



Department of Defense Education Activity

ADMINISTRATIVE INSTRUCTION

NUMBER

DIVISION

SUBJECT: Sustainability and Energy Efficiency Program

References: See Enclosure 1.

1. **PURPOSE.** This Administrative Instruction establishes a Department of Defense Education Activity (DoDEA) Sustainability and Energy Efficiency Program in accordance with Sections 433 and 438 of Public Law 110-140, “Energy Independence and Security Act of 2007,” December 19, 2007 (Reference (a)), sections 109 and 203 of Public Law 109-58, “Energy Policy Act of 2005,” August 8, 2005 (Reference (b)), Executive Order 13423, “Strengthening Federal Environmental, Energy, and Transportation Management,” January 24, 2007 (Reference (c)), Executive Order 13514, “Leadership in Environmental, Energy, and Economic Performance,” October 5, 2009 (Reference (d)), “Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding,” January 24, 2006 (Reference (e)), U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED) for Schools Rating System, current edition (Reference (f)), subparts 436.1 through 436.24 of title 10, Code of Federal Regulations (Reference (g)), American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 62.1-2007, sections 4 through 7, Standard 55-2004, Standard 52.2-1999 (with errata but without addenda), Standard 90.1-2007 (with errata but without addenda) (Reference (h)), California Department of Health Services Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda (Reference (i)), Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, 2nd Edition 2007, SMACNA 008-2008 (Chapter 3), (Reference (j)), American National Standards Institute (ANSI) Standard S12.60-2002, Acoustical Performance Criteria, Design Requirements and Guidelines for Schools (Reference (k)), section 17094 of U.S. Code, Stormwater Runoff Requirements for Federal Development Projects (Reference (l)), U.S. Environmental Protection Agency’s (EPA) Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects of the Energy Independence and Security Act (Reference (m)), U.S. Department of Agriculture (USDA) Bio-based Affirmative Procurement Program (Reference (n)), National Institute of Building Sciences Guideline 3-2006 (Reference (o)), and in support of DoDEA’s commitment to provide students with a world-class education.

2. APPLICABILITY. This Administrative Instruction applies to

a. The Office of the Director, DoDEA; the Director, Domestic Dependent Elementary and Secondary Schools, and Department of Defense Dependents Schools, Cuba (DDESS/DoDDS-Cuba); the Director, Department of Defense Dependents Schools, Europe (DoDDS-E); the Director, Department of Defense Dependents Schools, Pacific, and Domestic Dependent Elementary and Secondary Schools, Guam (DoDDS-P/DDESS-Guam), (hereafter collectively referred to as “DoDEA Area Directors”).

b. Construction activities in the continental U.S., and, to the extent possible (i.e., with consideration for mission objectives and Host Nation Agreements), outside the continental U.S. (OCONUS).

c. The execution of all DoDEA military construction (MILCON) projects, sustainment, restoration and modernization (SRM) projects that include the replacement or improvement of building energy systems (including the building envelope, lighting, and heating, ventilation, and air conditioning (HVAC)) and minor construction projects that exceed 25 percent of the current replacement value and includes the replacement or improvement of building energy systems (including the building envelope, lighting, and HVAC).

d. All projects that have not issued a Parametric Design Charrette Report prior to the publication of this Administrative Instruction.

3. DEFINITIONS. See Glossary.

4. POLICY. It is DoDEA policy that facility construction programs are executed in a sustainable manner to foster academic growth and improve energy efficiency, in accordance with References (a) through (o).

5. RESPONSIBILITIES. See Enclosure 2.

6. PROCEDURES. See Enclosure 3.

7. EFFECTIVE DATE. This Administrative Instruction is effective immediately.

Marilee Fitzgerald
Director

Enclosures

1. References
2. Responsibilities
3. Procedures
4. Commissioning Plan Template, Building Shell Commissioning
5. DoDEA LEED Implementation Guide
6. DoDEA Owner's Project Requirements Template

Glossary

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ENCLOSURE 1

REFERENCES

- (a) Sections 433 and 438 of Public Law 110-140, “Energy Independence and Security Act of 2007,” December 19, 2007
- (b) Sections 109 and 203 of Public Law 109-58, “Energy Policy Act of 2005,” August 8, 2005
- (c) Executive Order 13423, “Strengthening Federal Environmental, Energy, and Transportation Management,” January 24, 2007
- (d) Executive Order 13514, “Leadership in Environmental, Energy, and Economic Performance,” October 5, 2009
- (e) “Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding,” January 24, 2006
- (f) U.S. Green Building Council’s LEED for Schools Rating System, current edition
- (g) Subparts 436.1 through 436.24 of title 10, Code of Federal Regulations
- (h) ASHRAE Standard 62.1-2007, sections 4 through 7, Standard 55-2004, Standard 52.2-1999 (with errata but without addenda), Standard 90.1-2007 (with errata but without addenda)
- (i) California Department of Health Services Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers (including 2004 Addenda)
- (j) SMACNA IAQ Guidelines for Occupied Buildings under Construction, 2nd Edition 2007, SMACNA 008-2008 (Chapter 3)
- (k) American National Standards Institute (ANSI) Standard S12.60-2002, Acoustical Performance Criteria, Design Requirements and Guidelines for Schools
- (l) Section 17094 of U.S. Code, Storm Water Runoff Requirements for Federal Development Projects
- (m) U.S. EPA’s Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects of the Energy Independence and Security Act
- (n) U.S.D.A. Bio-based Affirmative Procurement Program
- (o) National Institute of Building Sciences Guideline 3-2006

ENCLOSURE 2

RESPONSIBILITIES

1. DIRECTOR, DODEA. The Director, DoDEA, shall:

- a. Provide support to achieve compliance with the provisions of this Administrative Instruction and References (a) through (o).
- b. Appoint Sustainability and Energy Efficiency Program Manager, DoDEA, with designated oversight of the development, application, and accountability for policies, procedures, and standards pertaining to sustainability and energy efficiency.

