

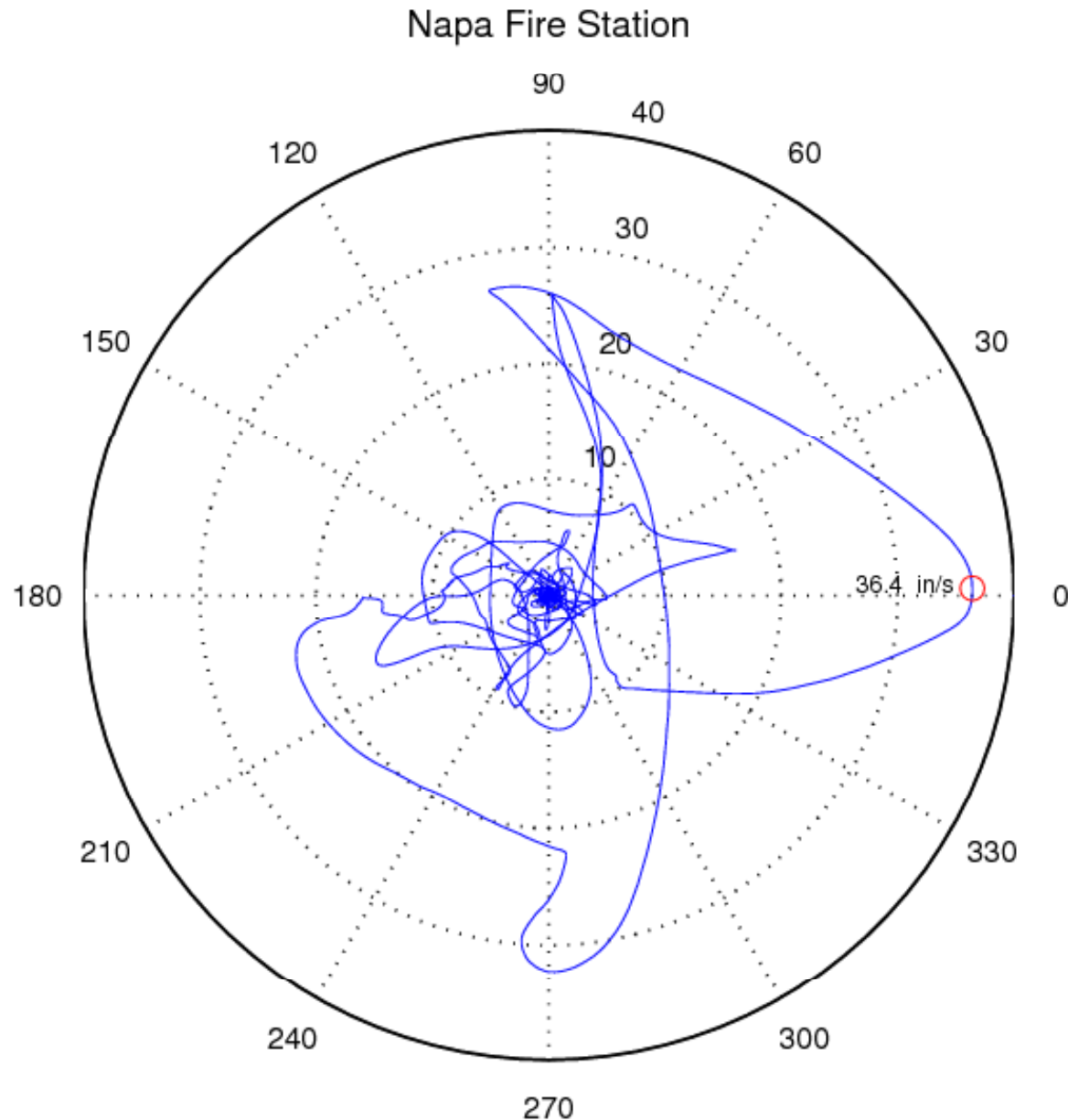
**StrongMotions**  
Knowledge and Clarity **Inc.**

