



## Environmentally Preferable Purchasing Program

# Defending the Environment At the Department of Defense

Using Environmentally Preferable Purchasing  
Procedures to Maintain the Pentagon and Other  
DOD Facilities





## **Environmentally Preferable Purchasing Program**

Environmentally preferable purchasing ensures that environmental considerations are included in purchasing decisions, along with traditional factors such as product price and performance. The EPP program provides guidance for federal agencies to facilitate purchases of goods and services that pose fewer burdens on the environment.



We want to hear from you! Please tell us about your environmentally preferable purchasing activities and efforts. We are collecting and sharing information, tools, and hints about what works and what doesn't as environmentally preferable purchasing evolves and expands. Please contact the EPP program by regular mail, e-mail, or fax:

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# Foreword

The federal government purchases more than \$200 billion worth of goods and services each year. Recognizing that purchasing decisions can have environmental consequences, the federal government is incorporating environmental considerations into its purchasing practices. As mandated in Executive Order 13101, *Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition*, the U.S. Environmental Protection Agency (EPA) finalized draft guidance to help federal agencies consider environmental concerns when making purchasing decisions. The guidance establishes principles to help identify products and services that have a reduced effect on human health and the environment.

EPA's guidance recognizes that environmentally preferable purchasing is a dynamic concept that, depending on the product category, will not necessarily be implemented in the same manner from agency to agency or even within a specific agency. To demonstrate some of the ways environmentally preferable purchasing principles are currently being applied, EPA is documenting pilot procurement projects undertaken by executive agencies, state and local governments, and the private sector.

This case study documents one of these projects. It describes efforts by the U.S. Department of Defense (DOD), with the help of EPA's Environmentally Preferable Purchasing (EPP) Program, to introduce environmentally preferable purchasing into routine renovations of the Pentagon—DOD's headquarters in Arlington, Virginia—and several other DOD facilities. The case study focuses on the development, award, and implementation of a 5-year, \$10 million-per-year indefinite delivery/indefinite quantity (ID/IQ) construction, renovation, and repair contract. The project demonstrates the feasibility of including environmentally preferable purchasing principles into federal contracts. We hope the lessons and insights documented in this case study will help you and your organization as you incorporate environmental concerns into your purchasing decisions.

This document provides an overview of recent environmentally preferable purchasing initiatives and includes references to specific products and companies. These references are included to provide additional detail and do not constitute endorsement or recommendation for use by the U.S. Environmental Protection Agency.

# Contents

<b>Introduction</b> .....	1
<b>Project Background</b> .....	3
Saving Money and Improving Environmental Performance .....	4
Incorporating Environmental Purchasing Into the Contract .....	5
<b>Product Research</b> .....	7
Federal Programs.....	7
Environmental Certification Programs.....	8
Independent Product Research.....	10
<b>Developing the Request for Proposal</b> .....	11
Additional Environmental Concerns.....	12
<b>Selecting the Contractor</b> .....	13
Work Begins.....	13
Educating the Contractor .....	13
Preparing Submittals .....	14
Educating Suppliers .....	15
Verifying Environmental Attributes.....	16
Selecting Products.....	17
Product Availability.....	18
Revising Specifications.....	18
Using the Products.....	18
<b>Lessons Learned</b> .....	20
Environmental Products Are Available .....	20
Environmentally Preferable Purchasing Can Be Incorporated Into the Traditional Purchasing Process .....	20
Environmental Products Can Meet Traditional Performance Requirements .....	20
Environmental Purchasing Does Not Increase Government Costs .....	20
Product Research Is a Good Investment.....	21
Contractors Can Help Increase Awareness of Environmental Purchasing Principles .....	21
Environmental Attribute Information Should Be Verified in Writing.....	21
Comprehensive, User-Friendly Environmental Information Is Critical .....	21
<b>Appendix A: Pentagon Renovation</b> .....	22
<b>Afterword</b> .....	23

# Introduction

The Pentagon has been a showcase for American pride, strength, and ingenuity for almost six decades. People around the world can identify it as the headquarters for the U.S. Department of Defense (DOD). Although the Pentagon provides office space for approximately 26,000 employees, is twice the size of the Chicago Merchandise Mart, and has three times the floor space of New York's Empire State building, it is not the only DOD office facility within the Washington, DC, metropolitan area. DOD's Washington Headquarters Services division also maintains offices supporting an additional 9,500 DOD employees who work nearby at the U.S. Court of Appeals for the Armed Forces, the Federal Office Building Number Two (known as the Navy Annex), and the Hybla Valley Federal Building.

The size of its work force and nature of its work require that DOD routinely renovate, repair, and reconfigure office space. DOD's Federal Facilities Division coordinates and supervises these routine activities. The 5-year indefinite delivery/indefinite quantity (ID/IQ) contract DOD awarded in 1997 to perform this type of work is the subject of this case study.

The contract is nearly identical to similar ID/IQ construction contracts awarded by DOD throughout the last six decades with one notable exception—its inclusion of language requiring the contractor to use environmentally preferable construction materials and practices. This case study documents DOD's reasons for incorporating environmental concerns into the contract, its methods for doing so, and its successes and lessons learned.

**Environmentally preferable products** are “products and services [that] have a lesser or reduced effect on human health and the environment when compared to other products and services that serve the same purpose.” This comparison may consider raw materials acquisition, production, manufacturing, packaging, distribution, reuse, operation, maintenance, or disposal of the product or service.

—**Executive Order 13101**, *Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition*, September 16, 1998.

