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CECW-EC

Engineering and Design
Protective Design Mandatory Center of Expertise

FOR THE COMMANDER:

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Chief of Staff

Purpose. This Engineer Regulation sets forth the authority, policy, roles, and responsibilities of the U.S. Army Corps of Engineers, Protective Design Mandatory Center of Expertise, located in the Omaha District. It also provides policy and guidance by which the U.S. Army Corps of Engineers commands and other Department of Defense and government agencies obtain services from the Protective Design Mandatory Center of Expertise. For Facility Explosive Safety issues and concerns such as: the design of structures to resist the effects of accidental explosions; the design of munitions and ammunition storage, maintenance, and production facilities; explosive safety criteria development; the application of current Department of Defense explosive safety criteria; and the siting of facilities, refer to ER 1110-1-8169 and contact the Facilities Explosive Safety Mandatory Center of Expertise.

Applicability. This regulation applies to all U.S. Army Corps of Engineers commands.

Distribution Statement. Approved for public release; distribution is unlimited.

Proponent and Exception Authority. The proponent of this regulation is the Corps of Engineers Civil Works Directorate, Engineering and Construction Division. The proponent has the authority to approve exceptions or waivers to this regulation that are consistent with controlling law and regulations. Only the proponent of a publication or form may modify it by officially revising or rescinding it.

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1. Purpose

This Engineer Regulation sets forth the authority, policy, roles, and responsibilities of the U.S. Army Corps of Engineers, Protective Design Mandatory Center of Expertise, located in the Omaha District. It also provides policy and guidance by which the U.S. Army Corps of Engineers commands and other Department of Defense and government agencies obtain services from the Protective Design Mandatory Center of Expertise. For facility explosive safety issues and concerns such as designing structures to resist the effects of accidental explosions; designing munitions and ammunition storage, maintenance, and production facilities; developing explosive safety criteria; applying current Department of Defense explosive safety criteria; and siting facilities, refer to ER 1110-1-8169 and contact the Facilities Explosive Safety Mandatory Center of Expertise. Distribution statement

2. Distribution statement

Approved for public release, distribution unlimited.

3. References

See Appendix A.

4. Associated publications

ER 1110-1-8158, Corps-Wide Centers of Expertise Program, listed in Appendix A.

5. Responsibilities

a. Responsibilities of the Commanding General, U.S. Army Corps of Engineers (USACE), defined in AR 190-13, include maintaining the Protective Design Mandatory Center of Expertise (PD-MCX) as a mandatory center of expertise for protective design technical expertise to Army organizations. The regulation further requires the PD-MCX to:

(1) Support the Office of the Provost Marshal General (OPMG) for the review, analysis, and application of facilities standards. Includes criteria to meet physical security, antiterrorism, and general force protection policies and objectives.

(2) Provide one non-voting advisor to the DA Physical Security Review Board.

b. Headquarters, USACE (HQUSACE), Civil Works Directorate, Engineering and Construction Division (CECW-EC), is the proponent responsible for technical and administrative oversight of the PD-MCX. They ensure that adequate workforce is authorized to maintain the technical expertise and capabilities detailed in this regulation. They ensure that adequate central funding is made available to cover all costs associated with the mandatory and elective centrally funded services from paragraphs 9 and 10.

c. USACE Divisions and Districts are responsible for knowing when they need support from the subject matter experts at the PD-MCX as defined in this regulation. They are responsible for providing funding to cover all reimbursable service requests sent to the PD-MCX.

d. The Omaha District is responsible for maintaining the PD-MCX at a level in the organization that is appropriate for the PD-MCX activities and conducive to successful

execution of the mission and functions identified in this regulation. Mission and functions of the PD-MCX cannot be changed without the approval of the proponent. Omaha District leadership ensures that staffing levels in the PD-MCX are adequate to handle all of the tasks assigned in this regulation. Organizational and administrative support such as training, office space, contracting, and computer hardware and software are provided by the district, as is done for other district organizational elements.

e. The PD-MCX is responsible for maintaining state-of-the-art technical expertise in all areas of protective design including, but not limited to:

(1) Design according to Unified Facilities Criteria (UFC) 4-010-01.

