Future Directions in Facility Design & Construction

May 2, 2023, 4:00 p.m.

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Future Directions in Facility Design & Construction

Moderator: J.J. Tang, FAIA, F.SAME, HDR

Speakers:

- Kenneth Simmons, AIA, Chief of Construction, USACE HQ
- Brandon Tobias, AIA, Deputy Chief Engineer, NAVFAC HQ
- Renee Ayala, P.E., Chief Technical Services Division, AFCEC HQ

HOUSEKEEPING NOTES & TIPS

- ☑ Take Note of Emergency Exits
- ☑ Silence Your Mobile Devices
- ☑ Thank You to Our Sponsors!
- ☑ Questions will be addressed in the allotted time
- ☑ Presentations will be posted in the Attendee Service Center (ASC) post conference

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JOINT ENGINEER TRAINING CONFERENCE & EXPO

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MAY 2-4 2023

San Antonio, TEXAS

SPEAKER

Fun Facts

Kenny Simmons, AIA

USACE, Chief of Construction

- Originally from Texas
- Kansas Jayhawk (Rock Chalk!)
- Transplant to Washington, D.C.
- Sports Teams:
  - MLB: Rangers / Nationals
  - NFL: Da Bears!
  - NASCAR: IS A SPORT (Go Kevin Harvick!)
- Volunteer with Kiwanis International and the Animal Welfare League of Arlington
- Enjoy Thanksgiving Dinner in Aruba

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MAY 2-4 2023

San Antonio, TEXAS

SPEAKER

Fun Facts

Brandon Tobias, AIA

NAVFAC, Deputy Chief Engineer

- Sports Teams:
  - Kansas Jayhawks
  - Denver Broncos
  - Kansas City Royals
- Vacation Spots:
  - I have 2yo & 4yo daughters – Disney World it is!
- Did you Know …
  - My wife and I lost count on our escape room record somewhere around 64-8…
- Hobbies:
  - Part time photographer
  - Cooking & Baking
  - Home Improvement

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MAY 2-4 2023

San Antonio, TEXAS

SPEAKER

Fun Facts

Renee Ayala, PE

AFCEC, Chief Technical Services Division

- Sports Team:
  - NCAA: Auburn Tigers (War Eagle!!)
- Did you Know …
  - I started my career in the DoD on Active Duty as a member of the U.S. Army Marksmanship Unit as an International Pistol Shooter
  - Competed in 1st International Competition when I was 16 Years Old, Oceania Shooting Championships Adelaide Australia
  - 1998 Shooting World Championships, Barcelona Spain (where I started dating my husband who was a running target shooter)
  - 2000 Olympic Trials
  - 2000 Military World Shooting Championships Ankara Turkey
  - 2001 ISSF Atlanta World Cup

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Poll Question

Have you attended APCOI session in the past? Choose all that apply!

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U.S. ARMY CORPS OF ENGINEERS

Society of American Military Engineers (SAME)
2023 Joint Engineer Training Conference

Future Directions in Facility Design & Construction

Kenny Simmons, AIA
USACE Chief of Construction
02 MAY 2023

U.S. ARMY

US Army Corps of Engineers®

USACE Mission, Vision, Priorities, Command Philosophy, and Campaign Plan

U.S. ARMY

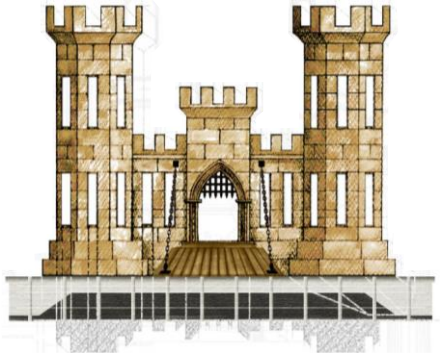
MISSION

Deliver vital engineering solutions, in collaboration with our partners, to secure our Nation, energize our economy, and reduce disaster risk.

VISION

Engineering solutions for the Nation's toughest challenges.

U.S. ARMY CORPS OF ENGINEERS



PRIORITIES

PEOPLE
READINESS
PARTNERSHIPS
INNOVATE

COMMAND PHILOSOPHY

- Promote and maintain a positive command climate
- Advance diversity and inclusion in our formations
- Deliver the Program
- Grow our next generation of leaders

Strong USACE Foundation

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

1 Support National Readiness (a.k.a. Deliver the Program)

Conflict — Sustain Current Readiness; Achieve Future Objectives
Crisis — COVID "Fights": Finish COVID 1.0, Post-COVID Foundation / Program, COVID 2.0, COVID All-Hazards, Stimulus / Supplemental

End State: USACE is trusted by DA, DoD, our partners / stakeholders, and the Nation to deliver quality projects and programs, on time and within budget, that enable the National Command Authority to secure the homeland, project national power, and pursue our Nation's vital interests.

1. Expand Use of Incremental Funding Clauses (IFC)
2. Streamline Economy Act Procedures for Army SRM
3. Increase Commonality of Components in USACE CW Projects
4. Improve Command Strategic Reviews
20. Implement Climate Action Plans

2 Modernize USACE

Change — People; How We Fight

End State: USACE effectively anticipates and deliberately implements meaningful innovations for all programs, projects, and processes. We enthusiastically embrace changes and new technologies that set the standard for program and project delivery for our partners and stakeholders.

