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Energy Efficiency and Renewable Energy

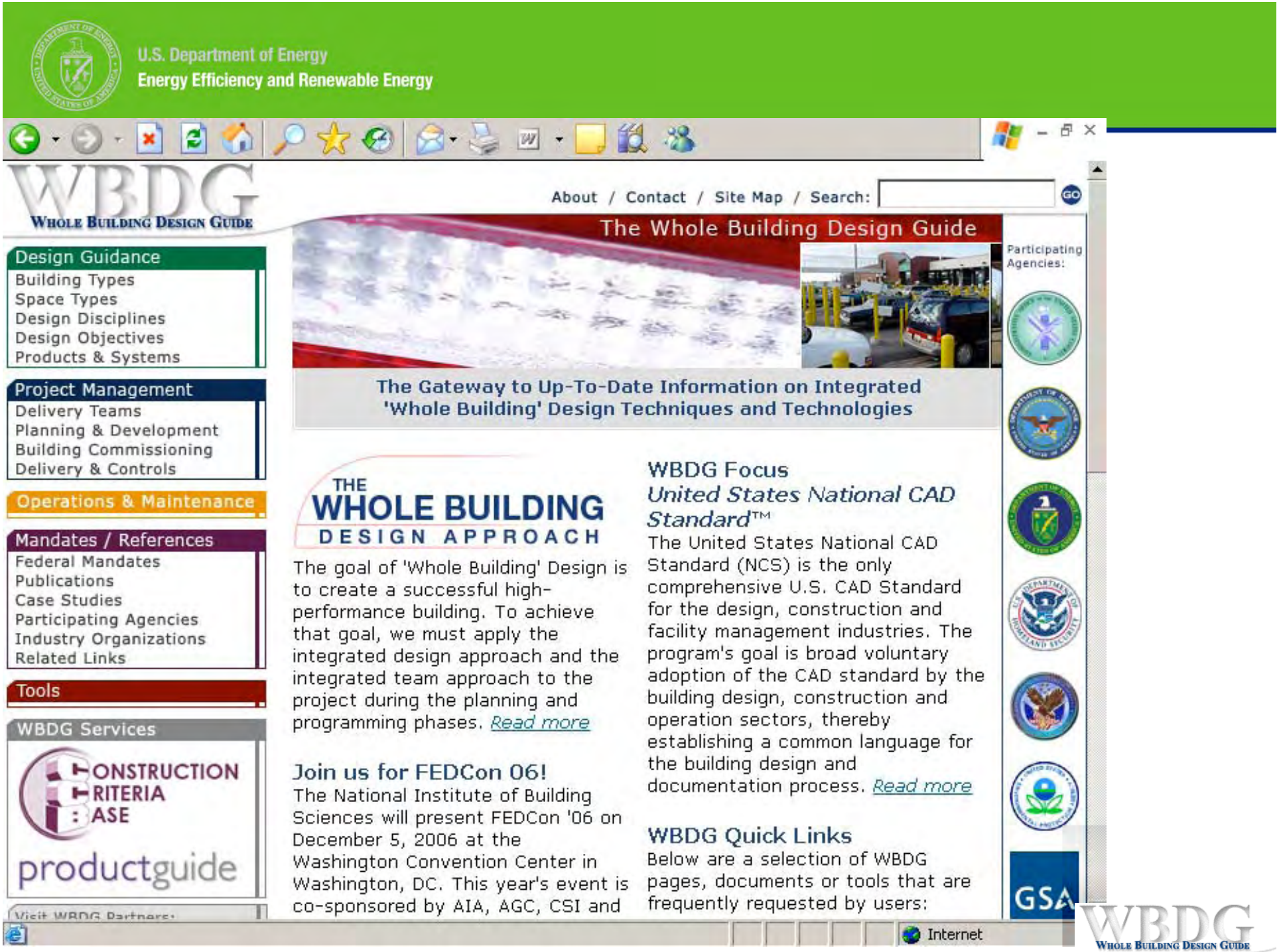
federal energy management program

Whole Building Design Guide

Sustainable Historic Buildings Resource Page

Richard Paradis, P.E.
Steven Winter Associates

WBDG
Whole Building Design Guide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The Whole Building Design Guide
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The Gateway to Up-To-Date Information on Integrated 'Whole Building' Design Techniques and Technologies
THE WHOLE BUILDING DESIGN APPROACH
The goal of 'Whole Building' Design is to create a successful high-performance building. To achieve that goal, we must apply the integrated design approach and the integrated team approach to the project during the planning and programming phases. Read more
Join us for FEDCon 06!
The National Institute of Building Sciences will present FEDCon '06 on December 5, 2006 at the Washington Convention Center in Washington, DC. This year's event is co-sponsored by AIA, AGC, CSI and
WBDG Focus
United States National CAD Standard™
The United States National CAD Standard (NCS) is the only comprehensive U.S. CAD Standard for the design, construction and facility management industries. The program's goal is broad voluntary adoption of the CAD standard by the building design, construction and operation sectors, thereby establishing a common language for the building design and documentation process. Read more
WBDG Quick Links
Below are a selection of WBDG pages, documents or tools that are frequently requested by users:
GSA
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Whole Building Design Guide

What is Whole Building Design?

- It is an **Integrated Design Approach** and an
- **Integrated Team Process** to achieve high-performance buildings

'Whole Building' Approach

NREL Solar Laboratory
Golden, CO

- Materials, systems, and assemblies reviewed from many different perspectives
- Building components, sub-systems and materials are interdependent, can impact the total performance of the whole, and can perform 'double duty'

Integrated Project Team

Mark O. Hatfield U.S. Courthouse
Portland, OR

- Comprehensive Stakeholder involvement throughout the building's life cycle
- Evaluation for cost, quality-of-life, future flexibility, energy efficiency, overall environmental impact, productivity, creativity, and how the occupants will be enlivened

Applying the Integrated Team Process

Who needs to be at the table at the outset of your project to ensure an integrated team process?

- Architect
- Landscape Architect
- Owner, Client, Tenants
- Engineers
- Programmers
- Interior Designer
- Contractor
- Specialists (security, telecom, acoustics)
- Community Members or Other Stakeholders
- Operations and Maintenance Personnel
- Others???? (real estate buyer)

WBDG Goal

… to provide centralized access and use of facility information in a knowledge based management environment, from a 'whole building' perspective.

