Meeting the Security Threat –

Providing Services and Technologies for the Protection and Strengthening of Key Infrastructure from Ballistic and Blast Threats

IPS™

Infrastructure Protection Systems™

HIT

HIGH IMPACT TECHNOLOGY

- High Impact Technology was formed in 2004 as an advanced technology development, integration and commercialization company.
- HIT initially created key defensive technologies for the US Army in Iraq and Afghanistan.
- These technologies are currently being adopted by land forces world-wide.
- HIT is now using the multiple, advanced impact, ballistic and blast protective related technologies for key infrastructure projects.

Vehicle Protection Technologies:

I.) FUEL AND VEHICLE PROTECTION:

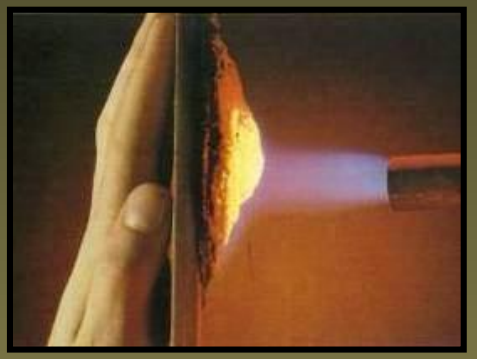
1. BattleJacket$_R$ - Fuel Systems Ballistic Protection.

An urgent requirement existed in 2004 for the US army to prevent and or minimize fuel leakage of fuel tankers due to small-arms fire.

FTSS – Fuel Tank Self-Sealing / BattleJacket

Vehicle Protection Technologies:

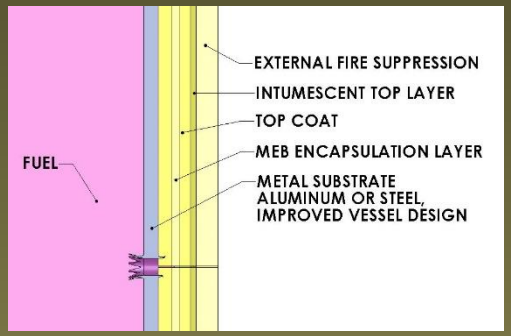
1. BattleJacket® - Fuel Systems Ballistic Protection.
2. FireCap™ - Intumescent Technologies

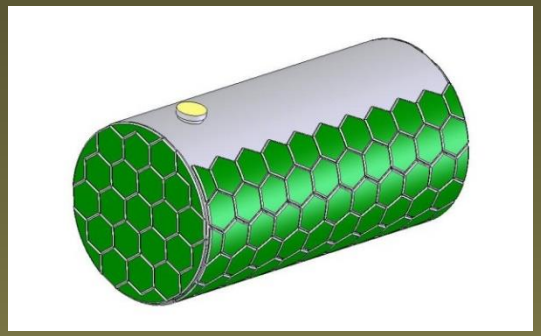


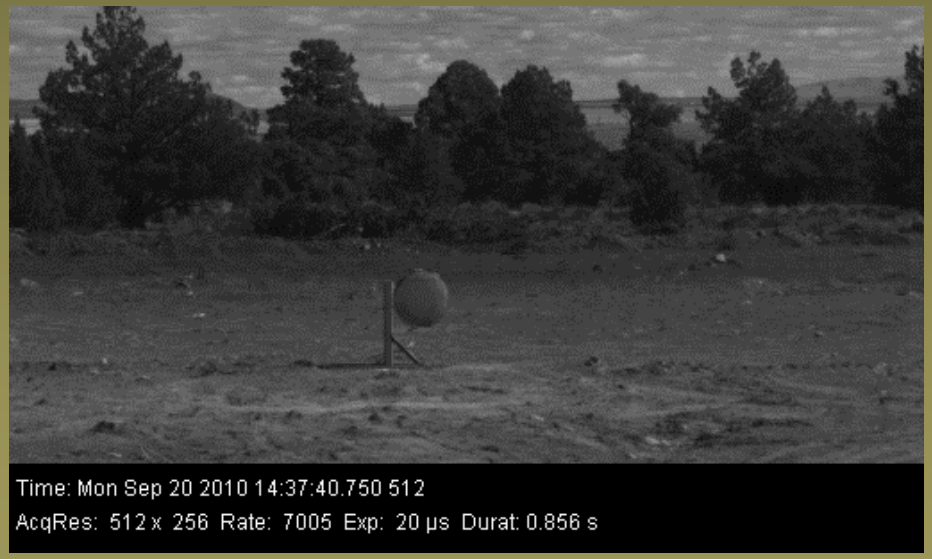
FireCap Protected Fuel Tank during Pool Fire – with full tank of fuel

Vehicle Protection Technologies:

1. BattleJacket® - Fuel Systems Ballistic Protection.
2. FireCap™
3. Hextinguish™ – IED Fire Suppression Technologies







High-Speed Video of IED Blast

Un-protected

IED Protected

Vehicle Protection Technologies:

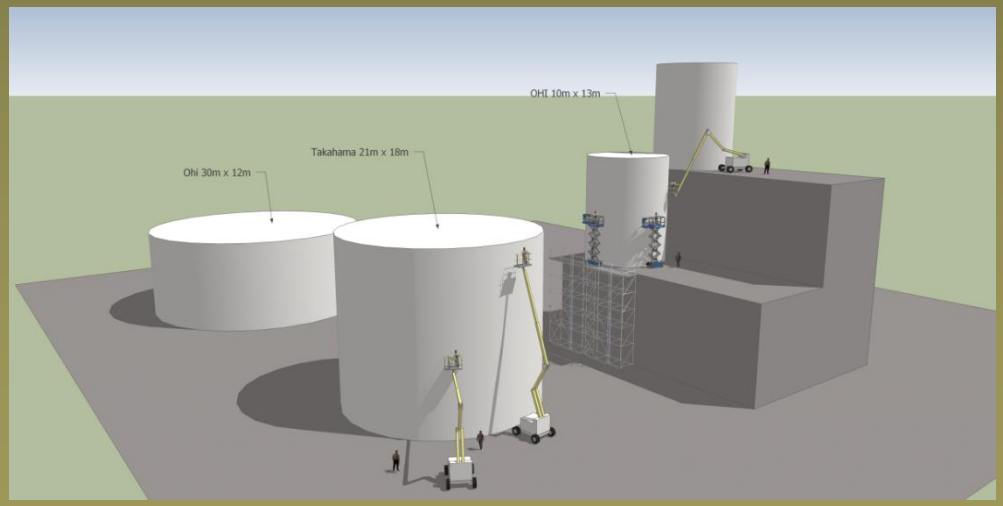
1. BattleJacket® - Fuel Systems Ballistic Protection.
2. FireCap™
3. Hextinguish™
4. BattleReady™ Tank (BRT) – Armor Design and Protection.

