



SUSTAINABLE DESIGN / CERTIFICATION – L.E.E.D.

SOF RIVERINE AND COMBATANT
CRAFT OPERATIONS FACILITY
N 62467-05-D-0096

**FINAL DESIGN ISSUE
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US DEPARTMENT OF THE NAVY – NAVFAC SOUTHEAST

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LEED Prerequisites and Obtainable Credits

Section A: Goals

- 1.0 Sustainable Design Strategies shall be implemented to minimize the energy consumption of facilities, conserve resources, minimize adverse affects to the environment, and improve occupant productivity.
- 2.0 The building shall be designed to meet the level of "Certified" (26 points minimum) under the U.S. Green Building Council's LEED Green Building Rating System for New Construction and Major Renovation version 2.2.

Section B: Prerequisites and Credits

1.0 Sustainable Sites (SS)

1.1 Prerequisite 1: Construction Activity Pollution Prevention – Required

Create and implement an Erosion and Sedimentation Control Plan for all construction activities associated with the project. The ESC Plan shall conform to the erosion and sedimentation requirements of the 2003 EPA Construction General Permit or local erosion and sedimentation control standards, whichever is greater. The plan shall describe the measures implemented to accomplish the following objectives:

- A. Prevent loss of soil during construction by stormwater runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse.
- B. Prevent sedimentation of storm sewer or receiving streams.
- C. Prevent polluting the air with dust and particulate matter.

1.2 SS Credit 1: Site Selection – N/A

1.3 SS Credit 2: Development Density and Community Connectivity – N/A

1.4 SS Credit 3: Brownfield Redevelopment – N/A

1.5 SS Credit 4.1 Alternative Transportation – Public Transportation Access – N/A

1.6 SS Credit 4.2: Alternative Transportation – Bicycle Storage and Changing Rooms – 1 point

Provide secure bicycle racks and/or storage within 200 yards of the building entrance for 5% or more of all building users (measured at peak periods), and provide shower and changing facilities in the building, or within 200 yards of a building entrance, for .5% of Full-Time Equivalent (FTE) occupants.

1.7 SS Credit 4.3: Alternative Transportation – Low-Emitting and Fuel Efficient Vehicles – N/A

- 1.8 SS Credit 4.4: Alternative Transportation - Alternative Transportation - Parking Capacity – 1 point
Size parking capacity to not exceed minimum local zoning requirements and provide preferred parking for carpools or vanpools for 5% of the total provided parking spaces.
- 1.9 SS Credit 5.1: Site Development - Protect or Restore Habitat – 1 point
Limit all site disturbance to 40 feet beyond the building perimeter, 10 feet beyond surface walkways, patios, surface parking and utilities less than 12 inches in diameter; 15 feet beyond primary roadway curbs and main utility branch trenches; and 25 feet beyond constructed areas with permeable surfaces that require additional staging areas in order to limit compaction in the constructed area.
- 1.10 SS Credit 5.2: Site Development - Maximize Open Space – 1 point
Provide vegetated open space area adjacent to the building that is equal to the building footprint.
- 1.11 SS Credit 6.1: Stormwater Design: Quantity Control – N/A
- 1.12 SS Credit 6.2: Stormwater Design: Quality Control – N/A
- 1.13 SS Credit 7.1: Heat Island Effect – Non-Roof – N/A
- 1.14 SS Credit 7.2: Heat Island Effect – Roof – 1 point
Use roofing materials having a Solar Reflectance Index (SRI) of at least or greater than 78.
Calculate SRI according to ASTM E 1980.
- 1.15 SS Credit 8: Light Pollution Reduction – 1 point
Interior Lighting: The angle of maximum candela from each interior luminaire as located in the building shall intersect opaque building interior surfaces and not exit out through the windows.
OR all non-emergency interior lighting shall be automatically controlled to turn off during non-business hours. Provide manual override capability for after hours use.
Exterior Lighting: Only light areas as required for safety and comfort. Do not exceed 80% of the lighting power densities for exterior areas and 50% for building facades and landscape features as defined in ASHRAE/IESNA Standard 90.1-2004, Exterior Lighting Section, without amendments.
Project shall be classified as LZ3-Medium (Commercial/Industrial, High-Density Residential).

