Green FF&E: Selecting Sustainable Furniture, Fixtures and Equipment (FF&E)

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Brailsford & Dunlavey – Catalysts for Building Community

GREEN CALIFORNIA SCHOOLS

Who are we?

Brailsford & Dunlavey is a Facility Planning and Project Management firm dedicated to serving

- Elementary and Secondary Schools
- Colleges and Universities
- Professional Sports Organizations
- Municipalities and Governments
- Private Organizations

What do we do?

Brailsford & Dunlavey helps develop **sustainable, "quality-of-life"** facilities including

- Student and Faculty Housing
- Student Athletic, Recreation and Wellness Facilities
- Student Unions
- Campus Edge Development
- Ballparks, Stadiums and Arenas

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Key Projects:

The Episcopal Academy, PA

New Campus Development

- Campus Center
- Athletic Center
- Academic Buildings
- Chapel
- Athletic Fields

Why do we need sustainable FF&E products?

Background

- Around 20% of America goes to school every day (USGBC)
- More than a quarter of these students and teachers attend schools that are considered substandard or dangerous to occupant health
- Green schools are productive learning environments with ample natural light, high-quality acoustics and air that is safe to breathe

Curtsy: USGBC

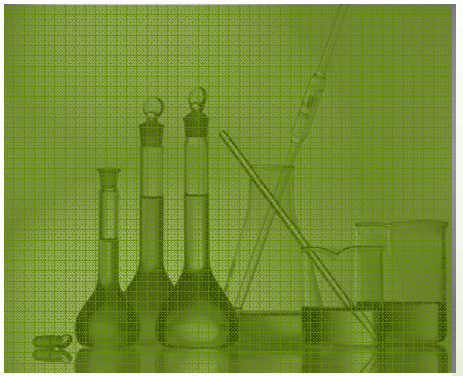

Curtsy: GreenGUARD

Application of Green FF&E in Schools

- Promotes good Indoor Environmental Quality (IEQ)
- Helps conserve energy, water and materials through the manufacturing process

Why do we need sustainable FF&E products?

"Indoor Air Quality (IAQ) and Student Performance", EPA Document



Findings:

- Illnesses resulting from poor IAQ increase absenteeism
  - Respiratory infection
  - Allergies or adverse reaction to chemicals

- Measured loss in performance from indoor pollution sources or inadequate ventilation
  - Reduced ventilation rates and higher indoor pollution is associated with a decreased ability to concentrate
  - Increased adverse health symptoms

Data Source:

Evidence of the association between IAQ and human performance is taken from school settings

Why do we need sustainable FF&E products?

Goals

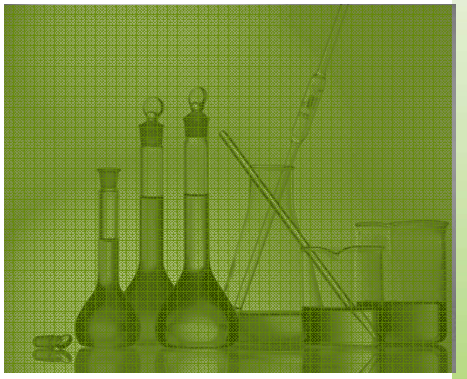
- Screen out hazardous chemicals from the manufacture, use and maintenance of furniture and equipment
- Meet project budget and reduce maintenance costs

Benefits

- Promote good health and well being
- Improve productivity of occupants
  - Reduce number of sick days and absenteeism
  - Better test scores
  - Better teacher retention

Incentives

- Earn credits toward LEED-Schools and Collaborative for High Performance Schools (CHPS) certifications



