APPENDIX C

COMPARISON OF ANALYTICAL AND EXPERIMENTAL RESULTS FOR THE 5-STORY MODEL STRUCTURE SEISMICALLY ISOLATED WITH XY-FP ISOLATORS
Test IELH200A: El Centro S00E 200%, Isolators at $\theta=0^\circ$

**Isolation System Displacement (mm)**
- Experimental
- Analytical ($f_{max}=0.06$)

**1st-Story Shear / Weight**
- Base Shear / Weight
- Time (sec)

**Axial Force (kN)**
- South Isolator Pair
- North Isolator Pair
- Weight $= 106.5$ kN

**Base Shear / Weight**
- Time (sec)
- Isolation System Displacement (mm)
Test IELB200A: El Centro S00E+V 200%, Isolators at $\theta=0^\circ$
Test IP7H100A: Pacoima S74W 100%, Isolators at $\theta=0^\circ$
Test IP7B100A: Pacoima S74W+V 100%, Isolators at $\theta=0^\circ$

Isolation System Displacement (mm)

1st-Story Shear / Weight

Axial Force (kN)

Base Shear / Weight

Time (sec)

Weight = 106.5 kN

I isolation System Displacement (mm)
Test IP1H100A: Pacoima S16E 100%, Isolators at $\theta=0^\circ$

- **Isolation System Displacement (mm)**
  - Experimental
  - Analytical ($f_{max}=0.07$)

- **1st-Story Shear / Weight**
  - Base Shear / Weight

- **Axial Force (kN)**
  - South Isolator Pair
  - North Isolator Pair
  - Weight = 106.5 kN

- **Time (sec)**
Test IP1B100A: Pacoima S16E+V 100%, Isolators at θ=0°

- **Isolation System Displacement (mm)**
  - Experimental
  - Analytical ($f_{\text{max}}=0.07$)

- **Base Shear / Weight**
  - Weight = 106.5 kN

- **Axial Force (kN)**
  - South Isolator Pair
  - North Isolator Pair

- **1st-Story Shear / Weight**

- **Time (sec)**
Test ITFH400A: Taft N21E 400%, Isolators at $\theta=0^\circ$

- **Isolation System Displacement (mm)**
  - Experimental
  - Analytical ($f_{\text{max}}=0.08$)

- **1st-Story Shear / Weight**
  - Range: $-0.3$ to $0.3$

- **Axial Force (kN)**
  - Range: $-50$ to $150$

- **Isolation System Displacement (mm)**
  - South Isolator Pair
  - North Isolator Pair
  - Weight = 106.5 kN

Time (sec)

- **Base Shear / Weight**
  - Range: $-0.3$ to $0.3$
Test ITFB400A: Taft N21E+V 400%, Isolators at θ=0°

- **Isolation System Displacement (mm)**
- **Axial Force (kN)**
- **1st-Story Shear / Weight**
- **Isolation System**
- **Base Shear / Weight**

*Experimental vs Analytical (f_{max}=0.08)*

- **Base Shear / Weight**
  - Weight = 106.5 kN

### Graphs:
- **South Isolator Pair**
- **North Isolator Pair**

- **Base Shear / Weight**
- **Isolation System**
- **Axial Force (kN)**
- **1st-Story Shear / Weight**
- **Isolation System Displacement (mm)**

- **Time (sec)**
  - 0 5 10 15 20 25 30

- **Axial Force (kN)**
  - -50 0 50 100 150

- **1st-Story Shear / Weight**
  - -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3

- **Isolation System Displacement (mm)**
  - -60 -40 -20 0 20 40 60
Test IHAH100A: Hachinohe N-S 100%, Isolators at $\theta=0^\circ$

- Experimental
- Analytical ($f_{\text{max}}=0.10$)

**Isolation System Displacement (mm)**

**1st-Story Shear / Weight**

**Axial Force (kN)**

**Isolation System Displacement (mm)**

**Base Shear / Weight**

Weight = 106.5 kN

**Time (sec)**

South Isolator Pair
North Isolator Pair
Test ISYH100A: Sylmar 90 100%, Isolators at θ=0°
Test ISYB100A: Sylmar 90+V 100%, Isolators at θ=0°

- Isolation System Displacement (mm)

- 1st-Story Shear / Weight

- Axial Force (kN)

- Isolation System Displacement (mm)

- Time (sec)

- Axial Force (kN)

- Base Shear / Weight

- Weight = 106.5 kN

TENSION

Experimental
Analytical (f_\text{max}=0.08)
Test IN9H100A: Newhall 90 100%, Isolators at $\theta=0^\circ$