2.0 Water Efficiency (WE)

- 2.1 WE Credit 1.1: Water Efficient Landscaping – Reduce by 50% - 1 point
Reduce potable water consumption for irrigation by 50% from calculated mid-summer baseline case. Reductions shall be attributed to any combination of the following: plant species factor,

irrigation efficiency, use of captured rainwater, use of recycled wastewater, use of water treated and conveyed by a public agency specifically for non-potable uses.

2.2 WE Credit 1.2: Water Efficient Landscaping - No Potable Use or Irrigation – 1 point

Achieve WE Credit 1.1 and use only recycled wastewater, use of water treated and conveyed by a public agency specifically for non-potable uses of irrigation OR install landscaping that does not require permanent irrigation systems. Temporary irrigation systems used for plant establishment are allowed if removed within one year of installation.

2.3 WE Credit 2: Innovative Wastewater Technologies – N/A

2.4 WE Credit 3.1: Water Use Reduction - 20% Reduction – 1 point

Employ strategies that in aggregate use 20% less water than the water use baseline calculated for building (not including irrigation) after meeting the Energy Policy Act of 1992 fixture performance requirements. Calculations are based on estimated occupant usage and shall include only the following fixtures (as applicable to the building): water closets, urinals, lavatory faucets, showers, and kitchen sinks.

2.5 WE Credit 3.2: Water Use Reduction – 30% Reduction – N/A

3.0 Energy and Atmosphere (EA)

3.1 Prerequisite 1: Fundamental Commissioning of Building Energy Systems - Required

The following commissioning process activities shall be completed by the commissioning team, in accordance with LEED Green Building Rating System for New Construction and Major Renovation version 2.2:

- A. Designate an individual as the Commissioning Authority (CxA) to lead, review and oversee the completion of the commissioning process activities.
 - 1. The CxA shall have documented commissioning authority experience in at least two building projects.
 - 2. The individual serving as the CxA shall be independent of the project's design and construction management, though they may be employees of the firms providing those services. The CxA may be a qualified employee or consultant of the Owner.
 - 3. The CxA shall report results, findings, and recommendations directly to the Owner.
 - 4. For projects smaller than 50,000 sq ft, the CxA may include qualified persons on the design or construction teams who have the required experience.
- B. The Owner shall document the Owner's Project Requirements (OPR). The design team shall develop the Basis of Design (BOD). The CxA shall review these documents for clarity and completeness. The Owner and design team shall be responsible for updates to their respective documents.

- C. Develop and incorporate commissioning requirements into the construction documents.
- D. Develop and implement a commissioning plan.
- E. Verify the installation and performance of the systems to be commissioned.
- F. Complete a summary commissioning report.

Commissioning activities shall be completed for the following energy-related systems, at a minimum:

- A. Heating, ventilating, air conditioning and refrigeration (HVAC&R) systems (mechanical and passive) and associated controls.
- B. Lighting and daylighting controls.
- C. Domestic hot water systems.

3.2 Prerequisite 2: Minimum Energy Performance – Required

Design the system to comply with both:

- A. The mandatory provisions (Sections 5.4, 6.4, 7.4, 8.4, 9.4 and 10.4) of ASHRAE/IESNA Standard 90.1-2004
- B. The prescriptive requirements (Sections 5.5, 6.5, 7.5, and 9.5) or performance requirements (Section 11) of ASHRAE/IESNA Standard 90.1-2004.

3.3 Prerequisite 3: Fundamental Refrigerant Management – Required

Zero use of CFC-based refrigerants in new base building HVAC&R systems. Small HVAC units (defined as containing less than .5 lbs of refrigerant), and other equipment that contains less than .5 lbs of refrigerant, are not considered part of the “base building” system and are not subject to the requirements of this credit.