Green FF&E Selection

Procurement Guide

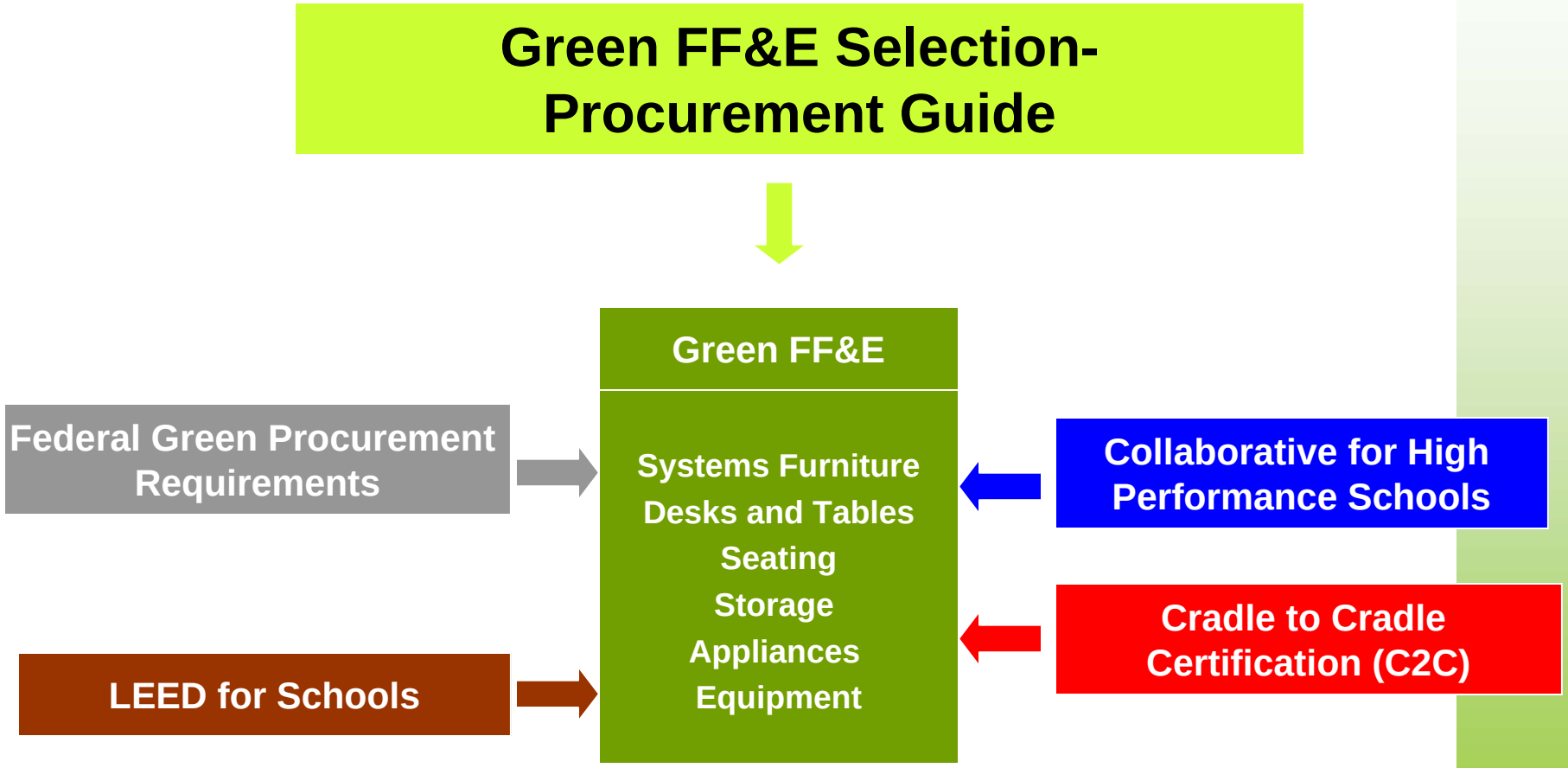
- Materials and Resources
- Indoor Environmental Quality
- Innovation in Design
- Water and Energy Efficiency
- Cradle to Cradle Certification


Curtsy: GreenGUARD and KI

Case Study:

The Episcopal Academy

Green FF&E Selection



Green FF&E Procurement Pro forma

Pro forma

- Guidelines for selecting sustainable FF&E products for a project

Methodology

- Develop a selection criteria based on federal green construction requirements for systems furniture and equipment, LEED-Schools and CHPS credits
- The applicable green credits are listed below
  - Materials and Resources
  - Indoor Environmental Quality
  - Water Efficiency
  - Cradle to Cradle Product Evaluation