2. ASSOCIATE DIRECTOR FOR FINANCE AND BUSINESS OPERATIONS (AD (F&BO)), DODEA. The AD (F&BO), DoDEA, shall:

- a. Promote and enforce sustainability and energy efficiency management practices within DoDEA.
- b. Ensure that the Sustainability and Energy Efficiency Program Manager, DoDEA, is accredited (LEED Accredited Professional, Building Design & Construction or Operations & Maintenance) through the Green Building Certification Institute (GBCI), or seeking accreditation, and provide overall management and oversight of the DoDEA Sustainability and Energy Efficiency Program.

3. SUSTAINABILITY AND ENERGY EFFICIENCY PROGRAM MANAGER (SEEPM), DODEA. The SEEPM, DoDEA, shall:

- a. Provide oversight for the development, application, and accountability for policies, procedures, and standards pertaining to the Sustainability and Energy Efficiency Program.
- b. Provide assistance to the architect/engineer (A/E) with registering projects with GBCI and tracking design credits through the completion of 100% design.
- c. Provide assistance to the construction contractor with the transfer of project administration from the A/E and tracking construction credits through the completion of the project.
- d. Support the DoDEA Area Offices in defining and achieving sustainability and energy efficiency goals.
- e. Review projects for compliance prior to GBCI design application and construction application.

f. Review DoDDS-P/DDESS-Guam project documentation for compliance with LEED Silver standards if actual certification is not pursued.

g. Register facilities with EnergyStar Portfolio Manager.

AREA DIRECTORS, DODEA. The DoDEA Area Directors shall:

a. Promote and enforce sustainability and energy efficiency practices in accordance with this Administrative Instruction.

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ENCLOSURE 3

PROCEDURES

1. GENERAL GUIDANCE. This Administrative Instruction outlines goals and responsibilities for the DoDEA Sustainability and Energy Efficiency Program to ensure compliance with DoDEA standards and Federal mandates.

2. REPORTING

a. Projects shall be registered with GBCI by the A/E no later than 35% concept design using the current LEED for Schools Rating System.

b. The A/E shall be responsible for uploading the pertinent information required for design credits by GBCI to LEED Online. At completion of the 100% design, with approval of the SEEPM, the A/E shall submit the project's design application to GBCI. All comments from GBCI shall be addressed by the A/E.

c. The A/E shall transfer LEED project team administration to the construction contractor upon completion of GBCI design review and approval of the SEEPM after construction contract award. The construction contractor shall be responsible for uploading the pertinent information required for construction credits by GBCI to LEED Online. No later than the beneficial occupancy date (BOD), with approval of the SEEPM, the construction contractor shall submit the project's construction application to GBCI. All comments from GBCI shall be addressed by the construction contractor.

d. The A/E and construction contractor must apply for and receive project certification at no less than a LEED Silver level under GBCI's most applicable current LEED rating system, or apply for a comparable rating under no less than an equivalent green building rating system, so long as a third party provides such rating.

e. DoDDS-P/DDESS-Guam projects shall be designed and constructed to LEED Silver standards at a minimum, including completing all documentation required by GBCI. The SEEPM DoDEA shall review documentation for compliance if actual certification is not pursued.

3. IMPLEMENTATION STRATEGIES. Exceptions to this Administrative Instruction require written approval from DoDEA Headquarters. The A/E, unless specifically exempted, shall perform life cycle cost analysis (LCCA) that conforms to References (a) and (g). The LCCA shall be documented as part of the basis of design. If it is determined that a requirement is not life cycle cost effective, then the highest level of cost effectiveness that is feasible for that

requirement will be accomplished based upon an LCCA for less than full compliance as determined by the A/E and approved by the SEEPM.

a. Enhancing the Learning Environment

(1) Indoor Environmental Quality Standards

(a) Meet the minimum requirements of Sections 4 through 7 of ASHRAE Standard 62.1-2007, Ventilation for Acceptable Indoor Air Quality (with errata but without addenda). Project teams wishing to use ASHRAE approved addenda may do so at their discretion.

(b) Design HVAC systems and the building envelope to meet the requirements of ASHRAE Standard 55-2004, Thermal Environmental Conditions for Human Occupancy (with errata but without addenda). Demonstrate design compliance in accordance with the Section 6.1.1.

(2) Moisture Control. Implement a shell commissioning plan as a strategy for controlling moisture, air flows, and condensation to prevent building damage and mold contamination. See Enclosure 4.

(3) Daylighting. Classroom spaces are to be provided with adequate, evenly distributed natural light to enhance the learning environment and reduce the need for electrical lighting. For new construction, demonstrate through computer simulations that 75 percent of classroom spaces achieve daylight illuminance levels of a minimum 25 footcandles (FC) and a maximum of 200 fc in a clear sky condition on September 21 at 9 a.m. and 3 p.m. Controls shall be provided to prevent contrast ratios from exceeding Illuminating Engineering Society recommendations.

(4) Low-Emitting Materials

(a) All paints and coatings, adhesives and sealants, flooring elements, composite wood and agrifiber products, gypsum board, insulation, acoustical ceiling systems and wall coverings installed in the building interior (defined as inside the weatherproofing system and applied on-site) must meet the testing and product requirements of the California Department of Health Services Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda. For OCONUS projects where a source is not ascertainable, comply with the above standard requirement to the highest level that is feasible.

(b) Mineral-based finish flooring products such as tile, masonry, terrazzo, and cut stone without integral organic-based coatings and sealants and unfinished/untreated solid wood flooring qualify without any indoor air quality (IAQ) testing requirements.

(c) Furniture must be GREENGUARD Children and Schools certified or comply with a comparable third party rating system. For projects where a source is not ascertainable, comply with the above standard requirement to the highest level that is feasible.

(5) Smoking Policy. Provide signage prohibiting smoking on school property.

(6) Indoor Chemical Pollutant Source Control

(a) Employ permanent entryway systems (includes permanently installed grates, grills and slotted systems that allow for cleaning underneath) at least 10 feet long in the primary direction of travel to capture dirt and particulates entering the building at regularly used exterior entrances.