# Unusually Strong Ground Motions from M6 South Napa Earthquake

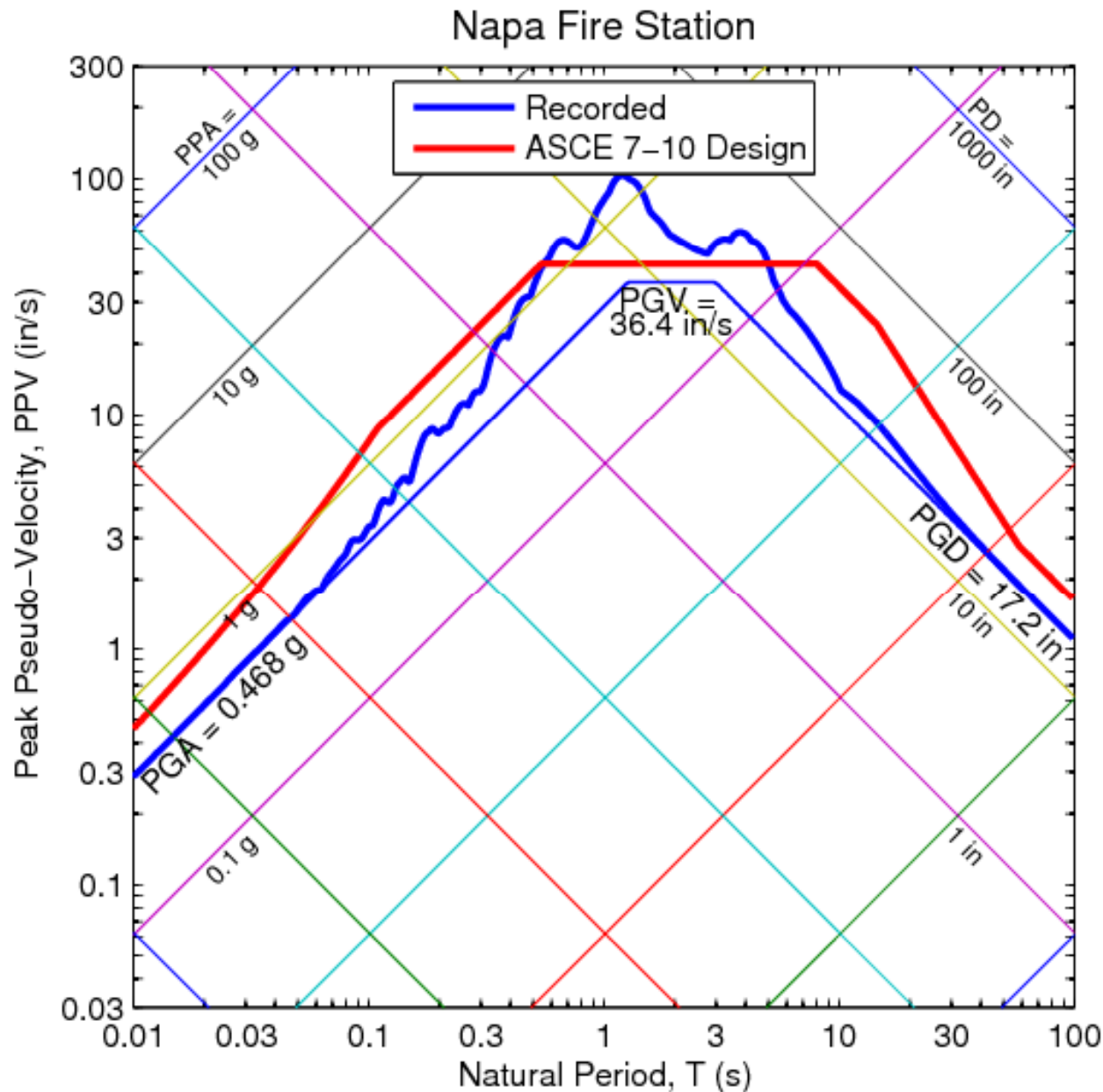
September 6, 2014

# Napa Fire Station (USGS 1765)

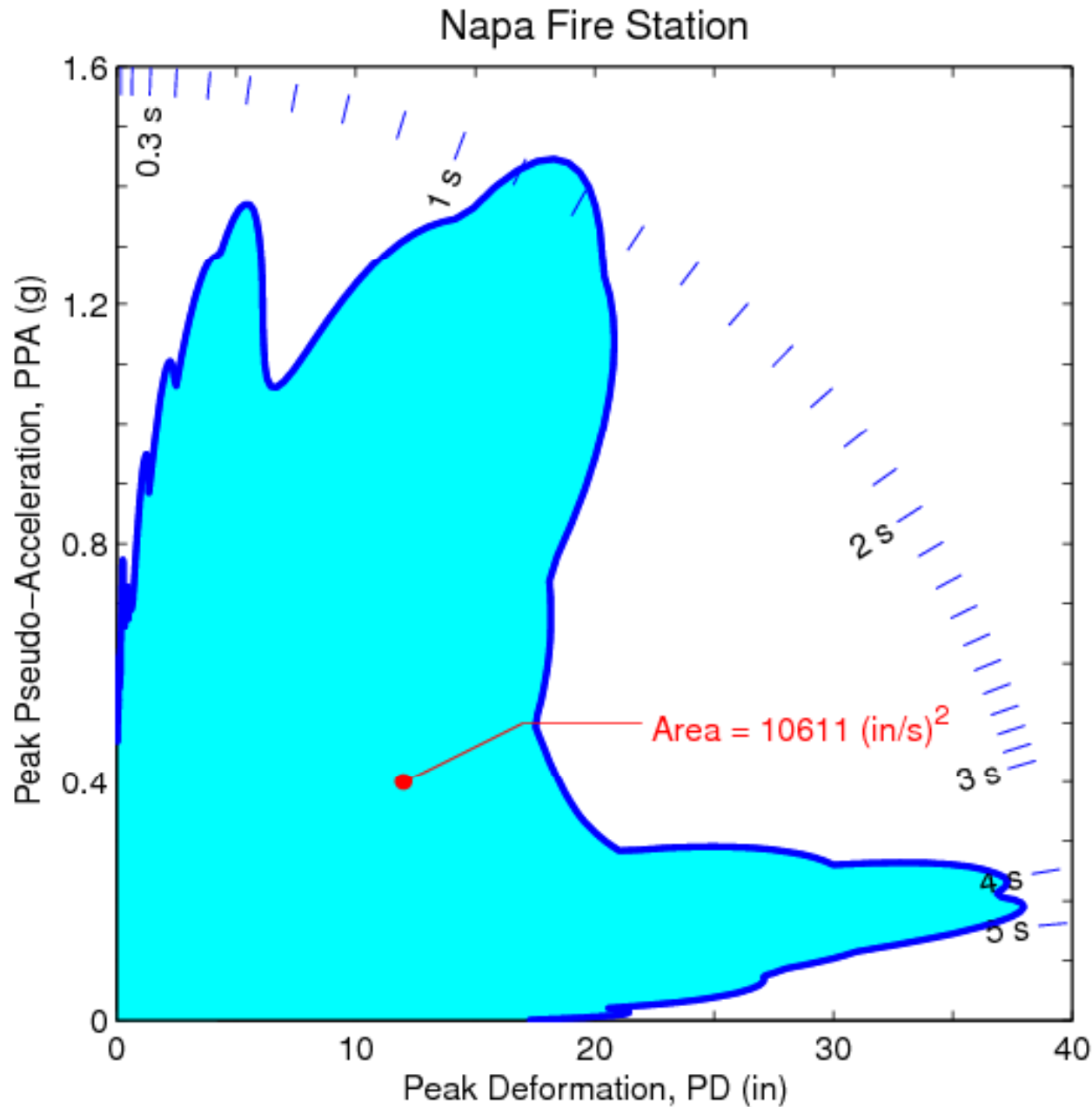
## Peak Ground Velocity = 36.4 in/s



# Recorded and Design