NAVFACINST 11010.45

REGIONAL PLANNING INSTRUCTION

SUSTAINABLE PLANNING

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1.0 OVERVIEW

This document provides a summary of Sustainable Planning policy as it relates to Navy installation planning. Sustainable development is required by law and policy is a requirement for the Navy. This module outlines the application of sustainable development principles to the planning process.

1.1 Definition of Sustainable Development

> *" Then I say the earth belongs to each . . . generation during its course, fully and in its own right, no generation can contract debts greater than may be paid during the course of its own existence."* -- Thomas Jefferson.
>
> *"I recognize the right and duty of this generation to develop and use the natural resources of our land; but I do not recognize the right to waste them, or to rob, by wasteful use, the generations that come after us*." Theodore Roosevelt.

The most commonly accepted definition of sustainable development is:

> *"Development that meets the needs of the present without compromising the ability of future generations to meet their own needs."*
>
> from the United Nations World Commission on Environment and Development (Brundtland Commission) Report, 1987

Sustainability implies a balanced relationship between natural and human systems. Sustainable development strives to achieve harmony between human development and natural systems by efficiently using the existing built environment and integrating new development with the natural context. It takes into account the full life cycle cost of a project, including broader concerns such as its effect on the environment and the community, not just the financial cost.

Sustainable development integrates facilities planning, design, construction, and operations management processes; bringing together the customer/user, planner, designer, contractor, and facility operator to achieve optimized energy, material and human resource expenditures over the life cycle of the facility. This approach recognizes that a good solution is one that solves several problems at once (i.e., leveraging investments) without creating new ones. Only a holistic, integrated approach achieves the optimal solutions that can meet today's needs without compromising future availability of resources.

As a federal entity the Navy has a responsibility to the people of the United States to be good stewards of resources we hold in public trust. Sustainable development is one way we fulfill that trust.

Sustainable planning is the application of sustainable development principles to the planning phase of project development in Navy terms, everything up to and including completion of project documentation (DD Form 1391).

1.2 Principles Embodied in Law

The National Environmental Policy Act and the Pollution Prevention Act provide the legislative foundation for implementing sustainable development at shore installations.

1.2.1 National Environmental Policy Act (NEPA) of 1969

The National Environmental Policy Act establishes national environmental policy based on the following principles:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- Assure for all Americans safe, healthful, productive, and esthetically, and culturally pleasing surroundings;
- Attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;
- Preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity and variety of individual choice;
- Achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities;
- Enhance the quality of renewable resources and approach the maximum attainable recycling of resources.

These principles embody sustainable development.

1.2.2 Pollution Prevention Act (PPA) of 1990

The Pollution Prevention Act establishes national policy for:

- Prevention or reduction of pollution at the source, whenever feasible.
- Pollution that cannot be prevented should be recycled (that is, find another use for materials that are waste products from the project in question).
- Pollution that cannot be prevented or recycled should be disposed and treated in an environmentally safe manner.

These policies define the priorities of sustainable development.

1.2.3 Related Laws and Implementing Regulations

While the foundation legislation is NEPA and PPA, additional laws and their implementing regulations that apply to various aspects of Sustainable Planning are included in Appendix A.

1.2.4 Executive Orders

The following Executive Orders require federal agencies, including the Navy, to implement various principles of Sustainable Planning:

- **Executive Order 13006** of 21 May 1996, Locating Federal Facilities on Historic Properties in Our Nation's Central Cities
- **Executive Order 13101** of 14 September 1998, Greening of the Government Through Waste Prevention, Recycling, and Federal Acquisition
- **Executive Order 13123** of 3 June 1999, Greening the Government Through Efficient Energy Management
- **Executive Order 13134** of 12 August 1999, Developing and Promoting Bio-Based Products and Bio-Energy
- **Executive Order 13148** of 21 April 2000, Greening the Government Through Leadership in Environmental Management.
- **Executive Order 13149** of 21 April 2000, Greening the Government Through Federal Fleet and Transportation Efficiency

1.3 Federally Accepted Principles of Sustainable Development

Executive Order 13123 tasked federal agencies with defining Sustainable Development principles for implementing Sustainable Development. A federal task force agreed to the following set of general principles:

- Optimizing siting potential;
- Minimizing energy consumption while maximizing use of renewable energy sources, to include bio-based products and bio-energy;
- Protecting and conserving water by reducing water consumption, to include recycling water and applying beneficial landscaping practices;
- Using environmentally preferable products;
- Enhancing indoor environmental quality; and
- Optimizing operations and maintenance practices to maintain specified performance levels.

From the Whole Building Design Guide, National Institute of Building Sciences website at http://www.wbdg.org/index.asp

1.4 Sustainable Planning Principles

In adapting the general principles contained in law and these federally accepted principles to the planning process, a planner will:

- Promote sustainable land use through compact/mixed-use development that minimizes the need to drive gas-powered vehicles and maximizes use of already developed land through infill, brownfields development, and preservation of natural, and cultural/historic

resources. Planners should avoid using undeveloped land, open space, water and soil conservation areas, existing natural ecosystems, endangered species habitats, and floodplains.

- Promote socio-economic development of the region by involving local community residents in setting the vision for and developing plans and actions for their communities and regions, and making optimum use of existing assets in the adjacent communities. An open planning process ensures that development does not disadvantage communities in the siting of unattractive facilities.

- Reduce the concentrations of carbon dioxide and other green house gases in the atmosphere by encouraging alternatives to the use of gas-powered vehicles. Development plans should adopt a pedestrian-friendly development design; provide access to public transit, bicycle, and pedestrian routes; promote alternatively fueled vehicles; maximize the use of alternative renewable energy sources; and adopt meaningful energy conservation measures.

- Encourage pollution prevention by specifying land uses that minimize or eliminate the use of extracted underground substances; by reducing the use of chemicals and synthetic compounds in their construction and building materials, operations, products, and services; by reducing and re-using by-products and waste; and by encouraging methods of landscape design and maintenance that uses native vegetation and reduces or eliminates the use of pesticides, herbicides, and synthetic fertilizers as well as encouraging the use of compost and recycled rain or gray water.

- Reduce the use of water through water conservation and recycling; re-using wastewater on-site and employing innovative wastewater treatment that minimizes or eliminates the use of chemicals.

The degree to which these principles are applied to Regional Shore Infrastructure Planning, and to projects identified in the planning process, will depend upon individual planners having the knowledge of these principles and taking deliberate measures to ensure the principles are a primary consideration in their products. Our focus cannot be on siting concerns alone; we must also consider long-term economic benefits. Planners must be aware of the need to incorporate sustainable development principles in project development. Project scope and cost estimates, as reflected in the DD Form 1391, must allow for sustainable development principles in order for designers, builders and facility managers to implement these principles.

2.0 SUSTAINABLE PLANNING GOALS

While the goals of the Navy's sustainable development policy cannot be realized until the completion of a project, awareness of them from the start will help with the planning process.

2.1 Enumerated Goals

Specific enumerated goals on energy usage and general goals are based upon requirements of the Executive Orders. Beginning with the planning phase, "for new construction, and improvement, renovation, and repair of existing facilities, the Navy's goal is to apply Sustainable Development

principles to achieve or exceed, where life cycle cost effective, the Environmental Protection Agency (EPA) and Department of Energy's (DoE) ENERGY STAR ™ Buildings and ENERGY STAR ™ Homes Programs, and the nationally recognized voluntary consensus standards as established by the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED™) rating systems, where applicable." Descriptions of ENERGY STAR ™ and LEED™ are included in Section 4.0 below.

2.2 Measure of Merit for Sustainable Development

Our Measures of Merit are based upon meeting the standards set for the EPA/DoE's ENERGY STAR ™ Buildings and ENERGY STAR ™ Homes Programs, and the LEED™ "certified" level established by the USGBC. The Navy's goal is to exceed the LEED™ "certified" level where justified by life cycle cost analysis.

2.3 Measure of Merit for Sustainable Planning

Our Measures of Merit for Sustainable Planning are to:

- The LEED™ Checklist is included in Appendix B. This criteria is applied to individual buildings being constructed on an installation, and is used to rate the building at construction completion. The rating is dependent upon planning that preceded the design of a particular facility, but is not measured until perhaps years after the regional plan is completed.

- Consider and apply to the degree possible within funding and regional constraints, the National Governors Association checklist for New Community Design contained in Chapter 4 of the report at http://www.nga.org/cda/files/072001NCDFULL.pdf. This checklist is included in Appendix C.

2.4 Reporting

The Navy submits annual progress reports to the EPA and the Office of the Federal Environmental Executive (OFEE), describing Navy efforts to comply with the Executive Orders.

3.0 RESPONSIBILITIES

Responsibilities are assigned by OPNAVINST 11000.16A, Command Responsibility for Shore Activity Land and Facilities.

Regional Commanders and the Commanding Officers of Stand-Alone Activities have ultimate responsibility for shore infrastructure, including the responsibility to program and budget resources to ensure compliance with the Sustainable Development goals.

NAVFACENGCOM is designated as the executive agent, responsible for implementing Sustainable Development policies. This instruction complies with the tasking to issue instructions amplifying and implementing Sustainable Development principles into shore infrastructure planning, acquisition, operation and management business, and disposal processes, and specifically shore infrastructure planning. By this instruction, and ongoing field support, NAVFACENGCOM makes available to the Regional Commanders and the Commanding Officers of Stand-Alone Activities technical and acquisition support, and specifically those promoting the incorporation of Sustainable Development policies and goals into Regional Shore Infrastructure Planning process.

4.0 RATING SYSTEMS

The Navy measures its performance using the standards set forth by the EPA/DoE's ENERGY STAR™ Buildings, ENERGY STAR™ Homes Programs, and the USGBC's LEED™ rating systems. Whether or not we achieve these ratings can only be determined at project completion. However, our ability to achieve these ratings begins with the planning phase. Planners must have an understanding of these rating systems, and promote their incorporation into the goals of the process.

