



**US Army Corps  
of Engineers®**

# ENGINEERING AND CONSTRUCTION BULLETIN

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**SUBJECT:** High Performing Sustainable Design Application to Renovation Projects (Lessons Learned).

**CATEGORY:** Policy and Guidance

## 1. References:

- a. Memorandum, ASA (IE&E), 17 JAN 17, subject: Sustainable Design and Development Policy Update.
- b. Unified Facilities Criteria 1-200-02, Change 3, 07 SEP 18, subject: High Performing and Sustainable Buildings (HPSB).
- c. ECB 2018-13, 04 SEP 18, subject: Lessons Learned from SDD Policy Validation Visits (Fort Leonard Wood & Fort Belvoir).
- d. ECB 2017-13, 08 JUN 17, subject: Lessons Learned from SDD Policy Validation Visits.

**2. Background:** USACE completed technical reviews and sustainable validations on (10) Army Military Construction projects between FY17 and FY18, to validate compliance with the Army's Sustainable Design and Development (SDD) Policy, (ref. a). We have made improvements in a number of areas, such as incorporating sustainable acquisition requirements in technical specifications, and maximizing the incorporation of passive energy features in our designs. While performing a review of large military construction projects, a number of smaller renovation and repair projects were also reviewed and validated. It was noted that the renovation and repair projects missed opportunities to incorporate sustainable features, and sustainable products.

**3. Purpose:** This ECB is intended to highlight areas of missed opportunities in renovation and repair projects and to share these lessons learned for implementation on future projects. In addition, this ECB will highlight resources and case studies in the area of Deep Energy Retrofit Design Techniques, and to disseminate this information for review, study and consideration by the technical disciplines.

**4. Guidance:** USACE projects will implement sustainable requirements as outlined in UFC 1-200-02, HPSB to achieve a building design that achieves the highest-performing sustainable design within the project's Programmed Amount (PA). Apply high performing sustainable building principles to renovation project as follows:

- a. Implement sustainable requirements as outlined in UFC 1-200-02, HPSB. Sustainment, Renovation and Modernization (SRM) projects as required to meet sustainable requirements in accordance with the Compliance Thresholds outlined in Table 1-1.

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b. Tracking of HPSB Guiding Principles Compliance is required on SRM projects in an existing building larger than 5000 SF and with a cost greater than \$3M and 50% Estimated Replacement Cost (ERC).

c. Third Party Certification is required on Renovations in existing building larger than 5000 SF and with a cost greater than \$3M and 50% Estimated Replacement Cost (ERC).

d. Renovation Thresholds: SRM projects which fall below the thresholds identified above, may not require HPSB Guiding Principles Compliance/Tracking or Third Party Certification, but are still required to incorporate as many sustainable features within scope as practical to ensure the project helps the Army to, plan, program, design and build facilities that are cost effective and reduce energy consumption during the Operations and Maintenance Phase of life cycle facility management.

**5. Lessons Learned:** The lessons learned below were captured in recent SDD Validation Visits. The following are examples of missed opportunities to incorporate sustainable features into projects that were appropriate and within scope:

a. Lessons Learned: SDD Validation of a SRM Project: A HQs SRM Building had a very large Command and Control mission requirement within the facility. Energy Star rated LCD Monitors/Screens were not incorporated, and so therefore, the project missed an opportunity to reduce energy consumption for this area of the facility.

b. Lessons Learned: SDD Validation of a SRM Project: A Boathouse Renovation project missed opportunities to incorporate energy efficient products, Daylighting and Controls, as well as Exterior Lighting System and Controls.

c. Lessons Learned: SDD Validation of a SRM Project: Entry Gate Visitor Pass Building project included the addition of a Lobby Area, Bathroom and Break room. This small SRM project missed opportunities to incorporate materials with Recycled content and/or Bio-based content. These requirements were not clearly designated in the technical specifications/SOW and therefore missed an opportunity to reduce negative impacts on the environment.

**6. USACE Sustainable Design Program:** USACE has established a Sustainable Design Program public presence on the Whole Building Design Guide at the following location: (<https://www.wbdg.org/ffc/army-coe/sustainable-design-program>). A SDD Lessons Learned Checklist has been posted for use by design teams and summarizes lessons learned captured in the last two years of SDD Validation Visits. The Sustainable Design Lessons Learned Checklist is available at <https://www.wbdg.org/ffc/army-coe/sustainable-design-program/lessons-learned>. Also available are renovation case studies and best practices under the “Additional Resources” category.

**7. Renovation Project Resource Information:** [A Guide to Achieving Significant Energy Use Reduction with Major Renovation Projects](#). Mr. Alexander Zhivov is a major contributor to the development of the aforementioned document. This guide is available at: [https://www.wbdg.org/FFC/ARMYCOE/SDP/DER\\_Major\\_Renovations\\_Guide\\_2017-11-06.pdf](https://www.wbdg.org/FFC/ARMYCOE/SDP/DER_Major_Renovations_Guide_2017-11-06.pdf). This document represents the culmination of a detailed study of various technologies,

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when applied together (as a bundle), as demonstrated will reduce the total building site energy use by about 50% (including plug loads). Technical characteristics of these building envelope-related technologies grouped into a “core technologies bundle” have been studied through modeling and life cycle cost (LCC) analysis for representative national climate conditions and presented in the “Deep Energy Retrofit – A Guide to Achieving Significant Energy Use Reduction with Major Renovation Projects”. The Guide provides examples of “best practices” that illustrate optimal methods of applying these technologies in different construction situations.

8. **Update:** The guidance contain herein is current and reflects current criteria in the policy documents referenced (ref. a and ref. b).

9. **Points of Contact:** HQUSACE point of contact for this ECB is Zenovia Wilcox, CECW-EC, (202) 761-4829.

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