3.4 EA Credit 1: Optimize Energy Performance – 5 points

Demonstrate a 24.5% improvement in the proposed building performance rating compared to the baseline building performance rating per ASHRAE/IESNA Standard 90.1-2004. The design must include all the energy costs within and associated with the building project.

3.5 EA Credit 2: On-site Renewable Energy – N/A

3.6 EA Credit 3: Enhanced Commissioning – N/A

3.7 EA Credit 4: Enhanced Refrigerant Management – N/A

3.8 EA Credit 5: Measurement and Verification – N/A

3.9 EA Credit 6: Green Power – N/A

4.0 Materials and Resources (MR)

4.1 Prerequisite 1: Storage and Collection of Recyclables – Required

Provide an easily accessible area that serves the entire building and is dedicated to the collection and storage of non-hazardous materials for recycling, including (at a minimum) paper, corrugated cardboard, glass, plastic, and metals.

4.2 MR Credit 1.1: Building Reuse - maintain 75% of existing walls, floors, and roof – N/A

4.3 MR Credit 1.2: Building Reuse - maintain 95% of existing walls, floors, and roof – N/A

4.4 MR Credit 1.3: Building Reuse - maintain 50% of interior – N/A

4.5 MR Credit 2.1: Construction Waste Management - divert 50% from disposal – 1 point

Recycle and/or salvage at least 50% of non-hazardous construction and demolition. 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 does not contribute. Calculations can be done by weight or volume, but must be consistent throughout.

4.6 MR Credit 2.2: Construction Waste Management - divert 75% from disposal – N/A

4.7 MR Credit 3.1: Materials Reuse - 5% – N/A

4.8 MR Credit 3.2: Materials Reuse - 10% – N/A

4.9 MR Credit 4.1: Recycled Content - 10% - 1 point

Use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the pre-consumer content constitutes at least 10% (based on cost) of the total value of the materials in the project.

The recycled content value of a material assembly shall be determined by weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value.

Mechanical, electrical, and plumbing components and specialty items such as elevator shall not be included in this calculation. Only include materials installed in the project. Furniture may be included, providing it is included consistently in MR Credits 3-7.

Recycled content shall be defined in accordance with the International Organization for Standardization document, ISO 14021 – Environmental labels and declarations – Self-declared environmental claims (Type II environmental labeling).

Post-consumer material is defined as waste material generated by households or by commercial, industrial and institutional facilities in their role as end-users of the product, which can no longer be used for its intended purpose.

Pre-consumer material is defined as material diverted from the waste stream during the manufacturing process. Excluded is reutilization of material such as rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it.

4.10 MR Credit 4.2: Recycled Content - 20% – N/A

4.11 MR Credit 5.1: Regional Materials - 10% extracted, processed, and manufactured regionally – 1 point
Use building materials or products that have been extracted, harvested or recovered, as well as manufactured, within 500 miles of the project for a minimum of 10% (based on cost) of the total materials value. If only a fraction of a product or material is extracted/harvested/recovered and manufactured locally, then only that percentage (by weight) shall contribute to the regional value.

Mechanical, electrical, and plumbing components and specialty items such as elevators and equipment shall not be included in this calculation. Only include materials permanently installed on the project. Furniture may be included, providing it is included consistently in MR Credits 3-7.

