EERI Technical Case Studies Webinar: September 19, 2017 Mexico Earthquake

Oaxaca 80

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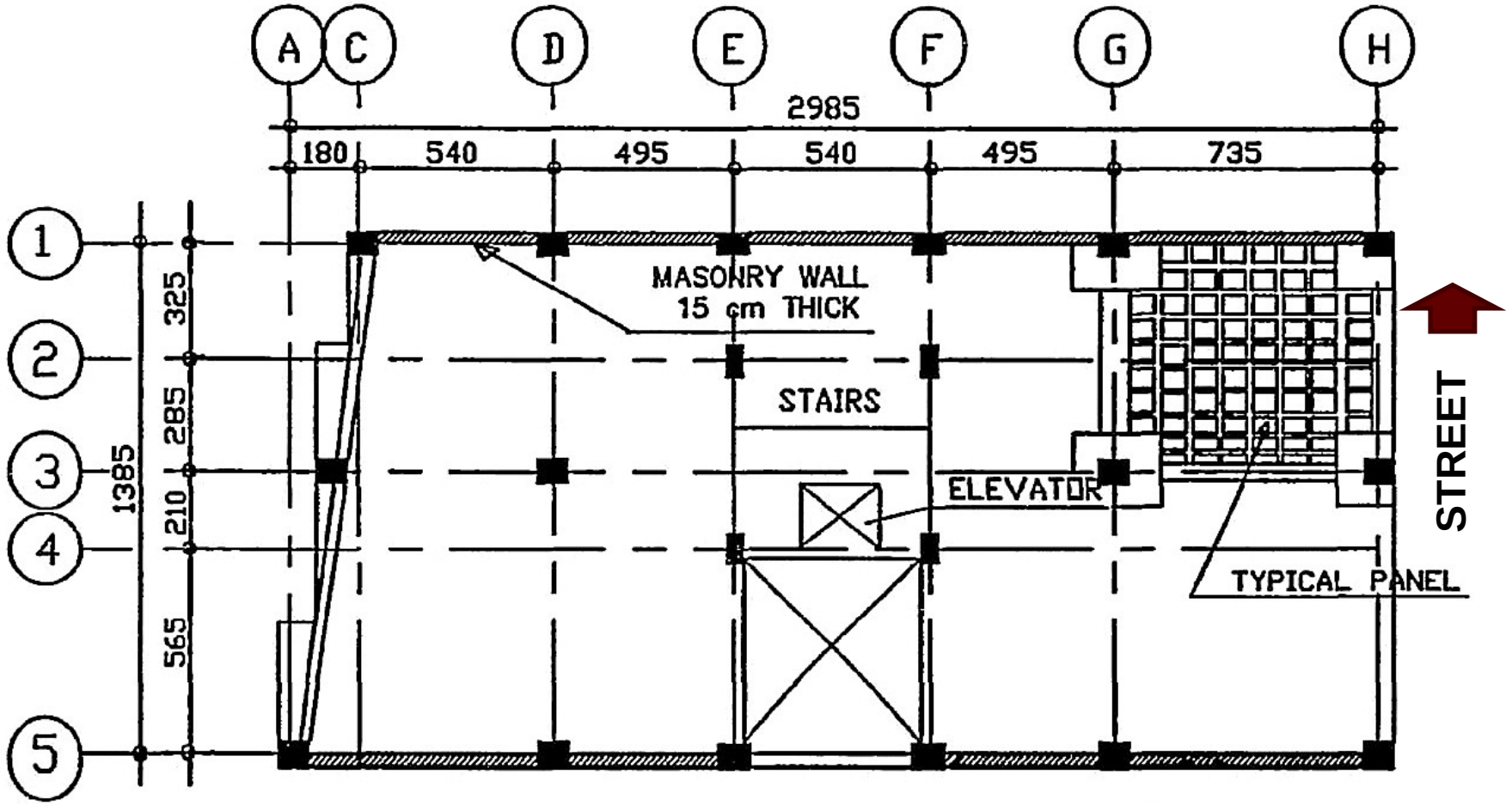
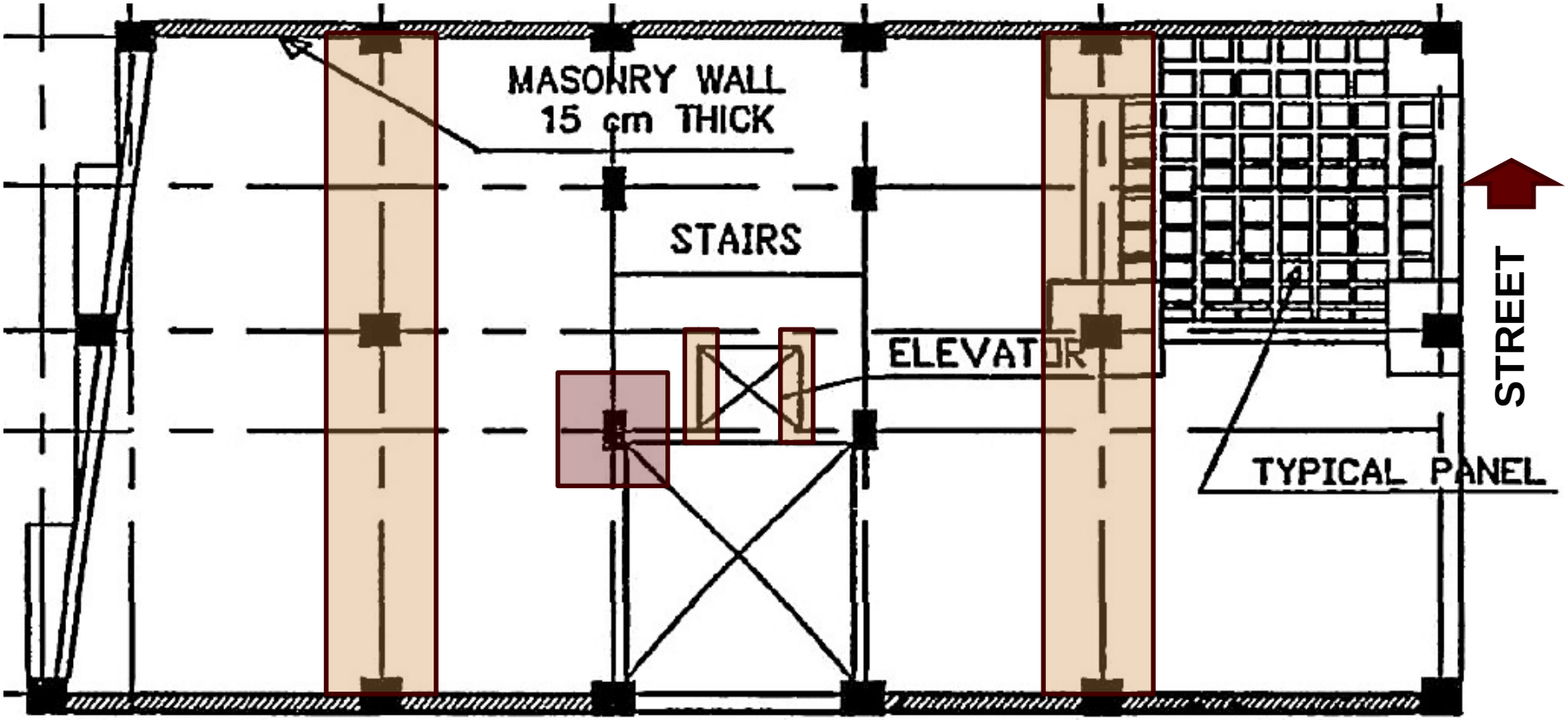
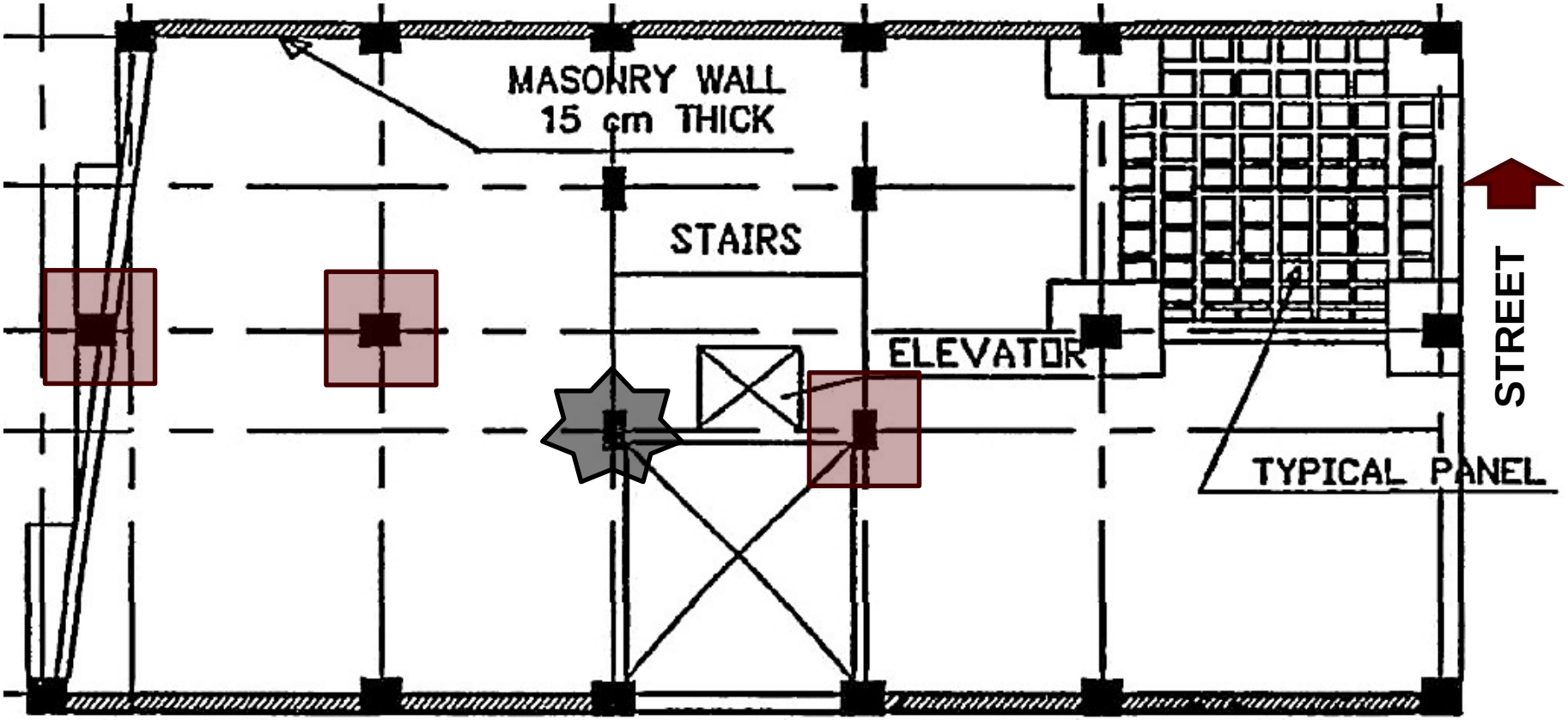
Building Layout