II. INFRASTRUCTURE PROTECTION

1.) BattleJacket - AQB

- HIT has developed a new coating called BattleJacket™ – AQB (Aqua-Beads).
- The coating was developed to protect water tanks from leaking after a ballistic event; this technology was developed to assure the water stored for nuclear reactor cooling, is always available.
- The coating has been fully tested / validated to 50 caliber threats.
- An applications procedure along with the training program, has been developed and is ready for use.

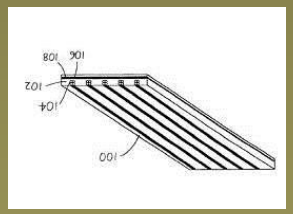
14.5 mm threat – passing through coating



2.) Wall / Building Blast Protection

- Armor design expertise allows for evaluation of structures and proposed designs.
- C-Bar – “Near Surface Reinforcement” allows for localized strengthening of wall sections (see Composite Rebar Section 7).
- Polyurea wall coating allows for “macro” strengthening of walls.

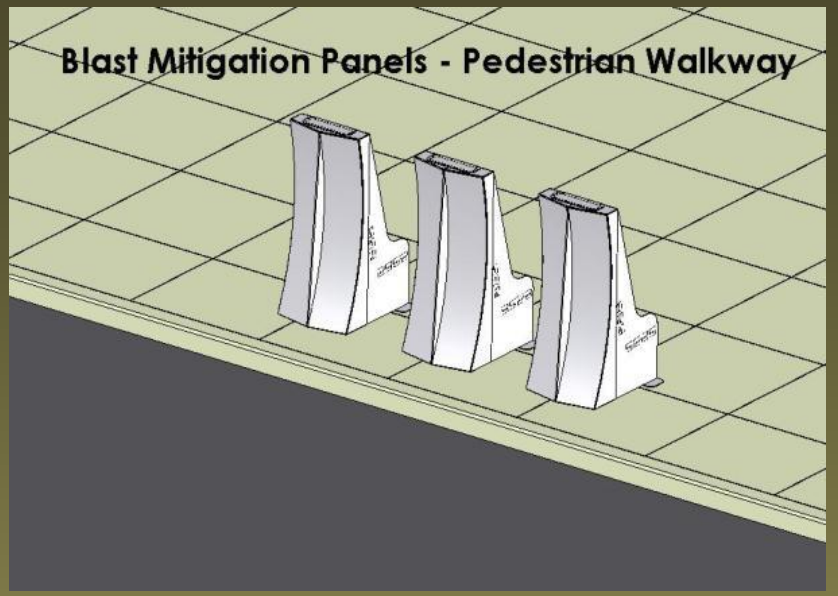
High-Speed video of Wall blast against Coated Wall



3.) BattleGuard™ – Blast Protection Technology

BattleGuard™ - Blast Protection Technology.

- High Impact Technology's BattleGuard system is designed to passively protect structures / personnel from direct blasts.



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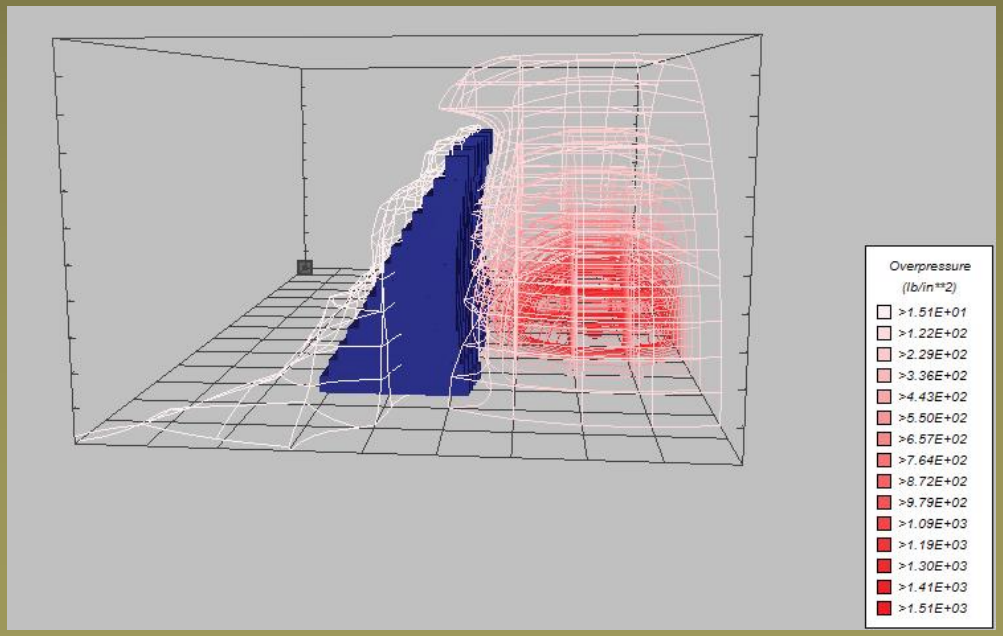

