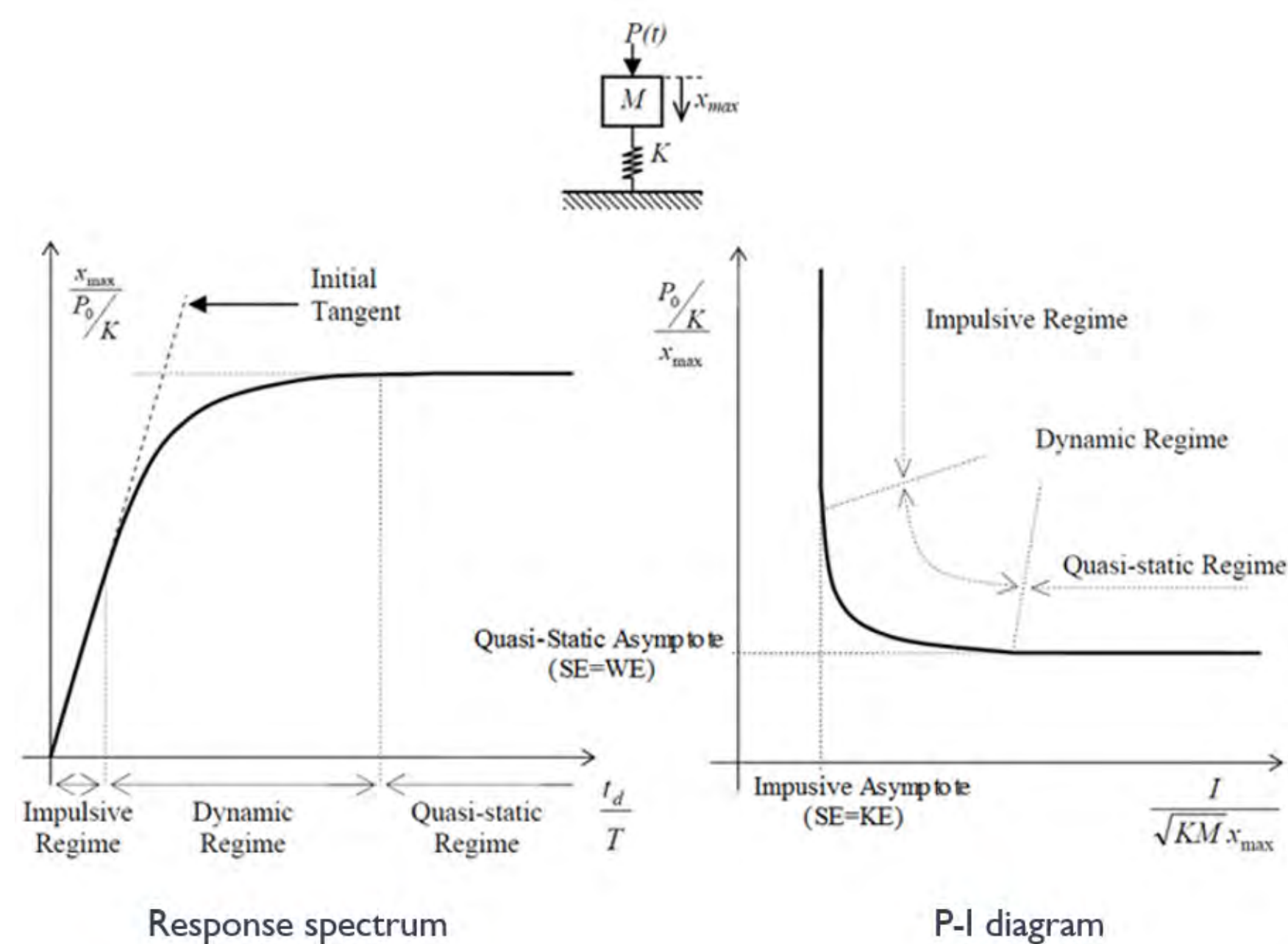


Energy Based Load-Impulse Diagrams

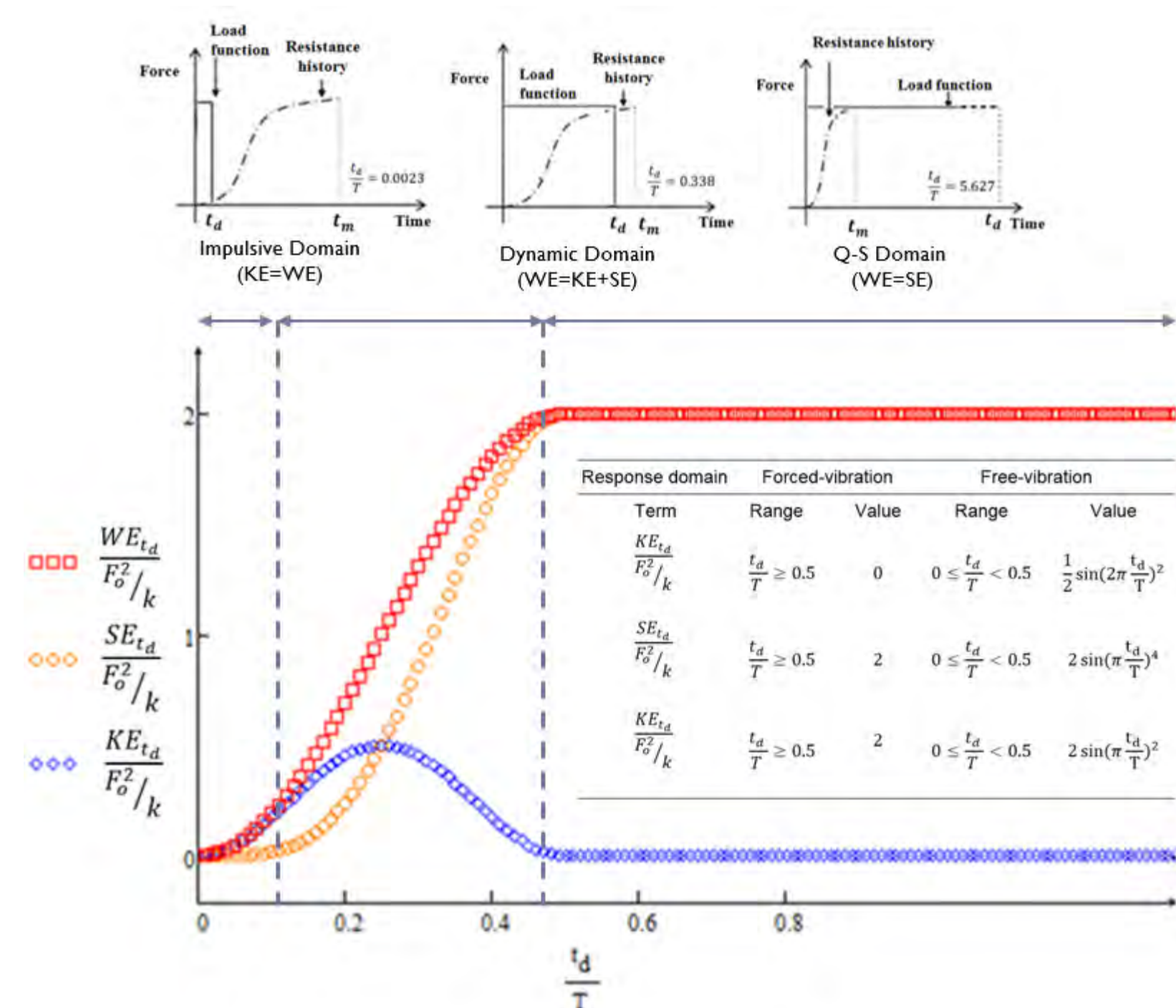
Introduction

- An energy-based approach for load-impulse diagrams for structural members under a wide range of dynamic loads will represent a fundamental improvement in the field of protective structures.
- This study proposed an energy based P-I diagrams (E-R diagrams) as a useful tool in preliminary strength design and damage assessment.