Response Spectra for 5% Damping

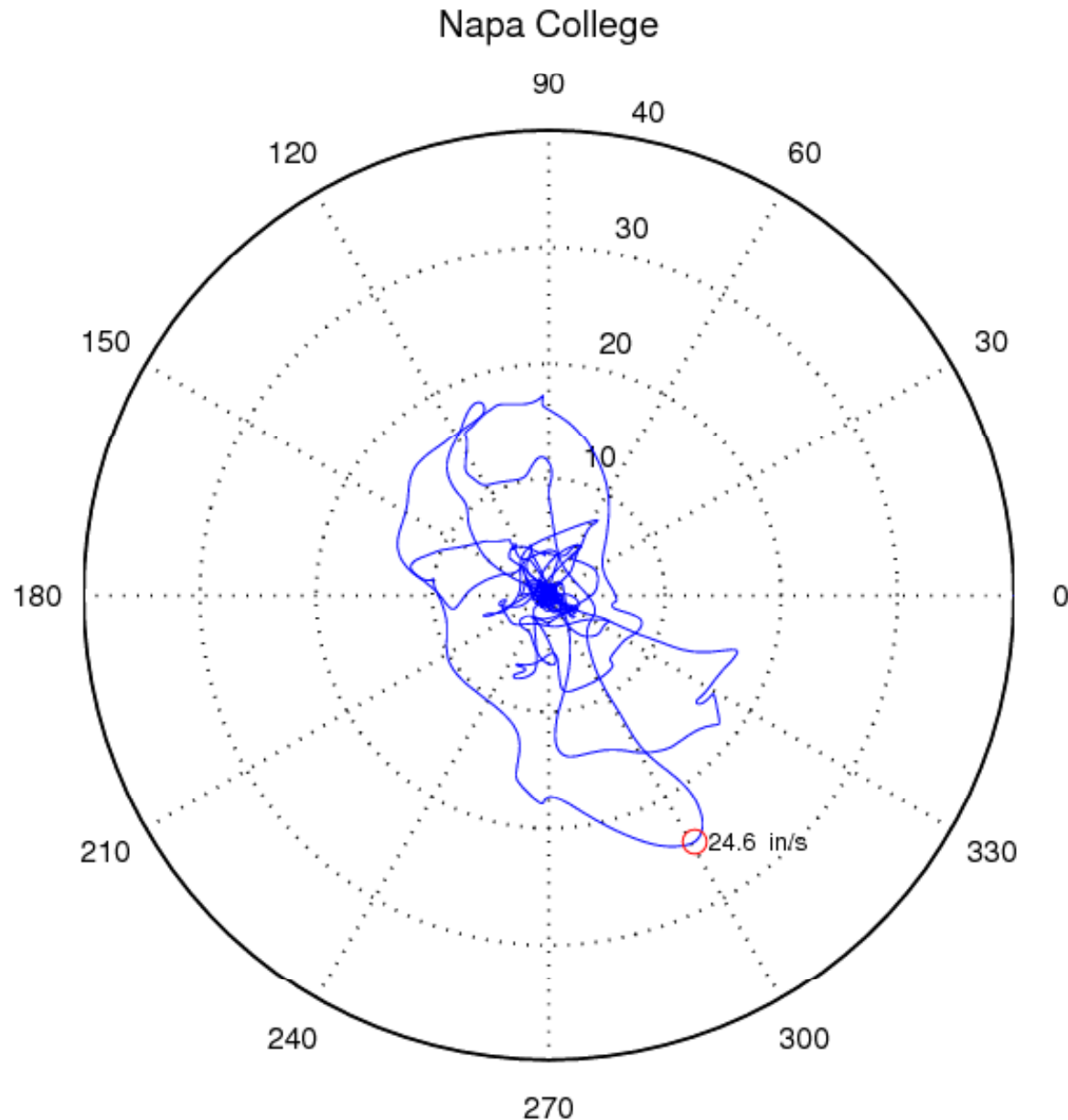


# Acceleration-Deformation Response Spectrum for 5% Damping

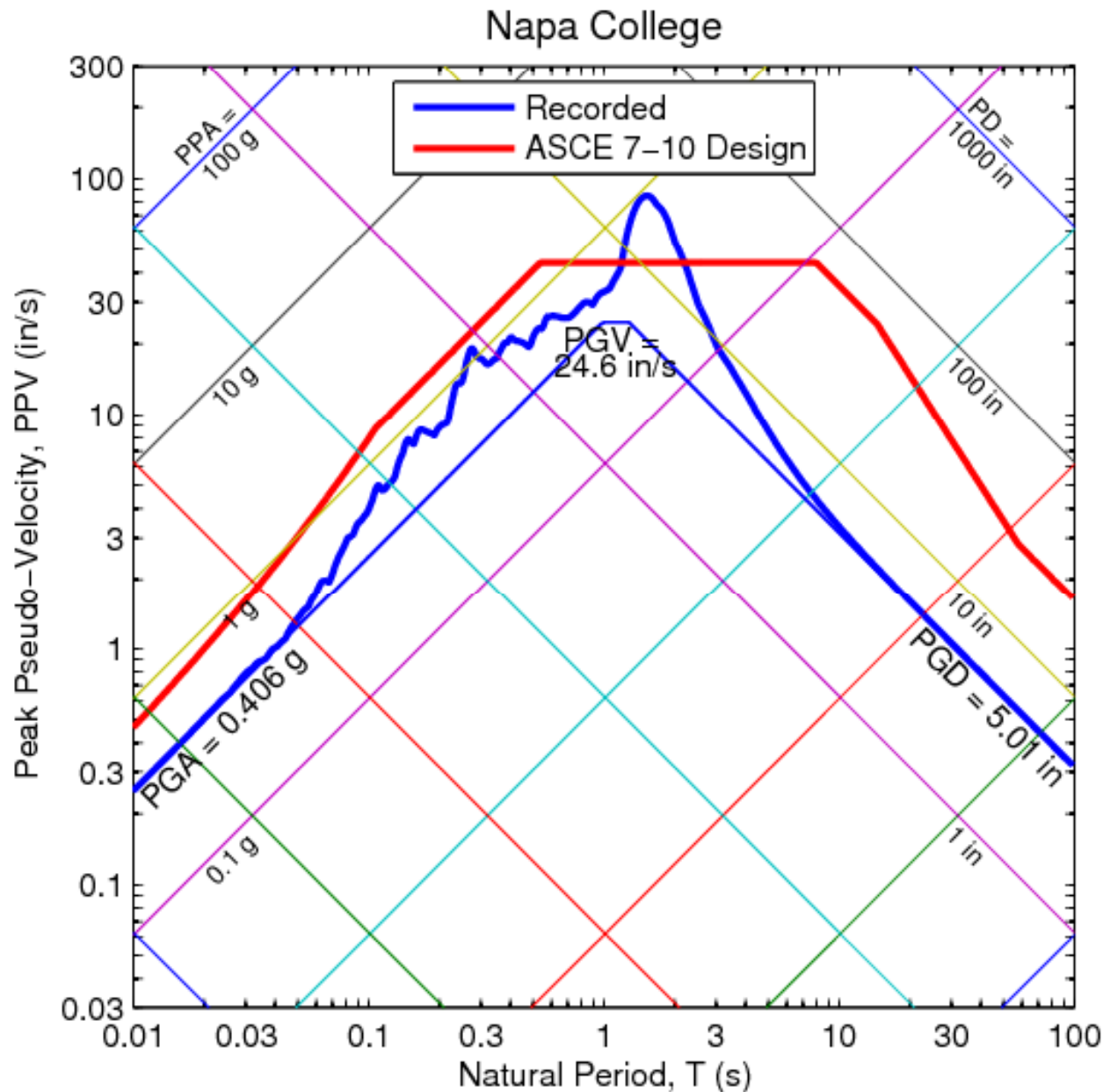


# Napa College (CGS 68150)

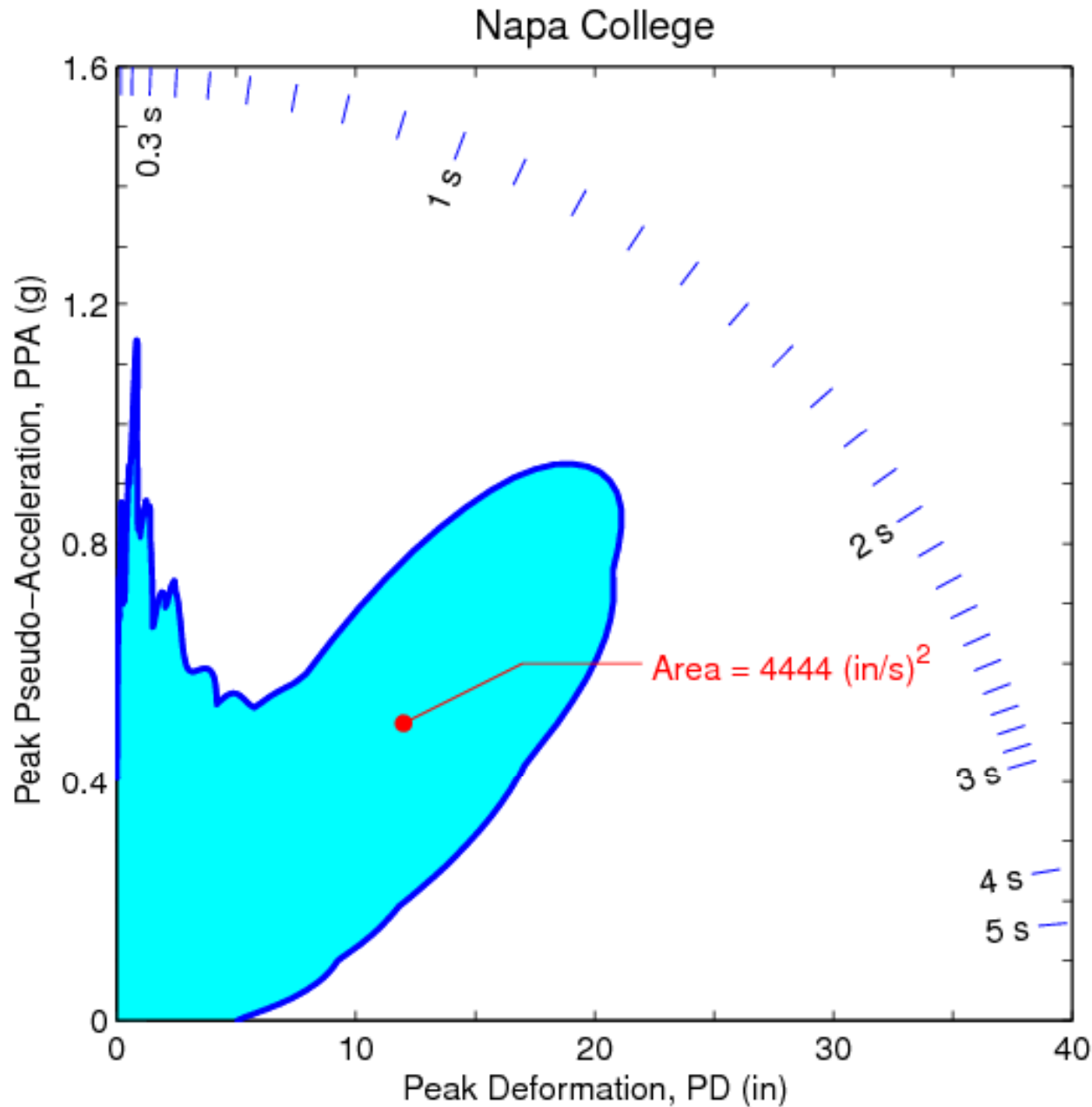