4.12 MR Credit 5.2: Regional Materials - 20% extracted, processed, and manufactured regionally – N/A

4.13 MR Credit 6: Rapidly Renewable Materials – N/A

4.14 MR Credit 7: Certified Wood – N/A

5.0 Indoor Environmental Quality (EQ)

5.1 Prerequisite 1: Minimum IAQ Performance – Required

Meet the minimum requirements of Sections 4 through 7 of ASHRAE 62.1-2004, Ventilation of Acceptable Indoor Air Quality. Mechanical ventilation systems shall be designed using the Ventilation Rate Procedure or the applicable local code, whichever is more stringent. Naturally ventilate buildings shall comply with ASHRAE 62.1-2004, paragraph 5.1

5.2 Prerequisite 2: Environmental Tobacco Smoke Control – Required

- A. Prohibit smoking in the building except in designated smoking areas.
- B. Locate any exterior designated smoking area areas at least 25 feet away from entries, outdoor intakes and operable windows.
- C. Locate designed smoking rooms to effectively contain, capture, and remove Environmental Tobacco Smoke (ETS) from the building. At a minimum the smoking room must be directly exhausted to the outdoors with no re-circulation for ETS-containing air to the non-smoking area of the building, and enclosed with impermeable deck-to-deck partitions.

5.3 EQ Credit 1: Outdoor Air Delivery Monitoring – N/A

5.4 EQ Credit 2: Increased Ventilation – N/A

5.5 EQ Credit 3.1: Construction IAQ Management Plan - during construction – N/A

5.6 EQ Credit 3.2: Construction IAQ Management Plan - before occupancy – N/A

5.7 EQ Credit 4.1: Low-Emitting Materials - Adhesives and Sealants – 1 point

All adhesives and sealants used on the interior of the building (defined as inside of the weatherproofing system and applied on-site) shall comply with the requirements of the following reference standards:

- A. Adhesives, Sealants and Sealant Primers: South Coast Air Quality Management District (SCAQMD) Rule #1168, VOC limits effective date of July 1, 2005 and rule amended date of January 7, 2005.
- B. Aerosol Adhesives: Green Seal Standard for Commercial Adhesives GS-36 requirements in effect on October 19, 2000.

5.8 EQ Credit 4.2: Low-Emitting Materials - Paints and Coatings – 1 point

Paints and coatings used on the interior of the building (defined as inside of the weatherproofing system and applied on-site) shall comply with the requirements of the following criteria:

- A. Architectural paints, coatings, and primers applied to interior walls and ceilings: Do not exceed the VOC content limits established in Green Seal Standard GS-11, Paints, First Edition, May 20, 1993. Primers must meet the VOC limit for non-flat paint.
- B. Anti-corrosive and anti-rust paints applied to interior ferrous metal substrates: Do not exceed the VOC content limit of 250 g/L established in Green Seal Standard GS-03, Anti-Corrosive Paints, Second Edition, January 7, 1997.
- C. Clear wood finishes, floor coatings, stains, sealers, and shellacs applied to interior elements: Do not exceed the VOC contents limit established in South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coatings, rules in effect on January 1, 2004.

5.9 EQ Credit 4.3: Low-Emitting Materials - Carpet Systems – 1 point

All carpet installed in the building interior shall meet the testing and product requirements of the Carpet and Rug Institute's Green Label Plus Program.

All carpet cushion installed in the building interior shall meet the requirements of the Carpet and Rug Institute Green Label program.

All carpet adhesives shall meet the requirements of EQ Credit 4.1: VOC limit of 50 g/L.

5.10 EQ Credit 4.4: Low-Emitting Materials - Composite Wood and Agrifiber Products – 1 point

Composite wood and agrifiber products used on the interior of the building (defined as inside of the weatherproofing system and applied on-site) shall contain no added urea-formaldehyde

resins. Laminating adhesives used to fabricate on-site and shop-applied composite wood and agrifiber assemblies shall contain no added urea-formaldehyde resins.

Composite wood and agrifiber products are defined as: particleboard, medium density fiberboard (MDF), plywood, wheatboard, strawboard, panel substrates, and door cores. Furniture and equipment are not considered base building elements and are not included.