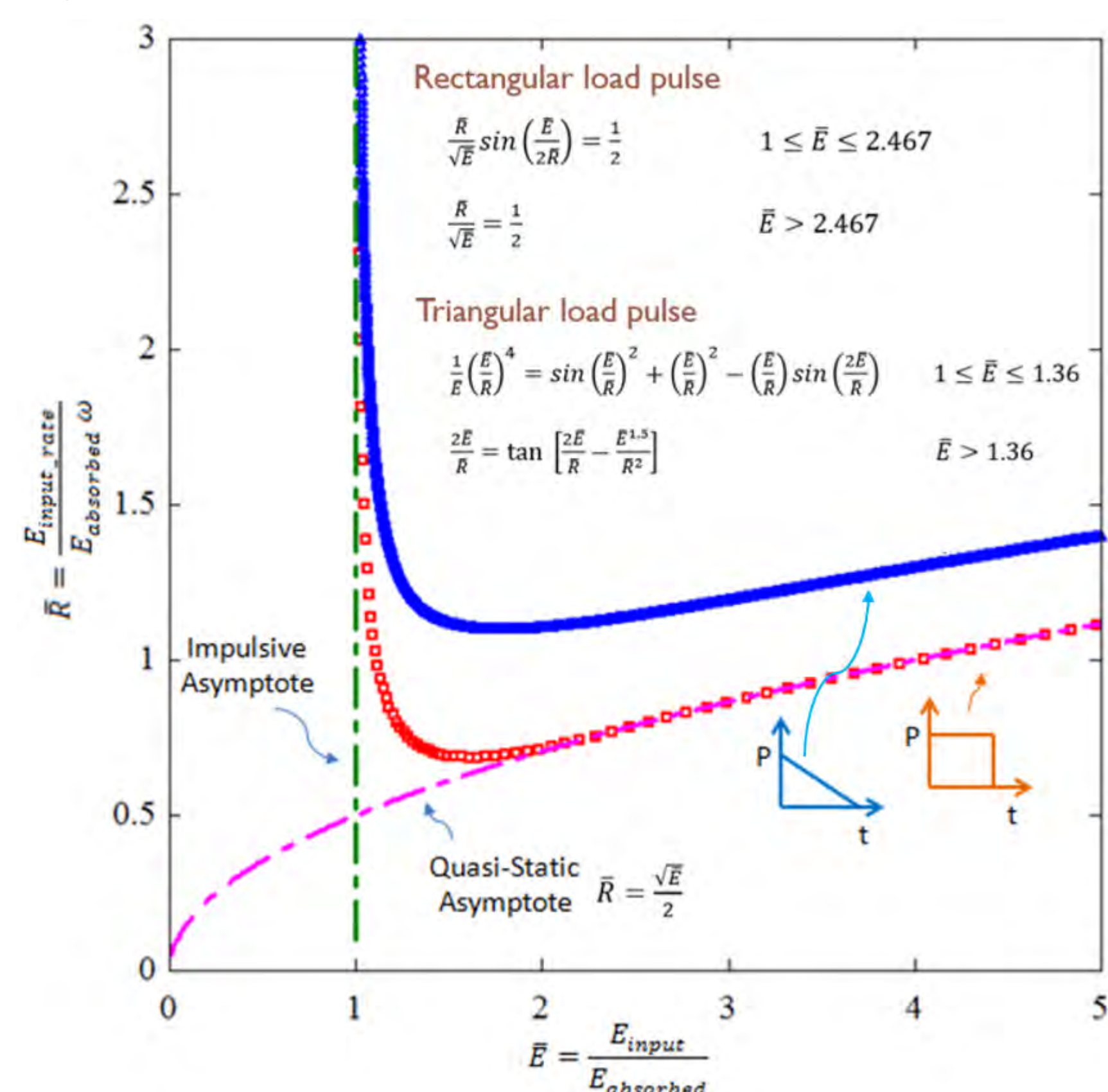
Energy Components Spectrum

- A comprehensive energy flow approach is proposed to define the entire P-I domain.