4.1 LEED™

The U.S. Green Building Council developed the Leadership in Energy and Environmental Design (LEED™) Green Building Rating System to evaluate sustainability for a project. The LEED™ rating system is a checklist of various "green" options for building design and construction, developed through a consensus by a consortium of industry groups. It evaluates environmental performance from a "whole building" perspective over a building's life-cycle, providing a definitive standard for what constitutes a "green building". The LEED™ rating system covers all phases of a project, from planning to commissioning and maintenance. Its five sections are:

- Sustainable Sites
- Water Efficiency
- Energy and Atmosphere
- Materials and Resources
- Indoor Environmental Quality

The Council has also developed an Operations & Retrofit Application Guide for Existing Buildings.

LEED™ is a self-assessing system designed for rating new and existing commercial, institutional, and high-rise residential buildings. It establishes measurable performance requirements and provides a checklist of criteria. Credit is earned for each factor met, for a total of up to 69 points. Seven pre-requisites are also listed; all seven must be met to qualify for certification. Different levels of green building certification are awarded based on the total credits earned. The Navy's goal is to exceed the LEED™ "certified" level (26 or more points) where justified by life-cycle cost analysis. (See Appendix B for the LEED™ Green Building Rating System Checklist.)

The first section of LEED™, Sustainable Sites, is the most relevant to the planning phase. However, a planner must be aware of the other requirements to properly consider sustainable development practices and to complete the DD Form 1391, especially as many of the requirements are interrelated. Consider LEED™ from the earliest planning stages. Identify the potential of meeting various requirements and discuss the impact of LEED™ on the scope of the project. For example, commissioning is required to meet LEED certification; this will affect the Statement of Work. Assign responsibility for following LEED™ to a team member. Planners, architects, and engineers should undergo training to become LEED™ certified.

4.2 Energy Star

EPA/DoE's ENERGY STAR™ rating is used to evaluate energy consumption for a completed building. The Navy's goal is to meet or exceed ENERGY STAR™ standards, where life-cycle cost effective. To accomplish this, the planner must be aware of the standards and incorporate compliance into the DD Form 1391. Though energy consumption will be determined primarily by decisions made during the design phase, site selection also influences the ultimate level of energy consumption. Choice of site and careful consideration of the placement of a structure allows the building to take advantage of positive climatic factors, such as sun angle and wind direction, and avoid negative climatic factors. Keeping such passive measures in mind in the planning phase makes ENERGY STAR™ standards easier to meet. Additionally, ENERGY STAR™ compliance depends on monitoring energy use for a period of one year after building occupancy. Include this monitoring as a requirement in the RFP.

4.3 National Governors Association New Community Design Checklist

In its 2001 report "New Community Design to the Rescue: Fulfilling Another American Dream," the National Governors Association presents the concept of New Community Design (NCD), which draws upon the principles previously articulated by the adherents of Smart Growth and Smart Communities, New Urbanism and Neo-Traditional Design, and Livable Communities to offers a distinct alternative to the developmental "sprawl" that has dominated real estate growth over the last 50 years. Key features of NCD include extensive mixed land use, reduced land consumption, community centers, ample green space, transportation options, and building designs that reflect the local culture and harmonize with the natural environment. NCD guidelines can also help improve public health, preserve open space, and enhance environmental quality.

5.0 SUSTAINABLE PLANNING STRATEGIES

Numerous planning processes and tools are currently used in the Navy planning process. The following sections address some of the other factors and requirements to consider when developing sustainable planning. In most cases, planners can coordinate sustainability with planning requirements that already exist; the regulations complement each other, rather than conflict. There are a few cases where the principles of sustainability may be in opposition to other planning requirements, in which case the planner must evaluate the options and make a

decision about which has priority. Sustainable development is required, but multiple approaches exist for achieving that goal.

5.1 Follow RSIP

An up-to-date Regional Shore Infrastructure Plan (RSIP) is the first tool for determining what your facility needs are, and what siting options exist for fulfilling them. Guidance on the RSIP process is included in this Instruction. The RSIP Process guidance addresses sustainability and its importance in the context of regional planning, and reiterates that sustainable planning is "integral to the RSIP process." Examples of goals of the RSIP process that are compatible with sustainable principles include:

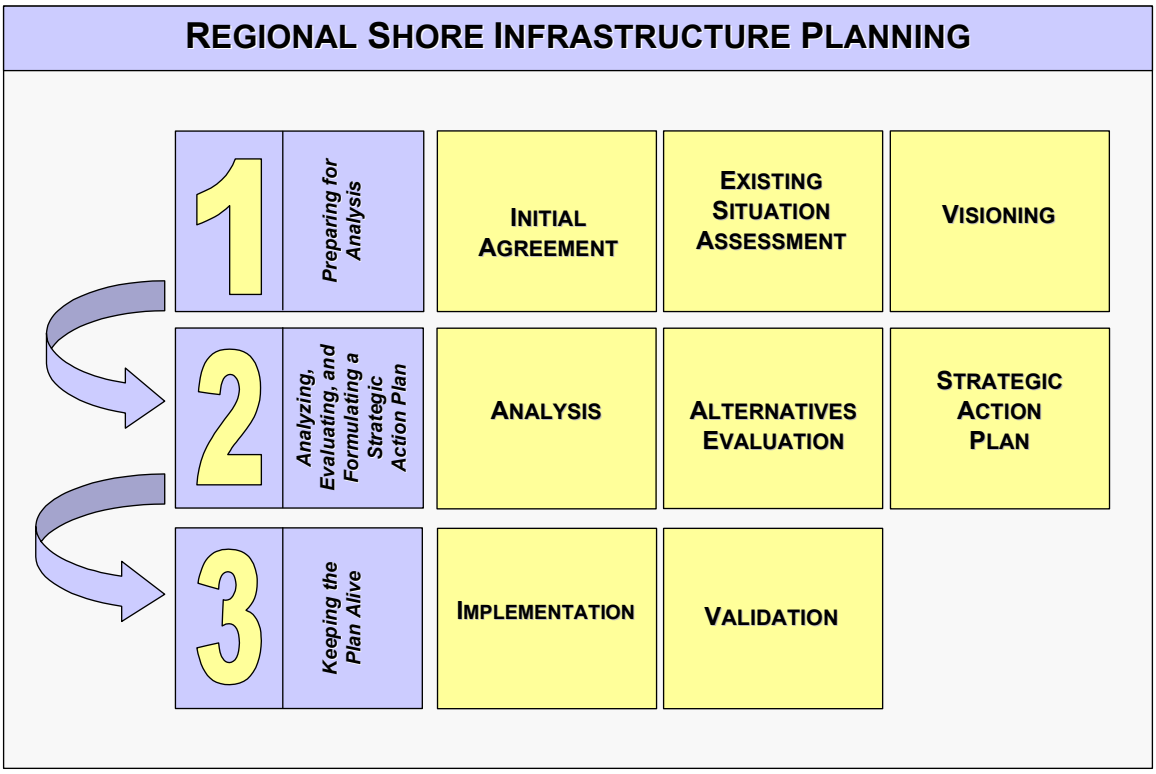
- Minimizing requirements and optimizing the use of existing land, facilities, and infrastructure
- Optimizing the use, economy, and investment strategies of Base Operations Support infrastructure
- Identifying efficient utility systems and infrastructure to achieve energy conservation goals
- Analyzing and recommending mutual land, facilities, transportation, and utility uses with other services, federal, state, and local agencies; and the private sector
- Recommending a variety of facility management methods that are beneficial to the Navy, such as joint use, outsourcing, privatization, and leasing
- Adopting a policy of "cradle-to-cradle" life-cycles for facilities through more flexible design and adaptive reuse
- Recognizing the environmental association of all planning recommendations and providing ecologically sustainable solutions that support and enhance the regional shore establishment.

This Instruction adds to this list of considerations by requiring the base development planner to follow the LEED™ and NGA New Community Design checklists.

Properly following the RSIP process means that a planner is already including sustainable planning. The RSIP process recognizes that planning begins well before a specific project, with an overall approach to facilities that incorporates sustainability. These long-term, general approaches include:

- Taking a more regional approach to planning, drawing in local and state governments.
- Coordinating Shore Facilities Planning and utilities planning.
- Improving the internet Navy Facilities Assets Data Store (iNFADS) to better reflect the current assets at a base.
- Starting with comprehensive planning before project planning.
- Making planning decisions predictable, consistent, and life-cycle cost-effective.

The RSIP process is composed of three levels that guide the regional plan from its inception, through completion, to implementation. Level 1 is Preparing for Analysis; Level 2 is Analyzing, Evaluating, and Formulating a Strategic Action Plan; and Level 3 is Keeping the Plan Alive. Eight tasks are divided between the three levels.



5.1.1 Level 1: Initial Agreement

This task develops an agreement between major stakeholders that defines the general framework and acts as foundation for the RSIP. Consider sustainability from this earliest stage. Define participants of the Planning Team, Working Groups, and Implementation Team. The Planning Team will develop a Work Plan, which includes a Statement of Services or a Statement of Work and a "clear definition of expectations" for project development. Incorporate environmental input early in the planning process to assist in formulating environmentally compatible plans that maximize efficient use of resources. At the planning phase, the planners need to be already in communication with the architects, engineers, maintenance people, affected community and government members, and users who will also work on the project, to ensure that everyone is working as a team to promote sustainability. The initial Statement of Purpose for the RSIP process, must include sustainable development in its goals and individual task objectives.

5.1.2 Level 1: Existing Situation Assessment

This task creates a set of comprehensive regional profiles that capture the unique character, issues and concerns of the RSIP and promote a basic understanding of the region. When developing these profiles, consider sustainability as a profile among those of the region.

Sustainability goals for regional planning suggest that the RSIP process consider both the natural and built environments as a single holistic system balancing one with another. This approach will encourage a comprehensive assessment, leading to more sustainable infrastructure alternatives later in the RSIP process. The Environmental Profile should be developed into two components: the Natural Environment (including obvious natural resources such as wetlands, etc.) and the Built Environment (which will include Historical and Archaeological resources). Consider them

both separately and together. Looking at the different factors of the region as an integrated system is a hallmark of sustainable principles.

5.1.3 Level 1: Visioning

This task defines regional goals and planning requirements, and guides future strategic infrastructure decisions. Develop several plausible future scenarios and choose one preferred scenario. Translate the Preferred Scenario into an infrastructure-focused on the Planning Requirement. Determine the "driving forces" that characterize the region and the planning goals. "Driving Forces" include community, economic and political factors, as well as support of Mission. The RSIP Process specifies that Visioning includes sustainable design as a driving force.