(2) Design according to Interagency Security Committee standards.

(3) Design to resist the effects of conventional weapons as defined in UFC 3-340-01.

(4) Design to resist the effects of nuclear weapons.

(5) Design that provides protection from chemical agents, biological agents, or radiological agents for people inside buildings according to UFC 4-024-01.

(6) Design that provides electromagnetic pulse (EMP), high altitude electromagnetic pulse (HEMP), high power microwave, and coronal mass ejection protection according to Military Standard (MIL-STD)-188-125-1, MIL-STD-188-125-2, DoD-STD-2169B, Military Handbook (MIL HDBK)-423, MIL-HDBK-419A, and TM 5-690.

(7) Design for environmental electromagnetic (EM) effects, electromagnetic interference (EMI) protection, EM shielding, and effects of radio frequency (RF) systems according to MIL-STD-188-141, MIL-STD-461, MIL-STD-464C and MIL HDBK 1195.

(8) Design of systems for RF shielding, EM shielding and TEMPEST electronic emanations protection.

(9) Design of facilities for acoustical shielding.

(10) Design of facilities for photonics shielding.

(11) Design to resist air blast or penetration effects from terrorist weapons such as vehicle bombs and direct- and indirect-fire weapons.

(12) Design of active and passive vehicle anti-ram barrier systems.

(13) Design of facilities or other barriers against forced entry threats as defined in UFC 4-026-01.

(14) Design of camouflage, concealment, and deception measures applied to permanent facilities as defined in UFC 3-340-01.

(15) Design of buildings to resist progressive collapse according to UFC 4-023-03.

(16) Design for security engineering, including physical security and force protection/antiterrorism. This design also includes threat and vulnerability assessments and identifies the need for electronic security systems (ESS) but does not include ESS design. For expertise in ESS design, refer to ER 1110-1-8162 and contact the Electronic Security Systems Mandatory Center of Expertise (ESS-MCX), office symbol CEHNC-EDM-S.

(17) Design of sensitive compartmented information facilities (SCIF) according to UFC 4-010-05 and special access program facilities (SAPF). Projects containing SCIFs completed by USACE require mandatory inclusion and funding of representatives from the USACE PD-MCX as part of the project delivery team according to UFC 4-010-05.

(18) Design of installation access control points according to UFC 4-022-01, The Army Standard for Access Control Points, and the Army Access Control Points Standard Design.

(19) Design for protection of critical infrastructure against criminal, terrorist, and saboteur threats.

(20) Design for protection of critical infrastructure for continuity of mission operations for facilities containing SCIF, HEMP, intelligence processing, and Command, Control, Communications, Computers, Cyber, Intelligence, Surveillance and Reconnaissance missions.

(21) Design for compliance with hazards of electromagnetic radiation to ordinance, hazards of electromagnetic radiation to fuels, and hazards of electromagnetic radiation to personnel.

(22) Design for compliance for protection from electrostatic discharge on electronic components, electronics systems, information technology systems, and communications systems.

(23) Design for compliance for data network protection according to MIL-HDBK-232A, RED/BLACK Engineering-Installation Guidelines.

(24) Design of physical security and antiterrorism elements of Civil Works and like projects.

f. The PD-MCX will serve as the HQUSACE point of contact for protective design and assists HQUSACE in protective design-related policy formulation, program guidance, technology transfer, research and development monitoring, specialized training, and interagency coordination. These services include, but are not limited to:

(1) Function as subject matter expert in all issues related to protective design for the Civil Works program and Military Missions program, including Interagency and International Support.

(2) Perform mandatory review on USACE projects with significant protective design elements as indicated in paragraph 8 of this regulation.

(3) Provide design assistance and consultation to USACE commands and other designated DoD and federal government design agents according to paragraph 9 of this regulation.

(4) Review design documents other than those that require mandatory review prepared by and for geographic districts according to paragraph 9 of this regulation.

(5) Monitor and coordinate research, development, testing, and evaluation (RDT&E) related to protective design with the USACE Engineer Research and Development Center (ERDC), Facilities Explosive Safety Center (FES-MCX), other government agencies and testing labs, foreign governments, universities, and private organizations.

