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References are in agreement with UMRL dated January 2010

- 3.1.1 General Disturbance
- 3.1.2 Water Resources
- 3.1.3 Land Resources
 - 3.1.3.1 Erodible Soils
 - 3.1.3.2 Erosion and Sedimentation Control Devices
 - 3.1.3.3 Tree and Plant Protection
- 3.1.4 Air Resources
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- 3.2 FIELD QUALITY CONTROL

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AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z400.1 (2004) Hazardous Industrial Chemicals -
Material Safety Data Sheets - Preparation

ASTM INTERNATIONAL (ASTM)

ASTM D 4840 (1999; R 2004) Sampling Chain-Of-Custody
Procedures

ASTM D 5663 (1997; R 2003) Validating Recycled Content
in Packaging Paper and Paperboard

ASTM E 1991 (2005) Environmental Life Cycle Assessment
of Building Materials/Products

ASTM E 2114 (2008) Standard Terminology for
Sustainability Relative to the Performance
of Buildings

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

ISO 14040 (2006) Environmental Management - Life
Cycle Assessment - Principles and Framework

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST)

NIST BEES 4.0 (2007) Building for Environmental and
Economic Sustainability Technical Manual
and User's Guide

U.S. DEPARTMENT OF AGRICULTURE (USDA)

Biomass R&D Act (2000) Biomass Research and Development Act

U.S. Farm Bill (2002) U.S. Farm Bill of May 2002

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

NPDES (1972; R 2005) National Pollutant
Discharge Elimination System

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED (2002; R 2005) Leadership in Energy and
Environmental Design(tm) Green Building
Rating System for New Construction
(LEED-NC)

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR Protection of Environment

40 CFR 261 Identification and Listing of Hazardous
Waste

1.2 DEFINITIONS

Definitions pertaining to sustainable development are as defined in

ASTM E 2114 and as specified.

- a. "Biobased content" is calculated as the weight of the biobased material divided by the total weight of the product, and is expressed as a percentage by weight.
- b. "Biobased materials" include fuels, chemicals, building materials, or electric power or heat produced from biomass as defined by the Biomass R&D Act. Minimum biobased content shall be as defined in the U.S. Farm Bill.
- c. "Chain-of-custody" is a process whereby a product or material is maintained under the physical possession or control during its entire life cycle.
- d. "Pollution and environmental damage" is caused by the presence of chemical, physical, or biological elements or agents. Human health or welfare is adversely affected; ecological balances are unfavorably altered; the utility of the environment for aesthetic, cultural, or historical purposes degrades.

1.3 PRECONSTRUCTION MEETING

After award of Contract and prior to commencement of the work, the Contractor shall schedule and conduct a meeting with the Contracting Officer to discuss the proposed Environmental Protection Plan and to develop a mutual understanding relative to the details of environmental protection. The requirements for this meeting may be fulfilled during the coordination and mutual understanding meeting as specified in Section 01 45 00.00 10 01 45 00.00 20 01 45 00.00 40 QUALITY CONTROL.

1.4 SUBMITTALS

NOTE: Submittals must be limited to those necessary for adequate quality control. The importance of an item in the project should be one of the primary factors in determining if a submittal for the item should be required.

A "G" following a submittal item indicates that the submittal requires Government approval. Some submittals are already marked with a "G". Only delete an existing "G" if the submittal item is not complex and can be reviewed through the Contractor's Quality Control system. Only add a "G" if the submittal is sufficiently important or complex in context of the project.

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes

following the "G" typically are not used for Navy projects.

Submittal items not designated with a "G" are considered as being for information only for Army projects and for Contractor Quality Control approval for Navy projects.

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are [for Contractor Quality Control approval.][for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Environmental Protection Plan[; G][; G, [_____]]

Instructor Qualifications

Submit reference data to demonstrate instructors' individual and firm's capabilities and experience.

SD-03 Product Data

[Life Cycle Assessments]

Packaging; (LEED)

Submit documentation indicating percentage of post-industrial and post-consumer recycled content per unit of product. Indicate relative dollar value of recycled content products to total dollar value of products included in project.