WBDG Building Type Page on Child Development Ctrs

w/ direct links to: Daylighting RP; Playground Design & Equipment RP; Assessment Tools for Accessibility, etc.

w/ DIRECT LINKS to Other Resources & Pubs.

Nation's Network of Child Care Resource & Referral (NACCRRA)
National Association for the Education of Young Children (NAEYC),

CCB Documents

DoD UFC 4-740-14 Design: Child Development Centers
GSA PBS-100 Child Care Center Design Guide

NGS

Handbook for Public Playground Safety
ASTM F-355, Shock Absorbing Properties of Playing Surface Systems and Materials

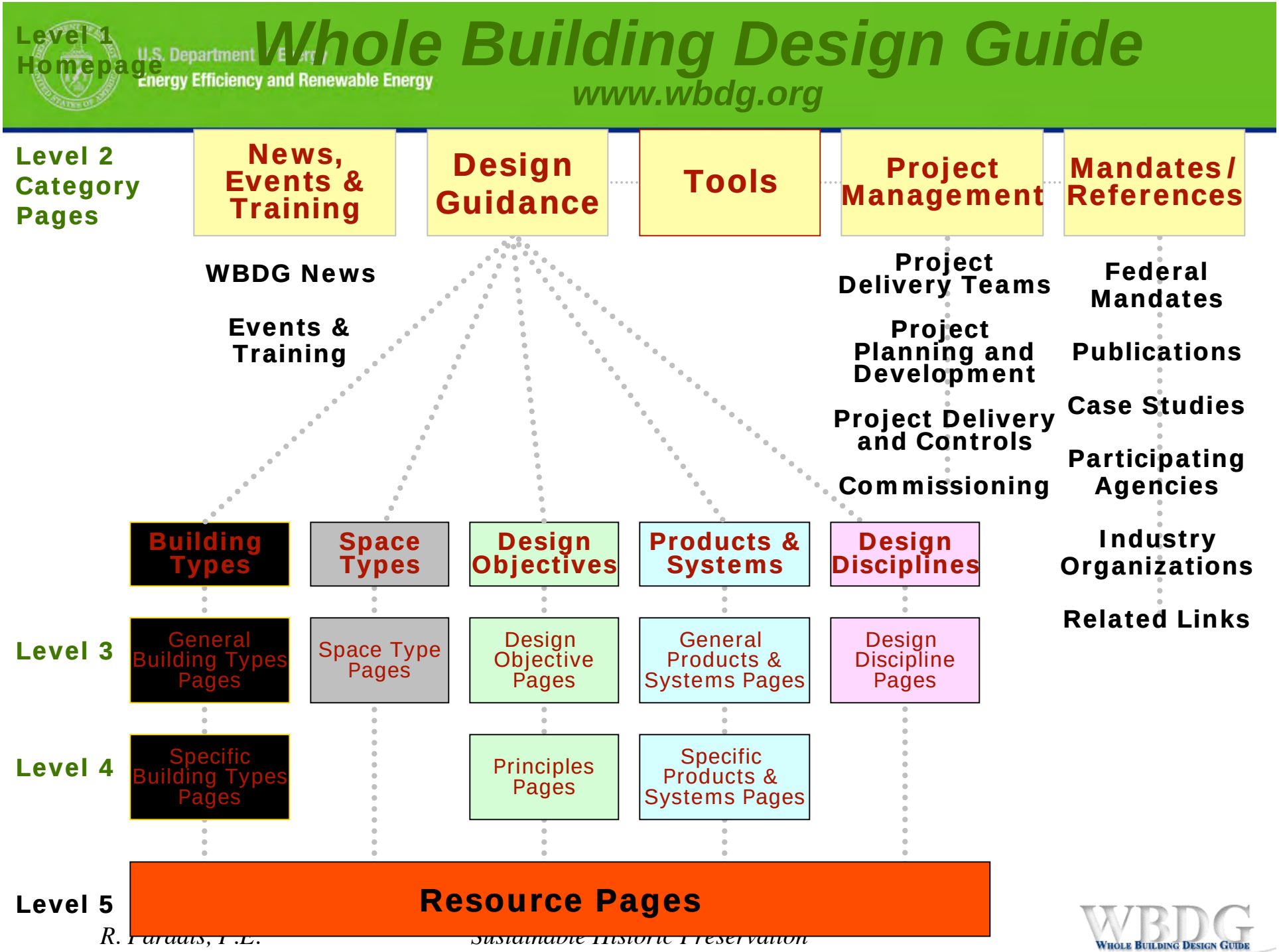
Impact of WBDG as a Tool

In October 2006

- 757,003 page views (June 06 highest 947,394)
- 402,490 visitor sessions*
- 193,358 unique visitors*
- 160,588 visitors who visited more than once*
- 993,150 pdf downloads from the WBDG website (Sep 06 highest 1,100,790)

By the end of this year, the totals will have exceeded the totals for the year 2005 by over 3 million