(a) Coordinate with ERDC at least annually to identify opportunities for technology transfer of RTD&E related to protective design.

(b) Identify and communicate requirements for protective design related RDT&E to ERDC.

(6) Develop, maintain, and disseminate DoD, Department of the Army (DA), and PD MCX criteria documents and computer programs related to protective design.

(7) Coordinate with federal government agencies, foreign governments, universities, and the private sector in areas of protective design.

(8) Review programming documents for protective design applications and installation access control points.

(9) Participate in the development and maintenance of UFCs, national codes, and standards related to protective design.

(10)Provide commissioning of vehicle barrier systems associated with Army access control points and certify compliance of access control point systems with the DoD Risk Management Framework (RMF).

g. The PD-MCX will provide protective design support to the DA-OPMG. This may include, but is not limited to:

(1) Support the review, analysis, and application of facilities standards and criteria to meet physical security, antiterrorism, and general force protection policies and objectives.

(2) Provide security engineering and force protection technical support to policy makers that allow them to develop new or revised policies addressing protective measures.

(3) Assist, as required, Army Commands (ACOMs), Army Service Component Command (ASCCs), Direct Reporting Units (DRUs), and installation commanders with terrorist threat assessments and vulnerability assessments.

(4) Provide one non-voting advisor to the DA Physical Security Review board and to the Army Physical Security Equipment Action Group.

6. Records management (recordkeeping) requirements

The records management requirement for all record numbers, associated forms, and reports required by this regulation are addressed in the Records Retention Schedule – Army (RRS-A). Detailed information for all related record numbers is located in the Army Records Information Management System (ARIMS)/RRS-A at https://www.arims.army.mil. If any record numbers, forms, and reports are not current, addressed, and/or published correctly in ARIMS/RRS-A, see DA Pam 25-403 for guidance.

7. Establishment

HQUSACE established the PD-MCX in 1985 in response to concerns by the Army Vice Chief of Staff following the bombing of the Khobar Towers barracks in Dhahran, Saudi Arabia. AR 190-13 was subsequently revised to include the requirement that HQUSACE maintain a center of expertise for protective design to assist in protecting the Army from similar attacks in the future.

8. Mission

The PD-MCX provides direct protective design technical support services to USACE activities, the Army, and other Department of Defense (DoD) and non-DoD federal agencies. The PD-MCX also provides technical support to foreign, state, and local governments and authorities when coordinated with and authorized by HQUSACE through an Interagency and International Services agreement. Work for non-DoD agencies will be performed according to ER 1140-1-211.

9. Mandatory services

Mandatory services are those that are required to be performed by the PD-MCX according to ER 1110-1-8158. Requests for MCX services must be initiated as early as possible in the planning and design process. Mandatory services may be executed using either centrally provided funds from higher headquarters or reimbursable funds provided by the elements that request the services according to the following:

a. Centrally Funded Mandatory Services. (USACE or DA OPMG funded.)

(1) Review of programming documents Department of Defense (DD) Form 1391 (FY__ Military Construction Project Data) during the USACE review and certification stage for all projects that include protective design elements.

(2) Review of programming documents DD Form 1391 during the USACE review and certification stage for all installation access control point projects.

(3) Review of programming documents DD Form 1391 during the USACE review and certification stage for all projects that include SCIFs.

(4) Maintenance of the DoD Anti-Ram Vehicle Barriers List.

b. Reimbursable Mandatory Services.

(1) Validate and certify the design and/or design changes when major subordinate command (MSC)/center/field operating agencies (FOA) Commanders/Directors relocate to transitional buildings, relocate to new buildings, or mitigate existing buildings not in compliance with DoD at Minimum Standards for Buildings (UFC 4-010-01) when the buildings meet one of the triggers for applicability of UFC 4-010-01.

(2) Review and certify all requests for waivers to the requirements of UFC 4 010 01 received from all continental United States Army elements according to AR 525-13, in support of and coordination with HQUSACE and submission to Assistant Secretary of the Army for approval.