SD-06 Test Reports

Field Quality Control Reports

SD-07 Certificates

Environmental Regulatory Requirements

For Government's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with environmental regulations bearing on performance of the work.

SD-08 Manufacturer's Instructions

[Material Safety Data Sheets]

SD-11 Closeout Submittals

Training Program

Submit [two] [__] copies of instructional program outline for demonstration and training, including a schedule of dates, times, length of instruction, instructors' names, learning objective, and teaching outline for each training module. At completion of training, submit [one] [__] complete training manual[s] for Government's use, and a list of participants with each participant's results of performance-based test for each training module. For Government's records, submit Contractor 40 CFR employee training records [upon request of the Contracting Officer].

Protection of Natural Resources

1.5 CONTRACTOR'S ENVIRONMENTAL MANAGER

Designate an on-site Environmental Manager responsible for overseeing the environmental goals for the project and implementing procedures for environmental protection.

1.5.1 Duties

The Environmental Manager shall be responsible for the following:

- a. Compliance with applicable federal, state, and local environmental regulations, including maintaining required documentation.
- b. Implementation of the Waste Management Plan.
- c. Implementation of the Indoor Air Quality (IAQ) Management Plan.
- d. Implementation of the Environmental Protection Plan.
- e. Environmental training for Contractor personnel in accordance with their position requirements.
- f. Monitoring and documentation of environmental procedures.

1.5.2 Qualifications

Minimum 5 years construction experience on projects of similar size and scope; minimum 2 years experience with environmental procedures similar to those of this project; familiarity with Environmental Management Systems (EMSs); familiarity with environmental regulations applicable to construction operations.

1.6 ENVIRONMENTAL REGULATORY REQUIREMENTS

NOTE: The following is a list of resources to assist the Contractor with regulatory compliance.

1. Storm water permits

Refer to The Office of Wastewater Management, NPDES Storm Water Program:

<http://www.epa.gov/npdes/stormwater>

2. Dredge and fill (Section 404) permits

Refer to U.S. EPA Office of Wetlands, Oceans, and Watersheds (OWOW): <http://www.epa.gov/owow/>

3. RCRA hazardous and non-hazardous solid waste requirements
Refer to EPA's Office of Solid Waste and Emergency Response:
<http://www.epa.gov/epaoswer/osw/laws-reg.htm>
4. Oil spill requirements for construction activities
Refer to EPA Oil Program web site:
<http://www.epa.gov/oilspill/>
5. Hazardous substances (Superfund Liability) requirements for construction activities
Refer to EPA's Superfund website:
<http://www.epa.gov/superfund/index.htm>
6. Polychlorinated Biphenyl (PCB) waste requirements
Refer to EPA's Polychlorinated Biphenyl (PCB) Homepage: <http://www.epa.gov/pcb/>
7. Air quality requirements for construction activities
Refer to EPA'S Air Program Mobile Sources Page:
<http://www.epa.gov/ebtpages/airmobilesources.html>
8. Asbestos requirements for construction activities
Refer to EPA's Asbestos Management and Regulatory Requirements Website:
<http://www.epa.gov/fedsite/cd/asbestos.html>
9. National Environmental Policy Act (NEPA) requirements for construction activities
10. Endangered Species Act
Refer to The US Fish and Wildlife Service Endangered Species Program: <http://endangered.fws.gov/>
11. National Historic Preservation Act
12. State Office/Department of Environmental Quality
13. Local Office/Department of Environmental Quality
14. The Construction Industry Compliance Assistance Center: an EPA-sponsored tool providing information on state and federal requirements;
<http://www.cicacenter.org/index.cfm>
15. The National Environmental Compliance Assistance Clearinghouse:
<http://cfpub.epa.gov/clearinghouse/>
16. The Associated General Contractors of America (AGC): provides tools to assist with compliance;
<http://www.agc.org/>

The Contractor shall be responsible for knowing federal, state, and local regulatory requirements pertaining to legal disposal of all construction and demolition waste materials. Comply with all applicable regulations and maintain records of permits, licenses, certificates, and other environmental regulatory requirement correspondences.