**DOD's 5-year ID/IQ contract requires the use of environmentally preferable materials and practices.**

## Pentagon Facts and Figures

The Pentagon is a virtual city in itself. Approximately **26,000 employees**, both military and civilian, contribute to the planning and execution of the defense of the United States. They arrive daily from Washington, DC, and its suburbs via subway at a station below the building or by driving over approximately **30 miles of access highways** that include express bus lanes. Those driving park approximately **8,770 cars** in **16 parking lots**. Once inside the building, employees climb **131 stairways** or ride **19 escalators** to reach offices occupying **3,705,793 square feet**.

While in the building, they tell time by **4,200 clocks**, drink from **691 water fountains**, and utilize **284 rest rooms**. A **restaurant staff of 230 people** working in **one dining room**, **two cafeterias**, and **six snack bars** (including one outdoors) serve **4,500 cups of coffee**, **1,700 pints of milk**, and **6,800 soft drinks** each day.

More than **200,000 telephone calls** are made daily through phones connected by **100,000 miles of telephone cable**. The Defense Post Office handles about **1,200,000 pieces of mail monthly**. Various Pentagon libraries support DOD research needs. The Army Library alone provides **300,000 publications** and **1,700 periodicals** in various languages.

Stripped of its occupants, furniture, and various decorations, the building alone is an extraordinary structure. Built during the early years of World War II, it is still thought of as one of the most efficient office buildings in the world. Despite **17.5 miles of corridors**, it takes only 10 minutes to walk between any two points in the building.



# Project Background

In early 1993, President Clinton began issuing a series of Executive Orders mandating that executive agencies take actions to improve their environmental performance. The Executive Orders promote energy efficiency, water conservation, reduced toxic emissions, waste prevention and recycling, and environmentally preferable purchasing. Three years before the first of these Executive Orders was issued, Congress authorized \$1.1 billion for the first major renovation of the Pentagon in 50 years. Responding to this new call from the President to reduce environmental impacts of government activities, DOD decided to use that planned renovation to make the Pentagon an environmental showcase, demonstrating and promoting energy-efficient and environmental technologies. While this major renovation is unrelated to the routine office renovation and reconfiguration work supervised by DOD's Federal Facilities Division, its history provides important context for the work described in this case study.<sup>1</sup>

## Environmental Executive Orders

The Executive Orders listed below provided additional incentives for DOD's incorporation of environmentally preferable purchasing language in its ID/IQ construction contract. To obtain copies of the Executive Orders, please visit [www.pub.whitehouse.gov/search/executive-orders.html](http://www.pub.whitehouse.gov/search/executive-orders.html).

- **Executive Order 13123**, *Greening the Government Through Efficient Energy Management*, June 8, 1999: This order strengthened and replaced several Executive Orders in place during the early phases of DOD's ID/IQ construction contract planning, including **Executive Order 12902**, *Energy Efficiency and Water Conservation at Federal Facilities*, and **Executive Order 12845**, *Requiring Agencies to Purchase Energy Efficient Office Equipment*. Executive Order 12902 mandated energy and water conservation in federal buildings and directed agencies to make profitable investments in energy efficiency to benefit the environment and the economy. It also directed agencies to designate a "showcase" facility incorporating these measures. Executive Order 12845 mandated that federal agencies purchase personal computers, monitors, and printers that meet EPA Energy Star requirements for energy efficiency, and "sleep" when they are inactive to conserve additional energy.
- **Executive Order 13101**, *Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition*, September 14, 1998: This order strengthened and replaced an earlier order, **Executive Order 12873**, *Federal Acquisition, Recycling and Waste Prevention*. Executive Order 12873 required Federal agencies to purchase recycled-content products designated by EPA and to buy other environmentally preferable products according to guidance developed by EPA's EPP Program.
- **Executive Order 12856**, *Federal Compliance with Right-To-Know Laws and Pollution Prevention Requirements*, August 3, 1993: This order directs agencies to cut toxic emissions 50 percent to improve indoor and outdoor air quality.

Executive agencies must increase energy efficiency, water conservation, and environmentally preferable purchasing and reduce toxic emissions.

<sup>1</sup>For more information on the overall Pentagon renovation effort, please see page 22.

**DOD assembled 30 leading environmental and energy design experts to explore options for the renovation project.**

The Rocky Mountain Institute (RMI), an independent, nonprofit research and educational foundation, provided consulting support on how to incorporate environmental and energy technologies into the Pentagon. RMI, together with the Pentagon Renovation and Planning Office, assembled 30 of the country's leading environmental and energy design experts for an intensive 3-day workshop to explore energy saving and environmental options for the overall Pentagon renovation project. The team identified numerous measures to help decrease energy use, improve overall environmental performance, and enhance human health and productivity.

The resulting report, *Energy Efficient/Environmentally Sensitive DOD Showcase Facility: The Pentagon, A National Historic Landmark*, contains a series of recommendations made by the workshop participants. The report is organized into five sections—energy; building ecology; water, landscaping, and grounds; materials, waste, and resource management; and cultural and behavioral change—but stresses the importance of an integrated approach to the overall environmental features of the building.

## **Saving Money and Improving Environmental Performance**

In addition to identifying ways to improve the Pentagon's environmental features, the RMI report also noted that the improved environmental performance could produce significant cost savings. RMI's results suggested the following possibilities:

- Investing in energy-efficient technologies would allow DOD to reduce the Pentagon's energy consumption by 55 to 60 percent.
- Improving indoor air quality (IAQ) by eliminating the use of construction materials with adverse IAQ impacts could increase worker productivity and save money by reducing absenteeism and decreasing medical and liability costs.
- Maintaining a comfortable working environment by upgrading the building's HVAC system and improving IAQ are expected to increase worker productivity by 6 percent, which represents a \$72 million annual savings.
- Installing water-efficient sinks, toilets, water fountains, and showers could reduce the Pentagon's water consumption, currently 125 million gallons a year, by as much as 25 percent—a savings of more than 31 million gallons a year.
- Making recycling easier for employees by creating room for additional collection bins and relocating collection stations will allow the Pentagon to double its current recycling rate from 25 percent to 50 percent. Doubling the recycling rate will allow DOD to double the money generated by the Pentagon recycling program.



