

 CORPORATE OFFICE PROPERTIES TRUST		<h2>Building Improvement Reference Guide</h2>		
Department: Design Services	Approval: Managing SVP, Asset Management & Leasing	Frequency of Review: Annual	Last Update: June 2017	Policy #

This Reference Guide is to provide sustainable options to use when budgeting and implementing capital improvement projects. The objective is to provide sustainable product guidelines that will help COPT buildings achieve a minimum LEED-certified level. The highlighted sustainable approaches are intended for unification across the entire COPT portfolio.

BUILDING IMPROVEMENT REFERENCE GUIDE

June 2017



Executive Summary

Intent:

The intent of this Reference Guide is to provide sustainable options to use when budgeting and implementing capital improvement projects. The objective is to provide sustainable product guidelines that will help COPT buildings operate at a LEED certified level.

Each project must be evaluated separately to determine the most appropriate use of funds and is not limited to the guidelines provided.

The highlighted sustainable approaches are intended for unification across the entire COPT portfolio.

Summary of Information:

Each reference sheet is broken into three sections.

- **'General Considerations'** will have zero or minimal cost increases and should be included in the project regardless of the total scope.
- **'Sustainable Strategies'** explains one or more options to consider and identifies an approximate cost impact. Please note these estimated cost impacts are approximated and will not incorporate other hidden fees, such as labor, demolition, contractor fees, etc... Each project should always obtain an accurate budget from the contractor prior to work commencement. Some strategies recommend a product/manufacturer that has been used within the COPT portfolio. The manufacturer's name is shown in **bold** text followed by the model or part name & number. If a possible suggestion has caused expensive repairs and/or is a constant maintenance issue, feel free to contact the COPT Design & Construction Services team with this information or questions concerning this information.
 - Cost Impact Key (additional cost impact over conventional measures):
 - \$ 25% increase
 - \$\$ 50% increase
 - \$\$\$ 75% increase
 - ? \$\$\$\$ 100% + increase
- **'Resources'** will assist with any additional product and vendor/consultant contact information, or required code/ legislative compliances.
 - [Product Specifications](#) are provided at end of the Reference Guide.
 - A [Glossary of Terms & Resources](#) is also provided.
- **LEED EB Credit Opportunities** will be listed at the bottom of the page identifying LEED EB credits that relate to the specific capital improvement project.

How to begin:

To utilize this reference guide click on the link here for '[Capital Improvement Finance Codes](#)'. Then locate and select the appropriate capital improvement code in the following list. Not all capital improvement codes will have a reference sheets.

Capital Improvement Financial Codes

Description:	Unit	Example
ADA	ADA	ADA Compliance/ramps/signs
Artwork/Sculpture	ART	Building/Lobby Artwork & Sculpture
ATFP	ATF	Anti-terrorist force protection
Boiler	HVC	Scheduled HVAC replacement, chiller, boilers/pumps, emergency
Building Caulking	CAU	Building caulking not expensed
Cafeteria	CAF	Cafeteria seating, improvements, kitchen tile replacement
Chiller	HVC	Scheduled HVAC replacement, chiller, boilers/pumps, emergency
Comprehensive Sign PKG	SGN	Upgrade/replacement sign directories
Conference Center Improvements	CNF	Conference Center Improvements
Corridor Improvements	COR	Corridor floor/carpet replacement, painting lighting, door replacement
Data Center	DAT	Data Center Improvements
Dumpster	HRD	Sidewalk, gazebo, dumpster, benches, flag pole, retaining wall, fence
Electric Improvements	ELE	Retro-fit
Electric Sub-meters	MET	Installation sub metering
Elevator Modernization	ELV	Refurb./ modernization
Emergency Generator	HVC	Scheduled HVAC replacement, chiller, boilers/pumps, emergency
Exterior Improvements Façade	EXT	Building facelift, exterior doors/stairs (unless ADArelated)
Fence	HRD	Sidewalk, gazebo, dumpster, benches, flag pole, retaining wall, fence
Fire Alarm	FIR	Alarm System Upgrade
Fitness Center	FIT	Fitness room equipment, carpet/floor replacement
Flex	FLX	
Garage	GAR	Asphalt replacement
Hardscape	HRD	Sidewalk, gazebo, dumpster, benches, flag pole, retaining wall, fence
HVAC	HVC	Scheduled HVAC replacement, chiller, boilers/pumps, emergency
Industrial	IND	
Landscaping	LND	Overhaul, irrigation, storm water drainage
Lighting	LGH	Exterior lighting/energy efficient upgrade" garage & parking lot, light poles
Lobby Renovation	LOB	Lobby renovation, carpet/floor replacement, clg, lighting, door
Medical	MED	
Monument Sign	MON	Exterior building monument signage
Office Additional TI	OFF	Additional TI
Parking Lot	PRK	Parking lot overlay, re-caulk control joints in lot, speed bump, bridge repair
Residential	RES	
Restroom	RST	Restroom renovation, water/sewer pump
Retail	RET	
Roof	ROF	Skylights, roof repair, anchor, permanent roof cranes/jibs
SCIF	SCF	Sensitive compartmentalized information facility
Security	SEC	BAS security system
Sidewalk	HRD	Sidewalk, gazebo, dumpster, benches, flag pole, retaining wall, fence
Skylights	ROF	Skylights, roof repair, anchor, permanent roof cranes/jibs
Sprinkler	SPR	Sprinkler work
Storage	STO	
Warehouse	WHS	
Water Heater/Storage	WHT	Water heaters, chiller, pump, water storage tank
Waterproofing	WTR	Waterproofing not expensed
Windows	WIN	Window replacement

Boiler: HVC

General Considerations: (minimal cost impact, should be incorporated into all projects):

- Require Contractor to divert construction debris from landfill by sending all items to recycling facility for separation & re-distribution to manufacturers.
- Prioritize items to be purchased that are manufactured within the local region
- Meet the [Advanced Building Benchmark Performances](#).

Sustainable Strategies:

- When replacing HVAC units on a building, first determine that the unit is sized to operate at an efficient rate.
- Purchase equipment with a high efficiency rating. Pay attention to the part loading rates, since this is where most of COPT's equipment operates. Refer to [COPT Existing Building Equipment Efficiency Recommendations](#) for suggestions on efficiency minimums.
- Do not use CFC refrigerants in HVAC systems. Purchase equipment that uses R410A or R407C refrigerants. Particularly avoid purchasing equipment requiring R22 refrigerants.
- If the HVAC upgrades include roof top mounted equipment, consider insulating the unit curb to a minimum R12 value.
- Specify Forest Stewardship Council (FSC) certified, urea formaldehyde free wood when installing blocking for roof curbs.

