DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, LOUISVILLE
CORPS OF ENGINEERS
P.O. BOX 59
LOUISVILLE, KENTUCKY 40201-0059

http://www.lrl.usace.army.mil

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ARCOS BULLITEN 2011-1 **(Revised 10 January 13)**

SUBJECT: Sustainability and Energy Efficiency

1. REFERENCE:
   a. Memorandum, ASA (IE&E), 27 Oct 10, subject: Sustainable Design and Development Update (Environmental and Energy Performance)

   b. ECB 2011-1, High Performance Energy and Sustainability Policy

   c. ECB 2010-14,Improving Building Performance Through Enhanced Requirements for Energy Performance and Select LEED Credits

   d. Army Reserve Energy Efficiency and Sustainability Policy (ENCLOSURE 1)

2. This memorandum is to clarify the issues related to implementation of sustainably and energy efficiency initiatives for the design and construction of Army Reserve facilities. The Army Reserve and Corps of Engineers have developed a Sustainability and Energy Efficiency Policy (Ref 1.d) to provide guidance to Project Develop Teams on how to implement the various energy mandates pertaining o Army Reserve facilities. The following represents additional guidance and clarifications.

3. All Army Reserve projects should comply with the Memorandum on Sustainable Design Development Policy (SDD) (Ref 1.a). ECB 2011-1 (Ref 1.b) and ECB 2010-14 (Ref 1.c) are not specifically mandated for Army Reserve projects. However, they do contain information relevant to energy efficiency and sustainability and PDT's should consider elements of the ECB's for inclusion in their designs.

4. Applicable information the SDD and ECB's should be included in Design Build RFPs. These documents should NOT be directly referenced in the RFP's. The minimum requirements from these documents have been updated in the Army Reserve Design Build Template Specifications (July 2011).

5. Project designs shall receive a minimum energy reduction of 40% from ASHRAE 90.1-2007. Project designs should explore greater energy reductions

6. ~~For FY 12 projects, solar hot water heating shall be required per the SDD if it is determined to be life cycle cost effective utilizing methods prescribed in the SDD. For design build projects, the RFP preparer shall perform a life cycle cost analysis to determine LCC effectiveness and include in the RFP if applicable. For FY 13 projects and beyond, the solar hot water heating requirement in the SDD shall apply regardless of the LCC analysis.~~ **REMOVED PER ARCOS 2013-1**

7. When considering other "special" systems such as ground source heat pumps, ~~VRF (variable refrigerant flow),~~ or renewable energy, as alternatives, options or betterments to the contract, careful consideration need to be given by the PDT to how these systems will be evaluated in source selection. Consideration to the cost of these systems and how they affect the minimum performance requirement needs to be presented. **REMOVED PER ARCOS 2013-1**

8. Air barrier drawings shall be included in all project designs. These drawings should at minimum include plan of the building indicating the desired perimeter boundary of the air barrier system, building sections, and other details showing critical interfaces. The drawings need to clearly demonstrate the location and how the barrier is to be constructed.

The point of contact for questions to this guidance is Brandon Martin (502) 315-6407, Brandon.T.Martin@usace.army.mil or Brian Cash (502) 315-6851, Brian.Cash@usace.army.mil.

Brian Cash, PE, PMP
Army Reserve Center of Standardization Manager
(502)-315-6851
Brian.Cash@usace.army.mil

ENCLOSURE 1

Army Reserve Sustainability and Energy Efficiency Policy

July 2011

Purpose: The purpose of this policy is to provide guidance to Project Development Teams (PDT) on Army Reserve projects on how the to implement various energy mandates pertaining to Army Reserve facilities.

Vision: Develop designs for Army Reserve facilities that achieve maximum energy efficiency and sustainability for the life of the building. Energy efficiency shall be a priority considered in all stages of project development including planning, design, construction, and operation and maintenance. Early sustainability and energy planning is key to successfully implementing the required mandates. Energy reduction shall be given primary consideration in meeting these mandates, followed by maximizing energy efficiency of building systems. After maximum energy efficiency of building systems is achieved, renewable energy initiatives shall be considered to achieve further reductions with net zero being the ultimate goal.

Early Energy Involvement: Energy Efficiency and Sustainability shall be considered at all phases of project development. Special attention to energy efficiency needs to occur in the beginning stages of project planning and design. The following represents information that shall be discussed at Energy Charrettes, kickoff meetings, ASIVs and Design Charrettes.

