

Naval Facilities Engineering Command Sustainable Design Program

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NAVFAC Atlantic

NAVFAC Sustainable Policy



- Reduce the total cost of ownership of shore facilities by implementing sustainable design concepts and principles.
- Use LEED as a tool in applying sustainable development and as a metric to measure the sustainability achieved.
- For FY09 & beyond:
 - >LEED Silver rating
 - >USGBC certified (process)*
 - >EPA Act 2005 as codified under US Code 10 CFR 433 & 435
 - >E.O. 13424, Strengthening Federal Environmental, Energy and Transportation Management



Training



Classroom – USGBC, FEMP & SBIC Workshops have been given to most of our component offices. Target audience is primary users of LEED, e.g. architects, engineers, planners, project managers.



NAVFAC has 78 LEED Accredited Professionals.

Online – Web-based training for members of the project acquisition team – all Business Lines – to educate and identify the changes to our internal processes to integrate sustainable development into our overall acquisition process.

Sustainable Online Training



A multimedia, online modular training course (and Web system)



- Provides an overview of sustainable development concepts and principles.
- Details each NAVFAC project team member's responsibilities throughout the acquisition process to assure achievement of sustainability goals.

WBDG
WHOLE BUILDING DESIGN GUIDE

Sustainable Online Training



Project Team Members

1. Real Estate
2. Environmental
3. Planning
4. Programming
5. Cost Engineering
6. Contracts
7. Project Management
8. Capital Improvement (NAVFAC architects & engineers)
9. ROICC/Construction Management
10. Public Works/Base Operations System (BOS)
11. Facilities Management/O&M
12. Facility Occupation & Use (customers/occupants)
- 13. A/E Design (Private architects & engineers)**
- 14. Facility Construction (contractors)**



Sustainable Online Training



Process Modules

Topics

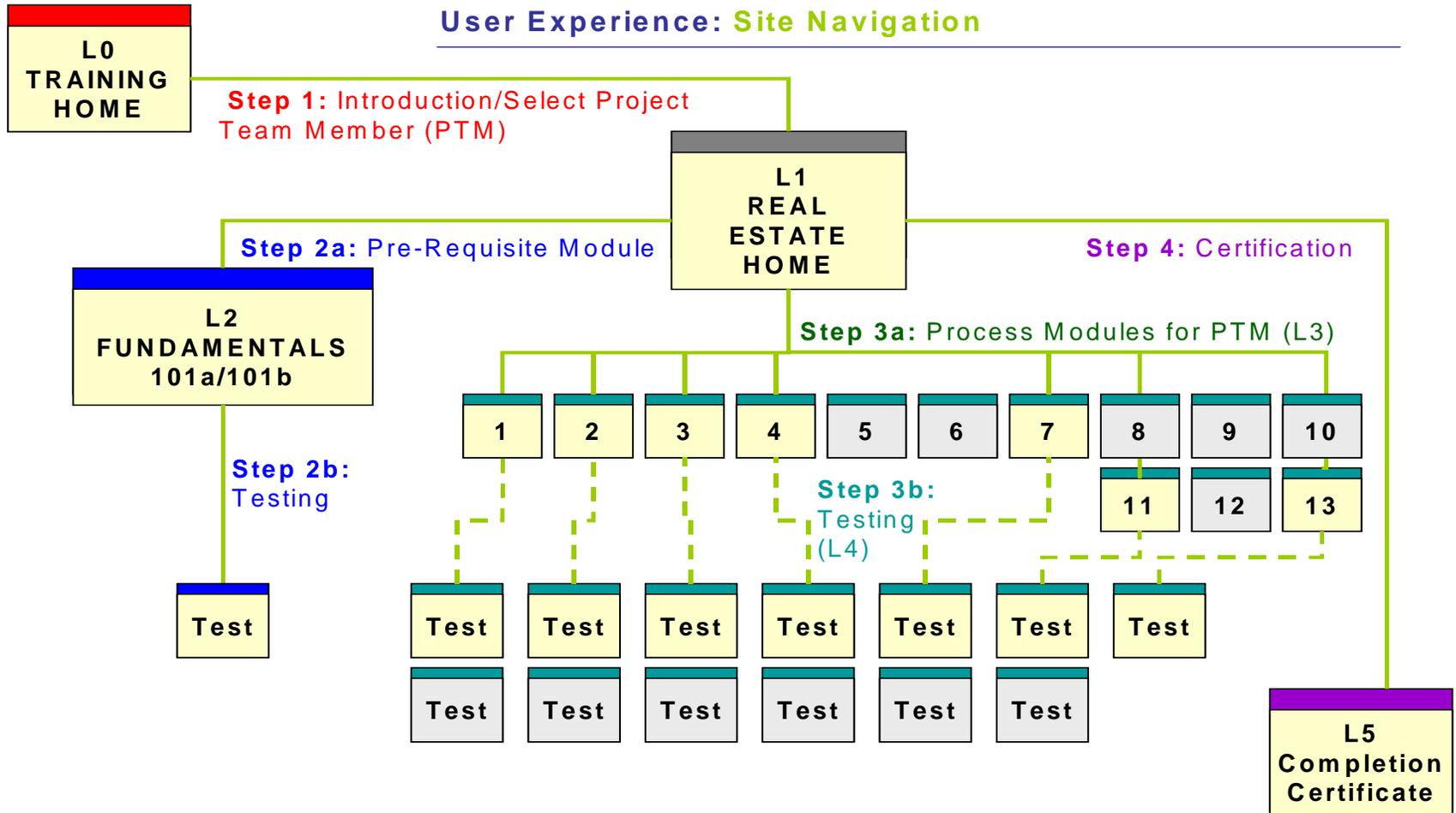
1. Feasibility Study
2. Program Development
3. Project Funding
4. Site Selection
5. Architect-Engineer Procurement
6. Design Charrette
7. Design Reviews
8. Construction Procurement
9. Construction
10. Commissioning
11. Turnover/Activation/Occupancy
12. Post-Occupancy/Operations & Maintenance
13. Disposal