* All Time High Total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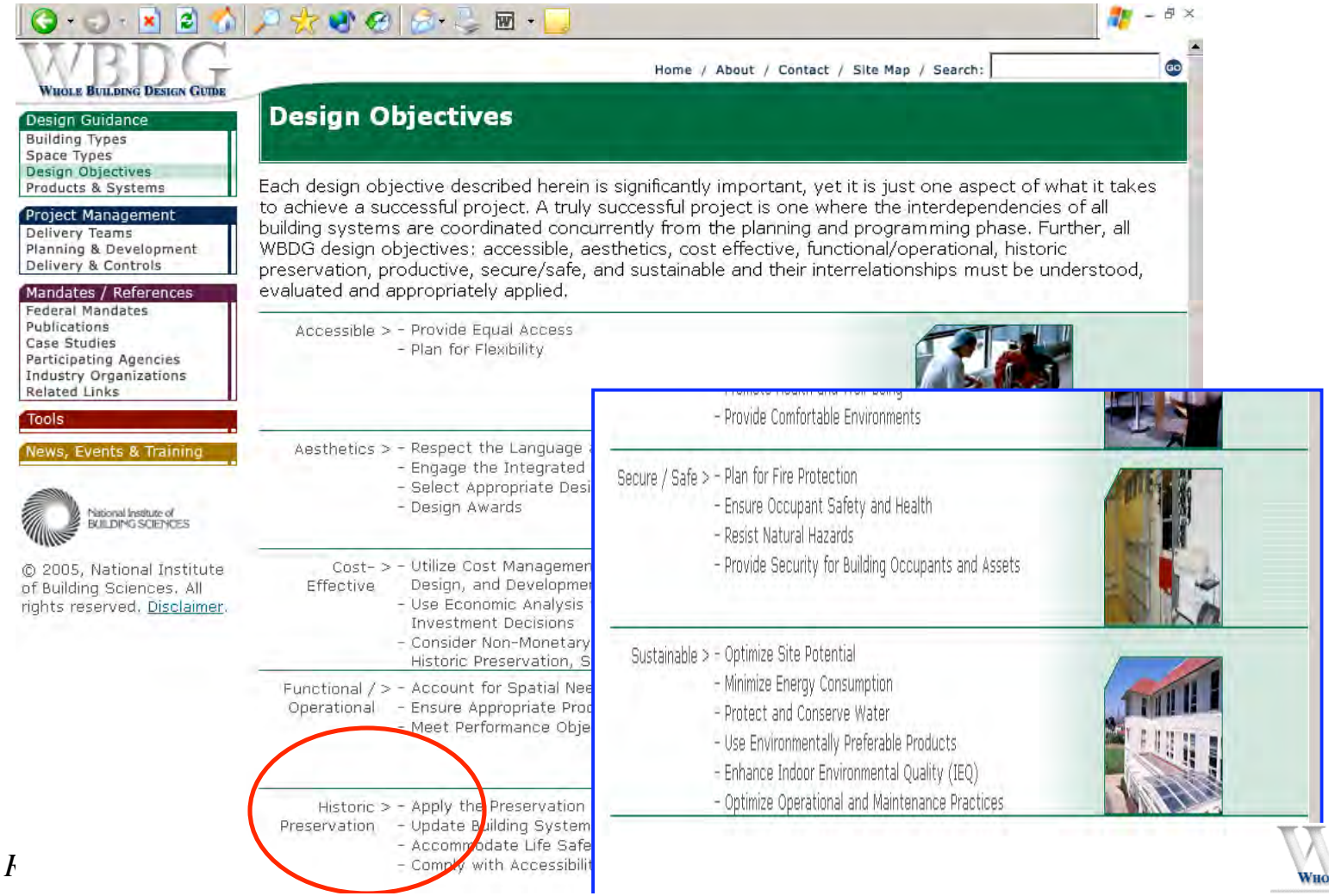
Design Objectives



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Historic Preservation

by the WBDG Historic Preservation Subcommittee

Design Objectives Index > Historic Preservation > - Apply the Preservation Process Successfully
- Update Building Systems Appropriately
- Accommodate Life Safety and Security Needs
- Comply with Accessibility Requirements

OVERVIEW

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Realizing the need to protect America's cultural resources, Congress established the National Historic Preservation Act (NHPA) in 1966, which mandates the active use of historic buildings for public benefit and to preserve our national heritage. Cultural resources, as identified in the National Register for Historic Places, include buildings, archeological sites, structures, objects, and historic districts. The surrounding landscape is often an integral part of a historic property. Not only can significant archaeological remains be destroyed during the course of construction, but the landscape, designed or natural, may be irreparably damaged, and caution is advised whenever major physical intervention is required in an extant building or landscape. The Archaeological Protection Act established the public mandate to protect these resources.

Internet

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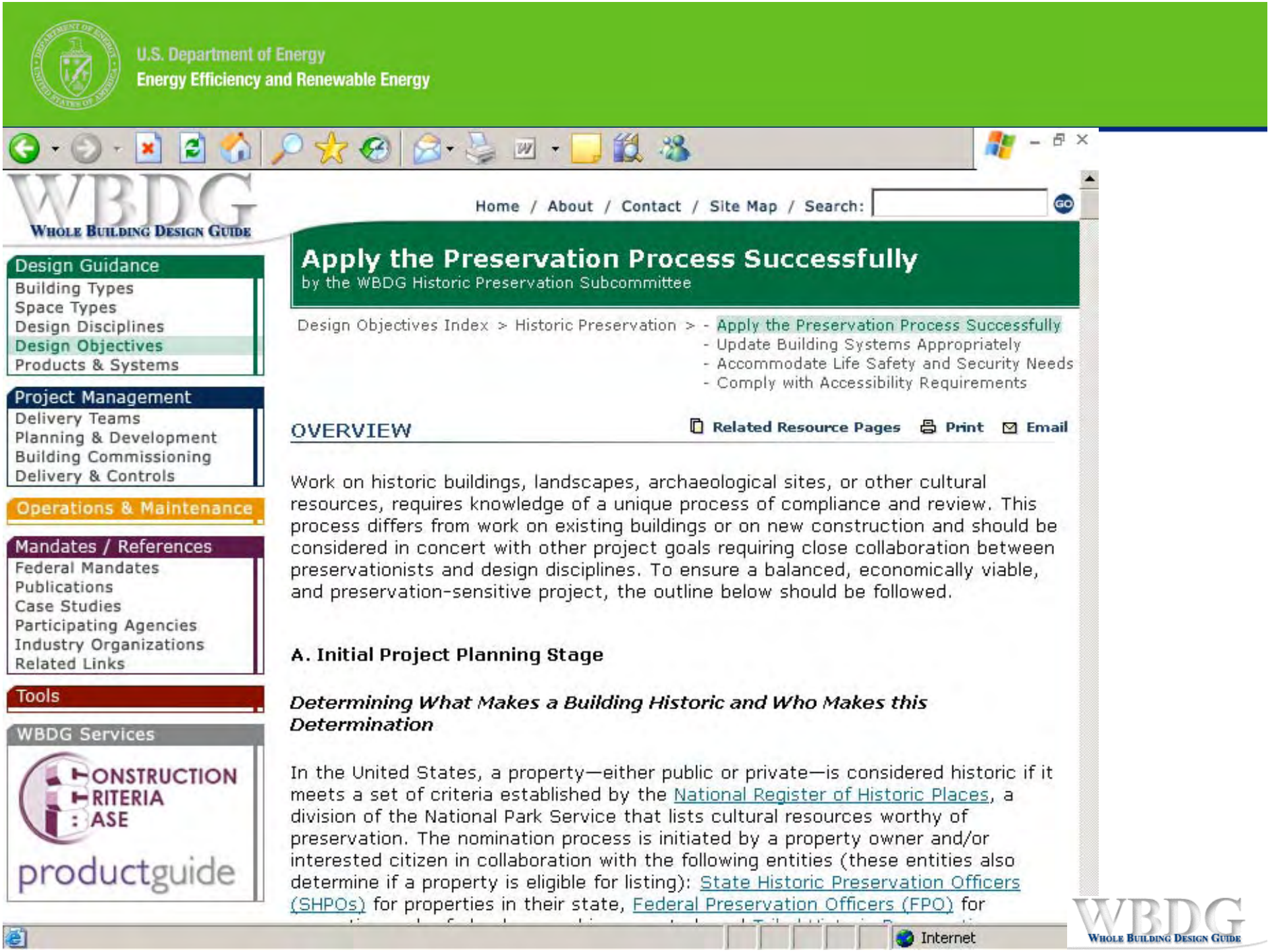
Four Treatment Approaches