5. Increase Diversity
6. Transform Talent Acquisition / Hiring Panels
7. Optimize Direct Hiring Authorities
8. Implement the USACE R&D Strategy
9. Improve Command Information
10. Modernize USACE Dredge Fleet
17. Transform USACE Workplace
18. Implement USACE Strategic Resourcing
22. Optimize USACE Executive Direction and Management

3 Improve Partnering and Strengthen Relationships

Competition — Globally Integrated Force Posture; Strengthen Access, Presence, and Influence

End State: USACE is the most trusted advisor and valued "partner of choice" for our International Allies and Partners, the Federal Government, industry, academia, State and local agencies, and the public through aggressive partnering that builds and maintains strong, meaningful, and lasting relationships.

11. Improve Partnering Consistency
19. Establish Doctrinal Army Installation Management Relationships

Institutional Transformation

4 Innovate Program and Project Delivery

Competition | Crisis | Conflict | Change

End State: USACE embodies "world-class" delivery excellence through consistent behaviors and proven, value-driven processes that achieve exceptional results and maintain trust. Our reputation is unchallenged, and we are trusted and respected as the Nation's Engineer.

12. Institute Risk-Informed Decision-making
13. Develop Multi-Year Capital Investment Strategies
14. Implement Alternative Financing
15. Decentralize Water Supply
16. Improve Quality Management, Scheduling, Cost Estimating, and Work Acceptance Practices
21. Improve Feasibility Studies
23. Transform our USACE SOH Culture

Winning **= SAFELY finishing quality projects, on time and within budget.**

USACE COMMITMENT TO RELATIONSHIPS

U.S. ARMY

U.S. ARMY CORPS OF ENGINEERS

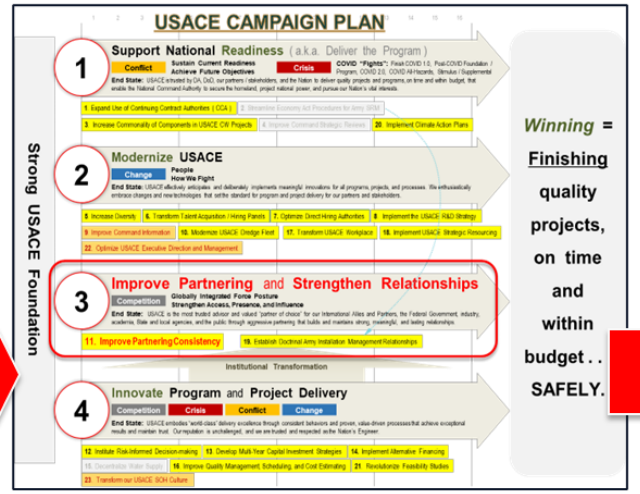
COMMAND PRIORITIES

PEOPLE

READINESS

PARTNERSHIPS

INNOVATE



Codifies best practices and lessons learned from across the federal government and industry

Next Steps

- **Training & Mentoring**
  - ✓ Self-paced training modules
  - ✓ Train-the-trainer
  - ✓ Formal mentoring programs
- **Standards**
  - ✓ AE / construction contract specifications
  - ✓ Facilitator standards
- **Governance**
  - ✓ Partnering Champions
  - ✓ Program / project performance measures and scorecards
- **Continuous Improvement**
  - ✓ Knowledge management portal

Reinforces the importance of relationships to mission success

Establishes the vision and philosophy for partnering excellence

Sets the standard for partnering on all construction projects

Promulgates the standard and drives implementation

Spectrum of Organizational Maturity

Basic — **Defined** — **Institutionalized**

- *Informal / project-based*

We are here

- *Enterprise policies and standards*
- *Local / regional training and governance*
- *Enterprise policies, standards, training, governance, and incentives*

Visit our public website: https://www.usace.army.mil/Business-With-Us/Partnering/

USACE is soliciting feedback at: Partnering@usace.army.mil

ACHIEVING SUSTAINABLE AND RESILIENT FACILITIES AND INFRASTRUCTURE

U.S. ARMY

LEGISLATIVE

EPACT 05: *Energy policy Act 2005*

EISA 07 : *Energy Independence and securities act 2007*

10 CFR 433: Energy Efficiency Standards for the Design and Construction of New Federal Commercial and Multi-Family High-Rise Residential Buildings

FY22 National Defense Authorization Act

- ✓ ***s.331-335: National Security Climate Resiliency Act –*** *consider strategic risks associated with military installation resilience.*
- ✓ ***s.2805: Flood Risk Management for Military Construction –*** *incorporate minimum flood mitigation requirements in UFCs.*
- ✓ ***s.2832: Master Plans for Major Military Installations –*** *coordinate resilience of military and community infrastructure.*
- ✓ ***s.2843: Energy Efficient Military Installations –*** *amend UFCs to adopt 2021 IECC and ASHRAE 90.1-2019.*
- ✓ ***s.2844: Improve Energy Resilience of Military Installations –*** *amend UFC to consider microgrids on MILCON Projects.*
- ✓ ***s.2861: Sustainable Building Materials Pilot Projects –*** *each Service conducts a pilot to evaluate the effect of sustainable materials*

EXECUTIVE

EO 13990: *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis*

EO 14008: *Tackling the Climate Crisis at Home and Abroad*

EO 14057: *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability*

Federal Sustainability Plan

- ✓ **100% carbon pollution-free electricity by 2030**
- ✓ ***Net-zero emissions from procurement by 2050***
- ✓ ***100% zero-emission vehicle acquisitions by 2035***
- ✓ ***Net-zero emissions operations by 2050, 65% by 2030***
- ✓ ***Net-zero buildings by 2045; 50% reduction by 2032***