Selection Criteria

Product Certification	Applicable product
GreenGUARD, BIFMA, C2C, ETV	Systems furniture and seating
FSC	Certified wood
Green Seal	Adhesives, sealants and coatings
Energy Star/IEEE	Domestic appliances and office equipment

Green FF&E Selection

Q & A

Procurement Guide

- **Materials and Resources**
- Indoor Environmental Quality
- Innovation in Design
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- Cradle to Cradle Certification

Case Study:

The Episcopal Academy

Green FF&E Procurement Pro forma

Selection Criteria	Requirements	Product Certification
Materials and Resources		
Resource reuse-furniture and furnishings	Use salvaged, refurbished or used furniture and furnishings for **5-10%** of the total furniture and furnishings budget	
Recycled content	Indicate percentage by weight of pre-consumer, post-consumer or post industrial materials used in a product	
Local/ regional materials	Use products made of materials extracted/ harvested and manufactured within a **500 mile radius** from the project site	
Bio-based materials	Use rapidly renewable materials harvested within a **ten-year** cycle	
Certified Wood	A minimum of **50 percent** of wood-based materials and products incorporated into the project must be certified	**Forest Stewardship Council (FSC)**

LEED for Schools

- LEED-Schools rating system recognizes the unique nature of the design and construction of K-12 schools

- LEED-Schools addresses
  - Classroom acoustics
  - Master planning
  - Mold prevention
  - Environmental site assessment

- LEED-Schools is the recognized third-party standard for high-performance schools that are healthy for students, comfortable for teachers, and cost-effective

- As of April 20, 2007, all new construction/ renovations of K-12 school facilities seeking LEED certification must use the LEED-Schools rating system

LEED for Schools

Credit category	LEED- Schools
Sustainable Sites	16
Water Efficiency	7
Energy and Atmosphere	17
Materials and Resources	13
Indoor Environmental Quality	20
Innovation and Design Process	6
Total Points:	79
Certified	29-36
Silver	39-43
Gold	44-57
Platinum	58-79

LEED for Schools- Applicable Credits for FF&E

LEED for Schools 2007
Registered Project Checklist

LEED-Schools Rating System			
Category	**Credit**	**Requirement**	**Possible Points**
Materials and Resources	3.1, 3.2	Materials Reuse- 5 - 10%	1 to 2
	4.1, 4.2	Recycled content, 10 - 20%	1 to 2
	5.1, 5.2	Regional Materials, 10 - 20%	1 to 2
	Credit 6	Rapidly Renewable Materials	1
	Credit 7	Certified Wood	1

Collaborative for High Performance Schools (CHPS)

Credit category	CHPS
Site	14
Water	5
Energy	24
Materials	11
Indoor Environmental Quality	17
District Resolutions	10
Total Points:	81
Certified	28 - 81

CHPS Rating for Schools- Applicable Credits for FF&E

Collaborative for High Performance Schools (CHPS) Scorecard			
Category	**Credit**	**Requirement**	**Possible Points**
Materials	3.2	Reuse of interior partitions	1
	4.5	Salvaged Materials	2
	4.1	Recycled Content	2
	4.2	Rapidly renewable materials	2
	4.4	Sustainable materials	1
	4.6	Instead of credits 4.1-4.5, use Environmentally Preferable Products (EPP) credit 4.6	7

Green FF&E Selection

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Curtsy: GreenGUARD and KI

Case Study:

The Episcopal Academy

Green FF&E Procurement Pro forma

Selection Criteria	Requirements	Product Certification
Indoor Environmental Quality (IEQ)		
Low emitting materials		
a. Composite/ engineered wood product	Composite wood/ agri-fiber products are to contain no added urea-formaldehyde	
b. Systems furniture and seating	All systems furniture/ seating introduced into the project space that has been manufactured or refurbished within one year prior to occupancy must be 1. GreenGUARD certified (or) 2. Meet EPA's Environmental verification (ETV) standards for volatile organic compounds (VOC) and aldehyde emissions (or) 3. Meet Business and Institutional Furniture Manufacturers Association (BIFMA) emissions standards	**GreenGUARD, ETV and BIFMA**

GreenGUARD Emission Standards

- GreenGUARD emission standards for low-emitting systems furniture and seating
- Applicable furniture include case goods systems, workstations and moveable walls