Resources:

- BGE, SMECO and other utility companies offer rebate programs that will reimburse projects that employ energy saving options. Visit [BGE's Smart Energy Savers Program](#) for more information.
- TAI Engineering: Brad Boutillier
- Advanced Building Performance: Paul Tseng

LEED EB Credit Opportunities:

Optimize Energy Performance

Enhanced Refrigerant Management

Purchasing – Facilities Management and Renovation

Building Caulking: CAU

General Considerations: (minimal cost impact, should be incorporated into all projects):

- Install low Volatile Organic Compounds (VOC) emitting materials, finishes & adhesives. Refer to the 'Resources' section for Government approved VOC thresholds
- Require Contractor to divert construction debris from landfill by sending all items to recycling facility for separation & re-distribution to manufacturers.
- Prioritize items to be purchased that are manufactured within the local region

Sustainable Strategies:

- Provide low VOC materials.
- Consider placing a redundant line of caulking at precast to precast, brick to precast, brick to brick or brick/precast to window joints.
Approximate cost increase: \$\$\$

Resources:

- [VOC content limits for Adhesives & Sealants: Comply with the South Coast Air Quality Management District Rule #1168 \(SCAQMD #1168\)](#)

LEED EB Credit Opportunities:

Purchasing – Facilities Management and Renovation

Cafeteria Improvements: CAF

General Considerations: (minimal cost impact should be incorporated into all projects):

- Install low Volatile Organic Compounds (VOC) emitting materials, finishes & adhesives. Refer to the 'Resources' section for Government approved VOC thresholds.
- All carpet products shall meet the Carpet & Rug Institutes Green Label Plus requirements (CRI-green label plus)
- Require Contractor to divert construction debris from landfill by sending all items to recycling facility for separation & re-distribution to manufacturing process.
- Salvage as many existing elements as possible
- Prioritize items to be purchased that are manufactured within the local region
- Install recycling bins next to trash receptacles to promote recycling efforts

Sustainable Strategies:

- Consider using regular paint in lieu of Polomyx for flexibility & ease of touch-up.
Specify: Sherwin Williams: Harmony paint or Benjamin Moore: EcoSpec Paint
Approx. cost increase: None; actual cost savings
- If installing carpet in dining area, use carpet tile in lieu of broadloom for general hygiene, flexibility, durability & ease of maintenance. (Note: Additional attackstock should also be ordered)
Specify: **J&J Commercial, Patcraft or Interface**
Approx. cost increase: \$-\$\$
- In lieu of any vinyl products, use environmentally friendly flooring products instead; such as rubber, linoleum, or any biobased product that are recyclable
Specify: Armstrong; Rubber, Bio based, or linoleum sheet or tile products
Approx. cost increase: \$\$-\$\$\$\$ (depending on which product selected)
- Install rubber or wood wall base in lieu of vinyl base
Specify: Roppe: rubber base
Approx. cost increase: \$
- Direct/Indirect light fixtures for more efficient & aesthetically pleasing light distribution
Specify: Cooper Lighting; Metalux Accord LED Series
Approx. cost increase: \$\$
- Using a ceiling tile with a higher reflective value will assist with light distribution & have a more aesthetically pleasing presentation
Specify: Armstrong: Cirrus or Ultima ceiling tile (preferably 2x2)
Approx. cost increase: \$-\$\$
- Select appliances/equipment with higher energy star ratings. Refer to Energy Star link below
- Solid Surface countertops in lieu of plastic laminate for durability
Approx. cost increase: \$\$

- Doors: Re-use as many existing doors as possible. (Note: paint application can be performed in-field using low VOC compliant paint. If re-staining, doors must be taken off site to avoid air contamination.)
 - If purchasing new doors, specify **Forest Stewardship Council (FSC)** wood doors with urea-formaldehyde free core. (Note: this certification is given to certain manufacturers that harvest wood from an environmentally friendly management process)
- Faucets - Install aerators on all existing fixtures to remain, install new automatic, low flow kitchen faucets
Specify: **Chicago Faucet:** deck mtd. Gooseneck faucet (#116.213.21.1)
Approx. cost increase: \$
- Consider dishes and silverware in lieu of plastic/Styrofoam ware to reduce waste in landfills. (Note: another consideration is items that properly decompose after use, such as corn plates.)
- If purchasing new furniture, encourage use of low VOC emitting materials, such as fabrics, adhesives, substrates, ECT....
Approx. cost increase: none - \$\$

Resources:

- [VOC content limits for paints: Comply with the Green Seal Standards \(GS-11\)](#)
- [VOC content limits for Adhesives & Sealants: Comply with the South Coast Air Quality Management District Rule #1168 \(SCAQMD #1168\)](#)
- For a listing of Energy Star rated appliance, visit the Governments web site at http://www.energystar.gov/index.cfm?c=bulk_purchasing.bus_purchasing
- All flooring work to be performed by Interfinish flooring.
- For general plumbing questions contact Don Henzi with Fidelity Engineering

LEED EB Credit Opportunities:

Indoor Water Use Reduction Efficiency

Purchasing – Facilities Management and Renovation

Solid Waste Management - Facilities Management and Renovation

Interior Lighting

Chillers: HVC

General Considerations: (minimal cost impact, should be incorporated into all projects):

- Require Contractor to divert construction debris from landfill by sending all items to recycling facility for separation & re-distribution to manufacturers.
- Select products that conserve water. See resources section below for the EPA standards.
- Prioritize items to be purchased that are manufactured within the local region
- Meet the [Advanced Building Benchmark Performances](#).

Sustainable Strategies:

- When replacing chiller units on a building, first determine that the unit is sized to operate at an efficient rate.
- Purchase equipment with a high efficiency rating. Pay attention to the part loading rates, since this is where most of COPT's equipment operates. Refer to [COPT Existing Building Equipment Efficiency Recommendations](#) for suggestions on efficiency minimums.
- Do not use CFC refrigerants in HVAC systems. Purchase equipment that uses R410A or R407C refrigerants. Particularly avoid purchasing equipment requiring R22 refrigerants.
- If the HVAC upgrades include roof top mounted equipment, consider insulating the unit curb to a minimum R12 value.
- Specify Forest Stewardship Council (FSC) certified, urea formaldehyde free wood when installing blocking for roof curbs.

