Army Transformation & LEED at Fort Carson, Colorado

May 2011

Presented by:
MAJ Kevin J. Lovell, PMP
USACE Operations Officer to Fort Carson
Omaha District, USACE
Agenda

- Introduction & Promotion
- Purpose
- The Airborne Manager
- Background: LEED Requirements
- Management of LEED into Design & Construction
- Fort Carson – A Case Study
Purpose

Provide overview of How the Fort Carson Team Integrated LEED into Planning and Design to Support Army Transformation

What is LEED?
Leadership in Energy & Environmental Design
Field Marshall the Viscount Montgomery of Alamein

Over the Last 70 Years, Paratroopers Served as America’s Vanguard. They Are Proud of Their Honor, And Have Never Failed a Task.

They Are a Breed Apart

Every Soldier an Emperor
Montgomery Could Have Been Referring to PMs, Engineers, & Architects

- And their Desire to Optimize, Innovate, & Achieve Success
- Introduction of LEED into Design & Construction Required Innovation & Élan

In That Spirit, Let’s Examine: LEED Integration in Design and Construction at Fort Carson, Colorado
Strategic Context

- Our Army is undergoing the largest organizational change since W W II
- TRANSFORM & GROW!!! by 74.2K
  - Move ~1/3 of the Army by end of FY 2011
  - Impacts 380K Soldiers and Families members
  - Affects 304 installations/locations

Execute Synchronized BRAC, Grow the Army, & Global Defense Posture Realignment

Facilitated by Military Construction (MILCON)

- Construct 743 Projects, worth $66.6 B from FY06-13 including
  - 20 Brigade Complexes & 69,000 Dormitory spaces;
  - 4,100 Family Housing Units & 66 Child Development Centers (Day Care Centers)
- 13 Full BRAC Closures; 8 Leased facility closures
- 53 Realignments (3 Major School realignments)

- Today’s action impacts quality of tomorrow’s force
What Does That Mean?

Need Places to Work, Live, Eat

- **Work**
  - Office Bldg’s: Old Bldg’s ones too small
  - Maintenance Bldg’s: Lack Size, Need updated Equipment & Features

- **Live**: Barracks (Dormitories)

- **Eat**: Dining Facilities (Cafeterias)

- Major Stakeholders and Sponsors Are Already Identified
What is the Plan & How Do We Get It Done?

- Identify Stakeholders, Requirements, Costs
- Process Changes.
  - Requirements Often Drove Acquisition
  - Change From Design-Bid-Build to Design-Build
    Standard Floor Plans to match Standard Unit Types
- Organizational Changes
What is LEED?

- Leadership in Energy & Environmental Design
- Developed by the US Green Building Council
- 3rd Party Verification that a Community or Building was Designed/Built using Strategies to Improve
  - Energy Savings
  - Water Efficiency
  - CO2 Emissions
  - Indoor Environmental
  - Quality
  - Resource Stewardship
LEED’s Purpose

• Purpose: Provide Owners and Operators a Framework to Identify & Implement Practical and Measurable
  • Design
  • Construction
  • Operations &
  • Maintenance Solutions.
Background: Why Change?

- Rising Overhead Costs for Base Operations
- Base Realignment and Closure
- Increased Base Populations
- Result: New Construction & Energy Efficiency Requirements
- Requirement: Decrease O&M Load Thru Energy Efficiency

Business as Usual Won’t Work, We Have to Change!!
INTEL: To Start, What Questions Do We Have, Paratroopers?

❖ To Tackle this Problem:
  ❖ What are Our Requirements?
  ❖ Who Should Be On Our Team?
  ❖ Who Are Our Stakeholders?
  ❖ How Do We Determine Feasibility?
  ❖ How Do We Implement It?
  ❖ What Challenges Could We Have?

SPIRIT: Sustainable Project Rating Tool
USACE Mission & Vision

- **Mission:** Provide Vital Public Engineering Services in Peace & War to Strengthen our Security, Energize the Economy, & Reduce Disaster Risks.