AGENCY

DoD Climate Adaptation Plan

DOD Climate Adaptation Strategic Framework

- Climate informed Decision Making
- Train and Equip a Climate Ready Workforce
- Resilient Built and Natural Infrastructure
- Supply Chain Resilience and Innovation
- Enhance Adaptation and Resilience Through Collaboration

Air Force Climate Action Plan

Air Force Climate Goals:

- Achieve net-zero emissions at AF installations by FY46; 50% emission reduction from 2008 levels by FY33
- Achieve 100% carbon pollution-free electricity on a net annual basis by FY30
- Achieve 100% zero emission non-tactical vehicles by FY35, 100% zero emission light-duty vehicle acquisitions by FY27 and aircraft support equipment by FY32

Navy Climate Action 2030

Navy Climate Goals:

- Achieve 65% reduction in Navy scope 1/2 GHG pollution by 2030, compared to 2008 levels
- Achieve 100% carbon pollution-free electricity by 2030
- Acquire 100% zero-emission vehicles by 2035 & light-duty vehicles by 2027
- Achieve 50% reduction in building emissions by 2032
- Draw down 5M metric tons of CO_2e annually through nature-based solutions by 2027

Army Climate Strategy

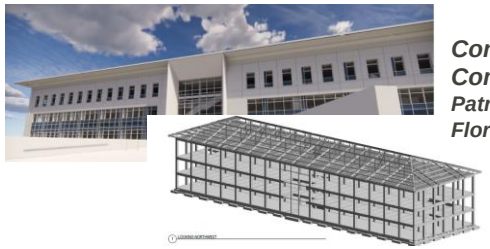
Army Climate Goals:

- Achieve 50% reduction in Army net GHG pollution by 2030, compared to 2005 levels
- Attain net-zero Army GHG emissions by 2050
- Proactively consider security implications of climate change in strategy, planning, acquisition, supply chain, and programming
- Microgrid on every installation by 2035

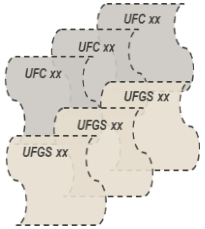
Pilot Projects

Ongoing – Sustainable Building Materials Pilots

New Army Barracks, Joint Base Lewis-McChord, Washington



Consolidated Communications Center, Patrick Space Force Base, Florida



Design & Construction Standards and Criteria

Experience & Subject Matter Expertise

END STATE:

Sustainable and Resilient Facilities and Infrastructure

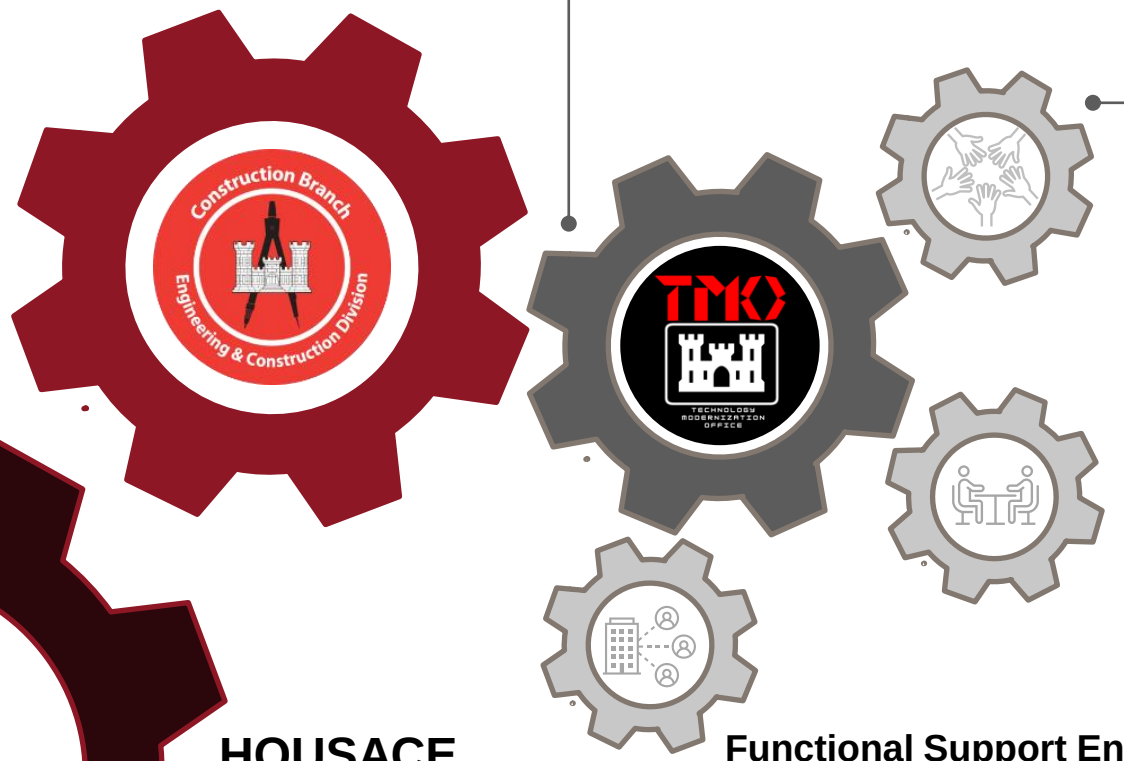
Key Take-Aways:

- DoD is actively pursuing sustainable design and construction solutions
- Federal, Defense, and Service-specific climate and resilience targets must be balanced with executability
- Partnerships across DoD and with industry during pilot project implementation and criteria development are essential to creating effective outcomes

CONSTRUCTION MANAGEMENT INNOVATION

HQ CM Innovation Office (CMIO)

CM Technology Modernization Office (TMO)



HQUSACE Leadership

Functional Support Entities

CM Innovation Project Delivery Teams

- RMS Sustainment Project
- New CM Platform Project
  - Leverage CM COTS
- New CM/CA Application (enhanced KMS)
  - Transform policy, process, best practice, training, etc. development and delivery to project teams
- Other CM Innovation Projects (AR/VR, 360 photos, drones/robotics, BIM/3D/4D, AI, etc.)