- ***Preservation*** focuses on the maintenance stabilization, and repair of existing historic materials and retention of a property's form as it has evolved over time.
- ***Rehabilitation*** acknowledges the need to alter or add to a historic property to meet continuing or changing uses while retaining the property's historic character.
- ***Restoration*** depicts a property at a particular period of time in its history, while removing evidence of other periods.
- ***Reconstruction*** re-creates vanished or non-surviving portions of a property for interpretive purposes.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Work on historic buildings, landscapes, archaeological sites, or other cultural resources, requires knowledge of a unique process of compliance and review. This process differs from work on existing buildings or on new construction and should be considered in concert with other project goals requiring close collaboration between preservationists and design disciplines. To ensure a balanced, economically viable, and preservation-sensitive project, the outline below should be followed.
A. Initial Project Planning Stage
Determining What Makes a Building Historic and Who Makes this Determination
In the United States, a property—either public or private—is considered historic if it meets a set of criteria established by the National Register of Historic Places, a division of the National Park Service that lists cultural resources worthy of preservation. The nomination process is initiated by a property owner and/or interested citizen in collaboration with the following entities (these entities also determine if a property is eligible for listing): State Historic Preservation Officers (SHPOs) for properties in their state, Federal Preservation Officers (FPO) for
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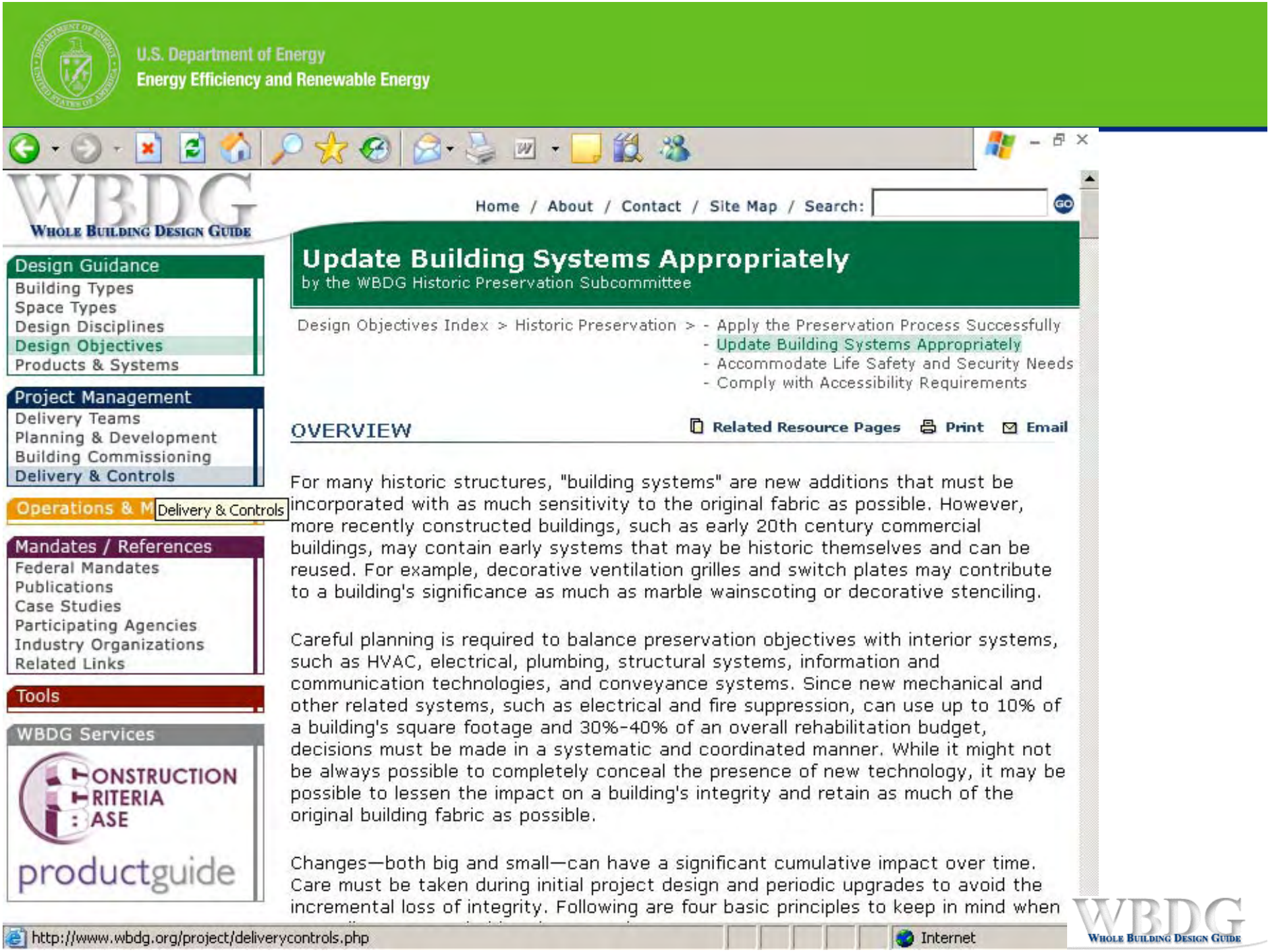
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For many historic structures, "building systems" are new additions that must be incorporated with as much sensitivity to the original fabric as possible. However, more recently constructed buildings, such as early 20th century commercial buildings, may contain early systems that may be historic themselves and can be reused. For example, decorative ventilation grilles and switch plates may contribute to a building's significance as much as marble wainscoting or decorative stenciling.
Careful planning is required to balance preservation objectives with interior systems, such as HVAC, electrical, plumbing, structural systems, information and communication technologies, and conveyance systems. Since new mechanical and other related systems, such as electrical and fire suppression, can use up to 10% of a building's square footage and 30%-40% of an overall rehabilitation budget, decisions must be made in a systematic and coordinated manner. While it might not be always possible to completely conceal the presence of new technology, it may be possible to lessen the impact on a building's integrity and retain as much of the original building fabric as possible.
Changes—both big and small—can have a significant cumulative impact over time. Care must be taken during initial project design and periodic upgrades to avoid the incremental loss of integrity. Following are four basic principles to keep in mind when
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Accommodate Life Safety and Security Needs