Damage after 1985 Earthquake

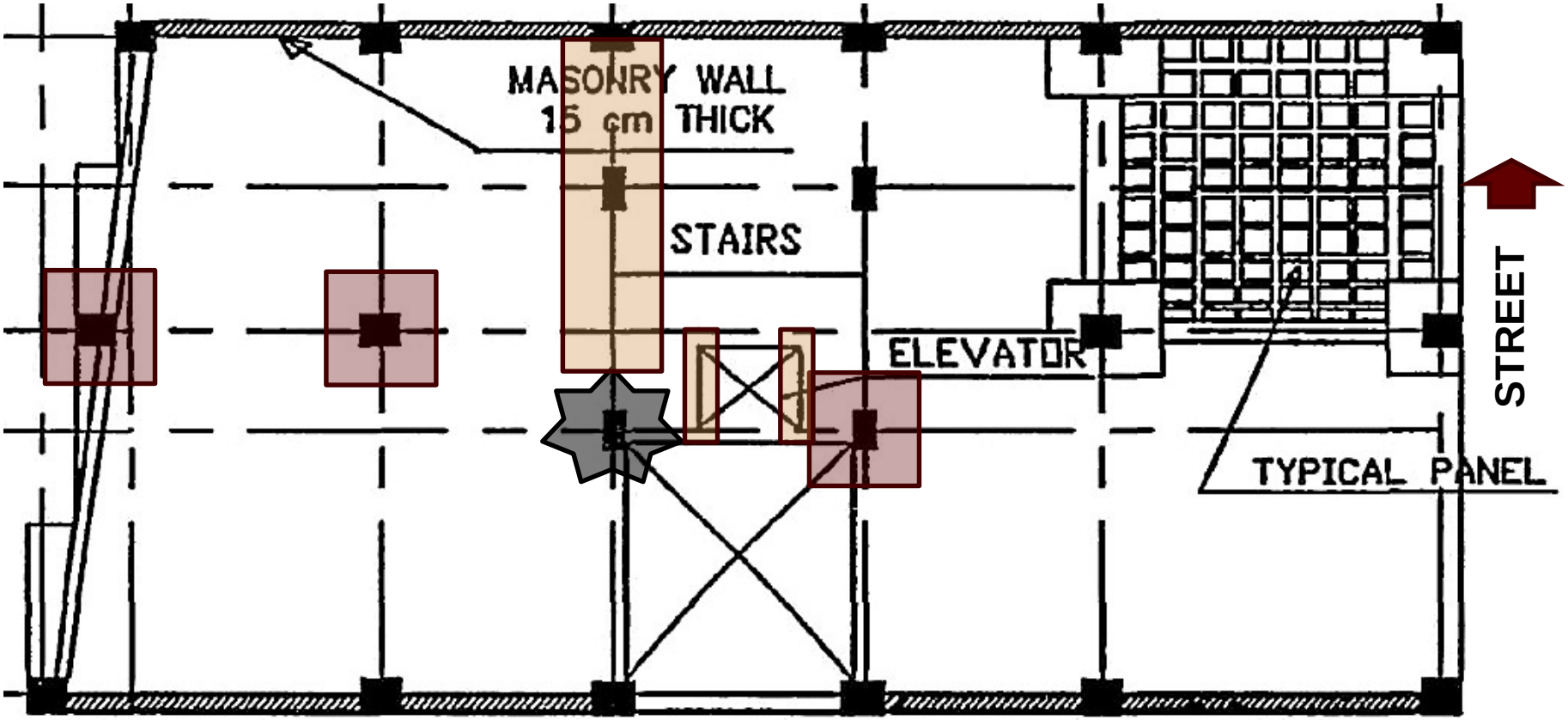


Damage after 2017 Earthquake



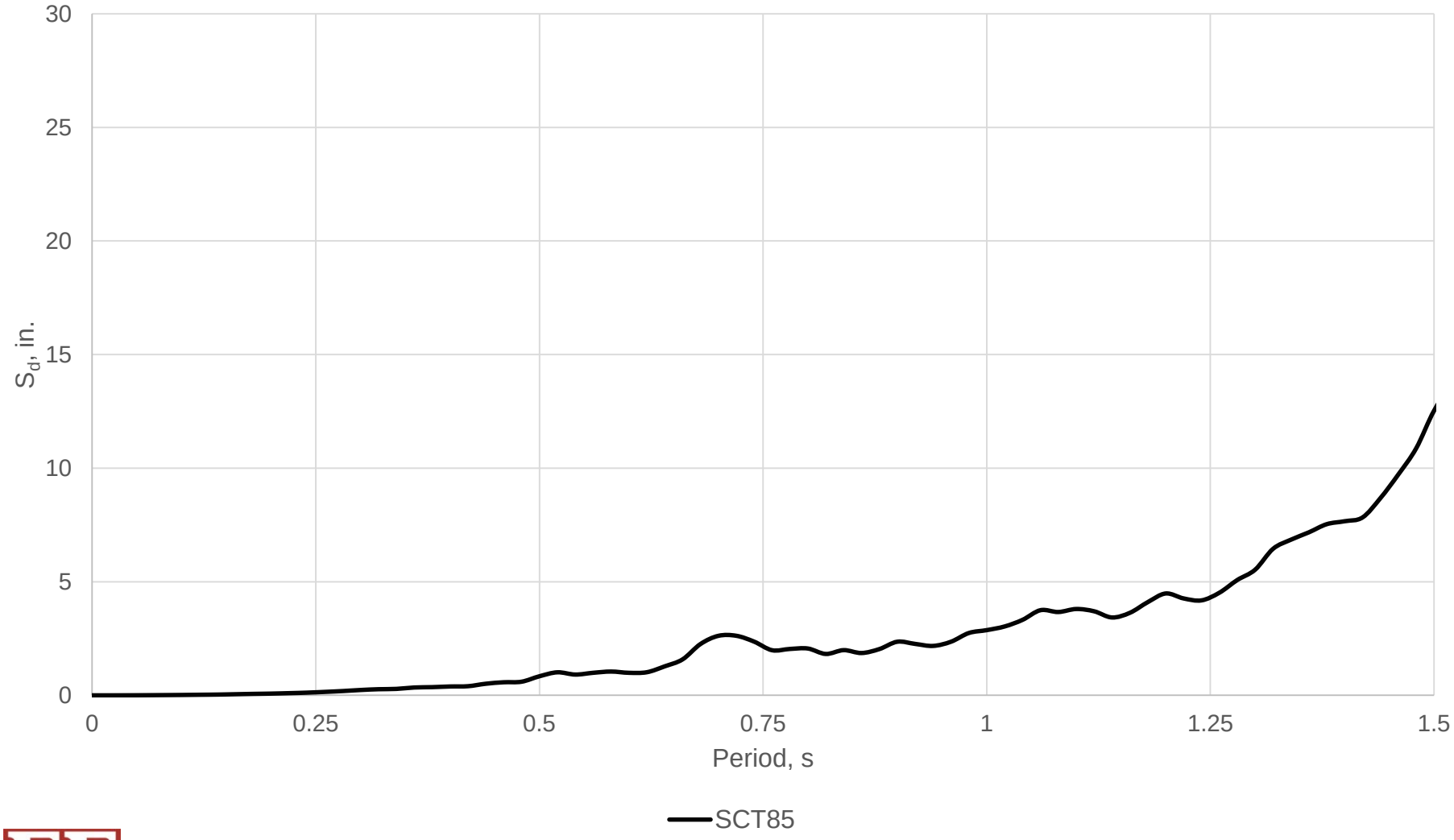
Damage after 2017 Earthquake

Damage after 2017 Earthquake

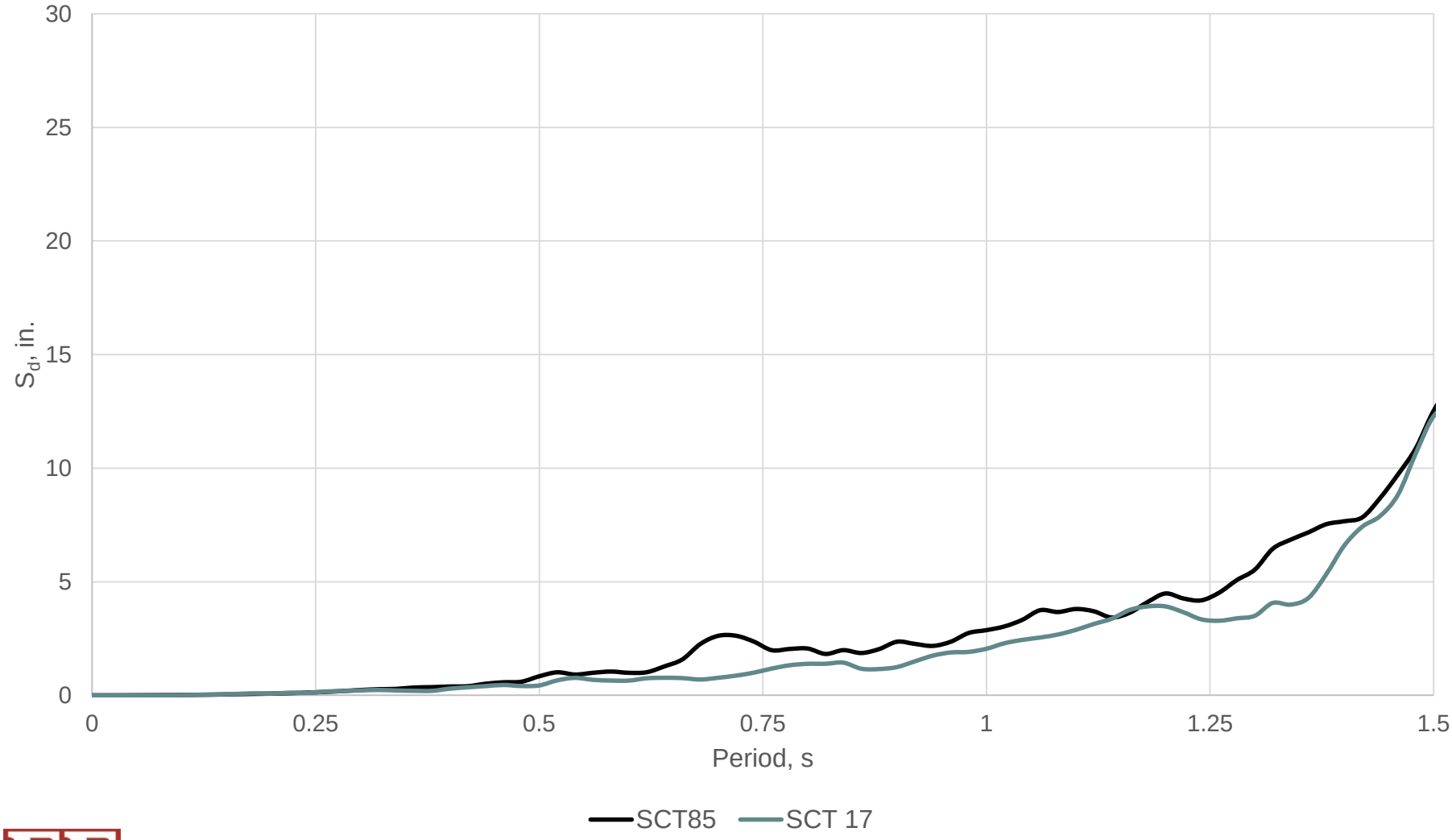


Damage after 2017 Earthquake