Peak Ground Velocity = 24.6 in/s



# Recorded and Design Response Spectra for 5% Damping

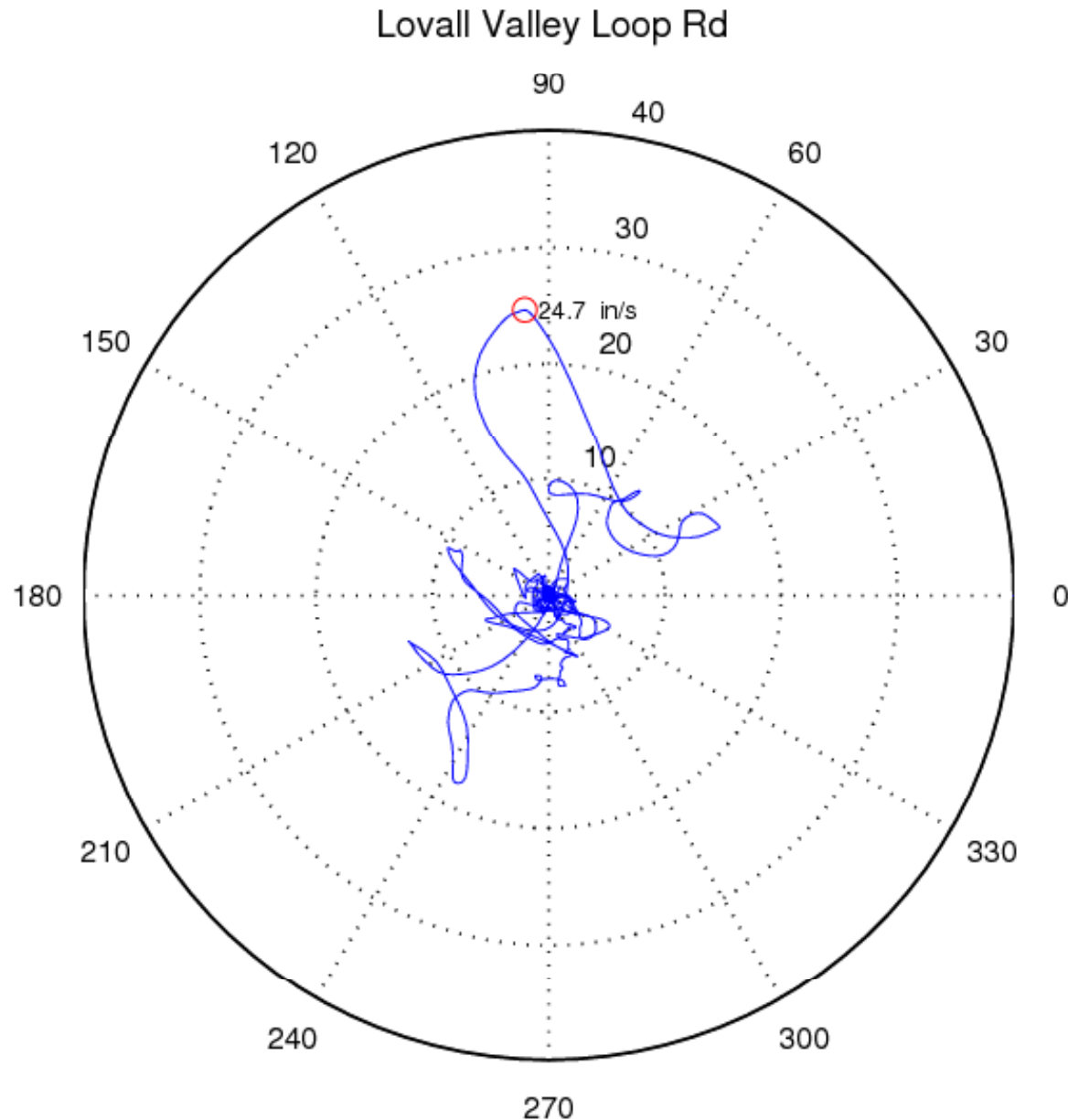


# Acceleration-Deformation Response Spectrum for 5% Damping



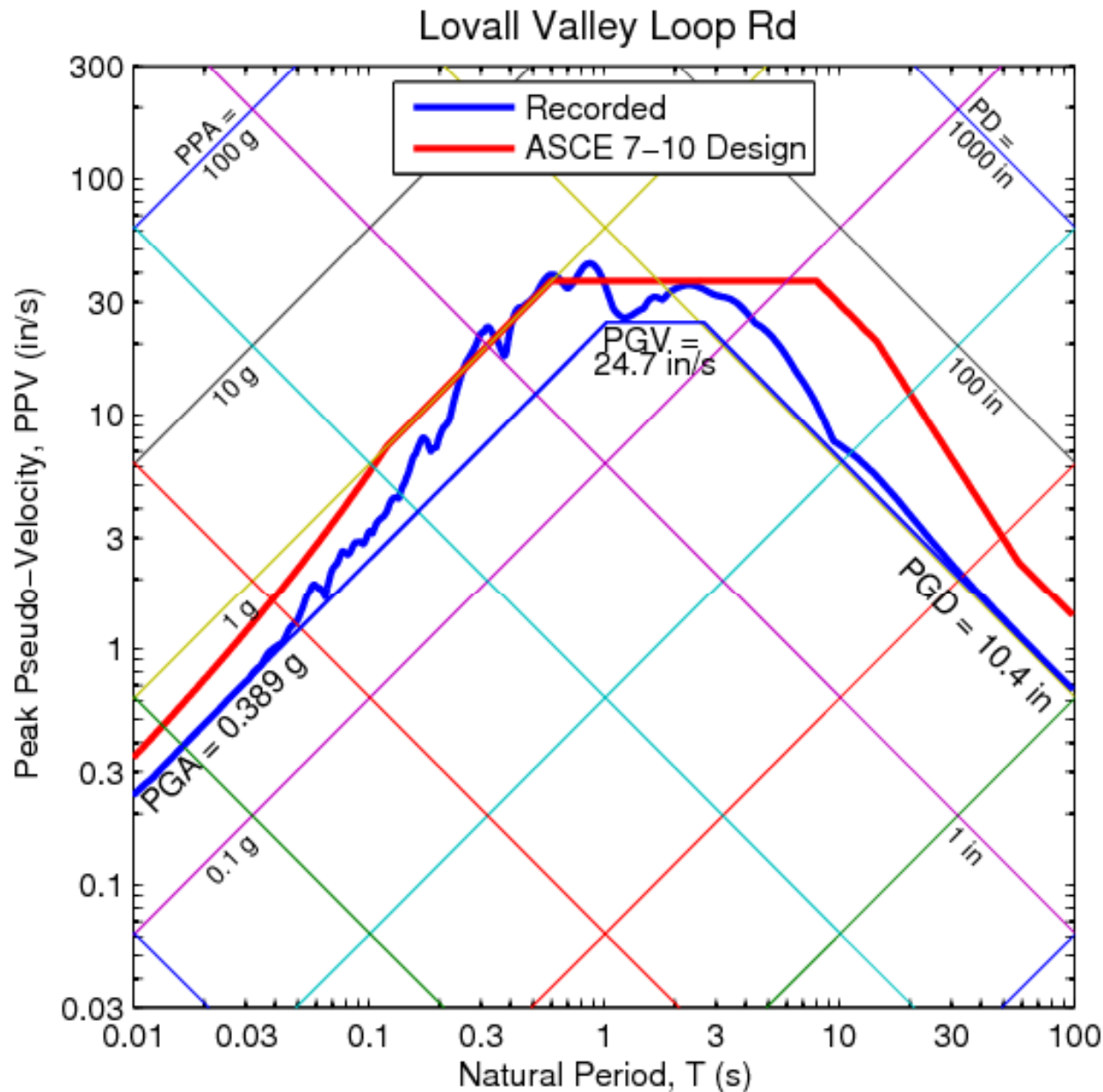
# Lovall Valley Loop Rd (NCSN N019B)