by the WBDG Historic Preservation Subcommittee

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OVERVIEW

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Most building projects place a higher priority on the protection of building occupants and assets than on the preservation of cultural resources. However, it is important to address the protection of the building's historic spaces, finishes, and collections in the design and implementation of safety and security measures. Because historic buildings are each a unique case, cost effective, synergistic, performance solutions developed in a collaborative environment will produce the best results. See also WBDG Whole Building Approach.

Designers, facility managers, fire, security and code officials, curators, preservation officials, and building occupants should be involved early on in the planning and design process. This allows the project team to look at issues holistically and remain flexible to the challenges of the historic property.

This federal courthouse in Tucson, AZ offers

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Comply with Accessibility Requirements

by the WBDG Historic Preservation Subcommittee

OVERVIEW

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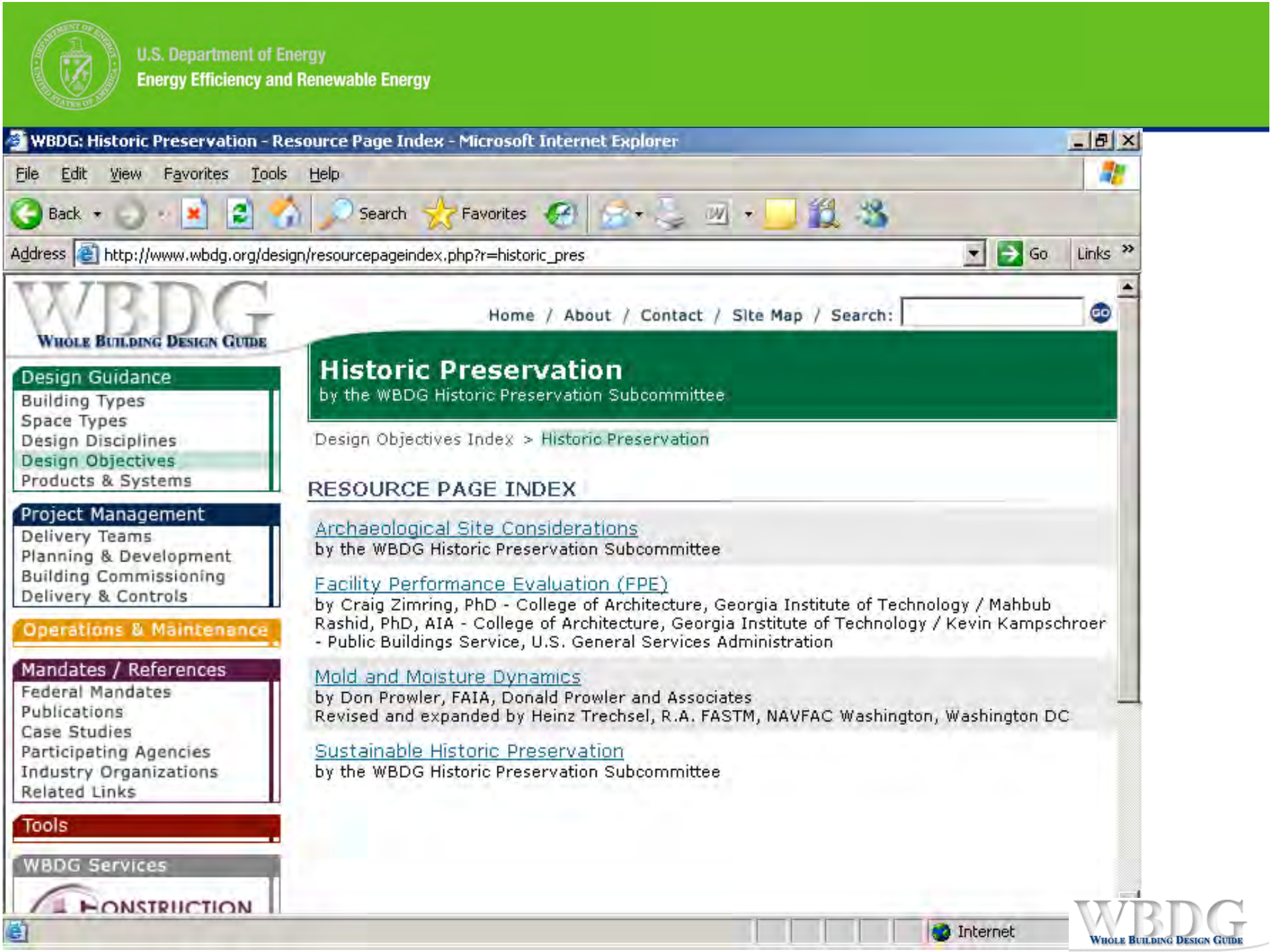
Most historic buildings were not originally designed to accommodate people with disabilities and special needs. However, persons with disabilities should experience sites, landscapes, buildings, and spaces in the same manner as other users whenever possible.

Providing access (exterior and interior) for persons with disabilities in ways that preserve the character of the historic property is a challenge and requires creativity and collaboration among the project team members. Compliance is required in these areas, but the accessibility standards (such as Uniform Federal Accessibility Standards (UFAS) and American with Disabilities Act Accessibility Guidelines (ADAAG)) are more flexible when applied to historic buildings. UFAS and ADAAG provide alternative solutions that allow retention of original historic fabric (such as narrow corridors).