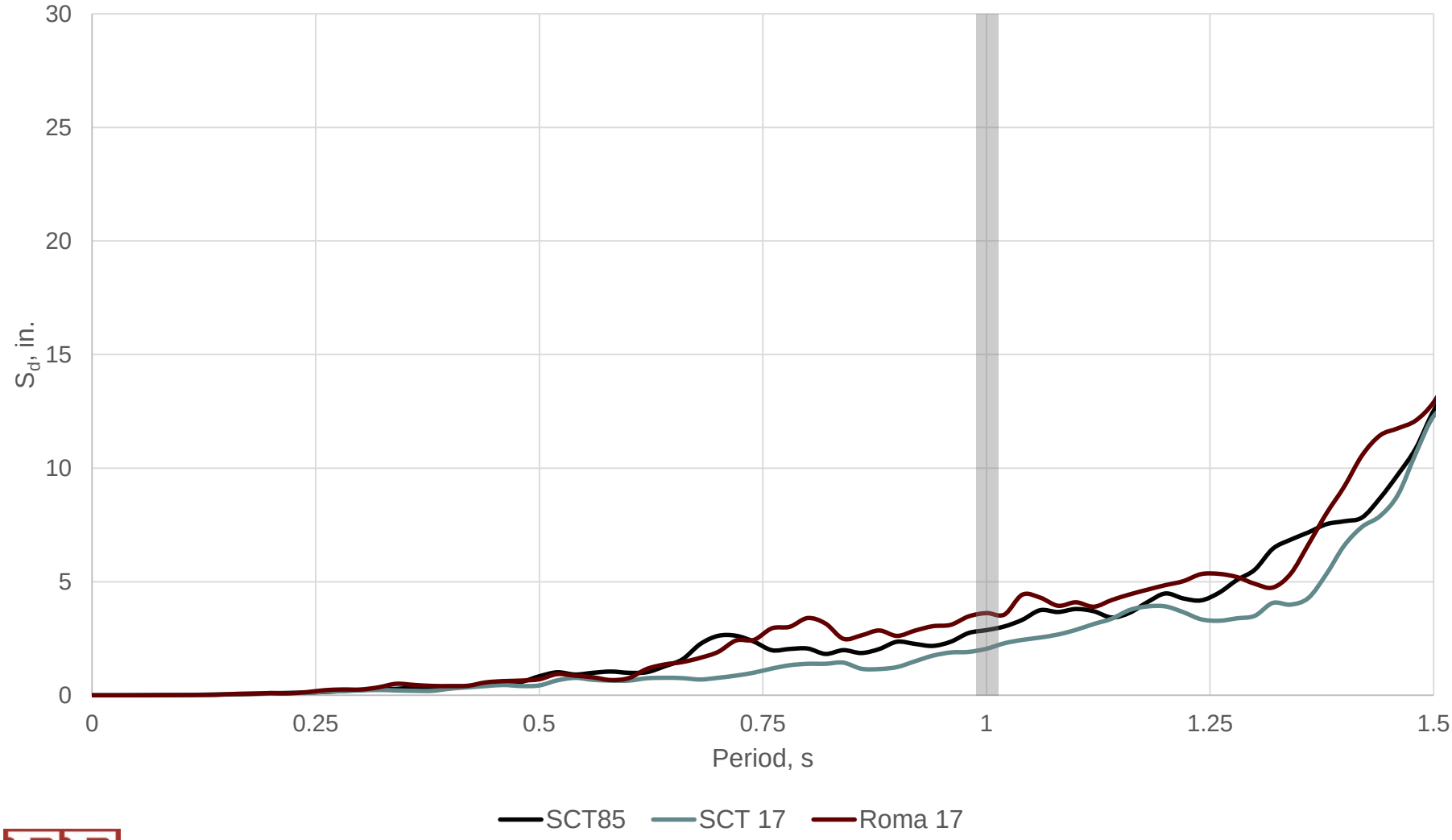
Displacement Spectra



Displacement Spectra



Displacement Spectra



Analysis

Three Approaches:

- Nonlinear Dynamic Analysis
  - LARZ (Developed at UIUC)
  - OpenSees
- Simplified Approach

LARZ

Ground Motion	LARZ Drift Ratio, %
SCT 85	4

LARZ

Ground Motion	LARZ Drift Ratio, %
SCT 85	4
SCT 17	2

LARZ

Ground Motion	LARZ Drift Ratio, %
SCT 85	4
SCT 17	2
Roma 17	3

OpenSees

Ground Motion	LARZ Drift Ratio, %	OpenSees Drift Ratio, %
SCT 85	4	3
SCT 17	2	
Roma 17	3	