5.1.4 Level 2: Analysis

Analysis uses examination, programming, and modeling to develop distinct infrastructure alternatives that present clear and viable choices for a wide range of infrastructure options. It develops alternatives to address regional planning goals determined in Level 1 tasks. Goals will include support of the mission and sustainability.

Use the Principles of Sustainable Development to guide the analysis of regional conditions and the development of alternatives. Sustainable development alternatives will be more viable and longer lasting, and more easily supported by the NEPA process required of all strategic actions.

5.1.5 Level 2: Alternatives Evaluation

In this task, assess the advantages, disadvantages, and potential conflicts of each alternative developed in Analysis, comparing the Alternatives to Vision Metrics. Measure the Alternatives against the Preferred Scenario and against the Planning Requirement. Rank the Alternatives in order of preference. Determine the Preferred Alternative after comparison against all the metrics. One set of metrics should be how well the Alternatives meet sustainable principles.

5.1.6 Level 2: Strategic Action Plan

In this task, establish baseline objectives for the Strategic Action Plan. This sets up smaller steps or tactics to implement the Preferred Alternative. Develop a timeline and set major milestones for each step.

Define the Navy and regional resources needed to accomplish the plan. This will include considerations of funding and existing resources such as facilities. Set your goals/performance metrics for measuring the successful implementation of the Strategic Action Plan. Include sustainable goals as part of the smaller steps: for example, meeting the LEED™ checklist as one performance metric.

5.1.7 Level 3: Implementation

This task covers day-to-day execution of the Strategic Action Plan and is the physical and procedural realization of the RSIP plan. It focuses on design and construction of physical improvements, but also continuation of the planning process.

Form an Implementation Oversight Committee to review, monitor, administer the Strategic Action Plan, including the Sustainable Planning requirements developed within that task. Administer resources to meet the Strategic Action Plan goals, monitor if conditions change and the Plan needs to be updated. Numerous processes have implications for fulfilling sustainable planning goals, among them: Environmental Compliance, Conservation, Pollution Prevention, and Restoration; Facility and Site Design; Transportation and Utilities Design.

5.1.8 Level 3: Validation

This final task ensures continuing monitoring of the RSIP process by the Implementation Oversight Committee. Review changes within the region and determine if the RSIP plan is still current and relevant, including how well the Regional Shore Infrastructure Plan meeting is meeting the needs and goals of the Region, including sustainability goals.

5.2 Mission Requirements

The first requirement of facilities is mission support. Sustainability, while subsidiary to that, can help in meeting the military mission. Support of the military mission is the primary goal of all planning. There should be no conflict between the military mission and sustainability, as stewardship of resources is part of our trust. Ideally, sustainability supports military readiness: planning the best use of facilities, consolidation, and the RSIP process support a more streamlined and prepared military. Maintaining and reusing facilities, pollution prevention, and preserving natural resources, all help to protect our resources and save money in the long run, which further supports the mission. In case of conflict between implementing sustainability and supporting the military mission, the mission takes priority.

Sustainable conceptual planning includes identifying the best use of existing resources to meet new mission requirements, and routine assessments of the facility condition to ensure that facilities continue to meet mission requirements. Facilities requirements are generated by mission requirements, with allowances for facility scope driven by base loading. Requirements are developed from the NAVFAC P-80. Sustainable conceptual planning includes identifying the best use of existing resources to meet new mission requirements, and routine assessment of the facility condition to ensure that facilities continue to meet mission requirements.

Where existing facilities exceed the mission requirement, identify alternative uses for the facility to meet other mission deficiencies. If alternatives cannot be identified, then consider transferring the asset to another mission element. Where no further use is possible, dispose of the facility. Until the facility is demolished, perform minimum maintenance and eliminate energy and utility usage. Specify deconstruction (taking apart the structure with the goal of reusing the materials and components) as the preferred method of demolition to the maximum extent possible, thereby reducing waste and promoting recycling.

Where existing facility deficiencies impacting the operational requirement are identified, consider restoring an existing facility to meet economical or serviceability standards before constructing a new facility. Consolidate functions and operations, whether in an existing structure, or a new one. By replacing mechanical systems and upgrading the energy efficiency of the building envelope, and renovating the interior layout to meet new functional and serviceability requirements, an existing facility can meet requirements at a lower cost while preserving the environment and historic structures.

Where new construction is required, revise the Regional Shore Infrastructure Plan, including cultural, natural resource, and pollution prevention plans, and identify the site. Use sustainability as one factor in the selection of a site.

5.3 Community

An essential principle of sustainability is considering the community as a whole. Navy installations do not exist in a void, and their effects and responsibilities do not end at the fence line. Examples of interconnectedness between a base and a local community include local traffic patterns around base, civilian use of base amenities, military personnel living off base, and military use of civilian amenities such as schools and retail outlets. One of the Navy's planning principles is promoting socio-economic development of the region by involving local community residents in setting the vision for and developing plans and actions for their communities and regions, and making maximum use of existing assets in the adjacent communities. Working with the community and local government on planning can lead to benefits other than sustainability. Good communication can result in community goodwill; fewer protests, leading to a shorter project time frame; and lower fees from legal battles over projects.

Coordination with the local community and government is already required: for example working with the State Historic Preservation Officer (SHPO) or with a local Planning Commission. If not, make this an essential part of the planning process. This involves cooperation on individual projects, but should also start with the overall regional planning process.

Approaches:

- Coordinate Navy and local community land use planning
- Participate in regional infrastructure planning and facilitate efficient regional solutions and best-value partnerships
- Identify "stakeholders" in the military and in the community
- Develop cooperative agreements with private/public sector
- Use local planning, zoning, and building standards that are more sustainable than Navy standards
- Rely on private community to augment or provide housing, support facilities, and transportation options

5.4 Sustainable Planning Checklist

5.4.1 Site Selection

Choice of a site for a project is the first step in sustainable planning. Identify the best, most appropriate use of a site, and recognize that some sites may not be suitable for development. In addition, consider if a new site is truly necessary, one sustainable approach is to renovate existing facilities in lieu of new construction. Another option is to clean up and develop "brownfields", or polluted sites. Consider preservation of historic structures and redevelopment of urban areas.

Consider the potential environmental impacts the proposed improvements will have on the surrounding environment, neighboring communities, and natural resources. Choose a site that links with a local transportation network. Consider cost and effort of transporting building materials. Determine if existing utilities will support facility requirements, or if new treatment plants or power plants are required. Also evaluate impacts on source water quality, increased stormwater runoff, increased erosion potential, noise, and ambient air quality. Avoid developing wetlands and habitat for endangered species, and strive to keep net green space across an installation the same.

The LEED™ Green Building Rating System addresses site selection in the first four criteria on its checklist, covering environmental, urban, and transportation factors. These requirements are:

- Selecting a site that preserves natural resources (Credit 1);
- Cleaning up and redeveloping polluted sites (Credit 3);
- Redeveloping urban areas (Credit 2); and
- Providing alternative transportation options other than gas powered vehicles (Credit 4).

See Appendix B for the detailed LEED™ Checklist for Sustainable Site selection. Strategies addressing environmental, urban, and transportation factors in the following sections are based on the LEED™ system, other organizations that promote sustainability, and the Navy's planning principles (see Section 1.4).

5.4.2 Environment

Choose your project site to protect natural resources.

- Consider the vegetation and topography of available sites and identify which would require the least amount of disruption in order to accommodate the project. Protect ecologically sensitive areas such as endangered species habitats, forests, meadows, wetlands, and waterfronts. Preserve culturally sensitive areas such as historic and archeological sites. Increase urban density rather than developing untouched green spaces. Maintain or increase the amount of green space, including planting trees, especially in dense urban areas where open parkland may not be possible.

- Understand the microclimate of possible sites and identify which have the best potential for sustainable design based on temperature, humidity, wind, and solar orientation.

Consider a site's potential for producing alternative forms of energy. For example, photovoltaics could be used to power remote guardhouses.

- Consider developing brownfield sites. The Navy has bases that may have polluted land from munitions, underground storage tanks, spilled fuel, machinery, etc. Clean up these areas and re-use them for new development rather than obtaining new land or building on undeveloped buffer land.

- Evaluate the topography of the possible sites. Accommodate topographically difficult terrain, avoiding disturbance of steep slopes where development could cause deep erosion. Avoid development of sites that would adversely affect watersheds. Accommodate natural watershed drainage patterns, and take advantage of water on a site in land use planning. Turn natural resource constraints into recreational activities.

When evaluating sites, consider how the building can fit on the site. The following strategies rightfully fit into the design phase, yet as many of these issues have their approaches decided by the end of the planning phase, the planner needs to consider them.

- Recognize the natural attributes of a site and integrate the building into the natural setting while preserving those natural attributes.

- Plan for efficient use of water through use of natural drainage, drought tolerant landscaping, and recycling.

- Reduce and manage stormwater runoff from the site. This involves consideration of a stormwater system layout and integration with existing utilities.

- Minimize paved areas and maximize green space and use of native vegetation.

- Align proposed structures on the site to take advantage of positive, or minimize negative, climatic and weather factors such as sun angle and wind direction, thereby using passive measures to reduce energy consumption.

- Minimize the footprint of the building and associated facilities on the site to retain open space. Plan the use of open spaces with appropriate landscaping and amenities (garden paths, fountains, benches, etc.) that promote the intended use. Bring the outside in, and the inside out, thereby connecting building occupants with nature.

- Make recycling convenient for occupants and construction contractors. The overall community design should help conserve resources and minimize waste.

5.4.3 Urban Redevelopment

Preserve green space by channeling development to areas that are already developed. Design to promote a sense of community.

- Make bases, or certain areas on bases, more compact. Provide a central, public focus for a community of mixed-use buildings, and make beneficial use of space in urban areas to promote social interaction at all hours of day and night. This approach also ties into

environmental and transportation aspects of sustainability, by preserving green space and allowing alternatives to automobiles.

- Channel development to existing communities or to urban areas with existing infrastructure. Increase localized density. During the site selection process give preference to previously developed sites with urban redevelopment potential.

- Retain a well-defined edge, such as an undeveloped greenbelt in a buffer zone, around developed areas.

