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RELEASED BY THE HOUSE
SUBCOMMITTEE ON MILITARY CONSTRUCTION,
VETERANS AFFAIRS, and RELATED AGENCIES,
COMMITTEE ON APPROPRIATIONS

**STATEMENT OF
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**BEFORE THE
HOUSE SUBCOMMITTEE ON MILITARY CONSTRUCTION,
VETERANS AFFAIRS AND RELATED AGENCIES,**

**OF THE
COMMITTEE ON APPROPRIATIONS
MARCH 11, 2025**

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Chairman Carter, Ranking Member Wasserman-Shultz, distinguished members of the Committee, thank you for the opportunity to testify on innovative military construction techniques.

Naval Facilities Engineering Systems Command (NAVFAC) is responsible for the acquisition, design, and construction of Department of Defense (DoD) facilities and infrastructure to support our warfighters at home and abroad. Our worldwide team of dedicated engineers, architects, planners, project managers, contracting officers, and other professionals are continuously identifying and implementing innovative infrastructure solutions to make U.S. warfighters more lethal, adaptable, and resilient. NAVFAC's Engineering & Expeditionary Warfare Center (EXWC) partners with industry experts, research universities, and the Army Engineer Research and Development Center to provide research, development, testing, and evaluation to deliver technology and unique solutions for the warfighter that focus on the expeditionary equipment, ocean and shore facilities of enduring bases, and forward-deployed and expeditionary locations for military operations. Finally, as a designated member of the DoD Tri-Service Unified Design program, NAVFAC collaborates with the other services to develop, continuously update, and maintain facility requirements, criteria, and specifications to ensure the most current commercial standards, industry innovations, and best practices are applied consistently across the Navy and the DoD.

Current Innovation Initiatives

Many of NAVFAC's completed facilities and projects under-construction leverage innovative construction approaches to best meet warfighter needs.

- Industrialized Construction (IC) – NAVFAC uses industrialized construction to prefabricate facility components (e.g., drydock structural elements, pre-engineered metal buildings (PEBs), parking garages, tilt-up and pre-cast concrete structures, and exterior curtain walls)

at off-site private fabrication yards to enable greater affordability and address workforce, supply chain, and logistical challenges. We are working with industry to expand our use of Industrialized Construction, especially at remote or isolated locations.

- Tension Fabric Structures (TFS) – TFSs demonstrate great benefits such as lower cost and reduced delivery time, and we are working through some challenges we’ve observed with TFS durability and inability to withstand high windborne debris events. Last year, NAVFAC issued guidance directing our field offices to evaluate the use of Alternative Construction Methods—such as TFS, PEB, and IC—on all projects, and we also developed new guide specifications for TFS with respect to aircraft hangars.

Evolving Innovation Initiatives

NAVFAC is actively testing and employing innovative technologies, materials, and methods for design and construction today, and we are leaning forward to increase collaboration with industry and government partners to identify and exploit opportunities to reduce project costs and delivery time.

- Additive Construction (also known as 3D Printing and Additive Manufacturing) – Although commercial capability and capacity is currently limited, NAVFAC continues to investigate additive construction for application to permanent, expeditionary, and austere missions. Initial analysis focused on use cases supporting expeditionary mission requirements, including INDOPACOM requirements, where austere facilities with non-complex systems and structures present acceptable risk exposure. With the ability to "print" building components and even entire structures layer by layer, 3D printing significantly reduces material waste and labor costs, while enabling the creation of complex, custom-designed parts that are difficult or impossible to produce using traditional methods.

- Modular, Industrialized, or Off-site Construction – NAVFAC is aggressively investigating and piloting modular construction techniques for a host of potential uses where the facility solutions include standard, repeatable modules that can be constructed at an off-site fabrication plant and transported to the project site for final assembly. The modular construction industry’s code-compliant facility production offers lower cost and faster delivery solutions for certain facility types—like child development centers and unaccompanied housing—if the government has acquisition approaches that contract for a sufficient quantity of common facility types or components to attract fabricators who are then willing to invest in scaling up and tooling their plant for the expected workload.
- Alternative Delivery Methods – NAVFAC is exploring the use of alternative delivery methods, such as Progressive Design-Build, Lean Design-Build, and Construction-Manager-at-Risk, to apply modern best practice delivery methods being used in the private sector that encourage innovation, speed project delivery, and reduce cost. Using the Other Transaction Authority (OTA) pilot authorized by Congress, NAVFAC is piloting a modular constructed child development center. Effective application of these innovative delivery methods often requires enabling legislation or regulatory change, and we are working to identify where such statutory or regulatory change is necessary to facilitate these innovations and improvements in project delivery.
- Mass Timber (also known as Cross Laminated Timber (CLT)) – NAVFAC is supporting a Navy pilot project that includes broader use of CLT for a child development center in Hampton Roads, Virginia. The facility will use a hybrid mass timber exterior envelope consisting of CLT walls and diaphragms. DoD has expressly acknowledged the applicability

of CLT with the creation of a guide specification. As the CLT construction industry matures, CLT may prove more competitive and could be utilized more broadly in DoD construction.

- High-Performance Concrete (HPC) - Recent HPC advancements have led to significantly higher performance, durability, strength, and resistance to extreme environmental conditions; as well as improved thermal and acoustic properties. These characteristics align well with the harsh environments at many Navy and DoD installations. HPC has been used extensively for our piers, runways, and other critical infrastructure; and we are broadening its application. The U.S. Marine Corps and NAVFAC are piloting the use of HPC for a new F-35 Hangar at Marine Corps Air Station Cherry Point.
- Carbon Fiber Reinforced Polymers (CFRP) – CFRP is increasingly being used in military construction, particularly for retrofitting and strengthening existing structures. CFRP materials are lightweight, durable, and highly resistant to corrosion, making them an ideal choice for reinforcing structural components, such as beams and columns, and fabricating panels for walls, flooring, and ceilings in naval facilities. CFRP materials are also versatile and can be used in a variety of applications, from repairing damaged infrastructure to enhancing the performance of new construction. Their use has expanded within NAVFAC projects as they provide significant strength without adding unnecessary weight, and the ability to incorporate special material properties to achieve radio frequency shielding, ballistic and explosive resistance, and other special requirements for military application.

Future Innovation Initiatives

NAVFAC is aggressively exploring and pursuing opportunities to employ Artificial Intelligence (AI) in our Planning, Design, and Construction space. We are also collaborating with

the Army Corps of Engineers and Air Force Civil Engineer Center to share information and identify areas of mutual interest to pursue solutions.

- AI Technology Exploration Workshop / Palo Alto Summit – In 2024, NAVFAC EXWC met with 10 leading AI companies that offer tools in the planning, design, and construction space. We are currently evaluating their capabilities to determine how they might best be applied.
- AI-Enhanced Structural Design Investigation – NAVFAC EXWC is testing and evaluating a firm that provides an AI-enhanced structural design capability. We are entering into a more formal partnership to give the company several facility design use cases so we can evaluate their capability in terms of cost, speed, and quality.
- AI Tools to Pre-award and Post-award Design and Construction Management – We are partnering with the National Renewable Energy Lab and National Institutes of Building Sciences to identify use cases where AI may be employed to increase efficiency, reduce costs, and accelerate project delivery.

Conclusion

As Chief Engineer for Naval Facilities Engineering Systems Command, I am proud to be part of an organization that continuously pushes engineering boundaries to ensure the lethality, resiliency, safety, effectiveness, and affordability of our forces. I look forward to your questions.