Engagement and Input

- Users and Working Groups
- CoP Leads and External System Stakeholders
- Engineering Research & Development Center (ERDC)
- Industry, academia, and trade associations

NEXT NGA WEST (N2W) PROGRAM UPDATE

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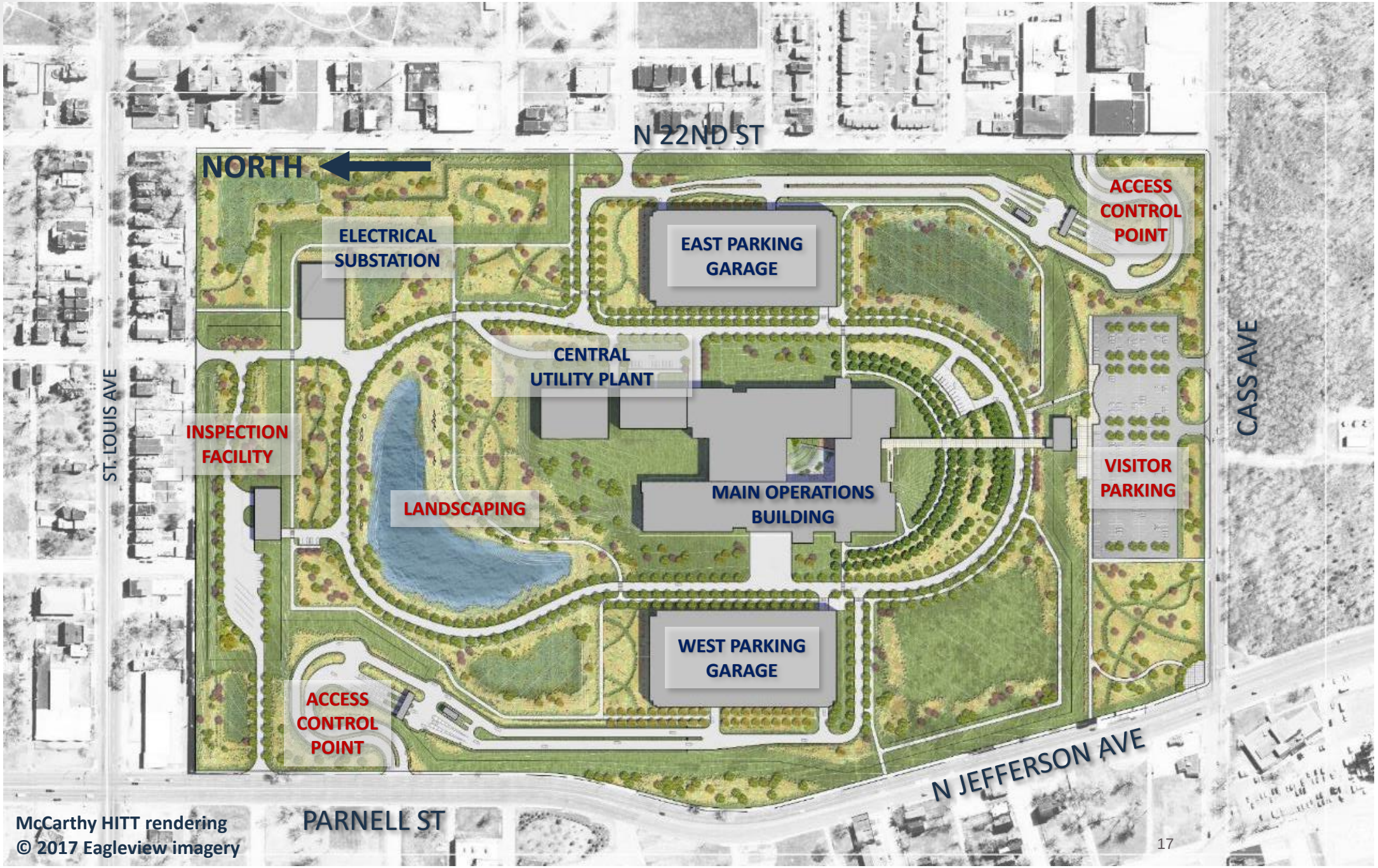

McCarthy HITT rendering
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N2W PROGRAM UPDATE

Design Build Budget

	Awarded	Current
Total MILCON	$635,473,846	$ 691,674,630
Phase 1	$319,965,869	$ 340,003,909
Phase 2	$315,507,977	$ 351,670,721
FF&E	$56,000,000	$ 56,000,000
O&M	$20,148,124	-

Small Business Set Asides

SBSA Projects (DBB)	Construction Award	Updates
Access Control Points (ACPs)	26 JUN 23	Out for revised proposals
Remote Inspection Facility (RIF)	16 MAY 23	Proposal evaluation in progress
Landscaping	04 DEC 23	Wrapping up final design based on industry feedback
VCC Surface Parking Lot (VCC PL)	27 NOV 23	Wrapping up changes to final design w/MVS

Highlights

Enclosure: Precast concrete panels, windows, roof and curtainwall are substantially complete.