(b) Sufficiently exhaust each space where hazardous gases or chemicals may be present or used (e.g. garages, housekeeping and laundry areas and copying and printing rooms) to create negative pressure with respect to adjacent spaces when the doors to the room are closed. For each of these spaces, provide self-closing doors and deck-to-deck partitions or a hard-lid ceiling. The exhaust rate must be at least 0.50 cubic feet per minute (cfm) per square foot, with no air recirculation. The pressure differential with the surrounding spaces must be at least 5 Pascals (0.02 inches of water gauge) on average and 1 Pascal (0.004 inches of water) at a minimum when the doors to the rooms are closed.

(7) Air Filtration

(a) Outside air ventilation systems shall be provided with particle filters or air cleaning devices to clean the outdoor air at any location prior to its introduction to occupied spaces. These filters or devices shall be rated a minimum efficiency reporting value (MERV) of 13 or higher in accordance with ASHRAE Standard 52.2-1999 (with errata but without addenda).

(b) Clean air filtration media shall be installed in all air systems after completion of construction and prior to occupancy.

(8) Protect Indoor Air Quality During Construction

(a) During construction meet or exceed the recommended control measures of the SMACNA IAQ Guidelines for Occupied Buildings under Construction, 2nd Edition 2007, SMACNA 008-2008 (Chapter 3).

(b) Protect stored on-site and installed absorptive materials from moisture damage.

(c) If permanently installed air handlers are used during construction, filtration media with a MERV of 8 must be used at each return air grille, as determined by ASHRAE Standard 52.2-1999 (with errata but without addenda). Replace all filtration media immediately prior to occupancy.

(d) Prohibit smoking inside the building and within 25 feet of building entrances once the building is closed in.

(9) Lighting Control. Provide a high level of lighting control in classrooms and offices to meet the needs of the occupants. At a minimum, classrooms will be provided with lighting modes to accommodate general illumination, day lighting, and audio/video equipment.

(10) Acoustical Performance Requirements

(a) Design the building shell, classroom partitions and other core learning space partitions to meet the Sound Transmission Class (STC) requirements of ANSI Standard S12.60-2002, Acoustical Performance Criteria, Design Requirements and Guidelines for Schools, except windows, which must meet an STC rating of at least 35.

(b) Reduce background noise level to 40 A-weighted decibels or less from HVAC systems in classrooms and other core learning spaces.

(11) School Buildings as Teaching Tools. The facility shall be evaluated for opportunities to serve as a teaching tool, highlighting technologies and design concepts applicable to academic programs.

b. Optimizing Energy Performance

(1) Energy Efficiency. MILCON projects shall demonstrate a minimum 40 percent improvement in the proposed building performance rating compared with the baseline building performance rating; a 50 percent improvement is encouraged. For SRM projects and minor construction projects that exceed 25 percent of the current replacement value of the total building and include the replacement or improvement of building energy systems, (including the building envelope, lighting, and HVAC) demonstrate a minimum 26 percent improvement in the proposed building performance rating compared with the baseline building performance rating. Calculate the baseline building performance according to Appendix G of ASHRAE Standard 90.1-2007 (with errata but without addenda) using a computer simulation model for the whole building project. Provide the Energy Star Target Finder score for the proposed building.

(2) Roofing. In climate zone 1-5 (published by the U.S. Department of Energy), use roofing materials with a solar reflectance index equal to or greater than 78 for low slope roof ($\leq 2:12$) and 29 for steep sloped roof ($\geq 2:12$) for a minimum of 75 percent of the roof surface. As an alternative, with the approval of the installation, a vegetated green roof may be installed.

(3) On-site Renewable Energy

(a) At a minimum, the facility will incorporate an on-site renewable energy component that will be highlighted as a teaching tool (e.g., wind power, photovoltaic).

(b) Use on-site renewable energy systems to offset building energy costs. Renewable energy shall account for 5 percent of the total facility energy cost, 13 percent is encouraged. The building annual energy cost calculated to document compliance with the energy efficiency requirement shall determine the estimated electricity use.

(c) Not less than 30 percent of the hot water demand shall be met by use of solar hot water heaters.

(4) Commissioning

(a) A third party independent commissioning authority (CxA) shall lead, review, and oversee the completion of all commissioning process activities.

(b) The commissioning (Cx) process activities must, at a minimum, be completed for the following energy related systems:

1. Heating, ventilating, air conditioning and refrigeration (HVAC&R) systems (mechanical and passive) and associated controls.
2. Lighting and daylighting controls.
3. Domestic hot water systems.
4. Renewable energy systems (e.g., wind, solar).
5. Building shell.
6. Energy metering systems

(c) The CxA shall:

1. Have documented commissioning authority experience in at least two schools or higher education building projects and 5 years experience.
2. Be independent of the work of design and construction.
3. Not be an employee of the A/E, though may be contracted through the A/E.
4. Not be an employee of, or contracted through, a contractor or construction manager holding constructor contracts.
5. Report results, findings and recommendations directly to the DoDEA Area Office Project Manager (AOPM) and the construction agent project manager (CAPM).
6. Develop and implement a commissioning plan.
7. Develop and incorporate commissioning requirements into the construction documents.

8. Conduct, at a minimum, one commissioning design review of the owner's project requirements (OPR), basis of design, and design documents no later than 35% concept design and back-check the review comments in the subsequent design submission.
9. Review contractor construction submittals applicable to systems being commissioned for compliance with the OPR and basis of design. This review must be concurrent with the review of the architect or engineer of record and submitted to the design team and the owner.
10. Verify the installation and performance of the systems to be commissioned.
11. Complete a summary commissioning report.
12. Be involved in reviewing the operation of the building with the Facility Manager responsible for operations and maintenance (O&M) and occupants within ten months after BOD. A plan for resolving outstanding commissioning-related issues must be included.

(d) The AOPM and CAPM shall document the OPR. The A/E shall develop the basis of design. The CxA must review these documents for clarity and completeness. The CxA shall be responsible for updates to the OPR. The A/E shall be responsible for updates to the basis of design.