- Incorporate urban design policies which promote a local sense of place by respecting local cultural and environmental features. Plan new development with respect to historical patterns, precedents, and boundaries.

- Preserve historic properties and districts by restoring existing facilities and infrastructure to meet new requirements.

- Plan, function, design and construct projects which group functionally similar requirements and provide larger, flexible facilities with more generic spaces that enhance sustainable development concepts.

5.4.4 Transportation

Managing transportation is where many of the principles of sustainable development meet. Reducing the use of gas powered vehicles, especially single occupant vehicles, has multiple benefits for sustainability: reducing a major source of air pollution; preserving green space as a result of compact facilities and fewer roads; and promoting community by getting people out of their cars. Here are some sustainable ideas associated with Transportation:

- Promote car pooling by giving priority for parking and/or subsidizing public transportation.

- Locate facilities near public transportation or provide shuttle service. Linking with an existing transportation network reduces the environmental impacts of the installation and also reinforces the community's sustainable efforts.

- Support alternative forms of transportation by providing bicycle racks and shower facilities.

- Plan for pedestrian environments. Make bases more compact, minimizing distances between facilities, and providing properly located sidewalks lighted for security. Improve major traffic routes through landscaping and safety considerations, incorporating "traffic calming" measures such as narrower roads and speed bumps.

5.4.5 Post-Planning Sustainable Factors

Factors of sustainable design, construction, and energy use are also covered in the LEED™ system. These do not apply to the planning process except that the planner must make allowance for them in the DD Form 1391 to allow funding and require sustainable measures in the Scope of

Work. Specific sustainable goals and approaches will be developed in the design phase, but the DD Form 1391 must indicate the intent to incorporate sustainable practices (see Section 6.2). In addition, the LEED™ system promotes project integration across disciplines. Many of the credits are interrelated and some in other sections depend on choices made during site selection. As an example, using a rainwater catchment as a strategy to achieve a water reduction credit affects the approach to stormwater management, a siting issue. Familiarity with the entire LEED™ Checklist is essential from project inception.

See the LEED™ checklist in Appendix B for a detailed list.

Indoor environmental criteria will be evaluated in comparison with the EPA/DoE's ENERGY STAR™ program. Siting a facility with respect to local climatic conditions can help the planner meet energy savings goals. Consider future maintenance needs, as these will have an effect on ENERGY STAR™ compliance.

5.5 NEPA and Sustainability

The National Environmental Policy Act provides the basis for sustainable policy. NEPA provides a process to follow, not just principles, to help the planner incorporate sustainability. Use NEPA as a tool to make decisions based on sustainable concepts instead of viewing it as an obstacle to implementing decisions already made. The NEPA process, elements, and questions should be used at each stage, not just at project development. The NEPA process identifies mitigation measures where there is an impact on the environment. Consider sustainable principles in preparing NEPA document and identifying impacts that will require mitigation. Be sure to follow up with implementing those mitigation measures.

5.6 Anti-Terrorism/Force Protection

The Navy is required to follow the Antiterrorism/Force Protection DOD Instruction 2000.16. Conflicts between AT/FP and sustainability may exist, especially on the issue of siting. Other green design elements may not be affected.

Examples of possible conflicts include:

- An ideal approach to community aspects of sustainability would allow shared use of Navy facilities with members of the community. However, this conflicts with security requirements that allow only persons with government or military IDs on Navy Installations.
- Minimum building standoff distances conflict with the principle of increasing urban density.
- Mixed use development isn't necessarily compatible with standoff distances for parking lots. Linking into public transportation options may violate security requirements.

On the other hand, certain requirements of AT/FP complement sustainable principles:

- Building envelope performance enhancements required for AT/FP may improve energy performance.

- Discouraging single-occupant cars, and therefore reducing the number of automobiles on base, may help with enforcement of security.

Evaluate the requirements of sustainability and AT/FP in relation to each other. In case of conflicts, the planner may have to give up some aspects of sustainability in order to protect people and infrastructure. AT/FP takes precedence over any specific approach to sustainability. All sustainability criteria may not be met for site selection, but a planner can compensate with attention to another category. In this case, the focus on meeting sustainability goals may move to another project phase, for example design or construction.

6.0 FUNDING AND BUDGETING ISSUES

Inherent contradictions exist between the federal budget process, which emphasizes first costs of facilities, and the requirements of sustainable planning. Ideally, a sustainable approach produces interior and exterior environments leading to increased human productivity and performance, and better human health. As the human resource constitutes the vast majority of the life cycle cost of a facility, any design measure that increases human productivity and health can be cost effective. As this is not necessarily quantifiable, planners must justify sustainability by evaluating the entire life-cycle of a facility, then integrate sustainability into the budgeting process.

Develop the scope and cost estimate that meets the sustainability goals. The tri-service parametric cost models initially will not include costs associated with all sustainable development objectives. For those goals that cannot be accommodated within the parametric cost models, but that are justified by life cycle cost analysis, identify the scope and costs as a separate item in the DD Form 1391. The scope and cost estimate for constructing and operating a facility over its life-cycle will be refined during each succeeding phase. These costs will in turn be used to refine the parametric model for future projects.

Study potential cost-effective use of technologies such as photovoltaics, on-site wastewater treatment, and graywater systems; where they show promise, include further studies as special requirements in the project description and in the budget. Budget for Full Systems Commissioning and for the preparation of Operations and Maintenance Support Information (OMSI) manuals, and include in the DD Form 1391.

Include sustainable development considerations in life-cycle cost analyses (LCCA) used to determine facility acquisition decisions made to correct facility deficiencies. Budget for environmental and energy-efficient equipment, systems and design solutions based on LCCA. First cost may be higher, but sustainable design produces long term operating savings.

6.1 Funding Options

During the programming and budgeting phase phase, the requirements identified in the planning phase are prioritized and included in a multi-year program through DoD's Planning, Programming, and Budgeting System (PPBS). For highest priority requirements, projects are generated with more detailed siting and scope. Projects can be considered individually or as a package (i.e., multiple projects required to achieve a common goal that due to funding or construct-ability limitations must be programmed over a multi-year program). In either case,

development of scope and costs for programming and budgeting purposes begins with the Functional Analysis and Concept Design (FACD). As part of this process it is important for an integrated team to establish Sustainability Goals, such as achieving the highest LEED™ certification. The Military Construction process emphasizes this "teaming approach" for all projects. The team should include all stakeholders – members from the Region/Warfare Center, Activity, EFD/EFA, and NAVFACHQ – and all relevant disciplines – planners, functional experts, Activity Liaison Officers (ALnO), designers, project managers, users, ROICC, environmental planners, and the A/E (at Final DD Form 1391 stage or later).

Analyze the alternatives available to satisfy the facilities requirements. The options may include repair or modernization of an existing building or facility, leasing a facility off base, looking within the region for an existing facility, a public-private venture (PPV), an Urgent Minor Construction (UMC) project, or a Military Construction (MCON) project. Any time there is an alternative to new construction this supports sustainability. The least cost alternative that will fully satisfy the operational requirements becomes the "best alternative". If MCON is determined to be the best alternative, the project development cycle begins with an Activity DD Form 1391 created by the activity planner. This develops the required scope and a rough cost estimate.

While the primary funding sources may be Military Construction (including Housing and Energy Conservation Investment Program (ECIP)) and Operations and Maintenance (minor construction and real property maintenance accounts), consideration should be given to alternative funding sources. Improvements to existing real property installed equipment directly related to preventing pollution may be funded using O&M Environmental Quality, Navy Pollution Prevention Equipment Program. The project will be identified in the Planning, Programming, and Budgeting System documents for each identified funding source. Use the ECIP to fund sustainability in projects (new and retrofit).

6.2 DD Form 1391

The DD Form 1391 marks the conclusion of the planning process. This lays out the required scope of the project and the cost estimate.

Sustainable design features are weighed against their life-cycle costs and environmental impacts. Historically, the design process has tried to include these features at no overall increase to the project cost, with varying levels of success. Some sustainable design features that would produce long term cost savings (life-cycle cost benefits) and would implement good sustainable practices have higher initial costs and could not be added to construction projects because of budgetary constraints. However, this emphasis on not increasing first costs is changing.

For new construction, renovation, and repair of existing facilities, the Navy's goal is to apply sustainable development principles to achieve or exceed, where life-cycle cost effective, the EPA/DOE's ENERGY STAR™ Buildings and ENERGY STAR™ Homes Programs and the USGBC's LEED™ rating systems, where applicable. To accomplish these goals, at project inception each EFD/A shall create an Integrated Product Team who will ensure all scoping decisions include sustainable development considerations. In order to meet the requirements, additional costs may be included under a line item titled "Sustainability Features" in the Primary Facility and/or Supporting Facilities sections of DD Form 1391, Block 9, where justified by life-cycle cost analysis. As a guide, the total of these added costs should not exceed 5% of the total facility cost (first line Cost of Block 9). However, if fully justified, this figure may be exceeded.

For an example of including sustainability in the DD Form 1391, see the sample form (Appendix D).

6.3 Life Cycle Cost Analysis

All of the sustainable design costs listed on the DD Form 1391 must be justified by documenting life-cycle cost savings in the economic analysis before they can be added to the project cost. Include only costs that would not achieve a "trade-off" effect in the initial construction costs of the project. An example of a trade-off whereby no additional cost would have to be documented on the DD Form 1391 is improvements to the building envelope that allow for the reduction of air handler size, and thus, cost. Where additional costs for sustainable features are included in the Block 9 costs, include a statement in Block 10 to outline those sustainability features.

Instructions on Life-Cycle Cost Analysis (LCCA) are found in CFR Title 10, Part 436, OMB Circular A-94, and NAVFAC P-442 (Economic Analysis Handbook). Mutually exclusive alternatives for energy or water systems shall be compared and evaluated on the basis of life-cycle costs or net savings over equivalent study periods. Alternative building designs for new buildings shall be evaluated on the basis of life cycle costs. The most cost-effective solution is that with the lowest life-cycle costs or the highest net savings.