Building Systems: Project focus is shifting from mechanical, electrical plumbing and fire protection rough-ins to equipment start up and testing. The main electrical distribution system has been energized. Air handling units, pumps and chillers have begun initial startups. Pre-functional and manufacturer startup testing is underway. The commissioning effort will continue to increase over the course of the next 6 months.

Interiors: FF&E underway. RF Shielded and STC initial spaces are complete, and testing is underway.

Follow on contracts: Electronic Security Systems contract (by Huntsville Center on behalf of NGA) has been awarded and the first Joint Occupancy spaces have been completed for follow on work. NGA IT has awarded contracts for equipment and networks in the facility that will also move into joint occupancy spaces over the course of the next 6 months.

Schedule

- Scheduled Construction Complete 1 August 2024
- Beneficial Occupancy Date 18 Oct 2024

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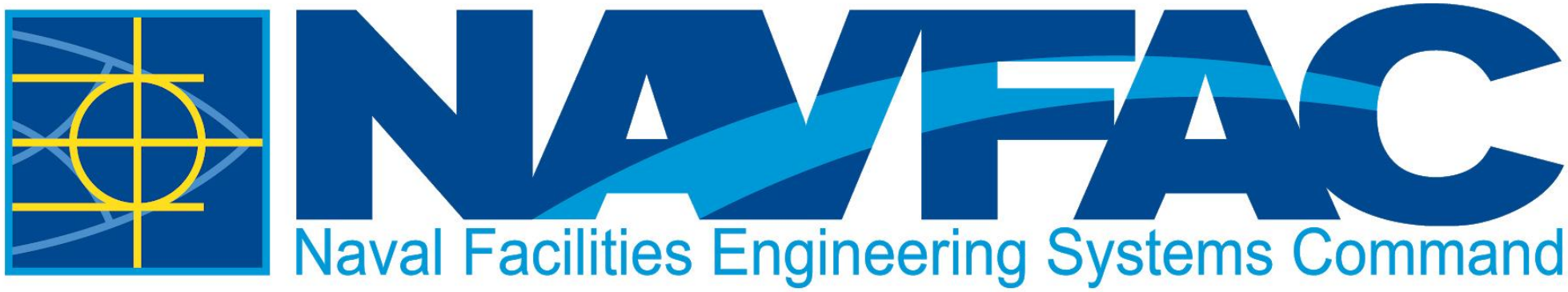
N2W AERIAL – NOVEMBER 2022



Future Directions in Facility Design and Construction

SAME Joint Engineer Training Conference

02 May 2023

Brandon Tobias | AIA, LEED AP BD+C
Deputy Chief Engineer
Naval Facilities Engineering Systems Command

NAVFAC Naval Facilities Engineering Systems Command

Discussion

- Growing Program
- Improving Performance
- Planning, Design & Construction Initiatives
- Infrastructure Risk Assessment and Communication
- Project Highlight

NAVFAC Enables Naval Forces

North Star: Performance and outcomes of SYSCOM Capabilities effectively enable Fleet readiness and Marine Corps force generation

Worldwide Reach…

- 100+ Points of delivery at Navy, USMC, and AF bases on five continents
- ~19k acquisition and technical professionals worldwide
- Global contracting capability for immediate response construction, Base Operating Support (BOS), and related support across a range of military operations (ROMO)

…Stakeholder-Focused Approach

- PRIDU, ADDU, and general support relationships
- Combatant Commanders, Fleets, MARFOR, CNIC/MCICOM, State Dept, DoD Agencies, etc.
- $15+ Billion in FY22 execution and 30,000 contract actions

22

FY23/PB24

- **DON MILCON Focus**
  - Navy: Increased lethality/new platforms, restore warfighter readiness, SIOP, Joint Force Facilities in Guam, and QOL
  - USMC: National Defense Strategy and long-term implementation of Commandant's Infrastructure Reset Strategy, 21st Century Force – Life Health Safety, mew platforms, QOL, utilities infrastructure,
  - DoD: INDOPACOM, Missile Defense Agency, DODEA, SOCOM

- **Projected FY23/FY24 Program**
  - FY24 MILCON Projects: 54 projects / $6,029M
  - FY23 MILCON Projects: 87 projects / $6,119M
  - Carryover MILCON Projects: 66 projects / $2,765M
  - FY23 SRM Projects > $20M: 20 projects / $786M

NAVFAC Naval Facilities Engineering Systems Command

Improving Performance

Leveraging data to analyze performance

- **Projects Awarded as Planned**
  - Emphasize early planning, programming and design
- **Project completion within Mission Need Date**
  - Identify critical path elements; incentivize schedule performance
- **Cost Estimates compared to Actual Award**
  - Improve planning/programming; adjust for inflation
- **Project Cost Growth During Construction**
  - Adjust acquisition strategy to share cost escalation risk