## Incorporating Environmental Purchasing Into the Contract

Although the RMI report was prepared originally for the overall Pentagon renovation effort and not specifically for the routine ID/IQ construction contracts, DOD's Federal Facilities Division (FFD) recognized that some of the suggestions could be incorporated into its next contract. Based on its experience with a previous environmentally preferable purchasing project—the repair and maintenance of the Pentagon parking lots (see box on page 6)—FFD had a good understanding of what was needed to successfully incorporate its environmental criteria into the contract. It needed to:

- Understand the environmental impacts of the construction materials used in the contract.
- Modify traditional product contract specifications to incorporate environmental requirements.
- Select a contractor willing to commit to DOD's environmental objectives.

### Contract Time Line

The following time line identifies key dates in the development and implementation of the ID/IQ construction contract.

- |   |                     |
|---|---------------------|
| • DOD begins developing contract                      | January 1997        |
| • DeLima Associates researches environmental products | February/March 1997 |
| • Request for Proposal (RFP) released                 | April 1997          |
| • Contract awarded to HITT contracting firm           | December 1997       |
| • HITT begins submittals research                     | January 1998        |
| • HITT starts construction project                    | March 1998          |

## DOD's Green Parking Lots

In 1995, DOD contacted EPA's EPP Program to help develop contract specifications to apply environmentally preferable purchasing in repairing and maintaining its parking lots. Together, the agencies created a successful approach for integrating environmentally preferable purchasing practices into contract language.

To prepare the contract, DOD and EPA used publicly available information and conducted a limited market survey to identify environmental attributes for 20 product categories. The team used this research to develop the RFP and resulting contract specifications.

The contract was awarded in June 1997 and proved it is possible to incorporate environmentally preferable purchasing practices into federal contracts. Although the ID/IQ construction contract is much larger in scope and complexity (referencing more than 400 products), a similar process was used to develop the specifications for both projects.

For more information on the parking lot repair and maintenance project, refer to EPA's case study, *Paving the Road to Success* (EPA 742-R-97-007). Call EPA's Pollution Prevention Information Clearinghouse at 202 260-1023 for a free copy or visit EPP's Web site at <[www.epa.gov/opptintr/epp](http://www.epa.gov/opptintr/epp)>.

# Product Research

With the help of EPA's EPP Program, DOD began searching for environmental attributes to include in the ID/IQ construction contract along with traditional performance requirements. To help identify these attributes, DOD examined the efforts of EPA and other federal agency programs and nongovernmental environmental certification programs, and hired an independent research organization.

## Federal Programs

In addition to the EPP program, which focuses on multiple attributes, DOD consulted several single-attribute environmental purchasing programs including EPA's Comprehensive Procurement Guidelines (CPG), Energy Star, and Green Lights programs; and the U.S. Department of Energy's (DOE's) Federal Energy Management Program (FEMP). DOD also consulted the National Park Service's Sustainable Design Database, which includes some multiple-attribute information. These programs provided environmental attribute information on a variety of products used in the ID/IQ construction contract. DOD used the information to develop its product specifications for the RFP. A brief description of each program follows:

**DOD gained insight from other federal government environmental purchasing programs.**

- As required by Executive Order 13101 and Section 6002 of the Resource Conservation and Recovery Act (RCRA), EPA's CPG program designates products available containing recovered materials. The program recommends recycled-content percentages and identifies potential suppliers. When purchasing designated products, federal agencies are required to purchase them containing the highest percentage of recycled content if the product meets agency needs. To date, the CPG program has designated and recommended recycled-content percentages for 55 products in eight categories, including products in the construction category. The construction products include building insulation products; carpet; cement and concrete containing coal fly ash or ground granulated blast furnace slag; consolidated and reprocessed latex paint; floor tiles; laminated paperboard; patio blocks; shower and restroom dividers/partitions; and structural fiber board. For additional information about the CPG program, please visit <[www.epa.gov/cpg](http://www.epa.gov/cpg)>.
- The EPA/DOE Energy Star program identifies ways to conserve energy, which saves money and helps protect the environment. In addition to numerous other product categories, the Energy Star program offers product information on a number of building products including utility distribution transformers, exit signs, heating and cooling systems, windows, doors, and skylights. For additional information, please visit <[www.epa.gov/energystar](http://www.epa.gov/energystar)>.
- EPA's Green Lights program focuses on the energy savings that can be obtained by installing highly energy-efficient lighting in homes and offices. Like the Energy Star program, it provides product information and identifies the potential cost savings of specific technologies. For additional information, visit <[www.epa.gov/greenlights](http://www.epa.gov/greenlights)>.
- DOE's FEMP program provides energy and water efficiency recommendations for 29 products in 11 categories. Each recommendation includes a chart

identifying the expected cost and energy or water savings. For additional information, visit <[www.eren.doe.gov/femp](http://www.eren.doe.gov/femp)>.

- The National Park Service’s Sustainable Design and Construction database contains environmental attribute information on more than 1,300 products from more than 550 manufacturers. It lists more than 7,000 construction debris recyclers and contains an extensive listing of books, periodicals, organizations, and online sources of sustainable design information. For additional information, please visit <[www.nps.gov/dsc/dsgncnstr/susdb/](http://www.nps.gov/dsc/dsgncnstr/susdb/)>.