Life cycle costs are the sum of the present values of: investment costs, less salvage values at the end of the study period; non-fuel operation and maintenance costs; replacement costs less salvage costs of replaced building systems; and energy and water costs. For a retrofit project, net savings may be found by subtracting life cycle costs based on the proposed project from life cycle costs based on not having it. For a new building design, net savings is the difference between the life cycle costs of an alternative design and the life cycle costs of the basic design. Well-documented economic analyses are required to follow the guidance and formats of NAVFAC P-442 Economic Analysis Handbook. ECONPACK For Windows is the recommended computer software package, which can generate a supporting economic analysis model consistent with NAVFAC P-442 and OMB Circular A-94 requirements. Federal Buildings Life-Cycle Costing (FBLLC) Software from DoE provides another valuable electronic tool for developing a LCCA involving sustainable design features.

The line item costs of the proposed features should be listed in the cost estimate back-up data and summarized in the Budget Estimate Summary Sheet. The economic analysis must justify the increased cost by detailing and incorporating energy, maintenance, and other life cycle cost savings into the appropriate locations of the economic analysis.

Appendix A

Laws, Executive Orders, Regulations, Directives, and Instructions That Support Sustainable Development

Environmental sustainability involves applying a holistic approach to optimizing the resources required by the shore establishment in support of the Navy's operational requirements. All aspects of shore infrastructure are examined in the context of the efficient use of energy, natural, and human resources, and their impact on the environment. Therefore, the number of laws, Executive Orders, regulations, directives, and instructions that bear on the subject are considerable.

Principle Legislation:

The following two pieces of legislation are the primary basis for implementing sustainable development at shore facilities:

National Environmental Policy Act (NEPA) of 1969, 42 U.S.C. 4321 et seq. establishes national environmental policy based upon the principles:

Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
Assure for all Americans safe, healthful, productive, and esthetically, and culturally pleasing surroundings;
Attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;
Preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity and variety of individual choice;
Achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities;
Enhance the quality of renewable resources and approach the maximum attainable recycling of depleted resources.

These principles define sustainable development.

Pollution Prevention Act (PPA) of 1990 (42 U.S.C. 13101-13109). This Act establishes the national policy is to:

Prevent or reduce pollution at the source, whenever feasible.
Pollution that cannot be prevented should be recycled.
Pollution that cannot be prevented or recycled should be disposed and treated in an environmentally safe manner.

These policies define the priorities of sustainable development.

Related Legislation:

While the principle legislation related to sustainable development of shore installations is the NEPA and PPA, the following laws also apply:

Conservation of Natural and Cultural Resources: Sustainable development protects cultural resources (including archaeological treasures and historic structures) through careful siting and restoration, and natural resources through preservation of habitats of indigenous and endangered species. Sustainable development complies with:

Archaeological and Historic Preservation Act of 1974, 16 U. S. C. 469 et seq. This Act directs Federal agencies to notify the Secretary of the Interior when any Federal construction project of a Federally licensed activity or program may cause irreparable loss or destruction of significant scientific, prehistoric, historic, or archaeological data. The Act also provides a mechanism for funding the protection of historic and archaeological data.

Conservation Programs on Military Installations (Sikes Act), 16 U.S.C. 670.a et seq. This Act requires each military department to manage natural resources and to ensure that necessary services are provided for the management of fish and wildlife resources on each installation. The Act authorizes cooperative agreements with state and local governments, non-governmental organizations, and individuals that call for each party to provide matching funds or services to carry out natural resources projects and initiatives.

Endangered Species Act (ESA) of 1973, 16 U.S.C. 1531 et seq. This Act determines which species are threatened or endangered, and protects both plant and animal species and their critical habitats. The Act prohibits any Federal action that may jeopardize such species and provides for the designation of critical habitat of such species wherein no action is to be taken concerning degradation of the habitat. The Act requires a biological assessment of Federal agency actions when an endangered or threatened species may be present in the area affected by the actions.

National Historic Preservation Act of 1966, 16 U. S. C. 470 et seq. This Act provides for the nomination, identification (through listing on the National Register of Historic Places (NRHP)), and protection of historical and cultural properties of significance. The Act establishes specific procedures for compliance, including initial review authority by the State Historic Protection Officer.

Public Buildings Cooperative Use Act of 1976, Public Law 94-541. This Act encourages the adaptive reuse of historic buildings as administrative facilities for Federal agencies or activities.

Soil Conservation Act of 1938, 16 U. S. C. 5901 et seq. This Act provides for the application of soil conservation practices on Federal lands.

Environmental, Health, and Safety: Sustainable development controls air pollution directly and indirectly by reducing energy requirements which reduces CO2 and other emissions, reducing the need for private transportation, considering the by products of various processes with a view to reducing waste, and by using low-volatile organic compounds and eliminating

toxic or carcinogenic materials (asbestos, PCBs, lead based paint, etc.) that adversely affect human health. Sustainable development conserves water resources through use minimization and reuse, including separation and reuse of black and gray water and rain water for irrigation and replenishment of ground water. Sustainable development prevents water pollution at the source and manages non-point source runoff. Sustainable development minimizes solid waste, and where waste is produced, reuses or cycles waste before disposing of the waste in an environmentally safe manner. Sustainable landscaping practices maximize use of indigenous plant species that require minimum irrigation and pesticide treatment. Sustainable development complies with:

Clean Air Act (CAA), 42 U.S.C. 7401 et seq. This Act, the major Federal legislation concerning the control of the Nation's air quality, requires the setting of National Ambient Air Quality Standards and the development of Federal and state programs to achieve these standards through the control of air pollution sources.

Clean Water Act (CWA), 33 U.S.C. 1251. This Act is a compilation of decades of Federal water pollution legislation and is the major Federal legislation concerning improvement of the nations water resources. The Act amended the Federal Water Pollution Control Act (FWPCA) and requires Federal agencies be consistent with State "non-point source" pollution abatement plans. The Act was amended in 1987 to strengthen enforcement mechanisms and to regulate storm water runoff. The Act provides for the development of municipal and industrial wastewater treatment standards and a permitting system to control wastewater discharges to surface waters.

Coastal Zone Management Act (CZMA) of 1972 (16 U. S. C. 1451 et seq.). This Act is closely related to the CWA as it provides incentives for coastal States to develop and implement coastal area management programs for water pollution abatement, particularly with regard to non-point source pollution. State coastal zone management programs incorporate flood control, sediment control, grading control, and storm water runoff control. Federal actions that have a direct impact on the coastal zone must be consistent to the maximum extent practicable with the state program. Sustainable development incorporates pollution prevention and control measures to abate negative impacts on the environment.

Federal Facilities Compliance Act (FFCA) of 1992, 42 U.S.C. 6901 note, 6908. This Act amends the Solid Waste Disposal Act (SWDA) to waive governmental immunity, thereby subjecting Federal agencies to civil and administrative penalties that are assessed in connection with a Federal, state, or local solid waste (SW) or hazardous waste (HW) regulatory program. The Act also provides Federally Owned Treatment Works (FOTW) with the same sewage exclusion from hazardous waste regulation as afforded to Publicly Owned Treatment Works (POTW).

Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), 7 U.S.C. 136 et seq. This Act provides the principal means for preventing environmental pollution from pesticides. The Act requires that all pesticide products registered by the EPA have label instructions for use, storage, and disposal on each container. It is unlawful to purchase, distribute, or use any pesticide that does not have an EPA registration number or for which registration has been canceled or suspended, or to apply, store, or dispose of any pesticide or container in any manner inconsistent with applicable regulations. The EPA is required to accept certain pesticides under recall for safe disposal. The Act was amended

in 1972 by the Federal Environment Pesticide Control Act and subsequently in 1975 and 1978.

Occupational Safety and Health Act (OSHA) of 1970, 29 U.S.C. 651 et seq. This Act ensures safe and healthful working conditions and authorizes the enforcement of the standards developed under the Act.

Safe Drinking Water Act (SDWA), 42 U.S.C. 300f et seq. This Act amended the Public Health Service Act and specifies a system for the protection of drinking water supplies through the establishment of primary drinking water standards to protect public health and secondary drinking water standards to protect public welfare. This Act requires each state to adopt a program to protect wells from contamination, and to enforce compliance. The 1996 amendments (Public Law 104-182) to the SDWA include new regulations based on risk and public health concerns; including prohibition on the use of lead in plumbing that carries potable water and the listing of unregulated contaminants which pose a health threat or which are known to occur in public water supplies. The amendments also waive sovereign immunity for Federal facilities.

Solid Waste Disposal Act (Public Law 89-272, 79 Stat. 997) of 1965, as amended by the Resource Conservation and Recovery Act (RCRA) of 1976 (Public Law 94-580, 90 Stat. 2795), as amended by 42 U.S.C. 6901-6907, Section 301 of Title 3, United States Code. This Act requires that Federal facilities comply with all Federal, State, and local requirements concerning the disposal and management of solid waste; including permitting, licensing, and reporting. The SDWA encourages beneficial reuse of solid waste through recycling and the use of EPA guideline products containing recovered materials.

Toxic Substances Control Act (TSCA), 15 U.S.C. 2601 et seq. This Act provides for the Federal regulation of chemical substances that present a hazard to health or the environment. Such regulation requires the testing of new substances and subsequent control of their commercial distribution. The Act also contains specific requirements relative to polychlorinated bi-phenyls (PCBs), asbestos, and radon.

Energy. Sustainable development conserves energy and associated pollutants including "greenhouse gases" in compliance with:

Energy Policy Act (EPACT) of 1992. This Act seeks to enhance the long-term energy security of the nation by reducing dependency on imported oil and by providing for improved energy efficiency. EPACT promotes the use of energy efficient products.

Energy Policy and Conservation Act of 1975, as Amended (42 U. S. C. 6201 et seq.). This Act was the direct of the oil embargo of 1973 by Mideastern oil producing states. The Act increased the supply of petroleum reserves, implemented price incentives to increase the supply of fossil fuels, and reduced demand for petroleum products by increasing the energy efficiency of automobiles, major appliances, and other consumer products. The Act also called for increased conservation of water resources through efficiencies in plumbing fixtures. Sustainable development conserves energy and water resources.

National Energy Conservation Policy Act of 1978 (Public Law 95-619). This Act promulgates conservation measures and efficiency standards to control the growth rate of energy demands. As such its goals are related to the EPACT.

Laws can be accessed at: http://www.law.cornell.edu/topics/environmental.html.