(5) Monitoring Results

- (a) Install building level utility meters.
- (b) Provide, at a minimum, sub-metering for kitchens, HVAC, domestic hot water, elevators and lighting.
- (c) The SEEPM shall register the facility with Energy Star Portfolio Manager
- (d) The Facility Manager shall work with the SEEPM, and CxA to measure and review the actual utility usage of the building and key end uses for a minimum of one year of post-construction occupancy.

c. Conserving and Protecting Water

(1) Water Use Reduction. Employ strategies that in aggregate use a minimum 30 percent less water than the water use baseline calculated for the building (not including irrigation), a 40 percent reduction is encouraged. Calculate the baseline in accordance with the current LEED for Schools Rating System.

(2) Water Efficient Landscaping. Use only captured rainwater, recycled wastewater, recycled graywater or water treated and conveyed by a public agency specifically for non-potable uses for irrigation. As an alternative, install landscaping that does not require permanent

irrigation systems. Temporary irrigation systems used for plant establishment are allowed only if removed within a period not to exceed 18 months of installation.

(3) Construction Activity Pollution Prevention. Create and implement an erosion and sedimentation control plan for all construction activities associated with the project. The plan must conform to the erosion and sedimentation requirements of the 2003 EPA Construction General Permit OR local standards and codes, whichever is more stringent.

(4) Stormwater Control. Projects shall comply with 42 U.S. Code 17094, when applicable, using DoD policy on implementation of Reference (I), and consistent with the US EPA's Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects of the Energy Independence and Security Act.

d. Reducing the Environmental Impact of Materials

(1) Storage and Collection of Recyclables. Provide an easily-accessible dedicated area for the collection and storage of materials for recycling for the entire building. Materials must include at a minimum paper, corrugated cardboard, glass, plastics and metals.

(2) Recycled Content. For EPA-designated products, specify products meeting or exceeding EPA's recycled content recommendations (reference the EPA Comprehensive Procurement Guidelines). For other products specify materials with recycled content when practicable. It is encouraged to use materials with recycled content such that the sum of postconsumer recycled content plus 1/2 of the pre-consumer content constitutes at least 10 percent based on cost (excludes material outside specification division 3-10 of CSI's 1995 Masterformat), of the total value of the materials in the project.

(3) USDA-designated products. Specify products with the highest content level per USDA bio-based content recommendations products meeting or exceeding USDA's bio-based content recommendations (reference the USDA Biobased Affirmative Procurement Program). For other products, specify bio-based products made from rapidly renewable resources and certified sustainable wood products. If these designated products meet performance requirements and are available at a reasonable cost, a preference for purchasing them shall be included in solicitations.

(4) Construction Waste Management. Recycle and/or salvage nonhazardous construction and demolition debris. Develop and implement a construction waste management plan that, at a minimum, identifies the materials to be diverted from disposal and whether the materials will be sorted on-site or comingled. Excavated soil and land-clearing debris do not contribute. Calculations can be done by weight or volume, but must be consistent throughout. The minimum percentage debris to be recycled or salvaged is 50 percent.

(5) Ozone Depleting Compounds. Zero use of chlorofluorocarbon (CFC)-based refrigerants in new base building HVAC&R systems. When reusing existing base building HVAC equipment, complete a comprehensive CFC phase-out conversion prior to project

completion. Phase-out plans extending beyond the project completion date will be considered on their merits.

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ENCLOSURE 4

COMMISSIONING PLAN TEMPLATE, BUILDING SHELL COMMISSIONING

Project Name
Installation

COMMISSIONING PLAN TEMPLATE
BUILDING SHELL COMMISSIONING

Model Template

Date

Prepared by:
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1.0 Overview

1.1 Introduction

The following document presents the Building Shell Commissioning Plan for the [Project Name] at [Installation]. Shell Commissioning (Cx) is a systematic process of ensuring that building exterior enclosure systems are designed, installed and perform in accordance with the Owner's Project Requirements (OPR) as represented in the basis of design documents, design plans and specifications. This plan has been developed to support the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) Green Building Rating System requirements for ID Credit: Building Shell Commissioning. It is designed to complement but not replace other Department of Defense (DoD) commissioning requirements for HVAC and other systems and the requirements for High Performance Building Standards as stipulated in the Project specifications. Compliance with National Institute of Building Sciences (NIBS) Guideline 3-2006 will serve as the minimum standard. This plan is an additional project activity beyond those specified in the standard Building Commissioning Plan which focuses on the testing, measurement, verification, and on-going optimal operational requirements of the building's mechanical systems. Instead, Shell Commissioning focuses on the testing and verification of the performance of the building systems related to the building shell identified in Section 1.2 below.

For this project, [enter name of commissioning authority] (CxA) will act in concert with [enter name of building contractor] (General Contractor) and [enter name of A/E] (A/E) to perform commissioning services for the Project.

1.2 Purpose and Scope

The Building Shell Commissioning Plan outlines the commissioning scope, commissioning roles and responsibilities, commissioning team members, acceptance/verification procedures, and documentation required. The Building Shell Commissioning Plan is intended to be a working document and is to be updated as design and construction progresses.

The Building Shell Commissioning Plan does not provide a detailed explanation of required testing procedures. The detailed testing requirements and procedures are found in the Project Specifications related to High Performance Building Standards.

Shell Commissioning is a systematic process of ensuring that the building shell components and systems perform interactively according to the design intent and the Government's specifications. This is achieved by beginning in the design phase, documenting the design intent and continuing through construction, acceptance and the warranty period with actual verification of performance.

The shell commissioning of the Project is achieved by developing and implementing the shell commissioning process specific to this project with respect to the shell commissioning activities and requirements outlined in the Project's Plans, Specifications, the U.S. Green Building Council's LEED Rating System for New Construction Reference Guide and NIBS Guideline 3-

2006. To define the shell commissioning process, the Commissioning Team (see section 2.2) develops a shell commissioning plan to provide direction for tasks during the design and construction and for additional testing requirements. The plan focuses on providing support to the specifications and provides forms for the application of the commissioning process.