1.7 ENVIRONMENTAL REQUIREMENTS FOR PRODUCTS

[1.7.1 Material Safety Data Sheets (MSDS)

NOTE: The ANSI standard includes 16 sections. The first ten address the specific requirements under OSHA; the last six, listed below, identify information that OSHA does not require, but that may be useful for green buildings.

Submit an MSDS for each product specified in other sections or required by OSHA to have an MSDS. MSDS shall be prepared [no earlier than June 1998] [within the previous five years] [_____]. Include information for MSDS Sections 1 through 16 in accordance with ANSI Z400.1 and as follows:

- a. Section 11: Include data used to determine the hazards cited in Section 3. Identify acute data, carcinogenicity, reproductive effects, and target organ effects. [Provide written description of the process used in evaluating chemical hazards relative to preparation of the MSDS.]
- b. Section 12: Include data regarding environmental impacts during raw materials acquisition, manufacture, and use. Include data regarding environmental impacts in the event of an accidental release.
- c. Section 13: Include data regarding the proper disposal of the chemical. Include information regarding recycling and reuse. Indicate whether or not the product is considered to be "hazardous waste" according to 40 CFR 261.
- d. Section 14: Identify hazard class for shipping.
- e. Section 15: Identify federal, state, and local regulations applicable to the material.
- f. Section 16: Include additional information relative to recycled content, biobased content, and other information regarding environmental and health impacts. [Identify the date MSDS was prepared.]

]1.7.2 Life Cycle Assessments (LCAs)

NOTE: LCAs provide detail on product and material environmental impacts. To be of value to the Government, LCAs for competing products must have comparable goals, objectives, system boundaries, functional units, and methodologies. If using BEES software, choose (within the software) the most appropriate type of Environmental Impact Category

weighting for the project.

For the following products, submit LCA data developed in accordance with [ASTM E 1991] [ISO 14040] [_____] [; and where BEES data exists, submit NIST BEES 4.0 analysis using [100][50][_____] percent Environmental Performance Weighting and the [EPA Scientific Advisory Board] [Harvard University] [Equal] [_____] Environmental Impact Category Weights].

- a. Masonry
- b. Finish Carpentry
- c. Plastic Fabrications
- d. Building Insulation
- e. Roofing
- f. Joint Sealers
- g. Wood & Plastic Doors
- h. Windows
- i. Skylights
- j. Glazed Curtain Wall
- k. Gypsum Board
- l. Tile
- m. Acoustical Ceilings
- n. Resilient Flooring
- o. Carpet
- p. Toilet Compartments
- q. Loading Dock Equipment
- r. Office Equipment
- s. Furnishings & Accessories
- t. Renewable Energy Equipment
- u. Elevators
- v. HVAC equipment
- x. Lighting equipment

]1.8 ENVIRONMENTAL PROTECTION PLAN

Prepare and submit an Environmental Protection Plan not less than 10 days before the preconstruction meeting. At a minimum, address the following

elements in accordance with this section:

- a. Identification and contact information for Environmental Manager.
- b. General site information, including preconstruction description and photographs.
- c. Summary of training program.
- d. Procedures to address water resources.
- e. Procedures to address land resources.
- f. Procedures to address air resources.
- g. Procedures to address fish and wildlife resources.
- h. Monitoring and quality control procedures.

Revise and resubmit Plan as required by the Contracting Officer. Approval of Contractor's Plan will not relieve the Contractor of responsibility for compliance with applicable environmental regulations.

1.9 ENVIRONMENTAL DEMONSTRATION AND TRAINING

Contractor shall provide environmental training for workers performing work on the project site.

1.9.1 Instructor Qualifications

Training shall be given by a firm or individual experienced in providing training or education similar in content and extent to that indicated for this project.

1.9.2 Coordination

Coordinate instruction schedule with Government operations. Adjust schedule as required to minimize disruption of Government operations. Coordinate instruction with demonstration and training of general building systems.