Resources:

- BGE, SMECO and other utility companies offer rebate programs that will reimburse projects that employ energy saving options. Visit [BGE's Smart Energy Savers Program](#) for more information.
- TAI Engineering: Brad Boutillier
- Advanced Building Performance: Paul Tseng

LEED EB Credit Opportunities:

Optimize Energy Performance

Enhanced Refrigerant Management

Purchasing – Facilities Management and Renovation

Conference Center Improvements: CNF

General Considerations: (minimal cost impact should be incorporated into all projects):

- Install low Volatile Organic Compounds (VOC) emitting materials, finishes & adhesives. Refer to the 'Resources' section for Government approved VOC thresholds.
- All carpet products shall meet the Carpet & Rug Institutes Green Label Plus requirements (CRI-green label plus)
- Require Contractor to divert construction debris from landfill by sending all items to recycling facility for separation & re-distribution to manufacturers.
- Salvage as many existing elements as possible
- Prioritize items to be purchased that are manufactured within the local region
- Install recycling bins next to trash receptacles to promote recycling efforts

Sustainable Strategies:

- Consider using regular paint in lieu of Polomyx for flexibility & ease of touch-up.
Specify: Sherwin Williams: Harmony paint or Benjamin Moore: EcoSpec Paint
Approx. cost increase: None; actual cost savings
- If installing carpet in dining area, use carpet tile in lieu of broadloom for general hygiene, flexibility, durability & ease of maintenance. (Note: Additional attackstock should also be ordered)
Specify: J&J Commercial, Patcraft or Interface
Approx. cost increase: \$-\$\$
- In lieu of any vinyl products, use environmentally friendly flooring products instead; such as rubber, linoleum, or any biobased product that are recyclable
Specify: Armstrong; Rubber, Bio based, or linoleum sheet or tile products
Approx. cost increase: \$\$-\$\$\$\$ (depending on which product selected)
- Install rubber or wood wall base in lieu of vinyl base
Specify: Roppe: rubber base
Approx. cost increase: \$
- Direct/Indirect light fixtures for more efficient & aesthetically pleasing light distribution
Specify: Cooper Lighting; Metalux Accord LED Series
Approx. cost increase: \$\$
- Provide different lighting levels/switching for various tasks to reduce overall energy consumption and occupant controllability.
- Specify Vacancy Sensors or dimmable light fixtures.
- Using a ceiling tile with a higher reflective value will assist with light distribution & have a more aesthetically pleasing presentation
Specify: Armstrong: Cirrus or Ultima ceiling tile (preferably 2x2)
Approx. cost increase: \$-\$\$
- Select appliances/equipment with higher energy star ratings. Refer to Energy Star link below

- Solid Surface countertops in lieu of plastic laminate for durability
Approx. cost increase: \$\$
- Doors: Re-use as many existing doors as possible. (Note: paint application can be performed in-field using low VOC compliant paint. If re-staining, doors must be taken off site to avoid air contamination.)
 - If purchasing new doors, specify **Forest Stewardship Council (FSC)** wood doors with urea-formaldehyde free core. (Note: this certification is given to certain manufacturers that harvest wood from an environmentally friendly management process)
- Faucets - Install aerators on all existing fixtures to remain, install new automatic, low flow kitchen faucets
Specify: Chicago Faucet: deck mtd. Gooseneck faucet (#116.213.21.1)
Approx. cost increase: \$
- Consider dishes and silverware in lieu of plastic/Styrofoam ware to reduce waste in landfills. (Note: another consideration is items that properly decompose after use, such as corn plates.)
- If purchasing new furniture, encourage use of low VOC emitting materials, such as fabrics, adhesives, substrates, ECT....
Approx. cost increase: none - \$\$

For Conferencing Centers that have Kitchen/break rooms see the following:

- Solid Surface countertops in lieu of plastic laminate for durability.
Approx. cost increase: \$\$
- Install aerators on all existing fixtures to remain
Approx. cost increase: Less than \$1.00/fixture
- Install automatic, low flow faucets
Specify: Chicago Faucet: deck mtd. Gooseneck (#116.213.21.1)
Approx. cost increase: \$
- Select appliances/equipment with higher energy star ratings. Refer to Energy Star link below

Resources:

- [VOC content limits for paints: Comply with the Green Seal Standards \(GS-11\)](#)
- [VOC content limits for Adhesives & Sealants: Comply with the South Coast Air Quality Management District Rule #1168 \(SCAQMD #1168\)](#)
- For a listing of Energy Star rated appliance, visit the Governments web site at http://www.energystar.gov/index.cfm?c=bulk_purchasing.bus_purchasing
- All flooring work to be performed by Interfinish flooring. Contact Amber Long

LEED EB Credit Opportunities:

Indoor Water Use Reduction Efficiency

Purchasing – Facilities Management and Renovation

Solid Waste Management - Facilities Management and Renovation

Interior Lighting

Corridor Improvements: COR

General Considerations: (minimal cost impact should be incorporated into all projects):

- Install low Volatile Organic Compounds (VOC) emitting materials, finishes & adhesives. Refer to the 'Resources' section for Government approved VOC thresholds.
- All carpet products shall meet the Carpet & Rug Institutes Green Label Plus requirements (CRI-green label plus)
- Require Contractor to divert construction debris from landfill by sending all items to recycling facility for separation & re-distribution to manufacturers.
- Salvage as many existing elements as possible
- Prioritize items to be purchased that are manufactured within the local region

Sustainable Strategies:

- Consider using regular paint in lieu of Polomyx for flexibility & ease of touch-up.
Specify: Sherwin Williams: Harmony paint or Benjamin Moore: EcoSpec Paint
Approx. cost increase: None; actual cost savings
- If installing carpet in dining area, use carpet tile in lieu of broadloom for general hygiene, flexibility, durability & ease of maintenance. (Note: Additional attackstock should also be ordered)
Specify: J&J Commercial, Patcraft or Interface
Approx. cost increase: \$-\$\$
- In lieu of any vinyl products, use environmentally friendly flooring products instead; such as rubber, linoleum, or any biobased product that are recyclable
Specify: Armstrong; Rubber, Bio based, or linoleum sheet or tile products
Approx. cost increase: \$\$-\$\$\$\$ (depending on which product selected)
- Install rubber or wood wall base in lieu of vinyl base
Specify: Roppe: rubber base
Approx. cost increase: \$
- Direct/Indirect light fixtures for more efficient & aesthetically pleasing light distribution
Consider reducing light fixtures count to approximately 35 foot-candles
Specify: Cooper Lighting; Metalux Accord LED
Approx. cost increase: \$\$
- Using a ceiling tile with a higher reflective value will assist with light distribution & have a more aesthetically pleasing presentation
Specify: Armstrong: Cirrus or Ultima ceiling tile (preferably 2x2)
Approx. cost increase: \$-\$\$

- Doors: Re-use as many existing doors as possible. (Note: paint application can be performed in-field using low VOC compliant paint. If re-staining, doors must be taken off site to avoid air contamination.)
 - If purchasing new doors, specify **Forest Stewardship Council (FSC)** wood doors with urea-formaldehyde free core. (Note: this certification is given to certain manufacturers that harvest wood from an environmentally friendly management process)

Resources:

- [VOC content limits for paints: Comply with the Green Seal Standards \(GS-11\)](#)
- [VOC content limits for Adhesives & Sealants: Comply with the South Coast Air Quality Management District Rule #1168 \(SCAQMD #1168\)](#)
- All flooring work to be performed by Interfinish flooring.