## Environmental Certification Programs

**DOD reviewed information from third-party certification groups.**

DOD also reviewed environmental attribute information from governmental and private environmental certification programs around the world such as the German government’s Blue Angel program, the Canadian government’s Environmental Choice program, and Green Seal, an independent, nonprofit organization in the United States. While DOD project managers found that most of these programs focus on office and household products and appliances rather than construction materials, they did discover that several certification programs have examined paint products. Green Seal, for example, maintains 24 paint products in its database that have met its environmental standards. DOD referred to Green Seal’s paint standards, including volatile organic compound (VOC) content levels and lists of prohibited organic and inorganic compounds in developing its paint specifications for the RFP (see page 9).



*Paints used as part of the renovation were screened for environmental preferability.*

## DOD Paint Specifications

Using information from third-party certification organizations and federal environmental programs, DOD developed specifications for paint used in the ID/IQ construction contract. It is important to note, however, that these specifications had to be modified when the contractor was unable to find a paint meeting all of them. The original environmental requirements included:

- The contractor must provide certification stating that paints proposed for use contain no mercurial mildewcide or insecticide.
- Toxic compounds having ineffective physiological properties, such as odor or irritation levels, shall not be used unless approved by the contracting officer.
- Paints containing lead in excess of 0.06 percent by weight of the total nonvolatile content (calculated as lead metal) shall not be used. Paint cans and their components cannot be fabricated with lead.
- Paints containing zinc chromate or strontium chromate pigments shall not be used.
- Paint shall not exceed VOC concentrations (in grams/liter), using EPA's test method 24 to determine concentration, higher than the following:
  - interior coatings - nonflat: 150 g/l; flat: 50 g/l
  - exterior coatings - nonflat: 200 g/l; flat: 100 g/l
  - solvent-based paints - 380 g/l
  - high-performance water-based acrylic coatings: 250 g/l
  - catalyzed epoxy coatings: 250 g/l
- All latex paints shall contain at least 50 percent recovered material. (NOTE: DOD eventually removed this requirement. See page 18 for additional information.)
- Products shall not contain the following materials:
  - Halomethanes: methylene chloride
  - Chlorinated ethanes: 1,1,1-trichloroethane
  - Aromatic solvents: benzene, toluene (methylbenzene), ethylbenzene
  - Chlorinated ethylenes: 1,2-dichlorobenzene
  - Polynuclear aromatics: naphthalene
  - Chlorobenzenes: 1,2-dichlorobenzene
  - Phthalate esters: di (2-ethylexyl) phthalate, butyl benzyl phthalate, di-n-octyl phthalate, diethyl phthalate
  - Miscellaneous volatile organics: acrolein, acrylonitrile

## Independent Product Research

**A market survey helped DOD determine which environmental attributes to include in its specifications.**

With funding provided by the EPP Program, DOD hired an independent product researcher, DeLima Associates, for a 60-day research effort to supplement the information gathered from federal sources and environmental certification organizations. The contractor's primary goal was to identify environmentally preferable products that met DOD's performance standards.

Using building magazines, catalogs, directories, and Internet sites that emphasize environmental issues, the contractor identified at least three suppliers offering products with enhanced environmental features for each product on DOD's initial list of 178 conventional building products. It then broke down DOD's initial product list into 44 product categories and developed a market survey to gather environmental information for each category. These surveys were mailed to more than 200 suppliers.

The surveys were designed to help DOD determine which environmental attributes to include for each product that would be described in the construction specifications. They included general questions about material acquisition, manufacturing and fabrication, construction, product use, maintenance, recyclability and disposal, packaging, and transportation issues. Additional product-specific questions elicited detailed information on each product category. Questions regarding forestry management practices, for example, were included in the surveys sent to wood product manufacturers. Sealant manufacturers received different environmentally oriented questions about VOC and toxic material content.

The researcher's effort produced ten, 3-inch-thick binders of product information, including Material Safety Data Sheets, product literature, and survey answers. DOD used the information to help develop the product specifications it included in the RFP.

# Developing the Request for Proposal

**A**fter completing the product research, DOD incorporated its findings into the product specifications section of the RFP used to solicit potential contractors. Traditionally, DOD inserts existing product specifications from previous RFPs when preparing a new one. Though the traditional approach saves time and helps ensure consistent performance, it limits the opportunity to introduce innovative products and processes, including products and services with improved environmental performance. For the ID/IQ construction RFP, DOD modified 75 percent of the more than 400 product specifications to include specific environmental features, according to Bob Cox, DOD project director for the ID/IQ construction contract.

**DOD modified more than 300 specifications to include specific environmental features.**

“We improved every one we had information to improve,” explained Cox. “Unfortunately, we didn’t have environmental information for every product. We felt that some didn’t require any improvements in environmental performance.” Recognizing that it would take a contractor extra time to locate suppliers on nontraditional products, DOD concentrated on incorporating environmental requirements where they were not already standard business practice. Cox explained that electric wires, for example, already routinely contain recovered copper so DOD felt no reason to specify that electric wires contain recovered copper in the RFP.

The following examples highlight a few of the beneficial environmental attributes introduced into the product specifications:

- **Packaging of Materials:** To the extent possible, all packaging, labeling, and instruction materials shall be made from recovered or biodegradable materials with the highest percentage of postconsumer materials possible. Contractor shall give preference to those manufacturers that minimize packaging.
- **Plumbing Fixtures:** All fixtures shall be water conserving, in accordance with the National Standard Plumbing Code.
- **Masonry:** Reinforcing steel rods and bars shall contain a minimum recycled steel content of 60 percent. Concrete masonry units shall contain a minimum recycled materials content of 50 percent.
- **Building Insulation:** Extruded polystyrene insulation shall not be manufactured with ozone depleting blowing agents and shall maximize use of recycled material.