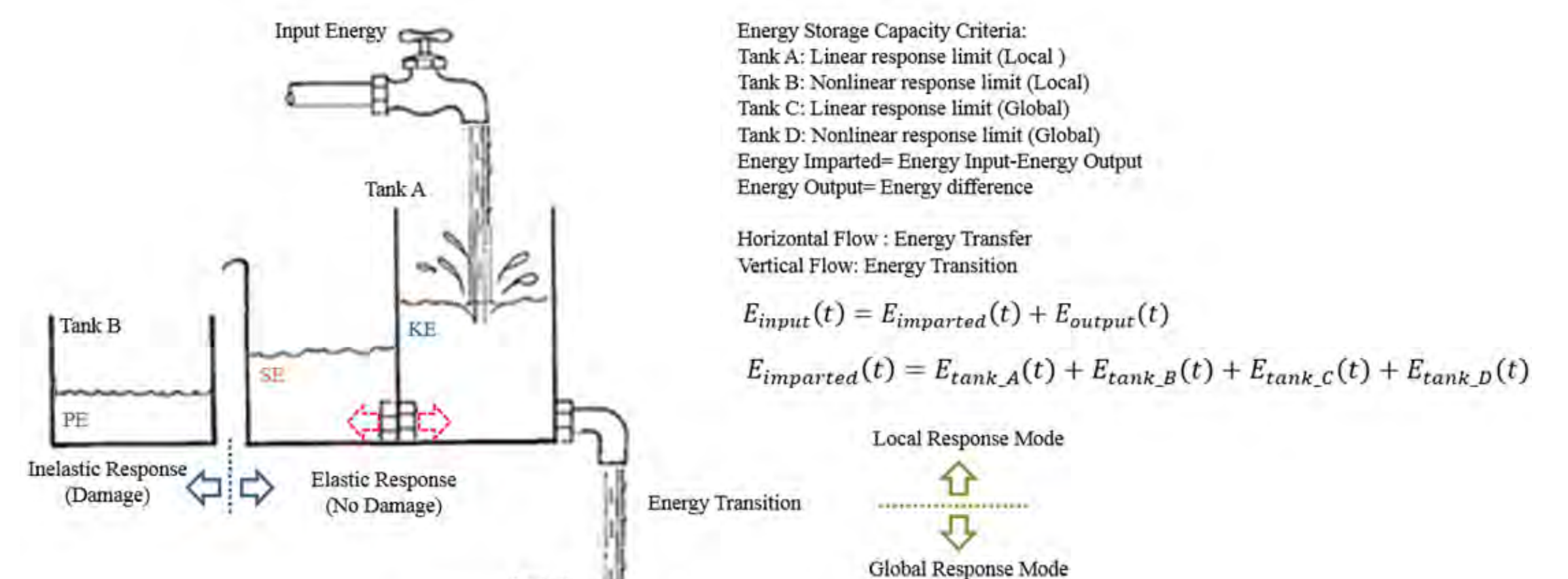
Analytical Solutions for E-R Diagrams

- Analytical solutions can be obtained for idealized load functions, which were accomplished based on the response functions.