LEED EB Credit Opportunities:

Purchasing – Facilities Management and Renovation

Solid Waste Management - Facilities Management and Renovation

Interior Lighting

Elevator Modernization: ELV

General Considerations: (minimal cost impact should be incorporated into all projects):

- Install low Volatile Organic Compounds (VOC) emitting materials, finishes & adhesives. Refer to the 'Resources' section for Government approved VOC thresholds.
- All carpet products shall meet the Carpet & Rug Institutes Green Label Plus requirements (CRI-green label plus)
- Require Contractor to divert construction debris from landfill by sending all items to recycling facility for separation & re-distribution to manufacturers.
- Salvage as many existing elements as possible
- Prioritize items to be purchased that are manufactured within the local region

Sustainable Strategies:

- Installing lighter weight materials inside cabs for less energy consumption & wear on elevator equipment
Specify: **Plastic laminates all sides or Mirror on back wall with Plastic laminates on side walls.** (Consider size of finished material with available size of raw materials; ie. a maximum length of laminate is 12' so a 12'-6" finished items would require an additional piece of laminate with extreme amount of waste)
Approx. cost increase: \$-\$\$ (variance in cost depends on how many mirrors incorporated)
- If installing carpet, use carpet tile in lieu of broadloom for flexibility, durability & ease of maintenance. (Note: Additional attic stock should also be ordered)
Specify: **J&J commercial, Patcraft or Interface**
Approx. cost increase: \$-\$\$
- If installing floor tile in elevator provide a schluter strip to help strengthen tile edges at flooring transition.
Approx. cost increase: less than \$5.00/sf
- Select lighting products that reduce energy consumption and heat load.
Lights should also be on an occupancy sensor so they do not run 24/7
Specify: **LED lights w/ vacancy sensor**
Approx. cost increase: \$\$
- Select a ceiling metal ceiling that assists with light distribution
Approx. cost increase: \$

Resources:

- [VOC content limits for paints: Comply with the Green Seal Standards \(GS-11\)](#)
- [VOC content limits for Adhesives & Sealants: Comply with the South Coast Air Quality Management District Rule #1168 \(SCAQMD #1168\)](#)
- For elevator cab renovations, contact Cab Craft for assistance

LEED EB Credit Opportunities:

Purchasing – Facilities Management and Renovation

Solid Waste Management - Facilities Management and Renovation

Interior Lighting

Fitness Center: FIT

General Considerations: (minimal cost impact should be incorporated into all projects):

- Install low Volatile Organic Compounds (VOC) emitting materials, finishes & adhesives. Refer to the 'Resources' section for Government approved VOC thresholds.
- All carpet products shall meet the Carpet & Rug Institutes Green Label Plus requirements (CRI-green label plus)
- Require Contractor to divert construction debris from landfill by sending all items to recycling facility for separation & re-distribution back to manufacturing process.
- Salvage as many existing elements as possible
- Prioritize items to be purchased that are manufactured within the local region

Sustainable Strategies:

- Consider using regular paint in lieu of Polomyx for flexibility & ease of touch-up.
Specify: **Sherwin Williams**: Harmony paint or **Benjamin Moore**: EcoSpec Paint
Approx. cost increase: None; actual cost savings
- If installing carpet, use carpet tile in lieu of broadloom for general hygiene, flexibility, durability & ease of maintenance. (Note: Additional attic stock should also be ordered)
Specify: **J&J Commercial**, **Patcraft** or **Interface**
Approx. cost increase: \$-\$\$
- In lieu of any vinyl products, use environmentally friendly resilient flooring products instead; such as rubber, linoleum, or any biobased products that are recyclable.
Specify: **Armstrong**: Rubber or Bio based sheet or tile products
Approx. cost increase: \$\$-\$\$\$ (depending on which product selected)
- Install rubber, wood or carpet wall base in lieu of vinyl base
Specify: **Roppe**: for rubber base only & carpet base to match carpet flooring
Approx. cost increase: \$-\$\$ (depending on which products selected)
- Direct/Indirect light fixtures for more efficient & aesthetically pleasing light distribution
Specify: **Cooper Lighting**; Metalux, Accord LED Series
Approx. cost increase: \$\$
- Using a ceiling tile with a higher reflective value will assist with light distribution & spec. a tile with a moisture barrier for health & hygiene
Specify: **Armstrong**: Cirrus or Ultima ceiling tile (preferably 2x2)
Approx. cost increase: \$-\$\$
- Doors: Re-use as many existing doors as possible. (Note: paint application can be performed in-field using low VOC compliant paint. If re-staining, must be taken off site to avoid air contamination.)
 - If purchasing new doors, specify **Forest Stewardship Council (FSC)** wood doors. (Note; this certification is given to certain manufacturers that harvest wood from an environmentally friendly management process)
- Select equipment with higher energy star ratings. Refer to Energy Star link below

For showers & restrooms within the Fitness Centers:

- Salvage existing metal toilet partitions. Partitions can be electrostatically painted (In field)
Approx. cost increase: None (cost savings to re-paint rather than purchase all new partitions)
- Solid Surface countertops in lieu of plastic laminate for durability.
Approx. cost increase: \$\$
- Automatic foam soap dispensers for cleanliness & general hygiene concerns.
Specify: **Total Concepts**: One shop foam dispenser (Note: these are counter-mounted)
Approx. Cost increase: \$
- Reduce water consumption by any of the following means: refer to resource section for government issued water consumption baseline and reductions on fixtures.

Faucets:

- Install aerators on all existing fixtures to remain
Approx. cost increase: Less than \$1.00/fixture
- Install automatic, low flow faucets
Specify: **Total Concepts**: Verona Auto Faucets or **Chicago Faucet**: HyTronic Series
Approx. cost increase: \$

Toilets:

- Re-use existing toilets, but install new dual flush valves (Note: older toilets may not be able to accommodate these values. May need to replace the whole fixture)
Specify: **Sloan**: Uppercut #WES-111 (manual dual flush)
Approx. cost increase: \$
Specify: **Sloan**: Ecos (automatic dual flush w/push button override)
Approx. cost increase: \$\$\$
- Install new wall mounted toilet with dual flush valve
Specify: **Kohler**: Kingston (K-4325) with valve by **Sloan**: Uppercut #WES-111
Approx. cost increase: \$\$\$

Showers:

- Install aerators on all existing fixtures to remain
Approx. cost increase: Less than \$1.00/fixture
- Install low flow shower heads
Specify: **Speakman Company**: Anystream Shower head (S-2253-AF)
Approx. cost increase: \$

Resources:

- [VOC content limits for paints: Comply with the Green Seal Standards \(GS-11\)](#)
- [VOC content limits for Adhesives & Sealants: Comply with the South Coast Air Quality Management District Rule #1168 \(SCAQMD #1168\)](#)
- For a listing of Energy Star rated appliance, visit the Governments web site at http://www.energystar.gov/index.cfm?c=bulk_purchasing.bus_purchasing
- All flooring work to be performed by Interfinish flooring.
- For general plumbing questions contact Don Henzi with Fidelity Engineering

LEED EB Credit Opportunities:

Purchasing – Facilities Management and Renovation

Solid Waste Management - Facilities Management and Renovation

Indoor Water Use Reduction

Interior Lighting

HVAC: HVC

General Considerations: (minimal cost impact, should be incorporated into all projects):

- Require Contractor to divert construction debris from landfill by sending all items to recycling facility for separation & re-distribution to manufacturers.
- Select products that conserve water. See resources section below for the EPA 1992 standards.
- Prioritize items to be purchased that are manufactured within the local region
- Meet the [Advanced Building Benchmark Performances](#).