## Basic Product Requirements

Although DOD added environmental attributes to its specifications, it did not modify its traditional performance requirements. All of the specified products are required to meet DOD’s traditional criteria, including that they:

- Meet consumer performance requirements.
- Meet industry standards, local codes, and all pertinent regulations.
- Are price competitive in the marketplace.

## Additional Environmental Concerns

**DOD requires the contractor to recycle or properly dispose of construction and demolition debris.**

In addition to incorporating environmental attributes into the product specifications, DOD included evaluation criteria in the RFP designed to measure each bidders' commitment to the environmental goals of the ID/IQ construction project. These criteria included language in the RFP requesting bidders to list the resources they would use to identify, evaluate, and obtain products meeting the environmental specifications. With this language, DOD could ensure that bidders were aware of the importance being placed on the RFP's environmental product requirements.

DOD's environmental commitment was not limited to the products to be used in the project—the RFP also emphasized that the contractor would be required to collect, segregate, and recycle or properly dispose of all construction and demolition (C&D) debris. As a result, bidders were asked to submit proposals for preparing a waste management plan that minimized construction waste and maximized C&D recycling.

DOD felt one way to ensure bidders were committed to and would promote its environmental goals was to identify companies that could demonstrate an existing environmental commitment. As a result, the RFP also required all bidders to discuss their current “operational practices [demonstrating] environmental stewardship.” The RFP defined environmental stewardship as practices that protect and enhance the environment or limit negative environmental impacts, such as company recycling initiatives, energy conservation measures, or a subsidized public transportation or car pool program for company employees.

### Summary of the RFP's Environmental Requirements

To ensure DOD could evaluate contractors on their environmental qualifications as well as traditional qualifications, the RFP requested bidders to explain the following:

- How they would identify and purchase products with positive environmental attributes.
- How they would minimize construction waste and maximize C&D debris recycling.
- How their current operating practices demonstrate environmental stewardship.



# Selecting the Contractor

**D**OD released the RFP in April 1997 and began evaluating proposals the following July. The bids were evaluated along traditional factors, including each contractor's past experience, previous job performance, references, quality control management plan, and cost estimates. In addition, DOD evaluated the proposals along environmental criteria identified in the RFP, including the contractor's proposal for identifying, evaluating, and obtaining environmentally preferable products; its plan to maximize C&D debris recycling; and the company's demonstrated environmental stewardship.

**Contractor bids were well within traditional price ranges even with environmental criteria included.**

Although DOD was concerned the environmental features of the RFP would increase the bidders' proposed cost estimates, bids were well within the traditional price ranges for ID/IQ construction contracts of similar size and scope.

After evaluating all of the proposals, DOD determined several bids could meet its traditional price and performance requirements. One of the defining differences among the proposals was the winning contractor's strategy for identifying environmental products and its demonstrated environmental stewardship. On December 30, 1997, HITT Contracting, Inc. was awarded the ID/IQ construction contract, which incorporated all of the environmental features originally identified in the RFP.

## Work Begins

After winning the contract, HITT had 60 days to prepare for project work. The contractor spent that time applying for security clearances and access badges for the Pentagon, setting up trailer space in the area allotted to contractors, and, most importantly, preparing the product information submittals as specified in the contract. As with any construction contract, before beginning work, the contractor is required to identify the products it will use to complete the job and obtain approval of the construction manager to use them. With the DOD contract, the contractor had to locate products meeting not only the performance specifications, but also the environmental specifications identified in the contract.

## Educating the Contractor

Although HITT was selected in part on the quality of its strategy for selecting environmental products, DOD spent significant time with the contractor ensuring that it fully understood DOD's commitment to environmental purchasing. Bob Cox, the DOD project director, suggested several improvements to HITT's product selection process, including proposing specific questions to ask of manufacturers and suppliers and recommending additional sources of information HITT did not include in its original strategy. DOD also shared the results of the DeLima Associates research project as a source of potential manufacturers and suppliers providing products with the environmental features DOD specified.

Throughout the submittal process, DOD emphasized to the contractor that it was carefully reviewing the contractor's implementation of the environmentally preferable purchasing plan. DOD wanted to ensure HITT and its subcontractors took the environmental specifications as seriously as DOD took them.

“The contractor had a good environmentally preferable purchasing strategy in its proposal, but because of our extensive product research, we could identify several areas for improvement. We worked closely with HITT to ensure they had all of the information they needed to do the job well. In fact, HITT had numerous manufacturers call me directly so I could explain the origins and importance of certain environmental attributes. At one point, I was fielding as many as 20 calls a day.”

— Bob Cox, DOD project director

## Preparing Submittals

HITT implemented its plan for locating environmental products, incorporating the additional strategies suggested by DOD, as soon as the contract was awarded. Though a part of every contract, the submittal process for the ID/IQ construction contract was the most extensive the contractor had encountered. The contractor began its research by asking all of the company’s construction managers for any information on products that met the contract’s environmental product requirements. The request did not produce many promising leads, but did identify the name of a green building construction expert with which the company had previously worked. The consultant was able to suggest a few products, but ultimately did not have the type of information that would help HITT identify and locate the needed products within its limited time frame.

Consequently, HITT began researching product information through available green building resources, including magazines and Internet sites. Although this effort produced lots of promising leads, the contractor found that the information was frequently not specific enough to ensure that the products would meet both DOD’s performance and environmental requirements. To supplement the information, HITT began calling its regular manufacturers and vendors to determine what information they had available.

Many suppliers were extremely helpful and had environmental information available or were able to recommend other suppliers and products. Other suppliers, however, were surprised to learn that the products they had been selling to HITT for years could not automatically be used for DOD’s ID/IQ construction contract. “Surprisingly, one of the hardest things we had to do was get our suppliers to realize that this was a different contract with new environmental requirements,” reported Lee Davies, HITT’s Senior Project Manager. “They kept saying, ‘We’ve been submitting these [nonenvironmental] products for years and they’ve always been accepted.’ Once we explained DOD’s need for environmental products, things got a little easier.”