(3) All USACE organizations must request the consulting services of the PD-MCX according to paragraph 10 for all in-house designs and for review of all in-house and Architect-Engineer (AE) design submittals for projects that include:

(a) SCIF design according to UFC 4-010-05. Projects containing SCIFs where USACE is the design agent require mandatory inclusion and funding of representatives from the USACE PD-MCX as part of the project delivery team according to UFC 4 010 05.

(b) Conventional weapons-resistant design.

(c) Nuclear weapon-resistant design.

(d) Chemical, biological, or radiological agent protection.

(e) EMP and HEMP shield system and facilities design according to MIL STD 188 125 1 and MIL-STD-188-125-2.

(f) TEMPEST electronic emanations protection, EM shielding, and RF shielding design.

(g) Environmental EM effects and EMI protective design.

(h) Buildings and infrastructure designed to resist air blast or penetration effects from terrorist weapons.

(i) Blast-resistant windows, glazed doors, and skylights.

(j) Forced-entry threats as defined in UFC 4-026-01.

(k) Progressive collapse analysis and design according to UFC 4-023-03.

(l) Acoustical shielding design.

(m) Photonics shielding design.

(n) Design for protection of critical infrastructure for continuity of mission operations for facilities containing SCIFs and SAPFs.

(o) HEMP shield systems, protection from EMPs, and protection from geomagnetic events for critical infrastructure and missions.

(4) Commissioning of Army installation access control point active vehicle barrier systems according to Unified Facilities Guide Specifications (UFGS) 34 75 13.13 and the Army Standard for Access Control Points.

10. Elective services

Elective services are those that do not fall under the mandatory services required of the PD-MCX, but that the PD-MCX may perform on request. They include those that can be done on a non-reimbursable basis using centrally provided funds from higher headquarters, or on a reimbursable basis using funds provided by the elements that request the services.

a. Non-reimbursable Elective Services. The PD-MCX provides the following non-reimbursable services:

(1) Short-term assistance on protective design requirements, project development, and technical issues to USACE MSCs, Districts, centers, or FOAs. Work is limited to a nominal “1-day” effort and does not include travel (USACE funded).

(2) Short-term assistance on security engineering and force protection requirements, planning, project development, and technical issues to Army commands, MSCs, or installations. Work is limited to a nominal “1-day” effort and does not include travel (DA OPMG funded).

b. Reimbursable Elective Services. The PD-MCX provides the following reimbursable services for buildings and infrastructure:

(1) Perform designs, design reviews, studies, and facility evaluations related to protective design for USACE elements, the Army, other DoD departments, and other federal, state, and local government agencies or authorities.

(2) Perform assessments, studies, facility evaluations, designs, and design reviews related to protective design for USACE elements, the Army, other DoD departments, non-DoD agencies, federal, state, and local governmental agencies, and, when authorized by HQUSACE, for foreign countries.

(3) Assist in the development of project specific design criteria (including assets, threats, and levels of protection) in accordance with UFC 4-020-01.

(4) Perform field surveys and studies that document damage from attacks using explosives.

(5) Assist Army installations with protective design-related requirements, programming, and project development.

(6) Criteria maintenance and development.

(7) Develop and conduct training in areas relating to protective design.

(8) Represent USACE or other customers at select conferences and technical working groups pertaining to the PD-MCX areas of responsibility.

11. Method of operation

a. Requests for protective design assistance or services can be submitted to the PD-MCX by telephone, email, or letter. Informal communication is encouraged; however, before any reimbursable work begins, the PD-MCX and requesting agency will develop a mutually acceptable scope of work, schedule, and budget estimate. Work for DoD agencies must conform to the requirements in ER 1140-1-211. Work for non-DoD agencies or for other than the U.S. government will conform to the requirements in ER 1140-1-211.

b. Requests from customers other than USACE for design services that include complete design projects must be coordinated with the appropriate USACE MSC, district, or FOA according to ER 5-1-10.

c. The types of work listed below is not subject to the requirements of ER 5-1-10. When this work requires that the PD-MCX personnel travel to a customer within the geographic boundaries of another district, the PD-MCX will contact the appropriate geographic district. The purpose, customer, location, date of visit, and personnel traveling will be furnished to the appropriate district point of contact.