Sustainable Strategies:

- When replacing HVAC units on a building, first determine that the unit is sized properly to operate at an efficient rate.
- Purchase equipment with a high efficiency rating. Pay attention to the part loading rates, since this is where most of COPT's equipment operates. Refer to [COPT Existing Building Equipment Efficiency Recommendations](#) for suggestions on efficiency minimums.
- Do not use CFC refrigerants in HVAC systems. Purchase equipment that uses R410A or R407C refrigerants. Particularly avoid purchasing equipment requiring R22 refrigerants.
- If the HVAC upgrades include roof top mounted equipment, consider insulating the unit curb to a minimum R12 value.
- Specify Forest Stewardship Council (FSC) certified, urea formaldehyde free wood when installing blocking for roof curbs.
- Consider providing outdoor airflow measurement devices that can monitor systems to ensure that system is operating within 15% of the design minimum

Resources

- BGE, SMECO and other utility companies offer rebate programs that will reimburse projects that employ energy saving options. Visit [BGE's Smart Energy Savers Program](#) for more information.
- TAI Engineering: Brad Boutillier
- Advanced Building Performance: Paul Tseng

LEED EB Credit Opportunities:

Purchasing – Facilities Management and Renovation

Optimize Energy Performance

Enhanced Refrigerant Management

Indoor Air Quality Management Program

Landscaping: LND

General Considerations: (minimal cost impact, should be incorporated into all projects):

- Select water-efficient, climate tolerant native or adapted plantings.
- Retrofit existing irrigation systems to incorporate high efficiency irrigation strategies.
- Use captured rainwater or graywater to feed irrigation systems.

Sustainable Strategies:

- Native plantings require less maintenance and potable water. Please refer to the following website for a list of regional trees, shrubs and ground coverings: [Regional Plantings for Maryland and Virginia](#). This link can also be used to navigate to other regions in COPT's portfolio.
No cost increase.
- When installing native plantings, consider not installing an irrigation system. No cost increase (savings).
- Consider adding moisture sensors to your current irrigation system to limit the amount of water used.
Approximate cost increase: \$
- Add or replace drip heads in lieu of irrigation heads.
Approximate cost increase: \$
- Consider adding rainwater collectors to your site. This could include underground storage facilities or rain barrels that can be used in your irrigation systems.
Approximate cost increase: \$\$\$

Resources:

- A list of nurseries that carry native plantings in Maryland can be found at the following link: [Maryland Native Plant Nurseries](#)
- Consult Paul Bassett at Hydro Logix for high efficiency irrigation designs and retrofit suggestions.
- Contact your local municipalities to see if graywater is available to feed or to truck to the building location for irrigation.

LEED EB Credit Opportunities:

*Site Development – Protect or Restore Habitat/Site Management
Outdoor Water Use Reduction*

Lighting: LGH

General Considerations: (minimal cost impact, should be incorporated into all projects):

- Require Contractor to divert construction debris from landfill by sending all items to recycling facility for separation & re-distribution to manufacturers.
- Prioritize items to be purchased that are manufactured within the local region

Sustainable Strategies:

- When replacing whole light fixtures, consider upgrading to LED light fixture.
- When replacing ballasts, consider using programmed start ballasts, which are compatible with vacancy sensors. If other ballasts are used with sensors they can prematurely fail, because they are not designed for the increased amount of switching caused by the sensors.
- Specify low or no mercury lamps. Establish a lamp purchasing plan that limits the amount of mercury lamps entering the building. The overall average of the mercury content in all of the lamps in the building should be less than 90 picograms per lumen-hour. [Building Lamps' Mercury Content](#) will help you determine the average amount of mercury per fixture in the building.
- Encourage tenants to use task lighting and reduce the use of overhead lights to a maximum of .85 Watts per sf.

Resources:

- BGE, SMECO and other utility companies offer rebate programs that will reimburse projects that employ energy saving options. Visit [BGE's Smart Energy Savers Program](#) for more information.
- For general lighting questions contact TAI Engineering – Matt Steiner
- For general energy performance questions contact Advanced Building Performance – Paul Tseng

LEED EB Credit Opportunities:

Purchasing – Facilities Management and Renovation

Purchasing - Lamps

Interior Lighting

Lobby Renovations: LOB

General Considerations: (minimal cost impact should be incorporated into all projects):

- Install low Volatile Organic Compounds (VOC) emitting materials, finishes & adhesives. Refer to the 'Resources' section for Government approved VOC thresholds.
- All carpet products shall meet the Carpet & Rug Institutes Green Label Plus requirements (CRI-green label plus)
- Require Contractor to divert construction debris from landfill by sending all items to recycling facility for separation & re-distribution to manufacturers.
- Salvage as many existing elements as possible
- Prioritize items to be purchased that are manufactured within the local region

Sustainable Strategies:

- Consider using regular paint in lieu of Polomyx for flexibility & ease of touch-up.
Specify: Sherwin Williams: Harmony paint or Benjamin Moore: EcoSpec Paint
Approx. cost increase: None; actual cost savings
- For tile flooring consider larger tiles, fewer & darker grout joints for cleanliness.
Approx cost increase: none
- Install carpet tile in lieu of broadloom for flexibility, durability & ease of maintenance. (Note: Additional attic stock should also be ordered)
Specify: J&J Commercial, Patcraft or Interface
Approx. cost increase: \$-\$\$
- Install environmentally friendly resilient flooring in lieu of vinyl products for back of the house areas, such as janitorial closets, loading dock hallways
Specify: Armstrong: Bio based tile or Linoleum Approx. cost increase: \$-\$\$
- Install rubber, wood or carpet wall base in lieu of vinyl base
Specify: Roppe: for rubber only & carpet base to match carpet flooring
Approx. cost increase: \$-\$\$
- Install walk-off mats in the main lobby at least 10' long in the travel direction to capture dirt and particulates prior to them entering the building.
- Direct/Indirect light fixtures for more efficient & aesthetically pleasing light distribution
Specify: Cooper Lighting; Metalux, Accord LED Series
Approx. cost increase: \$\$
- Doors: Re-use as many existing doors as possible. (Note: paint application can be performed in-field using low VOC compliant paint. If re-staining, doors must be taken off site to avoid air contamination.)
 - If purchasing new doors, specify Forest Stewardship Council (FSC) wood doors. (Note; this certification is given to certain manufacturers that harvest wood from an environmentally friendly management process)

Resources:

- [VOC content limits for paints: Comply with the Green Seal Standards \(GS-11\)](#)
- [VOC content limits for Adhesives & Sealants: Comply with the South Coast Air Quality Management District Rule #1168 \(SCAQMD #1168\)](#)
- All flooring work to be performed by Interfinish Flooring, contact Amber Long.