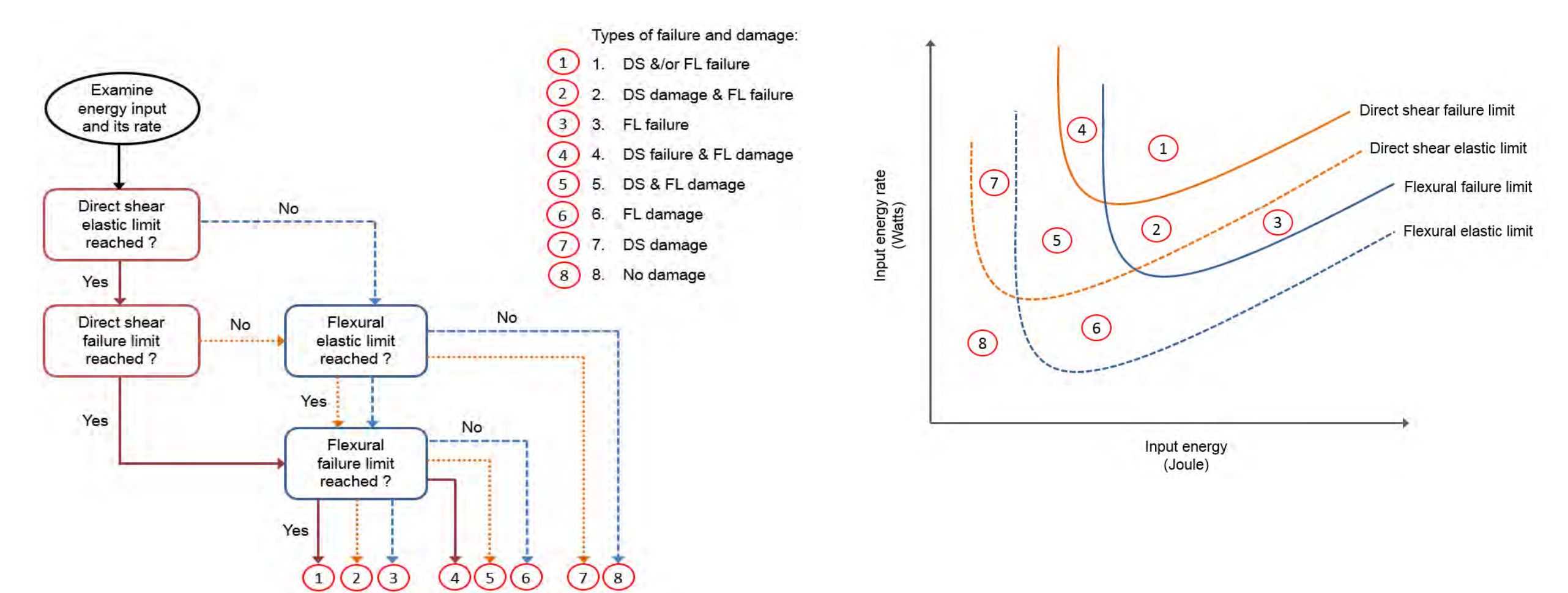
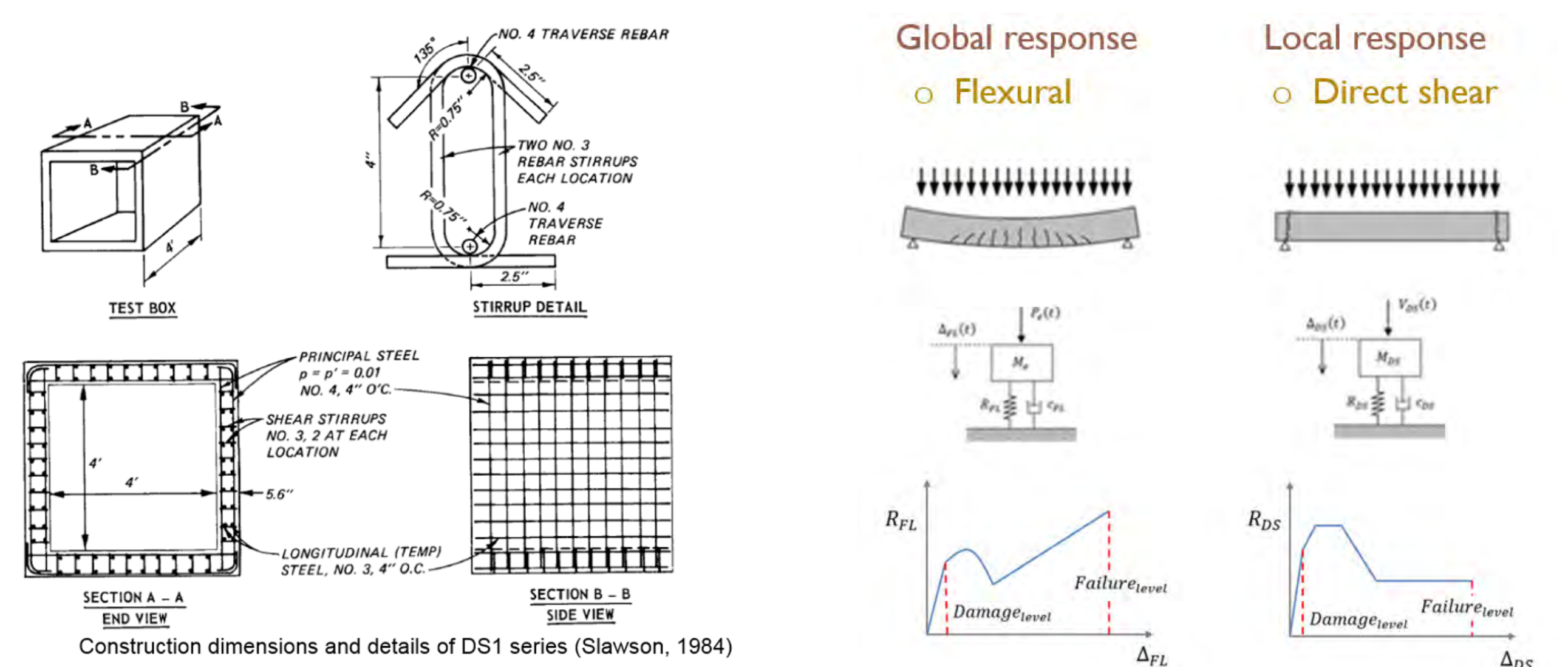


