Expeditionary Basecamp Passive Protection

JOCOTAS, 3 November 2011

Nicholas Tino, Mechanical Engineer
NSRDEC, Shelter Technology, Engineering, and Fabrication Directorate (STEFD)
Special Projects Team

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
03 NOV 2011		**00-00-2011 to 00-00-2011**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Expeditionary Basecamp Passive Protection	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **US Army Research, Development and Engineering Command (RDECOM),US Army Natick Soldier RD&E Center,Natick,MA,01760**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES
7th Bi-Annual DOD JOCOTAS Meeting with Rigid & Soft Wall Shelter Industry & Indoor & Outdoor Exhibition, 1-3 Nov 2011, Panama City Beach, FL

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**Same as Report (SAR)**	**11**	

The Problem

Warfighters in highly mobile forward units have no inherent ballistic protection in shelters and no time/manpower to install traditional ballistic protection (sandbags, concrete barriers). Multiple requests for ballistic protection for shelters have been received from theater.

Creating a low cost ballistic solution requires advancing current material technology, systems integration, and manufacturing processes.

Modular Ballistic Protection System (MBPS)

The Solution: Modular Ballistic Protection System (MBPS)

- Rapidly deployable ballistic protection
- Expeditionary protection from multiple ballistic threats
- Lightweight, Low Cost
- Redeployable (install around 32’ x 21’/4 man-hours)
- No Material Handling Equipment or special tools
- Immediate protection in all battlefield environments
- Withstands high impulse blast overpressures

NO TOOLS or MHE

MBPS Stand-Alone

MBPS has evolved into a stand-alone ballistic protection system.

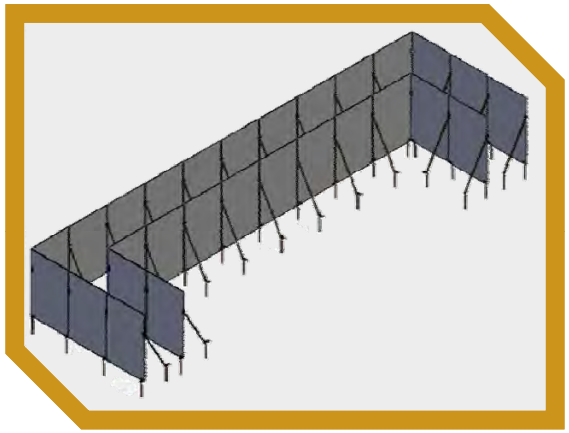
- Universal protection for shelters, equipment, supplies, or personnel.
- Can provide a quickly deployed protective fighting position.
- Effectively withstands blast loads in a multitude of soil conditions.

Current Prototypes:
Weight: 3.8 lbs/sq.ft.
Thickness: 0.4 inches
Cost: $20 per sq.ft.
Protection: Fragmentation & Ballistic.
Protection levels can be tailored to need.

MBPS Development

Up-armoring

Layering & Metallic Strike Face

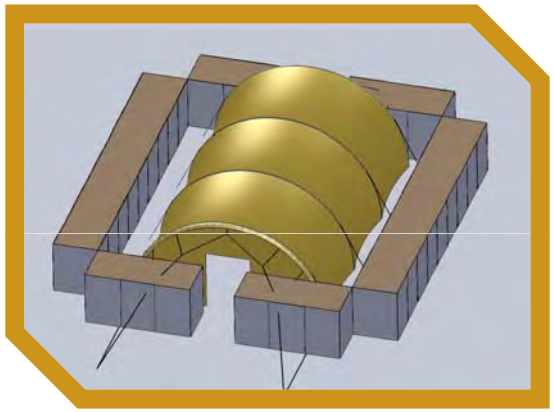


Higher levels of protection have been requested, multiple uparmor solutions possible:

- Metallic strike face add-on
- System layering approach
- Higher cost materials

2G Prototype

Anchorless & Fillable



Second generation MBPS concepts are in development:

- Anchorless design
- Two layer design, ability to fill if possible/needed.

AEWC ADVANCED STRUCTURES & COMPOSITES CENTER

1865 THE UNIVERSITY OF MAINE

Flexible Ballistic Solution

Flexible Solution for Air-supported Shelters

Through the Small Business Innovative Research (SBIR) program, a flexible ballistic solution was sought for an approach to protect shelters with unique arc shapes of non-traditional frame shelters.