While accessible design is covered in WBDG Accessible Branch, unique issues that must be resolved in order to provide accessibility in historic buildings will be discussed in this section.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Facility Performance Evaluation (FPE)
by Craig Zimring, PhD - College of Architecture, Georgia Institute of Technology / Mahbub Rashid, PhD, AIA - College of Architecture, Georgia Institute of Technology / Kevin Kampschroer - Public Buildings Service, U.S. General Services Administration
Mold and Moisture Dynamics
by Don Prowler, FAIA, Donald Prowler and Associates
Revised and expanded by Heinz Trechsel, R.A. FASTM, NAVFAC Washington, Washington DC
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Sustainable Historic Preservation

by the WBDG Historic Preservation Subcommittee

INTRODUCTION

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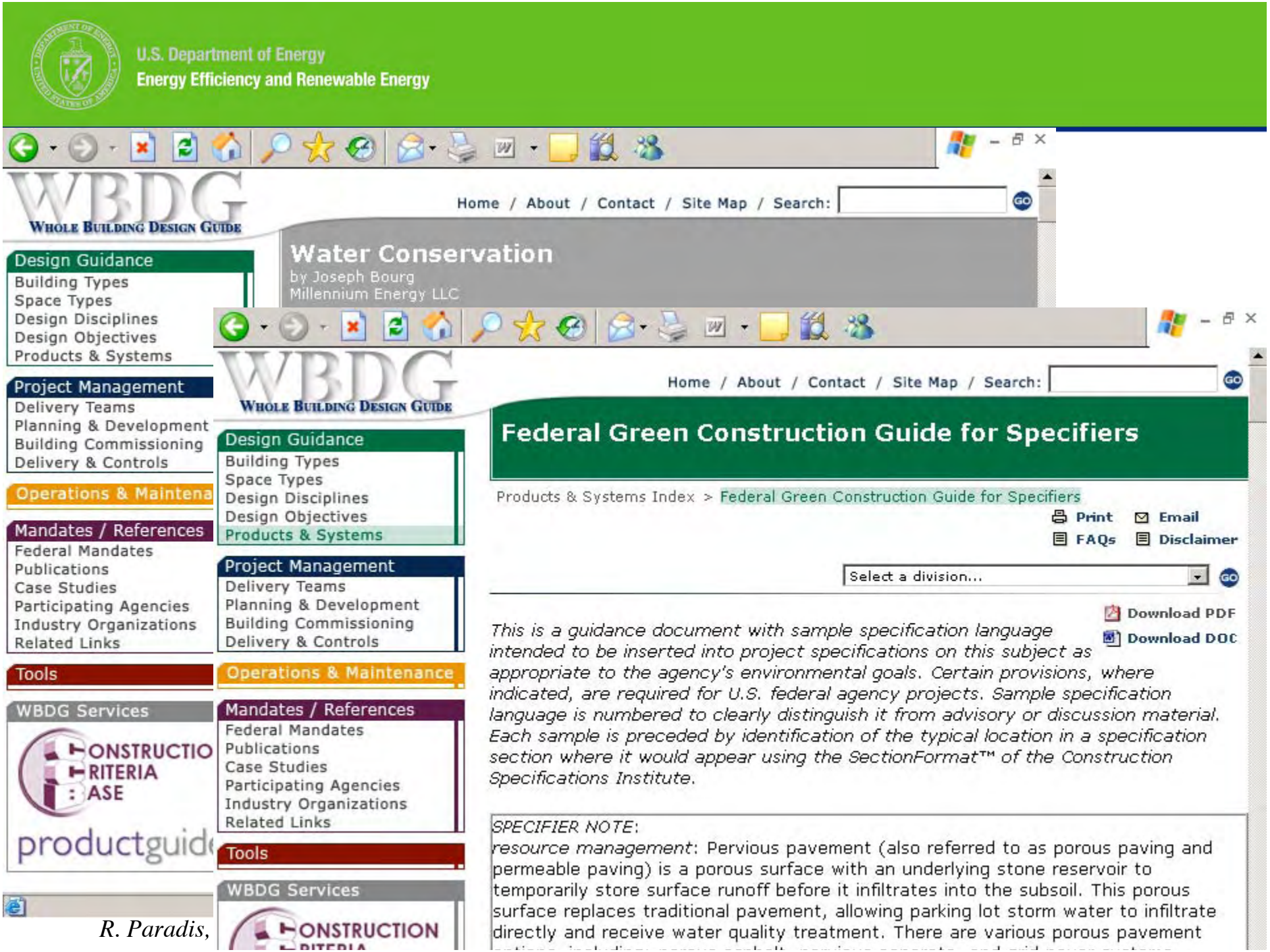
Historic buildings are inherently sustainable. Preservation maximizes the use of existing materials and infrastructure, reduces waste, and preserves the historic character of older towns and cities. The energy embedded in an existing building can be 30% of the embedded energy of maintenance and operations for the entire life of the building. Sustainability begins with preservation.

Historic buildings were traditionally designed with many sustainable features that responded to climate and site. When effectively restored and reused, these features can bring about substantial energy savings. Taking into account historic buildings' original climatic adaptations, today's sustainable technology can supplement inherent sustainable features without compromising unique historic character.

LEED® Silver Rated Balfour—Guthrie Building,

Sustainable Historic Preservation

- Sustainable Sites
  - Heat Island Reduction
- Water Efficiency
  - Water use reduction
3) Energy and Atmosphere
  - Minimum Energy Performance
  - Reuse of Historic Windows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by Joseph Bourg
Millennium Energy LLC
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This is a guidance document with sample specification language intended to be inserted into project specifications on this subject as appropriate to the agency's environmental goals. Certain provisions, where indicated, are required for U.S. federal agency projects. Sample specification language is numbered to clearly distinguish it from advisory or discussion material. Each sample is preceded by identification of the typical location in a specification section where it would appear using the SectionFormat™ of the Construction Specifications Institute.
SPECIFIER NOTE:
resource management: Pervious pavement (also referred to as porous paving and permeable paving) is a porous surface with an underlying stone reservoir to temporarily store surface runoff before it infiltrates into the subsoil. This porous surface replaces traditional pavement, allowing parking lot storm water to infiltrate directly and receive water quality treatment. There are various porous pavement

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by the WBDG Sustainable Committee

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Windows and Glazing
by Gregg D. Ander, FAIA
Southern California Edison

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INTRODUCTION

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Windows have long been used in buildings for daylighting and ventilation. Many studies have even shown that health, comfort, and productivity are improved due to well-ventilated indoor environments and access to natural light. However, windows also represent a major source of unwanted heat loss, discomfort, and condensation problems. In 1990 alone, the energy used to offset unwanted heat losses and gains through windows in residential and commercial buildings cost the United States $20 billion (one-fourth of all the energy used for space heating and cooling).