Since contractors traditionally use the same manufacturers, suppliers, and products for each contract, a contractor typically only has to make one or two phone calls per product to identify the products it will use for a particular contract. To locate the products used for the ID/IQ construction contract, however, HITT relied on a team of eight full-time employees who worked for 2 months calling manufacturers and vendors. Each of the 400 products took an average of 15 to 20 calls to locate a product meeting DOD’s specifications. As a result, HITT made between 6,000 and 8,000 phone calls as part of the submittal process.

To help manage the large volumes of product information it was gathering, the contractor developed a submittal package for potential vendors. After identifying a potential product, it sent the vendor an overview of the project and a list of the performance and environmental specifications required for the product in question. The vendor could simply follow the enclosed instructions to provide the contractor with the necessary information. A few forms came back incomplete and required additional phone calls, but, overall, the process worked well.

Although the number of calls and logistics involved seem excessive, HITT recognizes that over the life of the 5-year contract, which is worth as much as \$25 million to the company, the costs involved were minimal. In addition, the contractor views the cost as an investment towards future federal contracts. “For future contracts,” suggests Davies, “we will not need to conduct as much research. We can return to one or two calls per product just to keep our product information current. In addition, we now know more about environmental construction products and can use that knowledge to try and win future contracts.”

### Practice Makes Perfect

While HITT was researching and selecting the environmental products to use for the DOD project, the contractor decided to test some of the products itself. The contractor set up its trailer at the Pentagon using environmental products. “Everything in here is environmentally preferable,” Davies explained as he pointed at the walls painted with low VOC paint; the recycled-content carpet with minimal VOC emissions from the adhesive; the energy-efficient lights; recycled-content ceiling tiles; and sustainably harvested-wood furniture. “We figured if we’re going to be a part of this environmental building project, we’ll be a real part of it.”

### Educating Suppliers

In order to ensure it was identifying products meeting DOD’s environmental specifications, HITT discovered that it needed to first educate potential suppliers about environmentally preferable purchasing and then get the product information in writing. Many of the suppliers contacted by the contractor were unfamiliar with the environmental attributes of the products they were manufacturing or selling. As a result, HITT spent considerable time explaining DOD’s motivations for environmental purchasing. HITT also referred many of its potential suppliers to DOD when it could not answer specific questions about the environmental attributes.

One of the most challenging environmental specifications for HITT to explain was its search for wood products obtained from trees harvested from a sustainable forest. There is not currently any consensus among industry and environmental groups on the definition of “sustainable forestry.” Although the contract allowed the contractor to use products manufactured with timber grown in accordance with any one of several certification or forest management programs, most suppliers were not familiar with them. Many potential suppliers incorrectly assumed that because trees are a renewable resources, all forests are sustainable.<sup>2</sup>

<sup>2</sup> According to EPA’s *Interim Final Guidance on Environmentally Preferable Purchasing*, natural resources generally are not considered renewable unless they are naturally renewable in less than 200 years. Natural resources such as trees can be harvested in such a way that they are nonrenewable or unsustainable.

According to the Forest Stewardship Council (FSC), an independent, nonprofit, nongovernmental organization founded in 1993 by a diverse group of representatives from environmental and conservation groups, the timber industry, the forestry profession, indigenous peoples' organizations, community forest groups, and forest product certification organizations from 25 countries, a forest is sustainable if it is managed in an ecologically sound, socially responsible, and economically viable manner. The FSC defines a sustainable forest as a place where timber growth equals or exceeds harvesting rates in both quantity and quality while protecting rivers and streams from degradation due to erosion, decreasing the damage caused by harvesting, promoting biodiversity, and fairly compensating workers and local populations.

The American Forest and Paper Association (AF&PA), the national trade association of the forest, paper, and wood products industry, defines sustainable forestry as that which meets the needs of the present without compromising the ability of future generations to meet their own needs. Through its Sustainable Forestry Initiative, AF&PA members practice a land stewardship ethic that integrates the reforestation, managing, growing, nurturing, and harvesting of trees for useful products while conserving soil, air and water quality, wildlife and fish habitat, and aesthetics.

Sustainable forestry was a new concept for many of HITT's traditional vendors and required quite a bit of additional explanation and verification to ensure the products would meet DOD's environmental requirements. Part of the challenge was that with certain products like wood doors, the door manufacturer frequently did not know the origin of the wood it was using. To complicate the matter, HITT found that even the wood suppliers are not always sure of the origins of their wood.

"I talked to the vendor, the manufacturer, the mill manager, and the forest manager," said Ruth Bodnar, HITT Project Manager. "I did everything but talk to the tree before feeling satisfied that the products met contract specifications." Ultimately, the contractor only found a single company claiming to manufacture products in accordance with DOD's sustainable forestry specification that was willing to put the certification in writing.

### *Verifying Environmental Attributes*

Another important lesson HITT learned while conducting its product submittal research is the importance of obtaining environmental attribute information in writing. The contractor encountered several instances in which overzealous sales people misstated the environmental benefits of their products. According to Davies, "Some suppliers will tell you what you want to hear to get you to buy their product."

The sales representative for a recycled-content gypsum wall board manufacturer, for example, assured the contractor that the product contained 60 percent postconsumer content as specified in the DOD contract requirements. When HITT requested that the sales representative verify the information in writing, the representative refused to guarantee anything greater than 30 percent recycled content. Unable to locate any vendor with a product meeting DOD's specification, the contractor concluded that DOD's contract specifications were based on misinformation obtained during DOD's original product research. As a result, DOD revisited the specification and altered it to reflect the environmental information collected by HITT.

