CONCESSIONS & TENANTS
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INTRODUCTION

Airport concessions and tenants are businesses that have selected the airport as the location for their business. They have signed a lease and utilize airport infrastructure and services. They are an integral part of any airport’s day-to-day functions, and therefore inherently part of the overall service any airport provides to both the travelling and neighboring public.

Airport concessions provide an important passenger service amenity while providing significant financial benefits to the airport. Concessions include news and gifts, specialty retail stores, food and beverage, duty-free shops and many other services. Passengers arrive early for a departing flight or they have time before their connecting flight to shop, grab a bite to eat, or relax in the spa. Many airports have become shopping destinations with retail and food options typical of a shopping mall.

Airport tenants include a wide range of organizations and services, ranging from advertising, car rental, hotel, airlines, government agencies, organizations providing aircraft and aviation services, organizations handling cargo and mail, aircraft owners and fixed-base operators and often non-aviation businesses as well.

The Sustainable Airport Manual (SAM) Green Airplane Rating System for Concessions & Tenants is designed to certify the sustainability of concession and tenant activities, including daily operations as well as design and construction of new facilities within the terminals. SAM v3.2 has been modified to include the initiatives by the Chicago Department of Aviation’s Green Concessions Policy which was adopted on March 28, 2013.

This chapter is divided into two types of activities:

**Design & Construction** - Pertains to the build-out or interior renovations within the terminals or existing buildings

**Operations & Maintenance** - Pertains to all tenants with customer/passenger interaction

Due to the variation in the types of tenants, general tenant types have been defined based on their location and general nature of service. These are defined as:

**Design & Construction**

- **Terminal Food Service Tenants**: Concessionaires and tenants located within the terminal or other existing conditioned spaces that provide food services for a majority of their operations to passengers or customers. Examples include but are not limited to restaurants, taverns, snack shops, coffee shops, and bakeries.

- **Terminal Non-Food Service Tenants**: Concessionaires and tenants located within the terminal or other existing conditioned space that do not provide food services for a majority of their operations to passengers or customers. Examples include but are not limited to book stores, gift shops, newspaper stands, and other retail merchandise venues. **Note that this may also include non-tenant renovations within the terminals undertaken by the airport owner – not necessarily a tenant of the owner.**
• **Non-Terminal Tenants**: Concessionaires and tenants that are not located in a terminal or passenger facility but within an existing building or other conditioned space. Examples include but are not limited to airline offices, FBO tenants, cargo/freight operations, or other commercial or retail entities.

**Operations & Maintenance**

*Food Service Tenant*: Concessionaires and tenants located within the terminal or other existing conditioned spaces that provide food services for a majority of their operations to passengers or customers. Examples include but are not limited to restaurants, taverns, snack shops, coffee shops, and bakeries.

• **Full Service**: Tenants that have table service (i.e. a restaurant with a wait staff) and have some measure of control over the consumables and waste generated by the customers within their space.

• **Counter Service**: Tenants that provide mainly carry-out service by means of a counter. While tables may be present within/near the space, the tenant does not provide service via wait staff.

• **To-Go, Kiosk**: Tenants that sell food products from a free standing location, such as a kiosk. All products are prepared off-site and sold pre-packaged.

*Non-Food Service Tenant*: Concessionaires and tenants located within the terminal or other existing conditioned spaces that do not provide food services for a majority of their operations to passengers or customers. Examples include but are not limited to book stores, gift shops, newspaper stands, and other retail merchandise venues.

• **Buildout**: Tenants that sell products within a space where the tenant has control over layouts, configuration, lighting, etc.

• **Free-Standing, Kiosk**: Tenants that sell products in a free-standing area within the terminal corridors.

*Non-Terminal Tenants*: Tenants located outside of the terminal in existing conditioned spaces or buildings that service passengers or customers. Examples include rental car facilities not located in the terminal, fixed base operators, commercial developments, gas stations, and hotels.

• **Food Service Tenant**: Tenants offering food service in a location outside of the terminals.

• **Non-Food Service Tenant**: Tenants offering a non-food service or retail in a location outside of the terminals.

**APPLICABILITY**

SAM Concessions & Tenants (CT) focuses on the evaluation of all airport tenants who have direct customer interaction. Tenants who do not have direct customer interaction should refer to
the Operations & Maintenance (OM) chapter of the SAM. Some tenants may have operations that include both non-customer interaction and direct customer interaction. An airline, for example, has both types of operations and would be evaluated under both chapters; the terminal activities (with direct customer interaction) would be reviewed following this CT chapter, while the OM chapter would be applied where no direct customer interaction occurs, such as activities at aircraft gates and maintenance hangars.

Given the nature of the construction activities that may go on inside terminal spaces or other existing airport facilities, all tenant build-out projects and minor interior rehabilitation not involving exterior work, regardless of owner, would fall under the CT Design & Construction section. As an example, a Chicago Department of Aviation (CDA) food court renovation would be rated under the CT chapter because it is an interior-focused project. In the case where a tenant is building a new, stand-alone facility, e.g. a car rental facility that is not within an existing airport building or terminal, then the tenant should use the Design & Construction (DC) chapter of the SAM. A tenant build-out involving an existing building where the core and shell are reused but the interior requires a major interior rehabilitation including HVAC and envelope modifications and includes exterior civil work would also fall under the Design & Construction (DC) chapter.

**NOTE:**

For design & construction activities, the determining factor on whether the Design & Construction (DC) chapter or the Concessions & Tenants – Design & Construction (CT-DC) chapter applies is if the work is primarily interior or exterior. Use the DC chapter for exterior work; use the CT-DC chapter for interior work, irrespective of the whether it is a tenant or owner-driven project.

For operations & maintenance activities the entity being reviewed must have direct customer/passenger interaction to be evaluated under the Concessions & Tenants – Operations & Maintenance (CT-OM) chapter. Tenants who do not have direct interaction should refer to the Operations & Maintenance (OM) chapter.

**CONCESSIONS & TENANTS SECTIONS**

This chapter is divided into two sections: the CT-Design & Construction (CT-DC) section and the CT- Operations & Maintenance (CT-OM) section. The CT-Design & Construction section only pertains to the build-out or interior renovations within the terminals or existing buildings. Any construction or major exterior renovations of non-terminal tenant spaces would follow the guidelines of the SAM Design & Construction (DC) chapter. The CT-Operations & Maintenance section pertains to all tenants with customer/passenger interaction.

Tenants are rated on the achievement of credits depending on the appropriate category of the initiative/effort, based on sustainable elements included in the project from the following categories:
CT – Design & Construction

1.0 Sustainable Sites
2.0 Water Efficiency
3.0 Energy & Atmosphere
4.0 Materials & Resources
5.0 Indoor Environmental Quality
6.0 Construction Practices
7.0 Innovation for Concessions and Tenants in Design/Construction

CT – Operations & Maintenance

8.0 Company Policy
9.0 Responsible Procurement
10.0 Green Interiors
11.0 Water Management
12.0 Energy Management
13.0 Waste Stream Management
14.0 Venue Specific Considerations
15.0 Innovation for Concessions & Tenants in Operations & Maintenance
16.0 Monitoring & Reporting

Each category contains a specific number of credits, against which each tenant or tenant project is evaluated in order to determine the total number points earned. A list of the applicable credits is summarized in Appendix CT-A – Sustainable Airport Manual Green Airplane Rating System – Concessions & Tenants.

PROCESS

Within the Manual’s main body, each sustainable credit has five subsections: Intent, Requirements, Submittals, Technology/Strategy, and Case Studies, as described below:

- **Intent:** The primary motivations for any sustainable practice.

- **Requirements:** Specifies institutional, operational, and mechanical design or construction elements that satisfy the intent. The prerequisites must be achieved; the credits are optional, but contribute to the overall rating.

- **Submittals:** Required and supporting documentation and/or information required to achieve applicable prerequisites or credits. This documentation may include calculations, data, short narratives, policies, documents or references to specification sections or design drawings indicating how the requirements are being met.

- **Technology/Strategy:** Highlights specific ways of meeting the recommendations within the scope for each specific credit. Case studies where available, are presented to help guide the application of sustainable credits to Concession & Tenants projects and
efforts. While the tenant may undertake the above Technologies/Strategies at other airports, for the purposes of this credit activities only apply to operations at CDA Airports. To aid with consideration of applicable strategies and technologies, they are organized into the following three categories; “Standard Practice,” “Recommended Practice,” and “Best Available Practice.”

- **Standard Practice**: These are requirements that may be due to standards, specifications, codes, general best management or construction practices. They are practices already in place, and SAM prerequisites, which also serve to meet sustainable goals.

- **Recommended Practice**: These include recommendations that are expected to have insignificant impacts to cost and are therefore, encouraged to be incorporated.

- **Best Available Practice**: These are strategies and practices that are expected to enhance the sustainability efforts of the Chicago Department of Aviation (CDA), but are anticipated to potentially have an impact on the cost and/or schedule. Tenants are encouraged to explore the cost/environmental benefit ratio for such guidelines to the greatest extent practicable.

- **Case Study**: Examples of credit intent “in action” at airports and/or other industry facilities.

While not all strategies will be applicable, concessionaires and tenants are highly encouraged to think creatively and to consider the intent of each issue throughout the decision process.

**SUBMITTALS**

**Sustainable Airport Manual (SAM) Checklists**

Incorporation of sustainable elements into Terminal Tenant’s design and construction are tracked using the SAM **CT-Design & Construction Checklist.** Incorporation of sustainable initiatives and practice into Tenants daily operations are tracked using the SAM **CT- Operations & Maintenance Checklist.** The checklists are provided in **Appendix CT-B – Concessions & Tenants Checklist.**

In order to achieve points, certain requirements need to be met, as outlined in each credit. In some instances, studies and calculations would be appropriate. In other instances, this will be accomplished through product and material data or through referenced standards or specifications.

In addition to review of the checklist, the Sustainable Review Panel (SRP) will review any supporting documentation including calculations, specifications, and contractor’s submittals as needed to support the achievement of the credit(s). See Section titled **Implementation and Review Process** for detailed information about the SRP.
NOTE:

When submitting electronic files, include the name of the project and CDA project number (if applicable) in the file name for ease of processing, at a minimum. Submittal dates, milestones, and/or contractor names may also be included in file names. Submitting a filename such as “SAM Checklist” is not acceptable. An example file name could be:

SAM Checklist_CT-DC_JDesignInc_TH0000.14_T3 Retail Renovation_100%_20141102.xls

SAM Checklist_[SAM Chapter]_[Contractor]_[Project Number]_[Project Name]_[Milestone]_[Submittal Date]

SAM GREEN AIRPLANE RATING SYSTEM

CONCESSIONS & TENANTS – DESIGN & CONSTRUCTION

The SAM Green Airplane Rating System for CT – Design & Construction uses a five tier approach to rating a tenant similar to the Design & Construction rating system. “Green Airplane Certification” symbols are used to designate achievement levels. The levels are:

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<thead>
<tr>
<th>CT-DC GREEN AIRPLANE RATING SYSTEM</th>
</tr>
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<tbody>
<tr>
<td><strong>No. of Green Airplanes</strong></td>
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<tr>
<td>Prerequisites</td>
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</tr>
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</table>

NOTE:

When submitting electronic files, include the name of the project and CDA project number (if applicable) in the file name for ease of processing, at a minimum. Submittal dates, milestones, and/or contractor names may also be included in file names. Submitting a filename such as “SAM Checklist” is not acceptable. An example file name could be:

SAM Checklist_CT-DC_JDesignInc_TH0000.14_T3 Retail Renovation_100%_20141102.xls

SAM Checklist_[SAM Chapter]_[Contractor]_[Project Number]_[Project Name]_[Milestone]_[Submittal Date]
CONCESSIONS & TENANTS – OPERATIONS & MAINTENANCE

The SAM Green Airplane Rating System for CT –Operations & Maintenance uses a three tier approach to rating a tenant. “Green Airplane Certification” levels are used to designate achievements. The levels are:

**Achiever:** Tenant has completed the SAM review process and, at a minimum, accomplished all SAM Prerequisites.

**Leader:** Tenant has gone beyond the minimum expectations of the SAM Prerequisites and demonstrated a commitment to sustainable initiatives.

**Mentor:** Tenant has achieved the highest level of green airplane certification and meets several CDA requirements above and beyond the prerequisite credits. Tenant is a resource and a good example to other tenants and regularly promotes, advocates and improves upon their sustainability achievements.

In order to achieve SAM Mentor Certification, Food Service Tenants must also obtain the following eight (8) SAM Credits, where applicable:

1) SAM Credit AP.3 – Corporate Sustainability Policy
2) SAM Credit 8.2 – Establish and Implement Employee Sustainability Training Program
3) SAM Credit 9.4.2.1 – Consumer Disposable Products: Bio-based Content
4) SAM Credit 9.4.4.1 – Consumer Disposable Products: Post-Consumer Recycled Paper
5) SAM Credit 9.5.1 – Local/Regional Food Sources, 25% within 250 miles
6) SAM Credit 9.6.1 – Sustainable Food and Consumer Products, 20%
7) SAM Credit 13.4 – Waste Stream Audit
8) SAM Credit 13.7 – Storage and Collection of Recyclables

<table>
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<tr>
<th>Certification Level</th>
<th>Points Required to Achieve Rating</th>
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<tbody>
<tr>
<td></td>
<td>Terminal Tenants</td>
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<tr>
<td></td>
<td>Food Service Tenant</td>
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<tr>
<td></td>
<td>Full Service</td>
</tr>
<tr>
<td>Prerequisites</td>
<td>12</td>
</tr>
<tr>
<td>Achiever</td>
<td>5-43</td>
</tr>
<tr>
<td>Leader</td>
<td>44-69</td>
</tr>
<tr>
<td>Mentor*</td>
<td>70-88</td>
</tr>
</tbody>
</table>

*In addition to the points above, tenants must also meet the following credits, where applicable, to achieve a Mentor rating: AP.3, 8.2, 9.4.2.1, 9.4.4.1, 9.5.1 (Food Service only), 9.6.1 (Food Service only), 13.4, and 13.7.
IMPLEMENTATION AND REVIEW PROCESS

The SAM and its supporting documentation are administered by the Sustainable Review Panel (SRP), which currently consists of representatives from: the CDA Management Staff, CDA Concession & Tenant Staff and Representatives, and Airport Planners actively involved in CDA projects. The composition of the SRP is intended to be dynamic depending on needs.

The SRP is responsible for the submittals with respect to sustainability and provides technical support. CT Design & Construction reviews will take place as needed while performance reviews using CT Operations & Maintenance can take place routinely, such as annually or on the anniversary of the tenant’s lease agreement. The SRP is responsible for the review and awarding of “Green Airplane Certifications” based on the extent of incorporation of sustainable practices as outlined in this Manual and as documented on the submitted SAM Checklist(s).

In addition, the SRP is responsible for presentations and training to tenants with respect to the application of this Manual. The primary tasks of the SRP are to oversee the application of the Manual and review submittals for their compliance with the Manual.

For any and all sustainability-related questions and/or submittals, please use the following email address to submit forms electronically (preferred method): SAMdocs@cityofchicago.org
airportsgoinggreen.org

For comments, case studies, lessons-learned, new technologies or for any and all project submittal forms, please email:

SAMdocs@cityofchicago.org
Chicago Department of Aviation

SUSTAINABLE AIRPORT MANUAL

CONCESSIONS & TENANTS

DESIGN & CONSTRUCTION SECTION

NOTE:
Please refer to page CT-5 for introduction and applicability of this section.
1.0 SUSTAINABLE SITES

1.1 Prerequisite 1 – Adopt CDA Best Management Practices

Required

INTENT

Minimize the environmental impacts of facility operations.

REQUIREMENTS


Depending on the project, the owner, tenant, or ultimate occupant must incorporate the CDA BMP Manual into their tenant or lease agreement.

SUBMITTALS

Include confirmation that all applicable BMPs are followed. Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

The BMP Manual defines the practices and measures used to reduce or eliminate the amount of pollution to the environment surrounding Chicago O’Hare and Midway International Airports. The BMPs are typically in the form of a procedure, activity, or structural control.

Standard Practice

- The BMP Manual has been in effect since August 2002. There are a number of practices already implemented at Chicago O’Hare and Midway via this manual. Many of these practices deal with pollution prevention for all airport entities.

Recommended Practice

None

Best Available Practice

None
1.0 SUSTAINABLE SITES

1.2 Light Pollution Reduction

1 Point

INTENT

Minimize light trespass from the tenant space, reduce sky-glow to increase night sky access, improve nighttime visibility through glare reduction, and reduce development impact on nocturnal environments.

REQUIREMENTS

FOR INTERIOR LIGHTING

The angle of maximum candela from each interior luminaire as located in the space shall intersect opaque building interior surfaces and not exit out through the windows.

OR

All non-emergency interior lighting shall be automatically controlled to turn off during non-business hours. Provide manual override capability for after-hours use.

SUBMITTALS

Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

Adopt site lighting criteria to maintain safe light levels while avoiding off-site lighting and night sky pollution.

Standard Practice

- Install and utilize motion sensor lighting controls to turn off lighting during non-business hours or when space is not occupied and in use

Recommended Practice

- Minimize lighting where possible and model the lighting using a computer model
- Evaluate smart-lighting control systems and LED light technologies
2.0 Water Efficiency

2.1 Prerequisite 1 – Water Use Reduction

Required

INTENT

Increase water efficiency within tenant spaces to reduce the burden on municipal water supply and wastewater systems.

REQUIREMENTS

Employ strategies that in aggregate use 20% less water than the water use baseline calculated for the space. The baseline shall meet the requirements of the Energy Policy Act (EPAct) of 1992 and subsequent rulings by the Department of Energy, requirements of the Energy Policy Act of 2005, and the plumbing code requirements as stated in the 2006 editions of the Uniform Plumbing Code or International Plumbing Code as to fixture performance. Calculations are based on estimated occupant usage and may include the following fixtures and fixture fittings (as applicable to the tenant space): water closets, urinals, lavatory faucets, showers, kitchen sink faucets and pre-rinse spray valves.

<table>
<thead>
<tr>
<th>Commercial Fixtures and Fittings</th>
<th>Minimum Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial Toilets</td>
<td>1.28 gallons per flush (gpf)*</td>
</tr>
<tr>
<td></td>
<td>Except blow-out fixtures: 3.5 gpf</td>
</tr>
<tr>
<td></td>
<td>1.6/1.1 gpf – Dual Flush</td>
</tr>
<tr>
<td>Commercial Urinals</td>
<td>0.8 gpf</td>
</tr>
<tr>
<td>Commercial Lavatory (restroom) Faucets</td>
<td>1.8 gallons per minute gpm at 60 pounds per square inch (psi), private applications only (hotel or motel guest rooms, hospital patient rooms)</td>
</tr>
<tr>
<td></td>
<td>0.5 gpm at 60 psi** all others except private applications</td>
</tr>
<tr>
<td></td>
<td>0.25 gallons per cycle for metering faucets</td>
</tr>
<tr>
<td>Commercial Pre-Rinse Spray Valves (for food service applications)</td>
<td>Flow rate ≤ 1.6 gpm (no pressure specified; no performance requirement)</td>
</tr>
<tr>
<td>Commercial Clothes Washing—less than 80lbs</td>
<td>9 gallon/CF/cycle</td>
</tr>
<tr>
<td>Commercial Dishwashers</td>
<td></td>
</tr>
<tr>
<td>Undercounter – high temp</td>
<td>1.98 gallon/rack</td>
</tr>
<tr>
<td>Undercounter – low temp</td>
<td>1.95 gallon/rack</td>
</tr>
<tr>
<td>Door type – high temp</td>
<td>1.44 gallon/rack</td>
</tr>
<tr>
<td>Door type – low temp</td>
<td>1.85 gallon/rack</td>
</tr>
<tr>
<td>Single tank rack conveyor – high temp</td>
<td>1.13 gallon/rack</td>
</tr>
<tr>
<td>Single tank rack conveyor – low temp</td>
<td>1.23 gallon/rack</td>
</tr>
<tr>
<td>Multi-tank rack conveyor – high temp</td>
<td>1.1 gallon/rack</td>
</tr>
<tr>
<td>Multi-tank rack conveyor – low temp</td>
<td>0.99 gallon/rack</td>
</tr>
<tr>
<td>Commercial Fixtures and Fittings</td>
<td>Minimum Requirement</td>
</tr>
<tr>
<td>-------------------------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Flight type</td>
<td>180 gallon/hour</td>
</tr>
<tr>
<td>Commercial Ice Machines</td>
<td></td>
</tr>
<tr>
<td>ice machine (ice making head) IMH H &lt;450 lb/day</td>
<td>&lt;25 gal/100 lb ice</td>
</tr>
<tr>
<td>ice machine (ice making head) IMH H&gt;450 lb/day</td>
<td>&lt;25 gal/100 lb ice</td>
</tr>
<tr>
<td>ice machine (w/o remote compressor) H&lt;1000 lb/day</td>
<td>&lt;25 gal/100 lb ice</td>
</tr>
<tr>
<td>ice machine (w/o remote compressor) H&gt;1000 lb/day</td>
<td>&lt;25 gal/100 lb ice</td>
</tr>
<tr>
<td>ice machine (w/o remote compressor) H&gt;934 lb/day</td>
<td>&lt;25 gal/100 lb ice</td>
</tr>
<tr>
<td>ice machine self contained unit</td>
<td>&lt;35 gal/100 lb ice</td>
</tr>
<tr>
<td>ice machine water cooled</td>
<td>MUST BE ON CHILLED LOOP</td>
</tr>
<tr>
<td>Ice machines once through water cooled</td>
<td>BANNED</td>
</tr>
<tr>
<td>Food Steamers</td>
<td></td>
</tr>
<tr>
<td>Steam cooker – batch cooking</td>
<td>815 gallon/hour/plan</td>
</tr>
<tr>
<td>Steam cooker – high production/cook to order</td>
<td>84 gallon/hour/plan</td>
</tr>
<tr>
<td>Combination Oven</td>
<td></td>
</tr>
<tr>
<td>Countertop or stand mounted</td>
<td>40 gph</td>
</tr>
<tr>
<td>Roll-in</td>
<td>60 gph</td>
</tr>
<tr>
<td>Other Equipment</td>
<td>Performance baseline based on industry standards</td>
</tr>
</tbody>
</table>

*Based on 15 inch fryer

**AV = adjusted volume = (1.63 x freezer volume) + refrigerator volume

SUBMITTALS

Include descriptive narrative and calculations in the SAM Checklist.

TECHNOLOGY/STRATEGY

WaterSense™-certified fixtures and fixture fittings should be used where available. Use high-efficiency fixtures (water closets and urinals) and dry fixtures such as composting toilet systems to reduce the potable water demand. Consider the use of alternate on-site sources of water, (e.g., rainwater, stormwater, or air conditioner condensate), and graywater for non-potable applications (e.g., toilet and urinal flushing), as approved by the manufacturer, and for custodial uses.