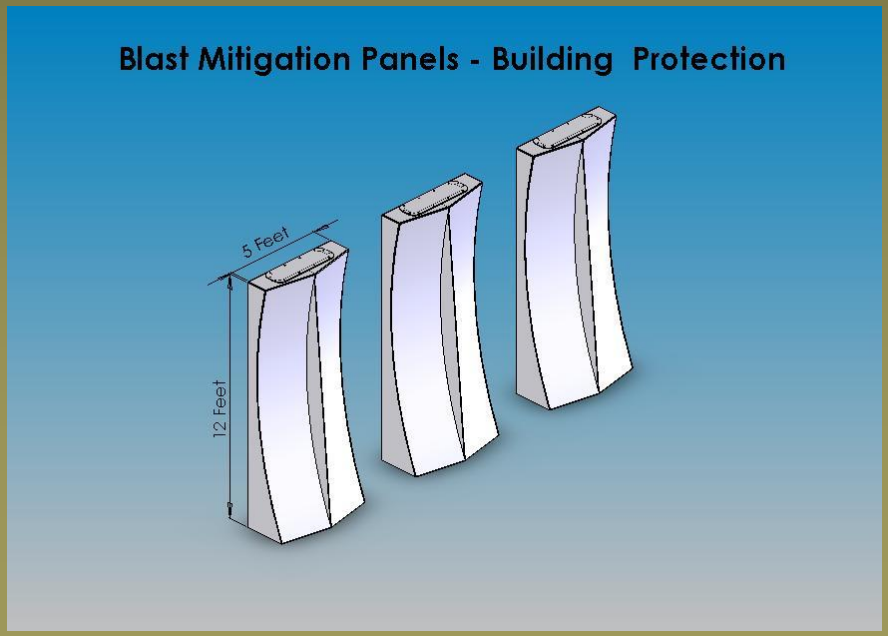

3.) BattleGuard™ – Blast Protection Technology – Con't

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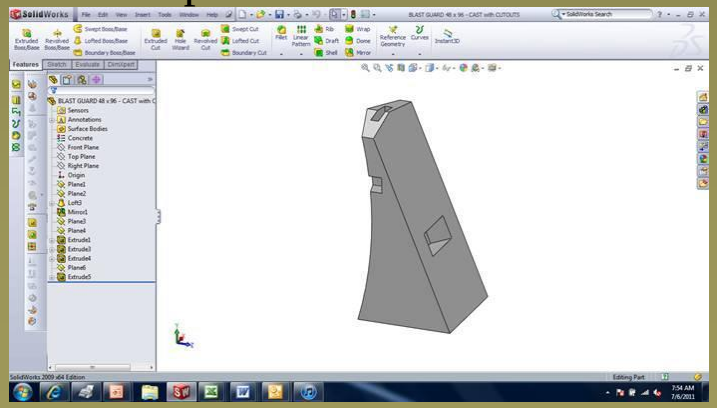
BattleGuard™ – "Smart" Blast Barriers

•BattleGuard™ is a "made to order" solution for application of wireless detection/assessment sensors for closed-circuit television and intrusion detection.

•Smart versions can include enhanced obstacles for unauthorized entry and will include electronic options that can be activated remotely.

•The "smart" variants allow for see-though capabilities for security when the Blast Guard™ is deployed primarily as a blast protection barrier.



3.) BattleGuard™ – Blast Protection Technology – Con't

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See VBIED Video

Recent Industry Sponsored Tests:

3.) BattleGuard™ – Blast Protection Technology – Con't

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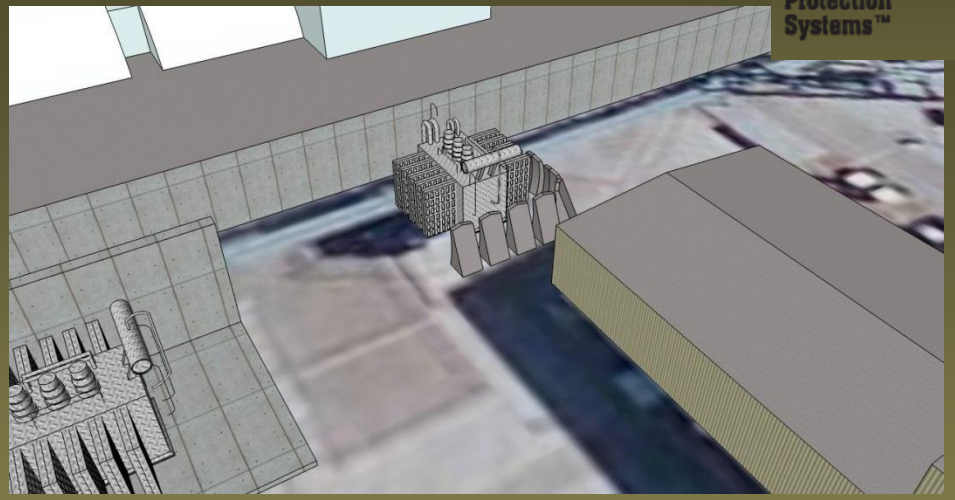
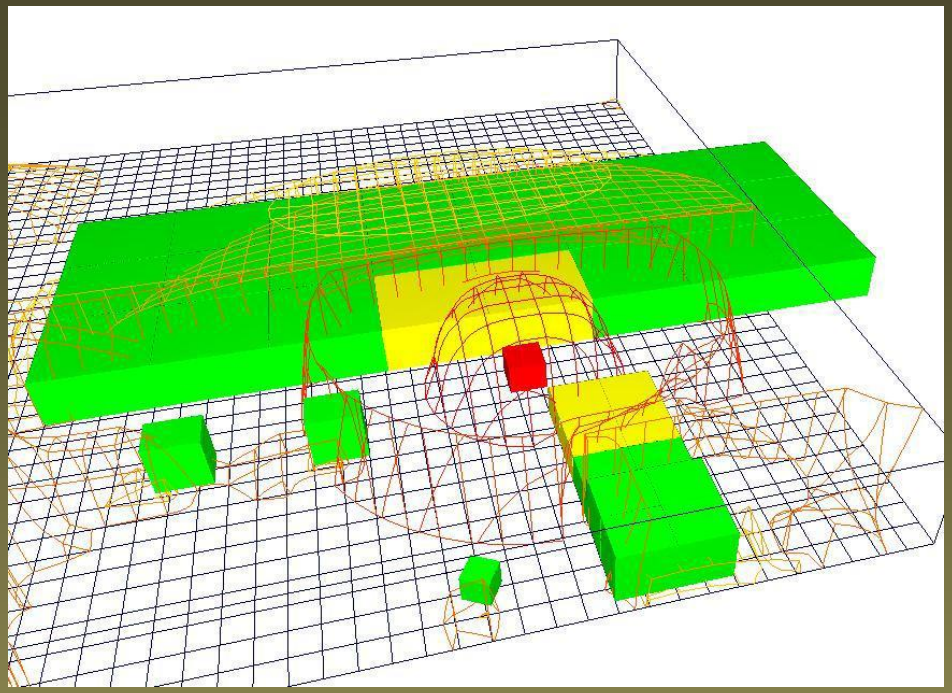
4.) Facility Threat Analysis, Simulation, Consultation