1. Component NAVY	FY 2003 MILITARY CONSTRUCTION PROGRAM			2. Date 7/5/01	
3. Installation and Location NAVAL STATION NORFOLK NORFOLK, VIRGINIA		4. Project Title BACHELOR ENLISTED QUARTERS (BEQ)			
5. Program Element 0204796N	6. Category Code 721.11	7. Project Number P-293	8. Project Cost (\$000) 37,000		
9. COST ESTIMATES					
	Item	U/M	Quantity	Unit Cost	Cost (\$000)
	BACHELOR ENLISTED QUARTERS (BEQ)	m2	95,550	-	54,350
	BACHELOR ENLISTED QUARTERS	m2	17,500	1,339	(23,430)
	BUILT IN EQUIPMENT	LS	-	-	(950)
	INFORMATION SYSTEMS	LS	-	-	(530)
	TECHNICAL OPERATING MANUALS	LS	-	-	(190)
	ANTI-TERRORISM/FORCE PROTECTION	LS	-	-	(2,240)
	PARKING STRUCTURE (2100 AUTOS)	m2	78,050	346	(27,019)
	SUPPORTING FACILITIES	LS	-	-	22,030
	SPECIAL CONSTRUCTION FEATURES	LS	-	-	(3,640)
	ELECTRICAL UTILITIES	LS	-	-	(2,300)
	MECHANICAL UTILITIES	LS	-	-	(1,890)
	PAVEMENT	LS	-	-	(1,580)
	SITE IMPROVEMENTS	LS	-	-	(1,640)
	DEMOLITION	LS	-	-	(250)
	THERMAL NOISE PLANT	LS	-	-	(4,180)
	FACILITY SUSTAINABLE DEVELOPMENT	LS	-	-	(3,500)
	DESIGN BUILD DESIGN COST	LS	-	-	(3,050)
	SUBTOTAL	-	-	-	76,380
	Contingency (5.0%)	-	-	-	3,820
	TOTAL CONTRACT COST	-	-	-	80,200
	Supervision Inspection & Overhead (6.0%)	-	-	-	4,800
	SUBTOTAL	-	-	-	85,000
	LESS PHASE II FUNDING	LS	-	-	-48,000
	TOTAL REQUEST	-	-	-	37,000
	Equipment Provided From Other Appropriation	-	-	(NON-ADD)	(5,140)
10. Description of Proposed Construction					
Project will construct bachelor enlisted quarters (BEQ). BEQ will be a multi-story, interior corridor, building with structural steel and masonry					

Sustainable Online Training



User Experience: Site Navigation



Whole Building Design Guide



WBDG
WHOLE BUILDING DESIGN GUIDE

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The Whole Building Design Guide

The Gateway to Up-To-Date Information on Integrated 'Whole Building' Design Techniques and Technologies