## Peak Ground Velocity = 24.7 in/s

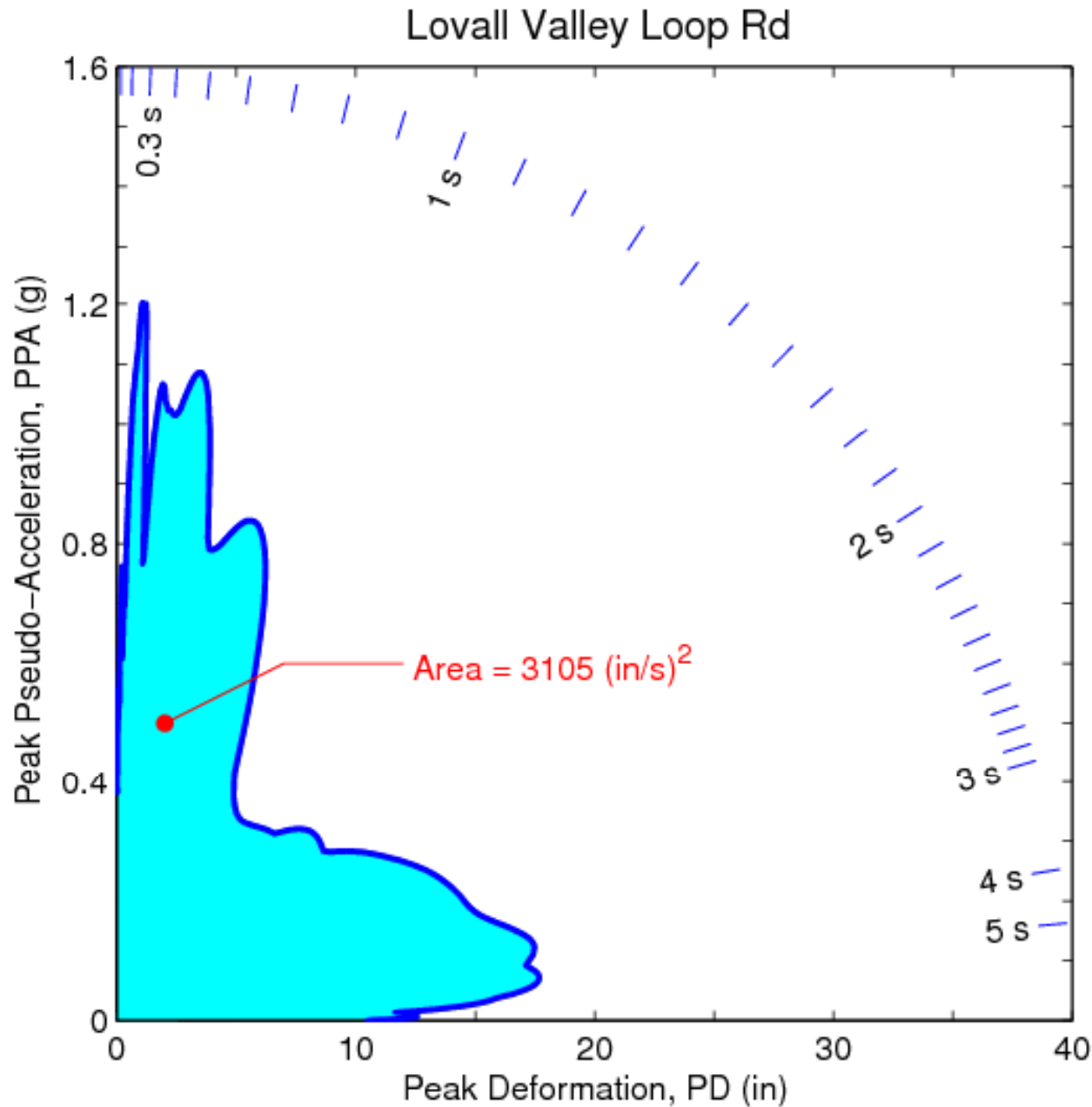




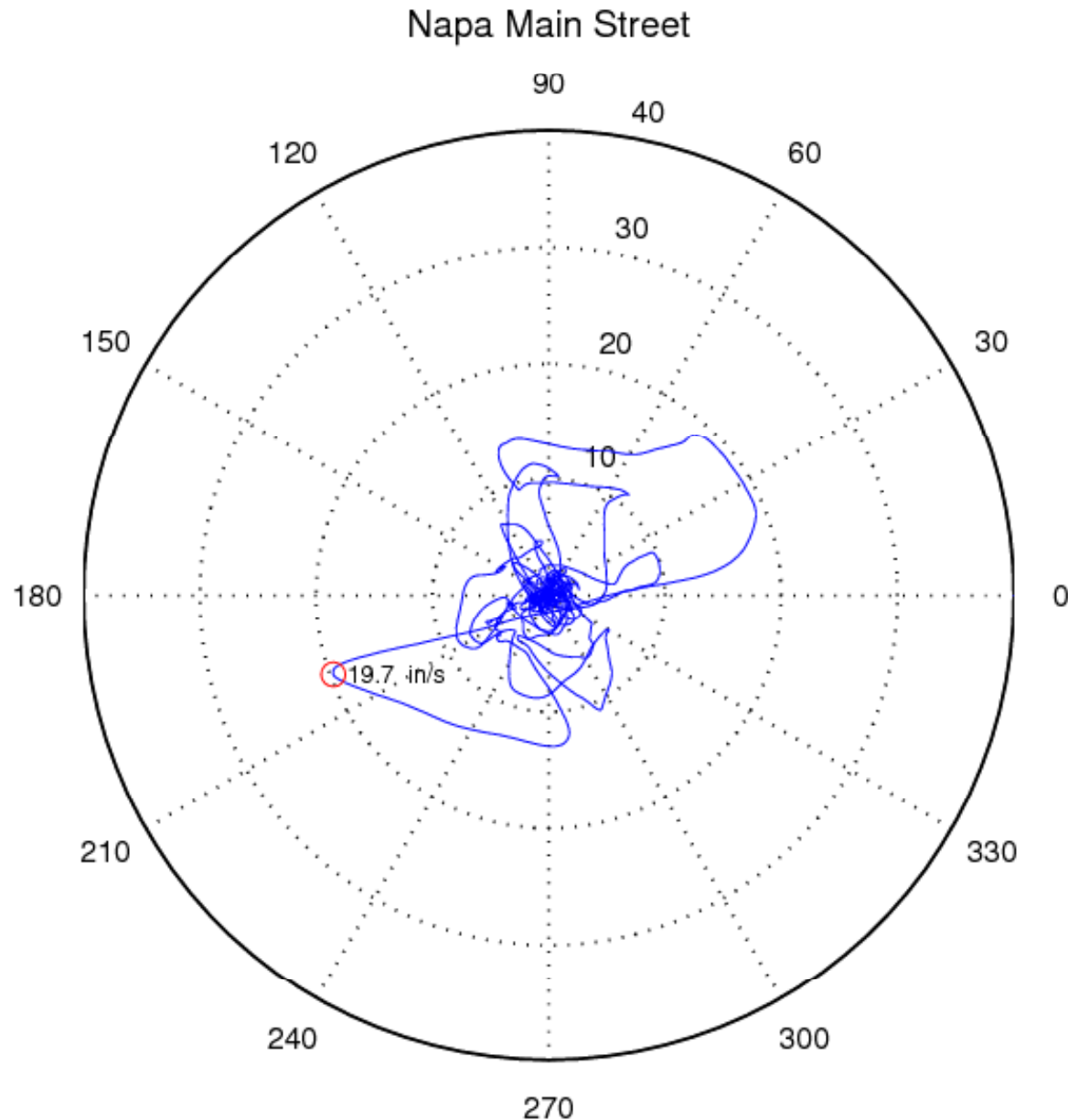
# Recorded and Design Response Spectra for 5% Damping



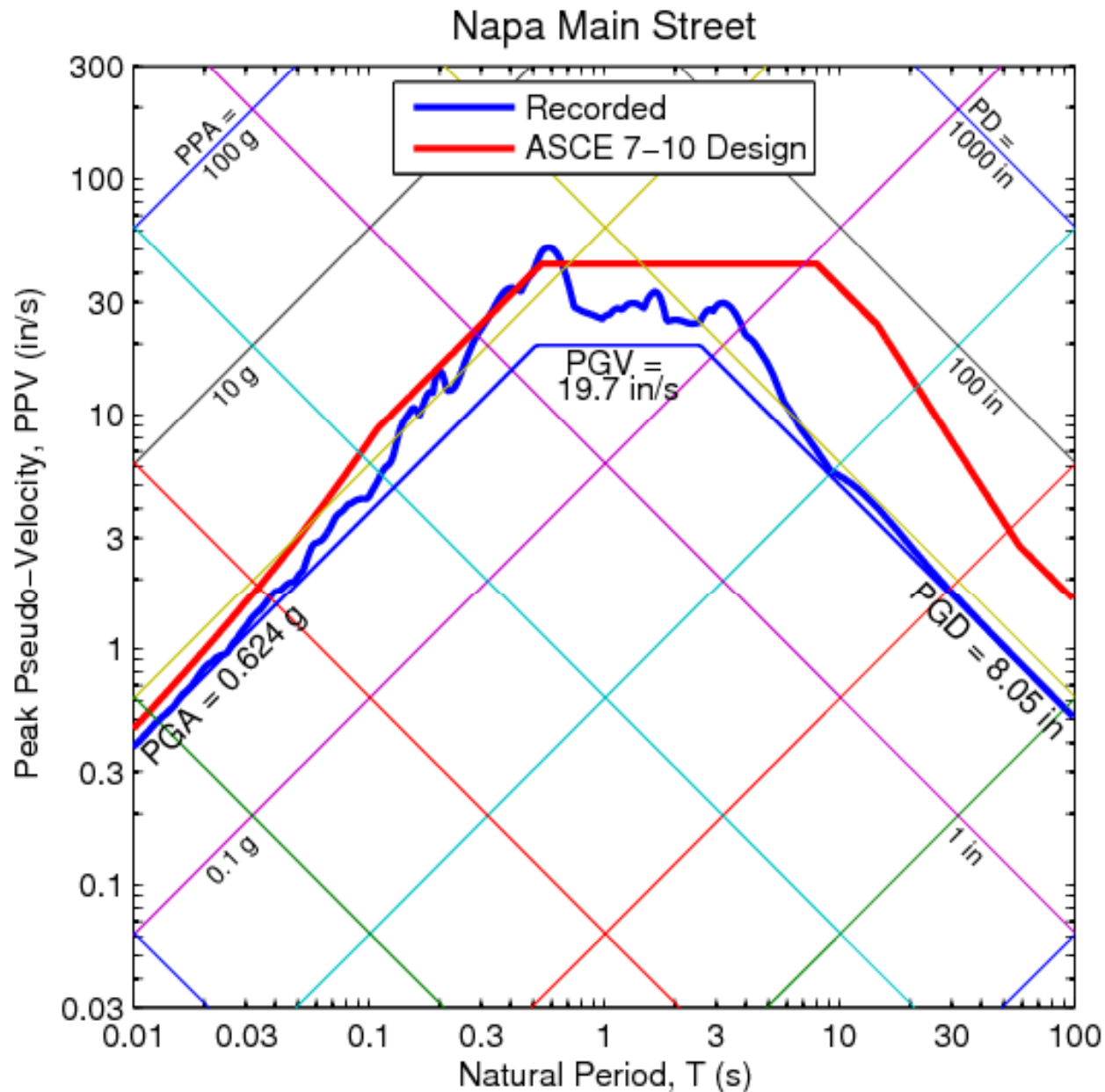
# Acceleration-Deformation Response Spectrum for 5% Damping