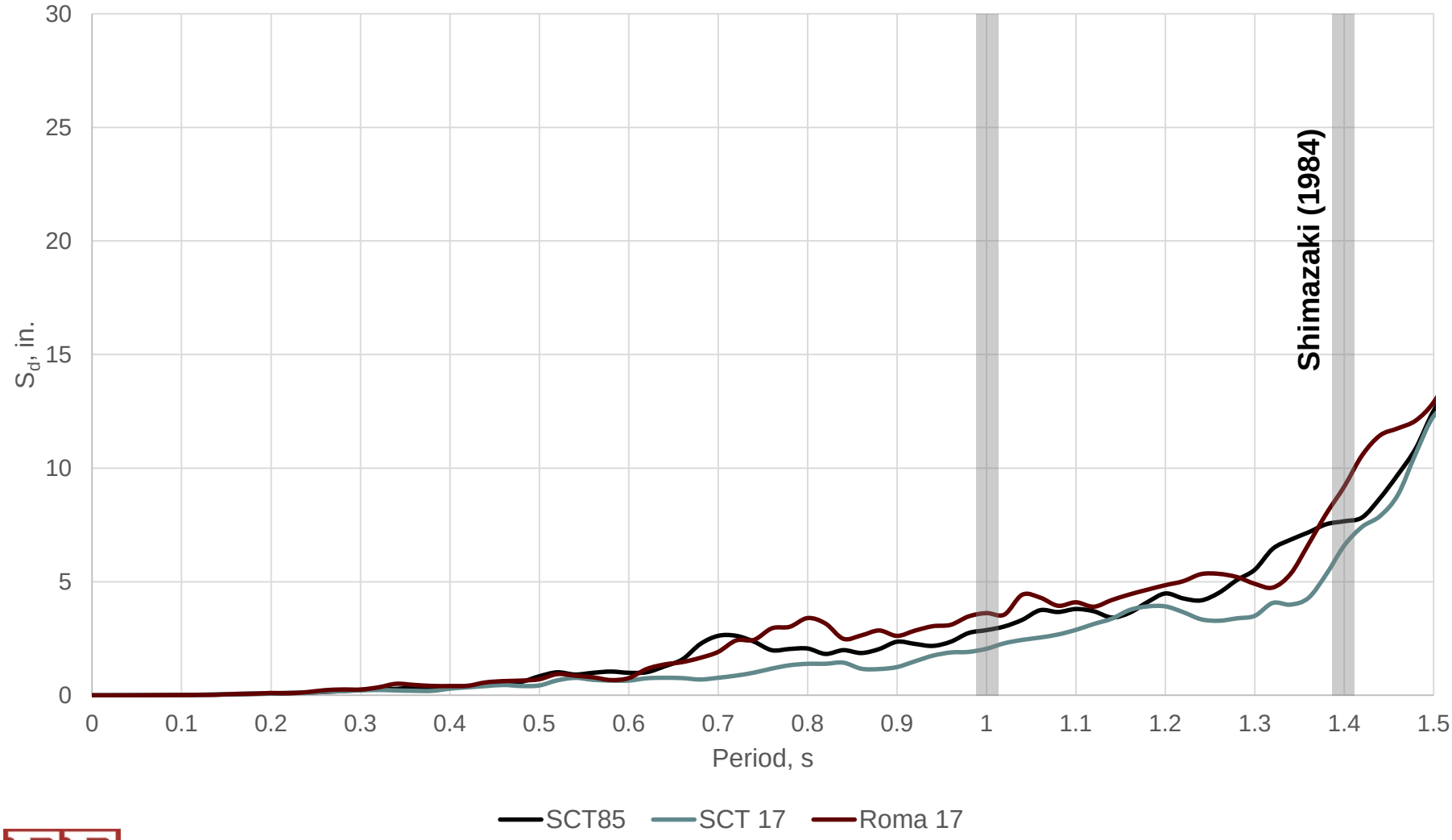
OpenSees

Ground Motion	LARZ Drift Ratio, %	OpenSees Drift Ratio, %
SCT 85	4	3
SCT 17	2	2
Roma 17	3	