Special consideration should be used to distinguish applicability of these technologies in high-volume passenger terminal areas versus office facilities, especially with respect to maintenance.
Standard Practice


Recommended Practice

- Must exceed CBC (EPAct 1992) by 20% to meet prerequisite
- Use high-efficiency fixtures and valves, automatic flush sensors, aerators on faucets and dual-flush toilets
- Use local generation of domestic hot water, as much as possible, to eliminate long piping runs associated with recirculation piping. Unless connecting to an existing hot water recirculating system.
- Domestic hot water for general plumbing fixtures should be designed for a temperature of 140°F maximum, but not less than 120°F

Best Available Practice

- Install dry fixtures such as composting toilets and waterless urinals to reduce wastewater volumes
- Use instantaneous hot water heating systems (i.e., tankless, on-demand hot water heating)
- Use zoned or sub-metering to measure and audit water consumption rates at points of use
2.0 Water Efficiency

2.2 Water Use - Additional Reduction

2 to 6 Points

INTENT

Further increase water efficiency within tenant space to reduce the burden on municipal water supply and wastewater systems.

REQUIREMENTS

Employ strategies that in aggregate use less water than the water use baseline calculated for the tenant space.

The minimum water savings percentage for each point threshold is as follows:

<table>
<thead>
<tr>
<th>SAM Credit</th>
<th>Water Reduction</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2.1</td>
<td>30%</td>
<td>2</td>
</tr>
<tr>
<td>2.2.2</td>
<td>35%</td>
<td>4</td>
</tr>
<tr>
<td>2.2.3</td>
<td>40%</td>
<td>6</td>
</tr>
</tbody>
</table>

Calculate the baseline according to the commercial baselines outlined below. Calculations are based on estimated occupant usage and must include only the following fixtures and fixture fittings (as applicable to the project scope): water closets, urinals, lavatory faucets, showers, kitchen sink faucets and pre-rinse spray valves.

<table>
<thead>
<tr>
<th>Commercial Fixtures and Fittings</th>
<th>Current Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial Toilets</td>
<td>1.6 gallons per flush (gpf)* Except blow-out fixtures: 3.5 (gpf)</td>
</tr>
<tr>
<td>Commercial Urinals</td>
<td>1.0 (gpf)</td>
</tr>
<tr>
<td>Commercial Lavatory (restroom)</td>
<td>2.2 gallons per minute (gpm) at 60 pounds per square inch (psi), private applications only (hotel or motel guest rooms, hospital patient rooms) 0.5 (gpm) at 60 (psi)** all others except private applications 0.25 gallons per cycle for metering faucets</td>
</tr>
</tbody>
</table>

1 Tables adapted from information developed and summarized by the U.S. Environmental Protection Agency (EPA) Office of Water based on requirements of the Energy Policy Act (EPAct) of 1992 and subsequent rulings by the Department of Energy, requirements of the EPAct of 2005, and the plumbing code requirements as stated in the 2006 editions of the Uniform Plumbing Code or International Plumbing Code pertaining to fixture performance.
<table>
<thead>
<tr>
<th>Commercial Fixtures and Fittings</th>
<th>Current Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial Pre-Rinse Spray Valves (for food service applications)</td>
<td>Flow rate ≤ 1.6 (gpm) (no pressure specified; no performance requirement)</td>
</tr>
<tr>
<td>Commercial Clothes Washing–less than 80lbs</td>
<td>9 gallon/CF/cycle</td>
</tr>
<tr>
<td>Commercial Dishwashers</td>
<td></td>
</tr>
<tr>
<td>Undercounter – high temp</td>
<td>1.98 gallon/rack</td>
</tr>
<tr>
<td>Undercounter – low temp</td>
<td>1.95 gallon/rack</td>
</tr>
<tr>
<td>Door type – high temp</td>
<td>1.44 gallon/rack</td>
</tr>
<tr>
<td>Door type – low temp</td>
<td>1.85 gallon/rack</td>
</tr>
<tr>
<td>Single tank rack conveyor – high temp</td>
<td>1.13 gallon/rack</td>
</tr>
<tr>
<td>Single tank rack conveyor – low temp</td>
<td>1.23 gallon/rack</td>
</tr>
<tr>
<td>Multi-tank rack conveyor – high temp</td>
<td>1.1 gallon/rack</td>
</tr>
<tr>
<td>Multi-tank rack conveyor – low temp</td>
<td>0.99 gallon/rack</td>
</tr>
<tr>
<td>Flight type</td>
<td>180 gallon/hour</td>
</tr>
<tr>
<td>Commercial Ice Machines</td>
<td></td>
</tr>
<tr>
<td>ice machine (ice making head) IMH H &lt;450 lb/day</td>
<td>&lt;25 gal/100 lb ice</td>
</tr>
<tr>
<td>ice machine (ice making head) IMH H&gt;450lb/day</td>
<td>&lt;25 gal/100 lb ice</td>
</tr>
<tr>
<td>ice machine (w/o remote compressor) H&lt; 1000lb/day</td>
<td>&lt;25 gal/100 lb ice</td>
</tr>
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<td>Countertop or stand mounted</td>
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<td>Other Equipment</td>
<td>Performance baseline based on industry standards</td>
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</tbody>
</table>

*Based on 15 inch fryer
**AV = adjusted volume = (1.63 x freezer volume) + refrigerator volume
SUBMITTALS

Include descriptive narrative and calculations in the SAM Checklist.

TECHNOLOGY/STRATEGY

For many retail applications, process water (water use related to the product of service provided) far outweighs water used for toilets, sinks and showers. Process water also includes water used in cooling systems or any other equipment not directly related to the Energy Policy Act of 1992 (e.g. faucets, toilets, urinals, and showerheads). In addition to specifying water-efficient fixtures and appliances, consider alternative sources of water for non-potable applications such as toilet and urinal flushing, mechanical systems, cleaning, vehicle washing and other applications that do not require potable water.

WaterSense™-certified fixtures and fixture fittings should be used where available. Use high-efficiency fixtures (water dispensers, water closets and urinals) and dry fixtures such as composting toilet systems to reduce the potable water demand. Consider the use of alternate on-site sources of water, such as rainwater, stormwater, or air conditioner condensate, and graywater for non-potable applications such as toilet and urinal flushing, as approved by the manufacturer, and custodial uses.

Standard Practice

None

Recommended Practice

- Use high-efficiency fixtures and valves, such as automatic sensors, aerators on lavatories and dual-flush toilets

Best Available Practice

- Dry fixtures such as composting toilets and waterless urinals to reduce wastewater volumes
3.0 ENERGY & ATMOSPHERE

3.1 Prerequisite 1 – Fundamental Systems Commissioning

Required

INTENT

Verify that the project’s energy related systems are installed, calibrated and perform according to the owner’s project requirements, basis of design, and construction documents.

REQUIREMENTS

- The following commissioning process activities shall be completed by the commissioning team. Designate an individual as the Commissioning Authority (CxA) to lead, review and oversee the completion of the commissioning process activities.
  - The CxA shall have documented commissioning authority experience in at least two building projects.
  - The individual serving as the CxA shall be independent of the project’s design and construction management, though they may be employees of the firms providing those services. The CxA may be a qualified employee or consultant of the Owner.
  - The CxA shall report results, findings and recommendations directly to the Owner.
  - For projects smaller than 50,000 gross square feet, the CxA may include qualified persons on the design or construction teams who have the required experience.

- The Owner shall document the Owner’s Project Requirements (OPR). The design team shall develop the Basis of Design (BOD). The CxA shall review these documents for clarity and completeness. The Owner and design team shall be responsible for updates to their respective documents.

- Develop and incorporate commissioning requirements into the construction documents.

- Develop and implement a commissioning plan.

- Verify the installation and performance of the systems to be commissioned.

- Complete a summary commissioning report.

COMMISSIONED SYSTEMS

Commissioning process activities shall be completed for the following energy-related systems, at a minimum:
- Heating, ventilating, air conditioning and refrigeration (HVAC&R) systems (mechanical and passive) and associated controls
- Lighting and daylighting controls
- Domestic hot water systems
- Renewable energy systems (wind, solar etc.)

**SUBMITTALS**

Include descriptive narrative in the SAM Checklist.

**TECHNOLOGY/STRATEGY**

Engage a CxA as early as possible in the design process. Determine the owner's project requirements, develop and maintain a commissioning plan for use during design and construction and incorporate commissioning requirements in bid documents. Assemble the commissioning team, and prior to occupancy verify the performance of energy consuming systems. Complete the commissioning reports with recommendations prior to accepting the commissioned systems. Owners are encouraged to seek out qualified individuals to lead the commissioning process. Qualified individuals are identified as those who possess a high level of experience in the following areas:

- Energy systems design, installation and operation
- Commissioning planning and process management
- Hands-on field experience with energy systems performance, interaction, start-up, balancing, testing, troubleshooting, operation, and maintenance procedures
- Energy systems automation control knowledge

Although the commissioning process should start as early in the design process as possible, it is allowable to engage a CxA agent to execute fundamental commissioning after construction has begun.

**Standard Practice**

- Commissioning Agents are typically engaged to conduct fundamental commissioning

**Recommended Practice**

- Review the design intent and the basis of design documentation
- Incorporate commissioning requirements into the construction documents
- Develop and utilize a commissioning plan
- Verify installation, functional performance, training, operations and maintenance documentation
- Complete a commissioning report
- Provide the owner with a single manual that contains the information required for re-commissioning systems
- Engage a commissioning team that does not include individuals directly responsible for project design or construction management to evaluate both space and site systems as part of the commissioning plan.

- **Priority Systems** - high energy consuming systems.
  - All HVAC system equipment
  - Lighting controls and sensors
  - Lighting
  - Refrigeration systems
  - Information Technology Systems - IT (included in process loads: to promote energy savings, use the exceptional calculation method described in ANSI/ASHRAE/IESNA 90.1-2010 G2.5)

- **Lower Priority Systems** – low energy consuming system.
  - Emergency Power Generators and Automatic Transfer Switching
  - Uninterruptible Power Supply systems
  - Life Safety systems; Fire protection Fire alarm, Egress pressurization
  - Lightning Protection
  - Domestic and Process water pumping and mixing systems
  - Equipment sound control systems
  - Data and Communication systems
  - Paging systems
  - Security systems
  - Plumbing
  - Illuminated guidance signage

**Best Available Practice**

None
3.0 ENERGY & ATMOSPHERE

3.2 Prerequisite 2 – Minimum Energy Performance

Required

INTENT

Establish the minimum level of energy efficiency for the tenant space systems to reduce environmental and economic impacts associated with excessive energy use.

REQUIREMENTS

Design portions of the tenant’s space to comply with the ANSI/ASHRAE/IESNA Standard 90.1-2010 (with errata but without addenda) to complete the following:

- Comply with the mandatory provisions (Sections 5.4, 6.4, 7.4, 8.4, 9.4 and 10.4) in Standard 90.1-2010 (with errata but without addenda)
- Achieve the prescriptive requirements (Sections 5.5, 6.5, 7.5 and 9.5) or performance requirements (Section 11) of ANSI/ASHRAE/IESNA Standard 90.1-2010 (with errata but without addenda)
- Reduce connected lighting power density 10% below that allowed by ANSI/ASHRAE/IESNA Standard 90.1-2010 (with errata but without addenda) using either the Space-by-Space Method or by applying the whole lighting power allowance to the entire tenant space
- Install ENERGY STAR equipment for 50% (by rated-power) of ENERGY STAR eligible items. This requirement includes; appliances, office equipment, electronics, and commercial food service equipment. Excluded are heating, ventilating and air conditioning (HVAC) and lighting.

SUBMITTALS

Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

Design the tenant space and systems to meet baseline requirements. Use a computer simulation model, where applicable, to assess the energy performance and identify the most cost-effective energy efficiency measures.

If a local code has demonstrated quantitative and textual equivalence following, at a minimum, the U.S. Department of Energy (DOE) standard process for commercial energy code determination, then the results of that analysis may be used to correlate local code performance

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2 Project teams wishing to use ASHRAE approved addenda for the purposes of this credit may do so at their discretion. Addenda must be applied consistently across all SAM credits.
with ASHRAE 90.1-2010. Details on the DOE process for commercial energy code determination can be found at: http://www.energycodes.gov/regulations/determinations.

**Standard Practice**


**Recommended Practice**

- Design tenant space using the more current ASHRAE/IESNA 90.1-2010 standard

**Best Available Practice**

None
3.0 ENERGY & ATMOSPHERE

3.3 Optimize Energy Performance
1 to 19 Points

INTENT
Achieve increasing levels of energy performance beyond the prerequisite standard to reduce environmental and economic impacts associated with excessive energy use.

REQUIREMENTS
Select one of the two compliance path options described below. Project teams documenting achievement using any of the 2 options are assumed to be in compliance with SAM Credit 3.2 Minimum Energy Performance.

OPTION 1 – ENTIRE SPACE ENERGY SIMULATION (1 to 19 points)

Demonstrate a percentage improvement in the proposed space performance rating compared with the baseline space performance rating. Calculate the baseline space performance according to Appendix G of ANSI/ASHRAE/IESNA Standard 90.1-2010 (with errata but without addenda) using a computer simulation model for the whole tenant space project.

The minimum energy savings percentages for each point threshold are as follows:

<table>
<thead>
<tr>
<th>SAM Credit</th>
<th>% Energy Reduction Over Baseline*</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.3.1</td>
<td>8%</td>
<td>1</td>
</tr>
<tr>
<td>3.3.2</td>
<td>10%</td>
<td>2</td>
</tr>
<tr>
<td>3.3.3</td>
<td>12%</td>
<td>3</td>
</tr>
<tr>
<td>3.3.4</td>
<td>14%</td>
<td>4</td>
</tr>
<tr>
<td>3.3.5</td>
<td>16%</td>
<td>5</td>
</tr>
<tr>
<td>3.3.6</td>
<td>18%</td>
<td>6</td>
</tr>
<tr>
<td>3.3.7</td>
<td>20%</td>
<td>7</td>
</tr>
<tr>
<td>3.3.8</td>
<td>22%</td>
<td>8</td>
</tr>
<tr>
<td>3.3.9</td>
<td>24%</td>
<td>9</td>
</tr>
<tr>
<td>3.3.10</td>
<td>26%</td>
<td>10</td>
</tr>
<tr>
<td>3.3.11</td>
<td>28%</td>
<td>11</td>
</tr>
<tr>
<td>3.3.12</td>
<td>30%</td>
<td>12</td>
</tr>
<tr>
<td>3.3.13</td>
<td>32%</td>
<td>13</td>
</tr>
<tr>
<td>3.3.14</td>
<td>34%</td>
<td>14</td>
</tr>
<tr>
<td>3.3.15</td>
<td>36%</td>
<td>15</td>
</tr>
<tr>
<td>3.3.16</td>
<td>38%</td>
<td>16</td>
</tr>
<tr>
<td>3.3.17</td>
<td>40%</td>
<td>17</td>
</tr>
<tr>
<td>3.3.18</td>
<td>42%</td>
<td>18</td>
</tr>
<tr>
<td>3.3.19</td>
<td>44%</td>
<td>19</td>
</tr>
</tbody>
</table>

* Baseline calculated in SAM Credit 3.2 Minimum Energy Performance
All energy uses associated with the project must be included in the energy simulation model. Improvements to non-regulated loads must be documented as described below. Regulated energy systems include HVAC (heating, cooling, fans, and pumps), service water heating, and lighting. Process loads for tenants may include refrigeration equipment, cooking and food preparation, clothes washing, and other major support appliances. Merchandise for sale that is plugged in, and small moveable appliances are not candidates for improved energy performance.

Appendix G of ASHRAE Standard 90.1-2010 requires that the energy analysis done for the Building Performance Rating Method include ALL of the energy costs within and associated with the building project. To achieve points using this credit, the proposed design must meet the following criteria:

- Comply with the mandatory provisions in ASHRAE Standard 90.1-2010, Sections 5.4, 6.4, 7.4, 8.4, 9.4 and 10.4 (with errata but without addenda)
- Include all the energy costs within and associated with the tenant space project
- Compare against a baseline space that complies with Appendix G to ASHRAE Standard 90.1-2010 (with errata but without addenda). There is no default process energy cost.

For the purpose of this analysis, process energy is considered to include, but is not limited to, office and general miscellaneous equipment, computers, elevators and escalators, kitchen cooking and refrigeration, laundry washing and drying, lighting exempt from the lighting power allowance (e.g. lighting integral to security operations) and other (e.g. waterfall pumps).

Regulated (non-process) energy includes lighting, HVAC (such as for space heating, space cooling, fans, pumps, toilet exhaust, kitchen hood exhaust, etc.), and service water heating for domestic or space heating purposes.

For this credit, process loads shall be identical for both the baseline tenant space performance rating and for the proposed tenant space performance rating. However, project teams may follow the Exceptional Calculation Method (ASHRAE 90.1-2010 G2.5) to document measures that reduce process loads. Documentation of process load energy savings shall include a list of the assumptions made for both the base and proposed design, and theoretical or empirical information supporting these assumptions.

OR

OPTION 2 — PRESCRIPTIVE COMPLIANCE PATH (1 to 5 points)

Comply with the prescriptive measures identified below. The tenant space must meet the following requirements below. Points will be awarded based on the number of appliance types or technologies implemented from the tables below. Points earned for this credit are as follows:

(see next page)
### Table 1 - All Tenants:

<table>
<thead>
<tr>
<th>Technology/Strategy</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED Lighting</td>
<td>For at least 30% of lighting load</td>
</tr>
<tr>
<td>CFL Lighting</td>
<td>For at least 60% of lighting load</td>
</tr>
<tr>
<td>Energy-Efficient Halogen Lamps</td>
<td>High pressure, krypton or xenon containing lamps (argon not acceptable)</td>
</tr>
<tr>
<td>T8 and T5 Fluorescent Lamps</td>
<td>Where applicable</td>
</tr>
<tr>
<td>Light Sensors or Timers</td>
<td>Where applicable</td>
</tr>
<tr>
<td>Motion-Controlled Sensors</td>
<td>Where applicable</td>
</tr>
<tr>
<td>ENERGY STAR Rated Appliances and Electronic Equipment</td>
<td>At least one ENERGY STAR item type but must be for all items of that type, e.g. all computers, all printers</td>
</tr>
<tr>
<td>ENERGY STAR Rated Ventilation Equipment</td>
<td>Includes exhaust and ceiling fans; at least one ENERGY STAR item type but must be for all items of that type, e.g. all exhaust fans</td>
</tr>
<tr>
<td>ENERGY STAR Rated HVAC Equipment</td>
<td>Includes furnaces and air conditioning units; at least one ENERGY STAR item type but must be for all items of that type, e.g. all exhaust fans</td>
</tr>
<tr>
<td>Appliances listed in Table 2</td>
<td>Per each item in Table 2 (maximum of 5 items)</td>
</tr>
<tr>
<td>User-Defined</td>
<td>The SRP will consider other proposed strategies and technologies. Points will be awarded at the discretion of the SRP.</td>
</tr>
</tbody>
</table>

Example: A food service tenant uses CFL lighting for 90% of its lighting load, has Energy Star rated reach-in refrigerators, and an Energy Star rated ice machine that meet the requirements of Tables 1 and 2 below. Therefore, for these three item types, 2 points would be earned for this credit.
### Table 2 – Food Service Tenants:

**Appliances Eligible for Additional Points toward Credit Requirements:**

<table>
<thead>
<tr>
<th>Appliance Type</th>
<th>Power Source</th>
<th>Minimum Efficiency</th>
<th>Max Idle Rate</th>
<th>Water Use</th>
<th>Energy Star Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fryers</td>
<td>elec</td>
<td>80%</td>
<td>1000 W*</td>
<td>n/a</td>
<td>Yes</td>
</tr>
<tr>
<td>Large vat fryers</td>
<td>elec</td>
<td>80%</td>
<td>1250 W</td>
<td>n/a</td>
<td>Pending</td>
</tr>
<tr>
<td>Steam cooker-back coating</td>
<td>elec</td>
<td>50%</td>
<td>135 W/pan</td>
<td>2 gph/pan</td>
<td>Yes</td>
</tr>
<tr>
<td>Steam cooker- high production/cook to order</td>
<td>elec</td>
<td>50%</td>
<td>275 W/pan</td>
<td>3 gph/pan</td>
<td>Yes</td>
</tr>
<tr>
<td>Hot food holding cabinets</td>
<td>elec</td>
<td></td>
<td>20 W/ft²</td>
<td>n/a</td>
<td>Yes</td>
</tr>
<tr>
<td>Solid door reach-in refrigerators</td>
<td>elec</td>
<td>0.06V+1.22 kWh/day</td>
<td>n/a</td>
<td>n/a</td>
<td>Yes</td>
</tr>
<tr>
<td>Solid door reach-in freezers</td>
<td>elec</td>
<td>0.29V+0.97 kWh/day</td>
<td>n/a</td>
<td>n/a</td>
<td>Yes</td>
</tr>
<tr>
<td>Solid door reach-in refrigerator/freezer</td>
<td>elec</td>
<td>0.27AV-0.71 kWh/day**</td>
<td>n/a</td>
<td>n/a</td>
<td>Yes</td>
</tr>
<tr>
<td>Glass door reach-in refrigerators</td>
<td>elec</td>
<td>0.086V+2.39 kWh/day</td>
<td>n/a</td>
<td>n/a</td>
<td>Pending</td>
</tr>
<tr>
<td>Ice cream freezer</td>
<td>elec</td>
<td>0.39V+0.82 kWh/day</td>
<td>n/a</td>
<td>n/a</td>
<td>Yes</td>
</tr>
<tr>
<td>Undercounter dish machines- high temp</td>
<td>elec</td>
<td>N/a</td>
<td>900 W</td>
<td>1 gal/rack</td>
<td>Yes</td>
</tr>
<tr>
<td>Undercounter dish machines- low temp</td>
<td>elec</td>
<td>N/a</td>
<td>500 W</td>
<td>1.7 gal/rack</td>
<td>Yes</td>
</tr>
<tr>
<td>Door type dish machine- high temp</td>
<td>elec</td>
<td>N/a</td>
<td>1000 W</td>
<td>0.95 gal/rack</td>
<td>Yes</td>
</tr>
<tr>
<td>Door type dish machine- low temp</td>
<td>elec</td>
<td>N/a</td>
<td>600 W</td>
<td>1.18 gal/rack</td>
<td>Yes</td>
</tr>
<tr>
<td>Single tank rack conveyor dish machine- high temp</td>
<td>elec</td>
<td>N/a</td>
<td>2000 W</td>
<td>0.7 gal/rack</td>
<td>Yes</td>
</tr>
<tr>
<td>Single tank rack conveyor dish machine- low temp</td>
<td>elec</td>
<td>N/a</td>
<td>1600 W</td>
<td>0.79 gal/rack</td>
<td>Yes</td>
</tr>
<tr>
<td>Multi-tank rack conveyor dish machine- high temp</td>
<td>elec</td>
<td>N/a</td>
<td>2600 kW</td>
<td>0.54 gal/rack</td>
<td>Yes</td>
</tr>
<tr>
<td>Multi-tank rack conveyor dish machine- low temp</td>
<td>elec</td>
<td>N/a</td>
<td>2000 W</td>
<td>0.54 gal/rack</td>
<td>Yes</td>
</tr>
<tr>
<td>Ice machine [ice making head] IMH H&lt;450 lb/day</td>
<td>elec</td>
<td>9.23-0.0077H kWh/100 lb ice</td>
<td>n/a</td>
<td>20 gal/100 lb ice</td>
<td>Yes [but with lower water use]</td>
</tr>
<tr>
<td>Ice machine [ice making head] IMH H ≥ 450 lb/day</td>
<td>elec</td>
<td>6.20-0.0010H kWh/100 lb ice</td>
<td>n/a</td>
<td>20 gal/100 lb ice</td>
<td>Yes [but with lower water use]</td>
</tr>
<tr>
<td>Appliance Type</td>
<td>Power Source</td>
<td>Minimum Efficiency</td>
<td>Max Idle Rate</td>
<td>Water Use</td>
<td>Energy Star Category</td>
</tr>
<tr>
<td>----------------------------------------------------</td>
<td>--------------</td>
<td>-----------------------------</td>
<td>---------------</td>
<td>-------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Ice machine [w/o remote compressor] H&lt; 1000 lb/day</td>
<td>elec</td>
<td>8.05-0.0035H kWh/100lb ice</td>
<td>n/a</td>
<td>20 gal/100 lb ice</td>
<td>Yes [but with lower water use]</td>
</tr>
<tr>
<td>Ice machine [w/o remote compressor] H ≥ 1000 lb/day</td>
<td>elec</td>
<td>4.64 kWh/100lb ice</td>
<td>n/a</td>
<td>20 gal/100 lb ice</td>
<td>Yes [but with lower water use]</td>
</tr>
<tr>
<td>Ice machine [w remote compressor] H&lt; 934 lb/day</td>
<td>elec</td>
<td>8.05-0.0035H kWh/100lb ice</td>
<td>n/a</td>
<td>20 gal/100 lb ice</td>
<td>Yes [but with lower water use]</td>
</tr>
<tr>
<td>Ice machine [w remote compressor] H ≥ 934 lb/day</td>
<td>elec</td>
<td>4.82 kWh/100 lb ice</td>
<td>n/a</td>
<td>20 gal/100 lb ice</td>
<td>Yes [but with lower water use]</td>
</tr>
<tr>
<td>Ice machine self-contained unit H&lt; 175 lb/day</td>
<td>elec</td>
<td>16.7-0.0436H kWh/ 100 lb ice</td>
<td>n/a</td>
<td>30 gal/100 lb ice</td>
<td>Yes [but with lower water use]</td>
</tr>
<tr>
<td>Ice machine contained unit H ≥ 175 lb/day</td>
<td>elec</td>
<td>9.11 kWh/100lb ice</td>
<td>n/a</td>
<td>30 gal/100 lb ice</td>
<td>Yes [but with lower water use]</td>
</tr>
<tr>
<td>Ice machine water cooled IMH H&lt;500 lb/day [note: must be on a chilled loop]</td>
<td>elec</td>
<td>7.02-0.005H kWh/100lb ice</td>
<td>n/a</td>
<td>20 gal/100 lb ice</td>
<td></td>
</tr>
<tr>
<td>Ice machine water cooled IMH H ≥ 500lb/day &lt;1436 lb/day [note: must be on a chilled loop]</td>
<td>elec</td>
<td>5.13-0.001H kWh/100lb ice</td>
<td>n/a</td>
<td>20 gal/100 lb ice</td>
<td></td>
</tr>
<tr>
<td>Ice machine water cooled IMH H ≥ 1436 lb/day [note: must be on a chilled loop]</td>
<td>elec</td>
<td>3.7 kWh/100lb ice</td>
<td>n/a</td>
<td>20 gal/100 lb ice</td>
<td></td>
</tr>
<tr>
<td>Ice machine water cooled SCU H&lt;200 lb/day [note: must be on a chilled loop]</td>
<td>elec</td>
<td>10.6-0.177H kWh/100lb ice</td>
<td>n/a</td>
<td>30 gal/100 lb ice</td>
<td></td>
</tr>
<tr>
<td>Ice machine water cooled SCU H ≥ 200 lb/day [note: must be on a chilled loop]</td>
<td>elec</td>
<td>7.07 kWh/100lb ice</td>
<td>n/a</td>
<td>30 gal/100 lb ice</td>
<td></td>
</tr>
<tr>
<td>Ice machine water cooled once-through [open loop]</td>
<td>BANNED</td>
<td>BANNED</td>
<td>BANNED</td>
<td>BANNED</td>
<td></td>
</tr>
<tr>
<td>Griddles</td>
<td>elec</td>
<td>70%</td>
<td>350 w/ft²</td>
<td>n/a</td>
<td>Pending</td>
</tr>
<tr>
<td>Range</td>
<td>elec</td>
<td>80%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Convection ovens [full size]</td>
<td>elec</td>
<td>70%</td>
<td>1750 W</td>
<td>n/a</td>
<td>Pending</td>
</tr>
<tr>
<td>Combination ovens [countertop or island]</td>
<td>elec</td>
<td>60%</td>
<td>800 W/pan</td>
<td>15 gph</td>
<td>Pending</td>
</tr>
<tr>
<td>Appliance Type</td>
<td>Power Source</td>
<td>Minimum Efficiency</td>
<td>Max Idle Rate</td>
<td>Water Use</td>
<td>Energy Star Category</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------</td>
<td>--------------------</td>
<td>---------------</td>
<td>-----------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Combination ovens [roll-in]</td>
<td>elec</td>
<td>60%</td>
<td>800 W/pan</td>
<td>20 gph</td>
<td>Pending</td>
</tr>
<tr>
<td>Bread toaster [light duty]</td>
<td>elec</td>
<td></td>
<td>3600 W [8% duty cycle] = 2 pop-ups</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-rinse spray valves</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>1.2 gpm</td>
<td>n/a</td>
</tr>
<tr>
<td>Kitchen exhaust hood</td>
<td>n/a</td>
<td>35% reduction in design [full speed] ventilation rate [cfm] or demand controlled ventilation</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Fryers</td>
<td>gas</td>
<td>50%</td>
<td>9000 BTU/h*</td>
<td>n/a</td>
<td>Yes</td>
</tr>
<tr>
<td>Large vat fryers</td>
<td>gas</td>
<td>50%</td>
<td>12000 BTU/h</td>
<td></td>
<td>Pending</td>
</tr>
<tr>
<td>Steam cooker- bach coating</td>
<td>gas</td>
<td>38%</td>
<td>2100 BTU/h/pan</td>
<td>2 gph/pan</td>
<td>Yes</td>
</tr>
<tr>
<td>Steam cooker- high production/ cook to order</td>
<td>gas</td>
<td>38%</td>
<td>4300 BTU/h/pan</td>
<td>3 gph/pan</td>
<td>Yes</td>
</tr>
<tr>
<td>Griddles</td>
<td>gas</td>
<td>38%</td>
<td>2700 BTU/h/ft²</td>
<td>n/a</td>
<td>Pending</td>
</tr>
<tr>
<td>Convection ovens [full size]</td>
<td>gas</td>
<td>43%</td>
<td>13000 BTU/h</td>
<td>n/a</td>
<td>Pending</td>
</tr>
<tr>
<td>Combination ovens</td>
<td>gas</td>
<td>40%</td>
<td>2850 BTU/h/pan</td>
<td>15 gph</td>
<td>Pending</td>
</tr>
<tr>
<td>Combination ovens</td>
<td>gas</td>
<td>40%</td>
<td>2850 BTU/h/pan</td>
<td>20 gph</td>
<td>Pending</td>
</tr>
<tr>
<td>Rack ovens- single</td>
<td>gas</td>
<td>50%</td>
<td>29000 BTU/h</td>
<td>n/a</td>
<td>Pending</td>
</tr>
<tr>
<td>Rack ovens- double</td>
<td>gas</td>
<td>50%</td>
<td>35000 BTU/h</td>
<td>n/a</td>
<td>Pending</td>
</tr>
<tr>
<td>Broiler [underfired]</td>
<td>gas</td>
<td>35%</td>
<td>12500 BTU/h/ft² peak input</td>
<td>n/a</td>
<td>No</td>
</tr>
<tr>
<td>Conveyor oven [small = &lt; 25 inch bell]</td>
<td>gas</td>
<td>42%</td>
<td>29000 BTU/h</td>
<td>n/a</td>
<td>Pending</td>
</tr>
<tr>
<td>Conveyor oven [large = &gt; 25 inch bell]</td>
<td>gas</td>
<td>42%</td>
<td>58000 BTU/h</td>
<td>n/a</td>
<td>Pending</td>
</tr>
<tr>
<td>Clothes washer</td>
<td>2.00 MEF</td>
<td></td>
<td>6.0 WF</td>
<td>n/a</td>
<td></td>
</tr>
</tbody>
</table>

*Based on 15 inch fryer  
**AV = adjusted volume = (1.63 x freezer volume) + refrigerator volume
SUBMITTALS

Include descriptive narrative and calculations in the SAM Checklist.

TECHNOLOGY/STRATEGY

For some tenants, regulated loads will represent the primary energy use. For others, process loads will be the biggest energy use. In either case, look at the equipment and systems that use energy and identify strategies to reduce energy use. Consider first cost, maintenance, replacement costs, and any potential benefit or detriment to staff or customers when selecting strategies. Design the tenant space and systems to maximize energy performance. Use a computer simulation model to assess energy performance and identify the most cost-effective energy efficiency measures. Quantify energy performance compared with the baseline benchmark. Install energy efficient equipment, such as retail display lighting, dishwashers and enclosed refrigerator cases. Utilize heat recovery and heat rejection strategies. Work with equipment manufacturers to improve energy efficiency, particularly for volume build applications. Small independent tenants can use historic utility bills from similar stores, generic retail energy data, and data from their local utility or computer modeling. Regardless of the methodology used by any tenant in setting their energy budget, the credit narrative should include a description of the methodology used and assumptions made.

Standard Practice


Recommended Practice

- Use a computer simulation model to assess energy performance and identify the most cost effective energy measures
- Provide high-efficiency motors and variable-speed pumping systems
- Provide energy efficient lighting systems including LED, fluorescent lighting, solar lighting and the use of lighting sensors or timers
- Organize circuiting of lighting and tenant space systems so that individual areas may be separately controlled relative to daylight and heating/cooling zones
- Optimize architectural features for daylighting and glare control. Consider light shelves, ceiling design, window placement, and window treatments
- Provide motion sensors in stairs, toilet rooms, storage rooms and equipment rooms unless life safety is compromised
- Provide ENERGY STAR compliant equipment and appliances
- Use LED lighting, wherever applicable
- Optimize lighting controls for energy savings and function
- Provide daylight harvesting control systems
- Use high performance glazing (double glazed, low-e) and window systems
- Utilize high efficiency motors, generators and pumps where applicable

**Best Available Practice**

Consider the following for tenant spaces:

- Integrate lighting systems with Tenant Space Automation System
- Use spectrally selective glazing
- Evaluate underfloor air distribution systems in office-type spaces
- Evaluate “green walls” for tenant space
- Utilize premium efficiency motors where applicable
3.0 ENERGY & ATMOSPHERE

3.4 Enhanced Commissioning

2 Points

INTENT

Begin the commissioning process early in the design process and execute additional activities after systems performance verification is completed.

REQUIREMENTS

Implement, or have a contract in place to implement, the following additional commissioning process activities in addition to the requirements of SAM Credit 3.1 Fundamental Systems Commissioning:

- Prior to the start of the construction documents phase, designate an independent Commissioning Authority (CxA) to lead, review, and oversee the completion of all commissioning process activities.
  - The CxA shall have documented commissioning authority experience in at least two building projects.
  - The individual serving as the CxA:
    - Must be independent of the work of design and construction;
    - Must not an employee of the design firm, though they may be contracted through them;
    - Must not be an employee of, or contracted through, a contractor or construction manager holding construction contracts; and
    - May be a qualified employee or consultant of the Owner.
  - The CxA must report results, findings and recommendations directly to the Owner.
- The CxA must conduct, at a minimum, one commissioning design review of the Owner’s Project Requirements (OPR), Basis of Design (BOD), and design documents prior to mid-construction documents phase and back-check the review comments in the subsequent design submission.
- The CxA must review contractor submittals applicable to systems being commissioned for compliance with the OPR and BOD. This review shall be concurrent with A/E reviews and submitted to the design team and the Owner.
- The CxA or other project team members must develop a systems manual that gives future operating staff the information needed to understand and optimally operate the commissioned systems.
• The CxA or other project team members must verify that the requirements for training operating personnel and tenant space occupants are completed.
• The CxA must be involved in reviewing the operation of the space with occupants within 10 months after substantial completion. A plan for resolving of outstanding commissioning-related issues must be included.

SUBMITTALS
Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY
Although it is preferable that the CxA be contracted by the Owner, for the enhanced commissioning credit, the CxA may also be contracted through the design firms or construction management firms not holding construction contracts. The LEED Reference Guide provides detailed guidance on the rigor expected for following process activities:

- Commissioning design review
- Commissioning submittal review
- Systems manual

Though the commissioning process should start as early in the design process as possible, it is allowable to engage a CxA agent to conduct the design review required after construction has started, so long as the project team agrees to implement any requested changes both to the documents and to construction that may have already occurred.

Standard Practice
None

Recommended Practice
• Review the design intent and the basis of design documentation
• Incorporate commissioning requirements into the construction documents
• Develop and utilize a commissioning plan
• Verify installation, functional performance, training, operations and maintenance documentation
• Complete a commissioning report
• Provide the owner with a single manual that contains the information required for re-commissioning systems
• Engage a commissioning team that does not include individuals directly responsible for project design or construction management to evaluate tenant systems as part of the commissioning plan
• Priority Systems - high energy consuming systems
  o All HVAC system equipment
- Lighting controls and sensors
- Lighting
- Refrigeration systems
- Information Technology Systems - IT (included in process loads: to promote energy savings, use the exceptional calculation method described in ANSI/ASHRAE/IESNA 90.1-2010 G2.5)

Lower Priority Systems – low energy consuming systems
- Emergency Power Generators and Automatic Transfer Switching
- Uninterruptible Power Supply systems
- Life Safety systems; Fire protection Fire alarm, Egress pressurization
- Lightning Protection
- Domestic and Process water pumping and mixing systems
- Equipment sound control systems
- Data and Communication systems
- Paging systems
- Security systems
- Plumbing
- Illuminated guidance signage

Best Available Practice

None
3.0 ENERGY & ATMOSPHERE

3.5 Measurement and Verification

3 Points

INTENT

Provide for the ongoing accountability of tenant energy consumption over time.

REQUIREMENTS

TERMINAL TENANTS (3 points):

AND

Complete one or more of the following:

- Install submetering equipment to measure and record energy use within the tenant space.
- Negotiate a lease whereby energy costs are paid by the tenant and not included in the base rent.

NON-TERMINAL TENANTS (3 points):

SUBMITTALS

Include descriptive narrative in the SAM Checklist and M&V Plan.

TECHNOLOGY/STRATEGY

Develop an M&V Plan to evaluate space and/or energy system performance. Characterize the space and/or energy systems through energy simulation or engineering analysis. Install the necessary metering equipment to measure energy use. Track performance by comparing predicted performance to actual performance, broken down by component or system as appropriate. Evaluate energy efficiency by comparing actual performance to baseline performance.
While the IPMVP describes specific actions for verifying savings associated with energy conservation measures (ECMs) and strategies, this Credit expands upon typical IPMVP M&V objectives. M&V activities should not necessarily be confined to energy systems where ECMs or energy conservation strategies have been implemented. The IPMVP provides guidance on M&V strategies and their appropriate applications for various situations. These strategies should be used in conjunction with monitoring and trend logging of significant energy systems to provide for the ongoing accountability of tenant energy performance.

**Standard Practice**

None

**Recommended Practice**

- Install continuous metering equipment for the following end-uses:
  - Lighting systems and controls
  - Constant and variable motor loads
  - Variable frequency drive (VFD) operation
  - Chiller efficiency at variable loads (kW/ton)
  - Cooling load
  - Air and water economizer and heat recovery cycles
  - Air distribution static pressures and ventilation air volumes
  - Boiler efficiencies
  - Indoor water risers

- Develop a Measurement and Verification plan that incorporates the monitoring information from the above end-uses and is consistent with Option B, C or D of the 2001 International Performance Measurement & Verification Protocol (IPMVP) Volume I: Concepts and Options for Determining Energy and Water Savings

- Consider the recommendations included in the Chicago Climate Action Plan

**Best Available Practice**

- Draft a Measurement & Verification Plan to apply during tenant operation that compares predicted savings to those achieved
3.0 ENERGY & ATMOSPHERE

3.6 Green Power

2 Points

INTENT

Encourage the development and use of grid-source, renewable energy technologies on a net zero pollution basis in order to off-set your carbon footprint.

REQUIREMENTS

Engage in at least a 2-year renewable energy contract to provide at least 35% of the tenant's electricity from renewable sources, as defined by the Center for Resource Solutions Green-e Energy product certification requirements.

OPTION 1 – DETERMINE THE BASELINE ELECTRICITY USE

Use the annual electricity consumption from the results of the subparts of SAM Credit 3.3 Optimize Energy Performance.

OR

OPTION 2 – ESTIMATE BASELINE ELECTRICITY USE

Use the U.S. Department of Energy Commercial Buildings Energy Consumption Survey database to determine the estimated electricity use.

SUBMITTEDS

Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

Determine the energy needs of the tenant space and investigate opportunities to engage in a green power contract. Green power is derived from solar, wind, geothermal, biomass or low-impact hydro sources. Visit www.green-e.org/energy for details about the Green-e program. The power product purchased to comply with credit requirements need not be Green-e certified. Other sources of green power are eligible if they satisfy the Green-e program’s technical requirements. Renewable energy certificates (RECs), tradable renewable certificates (TRCs), green tags and other forms of green power that comply with Green-e’s technical requirements can be used to document compliance with this section.

Standard Practice

None

Recommended Practice

- Investigate opportunities to engage in a green power contract with the utility
- Visit www.green-e.org for details about the Green-e program

Best Available Practice
None

CASE STUDIES

Energy Efficient Burger King
Burger King – Waghausel, Germany

The eco-friendly design developed in cooperation with Wirsol Solar AG (Baden-Württemberg) utilizes state-of-the-art technologies and renewable energy to power one-third of the restaurant’s energy consumption, thus reducing energy costs by 45% and the emission of CO₂ by more than 120 metric tons every year.

The 20/20 design is complemented with the latest eco-friendly technologies and energy efficient construction elements including:

- Interior heat recovery ventilation system that cools and heats the restaurant, saving 73% of energy consumption per year
- Long-lasting interior and exterior LED bulbs saving more than 55% of energy consumption annually
- Excess heat loss is captured to generate hot water, conserving 50% of energy usage annually
- A wind turbine contributing up to 2,500 kWh to the restaurant’s power supply was added to the traditional exterior BK® logo sign
- Photovoltaic and wind energy systems that save up to 45% of electricity annually;
- More than 720 solar photovoltaic modules generate over 53,500 kWh of electricity per year, which equals the annual consumption of five U.S. households
- A solar-powered electric vehicle charging station for hybrid cars
- A rainwater reclamation system for outside irrigation

In addition, the restaurant kitchen features the revolutionary Duke Flexible Batch Broiler, which maximizes cooking flexibility while reducing gas consumption and related costs by 52 percent electricity consumption and costs by 90 percent. All BURGER KING® restaurants in North America have installed this new broiler and the international rollout is expected to be completed by the end of 2012.

www.restaurantnewsresource.com/article46521.html

Electricity from Waste
Los Angeles World Airports - Los Angeles, California

Over 8,000 tons of food waste produced each year at Los Angeles International Airport is being used to produce methane gas which is then recycled and turned into electricity. This complex process involves food being ground up and mixed with water, creating slurry, which is then
heated up into methane gas and carbon dioxide. Eventually this is transferred offsite to an adjacent power generation plant and converted into electricity.

www.wasteage.com/mag/waste_los_angeles_airport/
4.0 MATERIALS & RESOURCES

4.1 Prerequisite 1 – Storage and Collection of Recyclables

Required

INTENT

Facilitate the reduction of waste generated by tenant space occupants that is hauled to and disposed of in landfills.

REQUIREMENTS

Provide an easily accessible dedicated area or areas that serve the tenant space for the collection and storage of materials for recycling, including (at a minimum) paper, corrugated cardboard, glass, plastics and metals. An area should also be dedicated to collection and storage of compostable food waste.

SUBMITTALS

Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

Designate an area for recyclable collection and storage that is appropriately sized and located in a convenient area. These areas would likely be designed and sized differently depending on the ultimate use and waste stream of the facility (e.g. office, airlines, concessionaires, etc.) Identify local waste handlers and buyers for glass, plastic, office paper, e-waste, newspaper, cardboard, metals, fluids, fixtures, and organic wastes. Instruct employees, occupants, and contractors on the recycling procedures. Consider employing cardboard balers, aluminum can crushers, recycling chutes and other waste strategies to further enhance the recycling program.

Standard Practice

- Investigate and incorporate collection rooms for recycling streams that make sense for each tenant space
- Designate an area for recyclable collection and storage that is appropriately sized and located in a convenient area

Recommended Practice

- Coordinate recyclable waste collection with hauler capability
- Recycle the following waste, whenever feasible:
  - Aluminum
  - Glass
  - Paper, newspapers, magazines and cardboard
  - Carpet
  - Wood (pallets/crates, etc.)
- Food waste/grease and compostables
- Organic waste and compostables
- Scrap metal
- Batteries
- Light bulbs
- Toner cartridges
- Electrical wiring
- Electronics including monitors

- Instruct employees, users and occupants on recycling procedures

**Best Available Practice**

- Employ cardboard balers, aluminum can crushers, recycling chutes and other technologies to enhance the recycling program
4.0 MATERIALS & RESOURCES

4.2 Construction Waste Management

1 to 3 Points

INTENT

Divert construction and demolition debris from disposal in landfills and incineration facilities. Redirect recyclable recovered resources back to the manufacturing process and reusable materials to appropriate sites.

REQUIREMENTS

Recycle and/or salvage nonhazardous construction and demolition debris. Develop and implement a construction waste management plan that, at a minimum, identifies the materials to be diverted from disposal and whether the materials will be sorted on-site. Calculations must be done by weight (conversion may be necessary) and must be consistent throughout. The minimum percentage debris to be recycled or salvaged for each point threshold is as follows:

<table>
<thead>
<tr>
<th>SAM Credit</th>
<th>Recycled or Salvaged</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.2.1</td>
<td>50%</td>
<td>1</td>
</tr>
<tr>
<td>4.2.2</td>
<td>75%</td>
<td>2</td>
</tr>
<tr>
<td>4.2.3</td>
<td>100%</td>
<td>3</td>
</tr>
</tbody>
</table>

Section 11-4-1905 of the Chicago City Code, includes applicability requirements. For CDA purposes, all airport projects are applicable regardless of Section 11-4-1905.

SUBMITTALS

Include descriptive narrative on the SAM Checklist indicating the name of the project that will utilize the material, if other than current project or temporary storage locations, and the following:

- A design estimate using the construction waste management form in CDA/OMP Specification 01524 – Construction Waste Management, to be provided by the designer with the SAM Design Checklist.
- A Waste Management Plan as outlined in CDA/OMP Specification 01524 to be provided by the Contractor no later than 30 days prior to start of construction
- Monthly construction waste management forms provided by the Contractor during construction
- A final construction waste total provided by the Contractor prior to final payment

The submittal requirements follow the City of Chicago waste ordinance (Chicago Code Section 11-4-1905) with the following exceptions:
- All airport projects, including those not subject to Section 11-4-1905 of the Chicago Code, shall be subject to the submittal requirements of this credit
- Submit documentation to CDA for tracking purposes in addition to documentation required by the ordinance

Note that the requirements of this credit are very similar to the Chicago construction waste ordinance and CDA/OMP Specification 01524 with the exceptions as noted above. The specification follows the City ordinance with additional provisions for submittal requirements and project applicability.