LEED EB Credit Opportunities:

Purchasing – Facilities Management and Renovation

Solid Waste Management - Facilities Management and Renovation

Interior Lighting

Green Cleaning

Office Additional T.I. Improvements: OFF

General Considerations: (minimal cost impact should be incorporated into all projects):

- Install low Volatile Organic Compounds (VOC) emitting materials, finishes & adhesives. Refer to the 'Resources' section for Government approved VOC thresholds.
- All carpet products shall meet the Carpet & Rug Institutes Green Label Plus requirements (CRI-green label plus)
- Require Contractor to divert construction debris from landfill by sending all items to recycling facility for separation & re-distribution to manufacturers.
- Salvage as many existing elements as possible
- Prioritize items to be purchased that are manufactured within the local region
- Install recycling bins next to trash receptacles to promote recycling efforts

Sustainable Strategies:

- Consider using regular paint in lieu of Polomyx for flexibility & ease of touch-up.
Specify: **Sherwin Williams**: Harmony paint or **Benjamin Moore**: EcoSpec Paint
Approx. cost increase: None; actual cost savings
- If installing carpet, use carpet tile in lieu of broadloom for general hygiene, flexibility, durability & ease of maintenance. (Note: Additional attic stock should also be ordered)
Specify: **J&J Commercial**, **Patcraft** or **Interface**
Approx. cost increase: \$-\$\$
- In lieu of any vinyl products, use environmentally friendly resilient flooring products instead; such as rubber, linoleum, or any biobased products that are recyclable.
Specify: **Armstrong**: Rubber or Bio based sheet or tile products
Approx. cost increase: \$\$-\$\$\$ (depending on which product selected)
- Install rubber, wood or carpet wall base in lieu of vinyl base
Specify: **Roppe**: for rubber base only & carpet base to match carpet flooring
Approx. cost increase: \$-\$\$ (depending on which products selected)
- Direct/Indirect light fixtures for more efficient & aesthetically pleasing light distribution
Specify: **Cooper Lighting**; Metalux, Accord LED Series
Approx. cost increase: \$\$
- Using a ceiling tile with a higher reflective value will assist with light distribution & spec. a tile with a moisture barrier for health & hygiene
Specify: **Armstrong**: Cirrus or Ultima ceiling tile (preferably 2x2)
Approx. cost increase: \$-\$\$
- Doors: Re-use as many existing doors as possible. (Note: paint application can be performed in-field using low VOC compliant paint. If re-staining, must be taken off site to avoid air contamination.)
 - If purchasing new doors, specify **Forest Stewardship Council (FSC)** wood doors. (Note; this certification is given to certain manufacturers that harvest wood from an environmentally friendly management process)
- Select equipment with higher energy star ratings. Refer to Energy Star link below

Faucets:

- Install aerators on all existing fixtures to remain
Approx. cost increase: Less than \$1.00/fixture
- Install automatic, low flow faucets
Specify: **Total Concepts:** Verona Auto Faucets or **Chicago Faucet:** HyTronic Series
Approx. cost increase: \$

Resources:

- [VOC content limits for paints: Comply with the Green Seal Standards \(GS-11\)](#)
- [VOC content limits for Adhesives & Sealants: Comply with the South Coast Air Quality Management District Rule #1168 \(SCAQMD #1168\)](#)
- For a listing of Energy Star rated appliance, visit the Governments web site at http://www.energystar.gov/index.cfm?c=bulk_purchasing.bus_purchasing
- Contact Interfinish flooring for all flooring work

LEED EB Credit Opportunities:

Purchasing – Facilities Management and Renovation

Solid Waste Management - Facilities Management and Renovation

Interior Lighting

Green Cleaning

Indoor Water Use Reduction Efficiency

Purchasing – Facilities Management and Renovation

Solid Waste Management - Facilities Management and Renovation

Interior Lighting

Restroom Renovations: RST

General Considerations (minimal cost impact should be incorporated into all projects):

- Install low Volatile Organic Compounds (VOC) emitting materials, finishes & adhesives. Refer to the 'Resources' section for Government approved VOC thresholds
- Require Contractor to divert construction debris from landfill by sending all items to recycling facility for separation & re-distribution back to manufacturers.
- Salvage as many existing elements as possible
- Prioritize items to be purchased that are manufactured within the local region

Sustainable Strategies:

- Salvage existing metal toilet partitions. Partitions can be electrostatically painted (in-field)
Approx. cost increase: none (cost savings to re-paint rather than purchase new partitions)
- Consider using regular paint in lieu of Polomyx for ease of touch-up.
Specify: **Sherwin Williams**, Harmony paint or **Benjamin Moore**, EcoSpec Paint
Approx. cost increase: None; actual cost savings
- Solid Surface countertops in lieu of plastic laminate for durability.
Approx. cost increase: \$\$
- Automatic foam soap dispensers for cleanliness & general hygiene concerns.
Specify: **Total Concepts**: One shop foam dispenser (Note: these are counter-mounted) Approx. Cost increase: \$
- Direct/Indirect light fixtures for more efficient aesthetically pleasing light distribution
Specify: **Cooper Lighting**; Metalux, Accord LED Series
Approx. cost increase: \$\$
- Consider vacancy sensors for reduction in energy consumption & do not run 24/7
- Reduce water consumption by any of the following means: refer to resource section for government issued water consumption baseline and reductions on fixtures.