Other supplier and product experiences were much more positive. One manufacturer of a low VOC paint, for example, was convinced its paint exceeded DOD's

**Requiring environmental attribute information in writing helped ensure that products met DOD's specifications.**

requirement that paint contain less than 50 grams per liter of VOCs. Unfortunately, the manufacturer did not have written documentation supporting its contention. Due to the volume of paint HITT was likely to purchase throughout the life of its Pentagon contract, the manufacturer paid several thousand dollars to have its product tested. Upon receiving the results proving that the product contained zero VOCs, the manufacturer shared them with HITT. The contractor subsequently included the product on its official product submittal list. The paint manufacturer is hoping the positive results will help it win other customers too.

## Selecting Products

After identifying products meeting DOD's performance and environmental requirements, HITT determined which of the products it should submit for use on the project. When the contractor located only one product meeting DOD's specifications, it was the product submitted. In instances when more than one product was identified, HITT compared the price, environmental attributes, and product availability before selecting the product. The contractor attempted to maximize the number of positive environmental attributes and minimize cost. Product availability, however, was also an important factor because many of the ID/IQ construction projects require quick turnaround.

### Comparing Environmental Attributes

Situations arose during the course of this contract that made it difficult to determine which was the environmentally preferable solution. For example, when HITT was researching two-foot by four-foot, recycled-content, suspended ceiling tiles, it located a manufacturer making both a recycled-content and a virgin material product. While typically there is no performance difference between recycled-content and virgin products, HITT questioned the durability of the recycled-content product in this case. "It's unusual for a manufacturer to make two competing products," explained Davies, "so we were worried the manufacturer was not confident in the recycled-content product's performance."

According to the vendor, its recycled-content product contains impurities that make it less durable than its virgin material product. The vendor explained that its recycled-content product was subject to sagging after 15 years of use, which was not true of the virgin product. Since HITT was selecting the product for a space that would typically be used for only 5 to 10 years, the reported performance difference was not an issue. After consulting with the DOD project manager, HITT decided to use the manufacturer's recycled-content product on this project.

## *Product Availability*

HITT discovered a few environmental products that it wanted to use but could not obtain easily. Suppliers frequently do not keep products in stock that are not in high demand. Rather, they manufacture them only when an order has been placed. As a result, these products can take weeks to become available. This was the case with some of the environmental products that HITT staff wanted to use but they needed access to products quickly because of the rapid five-day turnaround on many of the DOD jobs. They do not have time to wait for them to be manufactured and delivered.

The contractor worked closely with several vendors to resolve the availability issue. One manufacturer agreed to produce larger quantities of its products, anticipating that HITT would be using them frequently. For another product, HITT decided it was cost-effective to order a large quantity and store them off site.

## *Revising Specifications*

The contractor was unable to locate a paint meeting all of DOD's paint specifications. When developing the paint specification, DOD incorporated many of Green Seal's paint standards, which do not include a recycled-content requirement, along with a recycled-content requirement promoted by EPA's CPG program. Unfortunately, as HITT discovered, recycled-content paint is not yet available meeting all of the environmental standards adopted by DOD. Consequently, DOD was forced to decide whether the recycled-content requirement or the other environmental attributes were more important. After confirming that recycled-content paints meeting its standards were not available, DOD decided that protecting indoor air quality by minimizing VOCs and eliminating other constituents it determined to be hazardous was the more important environmental consideration. As a result, DOD removed the recycled-content requirement. HITT was then able to locate several products meeting DOD's revised specification.

## **Using the Products**

**Proper training and communication ensured successful installation and performance of environmentally preferable products.**

After submitting its product submittals and receiving DOD approval, HITT was ready to begin using the products. While most environmental products perform the same as traditional products, some require slightly different handling procedures in order to guarantee maximum performance. One of HITT's painting subcontractors, for example, reported that a certain VOC-free paint was not coating as well as traditional paints with higher VOC contents. The paint tended to pool at the point of application. The contractor reported the problem to the manufacturer and the manufacturer suggested a small change to the traditional application process, which dramatically improved the paint's performance.

For other products, manufacturers trained the contractor and subcontractors before work began to ensure that their environmental products were installed properly. One vendor, for example, manufactures a fire proofing material that DOD and HITT determined to be environmentally preferable. The company demonstrated the proper installation techniques and certified that HITT and its subcontractors were properly trained. The contractor has been so impressed with the product, it is using it on other jobs even when they do not require the use of environmental products.

Unlike many traditional institutional floor covering materials, another vendor's floor covering does not require wet adhesives and is installed slightly differently than traditional products. This vendor also provided HITT and its subcontractor with training to properly install its product.

As of May 1999, HITT had completed more than 150 jobs, all of which use products meeting DOD's environmental and performance criteria. DOD is happy with the quality of the work and very pleased with the cost and the environmental performance of the products being used to complete the work. The success of this effort clearly demonstrates that environmental products can be incorporated into federal construction contracts without decreasing quality or increasing costs.

# Lessons Learned

The size and scope of the DOD contract provided many valuable lessons about the environmental attributes for numerous construction materials. A few of these are described below.

## Environmental Products Are Available

Manufacturers do not always advertise the environmental features of their products even when they are impressive. The secret to finding them, according to those involved with this project, is to know what questions to ask. “Don’t ask for environmental products,” suggested Bob Cox, DOD project director, “ask for products containing specific environmental attributes. It can be difficult for manufacturers to know if their product meets your definition of ‘environmentally preferable.’ If you give them a list of attributes, the question is easier to answer.”