TECHNOLOGY/STRATEGY

Note that the City of Chicago waste ordinance mandates that a minimum of 50% of construction and demolition (C&D) waste produced on-site (as measured by weight) is recycled.

It is expected that these practices may lead to savings in material costs due to resource coordination and income generation from recycled/salvaged materials.

Standard Practice
- Utilize designated areas for recycling construction debris on-site

Recommended Practice
- Establish goals for diversion from disposal in landfills and incineration facilities and adopt a construction waste management plan to achieve these goals
- Consider recycling cardboard, metal, brick, mineral fiber panel, concrete, plastic, wood, glass, gypsum wallboard, carpet and insulation
- Construction debris processed into a recycled content commodity that has an open market value (e.g., wood derived fuel [WDF], alternative daily cover material, etc.) may be applied to the construction waste calculation
- Designate a specific area(s) on the construction site for segregated collection and labeling of recyclable materials, and track recycling efforts throughout construction
- Identify construction haulers and recyclers to handle the designated materials. Note that diversion may include donation of materials to charitable organizations and salvage of materials on-site
- Implement deconstruction planning and techniques into all demolition activities. Careful and planned deconstruction of a facility can provide sustainable benefits related to disposal, reuse of materials, etc.
- Ensure that employees are aware of waste management and recycling procedures

Best Available Practice
- Evaluate use, as appropriate, of pre-cast or pre-fabricated units whenever possible, to reduce on-site waste generation during construction
4.0 MATERIALS & RESOURCES

4.3 Material Reuse

1 to 2 Points

INTENT

Reuse building materials and products to reduce demand for virgin materials and reduce waste, thereby lessening impacts associated with the extraction and processing of virgin resources.

REQUIREMENTS

Use salvaged, refurbished or reused materials, the sum of which constitutes at least 5% or 10%, based on cost, of the total value of materials on the project. The minimum percentage materials reused for each point threshold is as follows:

<table>
<thead>
<tr>
<th>SAM Credit</th>
<th>Reused Materials</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.3.1</td>
<td>5%</td>
<td>1</td>
</tr>
<tr>
<td>4.3.2</td>
<td>10%</td>
<td>2</td>
</tr>
</tbody>
</table>

Only include materials in Construction Specification Institute (CSI) MasterFormat 1995 Divisions 2-10 in the calculations.

Mechanical, electrical and plumbing components and specialty items such as elevators and equipment cannot be included in this calculation. Include only materials permanently installed in the project. Furniture may be included if it is included consistently in SAM Credit 4.3 Materials Reuse through SAM Credit 4.7 Certified Wood. For terminal tenant spaces, do not include the existing shell of the space, i.e. walls, floor, ceiling, if not included in original project scope of work.

SUBMITTALS

Include descriptive narrative and calculations in the SAM Checklist.

Indicate the name of the project that will utilize the material, if other than current project and temporary storage locations if known.

TECHNOLOGY/STRATEGY

Identify opportunities to incorporate salvaged materials into the space design, and research potential material suppliers. Consider salvaged materials such as beams and posts, flooring, paneling, doors and frames, masonry, and metal railing (CSI Divisions 2 through 10, note: CSI Divisions 11 through 16 are counted in SAM Credit 4.9 – Equipment Salvage and Reuse).

Use a “virtual warehouse” to maintain a current listing of materials available for reuse on other projects.
Standard Practice

- Prior to the demolition and removal of existing materials and equipment within a project area, notify the Chicago Department of Aviation to allow for the harvesting of used materials and equipment for potential reuse

Recommended Practice

None

Best Available Practice

None
4.0 MATERIALS & RESOURCES

4.4 Recycled Content

1 to 2 Points

INTENT

Increase demand for building products that incorporate recycled content materials, thereby reducing impacts resulting from extraction and processing of virgin materials.

REQUIREMENTS

Use materials with recycled content such that the sum of post-consumer recycled content plus 1/2 of the pre-consumer content constitutes at least 10% or 20%, based on cost, of the total value of the materials in the project. The minimum percentage materials recycled for each point threshold is as follows:

<table>
<thead>
<tr>
<th>SAM Credit</th>
<th>Recycled Content</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.4.1</td>
<td>10%</td>
<td>1</td>
</tr>
<tr>
<td>4.4.2</td>
<td>20%</td>
<td>2</td>
</tr>
</tbody>
</table>

The recycled content value of a material assembly is determined by weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value. If specific material cost is not available, assume 45% of total cost (inclusive of materials, labor and equipment) is representative of the material cost.

Only include materials in CSI MasterFormat 1995 Divisions 2-10 in the calculations.

Mechanical, electrical and plumbing components and specialty items such as elevators cannot be included in this calculation. Include only materials permanently installed in the project. Furniture may be included if it is included consistently in SAM Credit 4.3 Materials Reuse through SAM Credit 4.8 Furniture and Equipment.

SUBMITTALS

Include descriptive narrative and calculations in the SAM Checklist.

The submittals include the following:

- A design estimate using the recycled content form in CDA/OMP Specification 01356 – Recycled Content, to be provided by the designer with the SAM Checklist
- A pre-construction estimate using the recycled content form in CDA/OMP Specification 01356 – Recycled Content, to be provided by the contractor
- A final construction estimate using the recycled content form in CDA/OMP Specification 01356 – Recycled Content, to be provided by the contractor with the final SAM Checklist
TECHNOLOGY/STRATEGY

Establish a project goal for recycled content materials, and identify material suppliers that can achieve this goal. During construction, ensure that the specified recycled content materials are installed. Consider a range of environmental, economic and performance attributes when selecting products and materials.

Standard Practice

It has become commonplace for manufacturers to provide recycled content of their building materials. If the information does not exist or cannot be obtained, CDA allows the use of the following recycled content percentages as a default for some of the common construction materials:

<table>
<thead>
<tr>
<th>Material</th>
<th>Post-consumer</th>
<th>Pre-consumer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel</td>
<td>25%</td>
<td>-</td>
</tr>
<tr>
<td>Copper</td>
<td>65%</td>
<td>-</td>
</tr>
<tr>
<td>Aluminum</td>
<td>80%</td>
<td>-</td>
</tr>
<tr>
<td>Gypsum board (drywall)³</td>
<td>2%</td>
<td>5%</td>
</tr>
<tr>
<td>Reinforced concrete pipe</td>
<td>2%</td>
<td>-</td>
</tr>
<tr>
<td>Asphalitic paving materials, conventional</td>
<td>45%</td>
<td>45%</td>
</tr>
<tr>
<td>Asphalitic paving materials, with roof shingles</td>
<td>67%</td>
<td>45%</td>
</tr>
</tbody>
</table>

Post-consumer Recycled Content is derived from materials that can no longer be used for their original purpose. Pre-consumer Recycled Content consists of raw material diverted from the waste stream during the manufacturing process.

Note that the values in the table above are typically very conservative. For example, depending on the process used to make the steel, the recycled content can be anywhere from 25% to 35% for steel produced in a basic oxygen furnace to almost 100% in an electric arc furnace.⁴ For this reason, the designers and contractors are encouraged to determine this information directly from the manufacturers and to not rely on these default values whenever possible.

³ Default values for Post-/Pre-consumer % content based on the following manufacturers’ specs for standard gypsum drywall sourced in Midwestern states: CertainTeed (IA) – 2%/3%; American Gypsum (OK) – 5%/0%; USG (IA) – 6%/1%; USG (IN) – 5%/38%

⁴ Steel Recycling Institute
Recommended Practice

- Establish a project goal for recycled content materials and identify material suppliers that can achieve this goal
- Consider the following major components for specifying maximum recycled content:
  - Wall and partition materials
  - Components of concrete and cement
  - Steel reinforcement
  - Structural steel
  - Miscellaneous steel
  - Steel fencing and furnishings
  - Unit masonry
  - Ductile iron pipe
  - Aluminum products
  - Steel doors and frames
  - Aluminum doors and windows
  - Plaster
  - Terrazzo
  - Acoustical ceilings
  - Drywall
  - Finish flooring including carpet, resilient flooring and terrazzo
  - Toilet and shower compartments
  - Special finishes

- During construction, ensure that the specified recycled content materials are installed and quantify the total percentage of recycled content materials installed

Additionally, the following websites are provided for guidance only:

U.S. General Services Administration - Environmental Products Overview
http://www.gsa.gov/portal/content/104543

Architectural Record – Green Product Guide
www.archrecord.construction.com/products/green/

Best Available Practice

- Encourage aggressive use of permeable pavement with high recycled content, where applicable, such as recycled ground tire rubber (GTR) for permeable asphalt
CASE STUDY

Recycled Content
Island Wood Campus – Bainbridge Island, Washington

The builders used concrete with a fly-ash content of 50%. A countertop made of recycled yogurt containers, toilet partitions made of recycled plastic, 100%-recycled-content cellulose insulation, recycled-glass wall tiles, walk-off mats made from recycled tires, and a recycled soybean-shell bio-composite countertop are all part of the portfolio of recycled-content building materials used at Island Wood. In addition, throw rugs in the bunkrooms were woven from upholstery remnants and discarded clothing.

4.0 MATERIALS & RESOURCES

4.5. Local/Regional Materials

1 to 3 Points

INTENT

Increase demand for building and all other materials and products that are extracted, harvested or recovered, as well as manufactured within the region, thereby supporting the use of indigenous resources and reducing the environmental impacts resulting from transportation.

REQUIREMENTS

Use building and all other materials or products that have been extracted, harvested or recovered, as well as manufactured, within 500 miles of the project site for a minimum of 10% or 20% (based on cost) of the total materials value. If only a fraction of a product or material is extracted/harvested/recovered and manufactured locally, then only that percentage (by weight) shall contribute to the regional value. An additional point can be achieved if 50% of the materials are extracted/harvested/recovered, as well as manufactured, within 250 miles of the project site. The minimum percentage of local/regional materials for each point threshold is as follows:

<table>
<thead>
<tr>
<th>SAM Credit</th>
<th>Local/Regional Materials</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.5.1</td>
<td>10%</td>
<td>1</td>
</tr>
<tr>
<td>4.5.2</td>
<td>20%</td>
<td>2</td>
</tr>
<tr>
<td>4.5.3</td>
<td>50% within 250 miles</td>
<td>3</td>
</tr>
</tbody>
</table>

If specific material cost is not available, assume 45% of total cost (inclusive of materials, labor and equipment) is representative of the material cost.

Only include materials in CSI MasterFormat 1995 Divisions 2-10 in the calculations.

Mechanical, electrical and plumbing components and specialty items such as elevators and FAA equipment shall not be included in this calculation. Only include materials permanently installed in the project. Furniture may be included if it is included consistently in SAM Credit 4.3 Materials Reuse through SAM Credit 4.8 Furniture and Equipment.

NOTE: Materials reused and salvaged that satisfy the requirements of SAM Credit 4.3 may also contribute to this credit.
SUBMITTALS

Include descriptive narrative and calculations in the SAM Checklist.

The submittals include the following:

- A design estimate using the recycled content form in CDA/OMP Specification 01355 – Regional Materials, to be provided by the designer with the SAM Checklist
- A pre-construction estimate using the recycled content form in CDA/OMP Specification 01355 – Regional Materials, to be provided by the contractor
- A final construction estimate using the recycled content form in CDA/OMP Specification 01355 – Regional Materials, to be provided by the contractor with the final SAM Checklist

TECHNOLOGY/STRATEGY

Establish a project goal for locally sourced materials, and identify materials and material suppliers that can achieve this goal. During construction, ensure that the specified local materials are installed and quantify the total percentage of local materials installed. Consider a range of environmental, economic and performance attributes when selecting products and materials.

Standard Practice

- The central location of Chicago makes many materials readily available

Recommended Practice

- Identify and specify materials that are extracted, processed, or manufactured within 500 miles of Chicago. Materials that may contribute toward this goal include but are not limited to: concrete, aggregate, asphaltic products, structural steel, masonry, gypsum wallboard, utility structures, gas and water piping. Note that piping used indoors for building systems should not be included. Reused and salvaged materials also qualify.

Best Available Practice

None
4.0 MATERIALS & RESOURCES

4.6 Rapidly Renewable Materials

1 Point

INTENT

Reduce the use and depletion of finite raw materials and long-cycle renewable materials by replacing them with rapidly renewable materials.

REQUIREMENTS

Use rapidly renewable building materials and products for 2.5% of the total value of all building materials and products used in the project, based on cost. Rapidly renewable building materials and products are made from plants that are typically harvested within a ten-year or shorter cycle.

Only include materials in CSI MasterFormat 1995 Divisions 2-10 in the calculations. Only permanently installed materials should be counted in this credit. Temporary construction materials are counted in SAM Credit 6.3 Sustainable Temporary Construction Materials.

SUBMITTALS

Include descriptive narrative and calculations in the SAM Checklist.

TECHNOLOGY/STRATEGY

- Establish a project goal for rapidly renewable materials and identify products and suppliers that can support achievement of this goal. Consider materials such as bamboo, cotton insulation, agrifiber, linoleum, wheatboard, strawboard and cork. Although not a plant material, also consider wool.

Standard Practice

None

Recommended Practice

- Identify materials and suppliers that can achieve this goal
- Consider materials such as:
  - Poplar OSB
  - Straw board or "agriboard"
  - Bamboo flooring
  - Cork
  - Wool carpets and fabrics
  - Cotton-batt insulation
  - Linoleum flooring
- Sunflower seed board
- Wheat grass or Straw board cabinetry and others.
- Rice husks for concrete

**Best Available Practice**

None

**CASE STUDY**

**Renewable Flooring**

**Shakey’s Pizza Restaurant Flooring – Ontario, Canada**

Shakey’s Pizza on Victoria Gardens Lane houses bamboo flooring, a renewable product that is kinder to the Earth when used over other hardwoods. The restaurant selected the areas near the buffet, bar and restrooms to put in bamboo flooring.

4.0 MATERIALS & RESOURCES

4.7 Certified Wood

1 Point

INTENT

Encourage environmentally responsible forest management.

REQUIREMENTS

Use a minimum of 50% (based on cost) of wood-based materials and products, which are certified in accordance with the Forest Stewardship Council’s principles and criteria, for wood building components. These components include, but are not limited to, structural framing and general dimensional framing, flooring, sub-flooring, wood doors and finishes. Only include materials permanently installed in the project. Furniture may be included, providing it is included consistently in activities concerning SAM Credit 4.8 Furniture and Equipment.

Only permanently installed materials should be counted in this credit. Sustainable temporary construction materials are counted in SAM Credit 6.3 Sustainable Temporary Construction Materials. Furniture may be included if it is included consistently in SAM Credit 4.3 Materials Reuse through SAM Credit 4.8 Furniture and Equipment.

SUBMITTALS

Include descriptive narrative and calculations in the SAM Checklist.

TECHNOLOGY/STRATEGY

Establish a project goal for FSC-certified wood products and identify suppliers that can achieve this goal. During construction, ensure that the FSC-certified wood products are installed and quantify the total percentage of FSC-certified wood products installed.

Standard Practice

None

Recommended Practice

- Identify suppliers that can achieve this goal during construction
- Ensure that the FSC-certified wood products are installed and quantify the total percentage of FSC-certified wood products installed

Best Available Practice

None
CASE STUDY

Certified Wood Floors
DOSA Restaurant – San Francisco Bay, California

Where possible, all new wood framing including plywood for shear walls is Forest Stewardship Council (FSC) certified. Also, booths, banquetttes and custom sofas were constructed with FSC certified wood for their framework. Cabinetry and millwork was fabricated locally using Durapalm plywood and/or FSC certified cherry wood. Low-VOC finishes are used to provide clean and durable surfaces.

http://dosasf.com/fillmore_eco.htm
4.0 MATERIALS & RESOURCES

4.8 Furniture and Equipment

1 Point

INTENT

Reduce the environmental and indoor air quality impacts of the furniture and equipment acquired for use in tenant space.

REQUIREMENTS

A point is awarded to projects that purchase durable goods (i.e. goods that are replaced infrequently or require capital program outlays to purchase) that meet any of the following sustainable requirements:

- Electric-Powered Equipment: Examples of electric-powered equipment include, but are not limited to, office equipment (computers, monitors, copiers, faxes, scanners, and printers), appliances (refrigerators, dishwashers, and water coolers), external power adapters, and televisions and other audiovisual equipment. To achieve a point, 40% of the total purchases of electric-powered equipment (by cost) meet one of the following criteria:
  - The equipment is ENERGY STAR labeled (for product categories with developed specifications).
  - The equipment (either battery or corded) replaces conventional gas-powered equipment. Examples include, but are not limited to, maintenance equipment and vehicles, landscaping equipment and cleaning equipment.

- Furniture: To achieve a point, 40% of the total purchases of furniture (by cost) meet one of the following criteria:
  - Purchased furniture contains at least 10% post-consumer or 20% pre-consumer material.
  - Purchased furniture contains at least 70% material salvaged from off-site sources or outside the airport boundary.
  - Purchased furniture contains at least 70% material salvaged from on-site sources, such as an equipment reuse program or internal reorganization.
  - Purchased furniture contains at least 50% rapidly renewable material.
  - Purchased furniture contains at least 50% FSC-certified wood.
  - Purchased furniture contains at least 50% material harvested and processed or extracted and processed within 500 miles of the project.

Each furniture purchase can receive credit for each sustainable criterion met (i.e. a $100 purchase that contains both 10% post-consumer recycled content and 50% content harvested within 500 miles of the project counts twice in the calculation, for a total of $200 in sustainable purchasing.)
To avoid double counting, furniture materials and electric equipment loads should not be counted in previous SAM categories, such as SAM Credit 4.5 Local/Regional Materials or SAM Credit 3.3 Optimize Energy Performance.

**SUBMITTALS**

Include descriptive narrative and calculations in the SAM Checklist.

**TECHNOLOGY/STRATEGY**

Designers are encouraged to specify items that help achieve the requirements of this credit whenever possible. A continuously updated list of ENERGY STAR labeled equipment can be found on [www.energystar.gov](http://www.energystar.gov). Sustainable furniture can be found from various sources. GREENGUARD Environmental Institute certifies products, including furniture. See [www.greenguard.org](http://www.greenguard.org) for a listing of GREENGUARD certified furniture.

**Standard Practice**

None

**Recommended Practice**

- Specify ENERGY STAR electric equipment and/or sustainable furniture systems, such as GREENGUARD certified furniture

**Best Available Practice**

None

**CASE STUDY**

**Green Restaurant**
Green McDonald’s – Cary, North Carolina

High efficiency and Energy Star rated appliances were installed in the kitchen and the bathrooms were fitted with air blade hand dryers that use 25 percent less energy and take half the time to dry than conventional driers.

[www.skanska-sustainability-case-studies.com/pdfs/60/60_McDonalds_v001.pdf](http://www.skanska-sustainability-case-studies.com/pdfs/60/60_McDonalds_v001.pdf)
4.0 MATERIALS & RESOURCES

4.9 Equipment Salvage and Reuse

1 Point

INTENT

Promote the reuse of equipment and products to reduce demand for virgin materials and reduce waste, thereby lessening impacts associated with the extraction and processing of virgin resources.

REQUIREMENTS

Use salvaged, refurbished or reused equipment and materials, in any appreciable amount on the project OR make available for reuse equipment and materials for other projects.

Mechanical, electrical, plumbing components, and specialty items such as pumps and equipment (CSI Divisions 11 through 16, note: CSI Divisions 2 through 10 are counted in SAM Credit 4.3 Material Reuse) can be included. Include only materials permanently installed in the project. Furniture may be included if it is included consistently in SAM Credit 4.3 Material Reuse through SAM Credit 4.7 Certified Wood.

SUBMITTALS

Include descriptive narrative and calculations in the SAM Checklist.

Indicate the name of the project that will utilize the material, if other than current project or temporary storage locations.

TECHNOLOGY/STRATEGY

The purpose of this credit is to recognize the reuse of items not covered by SAM Credit 4.3 Material Reuse.

Identify opportunities to incorporate salvaged materials into the design, and research potential material suppliers. Consider salvaged materials such as cabinetry and furniture, pumps, motors, electrical panels, fixtures and tanks.

Explore and encourage the development of a virtual warehouse for salvaged and reusable items.

Standard Practice

None

Recommended Practice

- In the process of demolition, reuse or make available mechanical, electrical, and plumbing components
Best Available Practice

None
5.0 INDOOR ENVIRONMENTAL QUALITY

5.1 Prerequisite 1 – Minimum Indoor Air Quality (IAQ) Performance

Required

INTENT

Establish minimum indoor air quality (IAQ) performance to enhance indoor air quality in tenant space, thus contributing to the comfort and well-being of the occupants.

REQUIREMENTS

Meet the minimum requirements of Sections 4 through 7 of ASHRAE 62.1-2010, Ventilation for Acceptable Indoor Air Quality. Mechanical ventilation systems shall be designed using the Ventilation Rate Procedure or the applicable local code, whichever is more stringent. Naturally ventilated spaces shall comply with ASHRAE 62.1-2010, paragraph 5.1.

SUBMITTALS

Include descriptive narrative and calculations in the SAM Checklist.

TECHNOLOGY/STRATEGY

Ventilation systems should meet or exceed the minimum outdoor air ventilation rates as described in the ASHRAE standard. Balance the impacts of ventilation rates on energy use and indoor air quality to optimize for energy efficiency and occupant health. Use the ASHRAE 62 Users Manual for detailed guidance on meeting the referenced requirements.

Standard Practice

- Identify potential IAQ conflicts on the site and locate air intakes away from air contaminant source, which might include loading areas, exhaust fans, and cooling towers
- Locate air intakes in secure areas for protection from potential security breaches
- Chicago Building Code uses ASHRAE 62.1-2004

Recommended Practice

- Design HVAC systems to meet ventilation requirements of the referenced standard
- Evaluate carbon or electrostatic filters
- Provide a security monitoring system and restrict access to outdoor air intakes
- In cases where conflicts with the City of Chicago ventilation code arise, meet the requirements of the more stringent code

Best Available Practice

None
CASE STUDY

Green Restaurant
Green McDonald’s – Cary, North Carolina

An indoor air quality management plan was implemented during construction and a pre-occupancy flush out involving MERV (Minimum Efficiency Reporting Value) 13 air filters was carried out to ensure good air quality prior to occupancy. The ventilation system provides 30 percent more ventilation than the ASHRAE 2004 standards prescribe and carbon dioxide sensors were installed at various heights throughout the building to monitor indoor air quality.

www.skanska-sustainability-case-studies.com/pdfs/60/60_McDonalds_v001.pdf
5.0 INDOOR ENVIRONMENTAL QUALITY

5.2 Prerequisite 2 – Environmental Tobacco Smoke (ETS) Control

Required

INTENT

Prevent or minimize exposure of occupants, indoor surfaces, and ventilation air distribution systems to Environmental Tobacco Smoke (ETS).

REQUIREMENTS

OPTION 1

- Prohibit smoking within the tenant space
- Smoking must be prohibited within 25 feet of entryways, outdoor air intakes and operable windows. Provide signage to allow smoking in designated areas, prohibit smoking in designated areas or prohibit smoking on the entire property.