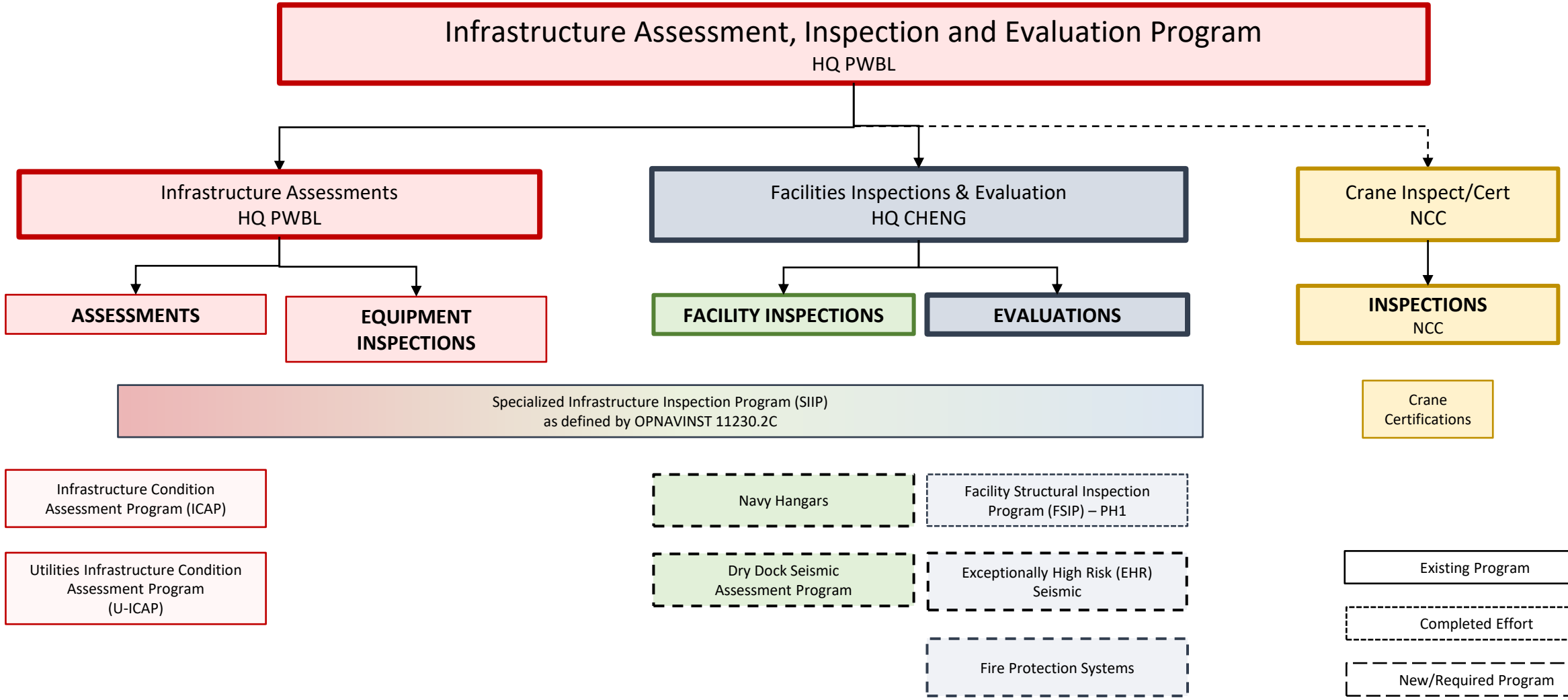
NAVFAC Naval Facilities Engineering Systems Command

Planning, Design & Construction Initiatives

- **Project Planning**
  - Reorganization to integrate planning into design
  - Better defined scope, cost, criteria, project readiness index
  - Increase leverage of CSRA(M)
- **Project Management**
  - Cradle to Grave and Certification
  - Evolve processes (e.g., PMP, risk mgmt., change mgmt.)
- **Construction Management**
  - Improved eCMS
  - 3-tier, scalable governance structure based on complexity
- **Technical Competency**
  - Increase IH DBB
  - Faster criteria updates/implementation
- **Industry Engagement**
  - Improved project partnering/governance
  - Innovative acquisition strategies (e.g. ECI, packaging)
  - Publicize “opportunities” online to expand industry partnership