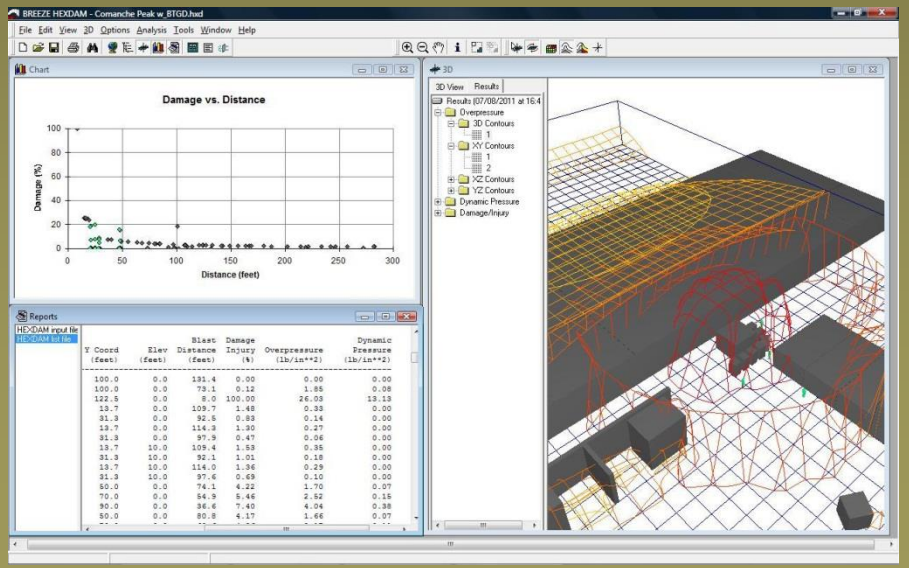
- HIT performs threat analysis and recommends protection methods.
- Shown is a case study of a recent project.

4.) Facility Threat Analysis, Simulation, Consultation – Con't



- Scale facility models are constructed replicating existing structures.
- Modeling software allows for pressure simulation and injury assessment as the threats are explored.

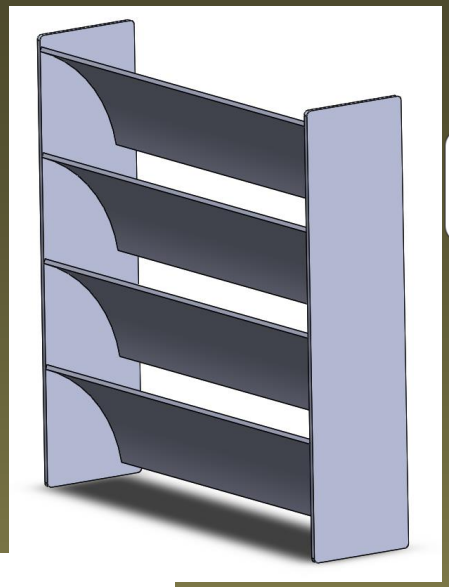
- Various threat scenarios can be simulated allowing for "protection" adjustments.
- Full scale blast testing is available for verification.

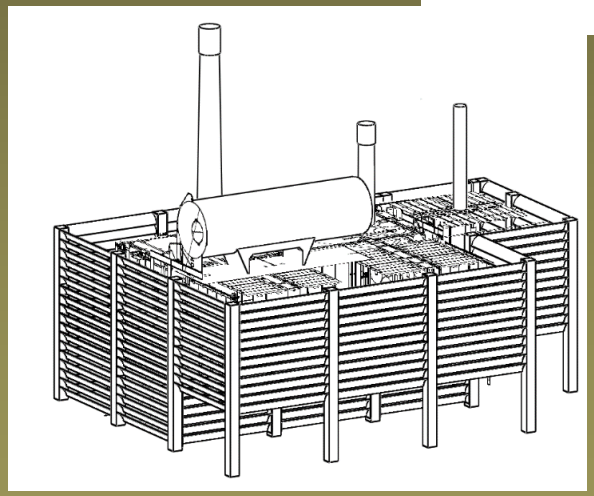


5.) Facility Ballistic Protection – Transformer Station (case study):

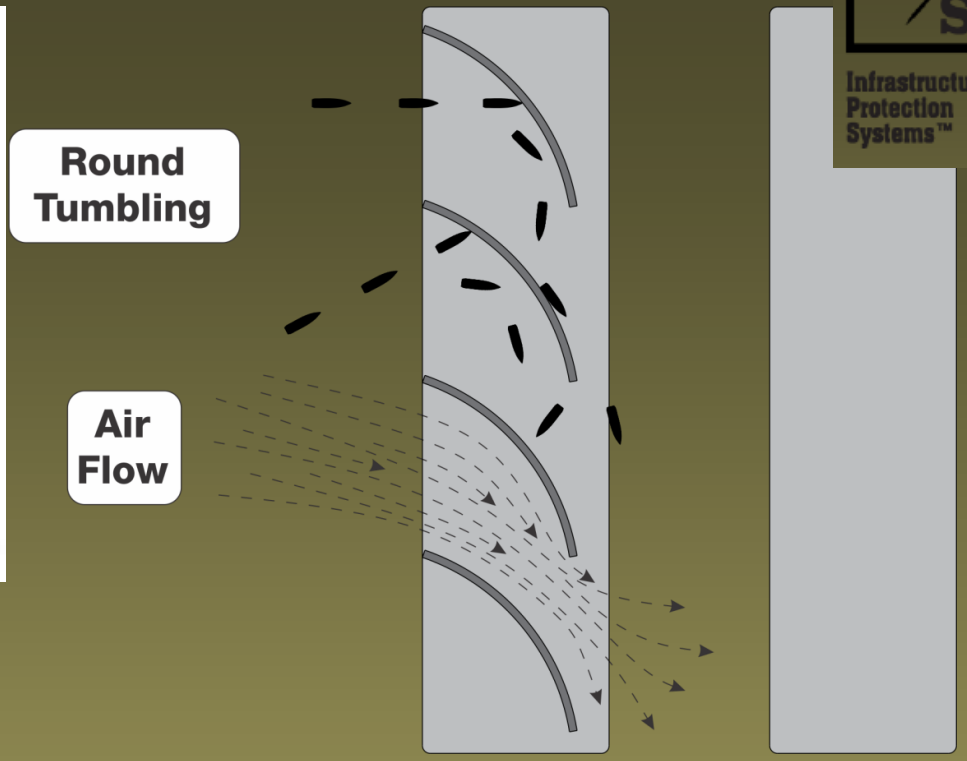
- With the absence of a clear ballistic threat definition, HIT Engineering selected a protection system around each transformer capable of defeating a 30 caliber Armor Piercing (AP) round shot from any direction, emanating from the periphery of the site.
- The initial visit allowed for a very quick site assessment and resulted in the design as presented; the following photos show the unprotected transformers from various views.