- **Vision:**
  - Disciplined, Team Focused, Innovative: “Go to where the puck is going, not where it’s been”
  - A GREAT engineering force
  - Deliver Sustainable Solutions to the Nation
USACE Organizations

- Divisions Separated by Watersheds
- Divisions Made Up of Districts
Omaha District Area of Operations

Districts Have Military & Civil Works Construction Programs
FORT CARSON:
A CASE STUDY IN LEED INTEGRATION
What Happened at FT Carson?

**Army Military & Civilian Pop**

<table>
<thead>
<tr>
<th></th>
<th>Starting point FY03</th>
<th>With BRAC</th>
<th>End Strength</th>
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<tr>
<td></td>
<td>15,119</td>
<td>23,656</td>
<td>28,533</td>
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Moved the 4th Infantry Division Headquarters & One Heavy Brigade from FT Hood

**GTA:** Grew a Special Forces Battalion

Restationing: Moved Infantry Brigade from Korea

Results: Facilities Not Big Enough & Not Enough
Planning & Acquisition

- **Risk Management**
  - Shift Risk Away from Government

- **Stakeholder Involvement:**

- **Acquisition:**
  - ECI
  - DB,
  - COS’s
  - Centralized Procurement

**Programmed Amount By FY**

- FY 05: $50
- FY 06: $150
- FY 07: $200
- FY 08: $150
- FY 09: $250
- FY 10: $100

- Millions
What Are Our Requirements?

- Comply with Existing Policy.
  - ASHRAE Standard: 30% Energy Savings
  - Buildings Must Be LEED Silver Certifiable

- Anticipate & Posture to Implement Future Policy.
  - Increased ASHRAE Standards
  - Change from LEED 2.2 to LEED 2009

ASHRAE: American Society of Heating, Refrigeration, & Air Conditioning Engineers
Sustainable Policy

• Changes are Fast and Furious!
• Current Policy = Command emphasis at all levels!
  ▪ Executive Orders (13423, 13514)
  ▪ DoD signer of Federal Environmental MOU “Guiding Principles”
  ▪ Policy Letters from Army & Air Force
  ▪ Criteria Documents
• Engineering & Const. Bulletin 2010-14, 28 JUN 10
• Sustainable Design & Development Policy Updates, DA Memorandum 8 July 2010

DoD: Department of Defense; DA: Department of the Army
Holy Construction Batman!!! How do We Do This?!?

Simple, Robin. We Call the US Army Corps of Engineers.
Current Policy

- **Current LEED Requirements (Army through FY12)**
  - All New Construction & Major Renovation Shall Be LEED-NC Silver “certifiable”
  - Certifiable -“Able to Achieve GBCI Certification if Submitted”
  - Family Housing & Communities Shall be SPIRIT Gold AND Energy Star Qualified New Homes
  - LEED Accredited Professional (AP) Required on All Design and Construction teams
  - From FY09 on All Silver Requirement Projects Must Be Registered and Use LEED Letter Templates
Policy Updates

Policy Update: ECB ‘10-14

- No Potable Water Used for Irrigation
- 30% Reduction in Water use
- Optimize Energy Points
  - DB
    - 40% Energy Savings Below ASHRAE 07 90.1.
    - Option for additional 10% energy savings.
  - DBB - 40% energy savings

- Enhanced Commissioning
- Thermal Comfort Design

D-B: Design-Build; D-B-B: Design, Bid, Build
Policy Updates

- Sustainable Design & Development (SDD) Policy for Army Facilities
  - Effective FY13: NO WAIVERS ALLOWED
  - Utility Metering On all Projects Over $200k
  - 30% Solar Hot Water Required
  - Indoor Water Consumption: 20% Below Baseline
  - All Bldgs Must Be Certified LEED NC/MR Silver/+ 
  - Family Housing must be LEED for Homes Certified Silver & Energy Consumption Levels 45% Below Baseline.
Assemble the team

- Who Are Our Stakeholders?
- FT Carson Garrison
- Utility Companies
- Tech Companies for Renewable Energy
- Suppliers for HVAC Equipment
- After Contract Award:
  Prime Contractor & Subs

HVAC: Heating, Ventilation, and Air Conditioning
What is Feasible?