5.11 EQ Credit 5: Indoor Chemical Pollutant Source Control – 1 point

Design to minimize and control pollutant entry into buildings and later cross-contamination or regularly occupied areas:

- A. Employ permanent entryway systems at least six feet long in the primary direction of travel to capture dirt and particulates from entering the building at entryways that are directly connected to the outdoors and that serve as regular entry points for building users. Acceptable entryway systems include permanently installed grates, grilles, or slotted systems that allow for cleaning underneath. Roll-out mats are only acceptable when maintained on a weekly basis by a contracted service organization
- B. Where hazardous gases or chemicals may be present or used (including garages, housekeeping/laundry areas and copying/printing rooms), exhaust each space sufficiently to create negative pressure with respect to adjacent spaces with the doors to the room closed. For each of these spaces, provide self-closing doors and deck to deck partitions or a hard ceiling. The exhaust rate shall be at least .50 cfm/sq. ft., with no air re-circulation. The pressure differential with the surrounding spaces shall be at least 5 Pa on average and 1 Pa at a minimum when the doors to the rooms are closed.
- C. In mechanically ventilated buildings, provide regularly occupied areas of the building with air filtration media prior to occupancy that provides a Minimum Efficiency Reporting Value (MERV) of 13 or better. Filtration should be applied to process both return and outside air that is to be delivered as supply air.

5.12 EQ Credit 6.1: Controllability of Systems – Lighting – 1 point

Provide individual lighting controls for 90% (minimum) of the building occupants to enable adjustments to suit individual task needs and preferences AND provide lighting system controllability for all shared multi-occupant spaces to enable lighting adjustment that meets group needs and preferences.

5.13 EQ Credit 6.2: Controllability of System - Thermal Comfort – N/A

5.14 EQ Credit 7.1: Thermal Comfort – Design – 1 point

Design HVAC systems and the building envelope to meet the requirements of ASHRAE Standard 55-2004, Thermal Comfort Conditions for Human Occupancy. Demonstrate design compliance in accordance with the Section 6.1.1 Documentation.

5.15 EQ Credit 7.2: Thermal Comfort – Verification – 1 point

Agree to implement a thermal comfort survey of building occupants within a period of 6 to 18 months after occupancy. This survey should collect anonymous responses about thermal comfort in the building including an assessment of overall satisfaction with thermal performance and identification of thermal comfort-related problems. Agree to develop a plan for corrective action if the survey results indicate that more than 20% of occupants are dissatisfied with the thermal comfort in the building. This plan should include measurement of relevant environmental variables in problem areas in accordance with ASHRAE Standard 55-2004.

5.16 EQ Credit 8.1: Daylight and Views - daylight 75% of spaces – N/A

5.17 EQ Credit 8.2: Daylight and Views - views 90% of spaces – N/A

6.0 Innovation in Design Process (ID)

6.1 ID Credit 1: Innovation in Design – N/A

6.2 ID Credit 2: LEED Accredited Professional – 1 point

At least one principal participant of the project team shall be a LEED Accredited Professional.

Section C: LEED Credits Summary

		Available Points	Project Potential	Certified Points
1.0	Sustainable Sites (SS)			
Prereq 1	Construction Activity Pollution Preventin	--	--	--
Credit 1	Site Selection	1	0	0
Credit 2	Development Density and Community Connectivity	1	0	0
Credit 3	Brownfield Redevelopment	1	0	0
Credit 4.1	Alternative Transportation – Public Transportation Access	1	0	0
Credit 4.2	Alternative Transportation – Bicycle Storage + Changing Rooms	1	1	1
Credit 4.3	Alternative Transportation - Vehicles	1	1	0
Credit 4.4	Alternative Transportation - Parking Capacity	1	1	1
Credit 5.1	Site Development - Protect or Restore Habitat	1	1	1
Credit 5.2	Site Development - Maximize Open Space	1	1	1
Credit 6.1	Stormwater Design - Quantity Control	1	1	0
Credit 6.3	Stormwater Design - Quality Control	1	1	0
Credit 7.1	Heat Island Effect - Non-roof	1	0	0
Credit 7.2	Heat Island Effect - Roof	1	1	1
Credit 8	Light Pollution Reduction	1	1	1
2.0	Water Efficiency (WE)			
Credit 1.1	Water Efficient Landscaping - Reduce by 50%	1	1	1