Energy Tank Analogy

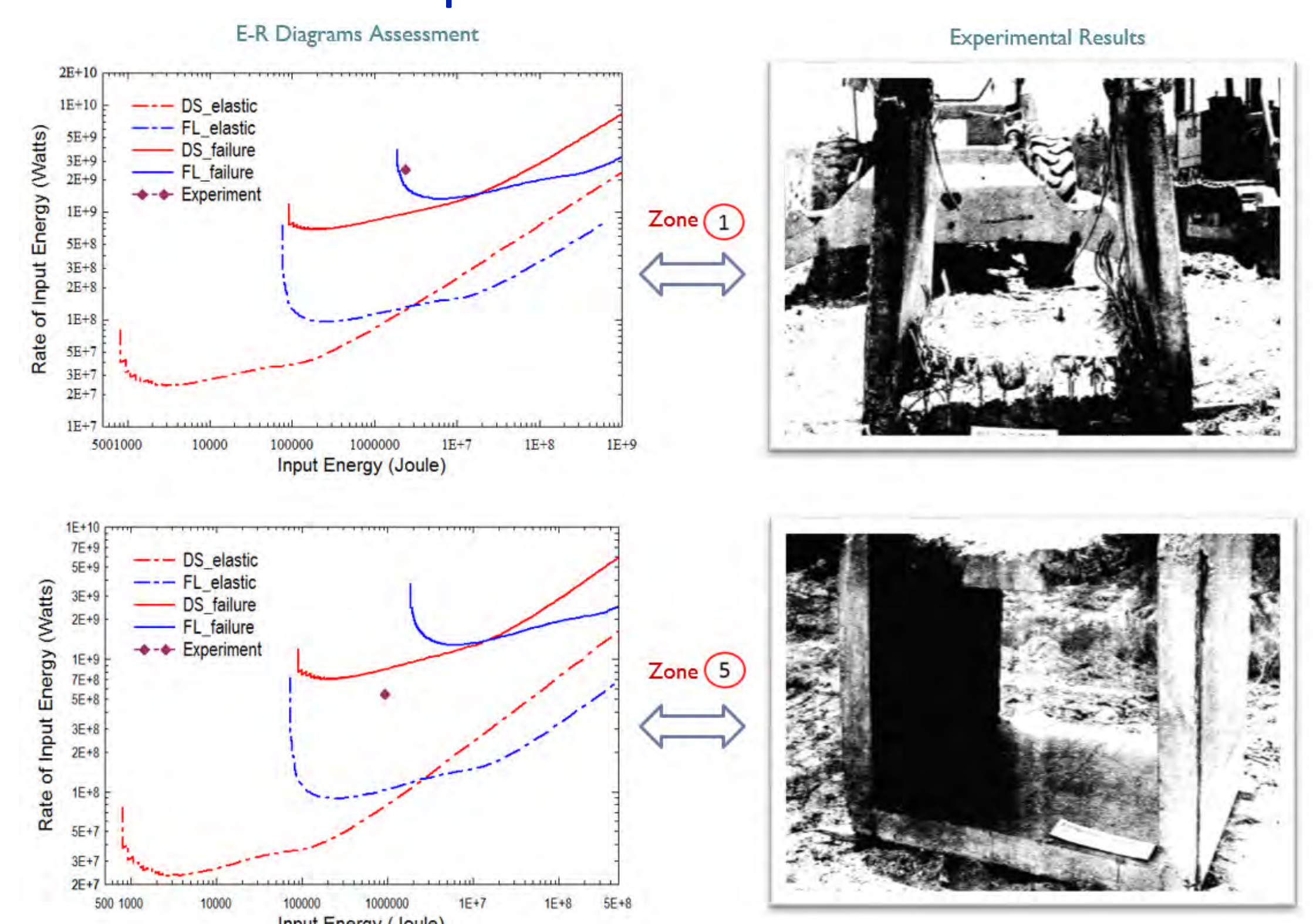
- It provides a simple and clear description of the energy flow for a structural system under transient loads.



Application of E-R Diagrams on Buried Structures



Validation with Experimental Data



Conclusions

- One can determine if the threat or hazard will cause a specific damage level by examining the input energy flow conditions.