UNIVERSITY SCIENCES BUILDING

BUILDING INTRODUCTION

SITE MAP

- **Building Introduction**
- Existing Structural System
- Problem Statement
- Proposed Solution
- Moment Frame Designs
- Viscous Fluid Damper Design
- Comparison of Designs
- Sustainability Breadth: Viability Study
- Questions/Comments

- New Laboratory/Classroom building
- Located in Northeast USA
- 138,000 SF
- Maximum Height: 94’-3”
- Construction Cost: $50 Million
- August 2009-September 2011
- LEED Gold (version 2.2)

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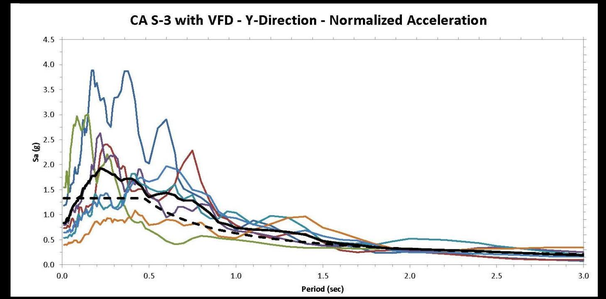
INITIAL SCALING

- Earthquake history records selected and scaled for nonlinear analysis
  - Records selected were recommended in FEMA P695
  - Scaling was done in a two-step process



HISTORY APPLICATION

- Histories first applied to CA S-3 model as linear loads to verify earthquake selection
  - Drifts ~0.3%
  - Loads too low
  - Arbitrary additional scale factor of 5
- Histories applied to CA S-3 with VFD model
  - Drifts ~0.1%
  - Dampers oversized
  - Damping coefficients reduced by trial-and-error
  - Velocity of final model used in recalculating damping force

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GREEN ROOF DESIGN – SYSTEM

- Extensive system chosen
  - Shallower, lighter
  - Not accessible, no occupied floors above
- Modular system chosen
  - Ease of installation
  - Ease of maintenance (both green roof and roof below)
- GreenGrid Roof

SAMPLE INSTALLATION