NSRDEC Objectives:

- Provide a level of protection against small arms and fragmenting munitions.
- Low volume pack.
- Utilize unique blast response over rigid solutions.

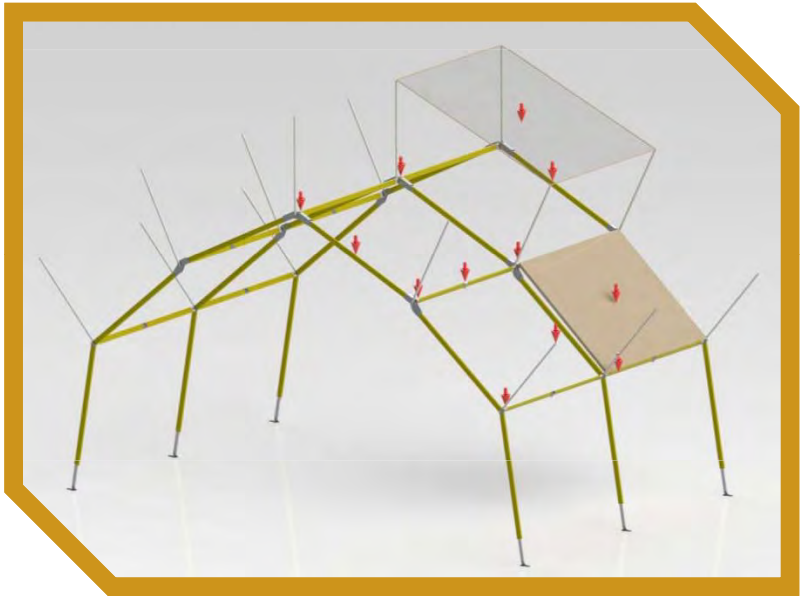
Phase II SBIR:

TEXTECH INDUSTRIES

Overhead Threat Protection

Overhead Threat Protection (OTP)

The task of developing an Overhead Threat Protection (OTP) system for direct hit survivability is also being pursued through the Small Business Innovative Research (SBIR) program.



NSRDEC Objectives:

- Quickly set up/deployed
- Reusable/redeployable
- Support the weight of ballistic paneling and pre-detonation layer at a stand-off
- Withstand large dynamic (impulse) loading
- Minimal deflection into the covered volume.

Phase II SBIR:

TPI
TECHNICAL PRODUCTS, INC.

Requirements & Testing

Ballistic Requirement

- Meets requirement document specified fragmentation protection capability (Note: Can be tailored to need and utilize same system)
- Performs well against relevant munitions in arena testing and modeling

General Performance Requirements

- Man-portable, No Heavy Equipment, No Special Tools
- Transportability: Tricon or 463L pallet (10,000 lb limit)
- Deployment / Strike times: 1 hour / 4 warfighters / 32'x21' shelter
- Extreme Climates: Temperature, Snow, Wind.
- Panel Durability: Impact Testing, Accelerated Weathering (UV, Water Absorption), Fire Resistance.

Program Status

- REF 10 liner
  - 2 MBPS SA systems in theater
- Tech Transition
  - Transition partner PM Force Sustainment Systems (PM FSS)
  - Moving forward with Stand Alone design only
  - Milestone A signed in 1QFY11
  - Milestone B tied to requirements document, awaiting Force Provider Expeditionary (FPE) CPD signature.
- Test community IPT established
- NSN and Interim Tech Manual established with NSRDEC Quick Reaction Cell (QRC) funding
- Sponsoring Threat Summit
  - Participants: ARL, NGIC, ATEC, AWG, NSRDEC, PM FSS

Partnerships

- Product Manager Force Sustainment Systems (PM FSS)
- AEWC Advanced Structures and Composites Center at the University of Maine - Orono
- National Ground Intelligence Command (NGIC)
- Army Test and Evaluation Command (ATEC)
- NSRDEC - Quick Reaction Cell (QRC)
- Army Corps of Engineers (ERDC)
- Air Force Research Lab (AFRL)
- Army Research Lab (ARL)
- NSRDEC - Ballistic Technology Team (WARPAD Directorate)
- Technical Products Inc. (TPI)
- Tex Tech Industries

Questions?

POCs

Nicholas Tino
nicholas.tino@us.army.mil
508.233.5930

Karen Horak
karen.horak@us.army.mil
508.233.4763

Laura Biszko
laura.biszko@us.army.mil
508.233.4499