THE PROTECTOR
Quarterly Newsletter

PROTECTIVE DESIGN CENTER
SERVING THE NATION AND THE WORLD

AVAILABLE SUPPORT SERVICES

Planning	• Criteria Development • AT Plan Development • Contingency Plan Development
Design	• IED Mitigation and Casualty Prediction • Blast Analysis and Protective Design • Design of Hardened Structures • Blast Resistant Window Design • Access Control Point (ACP) Design • Active Shooter Design & Assessments • Chemical/Biological Protection & Design • SCIF and E3 Facility Design
Review and Assess	• Energy System Protection & Continuity • Risk and Vulnerability Assessments • Infrastructure Assessments • UFC Compliance Reviews/Assessments • Analysis of Hardened Structures • Mailroom Compliance Assessments • Blower Door (Building Leakage) Testing
Training	• Security Engineering Training • Access Control Point Training • Blast Design Training

A MESSAGE FROM THE CHIEF:

This quarterly newsletter is part of the Protective Design Center's continuing efforts to provide the Federal Government security community with information related to protective design, antiterrorism, physical security, hardened structures, and access control.

Curt Betts, Chief Protective Design Center

INFRASTRUCTURE – AGING & VULNERABLE

GENERAL INFORMATION

- The 2013 Report Card for America's Infrastructure, prepared by the American Society of Civil Engineers (ASCE), provided the following grades for various infrastructure categories: Bridges - C+; Dams - D; Energy - D+; Levees - D-; Ports - C; and Hazardous Waste - D. Each category was evaluated on condition, public safety, and resilience, among other factors.
- The average age of the nation's bridges is 43 years; with one in five U.S. bridges built more than 50 years ago, according to the American Association of State Highway and Transportation Officials (AASHTO). Most of the bridges were designed to last 50 years, which means that more than half of the nation's bridges are approaching or past their expected lifespan.
- The average age of the nation's nearly 84,000 dams is 52 years. Many of these dams were built as low-hazard dams to protect undeveloped agricultural land; however, increasing development and population below many dams has resulted in them being reclassified as high-hazard dams. According to the Association of State Dam Safety (ASDS), approximately 4,000 of the nation's dams are deficient, with half of those being high-hazard dams. This means that large population groups are located downstream in relative close proximity to each of the nearly 2,000 high-hazard dams rated as deficient by the ASDS.
- Some of the electrical grid and pipeline distribution systems that the nation relies on were built in the 1880s. There are efforts to build new power transmission systems, but ongoing permit issues, weather events, and limited maintenance of existing system elements have hindered progress. The combined result has been an increasing number of failures and power interruptions.
- According to ASCE, there are approximately 100,000 miles of levees in the continental U.S. As with the nation's dams, many of these levees were originally designed to protect undeveloped farm land, but are now the only means of protection for large population groups located in communities developed after the levees were built. The reliability of these levees is largely unknown, due to age in many cases. The result may represent a potential risk to public safety.
- The Corps of Engineers estimates that the nation's ports are responsible for receiving more than 95-percent (by volume) of overseas trade produced or consumed by the U.S. Many of the nation's ports are in need of maintenance, modernization, and/or expansion. A significant disruption, at one or more major ports, could have a rather substantial impact on the economy and could affect military mobilization and sustainment efforts.
- The ASCE indicates that 1,280 hazardous waste sites and 400,000 Brownfield sites remain on the National Priorities List for cleanup. The Environmental Protection Agency (EPA) estimates that one in four Americans currently live within three miles of a hazardous waste site.

CONCERNS AND CONSIDERATIONS

- Age and lack of maintenance have made much of the nation's infrastructure vulnerable to natural or accidental events. Unfortunately, this also makes our critical infrastructure more vulnerable to deliberate acts, especially given that the prospect for deliberate acts was not generally considered in the original design. This situation is particularly concerning since communities are now located in areas near infrastructure that were uninhabited when the infrastructure was built.