- Technological Feasibility
- Cost Feasibility
- Schedule Feasibility
- Construction Feasibility
How Do We Implement It?

Cost  
Scope  
Schedule
What Are Our Challenges?

- Uncertainty and Risk
- Deliveries of Technically Complex Equipment
- Design Fails to Meet LEED Silver Requirements
- Policy Changes
USACE Sought Input To...

- ID Industry Best Practices
- Incorporate New Technology
- ID Commercial Construction Industry Standards
- ID Triple Constraint Impacts
- Max Effectiveness of Design-Build Process
What Are Our Requirements?

- LEED Certifiable Requirements
  - Design
  - Construction
  - Audit & Review for Each: 3rd Party or USGBC?
- Energy Savings
- Latest:
  - Energy Conservation
  - Water Conservation
  - Renewable Energy

USGBC: US Green Building Council
Planning

- Master Planning
  - LEED Must Be Considered in Sight Selection
  - Design Charrettes Specifically for LEED

- Request for Proposal Development
  - Must Have Clear LEED Goals:
    - “Certifiable” vs Certified
    - Evaluation Factors

- Extended LEED Template
  - Assign Action Items to an Individual
  - Include Summary Data, Current Status, % Complete
EXECUTION

 Overcoming Major Inertia:
  ► Developed Protocols & Procedures
  ► New Concepts: LEED, D-B, & CM At Risk

 LEED Certifiable Requirements:
  ► Design & Construction
  ► Audit & Review for Each: 3d Party or USGBC?

LEED Silver Certification Became a Contract Requirement
Gold Certified Facilities

- 7 Projects Containing 15 Buildings Total
  - 1st BDE, 4th ID Brigade & Battalion Headquarters; APR 08
  - 1st BDE, 4th ID Barracks Complex; DEC 08
  - 4th ID Band Training Facility; AUG 09
  - 1st BDE, 4th ID TEMFs; May 08
- Pending Certification
  - An Additional 7 Buildings
Silver Certified Facilities

- 12 Projects Containing 21 Buildings
  - 4th ID Division Headquarters; SEP 08
  - Multiple Company HQ Buildings
  - Multiple Barracks
  - Air Support Ops Squadron, APR 10
- Pending Certification:
  - An Additional 30 Buildings
EXECUTION: Technical Elements

- Model RFP: Gave Guidance in Specific Areas for Contractor to Concentrate LEED Efforts
- Wizard RFP: Gave Little Guidance Where to Concentrate LEED Related Efforts On.
- Then...
- Federal Mandates Gave Specific Guidance Where to Focus LEED Related Efforts
EXECUTION:
Organizational Elements

- Integrated Project Team Implementation
- Assembled the Team
- Must Have a Pro-Active Team

<table>
<thead>
<tr>
<th>Omaha District</th>
<th>State of Colorado</th>
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<tr>
<td>District LEED Coordinator</td>
<td>Environmental Concerns</td>
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<td>Designers and Reviewers</td>
<td>Contractors</td>
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<td>Field Personnel</td>
<td>Designers of Record</td>
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<tr>
<td>FT Carson</td>
<td>LEED Coordinator</td>
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<tr>
<td>A Receptive Customer</td>
<td>Field Personnel</td>
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<tr>
<td>Public Works</td>
<td>Superintendent</td>
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<td>Dept of Physical Security</td>
<td>Consultants</td>
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EXECUTION: Training Elements

- Determined the Training Requirements
  - New Culture, New Methods
  - Contracted & USACE Courses
  - IBC Training & Certification
  - LEED 101
  - Project Delivery (DB, DBB, CM at Risk)
EXECUTION:
Project Delivery Systems

► Performance Based Specs
► Design & Construction Methods

• Facilities: D-B & ECI
• Infrastructure: D-B-B

Why is this so important?

