

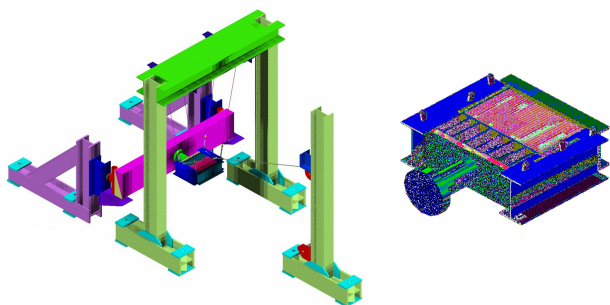
Autoclaved Aerated Concrete (AAC) Cladding Panels Under Impact Loads

Objective

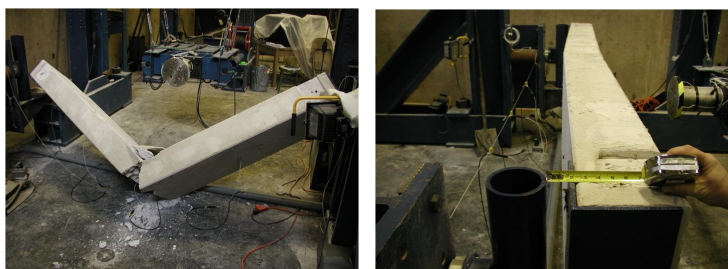
Study impact load transfer through cladding panels to their supports.

Experimental Approach

This research is intended to reveal the characteristics of load transfer through exterior cladding under impulsive loading.



Test Setup

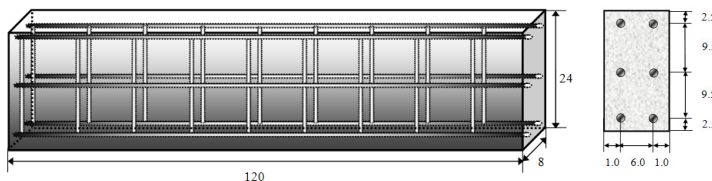


Typical Post Test View

Conclusion

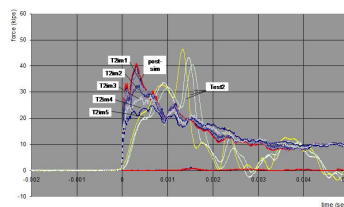
- Differences were observed between the peak applied impact and peak reactions.
- As the applied energy increased, a larger part of it was absorbed by the AAC damaged panel.
- Cladding panels can significantly affect impact load transfer to their supports.

Cladding Panels

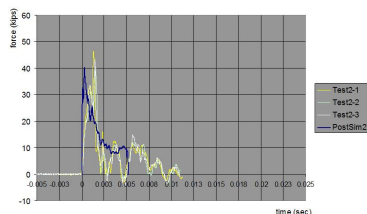


Numerical Approach

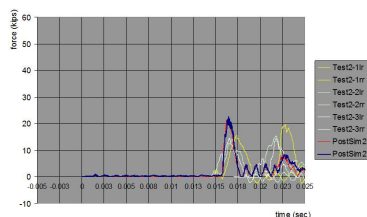
Advanced three-dimensional finite element models were established to analyze a impact energy absorption behaviors of AAC panels.



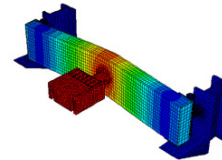
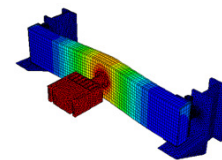
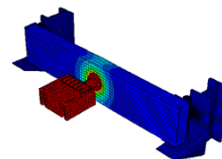
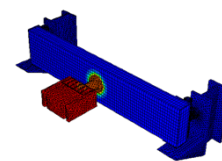
Parametric Study



Impact Force-History



Reaction Force-History



Deformed Models

Experimental Results

	Pendulum Weight (lbs)	Drop Height (in)	Impact Force (kip)	Reaction Force (kips)	Mid Span Deflection (in)	Residual Deflection (in)	Support Rebound (in)	Kinetic Energy (in-lbs)
CASE 1	500	12	25-28	8-11	2-3	0	6	6400
CASE 2	500	24	29-33	13-16	3	1-1.5	2-6	12960
CASE 3	1000	12	46-48	11-13	3-4	1.5-2	4	12000
CASE 4	1000	24	40-46	14-19	8	6	1-2	24000