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INFRASTRUCTURE – AGING & VULNERABLE

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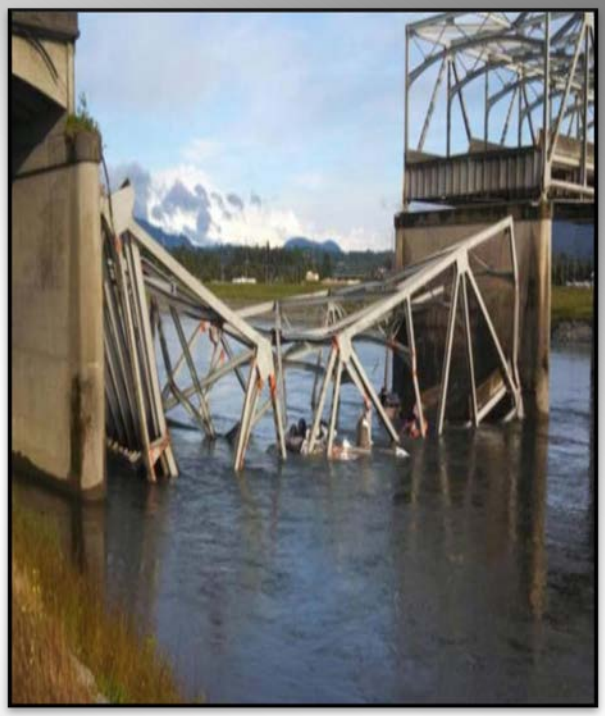
MORE CONCERNS AND CONSIDERATIONS



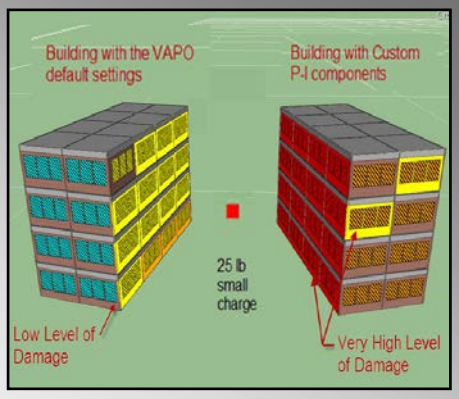
- The increase in population near infrastructure has not only resulted in many infrastructures being reclassified from low-hazard to high-hazard; it also makes those infrastructures much more attractive targets to aggressors intent on maximizing damage and loss of life. This greatly increases the threat to public safety unless steps are taken to mitigate known vulnerabilities.
- Protection is never absolute. In the case of electrical substations, high voltage transformers are particularly vulnerable to ballistics attacks, but they are very expensive, so spares are not generally readily available. While it is nearly impossible to completely protect these transformers from ballistics, there are a number of measures that can be taken to help mitigate the threat and/or speed recovery. These measures include obscuring line of sight, establishing redundancy, establishing MOAs/MOUs with other military installations or public utilities for quick access to spare parts, etc.
- Protection of ports is a daunting task since they are generally so vast, but measures can be taken to mitigate vulnerabilities and minimize overall impacts, such as focused protection of container cranes, early detection and response on land and water sides, installing vehicle barriers, etc.
- Bridges can vary in size and function (e.g., commuter traffic, equipment transport, military mobilization, etc.), so the approach to protection can vary. Depending on bridge type and situation, mitigating measures may include limiting vehicle size, focused protection of bridge piers, controlling bridge approaches, strategically placed electronic security systems, etc.

A discussion of PDC capabilities regarding infrastructure vulnerability mitigation can be found at: https://pdc.usace.army.mil/newsletter.

For questions or assistance regarding infrastructure assessments, designs, or design reviews, please contact:

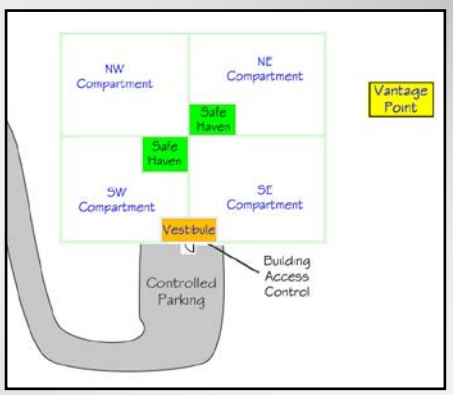
Mr. Bryan Cisar, 402-995-2362, bryan.r.cisar@usace.army.mil or Mr. Thomas Schuberth, 402-995-2374, thomas.f.schuberth@usace.army.mil