Faucets:

- Install aerators on all existing fixtures to remain
Approx. cost increase: Less than \$1.00/fixture
- Install automatic, low flow faucets
Specify: **Total Concepts**: Verona Auto Faucets or **Chicago Faucet**: HyTronic Series
Approx. cost increase: \$

Toilets:

- Re-use existing toilets, but install new dual flush valves (Note: older toilets may not be able to accommodate new flush valves. May need to replace the whole fixture)
Specify: **Sloan**: Uppercut #WES-111 (manual dual flush)
Approx. cost increase: \$
Specify: **Sloan**: Ecos (automatic dual flush w/push button override)
Approx. cost increase: \$\$\$

- Install new toilets with dual flush valves
Specify: **Kohler**: Kingston (K-4325) with valve by **Sloan**: UpperCut #WES-111
Approx. cost increase: \$\$\$

For Showers:

- Install aerators on all existing fixtures to remain
Approx. cost increase: Less than \$1.00/fixture
- Install low flow shower heads
Specify: **Speakman Company**: Anystream Shower head (S-2253-AF)
Approx. cost increase: \$

Resources:

- [VOC content limits for paints: Comply with the Green Seal Standards \(GS-11\)](#)
- [VOC content limits for Adhesives & Sealants: Comply with the South Coast Air Quality Management District Rule #1168 \(SCAQMD #1168\)](#)
- [Water Consumption baseline guidelines & reduction chart: Comply with the Energy Policy Act of 1992.](#)
- For general plumbing questions contact Don Henzi with Fidelity Engineering

LEED EB Credit Opportunities:

Purchasing – Facilities Management and Renovation

Solid Waste Management - Facilities Management and Renovation

Indoor Water Use Reduction

Interior Lighting

Roof Renovations: ROF

General Considerations: (minimal cost impact, should be incorporated into all projects):

- Require Contractor to divert construction debris from landfill by sending all items to recycling facility for separation & re-distribution to manufacturers.
- Prioritize items to be purchased that are manufactured within the local region and made from recycled content.

Sustainable Strategies:

- Select a roofing material that reduces heat islands. Heat islands are the thermal gradient differences between developed and undeveloped areas. A heat island is when a heat sinkhole is created. Heat sinkholes (such as black roofs) make the building have to work harder to keep cool. Roofing materials should have a solar reflective index equal to or greater than the table below.

Approximate cost increase: No cost impact

Roof Type	Slope	SRI
Low-sloped roof	< 2:12	78
Steep-sloped roof	> 2:12	29

- In addition to reflectivity, roof insulation also helps to reduce a building's energy consumption. The cooler the climate, the greater the need for a higher R-value to ensure that less heat is lost from the building envelope. Based on the climate zone that Maryland is located, roofing insulation should have a minimum R-value of 30. Generally 4-1/2 inches of polyisocyanurate insulation will get an R-30 value. Consult roofing manufacturer for compatible insulation materials.

Approximate cost increase: \$

- If the HVAC upgrades include roof top mounted equipment, consider insulating the unit curb to a minimum R12 value.

Approximate cost increase: \$

- Specify Forest Stewardship Council (FSC) certified, urea formaldehyde free wood when installing blocking for roof curbs.

Approximate cost increase: No cost impact

Resources:

- Product information is available at the Cool Roof Rating Council website (<http://www.coolroof.org>).
- Also, visit the Energy Star website for additional product information (http://www.energystar.gov/index.cfm?c=roof_prods.pr_roof_products)
- COPT has used the following manufacturers within its portfolio:
Carlisle SynTec Incorporated, Firestone Building Products Company & GAF

LEED EB Credit Opportunities:

Purchasing – Facilities Management and Renovation

Solid Waste Management - Facilities Management and Renovation

Water Heater/Storage: WHT

General Considerations (minimal cost impact should be incorporated into all projects):

- Install low Volatile Organic Compounds (VOC) emitting materials, finishes & adhesives. Refer to the 'Resources' section for Government approved VOC thresholds
- Require Contractor to divert construction debris from landfill by sending all items to recycling facility for separation & re-distribution back to manufacturers.
- Salvage as many existing elements as possible
- Prioritize items to be purchased that are manufactured within the local region
- Meet the [Advanced Building Benchmark Performances](#).

Sustainable Strategies:

- Specify Energy Star rated, high efficiency water heaters. Refer to the [Energy Star Approved Water Heaters](#) website and navigate to the type of water heater required for your building (ie heat pump, gas-fired, etc.).
- Prioritize items to be purchased that are manufactured within the local region

Resources:

LEED EB Credit Opportunities:

Purchasing – Facilities Management and Renovation

Solid Waste Management - Facilities Management and Renovation

COPT Equipment Efficiency Chart

Equipment	Capacity	SEER	EER	IPLV	Notes
Rooftop Packaged and Split System Air Conditioning Units	Less than 5.5 Tons	13	-	-	
	5.5 to 11 Tons	-	11	11.4	
	11 to 20 Tons	-	10.8	11.2	
	20 to 80 Tons	-	10	10.4	
	Greater than 80 Tons	-	9.2	9.4	
Water Source Heat Pumps	Less than 11.25 Tons		14		4.6 COP Heating
All Air Conditioning Equipment Shall Contain R410A or R407C Refrigerant					
Boilers-Gas Hot Water	-	-	-	-	80% Thermal Efficiency
Boilers-Gas Hot Steam	-	-	-	-	80% Thermal Efficiency
Boilers-Oil	-	-	-	-	83% Thermal Efficiency
Chillers		Full Load KW/Ton	IPLV KW/Ton		
Air Cooled w/ condenser	-	1.2	1		
Air Cooled w/o condenser	-	1.08	1.08		
Water Cooled	-	0.84	0.63		
Water Cooled Screw or Scroll	Less than 100 Tons	0.78	0.6		
	100 to 150 Tons	0.73	0.55		
	150 to 300 Tons	0.61	0.51		
	Greater than 300 Tons	0.6	0.49		
Water Cooled Centrifugal	Less than 150 Tons	0.61	0.62		
	150 to 300 Tons	0.59	0.56		
	300 to 600 Tons	0.57	0.51		
	Greater than 600 Tons	0.55	0.51		

Glossary of Terms & Resources

ASHRAE (American Society of Heating, refrigerating and Air-conditioning Engineers): a foundation that advances heating, ventilation, air conditioning and refrigeration to serve humanity and promote a sustainable world through research, standards writing, publishing and continuing education.

Black Water: wastewater from toilets & urinals.

CFCs (Chlorofluorocarbons): hydrocarbons that deplete the stratospheric ozone layer.

Contaminant: unwanted airborne constituent that reduces quality of air.

Construction IAQ Management plan: Specific construction processes that reduce air contamination in the building during construction phase & before tenant occupancy.

E-Benchmark (Advanced Buildings: Energy Benchmark for High Performance Buildings): a resource on the energy components of high performance buildings. The products offer a means to significantly exceed national codes and standards and represent best practices for energy efficiency in design, technologies, and practices for commercial buildings. They go beyond traditional guidelines by providing a roadmap for how to design and construct highly energy-efficient buildings and establish a standardized method of measuring performance.

Energy Star: a program that was first developed in 1992 by the US Environmental Protection Agency (EPA) as a method to identify and promote products that are energy efficient. Energy star rates products and buildings on their efficiency. Products identified as energy efficient can display the Energy Star label so that consumers can weigh a product's energy efficiency into their purchasing decisions. Buildings are monitored over a length of time with an interactive energy management tool that tracks and assesses the buildings energy and water consumption in a secure online environment.

Formaldehyde: naturally occurring VOC found in small amounts in animals & plants, but is carcinogenic and irritant to most people when present in high concentrations.