Building Shell Commissioning of this Project is intended to achieve the following:

- Verify commissioning requirements are incorporated in the construction documents with an emphasis on rain penetration control, durability, constructability, maintainability, and sustainability.
- Verify the design intent is met and the level of water and air tightness of the exterior enclosure is as specified in the OPR
- Verify that applicable components and systems are installed properly in accordance with design documents, basis of design report and OPR
- Integrate various sub-systems and major systems that are dependent on each other.
- Verify that applicable components and systems receive adequate checkout by installing Contractors.
- Verify and document proper performance of components and systems.
- Verify manufacturers' and contractor's warranties meet requirements as outlined in the specification and contracts documentation.
- Ensure that all as-built documentation is complete and accurate.
- Verify that O&M documentation left on site is complete.
- Verify that the Government's operating personnel are adequately trained.

1.3 Commissioning Process Overview

The Shell Commissioning of the Project will entail the following activities:

Construction Phase Commissioning Activities:

- Commissioning Plan Development
- Functional Installation Verification Sheet Development
- Submittals Review to validate that the performance parameters for each exterior enclosure system meet the OPR
- Functional Performance Testing Development. Air barrier testing is a minimum, additional testing could include: thermal imaging of the constructed building to identify

thermal leakage, water infiltration testing to identify leakage and prevent issues, and any additional testing as identified per specific building envelope systems.

- On-Site Progress Observations, especially during roof transition/roof termination installations, initial installations of sealants and the specific project interfacing conditions (below grade waterproofing, differing material interfaces and fenestration expansion joints, etc).
- Identification of Issues, Updating and Resolution
- Field Testing and Component Verification
- Training Review and Observations

Turnover Phase Commissioning Activities:

- O&M Manuals Review/Organize.
- Development of a systems manual for each major building exterior enclosure system, including but not limited to: roof, exterior walls, windows, doors, sealants, expansion joints, control joints and flashings
- Project Warranty Letter Review
- Final Commissioning Report-
 - Submittals and Data Sheets
 - Specifications
 - Commissioning and Project Testing Reports

1.4 Forms

Forms will be developed by the CxA team in accordance with the construction schedule. Forms will be reviewed by all members of the commissioning team for their input/comments, prior to implementation. As forms are developed and approved, they will be added to Appendix 1.0 of the commissioning plan. Examples of commissioning forms to be included in Appendix 1.0 include the following:

- Site Inspection Forms- CxA team will conduct site inspections dictated by construction schedule for verification by CxA team that systems are installed in accordance with plans, specifications, manufacturers requirements and shop drawings.
- Miscellaneous Test Verification Forms- CxA team will document tests required by the specifications and conducted by the responsible contractor. For example, air barrier pressure test.

2.0 Project and Contact Information

2.1 General Information

Project Name: [Begin project name with DoDEA followed by the project title from the project DD Form 1391. Contact the DoDEA Project Manager for this information]

Location: [Provide the information that best describes the location of the school on the installation]

Building Type: School

Construction Period: [From DD Form 1391]

2.2 Commissioning Team Members

The CxA shall review and oversee the shell commissioning process. The successful commissioning of the building shell requires the participation from many team members throughout the design and construction of a project. Table 1: Commissioning Team Roster – Owner and Design Team Representatives, contains the listing of team members and contact information for this Project representing the interests of the owner and designer. Table 2: Commissioning Team Roster –Builder’s Team Representatives contains the listing of team members and contact information for this Project representing the interests of the builder’s team.

Table 1: Commissioning Team Roster – Owner and Design Team Representatives

Team Member	Organization and Contact Name	Phone Number and E-Mail Address
Government Team- Construction Agent Project Manager	[enter name of organization] [enter name of POC]	[enter phone number] [enter e-mail address]
Government Team- Area Construction Engineer	[enter name of organization] [enter name of POC]	[enter phone number] [enter e-mail address]
Government Team- Installation Representative (Owner)	[enter name of organization] [enter name of POC]	[enter phone number] [enter e-mail address]
Government Team- Tenant Representative	[enter name or unit] [enter name of POC]	[enter phone number] [enter e-mail address]
Government Team- Contracting Officer	[enter name or unit] [enter name of POC]	[enter phone number] [enter e-mail address]
Design Team – Project Manager	[enter name of organization] [enter name of POC]	[enter phone number] [enter e-mail address]
Design Team – Architect/Design Team Lead	[enter name of organization] [enter name of POC]	[enter phone number] [enter e-mail address]
Design Team - LEED Accredited Professional	[enter name of company] [enter name of POC]	[enter phone number] [enter e-mail address]

Table 2: Commissioning Team Roster –Builder’s Team Representatives

Team Member	Organization and Contact Name	Phone Number and E-Mail Address
General Contractor Team - Project Manager	[enter name of company] [enter name of POC]	[enter phone number] [enter e-mail address]
General Contractor Team - Site Supervisor	[enter name of company] [enter name of POC]	[enter phone number] [enter e-mail address]
General Contractor Team - Quality Control Supervisor	[enter name of company] [enter name of POC]	[enter phone number] [enter e-mail address]
General Contractor Team - LEED Accredited Professional	[enter name of company] [enter name of POC]	[enter phone number] [enter e-mail address]

3.0 Commissioning Team Roles and Responsibilities

Commissioning Team Roles and Responsibilities presents an overview summary of roles and responsibilities of those team members with direct responsibility for commissioning activities.

3.1 Commissioning Authority

- 1) Oversee activities defined in the commissioning plan, thereby ensuring implementation of the overall quality control process.
- 2) Function as a catalyst and initiator to disseminate information and assist the design and construction teams in the completion of the commissioning process. This shall include construction observation, spot testing, verification and functional performance testing, and provide information to the responsible parties, e.g. contractors, design professionals, and the owner.

3.2 Government Team – Installation Representative (Owner)

- 1) Assign maintenance personnel and schedule them to participate in meetings, training sessions and inspections as follows:
 - a) Maintenance orientation and inspection
 - b) Owner’s training session
 - c) Final review at acceptance meeting
- 2) Provide utilities required for the commissioning process.

3.3 Government Team – Construction Agent Project Manager

- 1) Provide shop drawing and submittal review to determine conformity with the requirements and intent.
- 2) Review the developed testing documentation to ensure compliance with the design requirements.
- 3) Provide analysis of test results in terms of compliance and non-compliance to contract requirements.
- 4) Review and comment on the final commissioning report.