Emission	Permissible limit
Individual Volatile Organic Compounds (VOCs)	Less than or equal to 0.1 Threshold Limit Value (TLV)
Formaldehyde	Less than or equal to 0.05 parts per million (or 0.06 milligram/cubic meter)
Total VOCs or Toluene	Less than or equal to 0.5 milligram/cubic meter
Total Aldehydes	Less than or equal to 0.1 parts per million

Business and Institutional Furniture Manufacturers Association (BIFMA) Emission Standards

- BIFMA emission standards for low-emitting systems furniture and seating

Emission	Permissible limit for systems furniture	Permissible limit for seating
Total Volatile Organic Compounds (TVOC or toluene)	Less than or equal to 0.5 milligram/ cubic meter	Less than or equal to 0.25 milligram/ cubic meter
Formaldehyde	Less than or equal to 50 parts per billion	Less than or equal to 25 parts per billion
Total Aldehydes	Less than or equal to 100 parts per billion	Less than or equal to 50 parts per billion
4-Phenyl Cyclohexane	Less than or equal to 0.0065 milligram/ cubic meter	Less than or equal to 0.00325 milligram/ cubic meter

LEED for Schools- Applicable Credits for FF&E

LEED for Schools 2007
Registered Project Checklist

LEED-Schools Rating System			
Category	**Credit**	**Requirement**	**Possible Points**
Indoor Environmental Quality	**4**	**Low-emitting Materials**	**1 to 4**
Innovation in Design	**1.1**	**Use Cradle to Cradle Certified** building materials and products	**1**

CHPS Rating for Schools- Applicable Credits for FF&E

Collaborative for High Performance Schools (CHPS) Scorecard			
Category	**Credit**	**Requirement**	**Possible Points**
Indoor Environmental Quality	**2.2**	**Low-emitting Materials**	**½ to 4**

Green FF&E Selection

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The Episcopal Academy

Green FF&E Procurement Pro forma

Selection Criteria	Requirements	Product Certification
Water and Energy Efficient Equipment		
Domestic equipment- washers, dryers, refrigerators and dishwashers	Provide ENERGY STAR qualifications for equipment. Indicate water consumption rates in gallons per day (gpd) per unit for clothes washers and dish washers	**Energy Star**
Office equipment		
a. Computers, notebooks and monitors	Environmental performance in accordance with IEEE 1680 and the EPEAT Registry	Electronic Product Environmental Assessment Tool (EPEAT)
b. Printers and copiers	Provide electronic equipment that is Restriction of Hazardous Substances Directive (RoHS) compliant	**Energy Star and RoHS certification**

LEED for Schools- Applicable Credits for FF&E

LEED for Schools 2007
Registered Project Checklist

LEED-Schools Rating System			
Category	Credit	Requirement	Possible Points
Water Efficiency	3.1	Water use reduction, 20-40%	1 to 4
Energy and Atmosphere	4.1	Optimize Energy Performance	2 to 10

CHPS Rating for Schools- Applicable Credits for FF&E

Collaborative for High Performance Schools (CHPS) Scorecard			
Category	**Credit**	**Requirement**	**Possible Points**
Water Efficiency	**2.2**	**Reduce Indoor Potable Water Demand**	**1 to 2**

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- **Cradle to Cradle Certification**

Case Study:

The Episcopal Academy

MBDC's Cradle to Cradle Certification

C2C Certification

- The McDonough Braungart Design Chemistry (MBDC) Cradle to Cradle Certification evaluates furniture based on human health and environmental health criteria

Need

- Evaluate materials used in furniture products and production processes
- Provide manufacturers with a means to measure achievement in environmentally intelligent design
- Help customers purchase and specify sustainable products

Incentive

- USGBC issues an innovation credit for specification of products certified under the Cradle to Cradle (C2C) Certification program

MBDC's Cradle to Cradle Certification Criteria

- Develop environmentally focused furniture/product evaluation based on
  - Material health and reutilization
  - Renewable energy use
  - Efficient water usage
  - Socially responsible practices

MBDC's Cradle to Cradle Certification

Requirements

- Use of environmentally safe and healthy materials
- Design for material reutilization, such as recycling or composting
- Energy efficiency and the use of renewable energy
- Efficient use of water, and maximum water quality associated with production
- Instituting strategies for social responsibility