R. Paradis,

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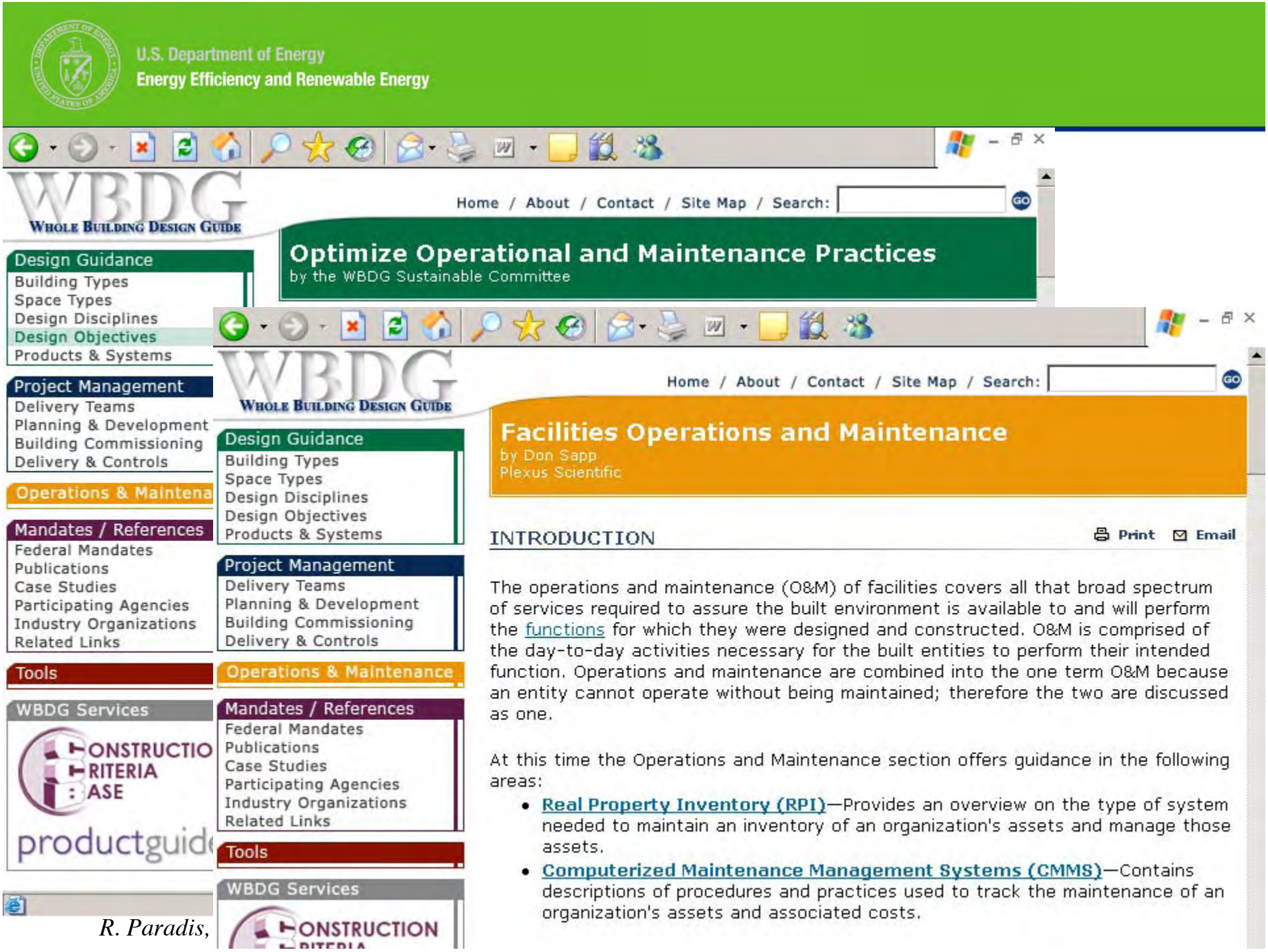
   - Source Reduction and Waste Management
   - Optimize Use of IAQ Compliant Products
   - Exterior and Interior Materials
5) Indoor Environmental Quality
   - Outside Air Introduction and Exhaust Systems
   - Controllability of Systems: Lighting
   - Daylighting and Views: Daylighting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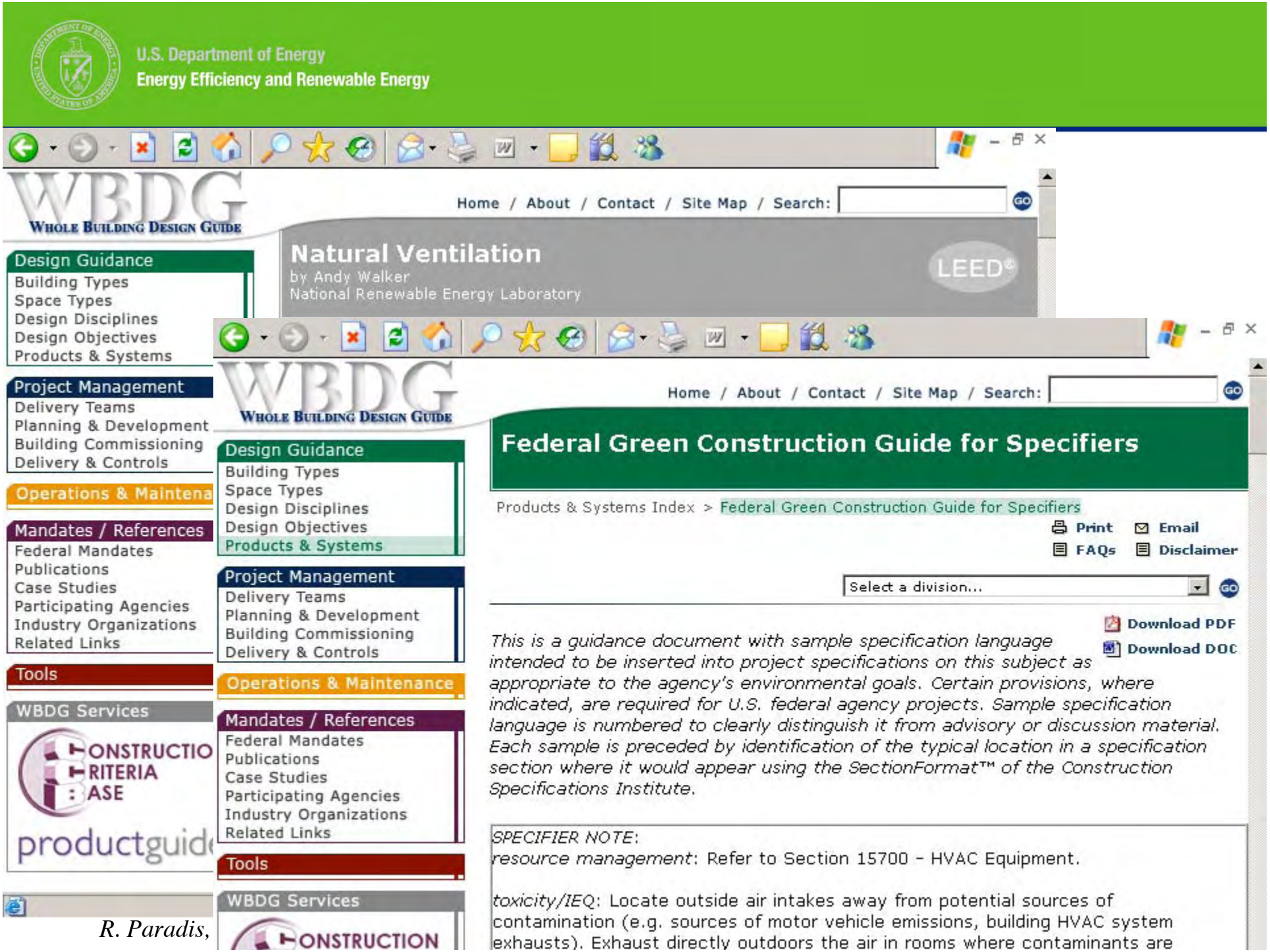
The operations and maintenance (O&M) of facilities covers all that broad spectrum of services required to assure the built environment is available to and will perform the functions for which they were designed and constructed. O&M is comprised of the day-to-day activities necessary for the built entities to perform their intended function. Operations and maintenance are combined into the one term O&M because an entity cannot operate without being maintained; therefore the two are discussed as one.
At this time the Operations and Maintenance section offers guidance in the following areas:
Real Property Inventory (RPI)—Provides an overview on the type of system needed to maintain an inventory of an organization's assets and manage those assets.
Computerized Maintenance Management Systems (CMMS)—Contains descriptions of procedures and practices used to track the maintenance of an organization's assets and associated costs.