Transformer Station – Proposed Ballistic Protection:





Sectional view of "louvered" armor. A 2' x 2' panel (shown above) has been fabricated to confirm the design / manufacturing process and to allow for certified ballistic testing at OBL.



Function of "louvered" armor shown. The louver angles within the armored panel height, are designed to limit rearward direction of any round or shrapnel, at any point around the periphery of the transformer, and direct it downward to the transformer base.

Transformer Station – Ballistic and Blast Protection Design:

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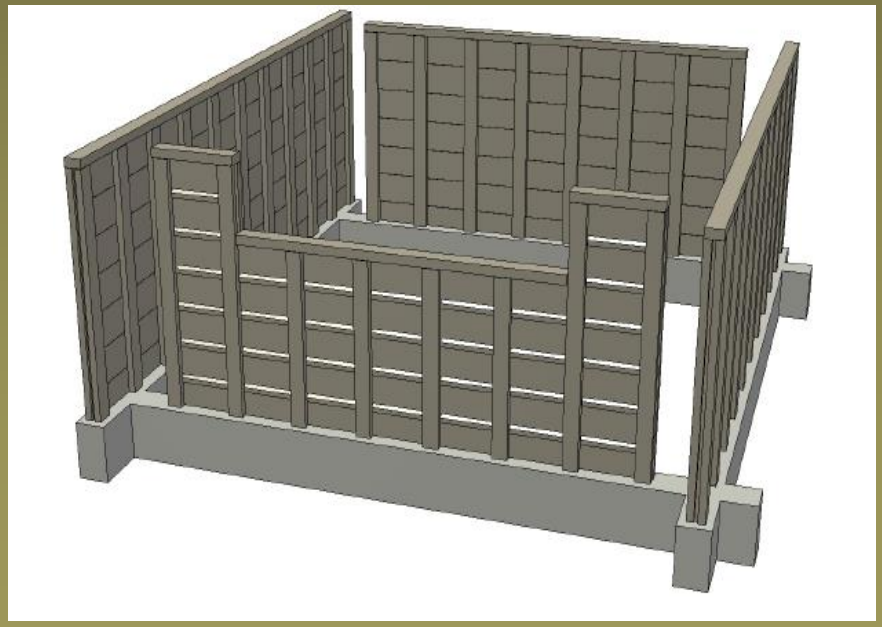
REQUIREMENTS:

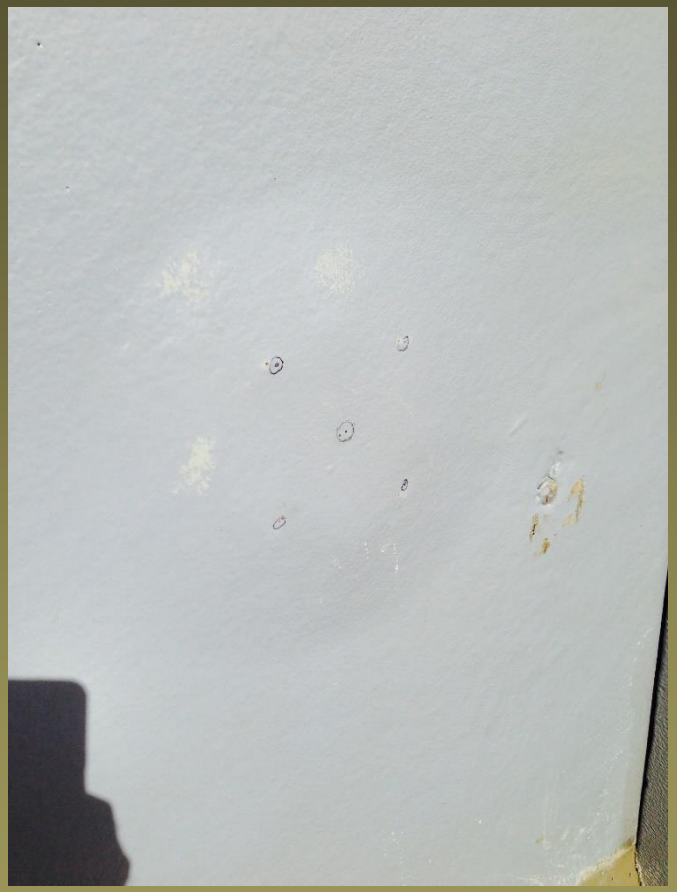
1. Wind speed: 90 mph
2. Ballistic rating: UL 752 level 8
3. Fire rating: 2 hr (ASTM E-119)
4. Wall height: 3 ft above the conservator tank
5. Construction: Modular design for easy removal/installation
6. Access: Provide 5 ft wide opening in all four corners
7. Oil Containment: Incorporate containment dykes into the ballistic / firewall foundation with integrated emergency drain system.
8. Lighting: Provide mounting brackets for lighting luminaires on the supporting columns

Video - Fire Testing on Concrete



Transformer Station – Ballistic and Blast Protection:

Infrastructure Protection Systems™



Wall Design – Ballistic Verification Testing

Transformer Station – Ballistic and Blast Protection:

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Recent Wall Design - Blast Verification Test

Transformer Station – Ballistic and Blast Protection:

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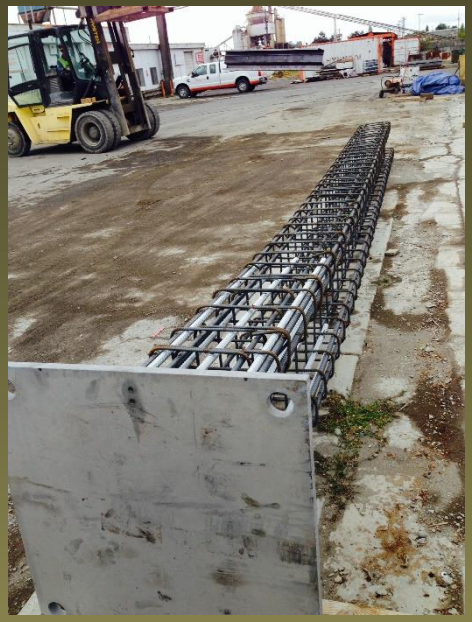
Wall Blast Verification Test – High-Speed Video

Transformer Station – Ballistic and Blast Protection – Wall Manufacturing and Coating Operations:

Wall Fabrication – Composite Rebar Reinforced, Pre-cast Transformer Protection Walls

Transformer Station – Ballistic and Blast Protection – Column Fabrication and Coating Operations:



Column Fabrication – Steel Rebar Reinforced, Pre-cast, Wall Support Columns

Transformer Station – Ballistic and Blast Protection:

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Wall Installation – Composite Rebar Reinforced, Pre-cast Transformer Protection Walls

Transformer Station – Ballistic and Blast Protection:

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Wall Installation – Composite Rebar Reinforced, Pre-cast Transformer Protection Walls

Transformer Station – Ballistic and Blast Protection:

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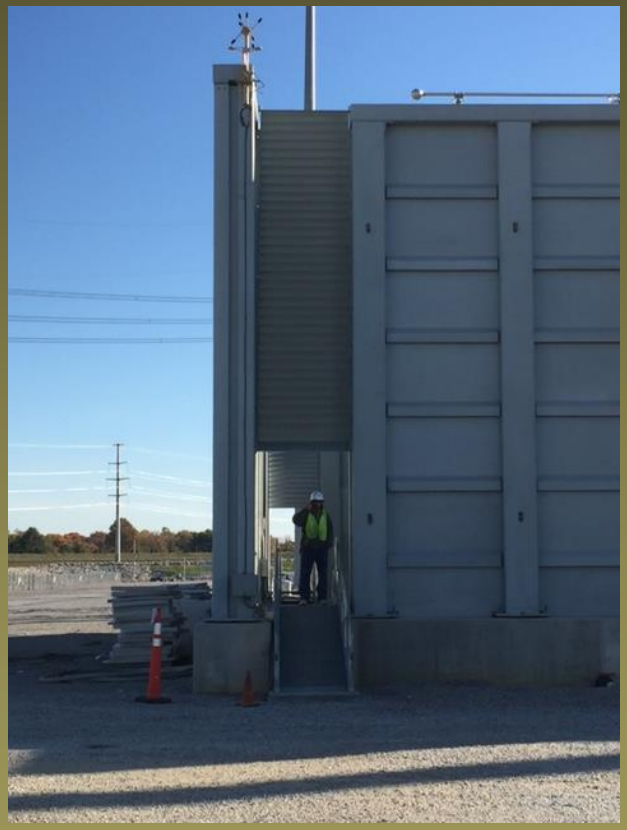
Transformer Protection Walls – Interior View

Transformer Station – Ballistic and Blast Protection:



Transformer Protection Walls with Louver Line-of-Sight Protection

Transformer Station – Ballistic and Blast Protection:

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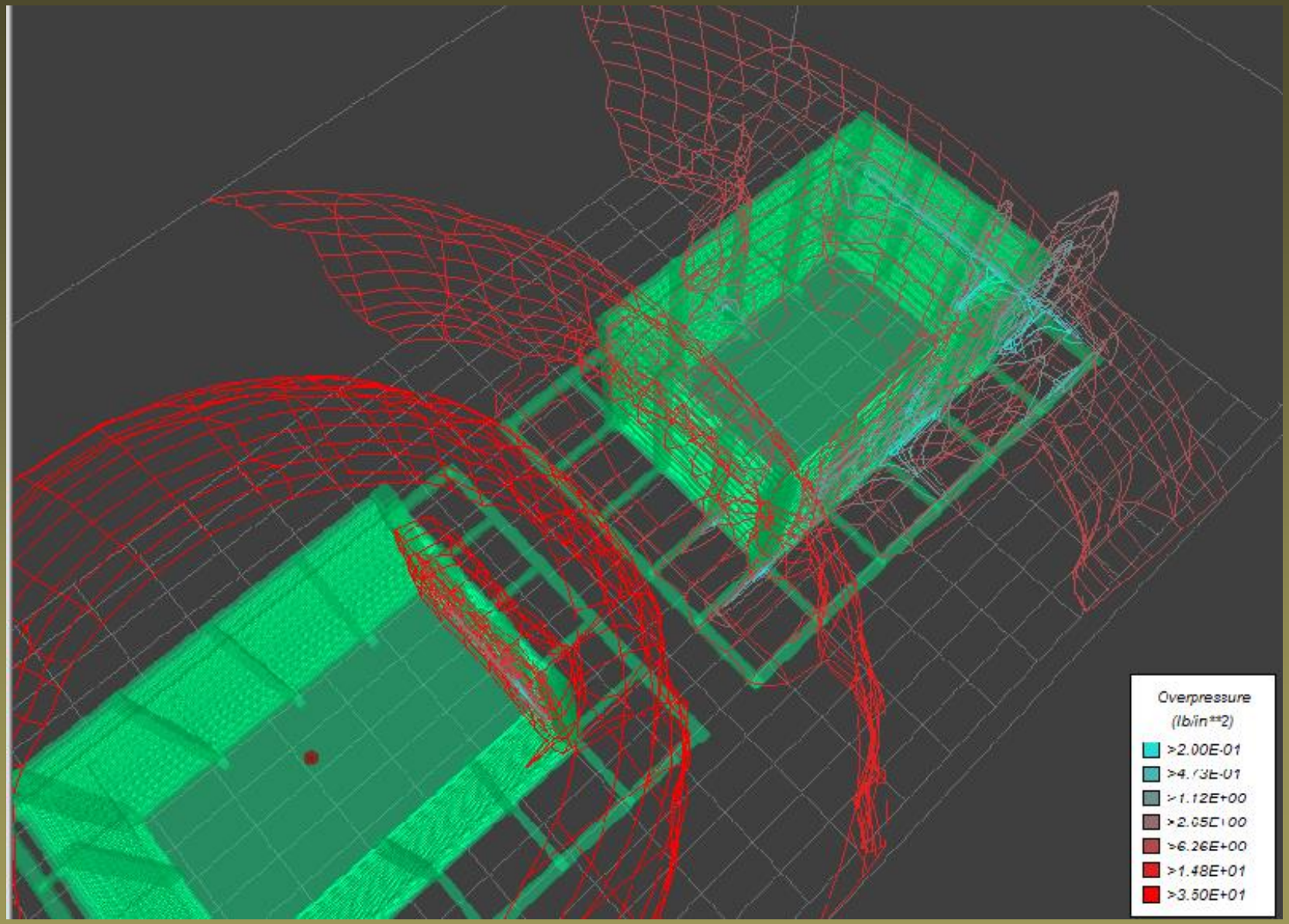
Completed October 2014 – Composite Rebar Reinforced, Pre-cast Transformer Protection Walls