Executive Orders:

Executive Order 13006 of 21 May 1996, Locating Federal Facilities on Historic Properties in Our Nation's Centeral Cities

Executive Order 13101 of 14 September 1998, Greening of the Government Through Waste Prevention, Recycling, and Federal Acquisition (replaces Executive Order 12873)

Executive Order 13123 of 3 June 1999, Greening the Government Through Efficient Energy Management (replaces Executive Orders 12902, 12759,and 12845).

Executive Order 13134 of 12 August 1999, Developing and Promoting Bio-Based Products and Bio-Energy

Executive Order 13148 of 21 April 2000, Greening the Government Through Leadership in Environmental Management

Executive Order 13149 of 21 April 2000, Greening the Government Through Federal Fleet and Transportation Efficiency.

Executive Order 13150 of 21 April 2000, Federal Workforce Transportation

Executive Orders can be accessed at http://www.nara.gov/fedreg/eo_clint.html

Regulations:

10 CFR 436, Federal Energy Management and Planning Programs

32 CFR 190, Natural Resources Management Program

32 CFR 775, DON Procedures for Implementing the National Environmental Policy Act (NEPA)

40 CFR 6, Environmental Protection Agency (EPA) Regulations on Implementation of National Environmental Policy Act (NEPA) Procedures

40 CFR 50, Environmental Protection Agency (EPA) Regulations on National Primary and Secondary Ambient Air Quality Standards

40 CFR 51-52, Environmental Protection Agency (EPA) Requirements for Preparation, Adoption, Submittal, Approval, and Promulgation of Implementation Plans

40 CFR 60, Environmental Protection Agency (EPA) Regulations on New Source Performance Standards

40 CFR 122, Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System Permit Regulations
40 CFR 125, Environmental Protection Agency (EPA) Regulations on Criteria and Standards for the National Pollutant Discharge Elimination System Permit Regulations

40 CFR 130, Environmental Protection Agency (EPA) Requirements for Water Quality Planning and Management

40 CFR 141-143, Environmental Protection Agency (EPA) National Drinking Water Regulations

45 CFR 150-186, Environmental Protection Agency (EPA) Regulations for Pesticide Programs

45 CFR 162, Environmental Protection Agency (EPA) Regulations in Insecticide, Fungicide, and Rodenticide Use

40 CFR 247, Environmental Protection Agency (EPA) Guidelines for Procurement of Products that Contain Recycled Materials

40 CFR 248, Environmental Protection Agency (EPA) Guidelines for Federal Procurement of Building Insulation Products Containing Recovered Materials

40 CFR 249, Environmental Protection Agency (EPA) Guidelines for Federal Procurement of Cement and Concrete Containing Fly Ash

40 CFR 250, Environmental Protection Agency (EPA) Guidelines for Federal Procurement of Paper and Paper Products Containing Recovered Materials

40 CFR 260-270, Environmental Protection Agency (EPA) Regulations Implementing RCRA

40 CFR 403, General Pretreatment Regulations for Existing and New Sources of Pollution

40 CFR 760-761, Environmental Protection Agency (EPA) Regulations for Controlling PCBs

60 FR 154, Environmentally and Economically Beneficial Practices Guidance

61 FR 201, Code of Environmental Management Principles for Federal Agencies.

Regulations can be accessed at: http://www.access.gpo.gov/nara/cfr/cfr-table-search.html.

Directives:

Defense Energy Program Policy Memoranda 91-1, 91-2, and 92-2

DoD Directive 4001.1 of 4 September 1986, Installation Management

DoD Directive 4715.1 of 24 February 1996, Environmental Security

DoD Directive 4715.3 of 3 May 1996, Environmental Conservation Program

DoD Directive 6050.1 of 30 July 1979, Environmental Effects in the United States of DoD Actions.

Department of Defense Instruction (DODI) 7041.3 of 7 November 1995, Economic Analysis for Decision Making.

DoD Directives can be accessed at: http://www.dtic.mil/whs/directives/

Instructions:

OPNAVINST 3501.167B, Shore Based Readiness Report (BESEP)

OPNAVINST 4100.5D, Energy Management

OPNAVINST 5090.1B, Environmental and Natural Resources Program Manual

OPNAVINST 6250.4B, Pest Management Programs

OPNAVINST 11000.16A, Command Responsibility for Shore Activity Land and Facilities

OPNAVINST 11010.23E, Management of Shore Base Maintenance of Real Property (MRP) Functions

OPNAVINST 11010.34B, Instructions for Preparation and Submission of the Type “A” Annual Inspection Summary and Narrative Assessment

OPNAVINST 11100.3, Shore Facilities Life Extension Program.

Navy instructions and directives can be accessed at http://neds.nebt.daps.mil/.

Guidance Documents:

NAVFAC Sustainable Design Policies:

Planning and Design Policy Statement 98-01, "Design of Sustainable Facilities and Infrastructure", dated 18 June 1998

Planning and Design Policy Statement 98-02, "Criteria Supporting the Design of Sustainable Facilities and Infrastructure", dated 18 June 1998

Planning and Design Policy Statement 98-03, "Procurement of Sustainable Facilities and Infrastructure through Architect-Engineer (A/E) Contracts", dated 18 June 1998.

Appendix B

LEED™ Checklist

The following is a modified version of the Green Building Rating System.

SUSTAINABLE SITES	YES	NO	N/A
Erosion and Stormwater Control			
Construction site sediment and erosion control plan that conforms to best management practices.[1]	☐	☐	☐
No net increase in the rate or quantity of storm water runoff from existing to developed conditions, OR, if existing imperviousness is greater than 50%, new development will result in a 25% decrease in the rate and quantity of stormwater runoff.	☐	☐	☐
Stormwater treatment systems designed to remove 80% of the average annual post development total suspended solids (TSS), and 40% total phosphorous (TP). [2]	☐	☐	☐
Site Selection			
If the site is **FREE** from the following unfavorable conditions, answer Yes. If the site **HAS** any of the following, answer No.	☐	☐	☐
Land whose elevation is lower than 5 feet above the elevation of the 100-year flood as defined by FEMA.			
Within 100 feet of any federal, state, or local wetland.[3]			
Land that provides habitat for any species on the Federal or State threatened or endangered list.			
If the site has any of these problems, strongly consider using another area.			
Urban Redevelopment			
Increase localized density through utilizing sites that are located within an existing minimum development density of 60,000 square feet per acre).	☐	☐	☐
Develop on a site classified as a brownfield and provide remediation. [4]	☐	☐	☐
Conserve water use through xeriscaping with native plants.	☐	☐	☐
Reduced Site Disturbance/Reduced Heat Islands			
Development plans required on greenfield sites; limit site disturbance to 40 feet beyond the building perimeter, 5 feet beyond primary roadway curbs, walkways, and main utility branch trenches, 25 feet beyond pervious paving areas, OR, on previously developed sites, restore a minimum of 50% of the remaining open area by planting native or adapted vegetation.	☐	☐	☐
Development footprint (including building, access roads and parking) is minimized as much as possible.	☐	☐	☐
Post development landscaping uses native plants that improve habitat for native species.	☐	☐	☐
Provide shade (within 5 years) on at least 30% of non-roof impervious surface on the site, OR, use light-colored/high-albedo materials (reflectance of at least 0.3) for 30% of the site's non-roof impervious surfaces, OR place a minimum of 50% of parking space underground, OR, use open-grid pavement system (net impervious area of LESS than 50%) of the parking area.	☐	☐	☐
ENERGY STAR Roof compliant, high reflectance AND low emissivity roofing for a minimum of 75% of the roof surface; OR, install a vegetated roof for at least 50% of the roof area. [5]	☐	☐	☐
Alternative Transportation			
Locate building within ½ mile of bus lines.	☐	☐	☐
Provide suitable means for securing bicycles, with convenient changing/shower facilities for use by cyclists, for 5% or more of building occupants.	☐	☐	☐
Provide preferred parking for carpools or van pools capable of serving 5% of the building occupants.	☐	☐	☐
Light Pollution Reduction			
Do not exceed Illuminating Engineering Society of North America (IESNA) footcandle level requirements, AND design interior and exterior lighting such that zero direct-beam illumination leaves the building site.[6]	☐	☐	☐
TOTAL SUSTAINABLE SITES SCORE			

SUSTAINABLE SITES	YES	NO	N/A
Erosion and Stormwater Control			
WATER EFFICIENCY			
Water Use Reduction			
Use only captured rain, graywater, or trenched wastewater to water landscape.	☐	☐	☐
Install non-potable water system for toilets, cooling towers, boilers, landscaping, vehicle washing, and other non-potable water needs.	☐	☐	☐
Employ strategies that in aggregate use 20% less water than the water use baseline after meeting Energy Policy Act of 1992 fixture performance requirements.	☐	☐	☐
Exceed the potable water use reduction by an additional 10%.	☐	☐	☐
Comply with the Department of Energy Performance Measured Protocol.	☐	☐	☐
TOTAL WATER EFFICIENCY SCORE			
ENERGY AND ATMOSPHERE			
Minimize Energy Performance			
Building uses high performance envelopes; sheet-wall, roofs, windows, etc., based on long-term insulation and durability requirements.	☐	☐	☐
Design to meet building energy efficiency and performance, as required by ASHRAE/IESNA 90.1-1999.	☐	☐	☐
Use energy efficient HVAC equipment and systems, Lighting systems that consume less than 1 watt/square foot for ambient lighting, ENERGY STAR© approved products, Sensors to control loads based on occupancy, schedule and/or the availability of natural resources use as a light or ventilation	☐	☐	☐
Provide proof that the following alternatives were evaluated for commercial and institutional buildings:	☐	☐	☐
Energy recovery systems that pre-heat or pre-cool in-coming ventilation air			
Integrated generation and delivery systems, such as co-generation, fuel cells, and off-peak thermal storage.			
Modular components such as boilers or chillers to optimize part-load efficiency and maintenance requirements.			
Direct Digital Controls.			
On a performance basis, measured against an identically sized and proportional building[9] the new structure forces purchased energy consumption by:			
New Buildings / Existing Buildings			
20% / 10%	☐	☐	☐
30% / 20%	☐	☐	☐
40% / 30%	☐	☐	☐
50% / 40%	☐	☐	☐
60% / 50%	☐	☐	☐
Eliminate Ozone Depleting Chemicals			
Supplied net fraction of the building's total energy use (as expressed as a fraction of annual energy cost through the use of on-site renewable energy systems such as solar or fuel cells.			
% of Total Energy Cost in Renewables			
5%	☐	☐	☐
10%	☐	☐	☐
20%	☐	☐	☐
Measurement and Verification			
Comply with the installed equipment requirements for continuous metering for the following:	☐	☐	☐
Lighting systems and controls.			
ENERGY AND ATMOSPHERE SCORE SUBTOTAL			