BLAST ANALYSIS SOFTWARE HELPS PREDICT BUILDING SURVIVABILITY



Blast analysis, using VAPO software, is a relatively inexpensive way to predict how well the various construction elements of your building will survive the blast pressures associated with the detonation of an explosive device. To ensure that you achieve accurate results, care must be taken to select the proper building components when developing the building model within VAPO. Once the building is modeled, it becomes relatively easy to run various blast scenarios (i.e., different explosive weights at different locations). More in-depth analysis can be achieved using SBEDS software. The SBEDS software provides a more definitive result since it includes a more detailed modeling of the building components. If your building is three stories or more, you should also consider executing a progressive collapse analysis. SAP2000 is a software package that performs the non-linear dynamic analysis necessary to determine whether progressive collapse is likely to occur. Read more…

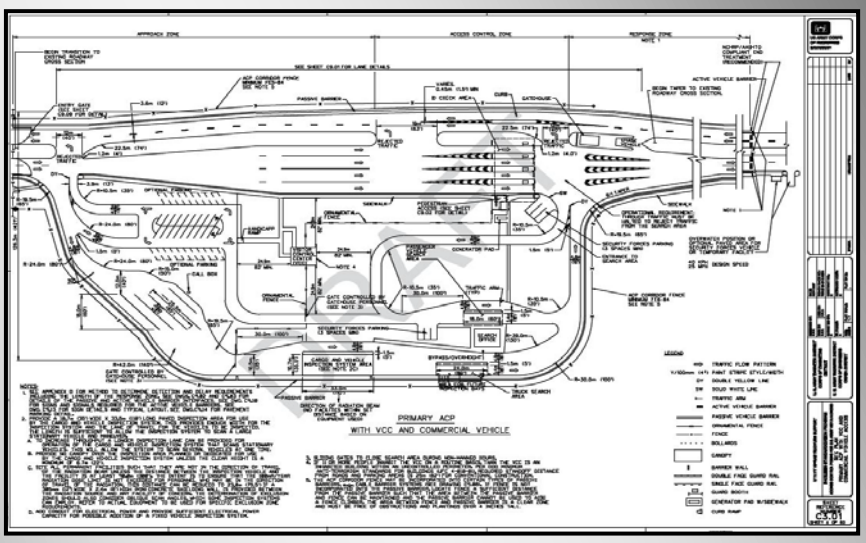
ACTIVE SHOOTER DESIGN, ASSESSMENT, PLANNING, & MITIGATION



Active shooter incidences have continued to increase in frequency and severity. Being located on a military installation does not make one immune to the potential for an active shooter incident, as demonstrated by the events that occurred at the Washington Naval Yard, Fort Hood, and Millington Naval Base. In fact, statistics reveal that active shooter incidences are more likely to occur at a restricted facility than an open commercial facility. It is nearly impossible to completely prevent an active shooter incident without disrupting work processes and the freedom of movement of personnel. It is possible, however, to reduce the likelihood of an incident and minimize the impacts, should an incident occur. The most effective plans to achieve this objective are those that include early warning, response, compartmentalization, shelter, egress, training, and exercises. Facilities/offices that assess their existing security posture, develop a good plan, provide training to personnel, and exercise the plan are best prepared to survive an active shooter incident with the least number of casualties and injuries to personnel. Read more…

ACP/ECF SUCCESS STARTS WITH A 1391

No doubt you have heard the following statement, “A failure to plan is a plan for failure”. This statement, while normally cautionary, holds very true when it comes to planning for Access Control Points (ACPs)/Entry Control Facilities (ECFs). Planning is critical to the overall success of an ACP/ECF project. Any mistakes made in the early stages of the planning process will only become magnified as the project progresses and can easily impact security, life safety, and the functionality of the completed ACP/ECF, not to mention the initial expense, life cycle costs, problems caused by loss of use, and costs that may result from litigation. As illustrated by the image, below, ACP design is extremely complex.