## Environmentally Preferable Purchasing Can Be Incorporated Into the Traditional Purchasing Process

As DOD discovered, incorporating environmentally preferable purchasing concerns into the traditional contracting process was not difficult. The same process was used that DOD uses with “traditional” ID/IQ contracts. The only important difference was the time DOD spent revising its product specifications. “Product specifications are periodically revised anyway,” explained Bob Cox, DOD project director, “We simply reviewed them earlier than normal and incorporated environmental concerns during the revision process.”

## Environmental Products Can Meet Traditional Performance Requirements

DOD did not modify its traditional performance requirements to incorporate environmental products into the ID/IQ construction contract. Instead, it added environmental requirements to its existing specifications. Using environmental products does not require lowering performance standards. In fact, the DOD contractor has discovered several environmental products that perform better and are less expensive than the products it traditionally used. As a result, the contractor is using them even when the specifications do not require the use of environmental products.

## Environmental Purchasing Does Not Increase Government Costs

Although DOD was concerned initially that the environmental specifications in the contract might increase costs, the actual bids were very consistent with similar contracts without an environmental emphasis. Contractors did not charge DOD a premium for using environmental products as some contracting officials feared. Instead, according to Bob Cox, the DOD project director, “The contract allows DOD to renovate or reconfigure interior office space using environmentally preferable products and remain within traditional price and time parameters.”

Incorporating environmentally preferable purchasing concerns into the traditional DOD contracting process was not difficult.



## Product Research Is a Good Investment

DOD's initial product research allowed it to identify the environmental attributes available in construction products. This allowed DOD's Federal Facilities Division to develop specifications that could be met by products currently available in the marketplace. The research effort will also make it easier to incorporate environmental specifications in future contracts.

Similarly, HITT conducted significant research to locate products meeting DOD's specifications. Its research will allow the contractor to accurately bid the environmental products on future contracts. HITT also feels its product research places the company at a potential advantage for future federal work, given the mandates for environmentally preferable purchasing.

**Product research allowed DOD to develop specifications that could be met by products currently available in the marketplace.**

## Contractors Can Help Increase Awareness of Environmental Purchasing Principles

The EPP Program's experience suggests environmental purchasing will become easier and easier as more and more people become familiar with the concept. One of the challenges has been spreading the message. Under the ID/IQ construction contract, the DOD contractor shared the environmental purchasing message with thousands of suppliers as part of its search for products meeting DOD's specifications. The contractor quickly recognized that as more and more manufacturers, suppliers, and vendors understand the emphasis the federal government is placing on environmental products, the easier the products should become to identify and locate. In fact, many suppliers are now contacting HITT directly because they have learned of its interest in environmental products.

## Environmental Attribute Information Should Be Verified In Writing

HITT and DOD quickly learned during the product submittal process that the accuracy of the environmental information provided by suppliers tends to increase if it is requested in writing. It helps ensure that suppliers have time to carefully compare their products against the selected environmental attributes. Requesting such information in writing also helps communicate the government's emphasis on the importance and accuracy of the information.

## Comprehensive, User-Friendly Environmental Information Is Critical

To purchase the best environmental products, consumers must have access to accurate information on the multiple environmental attributes of a product throughout its lifecycle—from raw material acquisition through manufacturing, use, and ultimate disposal. Unfortunately, the DOD team for this pilot project did not have access to as much environmental information as it would have preferred. As a result, when determining whether a product was environmentally preferable, the team relied primarily on single environmental attributes such as energy efficiency, recycled content, or toxicity instead of on multiple environmental attributes.

Providing comprehensive environmental data in a user-friendly format is the next important challenge. As Bob Cox explains, "The challenge is daunting, but the federal government must find ways to encourage industry and educational institutions to participate in the fact-finding process. Providing the information will make environmental purchasing easier and educate industry about the environmental impacts of its products and, hopefully, encourage industry to further improve its environmental performance."

## Appendix A: Pentagon Renovation

**B**uilt in 1942 to help meet U.S. defense needs during World War II, the Pentagon—now a National Historic Landmark—has never undergone a major renovation. After more than 50 years, renovation has become essential in order to meet health, fire, and safety codes and to provide reliable electrical, air-conditioning, and ventilating services. Absent a major renovation, the building infrastructure could become unreliable and unable to effectively support DOD’s mission. Repairs are necessary not only to ensure the safety and comfort of Pentagon workers, but also to save money and improve agency operations.

Acknowledging the need for major renovation, Congress appropriated \$1.1 billion in 1990 to modernize the Pentagon. DOD immediately began prioritizing its renovation needs and initiating the necessary design work. Renovation work is currently underway in the first of the Pentagon’s five “wedges.” The entire renovation is expected to be completed by Spring 2010.



*All 7,748 windows in the Pentagon will be removed (most of the frames are covered with lead paint) and replaced with double-pane thermal insulation glass. This alone will improve the energy efficiency of the building by about 25 percent.*



## **Afterword**

Many of the lessons learned as a result of DOD's experience with the ID/IQ construction contract have been incorporated into the numerous contracts supporting the overall Pentagon renovation effort. Similar environmental contract language also has been incorporated into a contract to build a new Remote Delivery Facility (RDF) to support Pentagon operations. The 200,000-square-foot RDF will allow DOD officials to safely inspect the cargos of the more than 300 vehicles per day that deliver goods to the Pentagon. This precaution is necessary to help prevent terrorist activity from affecting Pentagon operations.

The RDF contract, like the contract described in this case study and other contracts supporting the renovation effort, includes environmentally preferable purchasing goals. The offerers on this contract must show how they will integrate sustainable design and environmental purchasing into the design and construction of the RDF within the project constraints of cost, schedule, program requirements, and site conditions. Examples of sustainable design criteria include an emphasis on energy conservation, water conservation, waste management, and recycling, and protecting indoor air quality. Future Pentagon renovation contracts will continue to include environmentally preferable purchasing goals and sustainable design.



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