3.4 Design Team – Engineering Discipline Leads

- 1) Develop project specific design checklist for building shell commissioning.
- 2) Provide clarification and interpretation of the construction documents as it relates to the building shell.
- 3) Specify project performance verification tests.
- 4) Advise on changes to construction contract and design intent that may impact on the building shell upon request.

3.5 General Contractor Team – Quality Control Representatives

- 1) Develop project specific construction checklist for building shell commissioning.
 - 2) Review the design documents for their affect on the commissioning process and the final performance of the commissioned systems.
 - 3) Be responsible for coordinating all of the efforts and be responsible for seeing that all appropriate actions are taken to have the work performed in accordance with the commissioning plan.
 - 4) Participate in commissioning meetings.
 - 5) Review as-built records as required by contract documentation and turn them over to appropriate representatives of the contracting team.
- 1) Review all submittals.
 - 2) Develop project specific component/field verification sheets.

- 3) Submit verification test data for review to the CxA and construction agent project manager for review and acceptance.

4.0 Commissioning Deliverables

4.1 Key Commissioning Authority Deliverables

- 1) Review of Basis of Design and OPR.
- 2) Review of design documents and commissioning report.
- 3) Review Commissioning Plan.
- 4) Review building shell checklist forms.

4.2 Commissioning Report

A final Commissioning report by CxA team will be provided to Government. The report shall include the following sections:

- 1) Executive summary
- 2) Evaluation of the operating condition of the facility
- 3) Deficiencies that were discovered and the measures taken to correct them
- 4) Uncorrected deficiencies that were accepted by the owner
- 5) Test sheets
- 6) Reports that documented all field commissioning activities as they progress.
- 7) Approved As-built drawings
- 8) Operations and Maintenance manuals

ENCLOSURE 5

DODEA LEED IMPLEMENTATION GUIDE

1. GENERAL GUIDANCE. The following is an outline of procedures to aid in the implementation of LEED for DoDEA projects. It is not a complete list of all steps required to achieve certification. Certification requires an integrated design and construction approach with an emphasis on communication between stakeholders and documentation of LEED and project requirements. LEED is used as a third party verification tool to track DoDEA's achievement of goals and objectives.

Although they are similar to LEED, Federal and DoD sustainable design mandates are separate standalone requirements. Meeting the LEED requirements does not in itself constitute compliance with federal and DoD sustainable design mandates. The A/E and construction contractor shall first address compliance with these separate standalone federal and DoD requirements and then select LEED credits that contribute to compliance.

2. IMPLEMENTATION.

a. DD Form 1391.

(1) Establish the project sustainability and performance goals and address budget impacts.

(2) Develop the initial Owner's Project Requirements (OPR) document using guidance provided in Enclosure 6.

(3) Develop the initial LEED Project Checklist.

b. Parametric Design Charrette (Code 3) Report.

(1) OPR – Review and incorporate the OPR developed for the DD Form 1391. Refine the OPR as necessary with formal endorsement from the Installation, the DoDEA Design Center, SEEPM, and the AOPM.

(2) LEED Project Checklist - refine and/or validate the target sustainability credit goals for the project as identified in the DD Form 1391 and update the LEED Project Checklist accordingly.

(3) The CAPM will coordinate formal endorsement and filing of the endorsed LEED Project Checklist and OPR. The updated LEED Project Checklist will be endorsed by the Installation, the DoDEA Design Center, the SEEPM, the User and the AOPM.

c. RFP Development.

(1) Include completed OPR document and LEED Project Checklist.

(2) Indicate post-award LEED submittal and documentation requirements. Include and require compliance with the applicable LEED-NC Submittals document. Include monthly updates to the LEED documents.

(3) Require the A/E and construction contractor to provide a LEED AP assigned to the project through closeout.

(4) Require a Technical proposal that includes the LEED Project Checklist indicating proposed credits to be claimed.

(5) The CAPM will coordinate formal endorsement and filing of the endorsed LEED Project Checklist and OPR. The LEED Project Checklist representing the project current rating resulting from the conformed proposal will be endorsed by the Installation, the DoDEA Design Center, the SEEPM, the A/E, and the AOPM.

d. Registration Procedure - Project registration occurs no later than 35% concept design by the A/E. Projects should be registered before design commences so that the templates are available to the design team from the start of design.

(1) Select the appropriate rating system for the project.

(2) Verify the project meets the LEED Minimum Project Requirements. If so select YES, if not notify the SEEPM.

(3) Project Information Section:

(a) Project Title: Begin project name with DoDEA followed by the project title from the project DD Form 1391. Contact the DoDEA Project Manager for this information.

(b) Address 1 and 2: Provide the information that best describes the location of the school on the installation.

(c) City: Provide name of installation.

(d) County, State / Province, Country, Zip / Postal Code: Provide as known.

(e) School District: Select one of the following: DoDEA Americas, DoDEA Europe, or DoDEA Pacific.

(f) Anticipated Construction Start and End Dates: From DD Form 1391.

(g) Gross Square Footage: Provide total building area from DD Form 1391. Exclude area of any buildings that are exempt from the LEED achievement requirements.

(h) Is Project Confidential: Indicate NO except if project has security sensitivity.

- (i) Notification of Local Chapter: NO.
- (j) Anticipated Project Type: Provide as known.
- (k) Anticipated Certification Level: Silver minimum.
- (l) Project Owner POC: The DoDEA Sustainability and Energy Efficiency Program Manager shall act as owner; contact the DoDEA Project Manager for this information.
- (m) Owner Organization: DoDEA.
- (n) Owner Type: Government use: Federal.

e. Design.

(1) Design Charrette. A conference will be held and the conference agenda will include discussion of LEED roles and responsibilities, goals and compliance requirements, coordination issues including assignment of LEED Online team memberships for the construction agent, DoDEA Design Center, SEEPM and installation representatives for review purposes, discussion of possible problem areas, and review of documentation requirements. Meeting attendees will include CAPM, AOPM, DoDEA Design Center PM, SEEPM, User and Installation Representative(s) including planning and maintenance staff, all designers of record, and the design team, including LEED APs. For design/build projects include the construction team, including the assigned project LEED APs.

