

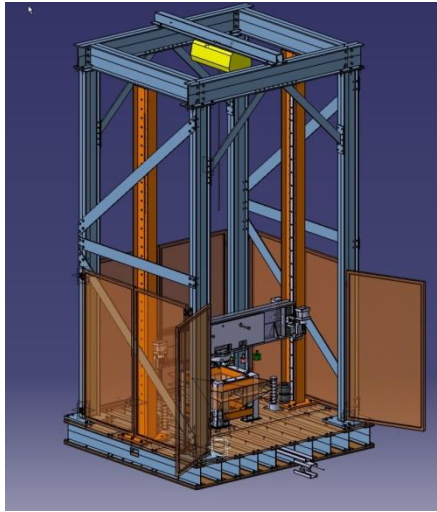
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High Energy Drop Tower

- Develop generic high energy drop tower system for testing of panels, fastener assemblies and other structures
- Tower must be able to accommodate wide range of test fixtures that include:
 1. Large flat panels with adjustable x-y-positioning
 2. Three point bend fixtures
 3. Direct impact fixtures
 4. Mobile fixtures (prior to field testing)
 5. Vehicle structures
- Impact node must be generic enough to accommodate large area impactor (blast), FSP type as well as custom nodes
- Base support must be rigid but allow for wide range of fixture assemblies
- Cost must be within limits

TOWER OF POWER



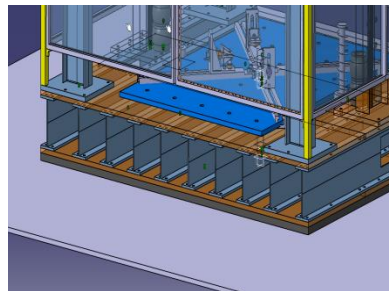
Tower Specifications

- Custom Built Tower (12 ft drop Height)
- 32,500J, (24,000ft lbs) Energy
- 8.6m/s (27fps) velocity
- 74in x 100in operating space
- 2000lb maximum drop weight (based on hoist rating, can go higher)
- 20ft total Height (can be extended)
- Dimensions: 227x112x 112in
- Magnetic release mechanism
- Self Energized Spring stops with air activation (16,000lb at 75psi)
- Hydraulic shocks and crane stops mounted on floor

Tower Specs. (cont.)

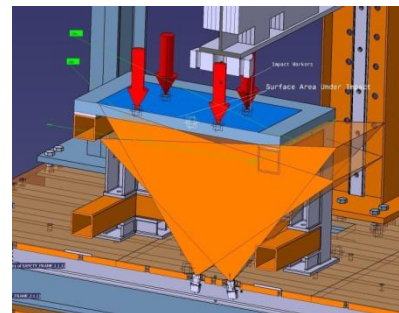
- “Maltese Cross” fixture developed for novel experimental measurements
- Cable transducer mounted on drop beam used to calculate impactor location, velocity, acceleration and initiate stops after impact
- Keyence Laser system mounted in floor (Optional)
- Load washers mounted on top cross beam
- Lighting system for high speed cameras
- Safety frame around base with access from front and back

Floor Details



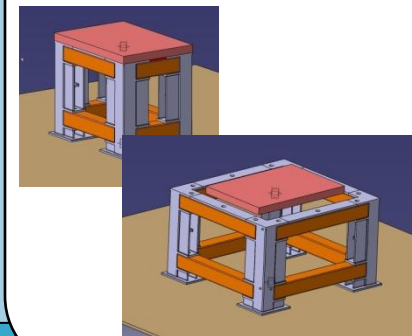
Sandwich construction with 6
120"x30"x1" Floor plates
&10 x 10.5"x 5.85" W F beams

Stereographic Cameras



Mounted under floor to capture full 3D strain field during impact

Panel Modularity for ARL Panel Testing



(Continued)

Tower of Power(6/1/09)



Tasks and Accomplishments

- Fabricate/Install Breaking System (including the ordering and installation of the pneumatic lines required to power the breaks)
- Prep vertical/central I-beams for compliance with braking system (grind away paint)
- Fabricate C-channel to mount hi-speed cameras
- Locate and Install 4 “mini” load cells at the crosslink at top of tower
- Prep/Install adapter plate and load cell to underside of central crossbeam
- Fabricate mounting brackets for accelerometers
- Fabricate brackets for/hang safety doors
- Miscellaneous fabrication of parts needed to complete installation of components
- Begin Setup of T.O.P. Computer Control
- Aid in wiring and final preparation of tower

Tower of Power (8/7/09)



Breaking System



Load Cell/Adapter Plate



Computer Control



ACKNOWLEDGEMENTS

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