Care has to be taken to make sure that all critical issues are addressed and that all of the required features are properly designed and placed. If not, the potential ramifications can easily include 100s of thousands to millions of dollars in change order expenses, extended delays that impact on military security, functionality issues that affect life safety and increase exposure to liability, and mission impacts that may result if an ACP/ECF has to be taken out of service to address and fix problems. Again, proper planning is the key to avoiding problems later and the hinge pin in the planning process is the DD Form 1391.

Key Elements Involved in Preparing a 1391 for an ACP/ECF Project:

◆ **Planning Charrette, Planning Charrette, Planning Charrette.** Why say it three times? Because it is that important to the overall success of an ACP/ECF project! The planning charrette allows the stakeholders to meet to establish the requirements of the ACP/ECF. It is vital that the charrette include members who are very familiar with ACP/ECF criteria and how they apply to the proposed ACP/ECF. The criteria are used to identify specific line items on the 1391. It is too common for critical and very expensive line items to be left off of the 1391.

◆ **Traffic Engineering Study.** A traffic engineering study is the key element of the planning process that drives the conceptual layout. It is not possible to properly size or lay out an ACP/ECF without a traffic engineering study that helps establish current and projected traffic conditions.

◆ **Development of the ACP/ECF Conceptual Layout.** The conceptual layout is the foundation for the 1391. It is essential to establishing project scope and determining quantities and estimating costs. One of the most critical yet misunderstood and complicated processes is the determination of the threat delay calculations. Accuracy in these calculations is essential to the proper placement of active vehicle barriers (AVBs). Improper placement of AVBs will negatively impact on the safety and security of the installation, not to mention the expense of moving them, later.

[On the right side of this page is a list of major 1391 development milestones.]

Enlist the support of ACP/ECF criteria and design professionals early and frequently during the planning and design phases to avoid costly modifications, loss of forward momentum, and mission impacting delays!

ACPs/ECFs are a very complex system of design elements and functions that work in concert with each other to achieve the intended objective. The development of the DD Form 1391 is a crucial step in the process. The following is a guide of major 1391 milestones for use in achieving the best results:

GUIDE OF MAJOR 1391 MILESTONES

- **Planning Charrette – Requirements Analysis**
  - ✓ Establish the need for ACP Facility or Infrastructure
  - ✓ Perform Traffic Engineering Study
  - ✓ Develop Conceptual Layout
- **Initiate DD Form 1391**
  - ✓ Develop Draft 1391 and Identify Planning & Design Data
  - ✓ Execute Review of Draft 1391 by All Stakeholders
  - ✓ Revise and Finalize Draft 1391
  - ✓ Submit 1391 into PAX Processor System
  - ✓ Submit for inclusion in the Future Years Development Program (FYDP)
- **Approved FYDP, Code 3 Release**
  - ✓ Design Charrette
  - ✓ Perform Project Definition Report (PDR): (Formal Review of Project Scope)
  - ✓ Perform Parametric Cost Estimate
  - ✓ Discrepancies Documented/Corrected in 1391
  - ✓ Component Major Command Locks Document
- **Adjust 1391 per PDR**
- **Obtain Component Approval, Design Directive Release.**

To schedule a class, contact the Training Coordinator:

Ann Mittelsdorf, 402-995-2930,
ann.m.mittelsdorf@usace.army.mil

Please allow 60 days advance notice for scheduling classes within CONUS and 90 days for OCONUS

To register for a class, contact the Registrar:

Katherine Barnett, 402-995-2393,
katherine.d.barnett@usace.army.mil

Security Engineering Class

UPCOMING CLASSES

Contracted:

- 9-13 June 2014 – HQDA (Fort Belvoir)*
- 28 July-01 August 2014 – IMCOM (Germany)*

* Agency personnel get priority placement; non-agency personnel attend at agency's discretion and pay tuition if seats are still available

Open Enrollment:

- 11-15 August 2014 – Open class at Fort Belvoir

Access Control Point Class

UNDER DEVELOPMENT

- Tentatively Fall/Winter 2014 – Open class at Fort Belvoir

PROTECTIVE DESIGN CENTER
US Army Corps of Engineers
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