Credit 1.2	Water Efficient Landscaping - No Potable Use or Irrigation	1	1	1
Credit 2	Innovative Wastewater Technologies	1	0	0
Credit 3.1	Water Use Reduction - 20%	1	1	1
Credit 3.2	Water Use Reduction - 30%	1	0	0
3.0	Energy and Atmosphere (EA)			
Prereq 1	Fundamental Commissioning of Building Energy Systems	--	--	--
Prereq 2	Minimum Energy Performance	--	--	--
Prereq 3	Fundamental Refrigerant Management	--	--	--
Credit 1	Optimize Energy Performance	10	5	5
Credit 2	On-site Renewable Energy	3	0	0
Credit 3	Enhanced Commissioning	1	0	0
Credit 4	Enhanced Refrigerant Management	1	0	0
Credit 5	Measurement and Verification	1	1	0
Credit 6	Green Power	1	0	0
4.0	Materials and Resources (MR)			
Prereq	Storage and Collection of Recyclables	--	--	--
Credit 1.1	Building Reuse - maintain 75%	1	0	0
Credit 1.2	Building Reuse - maintain 95%	1	0	0
Credit 1.3	Building Reuse - maintain 50% of interior	1	0	0
Credit 2.1	Construction Waste Management - divert 50%	1	1	1
Credit 2.2	Construction Waste Management - divert 75%	1	0	0
Credit 3.1	Materials Reuse - 5%	1	0	0
Credit 3.2	Materials Reuse - 10%	1	0	0
Credit 4.1	Recycled Content - 10%	1	1	1
Credit 4.2	Recycled Content - 20%	1	1	0
Credit 5.1	Regional Materials - 10%	1	1	1
Credit 5.2	Regional Materials - 20%	1	1	0
Credit 6	Rapidly Renewable Materials	1	0	0
Credit 7	Certified Wood	1	1	0
5.0	Indoor Environmental Quality (EQ)			
Prereq 1	Minimum IAQ Performance	--	--	--
Prereq 2	Environmental Tobacco Smoke Control	--	--	--
Credit 1	Outdoor Air Delivery Monitoring	1	0	0
Credit 2	Increased Ventilation	1	0	0
Credit 3.1	Construction IAQ Management Plan - during construction	1	1	0
Credit 3.2	Construction IAQ Management Plan - before occupancy	1	0	0
Credit 4.1	Low-Emitting Materials - Adhesives and Sealants	1	1	1
Credit 4.2	Low-Emitting Materials - Paints and Coatings	1	1	1
Credit 4.3	Low-Emitting Materials - Carpet Systems	1	1	1
Credit 4.4	Low-Emitting Materials - Composite Wood + Agrifiber Products	1	1	1
Credit 5	Indoor Chemical Pollutant Source Control	1	1	1

Credit 6.1	Controllability of Systems - Lighting	1	1	1
Credit 6.2	Controllability of System - Thermal Comfort	1	1	0
Credit 7.1	Thermal Comfort - Design	1	1	1
Credit 7.2	Thermal Comfort - Verification	1	1	1
Credit 8.1	Daylight and Views - daylight 75% of spaces	1	0	0
Credit 8.2	Daylight and Views - views 90% of spaces	1	0	0
6.0 Innovation in Design (ID)				
Credit 1	Innovation in Design - Green Education	4	1	0
Credit 2	LEED Accredited Professional	1	1	1
Credit Totals		69	36	26



By: _____

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Title: Managing Director, CC-CleanTech LLC

Date: 5/1/09



By: _____

Name: John J. Dlugos IV, LEED AP

Title: Vice President, Gallo Mechanical, LLC

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