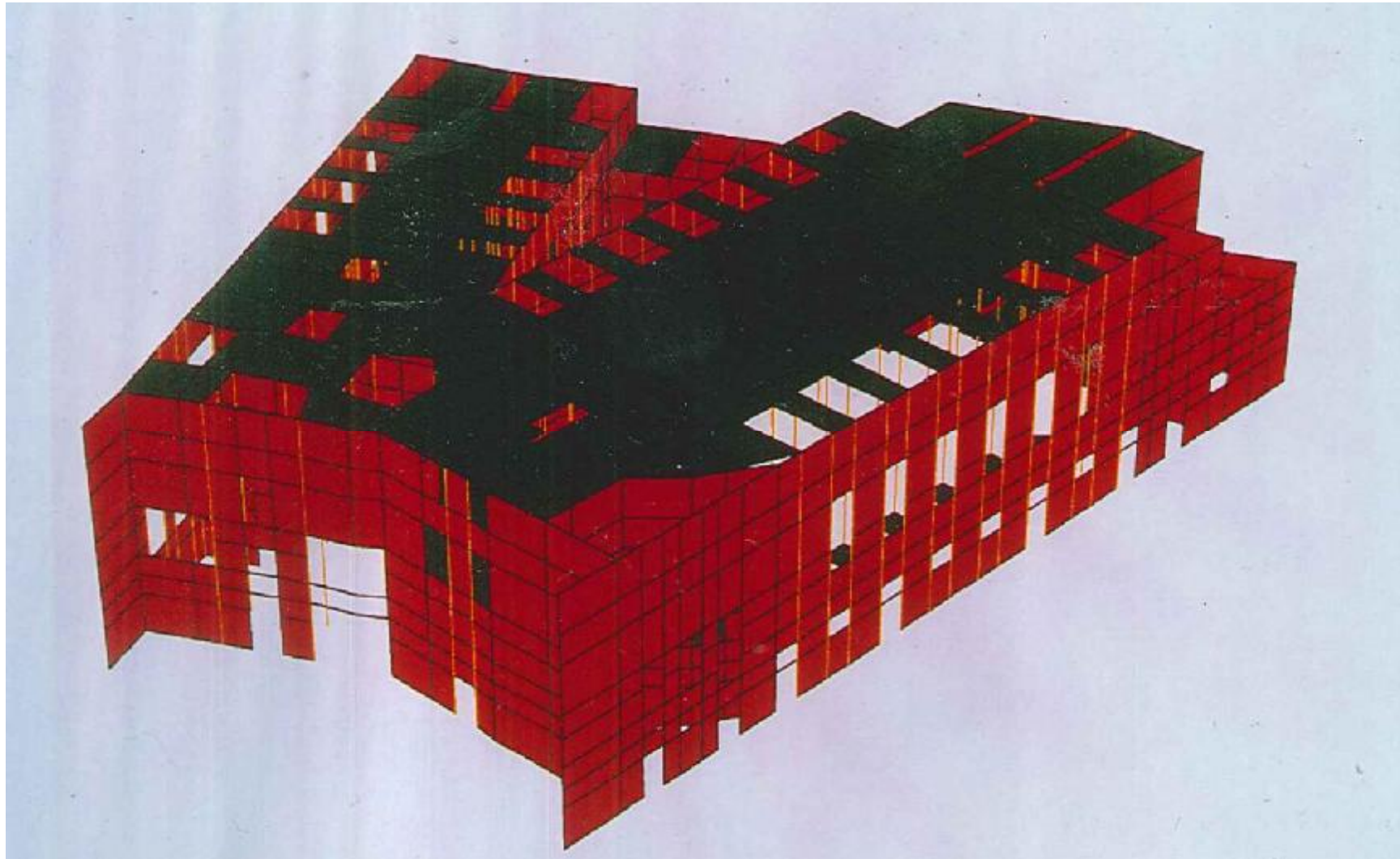
Response Spectra



Apex Zone ETABS Model



Halls Zone ETABS Model

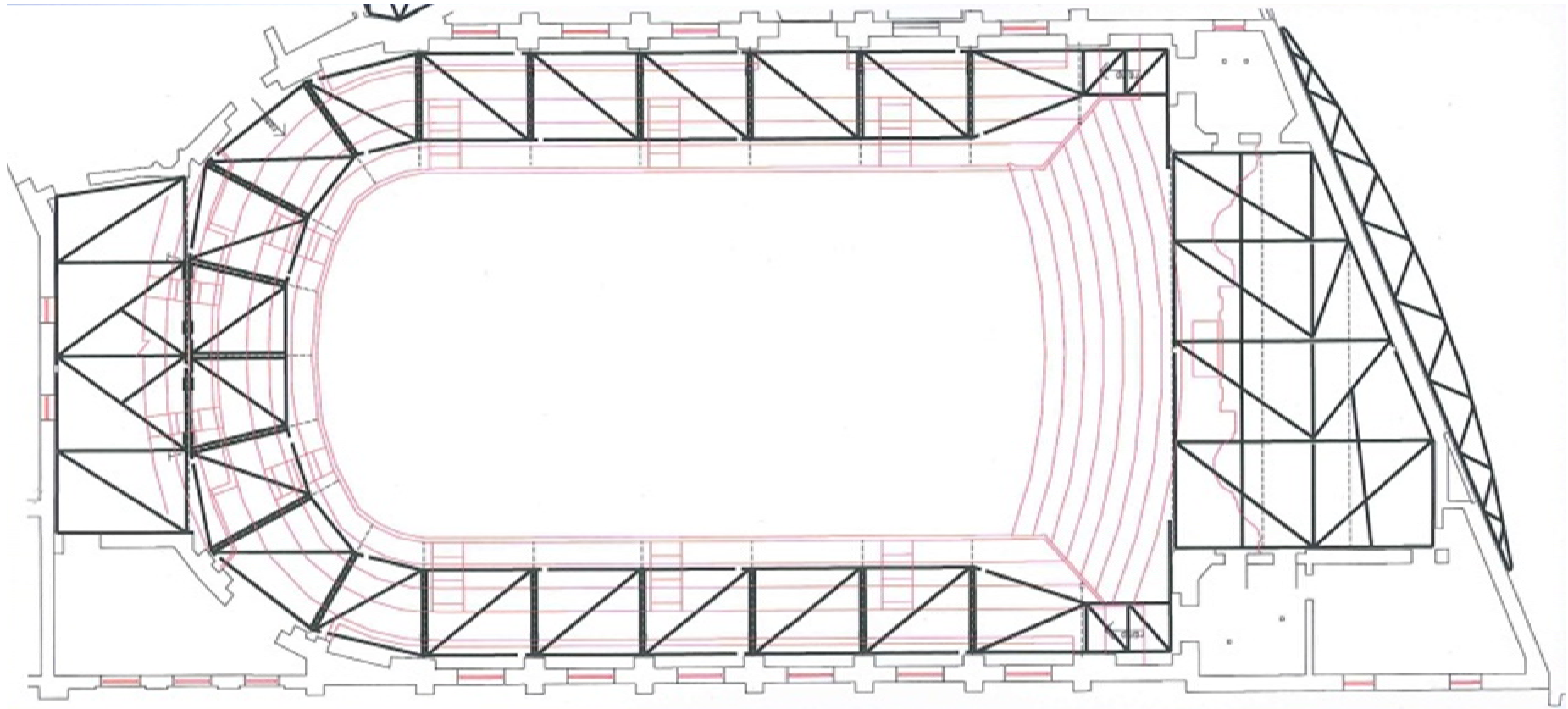


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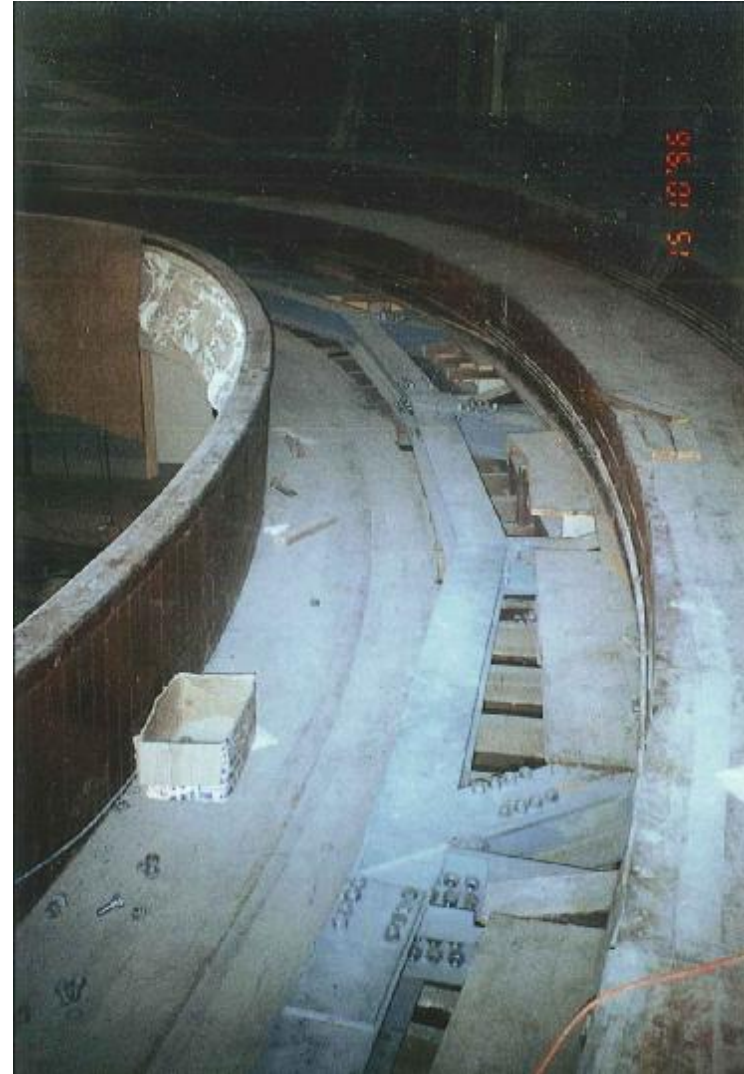
Great Hall Strengthening

- Circle level steel truss
- Ceiling level plywood diaphragm
- North end concrete shear wall
- South end concrete stitching of two walls
- External truss bracing South wall out-of-plane

Great Hall Circle Level Truss



Great Hall Circle Truss



South Wall Bracing Truss



Concert Chamber Strengthening

- Queen Street level steel sub-floor trusses
- Roof level pitched plywood diaphragm
- External wall concrete ribs
- Concrete floor diaphragm to foyer
- Concrete shear wall North end

Concert Chamber Truss (1 of 2)



Apex Strengthening

- Plywood floor diaphragms
- Plywood roof diaphragm
- Concrete transverse shear walls
- Titan ground anchors
- Tower restraining truss
- Wall pinning

1 / 2 Tower Truss Being Fitted



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Questions?



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