OR

OPTION 2

- Prohibit smoking in the tenant space except in designated smoking areas
- Smoking must be prohibited within 25 feet from entries, outdoor air intakes and operable windows
- Locate designated smoking rooms to effectively contain, capture and remove ETS from the tenant space. At a minimum, the smoking room must be directly exhausted to the outdoors with no re-circulation of ETS-containing air to the non-smoking area of the tenant space, and enclosed with impermeable deck-to-deck partitions. With the doors to the smoking room closed, operate exhaust sufficient to create a negative pressure with respect to the adjacent spaces of at least an average of 5 Pa (0.02 inches of water gauge) and with a minimum of 1 Pa (0.004 inches of water gauge).
- Performance of the smoking room differential air pressures shall be verified by conducting 15 minutes of measurement, with a minimum of one measurement every 10 seconds, of the differential pressure in the smoking room with respect to each adjacent area and in each adjacent vertical chase with the doors to the smoking room closed. The testing will be conducted with each space configured for worst case conditions of transport of air from the smoking rooms to adjacent spaces with the smoking rooms' doors closed to the adjacent spaces.

NOTE: It is acceptable to not designate any smoking areas and to provide signage to indicate the prohibition of smoking on the property to satisfy the prerequisite requirements.
SUBMITTALS
Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY
Prohibit smoking or effectively control the ventilation air in smoking rooms.

Standard Practice
- The State of Illinois prohibits smoking in almost all public spaces and workspaces
- The Chicago City Code Section 7-32-010 prohibits smoking within 15-feet of entry ways

Recommended Practice
- Require all areas to be non-smoking

Best Available Practice
- Where applicable, provide a designated smoking room designed to effectively contain, capture and remove ETS from the tenant space. At a minimum, the smoking room must be directly exhausted to the outdoors with no recirculation of ETS-mixed air to the non-smoking area of the tenant space, enclosed with impermeable deck-to-deck partitions and operated at negative pressure.
- Performance of the smoking rooms shall be verified by using tracer gas testing methods as described in the ASHRAE Standard 129-1997. Acceptable exposure in non-smoking areas is defined as less than 1% of the tracer gas concentration in the smoking room detectable in the adjoining non-smoking areas. Smoking room testing as described in ASHRAE Standard 129-1997, Section 8, is required in the contract documents and critical smoking facility systems testing results must be included in the commissioning plan and report or as a separate document.
5.0 INDOOR ENVIRONMENTAL QUALITY

5.3.1 Construction IAQ Management Plan: During Construction

1 Point

INTENT

Reduce indoor air quality problems resulting from the construction/renovation process in order to help sustain the comfort and well-being of construction workers and tenant space occupants.

REQUIREMENTS

Develop and implement an Indoor Air Quality (IAQ) Management Plan for the construction and pre-occupancy phases of the tenant space as follows:

- During construction meet or exceed the recommended Control Measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, 1995, Chapter 3
- Protect stored on-site or installed absorptive materials from moisture damage

If permanently installed air handlers are used during construction, filtration media with a Minimum Efficiency Reporting Value (MERV) of 8 shall be used at each return air grille, as determined by ASHRAE 52.2-1999. Replace all filtration media immediately prior to occupancy.

SUBMITTALS

Include descriptive narrative in the SAM Checklist including IAQ Management Plan and detailed photographic evidence.

TECHNOLOGY/STRATEGY

Adopt an IAQ management plan to protect the HVAC system during construction, control pollutant sources and interrupt contamination pathways. Sequence the installation of materials to avoid contamination of absorptive materials such as insulation, carpeting, ceiling tile and gypsum wallboard. Coordinate SAM Credits 5.3 Construction IAQ Management Plan and 5.5 Indoor Chemical and Pollutant Source Control to determine the appropriate specifications and schedules for filtration media.

If possible, avoid using permanently installed air handlers for temporary heating/cooling during construction. Consult the LEED 2009 Green Building and Construction Reference Guide for more detailed information on how to ensure the well-being of construction workers and occupants if permanently installed air handlers must be used during construction.

Standard Practice

None
Recommended Practice

- During construction meet or exceed the recommended Design Approaches of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guideline for Occupied Buildings under Construction, 1995, Chapter 3
- Protect stored on-site or installed absorptive materials from moisture damage
- Do not operate or protect air-handling equipment during construction from dust
- Sequence the installation of materials to avoid contamination of absorptive materials such as insulation, carpeting, ceiling tile and gypsum wallboard
- Minimize the use of air handlers during construction. If air handlers are used during construction, filtration media with a Minimum Efficiency Reporting Value (MERV) of 8 must be used at each return air grill, as determined by ASHRAE 52.2-1999.

Best Available Practice

None

CASE STUDIES

Construction Mitigation Program
Oakland International Airport – Oakland, California

During the airport’s Terminal Improvement Program, a number of mitigation efforts were implemented to reduce the construction impact on contractors, tenants, and travelers. A major component of these efforts involves a comprehensive checklist enforcing compliance with these practices. This checklist includes the evaluation of existing measures, the identification of measures that may require revision, and development of recommendations for corrective action.

www.oaklandairport.com/noise/environmental_construct.shtml

Green Restaurant
Green McDonald’s – Cary, North Carolina

An indoor air quality management plan was implemented during construction and a pre-occupancy flush out involving MERV (Minimum Efficiency Reporting Value) 13 air filters was carried out to ensure good air quality prior to occupancy. The ventilation system provides 30 percent more ventilation than the ASHRAE (American Society of Heating, Refrigerating and Air Conditioning Engineers) 2004 standards prescribe and carbon dioxide sensors were installed at various heights throughout the building to monitor indoor air quality.

www.skanska-sustainability-case-studies.com/pdfs/60/60_McDonalds_v001.pdf
5.0 INDOOR ENVIRONMENTAL QUALITY

5.3.2 Construction IAQ Management Plan: Before Occupancy

1 Point

INTENT

Reduce indoor air quality problems resulting from the construction/renovation process in order to help sustain the comfort and well-being of construction workers and tenant space occupants.

REQUIREMENTS

OPTION 1 — Flush-Out

After construction ends, prior to occupancy and with all interior finishes installed, perform a flush-out by supplying a total air volume of 14,000 cu.ft of outdoor air per sq.ft of floor area while maintaining an internal temperature of at least 60 degrees F and relative humidity no higher than 60%.

OR

If occupancy is desired prior to completion of the flush-out, the space may be occupied following delivery of a minimum of 3,500 cu.ft of outdoor air per sq.ft of floor area to the space. Once a space is occupied, it shall be ventilated at a minimum rate of 0.30 cfm/sq.ft of outside air or the design minimum outside air rate determined section 5.1, whichever is greater. During each day of the flush-out period, ventilation shall begin a minimum of three hours prior to occupancy and continue during occupancy. These conditions shall be maintained until a total of 14,000 cu.ft/sq.ft of outside air has been delivered to the space.

NOTE: All finishes must be installed prior to flush-out.

OR

OPTION 2 — Air Testing

- Demonstrate that the contaminant maximum concentrations listed below are not exceeded.

<table>
<thead>
<tr>
<th>CONTAMINANT</th>
<th>MAXIMUM CONCENTRATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>50 parts per billion</td>
</tr>
<tr>
<td>Particulates (PM10)</td>
<td>50 micrograms per cubic meter</td>
</tr>
<tr>
<td>Total Volatile Organic Compounds (TVOC)</td>
<td>500 micrograms per cubic meter</td>
</tr>
</tbody>
</table>
CONTAMINANT MAXIMUM CONCENTRATION
4-Phenylcyclohexene (4-PCH)* 6.5 micrograms per cubic meter
Carbon Monoxide (CO) 9 part per million and no greater than 2 parts per million above outdoor levels

* This test is only required if carpets and fabrics with styrene butadiene rubber (SBR) latex backing material are installed as part of the base building systems.

- For each sampling point where the maximum concentration limits are exceeded conduct additional flush-out with outside air and retest the specific parameter(s) exceeded to indicate the requirements are achieved. Repeat procedure until all requirements have been met. When retesting non-complying areas, take samples from the same locations as in the first test.
- The air sample testing shall be conducted as follows:
  - All measurements shall be conducted prior to occupancy, but during normal occupied hours and with the ventilation system starting at the normal daily start time and operated at the minimum outside air flow rate for the occupied mode throughout the test.
  - All interior finishes must be installed, including but not limited to millwork, doors, paint, carpet and acoustic tiles. Movable furnishings such as workstations and partitions should be in place for the testing, although it is not required.
  - The number of sampling locations will depend on the size of the tenant space and number of ventilation systems. For each portion of the tenant space served by a separate ventilation system, the number of sampling points shall not be less than one per 25,000 sq.ft or for each contiguous floor area, whichever is larger, and include areas with the least ventilation and greatest presumed source strength.
  - Air samples must be collected between 3 feet and 6 feet from the floor to represent the breathing zone of occupants, and over a minimum 4-hour period.

SUBMITTALS
Include descriptive narrative in the SAM Checklist including IAQ Management Plan and detailed photographic evidence.

TECHNOLOGY/STRATEGY
Prior to occupancy, perform a flush-out or test the air contaminant levels in the tenant space. The flush-out is often used where occupancy is not required immediately upon substantial completion of construction. IAQ testing can minimize schedule impacts but may be more costly.
The intent of this credit is to eliminate indoor air quality problems that occur as a result of construction. Architectural finishes used in tenant build-outs constitute a significant source of air pollutants, and must be addressed in order to qualify for this credit.

**Standard Practice**

None

**Recommended Practice**

- Replace all filtration media immediately prior to occupancy. Filtration media shall have a Minimum Efficiency Reporting Value (MERV) of 13, as determined by ASHRAE 52.2-1999 for media installed at the end of construction.

**Best Available Practice**

- After construction ends and prior to occupancy, conduct a two-week flush out with 100% fresh air

**CASE STUDY**

**Green Restaurant**

**Green McDonald’s – Cary, North Carolina**

An indoor air quality management plan was implemented during construction and a pre-occupancy flush out involving MERV (Minimum Efficiency Reporting Value) 13 air filters was carried out to ensure good air quality prior to occupancy. The ventilation system provides 30 percent more ventilation than the ASHRAE (American Society of Heating, Refrigerating and Air Conditioning Engineers) 2004 standards prescribe and carbon dioxide sensors were installed at various heights throughout the building to monitor indoor air quality.

[www.skanska-sustainability-case-studies.com/pdfs/60/60_McDonalds_v001.pdf](http://www.skanska-sustainability-case-studies.com/pdfs/60/60_McDonalds_v001.pdf)
5.0 INDOOR ENVIRONMENTAL QUALITY

5.4.1 Low-Emitting Materials: Adhesives and Sealants

1 Point

INTENT

Reduce the quantity of indoor air contaminants that are odorous, irritating and/or harmful to the comfort and well-being of installers and occupants.

REQUIREMENTS

All adhesives and sealants used within the tenant space (i.e., inside of the weatherproofing system and applied on-site) must comply with the following requirements as applicable to the project scope:

- Adhesives, Sealants and Sealant Primers: South Coast Air Quality Management District (SCAQMD) Rule #1168. VOC limits are listed in the table below and correspond to an effective date of July 1, 2005 and rule amendment date of January 7, 2005.

<table>
<thead>
<tr>
<th>Architectural Applications</th>
<th>VOC Limit [g/L less H₂O]</th>
<th>Specialty Applications</th>
<th>VOC Limit [g/L less H₂O]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indoor Carpet Adhesives</td>
<td>50</td>
<td>PVC Welding</td>
<td>510</td>
</tr>
<tr>
<td>Carpet Pad Adhesives</td>
<td>50</td>
<td>CPVC Welding</td>
<td>490</td>
</tr>
<tr>
<td>Wood Flooring Adhesives</td>
<td>100</td>
<td>ABS Welding</td>
<td>325</td>
</tr>
<tr>
<td>Rubber Floor Adhesives</td>
<td>60</td>
<td>Plastic Cement Welding</td>
<td>250</td>
</tr>
<tr>
<td>Subfloor Adhesives</td>
<td>50</td>
<td>Adhesive Primer for Plastic</td>
<td>550</td>
</tr>
<tr>
<td>Ceramic Tile Adhesives</td>
<td>65</td>
<td>Contact Adhesives</td>
<td>80</td>
</tr>
<tr>
<td>VCT &amp; Asphalt Adhesives</td>
<td>50</td>
<td>Special Purpose Contact Adhesive</td>
<td>250</td>
</tr>
<tr>
<td>Drywall &amp; Panel Adhesives</td>
<td>50</td>
<td>Structural Wood Member Adhesive</td>
<td>140</td>
</tr>
<tr>
<td>Cove Base Adhesives</td>
<td>50</td>
<td>Sheet Applied Rubber Lining Operations</td>
<td>850</td>
</tr>
<tr>
<td>Multipurpose Construction Adhesives</td>
<td>70</td>
<td>Top &amp; Trim Adhesive</td>
<td>250</td>
</tr>
<tr>
<td>Structural Glazing Adhesives</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substrate Specific Applications</th>
<th>VOC Limit [g/L less H₂O]</th>
<th>Sealants VOC Limit</th>
<th>VOC Limit [g/L less H₂O]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metal to Metal</td>
<td>30</td>
<td>Architectural</td>
<td>250</td>
</tr>
<tr>
<td>Plastic Foams</td>
<td>50</td>
<td>Nonmembrane Roof</td>
<td>300</td>
</tr>
<tr>
<td>Porous Material (except wood)</td>
<td>50</td>
<td>Roadway</td>
<td>250</td>
</tr>
<tr>
<td>Wood</td>
<td>30</td>
<td>Single-Ply Roof Membrane</td>
<td>450</td>
</tr>
<tr>
<td>Fiberglass</td>
<td>80</td>
<td>Other</td>
<td>420</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sealant Primers</th>
<th>VOC Limit [g/L less H₂O]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architectural Non Porous</td>
<td>250</td>
</tr>
<tr>
<td>Architectural Porous</td>
<td>775</td>
</tr>
<tr>
<td>Other</td>
<td>750</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Aerosol Adhesives:</th>
<th>VOC weight [g/L minus water]</th>
</tr>
</thead>
<tbody>
<tr>
<td>General purpose mist spray</td>
<td>65% VOCs by weight</td>
</tr>
<tr>
<td>General purpose web spray</td>
<td>55% VOCs by weight</td>
</tr>
<tr>
<td>Special purpose aerosol adhesives (all types)</td>
<td>70% VOCs by weight</td>
</tr>
</tbody>
</table>

**SUBMITTALS**

Include descriptive narrative in the SAM Checklist.

**TECHNOLOGY/STRATEGY**

Specify low-VOC materials in construction documents. Ensure that VOC limits are clearly stated in each section of the specifications where adhesives and sealants are addressed. Common products to evaluate include: general construction adhesives, flooring adhesives, fire-stopping sealants, caulking, duct sealants, plumbing adhesives, and cove base adhesives. Review product cut sheets, MSD sheets, signed attestations or other official literature from the manufacturer clearly identifying the VOC contents or compliance with referenced standards.

**Standard Practice**

- Low VOC materials are becoming more common in the market place

**Recommended Practice**

- Specify Low-VOC adhesives and sealants
- Consider the use of air scrubbers during the installation and curing of adhesives and sealers when used inside the passenger terminal or other public spaces

**Best Available Practice**

- Specify that all shop finished material meet the VOC emission requirements. Materials to consider are:
  - Primed steel
  - Finished metals including aluminum
  - Finished millwork
  - Finished steel and wood doors and windows
CASE STUDY

Non-Voc Material
DOSA Restaurant – San Francisco Bay, California

No-VOC epoxy flooring/wall coatings are used throughout back-of-house areas for a clean durable finish. Unlike typical epoxy coatings or fiberglass-reinforced panels (FRP), these eco-friendly epoxy formulas will not off-gas or contribute to VOC's in the interior environment.

http://dosasf.com/fillmore_eco.htm
5.0 INDOOR ENVIRONMENTAL QUALITY

5.4.2 Low-Emitting Materials: Paints and Coatings

1 Point

INTENT

Reduce the quantity of indoor air contaminants that are odorous, irritating and/or harmful to the comfort and well-being of installers and occupants.

REQUIREMENTS

Paints and coatings used within the tenant space (i.e., inside of the weatherproofing system and applied on-site) must comply with the following criteria as applicable to the project scope:

  - Flats: 50 g/L
  - Non-Flats: 150 g/L


- Clear wood finishes, floor coatings, stains, and shellacs applied to interior elements must not exceed the VOC content limits established in South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coatings, rules in effect on January 1, 2004.
  - Clear wood finishes: varnish 350 g/L; lacquer 550 g/L
  - Floor coatings: 100 g/L
  - Sealers: waterproofing sealers 250 g/L; sanding sealers 275 g/L; all other sealers 200 g/L
  - Shellacs: Clear 730 g/L; pigmented 550 g/L
  - Stains: 250 g/L

SUBMITTALS

Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

Specify low-VOC paints and coatings in construction documents. Ensure that VOC limits are clearly stated in each section of the specifications where paints and coatings are addressed. Track the VOC content of all interior paints and coatings during construction.
Standard Practice
None

Recommended Practice
- Specify Low-VOC field applied paints and coating
- Consider the use of air scrubbers during the installation and curing of paints and coatings when used inside the terminal

Best Available Practice
- Specify that all shop finished material meet the VOC emission requirements. Materials to consider are:
  - Primed steel
  - Finished metals including aluminum
  - Finished millwork
  - Finished steel and wood doors and windows

CASE STUDY
Low VOC Paints
DOSA Restaurant – San Francisco Bay, California

All paints are specified throughout the interior are low-VOC, low-odor formulas. Its washable finish in any sheen, quick dry-time, and seamless touch-up means a long-lasting paint finish. The finish on cabinetry is also low-VOC.

http://dosasf.com/fillmore_eco.htm
5.0 INDOOR ENVIRONMENTAL QUALITY

5.4.3 Low-Emitting Materials: Flooring Systems

1 Point

INTENT

Reduce the quantity of indoor air contaminants that are odorous, irritating and/or harmful to the comfort and well-being of installers and occupants.

REQUIREMENTS

All flooring must comply with the following as applicable to the project scope:

- All carpet installed shall meet the testing and product requirements of the Carpet and Rug Institute’s Green Label Plus program
- All carpet cushion installed shall meet the requirements of the Carpet and Rug Institute Green Label program
- All carpet adhesive shall meet the requirements of SAM Credit 5.4.1 Low-Emitting Materials: Adhesives and Sealants VOC limit of 50 g/L
- All of the hard surface flooring must be certified as compliant with the FloorScore® standard (current as of the date of this Rating System, or more stringent version) by an independent third party. Flooring products covered by FloorScore® include vinyl, linoleum, laminate flooring, wood flooring, ceramic flooring, rubber flooring, wall base, and associated sundries.
- An alternative compliance path using FloorScore® is acceptable for credit achievement according to the following stipulations. 100% of the non-carpet finished flooring must be FloorScore® certified, and it must comprise, at minimum, at least 25% of the finished floor area. Potential examples of unfinished flooring include floors in mechanical rooms, electrical rooms, and elevator service rooms.
- Concrete, wood, bamboo, and cork floor finishes such as sealer, stain and finish must meet the requirements of South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coatings, rules in effect on January 1, 2004. VOC limits are listed below.
  - Clear wood finishes: varnish 350 g/L; lacquer 550 g/L
  - Floor coatings: 100 g/L
  - Sealers: waterproofing sealers 250 g/L; sanding sealers 275 g/L; all other sealers 200 g/L
  - Shellacs: Clear 730 g/L; pigmented 550 g/L
  - Stains: 250 g/L
• Tile setting adhesives and grout must meet South Coast Air Quality Management District (SCAQMD) Rule #1168. VOC limits are listed below and correspond to an effective date of July 1, 2005 and rule amendment date of January 7, 2005.
  o  - Ceramic tile adhesive: 65 g/L
  o  - Grout and mortar: 250 g/L

• All flooring products will meet the testing and product requirements of the California Department of Health Services Standard Practice for The Testing Of Volatile Organic Emissions From Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda

SUBMITTALS

Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

Clearly specify requirements for product testing and/or certification in the construction documents. Select products that are either certified under the Green Label Plus program or for which testing has been done by qualified independent laboratories in accordance with the appropriate requirements.

The Green Label Plus program for carpets and its associated VOC emission criteria in micrograms per square meter per hour, along with information on testing method and sample collection developed by the Carpet & Rug Institute (CRI) in coordination with California’s Sustainable Building Task Force and the California Department of Health Services (DHS), are described in Section 9, Acceptable Emissions Testing for Carpet, DHS Standard Practice CA/DHS/EHLB/R-174, dated 07/15/04. This document is available at:

(also published as Section 01350 Section 9 [dated 2004] by the Collaborative for High Performance Schools [www.chps.net]).

FloorScore® is a voluntary, independent certification program that tests and certifies hard surface flooring and associated products for compliance with criteria adopted in California for indoor air emissions of Volatile Organic Compounds (VOCs) with potential health effects. The program uses a small-scale chamber test protocol and incorporates VOC emissions criteria developed by the California Department of Health Services, which are widely known as Section 1350.

Standard Practice

None

Recommended Practice

• Specify Low-VOC carpet systems. Ensure that VOC limits are clearly stated where carpet systems are addressed. Be attentive to carpet installation requirements.
Best Available Practice

- Consider the use of air scrubbers during the installation and curing of carpet or hard surface floor system adhesives and sealers when used inside the terminal
- Specify that all shop finished material meet the VOC emission requirements. Materials to consider are:
  - Primed steel
  - Finished metals including aluminum

CASE STUDY

Low-Emitting Flooring
DOSA Restaurant – San Francisco Bay, California

Porcelain tile flooring that is produced in a closed-loop process that recycles 100% of raw material and water wastes was specified throughout the dining, bar, and lounge areas. The porcelain contains no added VOC’s. With the proper use and maintenance these materials help reduce overall off-gassing in efforts to meet interior air quality standards. No sealants or waxes are required that could add harmful VOC’s to a building. (Most quarried stones must be sealed and waxed to maintain appearance). Tile in the employee bathroom is Crossville EcoCycle made from 40% recycled ceramic. Also, Plyboo Neopolitan Strand bamboo flooring, which is used throughout the restaurant, is not only a beautiful, unique look- its durability is suited for high-traffic areas with hardness twice that of red oak; it’s the hardest bamboo flooring on the market. The bamboo flooring is 100% bamboo with no fillers and it is urea-formaldehyde-free (PlybooPure), containing no VOC’s.

http://dosasf.com/fillmore_eco.htm
5.0 INDOOR ENVIRONMENTAL QUALITY

5.4.4 Low-Emitting Materials: Composite Wood and Agrifiber Products

1 Point

INTENT

Reduce the quantity of indoor air contaminants that are odorous, irritating and/or harmful to the comfort and well-being of installers and occupants.

REQUIREMENTS

Composite wood and agrifiber products used on the interior of the tenant space (defined as inside of the weatherproofing system) shall contain no added urea-formaldehyde resins. Laminating adhesives used to fabricate on-site and shop-applied composite wood and agrifiber assemblies shall contain no added urea-formaldehyde resins.

Composite wood and agrifiber products are defined as: particleboard, medium density fiberboard (MDF), plywood, wheatboard, strawboard, panel substrates and door cores. Materials considered fit-out, furniture, and equipment (FF&E) are not considered base building elements and are not included.