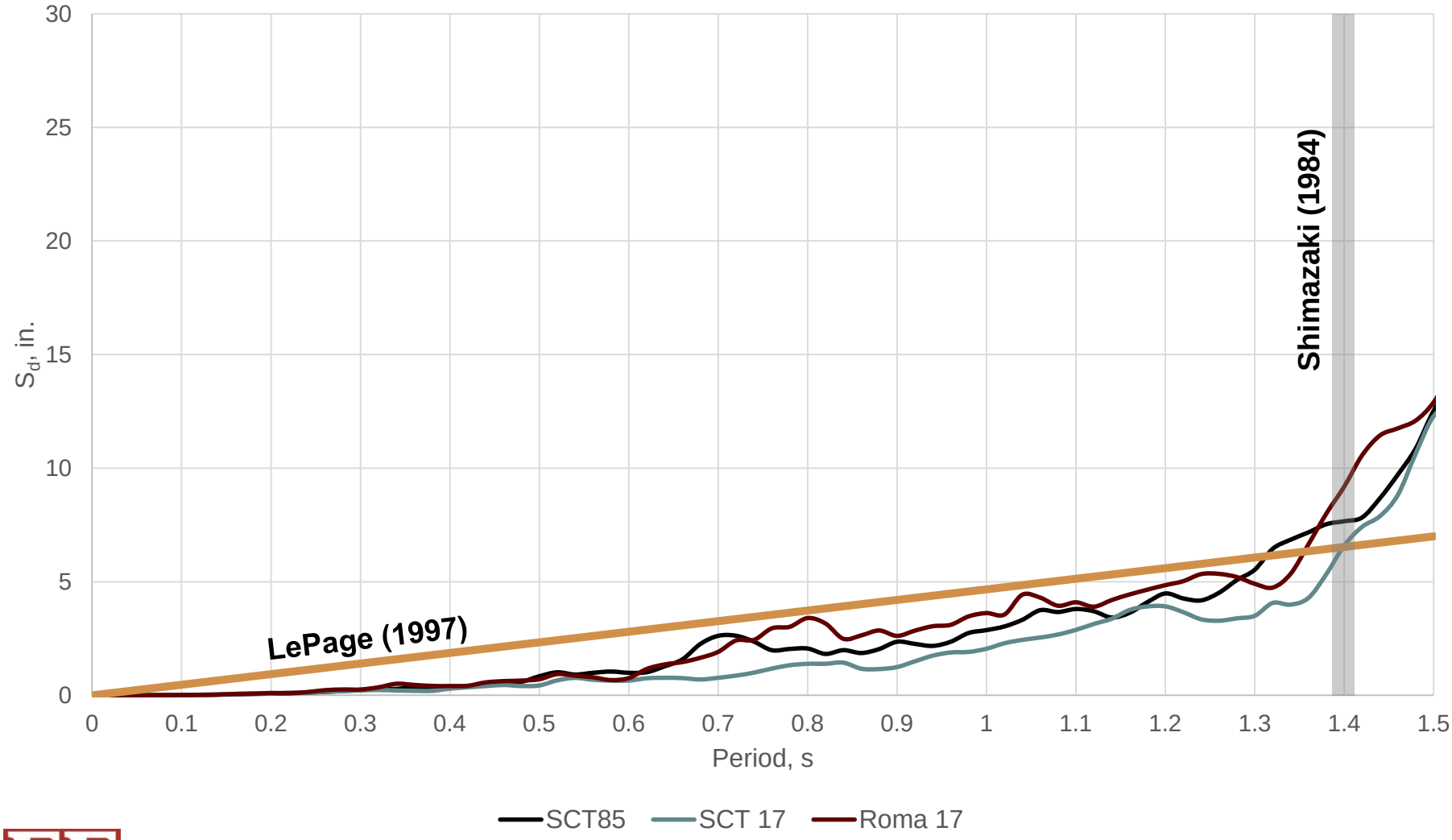
OpenSees

Ground Motion	LARZ Drift Ratio, %	OpenSees Drift Ratio, %
SCT 85	4	3
SCT 17	2	2
Roma 17	3	1