ENERGY AND ATMOSPHERE CONTINUED— SUSTAINABLE SITES	YES	NO	N/A
Constant and variable motor loads.			
Variable frequency drive (VFD) operation			
Chiller efficiency at variable loads (kW/ton).			
Cooling load.			
Air and water economizer and heat recovery cycles.			
Air distribution static pressures and ventilation air volumes.			
Boiler efficiencies.			
Building specific process energy efficiency systems and equipment.			
Indoor water risers and outdoor irrigation systems.			
ENERGY AND ATMOSPHERE TOTAL SCORE			
MATERIALS AND RESOURCES			
Building Reuse			
Maintain at least 75% of existing building structure and shell (exterior skin and framing excluding window assemblies.	☐	☐	☐
Maintain at least 25% (100% total) of existing building structure and shell (exterior skin and framing excluding window assemblies.	☐	☐	☐
Maintain 100% of existing building structure and shell AND 50% non-shell (walls, floor coverings, and ceiling systems).	☐	☐	☐
Construction Waste Management			
Plans developed to recycle and/or salvage at least 50% (by weight) of the construction, demolition, and land clearing waste.	☐	☐	☐
Plans developed to recycle and/or salvage an additional 25% (75% total by weight) of the construction, demolition, and land clearing debris.	☐	☐	☐
Material Content			
Plans specify salvaged or refurbished materials for 5% of building materials.	☐	☐	☐
Plans specify salvaged or refurbished materials for 10% of building materials.	☐	☐	☐
Plans require a minimum of 25% of building materials that contain in aggregate a minimum weighted average of 20% post consumer recycled content material, OR, a minimum weighted average of 40% post-industrial recycled content material.	☐	☐	☐
Plans require an additional 25% (50% total) of building materials that contain in aggregate, a minimum weighted average of 20% post consumer recycled content material, OR, a minimum weighted average of 40% post-industrial recycled content material.	☐	☐	☐
Plans require a minimum of 20% of building materials that are manufactured regionally within a radius of 500 miles.	☐	☐	☐
Of these regionally manufactured materials, plans require a minimum of 50% tat are extracted, harvested, or recovered within 500 miles.	☐	☐	☐
Plans specify rapidly renewable building materials for 5% of total building materials.	☐	☐	☐
Plans require a minimum of 50% of wood-based materials certified (framing, flooring, finishes, furnishings, and non-rented temporary construction applications such as bracing, concrete form work, and pedestrian barriers).[11]	☐	☐	☐
MATERIALS AND RESOURCES TOTAL SCORE			
INDOOR ENVIRONMENTAL QUALITY (IEQ)			
Minimum IAQ Performance			
Plans meet the minimum IAQ requirements.[12]	☐	☐	☐
Plans require mechanically ventilated buildings, design ventilation systems that result in air change effectiveness (E) greater than or equal to 0.9[13], AND naturally ventilated spaces demonstrate a distribution and laminar flow pattern that involves not less than 90% of the room or zone area in the direction of air flow for at least 95% of hours of occupancy.	☐	☐	☐

Indoor Air Quality			
Building operation prohibits smoking indoors.	☐	☐	☐
Plans specify installation of a permanent carbon dioxide (CO_2) monitoring system, AND initial operational set point parameters that maintain indoor carbon dioxide levels no higher than outdoor levels by more than 530 parts per million at any time.	☐	☐	☐
Plans specify during construction, meet or exceed the minimum requirements[14], AND replace all filtration media immediately prior to occupancy.	☐	☐	☐
Plans specify a minimum two-week building flush-out with new filtration media at 100% outside air after construction ends and prior to occupancy, OR, conduct a baseline indoor air quality testing procedure.[15]	☐	☐	☐
Plan requires that adhesives must meet or exceed the VOC limits, [16] AND all sealants used as a filler.[17]	☐	☐	☐
Plan requires paints and coatings must meet or exceed the VOC and chemical component limits of Green Seal.	☐	☐	☐
Plan requires carpet systems must meet or exceed the Carpet and Rug Institute Green Label Indoor Air Quality Test Program.	☐	☐	☐
Plans specify composite wood or agrifiber products must contain no added urea-formaldehyde resins.	☐	☐	☐
Plans specify permanent entryway systems (grills, grates, etc.) to capture dirt, particulates, etc. from entering the building at all high volume entryways, AND provide areas with structural deck to deck partitions with separate outside exhausting, no air recirculation and negative pressure where chemical use occurs (including housekeeping areas and copying/print rooms), AND provide drains plumbed for appropriate disposal of liquid waste in spaces where water and chemical concentrate mixing occurs.	☐	☐	☐
Personal Comfort			
Plans provide a minimum of one operable window and one lighting control zone per 200 s.f. for all occupied areas within 15 feet of the perimeter wall.	☐	☐	☐
Plans provide controls for each individual for airflow, temperature, and lighting for 50% of the non-perimeter, regularly occupied areas.	☐	☐	☐
Meets standard for thermal comfort, including humidity control. [18]	☐	☐	☐
Install a permanent temperature and humidity monitoring system.	☐	☐	☐
Achieves a minimum Daylight Factor of 2% (excluding all direct sunlight penetration) in 75% of all space occupied for critical visual tasks, not including low occupancy support areas where tasks would be hindered by the use of daylight.	☐	☐	☐
Directs line of sight to vision glazing from 90% of all regularly occupied spaces, not including low occupancy support areas.	☐	☐	☐
Building Interior and Exterior are aesthetically pleasing	☐	☐	☐
Plan requires noise to be minimized through the use of sound absorbing materials and equipment sound isolation.	☐	☐	☐
INDOOR AND ENVIRONMENTAL QUALITY (IEQ) TOTAL SCORE			
SUMMARY			
TOTAL SCORE			

To score a building design total all the Yes , No and NA boxes and then use the following formula.

Score = Yes/72– NA

The following rankings are based on the LEEDs ranking system:

Score	Rank
<50%	Fail
50 – 60%	Acceptable
61 – 80%	Good
80 – 100%	Outstanding

Cited Resources

[1]EPA's Storm Water Management for Construction Activities, EPA Document No. EPA-833-R-92-001, Chapter 13
[2]FEMA
[3]40 CFR, Parts 230-233 and Part 22
[4]EPA's Brownfield Redevelopment
[5]ASTM E408
[6]Recommended Practice Manual: Lighting for Exterior Environments
[7]10 CFR 435
[8]ENERGY STAR©
[9]ASHRAE/IESNA 90.1-1999, 90.10-1999, 90.2-1993
[10]Option B: Methods by Technology of the US DOE's International Performance Measurement and Verification Protocol (IPMVP)
[11]Forest Stewardship Council
[12]ASHRAE 62-1999, Ventilation for Acceptable Indoor Air Quality
[13]ASHRAE 129-1997
[14]Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guideline for Occupied Buildings under Construction, 1995
[15]Environmental Requirements, Baseline IAQ and Materials for the Research Triangle Park Campus, Section 01445
[16]South Coast Air Quality Management District Rule #1168
[17]Bay Area Air Resources Board Reg. 8, Rule 51
[18]ASHRAE Standard 55-1992, Addenda 1995

Appendix C

National Governor's Association Checklist

The NGA Principles for Better Land Use were used to develop this checklist. The Appendix presents a more detailed discussion of the NGA principles and their translation into evaluation criteria. For simplicity, questions are used for the format, but local communities and other parties may want to modify the checklist to reflect their own priorities. There is no intent to define what is "right" or "wrong." The goal is to provide a more systematic approach to understanding and evaluating information. For some projects, all of the questions may be answered in the affirmative. This means that the project is fully consistent with the NGA principles for better land use and "smart growth" approaches to growth management. But many projects will not satisfy all the criteria, even though they have many features desired by a community and which may also be significant alternatives to conventional low-density, automobile-dependent, single-use projects. The challenge is not to lower the standard too much, so that places that satisfy only a few criteria are not misleadingly labeled "smart growth" or NCD.

It would be unreasonable to expect that all projects or communities would be completely consistent with all the criteria. However, it is also inappropriate to label a place as a "smart growth" or NCD community if only a few of the criteria are satisfied. Some of the most basic criteria, like mixed land uses, support other criteria. Criteria questions Number 1 through 15 are the most important ones; they correspond to the fundamental goals category of six Better Land Use principles discussed in the Appendix.

Incomplete information could lead to difficulties in forming declarative answers to some questions, prompting the user to seek more information. Alternatively, rather than a "yes" or "no" answer, some people might prefer using low, medium, and high answers for the level of consistency of the project, or even numerical scores for the questions. To illustrate use of the checklist, an actual project, still at the conceptual stage but approved by local government, has been evaluated with the checklist.