(1) Requests for design services that are limited to protective design features that will be incorporated into a larger design package developed by the customer. This type of work is limited in scope and does not involve USACE as a construction agent.

(2) Requests for services such as vulnerability assessments, technical assistance, blast damage assessments, security engineering surveys, or protective design criteria development that are inherent functions of the PD-MCX.

d. All work within the scope of this regulation that involves protective design other than electronic security (as defined in ER 1110-1-8162) and facility explosive safety (as defined in ER 1110-1-8169) are coordinated with the PD-MCX. For projects that involve both electronic security and engineering/force protection design, the ESS-MCX and PD-MCX coordinate their efforts to provide the requesting agency complete security engineering services. The ESS-MCX and PD-MCX jointly determine on a project-by-project basis which MCX will assume the lead.

e. For projects that involve both explosive safety and protection design, the FES-MCX and PD-MCX coordinate their efforts to provide the requesting agency complete security engineering services. The FES-MCX and PD-MCX jointly determine on a project-by-project basis which MCX will assume the lead.

f. All correspondence and requests for PD-MCX services should be directed to: U.S. Army Corps of Engineers, Protective Design Center, ATTN: CENWO-EDS, 1616 Capitol Avenue, Omaha, NE 68102-4901. Phone: 402-995-2376. Email: PDC.Web@usace.army.mil.

12. Customer service quality standards

The PD-MCX maintains the following customer service quality standards:

a. The PD-MCX provides services and maintains expertise in the service areas in paragraph 9.

b. Requests for service are completed within agreed schedule and budget.

c. Any concerns and disputes from users and customers are addressed promptly. All issues are resolved or are escalated to the respective higher HQ for resolution assistance.

d. The PD-MCX measurably improves cost-effectiveness for the function within USACE.

e. The PD-MCX measurably improves the quality of the function within USACE.

f. The PD-MCX measurably improves responsiveness to the customer and the speed of accomplishing the function within USACE.

g. Additional information on the PD-MCX can be found at https://www.nwo.usace.army.mil/pdc/home/.

13. Reporting procedures

The PD-MCX prepares an annual report for the HQUSACE, Engineering and Construction Chief. The report includes a summary of major programs, activities, and funds from both reimbursable and direct funds sources. The report is based on fiscal year and is completed and furnished to the proponent no later than 90 days after the end of the fiscal year. If requested by the proponent during the year, the PD-MCX will provide an in-progress review giving current status of the major programs, activities, and funds. Normal day-to-day operation and reporting is on an informal, as needed basis.

Appendix A
References

Section I

Required Publications

Unless otherwise indicated, all U.S. Army Corps of Engineers publications are available on the USACE website at https://publications.usace.army.mil. Army publications are available on the Army Publishing Directorate website at https://armypubs.army.mil. DoD Publications are available on the ESD website at https://www.esd.whs.mil.

AR 190-13
The Army Physical Security Program
(This publication requires Common Access Card (CAC) to view. For access without a CAC, contact the PD-MCX)

AR 525-13
Antiterrorism
(This publication requires CAC to view. For access without a CAC, contact the PD-MCX)

Army Access Control Points Standard Design
(https://rfpwizard.mrsi.erdc.dren.mil/MRSI/content/cos/nwo/acp/Library/Standard%20Designs/Army%20ACP%20Standard%20Design%20Sept%202022_Final.pdf)

Army Standard for Access Control Points
(https://rfpwizard.mrsi.erdc.dren.mil/MRSI/content/cos/nwo/acp/Library/Army%20Standards/Access%20Control%20Points%20Army%20Standard%20April%202012.pdf)

DoD Anti-Ram Vehicle Barriers List
(https://usace.contentdm.oclc.org/utils/getfile/collection/p16021coll11/id/5827)

DoD-STD-2169B
High-Altitude Electromagnetic Pulse (HEMP) Environment
(http://everyspec.com/MIL-STD/MIL-STD-2000-2999/MIL-STD-2169B_NOTICE-1_40674/)