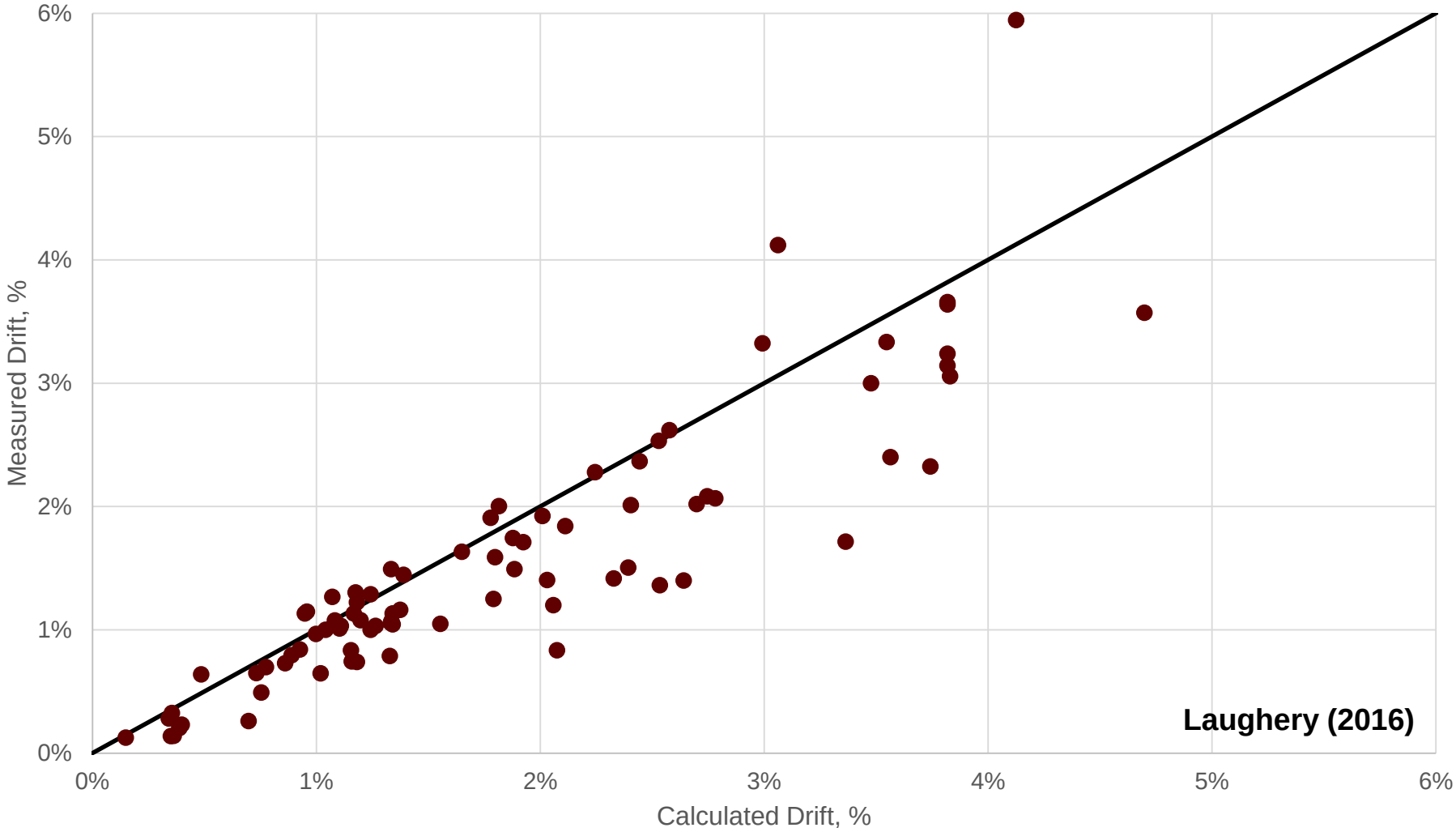
Simplified Approach



Simplified Approach



Simplified Approach



Simplified Approach

Ground Motion	LARZ Drift Ratio, %	OpenSees Drift Ratio, %	Simplified Approach Drift Ratio, %
SCT 85	4	3	0.8
SCT 17	2	2	0.8
Roma 17	3	1	0.8

Conclusion

- Simplified approach works
- All data:
  https://datacenterhub.org/resources/14726

Acknowledgements

Questions