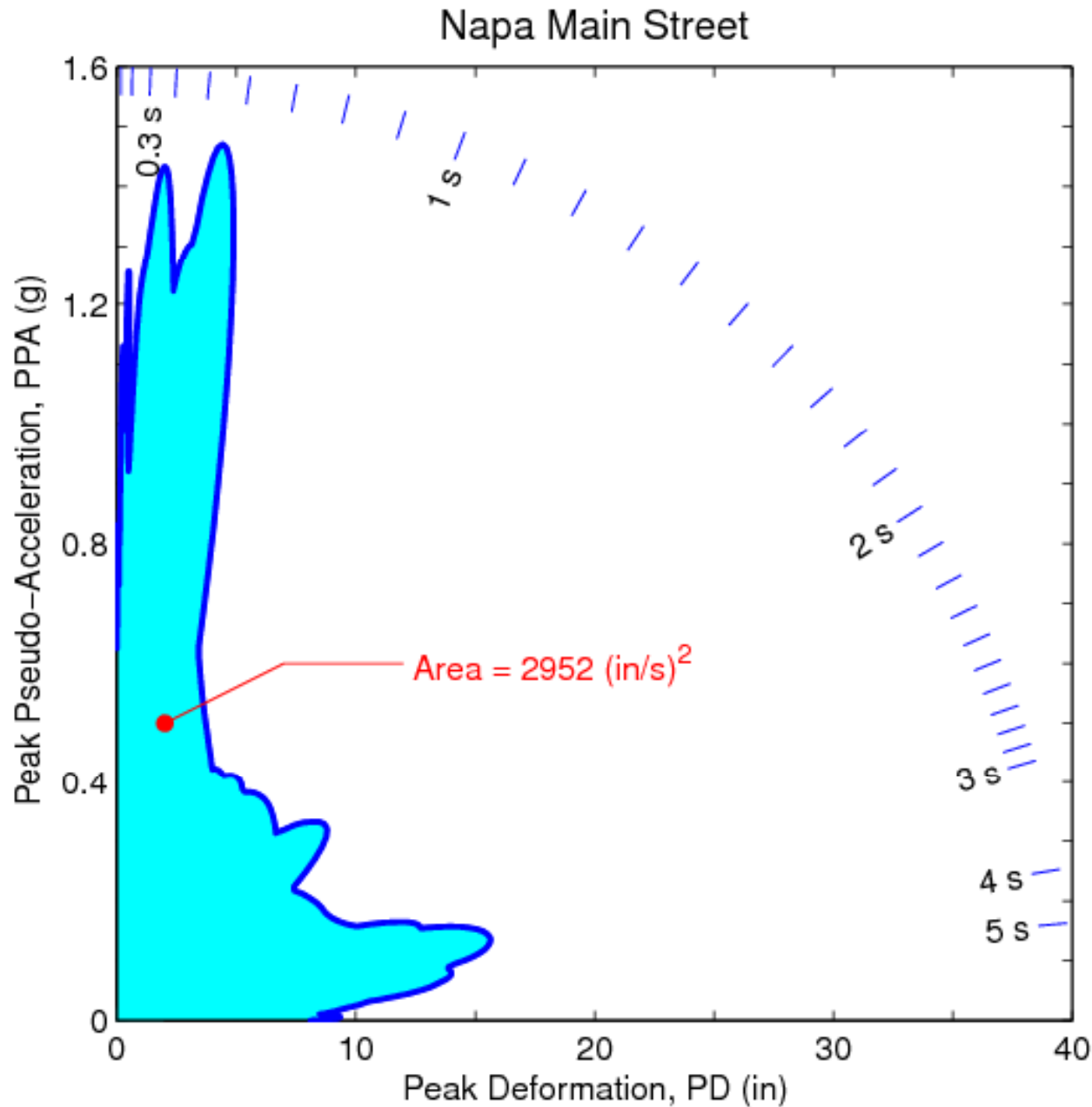
# Napa Main Street (NCSN N016) Peak Ground Velocity = 19.7 in/s