CHECKLIST FOR APPLYING THE NGA EVALUATION CRITERIA FOR NCDs

NGA Principle for Better Land Use	***Criteria Questions***	***Project Consistency (yes or no)***
Strengthen and encourage growth in existing communities	1. Is the location in an already-developed area? *The key need is to see if public services and infrastructure have already been created for the location.*	
Include mixed land uses	2. Is there a mix of housing, office space with significant employment opportunities, schools, retail shopping, outdoor recreation areas, and civic/public spaces and buildings? *For infill projects, it may be necessary to consider what is available in neighboring areas.*	
Create a range of housing opportunities and choices	3. Does the housing include different types of homes, such as single-family detached, multifamily apartment buildings, and condos for purchase or renting; and do they cover a range of prices to address a full spectrum of income levels, including affordable housing? *For infill projects, it may be necessary to consider what is available in neighboring areas. Distributed affordable housing in the 10-percent to 15-percent range is feasible.*	
Preserve open space, farmland, natural beauty, and critical environmental areas	4. Does the project avoid converting working lands, such as farms and ranches, into development? *Former working lands that are no longer being used and that are zoned for development are acceptable.*	
	5. Does the project avoid fragmenting existing green space, especially natural habitats and forests? *The need is to understand the original environmental setting and whether development will cause harm by isolating green spaces and block the ability of species to remain healthy.*	
	6. Does the project design protect the local watershed? *Water runoff and other factors should be examined to determine whether the development is harming the watershed. To minimize water runoff, the fraction of land paved over for streets and parking typically should not exceed 20 percent to 30 percent.*	
	7. Does the project location avoid increasing the risk or negative impacts of natural disasters? *Consideration should be given to what kinds of periodic natural hazards exist for the site and whether even the best forms of NCD would be inappropriate for a specific location that is vulnerable, for example, to flooding, wildfires, mudslides, beach erosion, or high winds.*	

	8. Does the project use compact design to minimize the amount of land per dwelling unit? *The average number of housing units per residential acre is the appropriate measure. The best greenfields NCD projects will have densities in the range of at least five units to 10 units per acre, and often much higher. Infill projects will usually have at least 20 units per residential acre. Much depends on the mix of housing; if only single-family detached homes are included, lower densities will prevail.*	
	9. Does the project maintain or create green spaces throughout the new community for public and recreational uses, including continuous green pathways for biking and walking and pocket parks in neighborhoods? *The best greenfields NCD projects will have 20 percent to 50 percent of the total land area as diverse and well-dispersed green spaces. Infill projects may have as little as 5-percent green spaces.*	
	10. Does the project use energy-efficient designs and green building methods to reduce offsite land use? *The goal is for construction materials and home design to be consistent with the highest energy efficiency standards, and not just for inside appliances.*	
Provide a variety of transportation choices	11. Does the project provide convenient access to public transit? For larger projects, does transit operate within the community? *Any form of public transit is acceptable. Convenience means that residents can walk to public transit within about 10 minutes to 15 minutes. Housing densities above 15 units per residential acre aid use of transit. The difficulty in having transit options for greenfields NCD projects places even more importance on the mixed-use criterion, particularly with respect to employment opportunities.*	
	12. Does the street layout or grid provide multiple access points to and from the surrounding areas as well as multiple paths for travel through the community by vehicles and bikes? *The measure is connectivity of streets and greenways throughout the community, so people can have convenient access to all parts of the community by walking, biking, or driving. Cul-de-sacs should not be part of the street design. Only one way into and out of the community is not desirable, because it will cause traffic congestion.*	

	13. Is teleworking facilitated by broad-band capabilities in homes? *Today, most telework opportunities require more than the use of the phone and mail. High-quality Internet connections are needed. Home designs now can include special attention to work areas. This complements the presence of employment opportunities and works toward the goal of minimizing dependence on cars.*	
Foster walkable, close-knit neighborhoods	14. Do the design and layout of buildings and streets promote one or more real neighborhoods by facilitating interactions among residents, including diverse gathering places? *The best NCD projects take every conceivable opportunity to promote neighborly interactions. Front porches and garages behind houses are hallmarks of NCD. Community centers, public spaces, benches on sidewalks in commercial areas and in green areas, pocket parks, and trails are key features.*	
	15. Have the streets been designed with sidewalks, appropriate lighting, and connectedness, to promote easy and safe walking? *Any design that lacks sidewalks on all streets is inconsistent with NCD. In the best NCD projects, landscaping along sidewalks makes them comfortable and attractive. Residential street widths are often in the 20-feet to 22-feet range (compared to conventional streets of 36 feet), and a 600-foot grid size is often preferred to reduce vehicles per day.*	
Take advantage of existing community assets	16. Does the project blend in with the environmental setting and cultural features of surrounding areas? *Good NCD design honors the original natural setting of the location and incorporates environmental assets into the design, in contrast to giving priority to using land for construction. From a visual and aesthetic perspective, the NCD place should blend harmoniously with the surrounding area, in both physical and cultural terms. Architectural features should be consistent with the surrounding community.*	
	17. Has the project considered the use of existing brownfields or grayfields sites for some or all of the needed land? *The goal of more efficient land use requires that NCD projects give serious consideration to using land that is abandoned or greatly underused because of environmental or other reasons. For brownfields sites, this requires attention to any cleanup requirements for using the land for residential purposes, unless the contaminated area is small enough to accommodate some nonresidential component of the project.*	

Promote distinctive, attractive communities with a strong sense of place, including the rehabilitation and use of historic buildings	18. Do the design, layout, and mix of land uses provide a distinctive style and feel to the place, with all elements blending together harmoniously? *This is a qualitative judgment. In the best NCD projects, the designers and planners have carefully considered all the mixed uses and how their layout and architectural features conform to a well-conceived style of the community. The chosen style is often linked to the history of the site and surrounding areas, or to the style of the surrounding community in the case of an infill project. This does not at all imply dull consistency among homes. In good design, there is diversity within a consistent style.*	
	19. Has the project committed to using older and historic buildings on the original site? *For both infill and greenfields projects, the best NCD developers make creative and effective use of structures on the original site, especially ones with historic and architectural significance.*	
Encourage citizen and stakeholder participation in development decisions	20. Have the developer and local government agencies used the best techniques to fully engage all categories of local stakeholders in meaningful activities to guide the design of the community? *The best NCD developers do not bring a fully worked-out community design to the public or government officials. Today, the best practice is to use new and advanced forms of digital technology tools, visual preference surveys, and highly interactive meetings that solicit local input in a collaborative design process. Meaningful activities are ones that provide for true participation in the development of the community design, not merely an opportunity for people to react to a developer's design.*	
Make development decisions predictable, fair, and cost-effective	21. Has the local government adopted zoning codes that give as much support for a mixed-use community as for a typical single-use project (e.g., a sprawl housing subdivision, strip mall, or office park)? *Developers and others who are advancing an NCD project need to take some responsibility for improving local codes that do not support NCD. Many NCD developers have been successful in obtaining new parallel or overlay codes that remove the need for obtaining high-cost variances from codes that do not by right support NCD.*	
	22. Does the appropriate authorizing or regulatory agency have a process that prevents lengthy and unpredictable delays for developers? *Here too, developers and others supportive of NCD can work for improvements in local ordinances and procedures, such as giving priority to NCD applications and guaranteeing decisions within a short time.*	

	23. Has the developer made clear how the project may be constructed in different phases over extensive time periods, yet be mixed-use, and is it clear how the original plan will be followed? *The best NCD developers make clear exactly how a project will be executed over time and how market uncertainties will affect decisions to implement the original community design and plan. It is important to be concerned about significant periods when there may be no*	
	24. Will impact fees or other measures reduce uncertainties about the ability or willingness of local government to pay for all needed public services and infrastructure? *Careful attention should be given to whether the local government is empowered to levy some form of impact fee; whether any such imposed fees will cover all public services and infrastructure; and if those fees will match future costs. The major concern is that some public services and infrastructure, particularly schools, may not be provided for a new development, reducing the quality of life for residents and jeopardizing full build-out of all components of the original community design.*	

Appendix D

Sample DD Form 1391

1. Component	FY 2003 MILITARY CONSTRUCTION PROGRAM	2. Date
NAVY		7/5/01

3. Installation and Location/UIC: N62688	4. Project Title
NAVAL STATION NORFOLK NORFOLK, VIRGINIA	BACHELOR ENLISTED QUARTERS (BEQ)

5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)
0204796N	721.11	P-293	37,000

9. COST ESTIMATES

Item	U/M	Quantity	Unit Cost	Cost ($000)
BACHELOR ENLISTED QUARTERS (BEQ)	m2	95,550	-	54,350
BACHELOR ENLISTED QUARTERS	m2	17,500	1,339	(23,430)
BUILT IN EQUIPMENT	LS	-	-	(950)
INFORMATION SYSTEMS	LS	-	-	(530)
TECHNICAL OPERATING MANUALS	LS	-	-	(190)
ANTI-TERRORISM/FORCE PROTECTION	LS	-	-	(2,240)
PARKING STRUCTURE (2100 AUTOS)	m2	78,050	346	(27,010)
SUPPORTING FACILITIES	LS	-	-	22,030
SPECIAL CONSTRUCTION FEATURES	LS	-	-	(3,640)
ELECTRICAL UTILITIES	LS	-	-	(2,300)
MECHANICAL UTILITIES	LS	-	-	(1,890)
PAVEMENT	LS	-	-	(1,580)
SITE IMPROVEMENTS	LS	-	-	(1,640)
DEMOLITION	LS	-	-	(250)
THERMAL NODE PLANT	LS	-	-	(4,180)
FACILITY SUSTAINABLE DEVELOPMENT	LS	-	-	(3,500)
DESIGN BUILD DESIGN COST	LS	-	-	(3,050)
SUBTOTAL	-	-	-	76,380
Contingency (5.0%)	-	-	-	3,820
TOTAL CONTRACT COST	-	-	-	80,200
Supervision Inspection & Overhead (6.0%)	-	-	-	4,800
SUBTOTAL	-	-	-	85,000
LESS PHASE II FUNDING	LS	-	-	-48,000
TOTAL REQUEST	-	-	-	37,000
Equipment Provided From Other Appropriation	-	-	(NON-ADD)	(5,140)

10. Description of Proposed Construction

Project will construct bachelor enlisted quarters (BEQ). BEQ will be a multi-story, interior corridor, building with structural steel and masonry bearing walls on a pile foundation, slab on grade, brick/block exterior walls, concrete floors, finished interior walls and ceiling, standing-seam metal roof, metal gutters, metal downspouts, insulation, utilities, sound attenuation, and metal doors and windows. The facility will be comprised of 500 modules incorporating a "1+1" module style, permanent quarters with private sleeping rooms, a shared head, and private closets. The BEQ will include high efficiency central heating/air conditioning, telephones and local area network cable outlets, elevators, fire alarm system, sprinklers with fire pump, and utilities. Provide electrical and mechanical utilities at the site. Provide landscaping with irrigation systems and parking for the new facility. Parking will be provided for 70% of the assigned personnel (700 parking spaces).

A Thermal Node Plant for the area is included in this project and will service all the BEQ's in the area. The plant structure will be sized to

(Continued On DD 1391C..)

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