1.9.3 Training Program

Develop a training program for all site workers that includes the following topics:

- a. Overview of environmental and sustainability issues related to the building industry.
- b. Overview of environmental and sustainability issues related to the project.
- c. Compliance with applicable federal, state, and local environmental regulations.
- d. Review of site specific procedures and management plans implemented during construction, including the Waste Management Plan, Indoor Air Quality (IAQ) Management Plan, Environmental Protection Plan, and procedures for noise and acoustics management.

1.9.3.1 Scheduling

Provide instruction at mutually agreeable time[s].

1.9.3.2 Training Modules

Develop a learning objective and teaching outline for each topic in the Training Program. Include a description of specific skills and knowledge that each participant is expected to acquire. Instructors shall be well-versed in the particular topics that they are presenting.

1.9.3.3 Evaluation

At the conclusion of each training module, assess and document each participant's understanding of the module by use of [an oral][a written][a demonstration]performance-based test.

PART 2 PRODUCTS

2.1 ENVIRONMENTALLY PREFERABLE PRODUCTS

NOTE: EPA is required to designate products that are or can be made with recycled/recovered materials, and to recommend practices for buying these products. Federal agencies are required to purchase designated products with the highest recovered material content level practicable. Federal agencies are also required to purchase biobased products for all items costing over \$10,000.

Consider raw materials acquisition, production, manufacturing, packaging, distribution, reuse, operation, maintenance, and disposal of products, and provide products and materials with the least effect on the environment, determined by LCA analysis, released toxins, and other methods.

2.1.1 Prohibited Materials

The use of the following materials is prohibited:

- a. Products containing asbestos.
- b. Products containing urea formaldehyde.
- c. Products containing polychlorinated biphenyls.
- d. Products containing chlorinated fluorocarbons.
- e. Solder or flux containing more than 0.2 percent lead and domestic water pipe or pipe fittings containing more than 8 percent lead.
- f. Paint containing more than 0.06 percent lead.

2.1.2 Packaging

NOTE: Easily recyclable packaging includes, among

others, industrial paperboard, carrier board, and brown papers (e.g., wrapping papers and bags).

Where Contractor has the option to provide one of the listed products or equal, preference shall be given to products with minimal packaging and easily recyclable packaging, and to manufacturers with policies that take back product packaging.

2.1.2.1 Industrial Paperboard

NOTE: Industrial paperboard is an EPA designated product for recycled content. See Section 01 62 35 RECYCLED/RECOVERED MATERIALS and include recycled content options unless designer determines that justification for non-use exists. Use of materials with recycled content, calculated on the basis of post-industrial and post-consumer percentage content, contributes to the following LEED credit: MR4. Coordinate all recycled content products with Section 01 33 29 LEED(tm) DOCUMENTATION.

Minimum [45][100][_____] percent post-consumer recycled content in accordance with ASTM D 5663.

2.1.2.2 Carrier Board

NOTE: Carrierboard is an EPA designated product for recycled content. See Section 01 62 35 RECYCLED/RECOVERED MATERIALS and include recycled content options unless designer determines that justification for non-use exists.

Minimum [10][100][_____] percent recycled content with a minimum of [10][15][_____] percent post-consumer recycled content in accordance with ASTM D 5663.

2.1.2.3 Brown Papers

NOTE: Brown papers are EPA designated products for recycled content. See Section 01 62 35 RECYCLED/RECOVERED MATERIALS and include recycled content options unless designer determines that justification for non-use exists.

Minimum [5][40][_____] percent recycled content with a minimum of [5][20][_____] percent post-consumer recycled content in accordance with ASTM D 5663.

2.1.3 Substitutions

Notify the Contracting Officer when Contractor is aware of materials, equipment, or products that meet the aesthetic and programmatic intent of

Contract Documents, but which are more environmentally responsible than materials, equipment, or products specified or indicated in the Contract Documents. Submit the following for initial review by the Contracting Officer:

- a. Product data including manufacturer's name, address, and phone number.
- b. Description of environmental advantages of proposed substitution over specified product.

PART 3 EXECUTION

3.1 PROTECTION OF NATURAL RESOURCES

NOTE: Limiting greenfield site disturbance and restoring damaged sites contributes to the following LEED credit: SS5.