SUBMITTALS

Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

Specify wood and agrifiber products that contain no added urea-formaldehyde resins. Specify laminating adhesives for field and shop applied assemblies that contain no added urea/formaldehyde resins. Review product cut sheets, MSD sheets, signed attestations or other official literature from the manufacturer.

Standard Practice

None

Recommended Practice

- Specify wood and agrifiber products with no added urea-formaldehyde resins

Best Available Practice

- Specify that all shop finished material meet the VOC emission requirements. Materials to consider are:
  - Primed steel
  - Finished metals including aluminum
  - Finished millwork
  - Finished steel and wood doors and windows
5.0 INDOOR ENVIRONMENTAL QUALITY

5.5 Indoor Chemical and Pollutant Source Control

1 Point

INTENT

Minimize exposure of occupants to potentially hazardous particulates and chemical pollutants.

REQUIREMENTS

Design to minimize and control pollutant entry into tenant spaces and later cross-contamination of regularly occupied areas:

- Sufficiently exhaust each space where hazardous gases or chemicals may be present or used (including housekeeping/laundry areas and copying/printing rooms) to create negative pressure with respect to adjacent spaces with the doors to the room closed. For each of these spaces, provide self-closing doors and deck to deck partitions or a hard lid ceiling. The exhaust rate shall be at least 0.50 cfm/sq.ft., with no air recirculation. The pressure differential with the surrounding spaces shall be at least 5 Pa (0.02 inches of water gauge) on average and 1 Pa (0.004 inches of water) at a minimum when the doors to the rooms are closed.

- In mechanically ventilated spaces, provide regularly occupied areas of the tenant space with new air filtration media prior to occupancy that provides a Minimum Efficiency Reporting Value (MERV) of 13 or better. Filtration should be applied to process both return and outside air that is to be delivered as supply air.

- Provide containment drains plumbed for appropriate disposal of hazardous liquid wastes in places where water and chemical concentrate mixing occurs for laboratory purposes.

SUBMITTALS

Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

Design facility cleaning and maintenance areas with isolated exhaust systems for contaminants. Maintain physical isolation from the rest of the regularly occupied areas of the tenant space. Install high-level filtration systems in air handling units processing both return air and outside supply air. Ensure that air handling units can accommodate required filter sizes and pressure drops.

Standard Practice

None
Recommended Practice

- Where chemical use occurs (including housekeeping areas and copying/printing rooms), provide segregated areas with deck to deck partitions with separate outside exhaust at a rate of at least 0.50 cubic feet per minute per square foot, no air re-circulation and maintaining a negative pressure
- Provide drains plumbed for appropriate disposal of liquid waste in spaces where water and chemical concentrate mixing occurs
- Select finish materials and assemblies that resist mold growth
- Designate central locations in the tenant space for storage of concentrated cleaning chemicals and other pollutant sources

Best Available Practice

- Design separate exhaust and plumbing systems for rooms or areas with contaminants to achieve physical isolation from the rest of the tenant space
5.0 INDOOR ENVIRONMENTAL QUALITY

5.6.1 Controllability of Systems: Lighting

1 Point

INTENT

Provide a high level of lighting system control by individual occupants or by specific groups in multi-occupant spaces (e.g. classrooms and conference areas) to promote the productivity, comfort and well-being of occupants.

REQUIREMENTS

Provide individual lighting controls for 90% (minimum) of the tenant space occupants to enable adjustments to suit individual task needs and preferences.

AND

Provide lighting system controls for all shared multi-occupant spaces to enable lighting adjustment that meets group needs and preferences.

SUBMITTALS

Include descriptive narrative and calculations in the SAM Checklist.

TECHNOLOGY/STRATEGY

Design the tenant space with occupant controls for lighting. Strategies to consider include lighting controls and task lighting. Integrate lighting systems controllability into the overall lighting design, providing ambient and task lighting while managing the overall energy use of the space.

Standard Practice

None

Recommended Practice

- Use motion-activated lighting
- Design lighting control systems to take advantage of daylight harvesting to reduce artificial lighting when adequate daylight is available
- Design areas to provide a variety of levels of light and sound in different areas simultaneously
- Provide task lighting or more light switching zones in office areas

Best Available Practice

None
CASE STUDY

Occupant Lighting Controls
Hertz Corporate – North America and Europe

In 2008, Hertz undertook a number of initiatives to manage and reduce energy usage at its locations in North America and Europe. Initial efforts have focused on Quick Hitters that are energy initiatives that can immediately address interior/exterior lighting, HVAC, and process loads (car wash, vacuum systems). Examples include HVAC Thermostat controls, LED exit signs, lighting occupancy controls, photocells, and time clocks.

5.0 INDOOR ENVIRONMENTAL QUALITY

5.6.2 Controllability of Systems: Thermal Comfort

1 Point

INTENT

Provide a high level of thermal comfort system control by individual occupants or by specific groups in multi-occupant spaces (i.e. classrooms or conference areas) to promote the productivity, comfort and well-being of occupants.

REQUIREMENTS

Provide individual comfort controls for 50% (minimum) of the occupants to enable adjustments to suit individual task needs and preferences. Operable windows can be used in lieu of comfort controls for occupants of areas that are 20 feet inside of and 10 feet to either side of the operable part of the window. The areas of operable window must meet the requirements of ASHRAE 62.1-2010 paragraph 5.1 Natural Ventilation.

AND

Provide comfort system controls for all shared multi-occupant spaces to enable adjustments to suit group needs and preferences.

Conditions for thermal comfort are described in ASHRAE Standard 55-2004 to include the primary factors of air temperature, radiant temperature, air speed and humidity.

SUBMITTALS

Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

Design the tenant space and systems with comfort controls to allow adjustments to suit individual needs or those of groups in shared spaces. ASHRAE Standard 55-2004 identifies the factors of thermal comfort and a process for developing comfort criteria for tenant spaces that suit the needs of the occupants involved in their daily activities. Control strategies can be developed to expand on the comfort criteria to allow adjustments to suit individual needs and preferences.

These strategies may involve system designs incorporating operable windows, hybrid systems integrating operable windows and mechanical systems, or mechanical systems alone. Individual adjustments may involve individual thermostat controls, local diffusers at floor, desk or overhead levels, or control of individual radiant panels, or other means integrated into the overall space, thermal comfort systems, and energy systems design. In addition, designers should evaluate the closely tied interactions between thermal comfort (as required by ASHRAE Standard 55-2004) and acceptable indoor air quality (as required by ASHRAE Standard 62.1-2010, whether natural or mechanical ventilation).
Standard Practice

None

Recommended Practice

- Provide individual thermal controls for occupants

Best Available Practice

- Provide underfloor air distribution systems with individual diffusers for office spaces
5.0 INDOOR ENVIRONMENTAL QUALITY

5.7.1 Thermal Comfort: Design

1 Point

INTENT

Provide a comfortable thermal environment that supports the productivity and well-being of occupants.

REQUIREMENTS

Design HVAC systems and the tenant space to meet the requirements of ASHRAE Standard 55-2004, Thermal Comfort Conditions for Human Occupancy. Demonstrate design compliance in accordance with the Section 6.1.1 Documentation.

SUBMITTALS

Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

Establish comfort criteria per ASHRAE Standard 55-2004 that support the desired quality and occupant satisfaction with tenant space performance. Design space and systems with the capability to deliver performance to the comfort criteria under expected environmental and use conditions. Evaluate air temperature, radiant temperature, air speed, and relative humidity in an integrated fashion and coordinate these criteria with SAM Credit 5.1 Minimum Indoor Air Quality Performance.

Standard Practice

None

Recommended Practice

None

Best Available Practice

- Provide ceiling fans or natural ventilation to increase air movement
- Provide humidification in HVAC systems serving office
- For spaces with humidification, install humidistats in addition to thermostats
5.0 INDOOR ENVIRONMENTAL QUALITY

5.7.2 Thermal Comfort: Employee Verification

1 Point (awarded only if credit is earned toward SAM Credit 5.7.1)

INTENT

Provide for the assessment of tenant space thermal comfort over time.

REQUIREMENTS

Agree to implement a thermal comfort survey of employees within a period of 6 to 18 months after occupancy. This survey should collect anonymous responses about thermal comfort in the tenant space including an assessment of overall satisfaction with thermal performance and identification of thermal comfort-related problems. Agree to develop a plan for corrective action if the survey results indicate that more than 20% of occupants are dissatisfied with thermal comfort in the space. This plan should include measurement of relevant environmental variables in problem areas in accordance with ASHRAE Standard 55-2004.

Thermal Comfort: Employee Verification is contingent on the successful completion and award of the credit -Thermal Comfort: Design.

SUBMITTALS

Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

ASHRAE Standard 55-2004 provides guidance for establishing thermal comfort criteria and the documentation and validation of performance to the criteria. While the standard is not intended for purposes of continuous monitoring and maintenance of the thermal environment, the principles expressed in the standard provide a basis for design of monitoring and corrective action systems.

Standard Practice

None

Recommended Practice

None

Best Available Practice

None
CASE STUDY

Benchmarking Building Quality
University of California – Berkley, California

At the Center for Built Environment at the University of California, Berkeley, they created a standardized environmental quality assessment survey that measures employees’ satisfaction with their workplace environment quickly and at a low price. A standard set of core questions is used to measure satisfaction with environmental factors such as indoor air quality, thermal comfort, and acoustics. The survey has been used to evaluate the performance of 22 buildings in the United States.

5.0 INDOOR ENVIRONMENTAL QUALITY

5.8 Noise Transmission

1 Point

INTENT

Limit noise levels in noise-sensitive, occupied spaces such as terminals and offices to increase employee productivity and passenger comfort.

REQUIREMENTS

Maintain predicted noise levels in all passenger terminal areas to a Noise Criteria (NC) below 40 and offices and conference rooms below NC30.

OR

Specify exterior glazing with a Sound Transmission Class (STC) of 35 or better per ASTM E413 and ASTM E1332 for all regularly occupied spaces.

SUBMITTALS

Include descriptive narrative in the SAM Checklist and show calculations indicating that NC levels are met in all critical areas or submit product data sheets for exterior glazing meeting the STC requirements.

TECHNOLOGY/STRATEGY

There are a number of design techniques that can influence the acoustical quality of indoor spaces. Generally, these can include improved glazing and partitions or less costly design practices such as tenant space and furniture orientation.

Standard Practice

- Design spaces in such a way as to orient noise sensitive areas away from major noise sources
- Use sound dampening glazing and wall partitions
- Locate copy machines and printers in separate rooms

Recommended Practice

- For office environments, specify acoustical ceiling with an appropriate noise reduction coefficient to meet the requirements of this credit
- Choose cubicle partitions that are at least 5 feet tall to provide a sound barrier to workstation occupants
- Insulate wall cavities for noise sensitive spaces and extension of partition walls to the structural deck
Best Available Practice

- Specify laminated glazing to reduce noise transmission for normally occupied spaces
6.0  CONSTRUCTION PRACTICES

6.1.1  Alternative Transportation During Construction: Staging Area

1 Point

INTENT

Reduce emissions due to construction vehicles by minimizing the amount of traffic to the construction site.

REQUIREMENTS

To meet this credit, the project must have a staging area where employees congregate prior to entering the project site, if applicable,

AND

Use multiple occupancy vehicles to access the project site from the centralized staging area.

SUBMITTALS

A staging area, with contractor trailer, should be included in the design drawings and drawing number referenced on the SAM Checklist. The contractor must state that the staging area, with contractor trailer, was present and list or describe how employees accessed the project site (e.g., pooled in trucks or shuttle bus) in the narrative.

TECHNOLOGY/STRATEGY

Standard Practice

- Most projects typically use heavier duty vehicles such as pick-up trucks or SUVs to provide workers with access to the project site. In some cases, for larger projects, buses are used.

Recommended Practice

- Establish procedures and make vehicles available for employee car pooling to the project site. For maximum benefit, shuttle buses or vans are preferred over lower occupancy vehicles such as pick-up trucks.

Best Available Practice

- Use fuel-efficient vehicles for car pooling employees to the project site
6.0 CONSTRUCTION PRACTICES

6.1.2 Alternative Transportation During Construction: Low-Emitting & Fuel-Efficient Vehicles, 10%

1 Point

INTENT

Reduce emissions from on-road construction vehicles (e.g., foreman pickups, shuttle buses).

REQUIREMENTS

The contractor must use fuel efficient and low-emitting vehicles for at least 10% of all on-road, contractor-owned construction vehicles that access the project site more than five calendar days per month. To meet this requirement, the vehicles must be listed as SmartWay certified vehicles according to the EPA Green Vehicle Guide. The listing of SmartWay certified vehicles can be found at: www.epa.gov/greenvehicles.

SUBMITTALS

For the sustainable construction checklist, the contractor must submit a list of its on-road vehicles and identify those which meet the EPA’s SmartWay certification as described above.

TECHNOLOGY/STRATEGY

Each model year, EPA rates every new car, truck, and SUV for greenhouse gas and smog-forming emissions on scales of 1-10. To earn the SmartWay designation, a vehicle must receive a combined score from both scales that is much better than the average vehicle. SmartWay Elite certification is given to only those vehicles that attain the highest scores on both scales. The thresholds for the combined scores needed to achieve a SmartWay certification vary by vehicle model year. The Air Pollution (or Smog) Score is based on the government emission standards for which the vehicle was certified to comply with and reflects vehicle tailpipe emissions that contribute to local and regional air pollution, creating problems such as haze, and health issues. The Greenhouse Gas score reflects fuel lifecycle emissions of carbon dioxide (CO₂) and other greenhouse gases. A partial list of heavier duty vehicles (pick-ups and SUVs) that meet these requirements are shown below for reference:

<table>
<thead>
<tr>
<th>Year/Vehicle Make/Model (Type)</th>
<th>Engine/Transmission/Fuel</th>
<th>Air Pollution Score</th>
<th>Greenhouse Gas Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008 GMC Canyon Crew Cab (Pick-Up)</td>
<td>5.3L/Auto 2WD/Gasoline</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>2007 Chevrolet Silverado K15 (Pick-Up)</td>
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<td>2008 Chevrolet Colorado (Pick-Up)</td>
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</tr>
<tr>
<td>2010 Ford Ranger (Pick-Up)</td>
<td>2.3L/Auto 2WD/Gasoline</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>2014 Toyota Highlander Hybrid (SUV)</td>
<td>3.5L/Auto 4WD/Gasoline</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>2014 Chevrolet Equinox (SUV)</td>
<td>2.4L/Auto 2WD/E85-Gasoline</td>
<td>6 (E85)</td>
<td>7 (E85)</td>
</tr>
<tr>
<td>2014 GMC Terrain (SUV)</td>
<td>2.4L/Auto 2WD/Gasoline</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>2012 Azure Dynamics Transit Connect Electric (Van)</td>
<td>Electric/Auto/Electricity</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>
Standard Practice

- Utilize hybrid and flex fuel vehicles

Recommended Practice

- Promote the use of vehicles that meet the requirements above for EPA SmartWay certified vehicles.

Best Available Practice

- Operate compressed natural gas (CNG), electric, fuel cell, biodiesel vehicles
6.0 CONSTRUCTION PRACTICES

6.1.3 Alternative Transportation During Construction: Low-Emitting & Fuel-Efficient Vehicles, 50%

1 Point

INTENT

Reduce emissions from on-road construction vehicles.

REQUIREMENTS

The contractor must use fuel efficient and low-emitting vehicles for at least 50% of all on-road, contractor-owned construction vehicles that access the project site more than five calendar days per month. To meet this requirement, the vehicles must be listed as SmartWay certified vehicles according to the EPA Green Vehicle Guide. The listing of SmartWay certified vehicles can be found at: www.epa.gov/greenvehicles.

SUBMITTALS

For the sustainable construction checklist, the contractor must submit a list of its on-road vehicles and identify those which meet the EPA’s SmartWay certification as described above.

TECHNOLOGY/STRATEGY

Each model year, EPA rates every new car, truck, and SUV for greenhouse gas and smog-forming emissions on scales of 1-10. To earn the SmartWay designation, a vehicle must receive a combined score from both scales that is much better than the average vehicle. SmartWay Elite certification is given to only those vehicles that attain the highest scores on both scales. The thresholds for the combined scores needed to achieve a SmartWay certification vary by vehicle model year. The Air Pollution (or Smog) Score is based on the government emission standards for which the vehicle was certified to comply with and reflects vehicle tailpipe emissions that contribute to local and regional air pollution, creating problems such as haze, and health issues. The Greenhouse Gas score reflects fuel lifecycle emissions of carbon dioxide (CO2) and other greenhouse gases. A partial list of heavier duty vehicles (pick-ups and SUVs) that meet these requirements are shown below for reference:

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<tr>
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<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>
Standard Practice

- Utilize hybrid and flex fuel vehicles

Recommended Practice

- Promote the use of vehicles that meet the requirements above for EPA SmartWay certified vehicles.

Best Available Practice

- Operate compressed natural gas (CNG), electric, fuel cell, biodiesel vehicles
6.0 CONSTRUCTION PRACTICES

6.2 Construction Noise and Acoustical Quality

1 Point

INTENT

Improve the exterior noise quality during construction affecting residential areas or other noise sensitive areas.

REQUIREMENTS

Although the City of Chicago has an environmental noise ordinance (Article XXI – Environmental Noise and Vibration Control), it does not apply to construction or demolition work on public improvements authorized by a government body or agency (City Ordinance 11-4-2835).

The requirements of this credit will only apply to noise disturbances that are in the terminal area. Noise disturbances are defined as any sound which is audible at a distance of 600 feet from its source or any sound which generates a sound pressure level in the public way exceeding 70 dB(A) when measured 10 feet from the source (City Ordinance 11-4-2710).

To achieve a point under this credit, the following requirements must be met during construction for those sites that are near noise sensitive areas as defined by the Chicago City Ordinance:

Meet the noise restrictions listed in the Chicago City Ordinance (XXI, Part B) which include, but are not limited to, noise from mechanical stationary sources (11-4-2810), loading and unloading operations (11-4-2830), and construction equipment (11-4-2835) during nighttime hours.

OR

Implement a noise abatement or noise mitigation plan that identifies site specific, mechanical, structural or operational measures to reduce noise disturbances in noise sensitive areas adjacent to the project site.

SUBMITTALS

Although not required for the sustainable design checklist, indicate noise sensitive areas on plans to aid contractor in determining the best noise mitigation strategies.

For the sustainable construction checklist, the contractor must indicate that the requirements of the Chicago Environmental Noise Ordinance have been met or submit a noise mitigation plan identifying the measures taken to reduce noise disturbances in the affected areas.

TECHNOLOGY/STRATEGY

The primary paragraph related to construction activities is Chicago City Ordinance 11-4-2835 which states that no fuel or electric powered mechanical equipment may be used during the hours of 8:00pm and 8:00am and within 600 feet of a residential area or hospital. The ordinance
further states that public improvements authorized by a government agency, like the OMP, are not subject to this ordinance, however, a point will be given under this credit for those projects that choose to comply with the above mentioned ordinance.

There are numerous noise mitigation methods that can be employed some of which are site or equipment specific. The easiest method of noise mitigation is to locate the noise source in an area that is not noise sensitive and to conduct that work during daytime hours, 8:00am to 8:00pm. Where this is not possible, temporary barriers can be erected to mitigate the noise emanating from a source.

For reference, see Commonwealth of Massachusetts, Section 721.560 – Construction Noise Control.

Standard Practice

None

Recommended Practice

None

Best Available Practice

None
6.0 CONSTRUCTION PRACTICES

6.3 Sustainable Temporary Construction Materials

1 Point

INTENT

Reduce the use and depletion of finite raw materials and long-cycle renewable materials by replacing them with high recycled content, rapidly renewable materials and FSC certified wood products for temporary uses during construction.

REQUIREMENTS

Temporary construction materials include, but are not limited to, any materials that are used for construction that are not incorporated into the final development such as formwork, temporary carpentry, and signage. For the purposes of this calculation, only the material cost, excluding labor and equipment, shall be used. In order to meet the requirements of this credit, one of the following requirements must be met:

Using a recycled content calculation similar to SAM Credit 4.4 Recycled Content, determine the percentage of recycled content in the temporary construction materials based on overall temporary construction material cost. To achieve a point in this credit, the overall recycled content of the temporary construction materials must be 30% or greater by cost.

OR

Using a rapidly renewable content calculation similar to SAM Credit 4.6 Rapidly Renewable Materials determine the percentage of the rapidly renewable materials based on overall temporary construction material cost. To achieve a point in this credit, the overall recycled content of the temporary construction materials must be 10% or greater by cost.

OR

Using a certified wood calculation similar to SAM Credit 4.7 Certified Wood, determine the percentage of certified wood materials based on the total wood-based material cost. To achieve a point in this credit, the overall recycled content of the temporary construction materials must be 60% or greater by cost.

Do not count temporary construction materials under any of the credits in Section 4.0 – Materials & Resources.

SUBMITTALS

Although not required for the CT Design Checklist, include specification sections that indicate how these requirements are met.

For the CT Construction Checklist, the contractor must provide a calculation of the actual materials used indicating that at least one of the above requirements was met.
Use calculation templates similar to the SAM Credits in Section 4.0 – Materials & Resources as appropriate.

TECHNOLOGY/STRATEGY

Many temporary construction materials can help achieve the requirements of this credit. Although not tracked by LEED, CDA has added this credit in order to promote the use of such materials during construction, as well as for final development stages of a project.

Standard Practice

- Although many temporary construction materials meet the requirements of this credit, their use is typically not tracked or promoted. The designer is encouraged to specify sustainable materials in construction wherever possible. The contractor is further encouraged to use these types of materials in the cases where they may not be explicitly specified.

Recommended Practice

Materials that may have high recycled content include, but are not limited to:

- Temporary steel structures or materials
- Metal barricades
- Temporary piping (HDPE, ductile iron)
- Steel formwork

Materials that have rapidly renewable materials include, but are not limited to:

- Poplar oriented strand board (OSB) for formwork or temporary carpentry
- Plant-based cladding and insulation materials

FSC certified wood products for temporary construction materials may include:

- Wood formwork
- Temporary wood structures or scaffolding

Best Available Practice

None
7.0 INNOVATION FOR CONCESSIONS & TENANTS – DESIGN & CONSTRUCTION

1. Innovation for Design & Construction

1 to 3 Points

INTENT

Provide design teams and projects the opportunity to achieve exceptional performance above the requirements set by the Sustainable Airport Manual Green Airplane Rating System and/or innovative performance not specifically addressed by the Sustainable Airport Manual.

REQUIREMENTS

In writing, identify the intent of the proposed innovation credit, the proposed requirement for compliance, the proposed submittals to demonstrate compliance, and the approach (strategies) that go above and beyond existing credit requirements or that meet the intent of this credit.

Up to three points are available for this credit:

<table>
<thead>
<tr>
<th>SAM Credit</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1</td>
<td>1</td>
</tr>
<tr>
<td>7.2</td>
<td>1</td>
</tr>
<tr>
<td>7.3</td>
<td>1</td>
</tr>
</tbody>
</table>

SUBMITTALS

Include descriptive narrative in the SAM Checklist following the criteria in the Requirements section above.

TECHNOLOGY/STRATEGY

Substantially exceed a SAM performance credit such as energy performance or water efficiency and/or apply strategies or measures that demonstrate a comprehensive approach and quantifiable environment and/or health benefits.

Refer to LEED Credit Interpretation Results (CIRs) or the Innovation in the LEED Design Credit Catalog for potential strategies that may be considered for innovation. Most will pertain to building related innovations; however the SRP will review proposed innovations by the designer or contractor on a case by case basis.