(2) Design Documents. LEED credit requirements will be incorporated into drawings and specifications, including all required construction phase documentation (as defined in LEED Submittals document).

(3) LEED Supporting Documentation. Each design submittal will include the LEED Project Checklist identifying all credits claimed. Final design submittal for each portion of the work will include all required design documentation (as defined in LEED Submittals document) for that portion of the work (example - all site credit design documentation with final site design). All design documentation will be uploaded to LEED Online when final design is submitted.

(4) The CAPM will coordinate formal endorsement and filing of the endorsed LEED Project Checklist and OPR. The LEED Project Checklist representing the project current rating resulting from the final design will be endorsed by the Installation, the DoDEA Design Center, the SEEPM, the A/E and AOPM.

(5) Design Phase Certification - Projects will be required to submit a design application to LEED online to establish the design score. Throughout the certification process the Designer of Record shall be required to answer questions from the GBCI review team and must remain available to support the certification process to achieve certification.

(6) Transfer to construction contractor. After the LEED Design Submittal has been completed and the construction contract has been awarded, the A/E shall transfer LEED administrative privileges to the construction contractor so that contractor can complete the construction credit documentation and project certification.

f. Construction.

(1) Preconstruction Conference. A conference will be held and the conference agenda will include discussion of roles and responsibilities, goals and compliance requirements, coordination issues including assignment of LEED Online team memberships for the construction agent and installation representatives for review purposes, discussion of possible problem areas, and review of documentation requirements relating to LEED. Meeting attendees will include designer of record, all project-assigned LEED APs, construction contractor, AOPM, CAPM, SEEPM, construction staff and Installation Representative(s) including maintenance personnel.

(2) LEED-Supporting Documentation. The construction contractor will update the LEED Online documentation on at least a monthly basis. Monthly review of LEED documentation by Construction Agent staff is required and progress payments will be coordinated with this review. The Construction Agent staff, SEEPM and Installation will review the LEED supporting documentation and may request additional audit documentation where deemed necessary.

(3) Contractor Non-compliance. DoDEA's options for non-compliance to influence the construction contractor's behavior include interim unsatisfactory performance evaluation, withholding of progress payments and lastly, termination for default and re-procurement.

(4) Certification - Certification is applied for no later than the BOD. Financial closeout of contracts that require certification cannot occur until certification ruling is obtained. GBCI does not require that post-occupancy credit activities be complete at the time of certification request but contract requirements must be completed prior to project financial closeout. Throughout the certification process the construction contractor shall be required to answer questions from the GBCI Review Team and must remain available to support the certification process to achieve certification.

g. Government Validation. All projects produce LEED documentation as part of project development and execution, using project funds. The CAPM is responsible for reviewing the project documentation and validating that all credits are correctly interpreted and documented in accordance with the LEED standard, from design through construction closeout. This is required on all projects, including those that will be formally LEED certified by GBCI. DoDEA expects the CAPM to review and validate LEED compliance as part of Design and Construction Agent activities. The CAPM is responsible at all project phases for ensuring that Government Validation by qualified individuals (LEED AP as well as appropriate engineering disciplines) occurs. Validation of design credits is part of design independent technical review/conformance review. Validation of construction credits is part of construction Supervision and Administration

(S&A) activities. Government Validation of projects may include audit of any or all credits claimed and request for additional information at the SEPM's discretion. The Designer of Record and construction contractor will compile all backup supporting data for all LEED credits claimed but are not required to submit additional information unless requested.

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ENCLOSURE 6DODEA OWNER'S PROJECT REQUIREMENTS TEMPLATE

1. GENERAL GUIDANCE. The Owner's Project Requirements (OPR) is a written document that details the ideas, concepts and criteria that are determined by the owner to be important to the success of the project. It provides the design team and commissioning authority (CxA) a "road map" for the development of a successful design and enables them to verify the needs have been addressed in the construction documents. The OPR shall be created by the AOPM for the DD Form 1391. The OPR needs to be updated at each major design milestone and approved by the [Installation/User/Government]. It shall be the responsibility of the CAPM to update the document at the Parametric Design Charrette. It shall be included in the RFP. Upon selection of a CxA, the CxA shall assume responsibility for implementing, refining, and augmenting the OPR throughout design, construction, and the post occupancy period of one year following substantial completion.

2. GENERAL PROJECT DESCRIPTION.

a. Purpose. The purpose of this project is to provide [new school facilities] to educate [elementary/middle/high] school students. The facility will be approximately [00,000] square feet in size and is designed to serve a student population of [000] students and a staffing compliment of [00] instructors and [00] other staff members. This facility is intended to be a 21st Century Education Facility.

b. History. This project is a [design/bid/build, design/build] delivery project consistent with design standards, specifications and project delivery methods developed and executed for [DDESS/DoDDS-Cuba/DoDDS-E/DoDDS-P/DoDDS-Guam] standard facilities. The DoDEA (Department of Defense Education Activity) Design Center is the subject matter expert for the owner. The [USACE/NAVFAC] [Regional] District is the construction agent for the owner.

c. Program. The [elementary/middle/high] school shall be designed to accommodate students from [prekindergarten level through twelfth grade]. DoDEA Education Facilities (EdSpecs) form the basis for planning and construction for the Department of Defense school facilities and are applicable to this project.

d. Facility Schedule

(1) Typical school week hours of operation (M-F):

(2) Typical weekend hours of operation:

(3) After school activities and special events days and hours:

e. Restrictions and Limitations

(1) Installation restrictions (Installation Master Plan):

(2) Standoff distance:

(3) Utility issues:

(4) Easements, right of ways:

(5) Access limitation:

(6) Height restrictions:

f. Owner/User Project Requirements

(1) This project shall achieve a minimum Silver rating in accordance with US Green Building Council's LEED ® rating system.