THE WHOLE BUILDING DESIGN APPROACH

The goal of 'Whole Building' Design is to create a successful high-performance building. To achieve that goal, we must apply the integrated design approach and the integrated team approach to the project during the planning and programming phases. [Read more](#)

WBDG Focus

Journal of Building Enclosure Design

The Building Enclosure Technology and Environment Council (BETEC) of the National Institute of Building Sciences (NIBS) is pleased to announce the continuation of our relationship with Matrix Group Publishing in the production of the *Journal of Building Enclosure Design*—the premier publication for research and development on building enclosure systems for North America. [Read more](#)

2007 Energy

August 5-8, 2007 • New Orleans, Louisiana

Join us August 5-8, 2007 in New Orleans, LA, and help celebrate the 10th anniversary of the Federal

Participating Agencies:

- U.S. DEPARTMENT OF DEFENSE
- U.S. DEPARTMENT OF ENERGY
- U.S. DEPARTMENT OF JUSTICE
- U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES
- U.S. DEPARTMENT OF HOMELAND SECURITY
- U.S. DEPARTMENT OF TRANSPORTATION
- U.S. ENVIRONMENTAL PROTECTION AGENCY
- GSA

Visit WBDG Partners:
GreenerBuildings

Internet

DoD & NAVFAC Portals



WBDG: Department of Defense (DOD) - Microsoft Internet Explorer provided by NMCI

Address: http://www.wbdg.org/references/pa_dod.php

WBDG WHOLE BUILDING DESIGN GUIDE

Home / About / Contact / Site Map / Search:

Department of Defense (DOD)

Participating Agencies Index > Department of Defense

Unified Facilities Criteria Program

[Unified Facilities Guide Specifications \(UFGS\)](#)
[Unified Facilities Criteria \(UFC\) Technical Publications](#)
[Criteria Change Request \(CCR\)](#)
[Unified Facilities Spreadsheets](#)

The Department of Defense (DoD) and the military services have initiated a program to unify all technical criteria and standards pertaining to planning, design, construction, and operation and maintenance of real property facilities. The objective of the Unified Facilities Criteria (UFC) program is to streamline the military criteria system by eliminating duplication of information, increasing reliance on private-sector standards, and creating a more efficient criteria development and publishing process. Both technical publications and guide specifications are part of the UFC program. Previously, each service had its own publishing system resulting in criteria being disseminated in different formats. [UFC documents](#) have a uniform format and are identified by a number such as UFC 1-300-1.

Though unification of all DOD criteria is the ultimate goal, there are instances when a particular document may not apply to all services, or some documents may have not been fully revised to reflect all service requirements before being issued in the UFC system. In these instances, the UFC or UFGS (in MasterFormat™ 1995) document number will be followed by an alpha-designator, such as UFC 1-300-09N or UFGS 01320A. Alpha-designators are as follows:

US Army Corps of Engineers®

Go to...

NAVFAC Publications

- NAVFAC Publications
- Interim Technical Guidance
- Eng. Criteria and Programs Office
- Specification Graphics
- Regional Guide Specifications
- NAVFAC Design-Build Master (NDBM)
- Reports and White Papers
- Non-Government Standards-IHS
- British Standards-IHS
- IHS Technical Solutions
- Tools

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LEED-DoD Antiterrorism Standards Tool



DoD requires its buildings to be secure and sustainable. The challenge is to satisfy these design requirements in a balanced, integrated cost-effective solution.

This tool:

- analyzes and integrates LEED and UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings,
- can save design and construction costs,
- and will integrate AT requirements, sustainable strategies/features and aesthetics.



- Design Guidance**
 - Building Types
 - Space Types
 - Design Objectives
 - Products & Systems
- Project Management**
 - Delivery Teams
 - Planning & Development
 - Delivery & Controls
- Mandates / References**
 - Federal Mandates
 - Publications
 - Case Studies
 - Participating Agencies
 - Industry Organizations
 - Related Links
- Tools**
- News, Events & Training**



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LEED®-DoD Antiterrorism Standards Tool

Tools Index > - [LEED®-DoD Antiterrorism Standards Tool](#)

[Introduction](#) [Application](#)
[How To Use This Tool](#) [Relevant Codes & Standards](#)
[General Issues](#) [Additional Resources](#)

Legend

- Complimentary requirements
- Conflicting and complimentary requirements
- Conflicting requirements
- Not conflicting or complimentary, but have related considerations