5 Available at www.usgbc.org.
7.0 INNOVATION FOR CONCESSIONS & TENANTS – DESIGN/CONSTRUCTION

7.4 Menu Items (Green Walls, LED lights, Recycled Content Finishes, Rapidly Renewable Finishes, Instantaneous Hot Water Heating, Non-Terminal Tenant Options)

1 to 3 Points

INTENT

Promote specific technologies and additional strategies considered to be important to the sustainability of the airport environment.

REQUIREMENTS

A point will be awarded for each of the technologies or strategies listed below that are used on a project up to a maximum of 3 points:

- Green Walls – Use green, vegetated wall systems
- LED Lighting – Use LED lighting within the tenant spaces
- Recycled Content Finishes – Use recycled content materials such as recycled glass for floors, countertops, tabletops, walls, shelves, cabinets, tiles or any areas within the tenant space
- Rapidly Renewable Finishes – Use rapidly renewable materials such as bamboo, strawboard, wheatboard, cork, etc. within the tenant space
- Instantaneous Hot Water Heating – Use demand, tankless, instantaneous water heating technology
- For Non-Terminal Tenants:
  - Construction Equipment Retrofit – Retrofit all construction equipment over 50 hp and on site for more than 14 calendar days per month to EPA Tier 3 emission standards
  - Photovoltaics – Use photovoltaic systems to generate electricity. System must generate 0.5 kW or greater
  - Geothermal Heating/Cooling – Any geothermal system to provide heating and cooling is acceptable
  - Wind Power – Generate on-site electricity using wind turbines, horizontal or vertical. System must generate 0.5 kW or greater
  - Rainwater Harvesting – Use cisterns, rain barrels, or other vessels to store rain water for other uses including, but not limited to, irrigation, vehicle washing, and other general, non-potable uses. The harvested rainwater must have an intended use. Minimum storage capacity is 200 gallons.
Permeable Pavement – Use permeable pavement such as concrete, asphalt, or pavers, for at least 5% of the total pavement area of the project not subject to aircraft traffic or 1,000 sq. ft, whichever is greater

Trombe or Solar Walls – Use passive solar preheating of intake air for space heating using wall systems or other building surfaces

Green Walls – Use green, vegetated wall systems on exterior of building envelope for at least 25% of the vertical wall surfaces or the entirety of south and/or west facing walls, whichever is greater

Warm-Mix Asphalt – Use warm-mix asphalt for at least 5% of the total pavement area of the project or 1,000 sq. ft, whichever is greater

Alternative Hot Water Heating – Use solar thermal for 25% or demand (tankless) hot water heating systems for 100% of the project’s hot water demand. Excludes process water demand.

**SUBMITTALS**

Include descriptive narrative and calculations in the SAM Checklist. Indicate in the narrative which of the above technologies and strategies are being included in the project and, where applicable, indicate where these items are shown in the drawings or specifications.

**TECHNOLOGY/STRATEGY**

Choose any of the following:

- **Green Walls** – Vegetated green wall systems can result in significant air conditioning savings. Green walls fall in to two categories:
  - Green facades: Made up of climbing plants growing directly on a wall
  - Living walls: Modular panels often made of steel containers, geotextiles, irrigation systems, growing medium and vegetation
- **LED Lighting** – LED lights use up to 90% less energy than incandescent light sources, have a longer lifetime, greater durability and reliability
- **Recycled Content Finishes** – Recycled content finishes use readily recycled materials like glass, marble, stone, etc. that can be obtained locally and don’t require excessive processing like virgin materials
- **Rapidly Renewable Finishes** – Rapidly renewable finishes are natural, non-petroleum-based building materials (petroleum based materials are non-renewable) that have harvest cycles under 10 years. Such materials include bamboo, straw, cork, natural linoleum products (such as Marmoleum), wool, wheatboard, strawboard, etc.
- **Instantaneous Hot Water Heating** – Instantaneous hot water heating technology uses include demand, instantaneous, or tankless water heaters. Demand water heaters heat water directly without the use of a storage tank thus avoiding the standby heat losses associated with conventional storage tank water heaters. When a hot water tap is turned on, cold water travels through a pipe into the unit. Either a gas burner or an electric...
element heats the water as it passes through coiled piping within the unit. As a result, demand water heaters deliver a constant supply of hot water not limited by the volume of a storage tank.

- **For Non-Terminal Tenants:**
  - Construction equipment retrofit – The use of particulate traps and catalysts to meet more stringent EPA emissions standards for older construction equipment
  - Photovoltaics – Photovoltaic or solar-electric systems may be ground-mounted, roof-mounted, or built into the roof or walls of a building, known as building integrated photovoltaic (BIPV)
  - Geothermal heating/cooling systems – Any geothermal system to provide heating and cooling is an acceptable strategy
  - Wind power – Generate on-site electricity using wind turbines, horizontal or vertical
  - Rainwater harvesting – Collecting rainwater from the many roofs at an airport would provide a large source of clean non-potable water. Although the supply would far exceed the demand, the use of harvested rainwater should be taken on a site-specific case by case basis. Although airport irrigation is limited to ornamental planters, other uses such as vehicle washing may be amenable to this technology.
  - Permeable pavement – The amount of pavement at an airport makes permeable pavement an attractive application for the management of stormwater. Although major pavement areas such as runways, taxiways, and apron areas cannot include permeable pavement, there is a significant amount of non-aviation related pavement areas. Using permeable pavement, unit pavers or permeable asphalt or concrete, may also further contribute to the sustainability of a project because these materials can contain high recycled content materials that are locally available, and may reduce heat island effects for non-roof areas, in addition to their stormwater management aspects. All three of these types of pavements have been demonstrated and are being used by the City of Chicago in its Green Alley Program under the direction of Chicago Department of Transportation (CDOT).
  - Trombe or Solar walls – These systems use solar energy to heat a thermal mass, usually a concrete wall or an air gap between an interior wall and a dark-colored exterior surface, as means to preheat intake air. On very cold days, the heating system can condition preheated air rather than putting the additional energy in heating cold outside air, thereby realizing an energy savings. In some cases, the wall may also have a photovoltaic component that generates electricity.
  - Green Walls – Vegetated green wall systems on exterior of building envelope can reduce wall surface temperatures by as much as 18°F (depending on which direction it is facing), which also results in significant air conditioning savings, while reducing the heat island effect.
Warm-Mix Asphalt - Warm-mix asphalt allows the producers of hot-mix asphalt pavement material to lower the temperatures at which the material is mixed and placed on the road. Reductions of 50°F to 100°F have been documented. Such drastic reductions have the obvious benefits of cutting fuel consumption and decreasing the production of greenhouse gases. In addition, engineering benefits include better compaction on the road, the ability to haul paving mix for longer distances, and extending the paving season by being able to pave at lower temperatures.

Water heating – Solar thermal hot water heating technology uses a solar collector which is simply a heat exchanger designed to convert the sun’s radiant light energy into thermal energy to be stored for later use. This collector uses optics and parabolic concentration technology to heat the fluid media passing through the selectively coated tubing manifold. The fluid media is circulated, via a pump, through the collector and into a storage tank located within the home/building. Other water heating technologies that are encouraged include demand, instantaneous, or tankless water heaters. Demand water heaters heat water directly without the use of a storage tank thus avoiding the standby heat losses associated with conventional storage tank water heaters. When a hot water tap is turned on, cold water travels through a pipe into the unit. Either a gas burner or an electric element heats the water as it passes through coiled piping within the unit. As a result, demand water heaters deliver a constant supply of hot water not limited by the volume of a storage tank.

CASE STUDY

Living Green Wall
El Japonez – Mexico City, Mexico

Located in Mexico City, Restaurant Japonez offers Asian-inspired dishes in a serene landscape seated between a living wall, wood, and an incredible glass enclosure. More than decorative in nature, the wall helps keep the thermostat steady throughout the year while infusing the interior spaces with fresh air.

7.0 INNOVATION FOR CONCESSIONS & TENANTS – DESIGN/CONSTRUCTION

7.5 LEED Accredited Professional

1 Point

INTENT

Support and encourage the design integration required by LEED to streamline the application and certification process.

AND

To facilitate the incorporation of sustainable design and construction elements.

REQUIREMENTS

At least one principal participant of the project team shall be LEED accredited (i.e., LEED Green Associate; LEED Accredited Professional).

SUBMITTALS

Identify the LEED accredited individual(s) in the SAM Checklist and submit proof of their LEED certification.

TECHNOLOGY/STRATEGY

Educate the project team members about green building design and construction, the LEED requirements and application process early in the life of the project. Consider assigning integrated design and construction process facilitation to the LEED accredited individual.

Standard Practice

None

Recommended Practice

- The CDA requires that each design consultant and/or design management team include a LEED accredited individual on its staff to oversee the design and assist with construction administration

Best Available Practice

None
7.0 INNOVATION FOR CONCESSIONS & TENANTS – DESIGN/CONSTRUCTION

7.6 LEED Certified Project

1 to 4 Points

INTENT

Promote the incorporation of environmentally sustainable design in building and infrastructure improvements by registering and certifying a project through the LEED certification process and rating system.

REQUIREMENTS

Achieve certification via the LEED Retail Commercial Interior (or other applicable LEED category) process – Certified, Silver, Gold, or Platinum. Up to four points are available for this credit:

<table>
<thead>
<tr>
<th>SAM Credit</th>
<th>Certification Level</th>
<th>Points</th>
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</thead>
<tbody>
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<td>3</td>
</tr>
<tr>
<td>7.6.4</td>
<td>Platinum</td>
<td>4</td>
</tr>
</tbody>
</table>

SUBMITTALS

Include descriptive narrative in the SAM Checklist demonstrating that the project has been registered under LEED during the design process. Provide the LEED submittal documentation and final determination. Indicate what level of LEED certification has been achieved after construction.

TECHNOLOGY/STRATEGY

Educate the project team members about green building design & construction and application of the LEED Rating System early in the life of the project. Consider pursuing LEED for any occupied building project.

Standard Practice

- Projects are encouraged to seek LEED certification, where applicable

Recommended Practice

- Encourage LEED Silver or better rating for Retail Commercial Interior buildings
Chicago Department of Aviation

SUSTAINABLE AIRPORT MANUAL

CONCESSIONS & TENANTS

OPERATIONS & MAINTENANCE
SECTION

NOTE:
Please refer to page CT-5 for introduction and applicability of this section.
8.0 COMPANY POLICY

8.1 Prerequisite 1 – Tenant Environmental Liaison

Required

INTENT

Facilitate the dissemination of environmental information within the workplace and create a link with CDA staff for environmental issues.

REQUIREMENTS

Designate an employee to serve as the tenant’s environmental liaison. Liaison will be expected to attend any CDA Green Tenant Meetings and serve as the primary point of contact during the conduct of SAM reviews.

SUBMITTALS

Include the name and contact information of the tenant liaison in the SAM Checklist as well as a descriptive narrative of any environmental/sustainability training the liaison has received.

TECHNOLOGY/STRATEGY

Standard Practice

- Designate one person in the organization to serve as the environmental liaison. Said liaison will be tasked with reviewing the Sustainable Airport Manual and identifying any credits applicable to the tenant.

Recommended Practice

- The environmental liaison will educate co-workers about the environmental policies of the tenant and integrate them into the tenant’s Environmental Employee Training Program (See SAM Credit 8.23 Establish and Implement Environmental Employee Sustainability Training Program).

Best Available Practice

- Promote and maintain relationships with external organizations, collaborate with other tenants to preserve and enhance the environmental quality of the Airport.
8.0 COMPANY POLICY

8.2 Establish and Implement Employee Sustainability Training Program

2 Points – Required for CT-OM Mentor Certification

INTENT

In keeping with the spirit and intent of this Manual, it is strongly encouraged that companies working in support of CDA on any project establish and adopt their own employee training program.

REQUIREMENTS

Establish and implement an Employee Sustainability Training Program.

SUBMITTALS

Provide an electronic copy of the company’s Employee Sustainability Training Program and provide descriptive narrative on SAM Checklist documenting training sessions and their respective attendance numbers.

TECHNOLOGY/STRATEGY

As part of the Employee Sustainability Training Program a variety of topics should be covered to provide the employees with an overall understanding of the environmental, social and fiscal responsibility that the company has committed to and how they can contribute to the organization meeting their sustainability goals. Through the development of a training program it will allow the company to provide consistent training to all employees and address facility specific issues.

Standard Practice

None

Recommended Practice

- Individual programs can be tailored to meet each company’s specific sustainability goals and can include topics such as:
  - Corporate Sustainability Policy
  - Water Management Plan
  - Waste Reduction
  - Storage and Collection of Recyclables
  - Composting or Re-use Options
  - Managing and Disposing of Waste
  - CDA’s Green Commitment
Best Available Practice

None

CASE STUDIES

Employee Training
Ben & Jerry’s Ice Cream

During the first two days of training, new employees are told about the company's environmental involvement including recycling. A bulletin board in the stores displays letters from headquarters and any new initiatives.

www.mwcog.org/environment/recycling/hotel/mentor/BEN.HTM

Environmental Stewardship Training Program
Dallas – Ft. Worth International Airport – Dallas, Texas

The Training program solicits the participation of Dallas – Ft, Worth’s (DFW) 1,650 employees in an airport-wide commitment to environmental stewardship.

8.0 COMPANY POLICY

8.3.1 Alternative Transportation: Public Transportation Access

3 to 6 Points

INTENT

Reduce pollution and land development impacts from automobile use.

REQUIREMENTS

Demonstrate that a percentage of total employees are using public transportation. Points will be awarded as follows:

<table>
<thead>
<tr>
<th>SAM Credit</th>
<th>Percentage of Employees</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.3.1.1</td>
<td>25%</td>
<td>3</td>
</tr>
<tr>
<td>8.3.1.2</td>
<td>50%</td>
<td>4</td>
</tr>
<tr>
<td>8.3.1.3</td>
<td>75%</td>
<td>5</td>
</tr>
<tr>
<td>8.3.1.4</td>
<td>100%</td>
<td>6</td>
</tr>
</tbody>
</table>

SUBMITTALS

Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

Perform a transportation survey of employees to identify current usage and encourage knowledge and utilization of mass transit. There are numerous public transportation options in the vicinity of the airport system:

- Chicago Transit Authority (CTA) Blue Line, Orange Line
- Chicago Transit Authority (CTA) Local Bus Routes
- Metra
- Pace Bus Service
- CDA Employee Shuttle bus or ATS in conjunction with any of the above

Standard Practice

None

Recommended Practice

- Supply public transit route information and schedules to employees
- Provide Pre-Tax Deductions from paychecks to cover public transportation needs
Best Available Practice

- Offer incentives to employees to use public transportation, examples may include:
  - Transit pass subsidies
  - Emergency Ride Home Program so that employees are not penalized for not having a vehicle if they or a member of their family needs to leave for an emergency
  - Gift cards or monetary incentives (non-transit related)
8.0 COMPANY POLICY

8.3.2 Alternative Transportation: Bicycle Access, Storage and Changing Rooms

2 Points

INTENT

Reduce pollution and land development impacts from automobile use.

REQUIREMENTS

Provide secure bicycle racks and/or storage

AND

Provide shower and changing facilities in the building, within 200 yards of a building entrance.

SUBMITTALS

Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

Include amenities such as bicycle racks and showering/changing facilities such that employees are encouraged to use bicycles, therefore reducing parking needs. The showering/changing facilities may be shared with other tenants or nearby buildings.

Bicycle access may require coordination with airport security.

Standard Practice

None

Recommended Practice

- Supply local bike path information to employees
- Clearly display the location(s) of secure bicycle parking, lockers and showers

Best Available Practice

- Provide incentives to employees to bike to work, examples may include:
  - Discounts on bicycle accessories and maintenance at local bike shops
  - Emergency Ride Home Program so that employees are not penalized for not having a vehicle if they or a member of their family needs to leave for an emergency
  - Gift cards or monetary incentives
- Offer a bike safety course to promote biking to work
8.0 COMPANY POLICY

8.3.3 Alternative Transportation: Low-Emitting and Fuel-Efficient Vehicles

1 to 4 Points

INTENT

Reduce pollution and land development impacts from employees’ personal vehicle use. Fleet vehicle use is addressed in SAM Credit 14.6 of this chapter. For the installation of alternative fuel infrastructure see SAM Credit 14.7.

REQUIREMENTS

Demonstrate that a percentage of total employees are utilizing low-emitting* and fuel-efficient** vehicles for commuting to work. Points will be awarded as follows:

<table>
<thead>
<tr>
<th>SAM Credit</th>
<th>% of Employees</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.3.3.1</td>
<td>5%</td>
<td>1</td>
</tr>
<tr>
<td>8.3.3.2</td>
<td>25%</td>
<td>2</td>
</tr>
<tr>
<td>8.4.3.3</td>
<td>50%</td>
<td>3</td>
</tr>
<tr>
<td>8.4.3.4</td>
<td>100%</td>
<td>4</td>
</tr>
</tbody>
</table>

*Low-emitting vehicles must have an Air Pollution Score or a Greenhouse Gas Score of 6 or greater according to the EPA Green Vehicle Guide.

**Fuel-efficient vehicles are defined as vehicles that have achieved a minimum green score of 40 on the American Council for an Energy Efficient Economy (ACEEE) annual vehicle rating guide.

SUBMITTALS

Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

Perform a transportation survey of employees to identify current usage.

The Green Vehicle Guide is prepared annually by the EPA (www.epa.gov/greenvehicles). The Air Pollution Score is based on the government emission standards for which the vehicle was certified to comply with and reflects vehicle tailpipe emissions that contribute to local and regional air pollution, creating problems such as haze, and health issues. This score reflects fuel lifecycle emissions of carbon dioxide (CO2) and other greenhouse gases. The scores are on a scale of 1 to 10, 10 being the highest rating.
Standard Practice

None

Recommended Practice

- Provide preferred parking for alternative fuel vehicles

Best Available Practice

- Offer incentives to employees to use low-emitting and fuel-efficient vehicles, examples may include:
  - Fuel gift cards
  - Other monetary incentives
- Install electrical receptacles for charging of electric vehicles
8.0 COMPANY POLICY

8.3.4 Alternative Transportation: Carpooling

1 to 4 Points

INTENT

Reduce pollution and land development impacts from single occupancy vehicle use for employees.

REQUIREMENTS

Demonstrate that a percentage of total employees are carpooling. Points will be awarded as follows:

<table>
<thead>
<tr>
<th>SAM Credit</th>
<th>% of Employees</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.4.4.1</td>
<td>5%</td>
<td>1</td>
</tr>
<tr>
<td>8.4.4.2</td>
<td>25%</td>
<td>2</td>
</tr>
<tr>
<td>8.4.4.3</td>
<td>50%</td>
<td>3</td>
</tr>
<tr>
<td>8.4.4.4</td>
<td>100%</td>
<td>4</td>
</tr>
</tbody>
</table>

SUBMITTALS

Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

Minimize employee parking lot/garage size. Consider sharing parking facilities with adjacent buildings. Consider alternatives that will limit the use of single occupancy vehicles.

Standard Practice

- Provide preferred parking for carpools or vanpools, marked as such

Recommended Practice

- Offer incentives to employees who participate in carpools or vanpools:
  - Employee preference on work shift scheduling with their carpoolers/vanpoolers
  - Emergency Ride Home Program so that employees are not penalized for not having a vehicle if they, a member of their family, or a member of their carpool/vanpool needs to leave for an emergency
  - Fuel gift cards
  - Other monetary incentives
Best Available Practice

None
8.0 COMPANY POLICY

8.4 Community Education

1 Point

INTENT
Promote awareness of tenant environmental and sustainability initiatives.

REQUIREMENTS
Educate consumers/clients/public about the environmental stewardship to which the tenant has committed, and the results of these efforts.

SUBMITTALS
Include descriptive narrative in the SAM Checklist of methods of community education.

TECHNOLOGY/STRATEGY
Provide and promote education through the following means that include, but are not limited to:

- Flyers
- Pamphlets
- Press Releases
- Signage
- Kiosks
- Workshops
- Conferences
- Website
- Public exhibits

Standard Practice
None

Recommended Practice
- Post environmental education information around tenant space detailing the efforts of the concessionaire or tenant
- Promote customer participation to initiatives that contribute to the tenant’s environmental goals
- Solicit suggestions from customers on how to improve company’s environmental and social programs
Best Available Practice

- Offer incentives to consumers/clients/public if they contribute to the tenant’s environmental goals

CASE STUDY

Make a Difference
Starbucks

For the good of the planet, Starbucks is encouraging everyone to switch from paper cups to reusable travel mugs. Since 1985 the company has been offering a discount to customers who bring in a reusable travel mug. This endeavor is aimed to aid in their long-term goal of 100% reusable or recyclable cups by 2015.

9.0 RESPONSIBLE PROCUREMENT

9.1 Prerequisite 1 – Eliminate Use of Polystyrene Foam

Required

INTENT
Reduce the environmental impact of polystyrene production and disposal.

REQUIREMENTS
Eliminate polystyrene foam in tenant operations.

SUBMITTALS
Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY
Eliminating use of polystyrene foam accomplishes multiple goals because it is a petroleum based product that uses HCFCs during production, and it does not readily degrade after disposal.

Standard Practice
None

Recommended Practice
- To the greatest extent possible, eliminate the use of polystyrene foam products as part of a responsible procurement practice

Best Available Practice
None

CASE STUDY

Food Service Waste Reduction Ordinance
San Francisco International Airport – San Francisco, California

The Food Service Waste Reduction ordinance, effective June 1, 2007, prohibits any establishment that serves food prepared in San Francisco from using polystyrene foam (Styrofoam) to-go containers. The Ordinance further requires that any containers used be either recyclable or compostable in the City's programs.

9.0 RESPONSIBLE PROCUREMENT

9.2 Prerequisite 2 – Sustainable Food and Consumer Product Procurement

Required

INTENT

Reduce the environmental impacts associated with food production and distribution.

REQUIREMENTS

Tenants agree to source organic products and sustainably harvested food for both direct sale and in food preparation for at least 10% of the tenant’s total food, health, and cosmetic purchases that meet, in any combination, the definition of sustainable foods and products using the table below. Sustainable foods and products are defined as meeting any one or more of the following criteria:

- Non-genetically modified organisms (non-GMO)
- Antibiotic free or no added hormones animal products
- Free-range, cage-free, or grass fed animal products
- USDA National Organic Program Certified
- Food Alliance Certified
- Rainforest Alliance Certified
- Protected Harvest Certified
- Fair Trade
- Marine Stewardship Council’s Blue Eco-Label
- Blue Ocean Institute Seafood Guide, no “Red” listed species
- Monterey Bay Aquarium, “Green” or “Yellow” listed species
- Others as approved by CDA, where applicable

See also SAM Credit 9.6 – Sustainable Food and Consumer Products.

Example: Annually, a concessionaire purchases for sale $50,000 of food products including $10,000 of fair trade coffee, $10,000 of Rainforest Alliance Certified bananas, $10,000 of organic apples, and $20,000 of conventional strawberries. With the exception of the strawberries, the other food products meet the criteria above, therefore:

\[
\frac{10,000 + 10,000 + 10,000}{50,000} = 60\% \text{ of foods meet the requirements}
\]

Therefore, this prerequisite is met.
SUBMITTALS

Include descriptive narrative on SAM Checklist detailing the percentage of organic consumer products and organic and sustainably harvested food sources utilized.