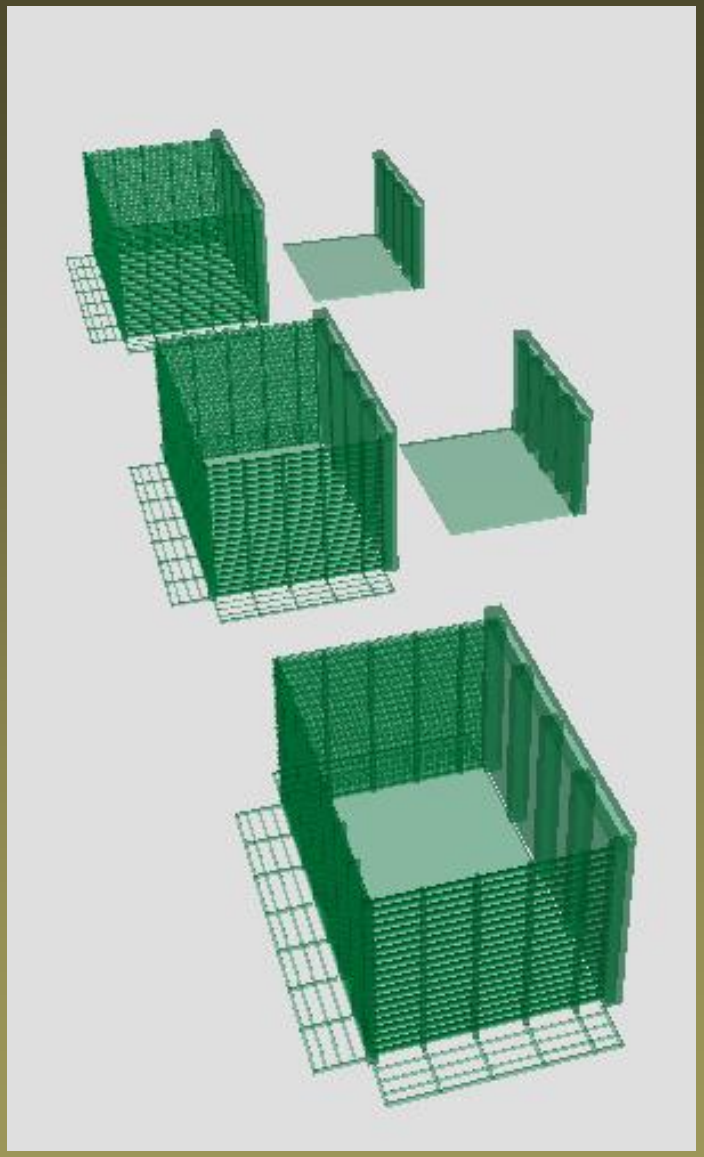
New Site Assessments, Design and Validation:

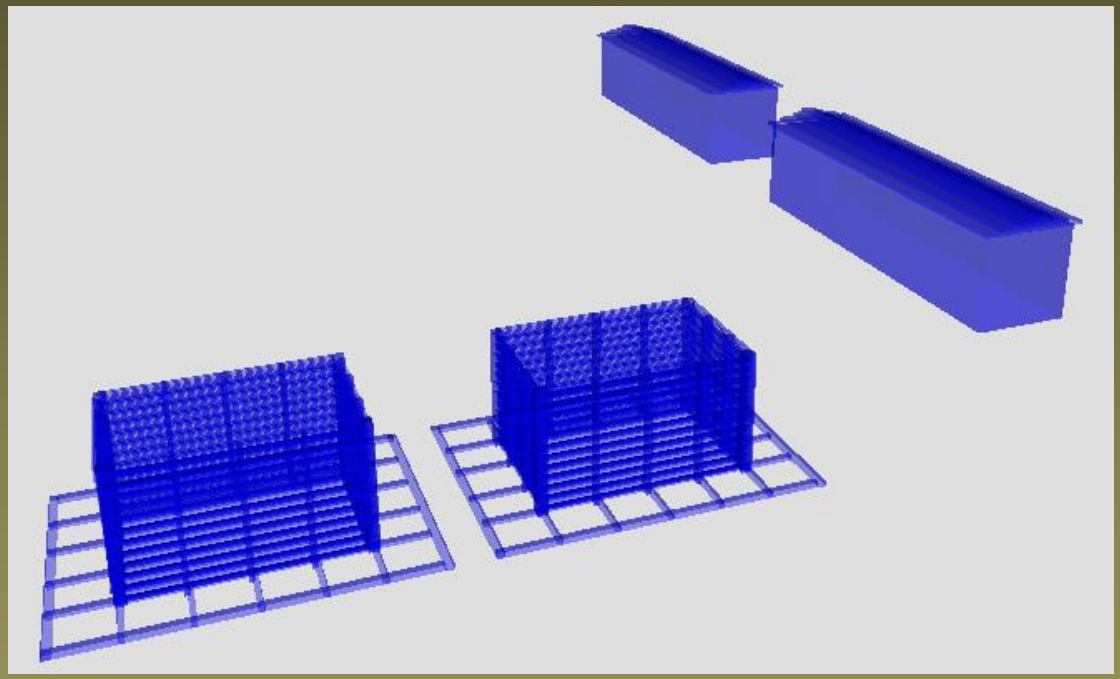


Blast Modeling of Louver Enclosure Design

New Site Assessments, Design and Validation:

Infrastructure Protection Systems™





New Facility Protection Designs are being Developed by HIT –
Modifications to the Louver Designs allow for “Horizontal” Foundations

New Site Assessments, Design and Validation:

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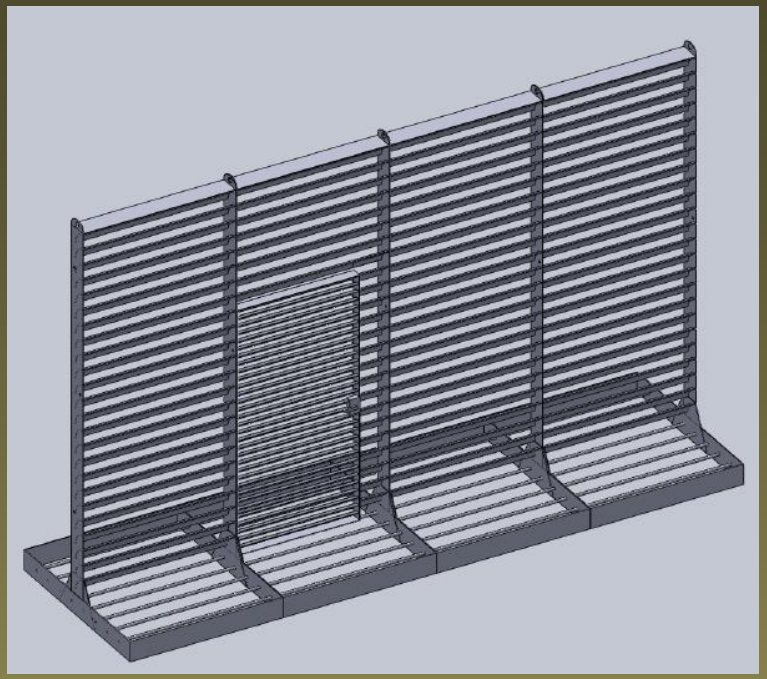

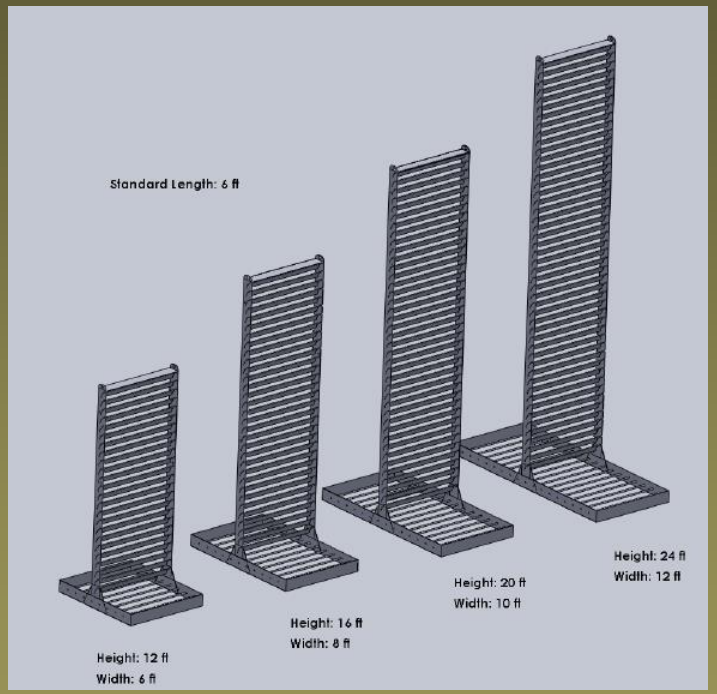

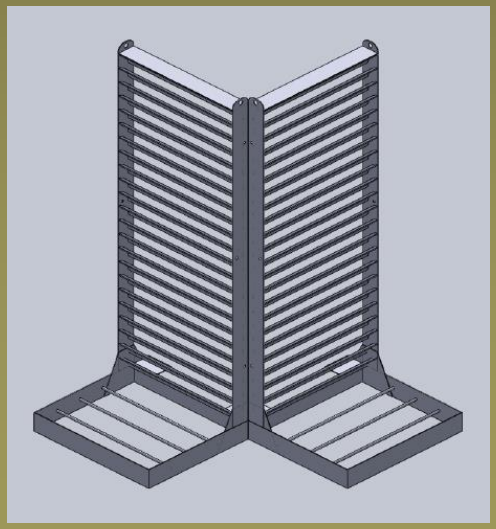

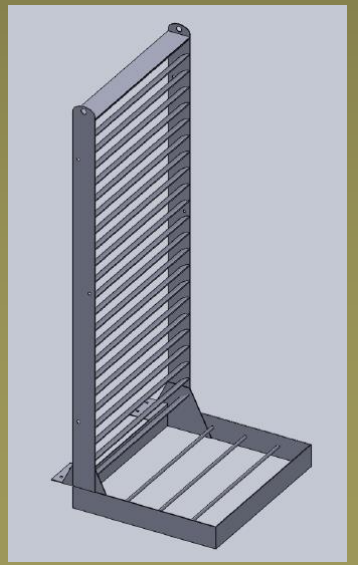

Various Louver Designs Allow for Design Versatility

Conclusions / Discussion