Download
 UFC 4-010-01
 DoD MINIMUM ANTITERRORISM
 STANDARDS FOR BUILDINGS

LEED® Credit	Antiterrorism Standard																					
Sustainable Sites	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
SS-P1 Erosion & Sedimentation Control																						
SS-1 Site Selection																						
SS-2 Development Density																						
SS-3 Brownfield Redevelopment																						
SS-4.1 Alternative Transportation, Public Transportation Access																						
SS-4.2 Alternative Transportation, Bicycle Storage & Changing Rooms																						
SS-4.3 Alternative Transportation, Alternative Fuel Vehicles																						
SS-4.4 Alternative Transportation, Parking Capacity																						
SS-5.1 Reduced Site Disturbance, Protect or Restore Open Space																						
SS-5.2 Reduced Site Disturbance, Development Footprint																						
SS-6.1 Stormwater Management, Rate and Quantity																						

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UFC 4-010-01

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SS-4.3	Alternative Transportation, Alternative Fuel Vehicles	■		■	■	■											■						
SS-4.4	Alternative Transportation, Parking Capacity	■		■	■	■																	
SS-5.1	Reduced Site Disturbance, Protect or Restore Open Space	■	■		■																■		
SS-5.2	Reduced Site Disturbance, Development Footprint	■	■	■		■			■												■		
SS-6.1	Stormwater Management, Rate and Quantity	■	■	■		■			■							■							

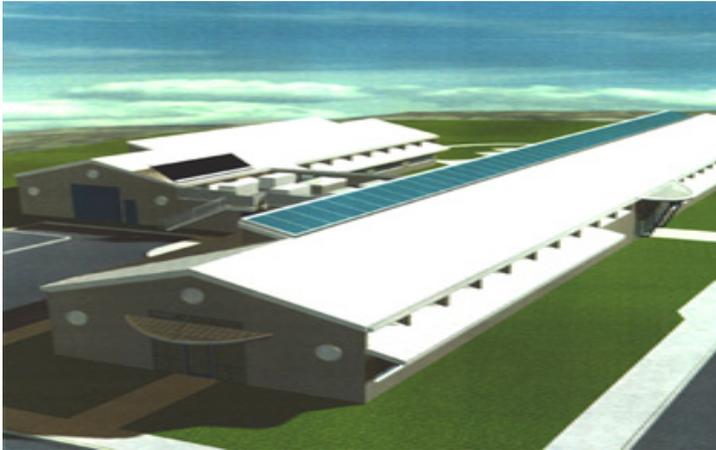
Defense Intelligence Analysis Center Addition Bolling AFB, District of Columbia



Case Studies



Eliminate mistakes and repeat successes



Sustainable Program Initiatives



- Revising criteria and contract documents
- EPAct 2005 Studies – Administrative Bldgs., Bachelor Quarters and Maintenance Facilities for Norfolk VA, Chicago IL, Gulfport MS and Seattle WA
- NAVFAC Sustainable Design Program Website on WBDG
- Sustainable Installation Design Guide
- Sustainable Disaster Design Guide

Impacts of New Policies

- **Costs**

- Design & Construction Cost
- Project Budgets

- **RFP & Other Contracts**

- Selection
- Proposals
- Submittals

- **Design & Construction**

- Studies
- Design Submittals
- Construction Submittals
- ❖ Sustainable Features



\$ Costs \$



- **Added Costs**

- LEED Certified 0-2% ECC
- EPACT 05 & LEED Silver 1-3% ECC

- **FY07 & FY08**

- No Additional Funding
- Meet old criteria if started before Jan 3, 2007
- Meet EPACT05 if started after Jan 3, 2007 (New Buildings only)
 - 30% Below ASHRAE 90.1 Energy Standard
- LEED Silver option or rating factor (FY08)

- **FY09**

- Funded for EPACT05
- Funded for LEED Silver
- Funded for EO 13423 & other policy requirements

Contracts



- **Source Selection**
 - **Past Experience**
 - **Technical Qualifications**
- **RFP Proposals**
 - **LEED Checklist**
 - **Narrative on each credit**
 - **Inclusion of sustainable features in proposal**
- **Design & Construction Submittals**
 - **Energy Studies**
 - **Sustainable Features in plans & specs**
 - **LEED Documentation**

Studies & Submittals



- **EPACT 05 - 30% Below ASHRAE 90.1 Study**
 - **Evaluate Energy Saving Features**
 - Mechanical Systems
 - New Technology HVAC System
 - Heat Recovery
 - Fuel Sources
 - Architectural Features
 - Building Orientation
 - Windows, Roofs & Insulation
 - Daylighting & Shading Features
 - Lighting Systems
 - Daylighting
 - Occupancy Sensors
 - New Lighting Technologies
 - **Renewable Energy Study**
 - Solar Heat, Solar Domestic Water Heating
 - Solar PV, Wind Power