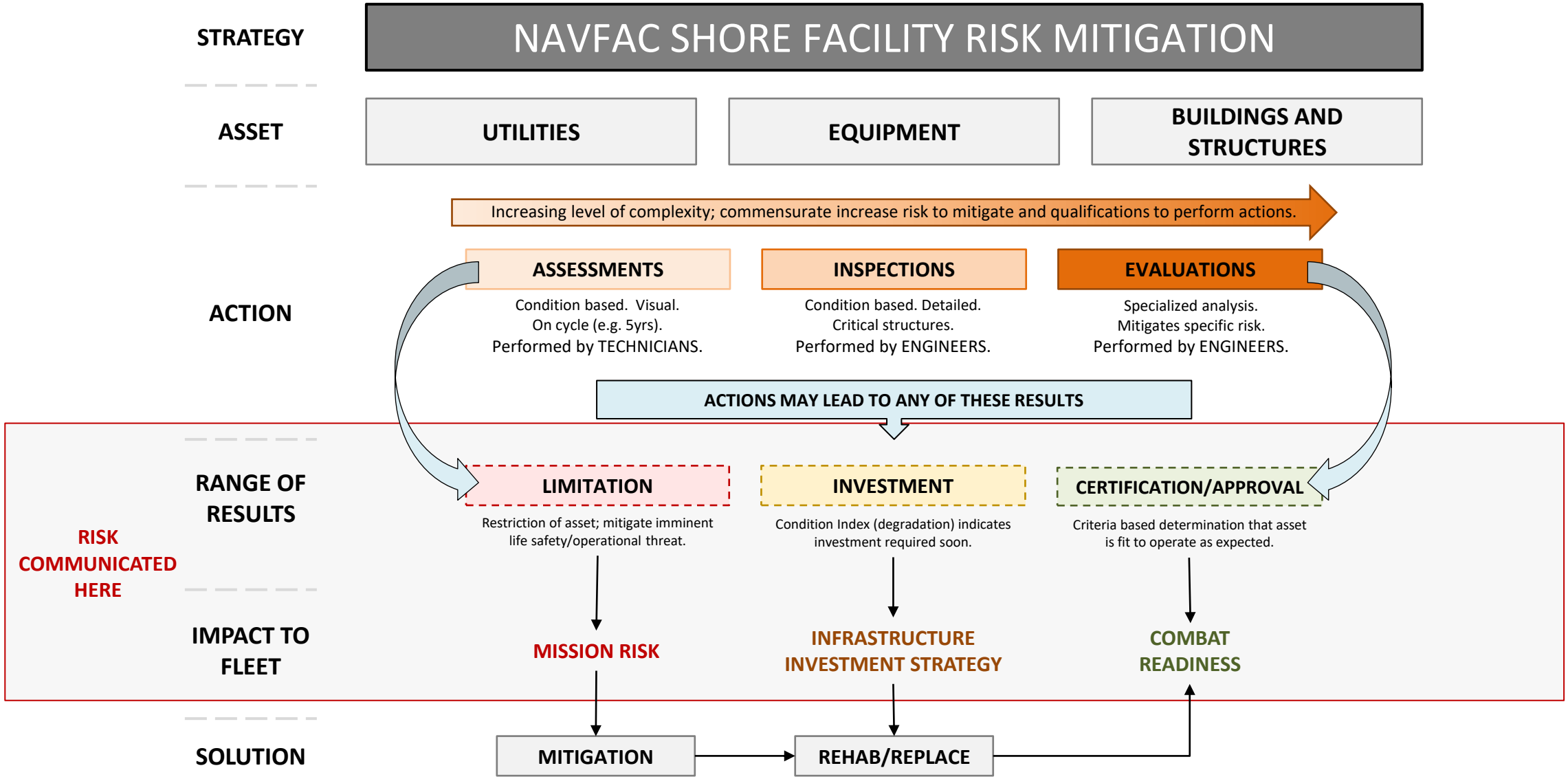
We’re using data, metrics & initiatives to drive projects to the left

Infrastructure Risk Assessment



NAVFAC Naval Facilities Engineering Systems Command

Risk Communication



Project Highlight:
Master Time Clock & Operations Facility (MTCOF)

Location: US Naval Observatory (USNO)
Size: 15,000 GSF (new), 75,000 GSF (renovation)
Cost: $101M
Designer of Record: Wiley Wilson/Burns & McDonnell JV

- NAVFAC LANT (design)
- NAVFAC WASH (construction)

Contractor: Environmental Chemical Cooperation

MTCOF consisted of conversion of multiple older facilities and the construction of a new, modern, and secure facility (Building 51) to house the Master Clock for the Department of Defense, mission operations center, and Earth Orientation Parameter Center (EOPC), which supports the mission of maintaining precise time and collection of astronomical data.

MTCOF features a cast stone-panel façade, a linear layout, redundant equipment rooms located at each end, a single entrance, and no windows.

In addition to the construction of Building 51, the MTCOF project entailed conversion of Building 52, a three-story administration building, 52A, a three-story data processing center, and Building 78, a two-story optics laboratory. The conversion of each building included upgrades to the architectural, structural, electrical, mechanical and fire protection systems. Finally, Building 3, the historic Clock House originally designed by renowned architect Richard Morris Hunt, underwent conversion and careful historic restoration that involved NAVFAC Washington professionals from a variety of specializations.

Contact Information

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Future Directions in Design and Construction

Renee Ayala, P.E.

AFCEC/CF

2 May 2023

Classification

The classification of the brief is UNCLASSIFIED and the discussion can go up to UNCLASSIFIED