- Integrated Design Approach – multiple disciplines shall be involved in the early planning and design of the project. Through integrated design, initiatives can be considered collaboratively to maximize benefits.
- Early identification of existing climate conditions and opportunities shall be discussed at early project meetings.
- Establishment of Energy/LEED Goals
- Early Energy Modeling – Early energy modeling is a useful to tool that shall be considered in making early project decisions. Utilizing energy modeling before the building layout is established will provide the greatest opportunity to achieve maximum energy efficiency. Other types of modeling, such as daylight modeling, should also be performed.
    - Energy Charrette – Generic building model utilizing basic assumptions and climate conditions. Model will be utilized to discuss potential opportunities and establish early energy goals.
    - Design Charrette – Comparison of alternatives and building siting. A preliminary energy reduction calculation shall be developed for each alternative developed at the Charrette.

- Building Occupancy – Designs need to consider the various occupancy levels of the facility throughout its expected use. While the primary basis of design is the largest drill weekend, other uses of the building need to be considered in the design.
    - Drill Weekend Occupancy
    - Monday – Friday Full Time Occupancy

Project teams shall study various energy efficiency alternatives and initiatives early in the design with initial cost estimates. This information shall be presented to ARIM-D for determination on which initiatives to proceed into design.

Life Cycle Costs: A life cycle cost (LCC) analysis shall be performed on all major energy initiatives considered (>1% PA). However, with the current energy mandates, LCC is only one component to be considered in the selection of alternatives. LCC information shall be presented to ARIM-D for determination of implementation. Projects should be designed with initiatives that maximize the authorized PA. Energy efficiencies that exceed PA should be considered as bid options. For Design Build projects, betterments should be utilized to encourage energy efficient designs.

Energy and Sustainability Enhancements: The following represents identified energy/sustainability initiatives that should be considered in Army Reserve facilities. Several of these initiatives span across several disciplines. Through the integrated design approach, they shall be considered collaboratively by all disciplines. **This list is not comprehensive and project teams should explore other initiatives that are regional or site specific.**

<u>Civil/Site Design Initiatives</u>

- Low Impact Development
    - Rainwater Harvesting
    - Bioswales
    - Permeable Pavement
    - Heat Island
    - Native/Low Maintenance Plantings
    - Outdoor Water Consumption
    - LEED Sustainable Sites Checklist

- Site Selection – ASIV
    - LEED Sustainable Sites Checklist
    - ASHRAE 189.1 Sec 5 Requirements
        - Allowable Sites
        - Prohibited Development

<u>Architectural Initiatives</u>

- Building Siting/Orientation
- Internal layout and orientation
- Air/Vapor Barrier
    - Thermography Requirements
- Increased R values/U values
- Insulated Concrete Forms
- Passive solar design
    - Thermal Mass
    - Shading
- Day lighting
    - Solar Tubes/Skylights
    - Window Placement
    - Daylighting analysis
- Roofs – Energy Efficiency shall be considered in roof selection
    - Cool Roofs
    - Green Roofs
    - Roof Slope Considerations

Mechanical/Electrical Initiatives

- Commissioning
    - Enhanced Commissioning
- Innovative High Efficiency Systems
    - Energy Star/FEMP
    - Energy Heat Recovery Systems
    - Dedicated Outside Air Systems for ventilation with heat recovery
    - Indirect Evaporative Cooling
    - Solar Walls
- Radiant Heating
- System Controls
- Solar Hot Water – 30% minimum
    - 100% also should be considered.
- Demand Control Ventilation
- Utility Monitoring Requirement
- 40% Minimum Reduction with 50% Energy Reduction being the achievable goal without Renewable Energy, Net Zero with Renewable Energy. Bid options should be developed to achieve 50% reduction and net zero.
    - Energy reduction based on ASHRAE 90.1 2007 baseline. Consideration of energy reduction per LEED guidelines also need to be considered.

- Water Conservation
    - Low Flow Fixtures per ASHRAE 189.1
    - Gray Water Use
- Lighting
    - Site Lighting – Solar LED Fixtures
    - Occupancy/Daylight sensors
    - Interior LED Lighting
- Renewable Energy
    - Wind, Solar, Geothermal (GSHP)
    - Future provision for renewable energy if not included in project.

This policy was developed in conjunction with ARIM-D through the Army Reserve Criteria Control Board (CCB).