Comply with applicable regulations and these specifications. Preserve the natural resources within the project boundaries and outside the limits of permanent work performed under this Contract in their existing condition or restore to an equivalent or improved condition as approved by the Contracting Officer. Where violation of environmental procedures requirements will irreversibly damage the site, documentation of progress at [_____] intervals shall be required.

3.1.1 General Disturbance

Confine demolition and construction activities to [work area limits indicated on the Drawings] [maximum 12 m 40 feet beyond the building perimeter, 1.5 m 5 feet beyond solid paving, and 7.5 m 25 feet beyond pervious paving]. Remove debris, rubbish, and other waste materials resulting from demolition and construction operations from site. Transport materials with appropriate vehicles and dispose of them off site to areas that are approved for disposal by governing authorities having jurisdiction. Avoid spillage by covering and securing loads when hauling on or adjacent to public streets or highways. Remove spillage and sweep, wash, or otherwise clean project site, streets, or highways. Burning is prohibited.

3.1.2 Water Resources

Comply with requirements of the NPDES and the applicable State Pollutant Discharge Elimination System (SPDES). Prevent oily or other hazardous substances from entering the ground, drainage areas, or local bodies of water. Store and service construction equipment at areas designated for collection of oil wastes. Prevent ponding of stagnant water conducive to mosquito breeding habitat. Prevent run-off from site during demolition and construction operations. [Equipment will not be permitted to ford live streams.] [Equipment will be permitted to ford live streams if temporary culverts or bridges are constructed for the purpose. Remove temporary culverts and bridges upon completion of work and repair the area to its original condition, unless otherwise accepted in writing by the Contracting Officer.]

3.1.3 Land Resources

Prior to construction, identify land resources to be preserved within the work area. Do not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and landforms without permission from the Contracting Officer. Coordinate protection practices with work specified in Division 2 SITEWORK.

3.1.3.1 Erodible Soils

Plan and conduct earthwork to minimize the duration of exposure of unprotected soils, except where the constructed feature obscures borrow areas, quarries, and waste material areas. Clear areas in reasonably sized increments only as needed to use the areas developed. Form earthwork to final grade as shown. Immediately protect side slopes and back slopes upon completion of rough grading.

3.1.3.2 Erosion and Sedimentation Control Devices

Construct or install temporary and permanent erosion and sedimentation control features as required.

3.1.3.3 Tree and Plant Protection

NOTE: For old growth and other significant trees and plants, consider a more aggressive approach to protection than the standard prohibitions.

Protect as specified in Division 2 SITEWORK and as specified. Prior to start of construction, tag each tree and plant scheduled to remain. In the event of damage to tree or plant, the Government may, at the Contracting Officer's discretion, deduct the indicated value of the damaged tree or plant from the Contract Sum.

3.1.4 Air Resources

Comply with Indoor Air Quality (IAQ) Management Plan and as follows:

- a. Prevent creation of dust, air pollution, and odors.
- b. Sequence construction to avoid unnecessary disturbance to site.
- c. Use mulch, water sprinkling, temporary enclosures, and other appropriate methods as needed to limit dust and dirt rising and scattering in air. Do not use water when it may create hazardous or other adverse conditions such as flooding and pollution.
- d. Store volatile liquids, including fuels and solvents, in closed containers. Do not store with materials that have a high capacity to adsorb VOC emissions or in occupied spaces.

NOTE: Materials which are woven, fibrous, or porous in nature, such as acoustical ceilings, carpet, and textiles, have a high capacity to absorb VOC emissions.

- e. Properly maintain equipment to reduce gaseous pollutant emissions.

3.1.5 Fish and Wildlife Resources

Manage and control construction activities to minimize interference with and damage to fish and wildlife. Do not disturb fish and wildlife. Do not alter water flows or otherwise significantly disturb the native habitat related to the project and critical to the survival of fish and wildlife, except as indicated or specified.

3.2 FIELD QUALITY CONTROL

Comply with requirements of agencies having jurisdiction and as specified herein. Provide field practices, shipping, and handling of samples in accordance with [ASTM D 4840](#). Provide [Field Quality Control Reports](#) in accordance with approved Environmental Protection Plan.

-- End of Section --