DB: Design-Build; DBB: Design-Bid-Build
EXECUTION:
Organizational Elements

- Build The LEED Culture
- Cross Project Coordination: Build the Campus
- Process Must Be Lived from Day 1
  - LEED Submittals
  - Waste/Scrap/Land Fill Operations
  - Energy & Water Efficiency
  - Innovation & Design for Exceeding Standards
  - Materials: Recycled Content in Buildings
EXECUTION: Organizational Elements

- Proj. LEED Coordinator
  - Responsible for achievement of LEED goals
  - Coordinates Design and Construction Strategy
  - Manages IPT Meetings
  - Manages Extended LEED Template Document
  - Tracks Milestones & Keeps Contractor Team On Task

- District LEED Coordinator
  - LEED Policy & Strategies
  - Ensures Cohesiveness in Contract Documents
  - SME for Source Selections & Design Reviews
  - Tracks and Reports Status
  - Shares Successful Strategies
  - Coordinates LEED training
Monitoring and Control

- **LEED Implementation Planning:**
  - Monthly Meetings Separate from Design Meetings

- **Design Phase:**
  - Meetings Held Weekly
  - Contractor and USACE Reps Attended

- **Construction Phase:**
  - Meetings Held Less Here
  - Contractor, Subcontractor Attended
Monitoring and Control

- Prep Meetings for Each Phase of Work
  - Project Phases Tied to the WBS
  - Contractor and USACE Attended
  - Meeting Agendas Included:
    - LEED Elements of the Phase
    - General Project Requirements Associated with Sub Contractors on LEED Requirements

- Major Construction Projects Could Have More Than 50 Prep Meetings
Monitoring and Control

- Contractor LEED Coordinator
  - Drives Home Individual Impact on Job Site
  - Disposal Requirements
  - Recyclables, Non-Recyclables, HAZMAT

- Subcontracted Workforce Gets the Message:
  Do the Wrong Thing & It Could Cost You
Project Close Out

- You have Done a Great Job, Now Turn the Building Over
- Project Close Out Now Includes Owner and User Training in Sustainable Features
- Pass Project Admin Rights to Owner on LEED Online in lieu of Hard Copies
- ADVERTISE SUCCESS!!
### LEED Facts

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<tr>
<th>Category</th>
<th>Possible Points</th>
<th>Points Achieved</th>
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**1st BDE, 4th ID Brigade & Battalion Headquarters**
4th Infantry Division Headquarters

LEED Facts
Possible Points 69
Points Achieved 33

- Early Contractor Involvement (ECI)
  - Omaha District Design Branch Designs Facility with a Contractor
  - That Design is Then Solicited and Awarded to a Prime Construction Contractor
1st BDE, 4th ID Barracks Complex

LEED Facts
Possible Points 69
Points Achieved 39

Sustainable Sites 7
Water Efficiency 3
E & A 11
M & R 4
IEQ 9
I & D 5
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LEED Facts
Possible Points 69
Points Achieved 37

- Sustainable Sites 9
- Water Efficiency 4
- E & A 6
- M & R 6
- IEQ 8
- I & D 4

1st BDE, 4th ID Company Operations Facilities
Tough Nuts to Crack

- Community Connectivity
  - Army Programs Singular Buildings
- Public Transportation Access
- Training the Maintenance Work Force on New HVAC and Light Systems
  - Old Dogs Must Learn New Tricks
Certification

• 20 Projects Consisting of 35 Buildings Certified Gold or Silver
• Add’l 25 Projects Consisting of 40 Buildings Have Been Awarded & Pending Certification
PUSH THE ENVELOPE

- Latest: Re-Investment for Energy Efficiency
  - Push the LEED Requirement
  - Push the ASHRAE Standard:
    - Energy & Water Conservation
  - Renewable Energy

GOALS:
- Drive Down O&M
- Achieve Net Zero
Follow Up Success with More Success

- Latest:
  - Energy Conservation
  - Water Conservation
  - Renewable Energy
QUESTIONS & COMMENTS