# Recorded and Design Response Spectra for 5% Damping

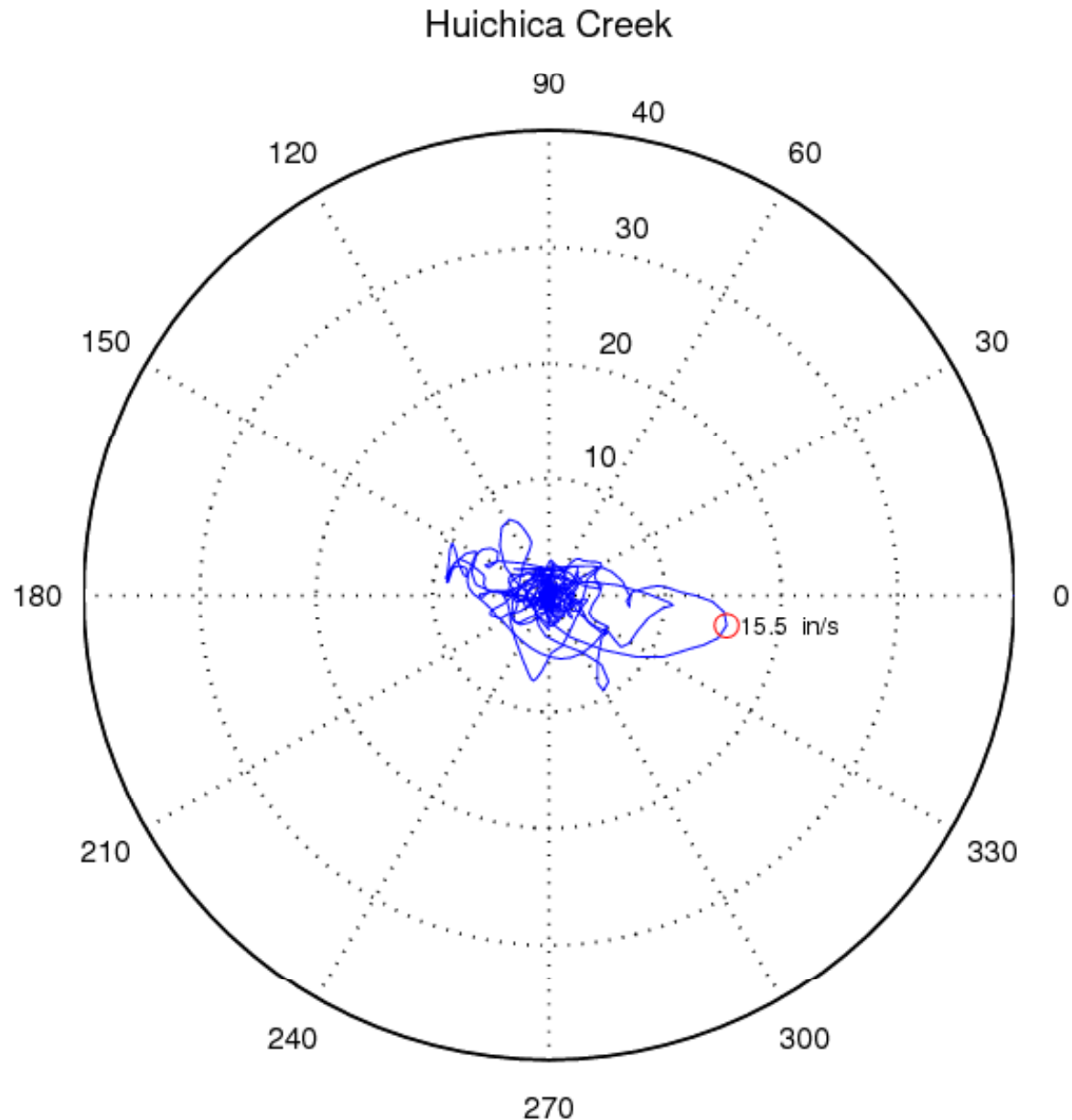


# Acceleration-Deformation Response Spectrum for 5% Damping

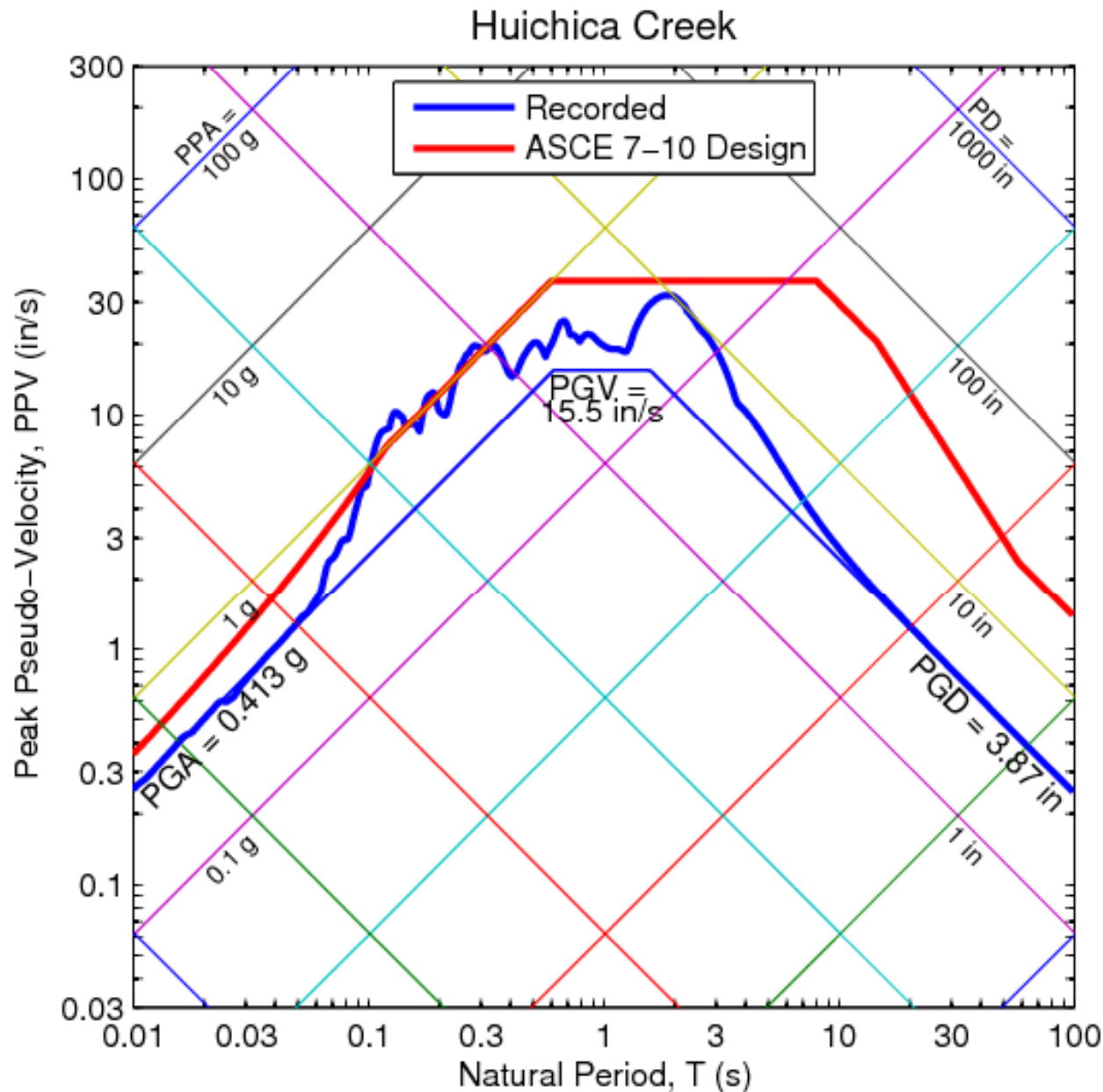


# Huichica Creek (NCSN NHC)

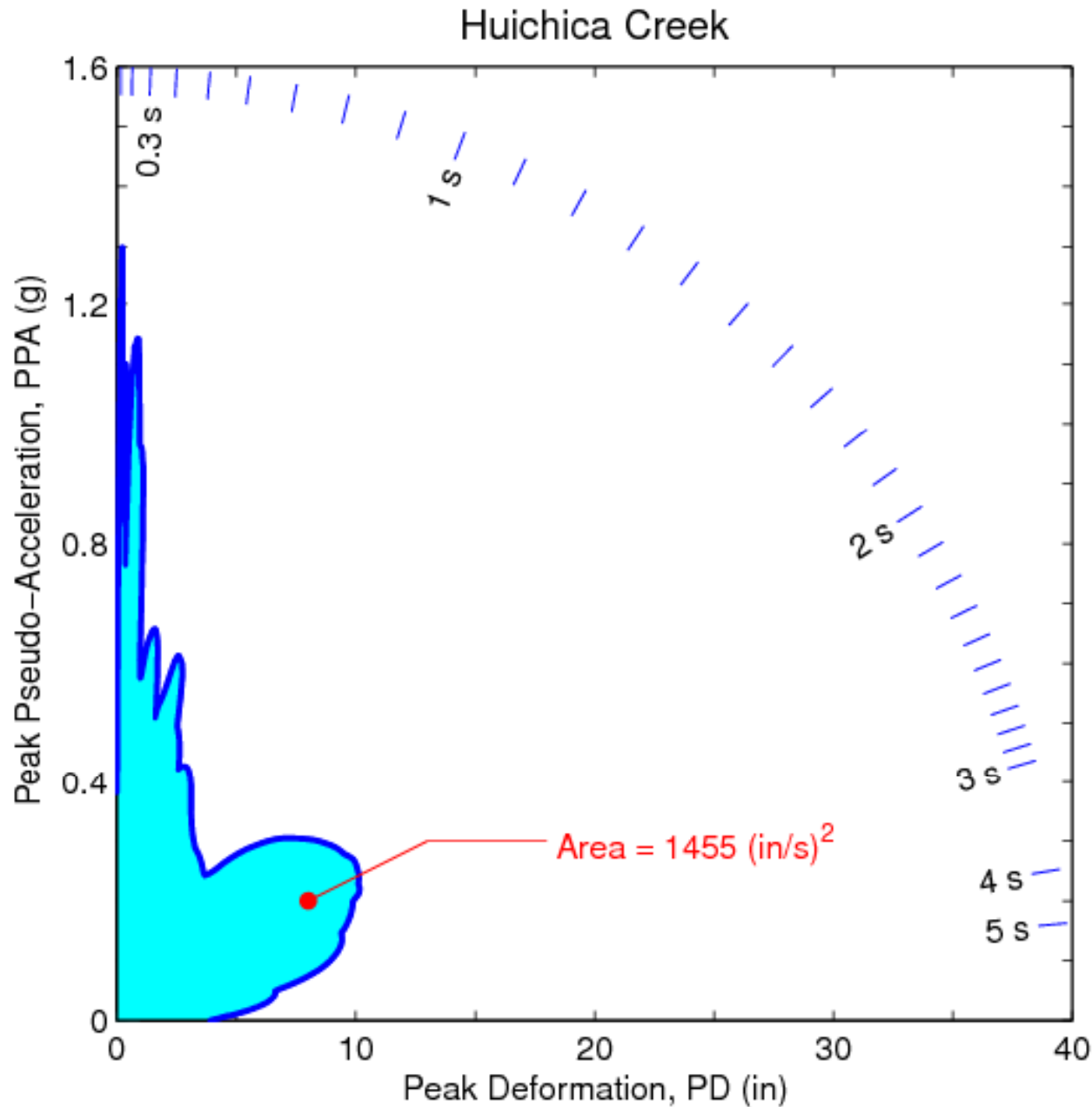
## Peak Ground Velocity = 15.5 in/s



# Recorded and Design Response Spectra for 5% Damping



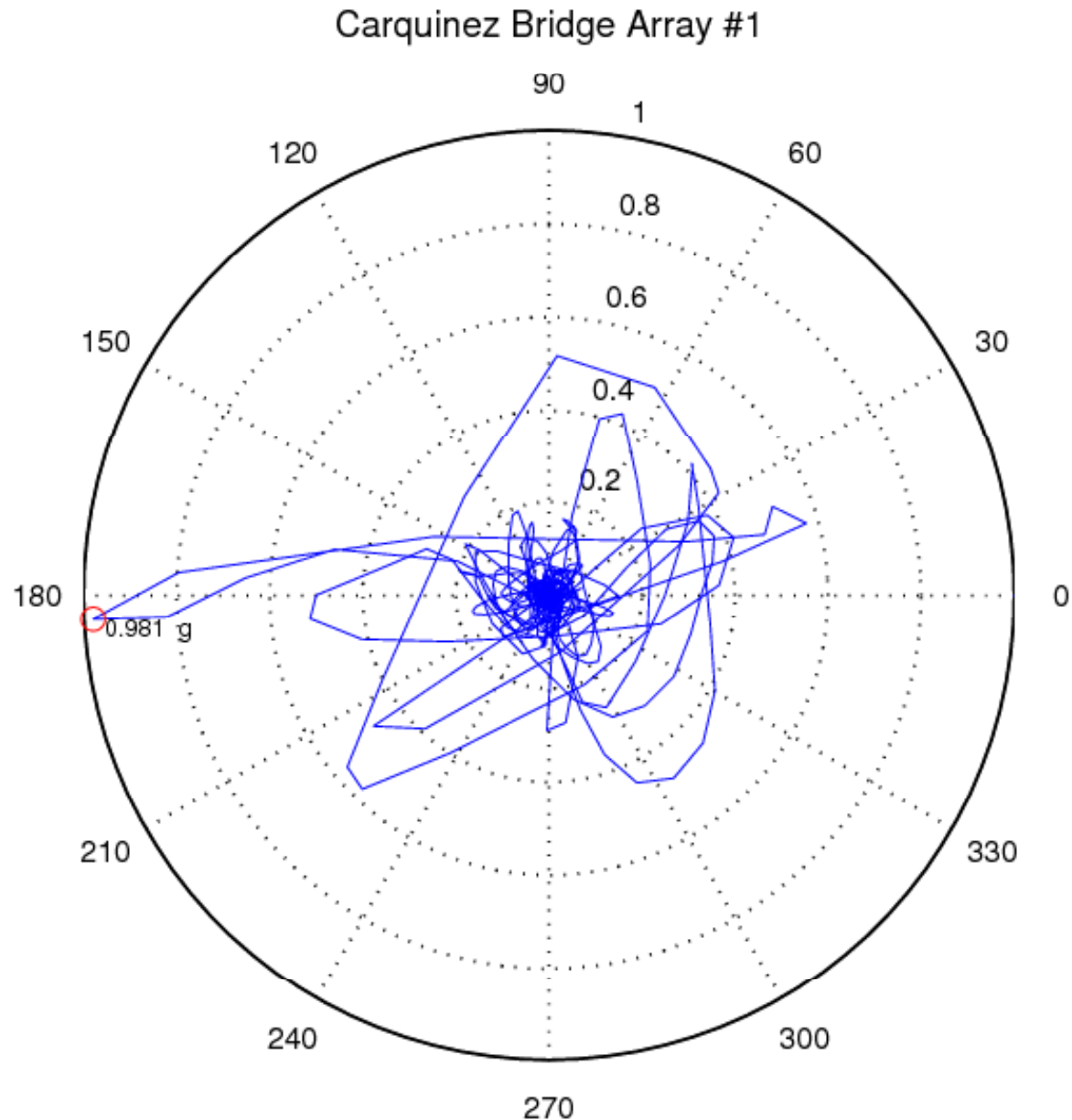
# Acceleration-Deformation Response Spectrum for 5% Damping