- **LEED Documentation**

- **Design Submittals**

- General LEED Documentation

- Various LEED Credit Calculations

- Water Savings

- Recycled Content

- Local Materials

- **Construction Submittals**

- Product data in shop drawings

- Recycled Content

- Local Materials

- EPP Products

- Waste Management Documentation

- Energy Benchmarking



Design & Construction

LEED Credit



25

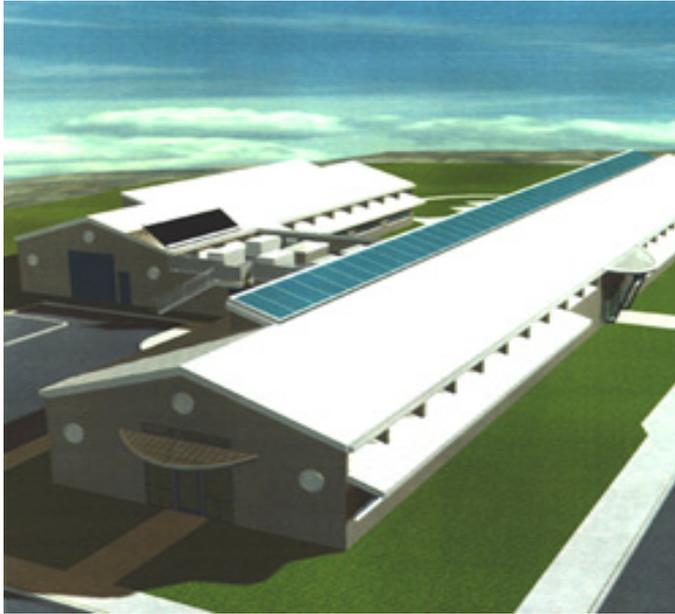
Required Sustainable Features

- **IAQ During and After Construction**
 - Protect Site, Materials, Ductwork
 - Flush Building after Construction
- **10% Recycled Content**
- **Environmentally Preferable Products (EPP)**
 - Bio-based
 - Rapidly Renewable
 - EPA EPP Certified
 - Forest Stewardship Council (FSC) Certified Wood
- **Construction Waste Management**
- **Eliminate Ozone Depleting Compounds**
- **Energy Star Equipment**
- **Renewable Energy (If Cost Effective)**

LEED Credits Achieved (33 req'd for LEED Silver)

Building 850

Port Hueneme, CA



Public Works Department administrative building – 10,000 SF renovation & 7,000 SF addition

Sustainable Features

- Prototype natural gas heat pump A/C
- VAV under floor distribution system
- High efficiency pulse boilers
- Natural ventilation
- Solar space & domestic water heating systems
- Photovoltaic power generation system
- Daylighting
- Shading & innovative glazing elements
- Fluorescent lighting
- Occupancy & photo sensors controls



AIA/COTE
2002 Top
Ten
Green
Project

Personnel Support Facility NAB Little Creek, VA



- 37,754 SF Educational/Admin Bldg
- 21% reduction in energy usage over ASHRAE 90.1
- 50% reduction in water usage
- Over 75% construction waste diverted from landfill
- Energy savings = 146,910 kWh/yr > \$11,370/yr
- Water savings = 517,458 gal/yr > \$3,000/yr
- Constr Cost \$7,500,000
- Sust Cost \$150,000 = 2% of Const Cost
- ROI/Simple payback = 10% / 10 yrs



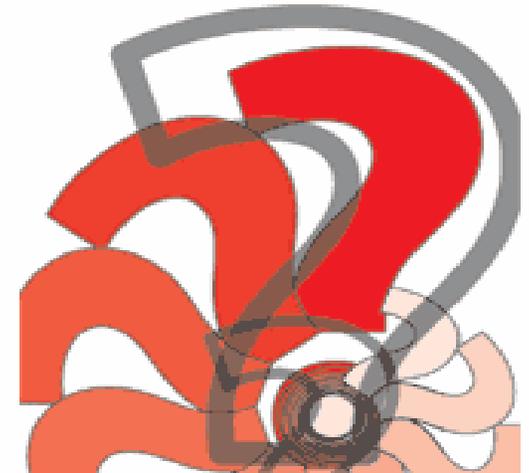
“Silver”



Questions & Comments



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