ER 5-1-10
USACE Work Assignments and Responsibility

ER 1110-1-8158
Centers of Expertise Program

ER 1110-1-8162
Design and Construction Policy for Electronic Security Systems

ER 1110-1-8169
Facilities Explosives Safety Mandatory Center of Expertise

ER 1140-1-211
Reimbursable Services

Interagency Security Committee Standards
(https://www.cisa.gov/isc-policies-standards-best-practices)

MIL-HDBK-232A
Red/Black Engineering-Installation Guidelines
(https://www.wbdg.org/ffc/navy-navfac/criteria-manuals/mil-hdbk-232a)

MIL-HDBK-419A
Grounding, Bonding, and Shielding for Electronic Equipments and Facilities, Volume 1 and Volume 2
(https://www.wbdg.org/ffc/navy-navfac/criteria-manuals)

MIL-HDBK-423
High Altitude Electromagnetic Pulse (HEMP) Protection for Fixed and Transportable Ground-Based C41 Facilities
(http://everyspec.com/MIL-HDBK/MIL-HDBK-0300-0499/MIL-HDBK-423_PLACEHOLDER_8045/)

MIL-HDBK-1195
Radio Frequency Shielded Enclosures
(https://www.wbdg.org/FFC/NAVFAC/DMMHNAV/1195.pdf)

MIL-STD-188-125-1
High-Altitude Electromagnetic Pulse (HEMP) Protection for Ground-Based C4I Facilities Performing Critical, Time-Urgent Missions (Part 1 - Fixed Facilities)
(http://everyspec.com/MIL-STD/MIL-STD-0100-0299/MIL-STD-188_125-1_24887/)

MIL-STD-188-125-2
High-Altitude Electromagnetic Pulse (HEMP) Protection for Ground Based C4I Facilities Performing Critical, Time-Urgent Missions Part 2 Transportable Systems
(http://everyspec.com/MIL-STD/MIL-STD-0100-0299/MIL-STD-188_125-2_24889/)

MIL-STD-188-141
Interoperability and Performance Standards for Medium and High Frequency Radio Systems
(http://everyspec.com/MIL-STD/MIL-STD-0100-0299/MIL-STD-188-141A_24838/)

MIL-STD-461
Requirements for the Control of Electromagnetic Interference Emissions and Susceptibility
(http://everyspec.com/MIL-STD/MIL-STD-0300-0499/MIL-STD-461_8678/)

MIL-STD-464C
Electromagnetic Environmental Effects, Requirements for Systems
(http://everyspec.com/MIL-STD/MIL-STD-0300-0499/MIL-STD-464C_28312/)

MIL-STD-2169
High-Altitude Electromagnetic Pulse (HEMP) Environment
(http://everyspec.com/MIL-STD/MIL-STD-2000-2999/MIL-STD-2169C_NOTICE-1_56140/)

TM 5-690
Grounding and Bonding in Command, Control, Communications, Computer, Intelligence, Surveillance, and Reconnaissance (C4ISR) Facilities
(https://armypubs.army.mil/ProductMaps/PubForm/TM_Admin.aspx)

UFC 3-340-01
Design and Analysis of Hardened Structures to Conventional Weapons Effects

UFC 4-010-01
DoD Minimum Antiterrorism Standards for Buildings

UFC 4-010-05
Sensitive Compartmented Information Facilities Planning, Design, and Construction

UFC 4-020-01
DoD Security Engineering Facilities Planning Manual

UFC 4-022-01
Security Engineering: Entry Control Facilities/Access Control Points

UFC 4-023-03
Design of Buildings to Resist Progressive Collapse (with Change 1)

UFC 4-024-01
Security Engineering: Procedures for Designing Airborne Chemical, Biological, and Radiological Protection for Buildings

UFC 4-026-01
Design to Resist Forced Entry

UFGS 34 75 13.13
February 2022, Crash Rated Active Vehicle Barriers and Controls
(https://www.wbdg.org/ffc/dod/unified-facilities-guide-specifications-ufgs)

Section II

Prescribed Forms
This section contains no entries.