FSC (Forest Stewardship Council): organization that establishes & assures environmentally friendly forestry management. Certification is given to certain manufacturers that harvest wood from in an environmentally friendly manor and are monitored & evaluated each year for compliancy.

Graywater: untreated waste water that has not been in contact with toilet wastewater. This water is not potable, but in many cases can be reused for other applications, such as irrigation.

Green: (as it relates to the building world) is a widely used term to describe the design & construction of buildings with minimal negative impact to the environment. With emphasis on the conservation of natural resources, energy efficiency, & a healthy interiorenvironment

HCFCs Hydro chlorofluorocarbons): refrigerants that are used in many HVAC units that cause significantly less depletion of stratospheric ozone layer compared to CFCs.

Indoor Air Quality: the composition of air inside a space that affects the health and wellbeing of the occupants

LEED (The Leadership in Energy and Environmental Design): Green Building Rating System™ encourages and accelerates global adoption of sustainable green building and development practices through the creation and implementation of universally understood and accepted tools and performance criteria. LEED is a third-party certification program and the nationally accepted benchmark for the design, construction and operation of high performance green buildings. First launched in August 1998

Potable Water: water that meets drinking water quality standards & is approved for human consumption and is supplied from wells or municipal water systems.

Renewable Energy: energy that is from resources that naturally replenish on an ongoing basis. Such as sunlight, wind, waves, rain, geothermal heat...

Sustainable: (as it relates to the building world) is a concept that new development must meet the needs of the present without compromising those of the future. Often measured in three independent dimensions Environment, Economics & Society (aka Triple Bottomline)

Urea Formaldehyde: combination of urea and formaldehyde that is used in some glues and emits (off-gasses) formaldehyde at room temperature.

USGBC (United States Green Building Council): is a 501(c)(3) nonprofit organization that certifies sustainable businesses, homes, hospitals, schools, and neighborhoods. USGBC is dedicated to expanding green building practices and education, and its LEED® Rating System.

VOC (Volatile Organic Compounds): Carbon compounds that interact in atmospheric photochemical reactions to the air which can be odorous, potentially irritating and/or harmful to the wellbeing of the occupants.

Consultant Resources Used by COPT & Contact Information:

Flooring: (Interfinish Flooring) 410.379.2400

HVAC or Plumbing: Brad Boutleer (TAI Engineering) 410.356.3108 x248

Electrical and Lighting: Matt Steiner (TAI Engineering) 410.356.3108 x229

Plumbing: Don Henzi (Fidelity Engineers) 410.771.9400

Energy Performance: Paul Tseng (Advanced Building Performance)

Elevator Renovation: Cab Craft

High Performance Irrigation: Paul Bassett (Hydro Logix)

VOC Emitting threshold for paints, stains & coatings

Green Seal Standards (GS-11)

Paint	VOC Limit [g/L less water]	Paint Type	VOC Limit [g/L less water]
Non-flat	150	Gloss	250
Flat	50	Semi-gloss	250
		Flat	250

Applications	VOC Limit [g/L less water]	Applications	VOC Limit [g/L less water]
Bond Breakers	350	Multi-color coatings	250
Clear wood finishes		Pre-treatment was primers	420
Varnish	350		
Sanding Sealers	350		
Lacquer	550		
Clear Brush Lacquers	680	Primers, Sealers & undercoats	200
Concrete-curing Compounds	350	Quick-dry enamels	250
Dry-fog coating	400	Quick dry primers, sealers &	200
Fire-proofing Exterior Coatings	350	Recycled Coatings	250
Fire-retardant		Rust Preventative Coatings	250
Coatings Clear	650		
Pigmented	350		
Drywall & Panel Adhesives	50	Shellac-Clear	400
Floor Coatings	100	Shellac-Pigment	550
Graphic Arts (sign) Coatings	500	Top & Trim Adhesive	250
Industrial Maintenance (IM)	250	Specialty Primers	350
High Temp. (IM) coating	420		
Zinc-rich IM Primers	420, 340, 100		
Japans/faux finish coatings	350	Stains	250
Magnesium Cement Coatings	450	Water Proofing Sealers	250
Mastic Coatings	300	Water-Proof Concrete / Masonry Sealers	400
Metallic Pigment Coatings	500	Wood Preservatives	350

VOC Emitting threshold for sealants & adhesives

South Coast Air Quality Management District Rule #1168 (SCAQMD #1168)

Architectural Applications	VOC Limit [g/L less water]	Specialty Applications	VOC Limit [g/L less water]
Indoor Carpet Adhesives	50	PVC Welding	510
Carpet Pad Adhesives	50	CPVC Welding	490
Wood Flooring Adhesives	100	ABS Welding	325
Rubber Floor Adhesives	60	Plastic Cement Welding	250
Subfloor Adhesives	50	Adhesive Primer for Plastic	550
Ceramic Tile Adhesives	65	Contact Adhesive	80
VCT & Asphalt Adhesives	50	Special Purpose Contact Adhesive	250
Drywall & Panel Adhesives	50	Structural Wood Member Adhesive	140
Cove Base Adhesives	50	Sheet Applied Rubber Lining Operations	850
Multipurpose Construction Adhesives	70	Top & Trim Adhesive	250
Structural Glazing Adhesives	100		
Substrate Specific Applications	VOC Limit [g/L less water]	Sealants	VOC Limit [g/L less water]
Metal to Metal	30	Architectural	250
Plastic Foams	50	Non-membrane Roof	300
Porous Material (except wood)	50	Roadway	250
Wood	30	Single-Ply Roof Membrane	450
Fiberglass	80	Other	420
Sealant Primers	VOC Limit [g/L less water]		
Architectural Non Porous	250		
Architectural Porous	775		
Other	750		
Aerosol Adhesives		VOC Weight [g/L minus water]	
General purpose mist spray		65% VOCs by weight	
General purpose web spray		55% VOCs by weight	
Special purpose aerosol adhesives (all types)		70% VOCs by weight	

Fixture Performance Charts

At a minimum provide fixtures that comply with the most stringent requirements of the latest version of the uniform plumbing code adopted by the AHJ or as noted below:

Fixture	Baseline [GPF=Gallons/flush] [GPM=Gallons/minute]
Water Closets	1.6 GPF
Urinals	1.0 GPF
Lavatory	2.2 GPM
Shower Heads	2.5 GPM
Kitchen Sink	2.5 GPM
Replacement Aerators	2.2 GPM

For higher water conservation measures, provide fixtures that comply with LEED standards:

Fixture	Reduction [GPF=Gallons/flush] [GPM=Gallons/minute]
Low-Flow Water Closets	1.1 GPF
Ultra Low-Flow Water Closet	.8 GPF
Low-flow Urinals	0.5 GPF
Low-Flow Lavatory	1.8 GPM
Ultra Low-flow Lavatory	0.5 GPM
Low-Flow Kitchen Sink	1.8 GPM
Low-Flow Shower Heads	1.8 GPM