(2) Owner Directives – the following are specific requests:

(a) Use [___ controls manufacturer to maintain existing system communication, permeable paving]

(b) Do not use [carpet, furniture without GREENGUARD certification]

(3) Community Requirements – [schools to be designed for afterhours access to gymnasium]

(4) Adaptability/expansion - [No future expansion is planned for this facility/Future expansion is planned for this facility as follows:]

(5) Seismic

(6) Safety and Security

(7) Aesthetics- installation master plan considerations

(8) Access to Technology and Informational resources

(9) Specialty Areas

3. GOALS.

a. Improve the Learning Environment

(1) Lighting for Improved Learning

(a) Goal - Improve the learning and teaching performance through effective lighting design.

(b) Benchmark – LEED IEQ Credit 8.1: Daylight and Views – Daylight, IEQ Credit 6.1: Controllability of Systems - Lighting

(2) Acoustics for Improved Learning

(a) Goal – Prevent poor acoustics from impacting the students’ ability to learn and the teachers’ ability to teach

(b) Benchmark – LEED IEQ Credit 9: Enhanced Acoustical Performance

(3) Air Quality for Improved Learning

(a) Goal – Reduce absenteeism

(b) Benchmark - LEED IEQ Prerequisite 1: Minimum Indoor Air Quality Performance, IEQ Credit 3.1: Construction Indoor Air Quality, IEQ Credit 4: Low Emitting Materials, IEQ Credit 5: Indoor Chemical and Pollutant Source Control

(4) Thermal Comfort for Improved Learning

(a) Goal - Provide air temperature and relative humidity for a comfortable learning environment so students and teachers can reach their full potential.

(b) Benchmark – LEED IEQ Credit 6.2: Controllability of Systems – Thermal Comfort, IEQ Credit 7.1: Thermal Comfort - Design

c. Improve Facility Efficiency

(1) Optimize Energy Performance

(a) Goal - Reduce energy consumption to the highest level possible that is economically viable without compromising the learning environment.

- (b) Benchmark – LEED EA Credit 1: Optimize Energy Performance (15 points)
- (2) Conserve Water
 - (a) Goal - Reduce water consumption to the highest level possible that is economically viable without compromising the learning environment.
 - (b) Benchmark – LEED WE Credit 1: Water Efficient Landscaping, WE Credit 3: Water Use Reduction
- d. Reduce the Environmental Impact of Materials
 - (1) School Recycling Program
 - (a) Goal – Teach students the importance of resource conservation and environmental stewardship.
 - (b) Benchmark – LEED MR Prerequisite 1: Storage and Collection of Recyclables
 - (2) Construction Recycling Program
 - (a) Goal – Divert a minimum of 50% construction debris from the waste stream through recycling and salvage
 - (b) Benchmark – LEED MR Credit 2: Construction Waste Management
 - (3) Responsible Selection of Materials
 - (a) Goal – Use sustainably responsible material in the construction of facilities
 - (b) Benchmarks – LEED MR Credit 4: Recycled Content, MR Credit 6: Rapidly Renewable Materials
 - (4) Reduce Ozone Depletion
 - (a) Goal – Zero use of CFC based refrigerants
 - (b) Benchmark – LEED EA Prerequisite 3: Enhanced Refrigerant Management

a. Monitor Results

(1) Commissioning

a. Goal – Verify the building systems are installed, calibrated and perform as intended

b. Benchmark – LEED EA Credit 3: Enhanced Commissioning

(2) Metering

(a) Goal – Provide accurate useful energy consumption data in a user friendly format

(b) Benchmark – Provide metering at the whole building level and sub metering for a minimum of HVAC, hot water, elevator, and kitchen. Use FEMP Metering Best Practices, Release 2.0 for guidance.

(3) Survey Users

(a) Goal - Provide superior customer service to students and teachers.

(b) Benchmark – IEQ Credit 7.2: Thermal Comfort Verification

5. SYSTEMS CRITERIA.

a. Building Systems Life Cycle Requirements - The school shall have a 25-year useful design life before a possible re-use/re-purpose or renovation requirement, to include normal sustainment, restoration, modernization activities and a 50-year building replacement life. The design and construction shall provide an appropriate level of quality to ensure continued use of the facility over that time period with the application of reasonable preventative maintenance and repairs that would be industry-acceptable to major civilian sector schools.

b. Site Infrastructure Life Cycle Requirements - The site infrastructure will have at least a 45-year life expectancy with industry-accepted maintenance and repair cycles. At a minimum, all equipment shall meet or exceed the minimum efficiencies as established by ASHRAE 90.1 - SI. The contractor shall purchase Energy Star or FEMP designated products. The term "Energy Star product" means a product is rated for energy efficiency under an Energy Star program. The term "FEMP designated product" means a product that is designated under the Federal Energy Management Program of the Department of Energy as being among the highest 25 percent of equivalent products for energy efficiency. In the case of an electric motor of 1 to 500 horsepower the Contractor shall select only a premium efficient motor.

- c. Maintainability Expectations
- d. System Integration

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GLOSSARY

PART I. ABBREVIATIONS AND ACRONYMS

ACRONYM

A/E	architect/engineer
ANSI	American National Standards Institute
AOPM	DoDEA Area Office Project Manager
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
BOD	beneficial occupancy date
CAPM	construction agent project manager
CFC	chlorofluorocarbon
CSI	Construction Specifications Institute
Cx	commissioning
CxA	commissioning authority
DDESS	Domestic Dependent Elementary and Secondary Schools
DoDDS	Department of Defense Dependents Schools
DoDEA	Department of Defense Education Activity
EPA	Environmental Protection Agency
FC	footcandles
GBCI	Green Building Certification Institute
HVAC	heating, ventilation, and air conditioning
IAQ	indoor air quality
LCCA	life cycle cost analysis
LEED	Leadership in Energy and Environmental Design

MERV	minimum efficiency reporting value
MILCON	military construction
NIBS	National Institute of Building Sciences
O&M	operations and maintenance
OCONUS	outside the continental U.S.
OPR	owner's project requirements
SEEPM	sustainability and energy efficiency program manager
SMACNA	Sheet Metal and Air Conditioning National Contractors Association
SRM	sustainment, restoration and modernization
STC	Sound Transmission Class
USDA	U.S. Department of Agriculture

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