- Isolation System Displacement (mm)
- 1st-Story Shear / Weight
- Axial Force (kN)
- Isolation System Displacement (mm)
- 1st-Story Shear / Weight
- Axial Force (kN)
- Base Shear / Weight

- Weight = 106.5 kN
Test IN9B100A: Newhall 90+V 100\%, Isolators at $\theta=0^\circ$

- **Isolation System Displacement (mm)**
  - Experimental
  - Analytical ($f_{\text{max}}=0.09$)

- **1st-Story Shear / Weight**

- **Axial Force (kN)**
  - South Isolator Pair
  - North Isolator Pair
  - Weight = 106.5 kN

- **Base Shear / Weight**
Test IN3H100A: Newhall 360 100% Isolators at $\theta=0^\circ$

**Isolation System Displacement (mm)**

- Experimental
- Analytical ($f_{\text{max}}=0.10$)

**Axial Force (kN)**

**1st-Story Shear / Weight**

- Weight = 106.5 kN

**Isolation System Displacement (mm)**

- South Isolator Pair
- North Isolator Pair

**Time (sec)**
Test IN3B100A: Newhall 360+V 100%, Isolators at θ=0°
Test IKBH100A: Kobe N-S 100%, Isolators at $\theta=0^\circ$

- **Isolation System Displacement (mm)**
  - Experimental
  - Analytical ($f_{max}=0.10$)

- **1st-Story Shear / Weight**
  - Experimental

- **Axial Force (kN)**
  - South Isolator Pair
  - North Isolator Pair
  - TENSION

- **Base Shear / Weight**
  - Weight = 106.5 kN
Test IKBB100A: Kobe N-S+V 100%, Isolators at $\theta=0^\circ$

- **Axial Force (kN)**
  - Scale: -50 to 150
  - South Isolator Pair
  - North Isolator Pair

- **Isolation System Displacement (mm)**
  - Scale: -40 to 40
  - Experimental
  - Analytical ($f_{\text{max}}=0.10$)

- **1st-Story Shear / Weight**
  - Scale: -0.3 to 0.3

- **Base Shear / Weight**
  - Scale: -0.3 to 0.3
  - Weight = 106.5 kN

**Note:**
- TENSION
- Time (sec)
Test IELH200C: El Centro S00E 200%, Isolators at $\theta=90^\circ$

Axial Force (kN)

1st-Story Shear / Weight

Isolation System Displacement (mm)

Base Shear / Weight

South Isolator Pair

North Isolator Pair

Weight = 106.5 kN

Experimental

Analytical ($f_{\text{max}}=0.07$)
Test IELB200C: El Centro S00E+V 200%, Isolators at $\theta=90^\circ$

- **Isolation System Displacement (mm)**
  - Experimental
  - Analytical ($f_{\text{max}}=0.07$)

- **1st-Story Shear / Weight**
  - $-0.2$ to $0.2$

- **Base Shear / Weight**
  - $-0.2$ to $0.2$

- **Axial Force (kN)**
  - $-50$ to $150$

- **Time (sec)**
  - $0$ to $25$

- **South Isolator Pair**
  - Axial Force (kN)
  - TENSION

- **North Isolator Pair**
  - Axial Force (kN)
  - TENSION

- **Weight = 106.5 kN**
Test IP1H100C: Pacoima S16E 100%, Isolators at θ=90°

Axial Force (kN)

1st-Story Shear / Weight

Isolation System Displacement (mm)

Isolation System Displacement (mm)

Base Shear / Weight

Weight = 106.5 kN

North Isolator Pair

South Isolator Pair

Isolator Pair TENSION

Time (sec)

TENSION
Test IP1B100C: Pacoima S16E+V 100%, Isolators at $\theta=90^\circ$

Isolation System Displacement (mm)

- Experimental
- Analytical ($f_{max}=0.08$)

Base Shear / Weight

1st-Story Shear / Weight

Axial Force (kN)

South Isolator Pair

North Isolator Pair

TENSION

Weight = 106.5 kN

Time (sec)
Test ISYH100C: Sylmar 90 100%, Isolators at $\theta=90^\circ$

- Experimental
- Analytical ($f_{\text{max}}=0.10$)

- Isolation System Displacement (mm)

- 1st-Story Shear / Weight

- Axial Force (kN)

- Base Shear / Weight

- Weight = 106.5 kN

- South Isolator Pair

- North Isolator Pair

- TENSION

- Time (sec)
Test ISYB100C: Sylmar 90+V 100%, Isolators at θ=90°
Test IN3H100C: Newhall 360 100%, Isolators at $\theta=90^\circ$