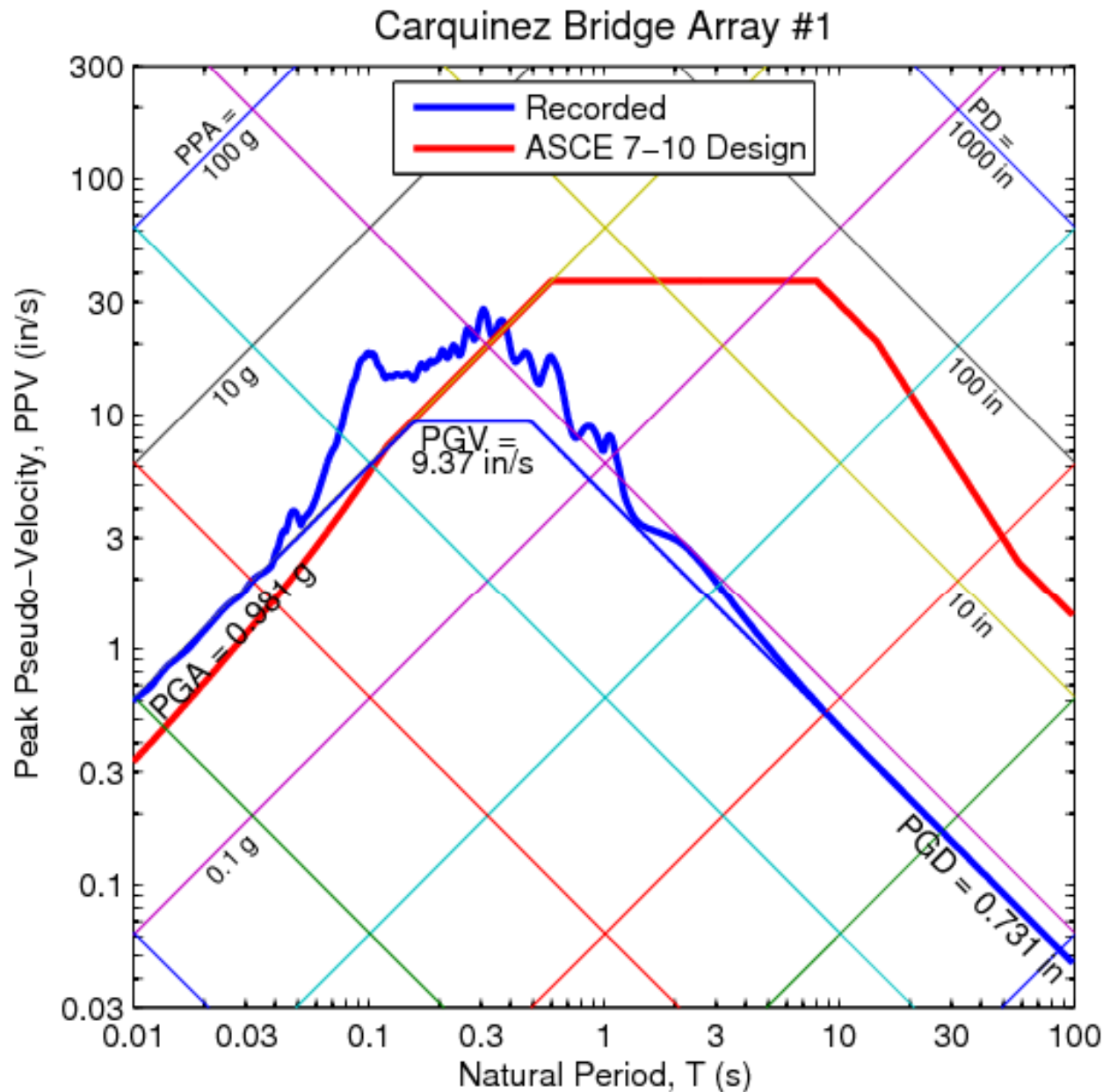


# Carquinez Bridge Array #1 (CGS 68206)

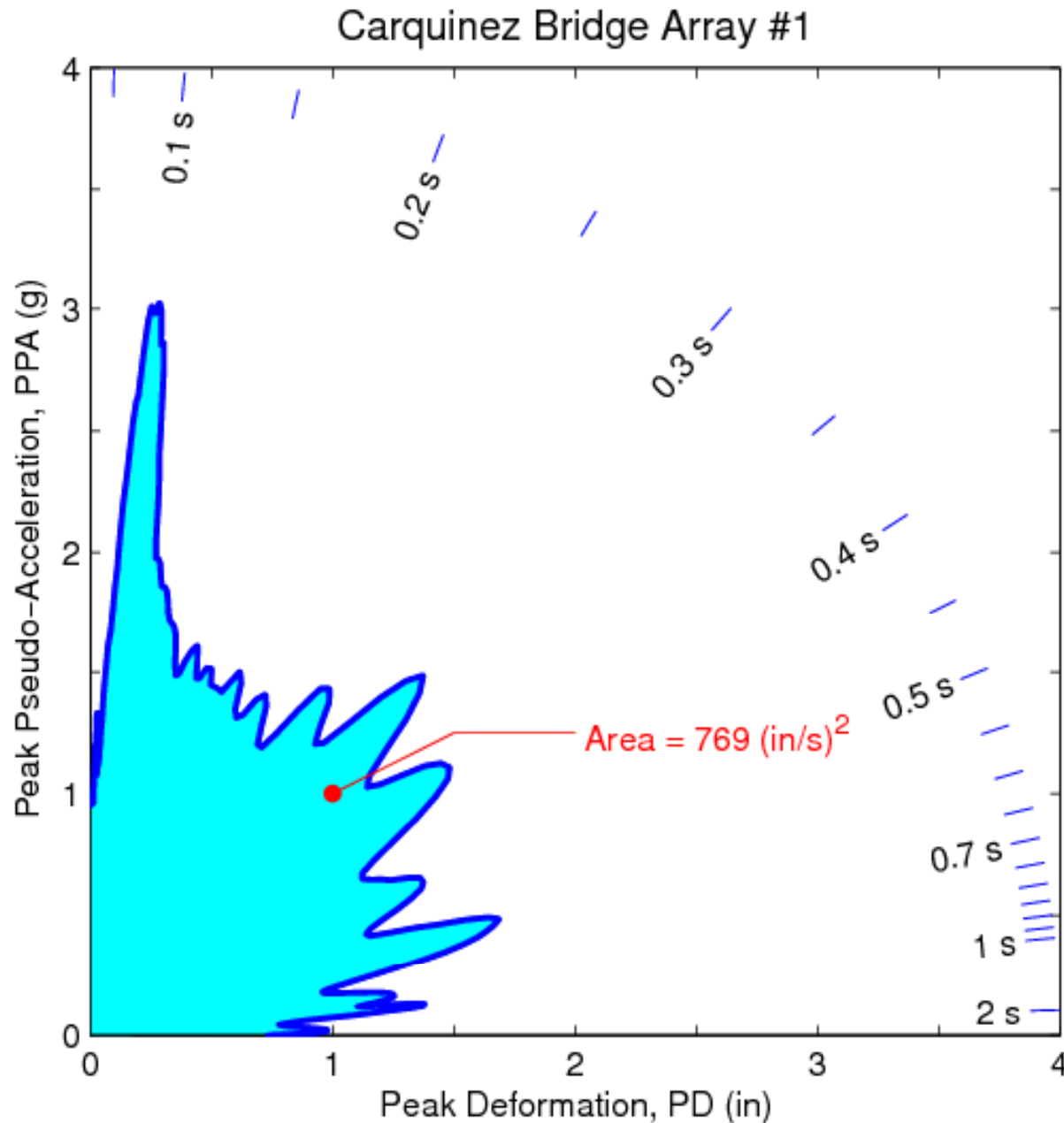
Peak Ground Acceleration = 0.981 g



# Recorded and Design Response Spectra for 5% Damping



# Acceleration-Deformation Response Spectrum for 5% Damping



# Comments

- Every earthquake produces some unusually strong ground motions at some stations
- The strongest ground motions are not necessarily those with the highest accelerations
- The reasons for unusually strong ground motions can be seismological, geotechnical or instrumental
- Even a smaller-than-design seismic event can produce higher-than-design ground motions at some sites