Purpose

To provide info on Air Force design and construction focus areas

Overview

- Net Zero
- Standard Designs
- Seismic Safety

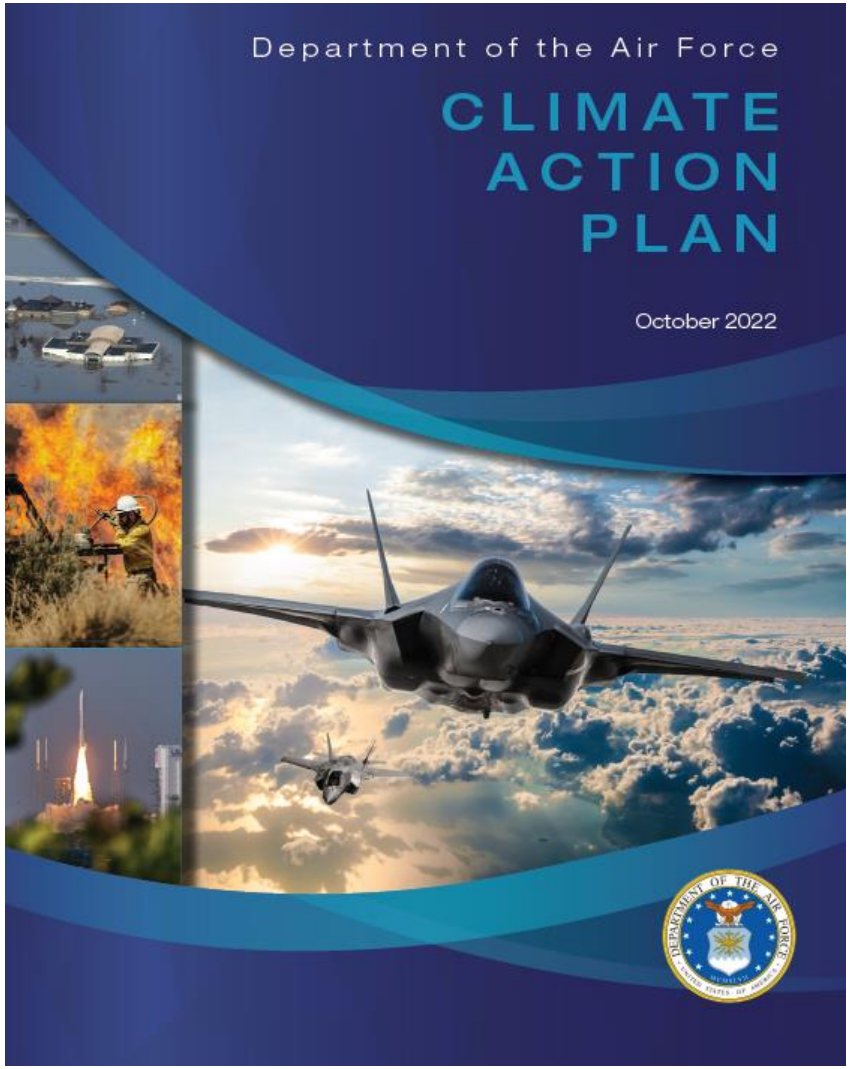
Net Zero: DAF Climate Action Plan

Secretary Kendall links climate to success of the mission

" … we recognize that the world is facing ongoing and accelerating climate change and we must be prepared to respond, fight, and win in this constantly changing world."

and emphasizes the need to make

" … climate-informed decisions"



Net Zero: New Building Requirements

- **New construction and modernization**
  - **All buildings greater than 25,000 gsf, designed to be net-zero emissions by FY30**
    - **Reduce EUI (and WUI)**
    - **All-electric systems**
    - **Carbon pollution-free electricity using on-site renewable energy or clean energy**
  - **Other cross-cutting strategies and requirements**
    - **Projects greater than 25,000 gsf, apply HPSB GPs**
      - **UFC 1-200-02**
    - **Use of low embodied carbon materials**
    - **Electric vehicle supply equipment**

gsf – Gross square feet; EUI – Energy Use Intensity; WUI – Water Use Intensity; HPSB – High Performance Sustainable Buildings; GP – Guiding Principles; UFC – Unified Facility Criteria

Net Zero: Piloting Efforts

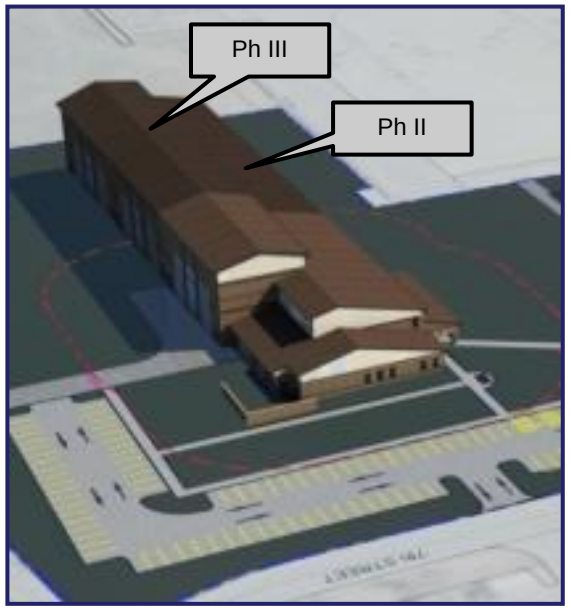
- **2022 NDAA Section 2861 Sustainable Materials pilot**
  - **Sustainable building materials as the primary construction material**
    - Defined as material the use of which will reduce carbon emissions over the life of the building; examples, mass timber and concrete
    - Location vulnerable to extreme weather in continental US
  - **Patrick SFB, Consolidated Communications Center**
    - Primary structural material is reinforced concrete
    - Targeting 30-40% reduction compared to conventional concrete
  - **USACE Engineer Research and Development Center providing support**
- **Net Zero pilots under development**
  - **Hanscom AFB Child Development Center and JBSA Medical Education and Training Campus Dorm**

Standard Design Program Current State

- 23 standard designs (see backup)
  - 15 – 35% design maturity
  - Developed between 2011 – 2019
  - Provide facility layout, adjacencies
- Expanding program with increased design percentage / facility types
- Looking for cost / time avoidance and savings through lessened:
  - Design duration
  - Design cost
  - Construction schedule growth
  - Construction cost growth

Standard Design Sample Project: KC-46A Flight Training Center, Phase III

- KC-46 flight sim at Altus AFB, OK
- 22k sq ft. / $12 M
- Utilized standard design
- Came in at $151 / sq ft vs. typ $611 /sq ft
- Constructed cost under programmed amount vs. typical 10% cost growth



Seismic Safety

- ASD(SUS) memo 20 Dec 2021 requires services to:
  - Appoint Seismic Safety Coordinators (SSCs)
  - Utilize Seismic Safety Action Classification (SSAC) tool to assess facility vulnerability
    - Non-destructive assessment
- Analyzing existing data
- Planning to screen buildings in high-risk areas
- Will need to develop plans to mitigate risks identified

Your Success is Our Mission!

- Kenneth Simmons
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- Brandon Tobias
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- Renee Ayala
- renee.ayala.1@us.af.mil

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