R. Paradis,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by Andy Walker
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SPECIFIER NOTE:
resource management: Refer to Section 15700 – HVAC Equipment.
toxicity/IEQ: Locate outside air intakes away from potential sources of contamination (e.g. sources of motor vehicle emissions, building HVAC system exhausts). Exhaust directly outdoors the air in rooms where contaminants are

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Electric Lighting Controls
by David Nelson, AIA
David Nelson & Associates

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OVERVIEW

Lighting controls have traditionally been used to create moods. Today, they are also used as part of a high quality energy efficient lighting system that integrates daylight and electric light sources to provide a comfortable and visually interesting environment for the occupants of a space. Electric lighting controls are appropriate for a wide variety of spaces, from restrooms to large open offices, from conference rooms to classrooms. They can be incorporated with daylighting to provide flexibility, energy savings, and ecological benefits. Although lighting controls are still most commonly used in commercial buildings, they are also increasingly being used in residential applications.

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GSA

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Complimentary requirements
Conflicting and complimentary requirements
Conflicting requirements
Not conflicting or complimentary, but have related considerations

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February 2005

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Construction Waste Management Database

GSA

Tools Index > Category Listing > - Construction Waste Management Database

The Construction Waste Management Database contains information on companies that haul, collect and process recyclable debris from construction projects. Created in 2002 by GSA's Environmental Strategies and Safety Division to promote responsible waste disposal, the Database is a free online service for those seeking companies that recycle construction debris in their area. Use the form below to search the Database by state, zip code or material(s) recycled.

Recyclers of construction and demolition waste may list their services in the database at no charge. Click here to register and add a company listing.

SEARCH THE DATABASE

To search the database, select material(s) you would like to be processed, and the geographic area by state or zip code.

Location:
State: –OR– Zip Code:

Material(s) you would like to be processed:

- Appliances
- Asphalt
- Cardboard
- Carpet
- Concrete
- Gypsum Drywall
- Metals: Non-ferrous
- Mixed/Co-mingled Waste
- Plastic
- Roofing: Asphalt-based
- Roofing: EPDM
- Salvaged/Surplus Materials for Reuse

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Department of Defense (DOD)

Participating Agencies Index > Department of Defense

Unified Facilities Criteria Program

Unified Facilities Guide Specifications (UFGS)
Unified Facilities Criteria (UFC) Technical Publications
Criteria Change Request (CCR)

US Army Corps of Engineers®

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NAVFAC

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The Department of Defense (DoD) and the military services have initiated a program to unify all technical criteria and standards pertaining to planning, design, construction, and operation and maintenance of real property facilities. The objective of the Unified Facilities Criteria (UFC) program is to streamline the military criteria system by eliminating duplication of information, increasing reliance on private-sector standards, and creating a more efficient criteria development and publishing process. Both technical publications and guide specifications are part of the UFC program. Previously, each service had its own publishing system resulting in criteria being disseminated in different formats. UFC documents have a uniform format and are identified by a number such as UFC 1-300-1.

Management of the UFC program is by an Engineering Senior Executive Panel (ESEP) comprised of the senior engineer executive from each military service and DoD. Numerous working groups with one or more technical experts from each


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