- **Isolation System Displacement (mm)**
  - Experimental
  - Analytical ($f_{\text{max}}=0.10$)

- **1st-Story Shear / Weight**
  - $-0.3$ to $0.3$

- **Axial Force (kN)**
  - $-50$ to $150$

- **Isolation System Displacement (mm)**
  - $-60$ to $60$

- **Base Shear / Weight**
  - $-0.3$ to $0.3$
  - Weight = 106.5 kN

- **Time (sec)**
  - 0 to 15

- **Axial Force (kN)**
  - South Isolator Pair
  - North Isolator Pair
  - TENSION

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Test IN3B100C: Newhall 360+V 100%, Isolators at $\theta=90^\circ$

Isolation System Displacement (mm)

Base Shear / Weight

Axial Force (kN)

1st-Story Shear / Weight

Time (sec)

Weight = 106.5 kN

South Isolator Pair

North Isolator Pair

TENSION

Experimental

Analytical ($f_{\text{max}}=0.10$)
Test IELH200G: El Centro S00E 200%, Isolators at $\theta=45^\circ$

Isolation System Displacement (mm)

1st-Story Shear / Weight

Axial Force (kN)

Base Shear / Weight

Weight = 106.5 kN

Time (sec)

Experimental

Analytical ($f_{\text{max}}=0.07$)

South Isolator Pair

North Isolator Pair

TENSION

TENSION

South Isolator Pair

North Isolator Pair

Weight = 106.5 kN

Isolation System Displacement (mm)
Test IELB200G: El Centro S00E+V 200%, Isolators at $\theta=45^\circ$

Isolation System Displacement (mm)

Axial Force (kN)

1st-Story Shear / Weight

Isolation System Displacement (mm)

Base Shear / Weight

Weight = 106.5 kN

Experimental

Analytical ($f_{\text{max}}=0.07$)

South Isolator Pair

North Isolator Pair

TENSION
Test IP1H100G: Pacoima S16E 100%, Isolators at $\theta=45^\circ$

- **Isolation System Displacement (mm)**

- **1st-Story Shear / Weight**

- **Axial Force (kN)**

- **Base Shear / Weight**

- **Isolation System**

- **Time (sec)**

- **South Isolator Pair**

- **North Isolator Pair**

- **Weight = 106.5 kN**

- **Experimental**

- **Analytical ($f_{max}=0.07$)**

- **TENSION**
Test IP1B100G: Pacoima S16E+V 100%, Isolators at $\theta=45^\circ$

- **Isolation System Displacement (mm)**
  - Experimental
  - Analytical ($f_{\text{max}}=0.07$)

- **1st-Story Shear / Weight**
  - $-0.3$ to $0.3$

- **Weight = 106.5 kN**

- **Axial Force (kN)**
  - South Isolator Pair
  - North Isolator Pair
  - TENSION

- **Base Shear / Weight**
Test ISYH100G: Sylmar 90 100%, Isolators at $\theta=45^\circ$

- Isolation System Displacement (mm)
- 1st-Story Shear / Weight
- Axial Force (kN)
- Isolation System Displacement (mm)
- Base Shear / Weight
- Time (sec)
- Weight = 106.5 kN
Test ISYB100G: Sylmar 90+V 100%, Isolators at $\theta=45^\circ$

- **Isolation System Displacement (mm)**
  - Experimental
  - Analytical ($f_{\text{max}}=0.07$)

- **1st-Story Shear / Weight**

- **Axial Force (kN)**

- **Time (sec)**

- **Base Shear / Weight**

- **Weight = 106.5 kN**

- **South Isolator Pair**

- **North Isolator Pair**

- **Weight = 106.5 kN**
Test IN3H100G: Newhall 360 100%, Isolators at $\theta=45^\circ$

- **Isolation System Displacement (mm)**
  - Experimental
  - Analytical ($f_{\text{max}}=0.08$)

- **1st-Story Shear / Weight**

- **Axial Force (kN)**
  - South Isolator Pair
  - North Isolator Pair
  - Weight = 106.5 kN

- **Base Shear / Weight**
  - Weight = 106.5 kN
Test IN3B100G: Newhall 360+V 100%, Isolators at θ=45°

- Experimental
- Analytical ($f_{\text{max}} = 0.08$)

**Base Shear / Weight**

- Weight = 106.5 kN

**Axial Force (kN)**

- South Isolator Pair
- North Isolator Pair

**1st-Story Shear / Weight**

**Isolation System Displacement (mm)**

**Time (sec)**