Methodology

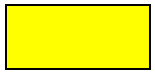
- Materials in furniture are evaluated based on their characteristics within the desired application
- Materials in furniture are classified under four categories or risk levels

Certification Levels

- Three certification levels- Silver, Gold and Platinum

Material health- Chemical risk levels

– Green: Little or no risk. Chemicals that are acceptable for use in the desired application



– Yellow: Low to moderate risk. Chemicals that are acceptable for use in the desired application until a green alternative is found

– Orange: Materials that are medium to high risk. Chemicals that are acceptable for use in the desired application until a green alternative is found

– Red: High risk. 'Red' chemicals should be phased out as soon as possible. 'Red' chemicals include all known or suspected carcinogens, endocrine disruptors, mutagens, reproductive toxins, and teratogens

MBDC's Cradle to Cradle Certification Criteria

Selection Criteria	Requirements	Product Certification
Cradle to Cradle Certification (C2C)		
Development of environmentally focused furniture/ product evaluation based on-		
Material health and reutilization	Use Cradle to Cradle Certified building materials and products for 2.5% of the total value of all building materials and products used in the project, based on cost	**MBDC's Silver, Gold and Platinum certification**
Renewable energy use		
Efficient water usage		
Socially responsible practices		

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Curtsy: GreenGUARD and KI

Case Study:

The Episcopal Academy

Case Study

- What was the challenge?
- What did we do?
- What did we learn?

Case Study: The Episcopal Academy

GREEN CALIFORNIA SCHOOLS

The Challenge –
Creating a FF&E program for six buildings

- Lower School
- Academic building
- Campus Center
- Athletic Center
- Chapel
- Mansion

FF&E Program

- **Provided and Installed by Owner Items**
- **Provided and Installed by Contractor Items**
- **Provided by Owner and Installed by Contractor Items**

Case Study: The Episcopal Academy

FF&E – Product Categories

- Lounge seating
- Office furniture and storage
- Classroom desks, chairs and tables
- Art studio tables, stools and equipment
- Athletic equipment
- Athletic field equipment and site furniture

Case Study: The Episcopal Academy

Green FF&E – Strategies

Selection Criteria	Product Certification	Strategy
Materials and Resources		
Resource Reuse/ Salvage Materials		Around 1.5% of the total FF&E budget is planned for existing office and classroom furniture from the existing school campus
Local/ Regional Materials		Most furniture is expected to be harvested, extracted or manufactured within 500 miles from the project site

Curtsy: GreenGUARD

Case Study: The Episcopal Academy

Green FF&E – Strategies

Selection Criteria	Product Certification	Strategy
Indoor Environmental Quality (IEQ)		
Innovation in Design		
Low emitting materials- systems furniture and seating	GreenGUARD, BIFMA and ETV	New office and classroom furniture that meet GreenGUARD VOC emission standards

Curtsy: GreenGUARD

Case Study: The Episcopal Academy

GREEN CALIFORNIA SCHOOLS

Green FF&E – Strategies

Selection Criteria	Product Certification	Strategy
Water and Energy Efficient Appliances and Equipment		
Reduce Potable Water demand	Energy Star	All appliances such as dishwashers, dryers, microwave ovens and refrigerators will be Energy Star certified
Optimize energy- Provide office equipment that complies with environmental performance standards and emits no hazardous substances	Energy Star, IEEE, RoHS	All computers, notebooks, printers and copiers are planned to be IEEE compliant and purchased per the Electronic Product Environmental Assessment Tool (EPEAT)

Case Study: The Episcopal Academy

Sustainable Lessons Learned

- Resource reutilization through use of salvaged or existing furniture, fixtures and equipment
  - Minimizes the need for newly manufactured materials and helps achieve savings in energy consumption and water used in the manufacturing of new products
  - Reduction of CO2 / Pollution or “carbon footprint”

- GreenGUARD Indoor Air Quality (IAQ), Energy Star, RoHS certified FF&E products
  - Use of low-emitting products improve the Indoor Air Quality (IAQ)
  - Provide a healthy classroom and office environment for students, faculty and administrators

Q & A

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