TECHNOLOGY/STRATEGY

Standard Practice

None

Recommended Practice

- Offer certified organic or sustainably harvested products
- Meat served should come from facilities or farms raised without antibiotics. Use of antibiotics on the farm, if practiced, must be minimal. Use of drugs with analogues in human medicine must be non-routine and rare.

Best Available Practice

None

CASE STUDIES

Angelina’s Metro Market - Organic and Natural Food
La Guardia International Airport – New York, New York

Angelina’s Metro Market serves organic, natural food like pasta and salads with over 30 toppings to choose from as well as pastries, bagels, muffins, sandwiches, fruits, veggies, cheese, yogurts, and more. Angelina’s also offers an array of over 120 organic beverages.

9.0 RESPONSIBLE PROCUREMENT

9.3 Sustainable Furniture

1 Point

INTENT

Reduce the environmental and indoor air quality impacts of the furniture acquired for use in the tenant space.

REQUIREMENTS

A point is awarded for the purchase of durable goods (i.e. goods that are replaced infrequently or require capital program outlays to purchase) that meet any of the following sustainable requirements:

Furniture: To achieve a point, 40% of the total purchases of furniture (by cost) meet one of the following criteria:

- Purchased furniture contains at least 10% post-consumer or 20% pre-consumer material
- Purchased furniture contains at least 70% material salvaged from off-site sources or outside the airport boundary
- Purchased furniture contains at least 70% material salvaged from on-site sources, such as an equipment reuse program or internal reorganization
- Purchased furniture contains at least 50% rapidly renewable material
- Purchased furniture contains at least 50% FSC-certified wood
- Purchased furniture contains at least 50% material harvested and processed or extracted and processed within 500 miles of the project

Each furniture purchase can receive credit for each sustainable criterion met (i.e. a $100 purchase that contains both 10% post-consumer recycled content and 50% content harvested within 500 miles of the project counts twice in the calculation, for a total of $200 in sustainable purchasing.

SUBMITTALS

Include descriptive narrative and calculations in the SAM Checklist.

TECHNOLOGY/STRATEGY

Designers are encouraged to specify items that help achieve the requirements of this credit whenever possible. Sustainable furniture can be found from various sources. GREENGUARD Environmental Institute certifies products, including furniture. See www.greenguard.org for a listing of GREENGUARD certified furniture.
Standard Practice
None

Recommended Practice
- Specify sustainable furniture systems, such as GREENGUARD certified furniture

Best Available Practice
None

CASE STUDY

GustOrganics- New York
Taranta- Boston, Massachusetts

GustOrganics and Taranta, in partnership with the Green Restaurant Association (GRA), have completed a number of sustainable and cost effective initiatives. Among a handle full of other green initiatives, GustOrganics Restaurant has also installed an energy efficient refrigerator, oven and freezer and initiated a recycling and composting program. Taranta Restaurant saved $1,300 a year by switching over to a hand dryer, and continues to see annual savings for upgrading to more energy efficient light bulbs.

http://www.dinegreen.com/restaurants/cases.asp
9.0 RESPONSIBLE PROCUREMENT

9.4.1 Consumer Disposable Products: Eliminate the use of Disposables

1 to 3 points

INTENT

Reduce the need for virgin materials and reduce the volume of solid waste generated by tenant activities.

REQUIREMENTS

Offer non disposable options for up to 3 points, which may be awarded by achieving use of any of the following options. 1 point is earned for one option; 2 points for two options; and three points for 3+ options:

- Reusable napkins
- Reusable hand towels
- Reusable utensils
- Reusable dishes
- Reusable glasses/mugs
- Other reusable items

SUBMITTALS

Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

Eliminate the use of disposable products in favor of reusable options.

Standard Practice

None

Recommended Practice

- Replace disposable products with reusable:
  - Napkins
  - Hand towels
  - Utensils
  - Dishes
  - Glasses/Mugs
Best Available Practice
None

CASE STUDY

Sustainable Tableware
San Francisco International Airport (SFO) – San Francisco, California

SFO food and beverage tenants are encouraged to provide sustainable food/beverage packaging, including using compostable bio-resin or paper bottles for water. Concessions vendors are “required to use biodegradable tableware and source separate all food service wastes for direct transport to off-Airport composting facilities.”

http://www.flysfo.com/web/page/about/T2/sustainability/
9.0 RESPONSIBLE PROCUREMENT

9.4.2 Consumer Disposable Products: Bio-Based Content

2 to 4 points – Required for CT-OM Mentor Certification

INTENT

Reduce the need for virgin materials and reduce the volume of solid waste generated by tenant activities.

REQUIREMENTS

Whenever applicable, purchase and utilize bio-based organic/plant based products and containers for customers and in employee break rooms and kitchens to facilitate composting.

Point values will be assigned based on the percentage of total disposable products purchased by overall cost. Up to 4 points are available by calculating items with the following attributes:

<table>
<thead>
<tr>
<th>SAM Credit</th>
<th>Percentage</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.4.2.1</td>
<td>25%</td>
<td>2</td>
</tr>
<tr>
<td>9.4.2.2</td>
<td>50%</td>
<td>4</td>
</tr>
</tbody>
</table>

Example: A concessionaire calculates that of their $100,000 total consumer disposable product purchases, $27,500 are bio-based.

\[
\frac{27,500}{100,000} = 27.5\% \text{ bio-based content}
\]

Therefore, 2 points are earned for this credit.

SUBMITTALS

Include descriptive narrative on SAM Checklist detailing the types of products used and calculations.

TECHNOLOGY/STRATEGY

Establish a buying procedure that eliminates the need for virgin paper products and plastic containers. During everyday operations, ensure that the specified organic items are being offered to the public and employees.

Potential items to include in the calculation, but not limited to, are:

- Take-out containers
- Take-out bags
- Cold cups
• Hot cups
• Plates
• Bowls
• Soup/chili cups
• Cutlery and straws
• Plastic bags
• Cup sleeves
• Cup carriers
• Bottles and jars
• Coasters
• Toothpicks

**Standard Practice**

None

**Recommended Practice**

None

**Best Available Practice**

When possible the tenant should use items made from plant based products. A variety of vendors now offer products that are not made of plastic or paper but rather:

• Sugarcane
• Corn
• Wheat
• Plant based fiber
• Potatoes

**CASE STUDIES**

**Eat Toasty, Be Green™**
**Quizno's Subs**

In 2010 Quiznos switched to new packaging which is made from renewable or recycled content that will reduce the chain’s environmental footprint. The new packaging includes:

• 100 % compostable wax-coated paper cups
• Pulp salad bowls made from renewable sugarcane
• Plastic lids made of 30% post-consumer recycled PET bottles
• Napkins made from 100% recycled material and fibers (90 percent post-consumer)
• Catering lunch boxes made of 100% recycled paperboard (35% post-consumer)
In addition, Quiznos employees also switched to uniforms made 100% from recycled soda pop bottles.

www.quiznos.com/subsandwiches/about/begreen.html

Earth Fresh Initiative
Baja Fresh Mexican Grill

In 2010 the food chain established their “Earth Fresh” initiative which focused on using sustainable food packaging and plates. The plates are made of a byproduct of wheat harvests and are certified by the Biodegradable Products Institute. Through the production of the natural unbleached burrito wrappers versus their traditional paper, they experienced a saving of a 46% reduction in water waste and a 21% reduction in wood pulp use. Another added benefit was the 16% reduction in solid waste and the cutting of their greenhouse gas emissions by 10%.

www.packagingdigest.com/article/449839-Baja_Fresh_introduces_new_greener_packaging_at_some_locations.php
9.0 RESPONSIBLE PROCUREMENT

9.4.3 Consumer Disposable Products: Post-Consumer Recycled Paper

1 to 3 points – Required for CT-OM Mentor Certification

INTENT

Reduce the need for virgin materials and reduce the volume of solid waste generated by tenant activities.

REQUIREMENTS

Whenever applicable, purchase and utilize recycled products and containers for customers and in employee break rooms and kitchens.

Point values will be assigned based on the percentage of total disposable paper products purchased by overall cost. Up to 3 points are available by calculating items with the following attributes:

<table>
<thead>
<tr>
<th>SAM Credit</th>
<th>Percentage</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.4.3.1</td>
<td>30%</td>
<td>1</td>
</tr>
<tr>
<td>9.4.3.2</td>
<td>60%</td>
<td>2</td>
</tr>
<tr>
<td>9.4.3.3</td>
<td>100%</td>
<td>3</td>
</tr>
</tbody>
</table>

Example: A concessionaire uses $30,000 worth of hot cups, $10,000 worth of cold cups, $10,000 worth of paper bags, $15,000 worth of cup sleeves, $10,000 worth of cup carriers, $15,000 worth of paper napkins, $5,000 worth of paper towels, $4,000 worth of receipt tape, and $1,000 worth of office paper, representing all paper items which total $100,000. Of these items, all contain post-consumer recycled paper with the exception of the receipt tape.

\[
\frac{\$96,000}{\$100,000} = 96\% \quad \text{of paper products contain Recycled Paper Content}
\]

Therefore, 2 points are earned for this credit.

SUBMITTALS

Include descriptive narrative on SAM Checklist detailing the types of products used and calculations.

TECHNOLOGY/STRATEGY

Establish a buying procedure that eliminates the need for virgin paper products and containers. During everyday operations, ensure that the specified recycled are being offered to the public and employees.
Tenants should use recycled items with high post-consumer content. Post-consumer means that the item’s recycled content comes from products that have been previously used and sent for recycling.

Potential items to include in the calculation, but not limited to, are:

- Take-out containers
- Food wrapper
- Cold cups
- Hot cups
- Plates
- Bowls
- Paper bags
- Cup sleeves
- Cup carriers
- Paper napkins
- Paper towels
- Bath tissue
- Facial tissue
- Seat covers
- Placemats
- Office paper
- Receipt tape
- Customer checks

**Standard Practice**

None

**Recommended Practice**

- Use post-consumer recycled paper products wherever possible

**Best Available Practice**

None

**CASE STUDIES**

**Eat Toasty, Be Green™**

**Quiznos Subs**

In 2010 Quiznos switched to new packaging which is made from renewable or recycled content that will reduce the chain’s environmental footprint. The new packaging includes:

- 100% compostable wax-coated paper cups
- Pulp salad bowls made from renewable sugarcane
- Plastic lids made of 30% post-consumer recycled PET bottles
- Napkins made from 100% recycled material and fibers (90% post consumer)
- Catering lunch boxes made of 100% recycled paperboard (35% post consumer)

In addition, Quiznos employees also switched to uniforms made 100% from recycled soda pop bottles.

www.quiznos.com/subsandwiches/about/begreen.html

Recycled Paper
Akasha Restaurant – California

Akasha Restaurant uses recycled paper content for its menu and other collateral paper products. Menus covers are made of recycled chip board.


Recycled Paper
Starbucks

Starbucks uses paper bags, napkins, shopping bags, cardboard boxes, paper towels, receipt tape and tissue paper that all contain varying amounts of pre- and post- consumer recycled content.

http://www.starbucks.com/responsibility/environment/recycling
9.0 RESPONSIBLE PROCUREMENT

9.5 Local/Regional Food Sources

2 to 4 Points – Required for CT-OM Mentor Certification

INTENT

Reduce the environmental and transportation impacts associated with food production and distribution.

REQUIREMENTS

Tenants agree to source local/regional products for both direct sale and in food preparation. Note that only those foods that are obtainable locally are to be counted in the calculation, e.g. in Chicago, it is not possible to get locally-grown bananas, therefore the cost of the bananas should not be included.

Example: Annually, a Chicago concessionaire purchases for sale $50,000 of food products including $10,000 of South American coffee, $10,000 of Central American bananas, $10,000 of Michigan apples, and $20,000 of California strawberries. Of these four items, only the apples and strawberries are obtainable locally (since coffee and bananas are tropical fruits), although the concessionaire chose to purchase non-local strawberries (> 250 miles away). In this case, the total locally-obtainable food purchases are $30,000 ($10,000 apples + $20,000 strawberries).

Points are awarded based on the percentage of the tenant’s total locally-obtainable food purchases by cost that are obtained within 250 miles using the following table:

<table>
<thead>
<tr>
<th>SAM Credit</th>
<th>Percentage Within 250 miles</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.5.1</td>
<td>25%</td>
<td>2</td>
</tr>
<tr>
<td>9.5.2</td>
<td>50%</td>
<td>4</td>
</tr>
</tbody>
</table>

Exemplary Performance – 4 additional points available

Additional credit will be given if a tenant sources local products. Exemplary Performance points are awarded based on the percentage of the tenant’s total locally-obtainable food purchases by cost that are within 100 miles using the following table:

<table>
<thead>
<tr>
<th>SAM Credit</th>
<th>Percentage Within 100 miles</th>
<th>Additional Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.5.3</td>
<td>25%</td>
<td>2</td>
</tr>
<tr>
<td>9.5.4</td>
<td>50%</td>
<td>4</td>
</tr>
</tbody>
</table>
Example: Of a tenant’s total food purchases, which is $10,000, $7,000 is sourced within 250 miles and $3,000 is sourced from over 250 miles away. Of that $7,000, $4,000 is sourced from within 100 miles. Therefore, 70% of purchases are within a 250 mile area so 4 points can be claimed under SAM Credit 9.4. Of the total purchases, 40% is sourced within 100 miles and an additional 2 points can be claimed for Exemplary Performance.

\[
\text{Purchases within 250 miles} = \frac{\$7,000}{\$10,000} = 70\% \text{ of purchases sourced within 250 miles}
\]

\[
\text{Purchases within 100 miles} = \frac{\$4,000}{\$10,000} = 40\% \text{ of purchases sourced within 100 miles}
\]

NOTE: 100 mile purchases are included in the 250 mile purchases.

SUBMITTALS
Include descriptive narrative on SAM Checklist detailing the percentage of local/regional food sources utilized.

TECHNOLOGY/STRATEGY
Food grown in local and surrounding areas tends to offer a selection of items that are fresher than produce flown or trucked in from other states and countries. Fresh products retain their nutrients better than frozen or canned options and support local businesses in the process.

Concessionaires can establish a relationship with area farms that sell direct to consumers and incorporate local and seasonal goods into their menu and operations. Produce can be used in the general food offerings and specialty dishes relative to seasonal items can be sold.

Standard Practice
None

Recommended Practice
- Purchases are produced or harvested within a 250 mile radius of the site
- Purchase products from local farm cooperatives or community supported agriculture (CSA) organizations.

Best Available Practice
- Purchases are produced or harvested within a 100 mile radius of the site
CASE STUDY

Slow Food Movement
San Francisco International Airport – San Francisco, California

In San Francisco's newly renovated Terminal 2, the Airport will require food and beverage tenants to agree to a 16-point sustainable food policy inspired by the Slow Food movement. Vendors must follow guidelines on portion sizes, sourcing of hormone-free meat and cage-free eggs, and source organic, regional produce wherever possible.

9.0 RESPONSIBLE PROCUREMENT

9.6 Sustainable Foods and Consumer Products

2 to 4 Points – Required for CT-OM Mentor Certification

INTENT

Reduce the environmental impacts associated with food production and distribution.

REQUIREMENTS

Beyond the requirements of SAM Credit 9.2, tenants agree to source organic products and sustainable harvested food for both direct sale and in food preparation. This credit pertains only to health and beauty products (i.e. cosmetics and soaps) and whole, non-processed foods (i.e. produce, meats, and cheeses). Sustainable foods and products are defined as meeting any one or more of the following criteria:

- Antibiotic free, no added hormones, or non-genetically modified organisms (GMO) animals and animal products
- Free-range, cage-free, or grass fed animals or animal products
- USDA National Organic Program Certified
- Food Alliance Certified
- Rainforest Alliance Certified
- Protected Harvest Certified
- Fair Trade
- Marine Stewardship Council’s Blue Eco-Label
- Blue Ocean Institute Seafood Guide, no “Red” listed species
- Monterey Bay Aquarium “Green” or “Yellow” listed species

Points are awarded based on the percentage of the tenant’s total food, health, and cosmetic purchases by cost that meet, in any combination, the definition of sustainable foods and products above using the table below:

<table>
<thead>
<tr>
<th>SAM Credit</th>
<th>Percentage</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.6.1</td>
<td>20%</td>
<td>2</td>
</tr>
<tr>
<td>9.6.2</td>
<td>40%</td>
<td>4</td>
</tr>
</tbody>
</table>

Example: Annually, a concessionaire purchases for sale $50,000 of food products including $10,000 of fair trade coffee, $10,000 of Rainforest Alliance Certified bananas, $10,000 of organic apples, and $20,000 of conventional strawberries. With the exception of the strawberries, the other food products meet the criteria above, therefore:
$10,000 + $10,000 + $10,000 = \frac{60\% \text{ of foods meet the requirements}}{50,000}$

Therefore, 4 points are earned for this credit.

**SUBMITTALS**
Include descriptive narrative on SAM Checklist detailing the percentage of organic consumer products and organic and sustainably harvested food sources utilized.

**TECHNOLOGY/STRATEGY**

**Standard Practice**
None

**Recommended Practice**
- Offer certified organic or sustainably harvested products
- Meat served should come from facilities or farms raised without antibiotics. Use of antibiotics on the farm, if practiced, must be minimal. Use of drugs with analogues in human medicine must be non-routine and rare.

**Best Available Practice**
None

**CASE STUDIES**

**Organic To Go™**
San Diego International Airport – San Diego, California

Organic To Go™ is the nation’s first fast-casual café chain to be certified as an organic retailer by the USDA. Open since 2009 the in the Food Court, the franchise offers ‘clean’ menu options and vegetarian alternatives. Organic To Go™ offers fresh, healthy and delicious food that is free of harmful additives, antibiotics, chemicals, pesticides, growth hormones or genetic modification. Ingredients are certified organic and locally sourced whenever possible.

10.0 GREEN INTERIORS

10.1 Prerequisite 1 – Minimum Indoor Air Quality (IAQ) Performance Required

INTENT

Establish minimum indoor air quality (IAQ) performance to enhance indoor air quality within tenant space, thus contributing to the comfort and well-being of the occupants.

REQUIREMENTS

Meet the minimum requirements of Sections 4 through 7 of ASHRAE 62.1-2010, Ventilation for Acceptable Indoor Air Quality. Mechanical ventilation systems shall be designed using the Ventilation Rate Procedure or the applicable local code, whichever is more stringent. Naturally ventilated spaces shall comply with ASHRAE 62.1-2010, paragraph 5.1.

If the project team cannot meet the outside air requirements of ASHRAE 62.1-2010 (with errata but without addenda), document the space and system constraints that make it not possible.

SUBMITTALS

Include descriptive narrative and calculations in the SAM Checklist.

TECHNOLOGY/STRATEGY

Ventilation systems should meet or exceed the minimum outdoor air ventilation rates as described in the ASHRAE standard. Balance the impacts of ventilation rates on energy use and indoor air quality to optimize for energy efficiency and occupant health. Use the ASHRAE 62 Users Manual for detailed guidance on meeting the referenced requirements.

Standard Practice

- Identify potential IAQ conflicts on the site and locate air intakes away from air contaminant source, which might include loading areas, exhaust fans, and cooling towers
- Locate air intakes in secure areas for protection from potential security breaches
- Chicago Building Code uses ASHRAE 62.1-2004

Recommended Practice

- Design HVAC systems to meet ventilation requirements of the referenced standard
- Evaluate carbon or electrostatic filters for use in tenant space
- Provide a security monitoring system and restrict access to outdoor air intakes for tenant space
• In cases where conflicts with the City of Chicago ventilation code arise, meet the requirements of the more stringent code.

Best Available Practice

None

CASE STUDY

Green Restaurant
Green McDonald’s – Cary, North Carolina

An indoor air quality management plan was implemented during construction and a pre-occupancy flush out involving MERV (Minimum Efficiency Reporting Value) 13 air filters was carried out to ensure good air quality prior to occupancy. The ventilation system provides 30 percent more ventilation than the ASHRAE (American Society of Heating, Refrigerating and Air Conditioning Engineers) 2004 standards prescribe and carbon dioxide sensors were installed at various heights throughout the building to monitor indoor air quality.

www.skanska-sustainability-case-studies.com/pdfs/60/60_McDonalds_v001.pdf
10.0 GREEN INTERIORS

10.2 Prerequisite 2 – Environmental Tobacco Smoke (ETS) Control

Required

INTENT

Prevent or minimize exposure of occupants, indoor surfaces, and ventilation air distribution systems to Environmental Tobacco Smoke (ETS).

REQUIREMENTS

OPTION 1

- Prohibit smoking in the tenant space
- Smoking must be prohibited within 25 feet of entryways, outdoor air intakes and operable windows. Provide signage to allow smoking in designated areas, prohibit smoking in designated areas or prohibit smoking on the entire property.

OR

OPTION 2

- Prohibit smoking in the tenant space except in designated smoking areas
- Smoking must be prohibited from within 25 feet from entries, outdoor air intakes and operable windows.
- Locate designated smoking rooms to effectively contain, capture and remove ETS from the tenant space. At a minimum, the smoking room must be directly exhausted to the outdoors with no re-circulation of ETS-containing air to the non-smoking area of the space, and enclosed with impermeable deck-to-deck partitions. With the doors to the smoking room closed, operate exhaust sufficient to create a negative pressure with respect to the adjacent spaces of at least an average of 5 Pa (0.02 inches of water gauge) and with a minimum of 1 Pa (0.004 inches of water gauge).
- Performance of the smoking room differential air pressures shall be verified by conducting 15 minutes of measurement, with a minimum of one measurement every 10 seconds, of the differential pressure in the smoking room with respect to each adjacent area and in each adjacent vertical chase with the doors to the smoking room closed. The testing will be conducted with each space configured for worst case conditions of transport of air from the smoking rooms to adjacent spaces with the smoking rooms' doors closed to the adjacent spaces.

NOTE: It is acceptable to not designate any smoking areas and to provide signage to indicate the prohibition of smoking on the property to satisfy the prerequisite requirements.
SUBMITTALS
Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY
Prohibit smoking in tenant space, or effectively control the ventilation air in smoking rooms.

Standard Practice
- Chicago Building Code prohibits smoking within 15 feet of entryways which is less stringent than this credit. The distance must be increased to 25 feet to meet this prerequisite.

Recommended Practice
- Require all parts of the construction sites to be non-smoking.

Best Available Practice
- Where applicable, provide a designated smoking room designed to effectively contain, capture and remove ETS from the tenant space. At a minimum, the smoking room must be directly exhausted to the outdoors with no recirculation of ETS-mixed air to the non-smoking area of the tenant space, enclosed with impermeable deck-to-deck partitions and operated at negative pressure.
- Performance of the smoking rooms shall be verified by using tracer gas testing methods as described in the ASHRAE Standard 129-1997. Acceptable exposure in non-smoking areas is defined as less than 1% of the tracer gas concentration in the smoking room detectable in the adjoining non-smoking areas. Smoking room testing as described in ASHRAE Standard 129-1997, Section 8, is required in the contract documents and critical smoking facility systems testing results must be included as a separate document.
10.0 GREEN INTERIORS

10.3 Prerequisite 3 – Green Cleaning

Required

INTENT

Reduce the exposure of occupants and maintenance personnel to potentially hazardous chemical, biological, and particulate contaminants, which adversely affect air quality, human health, and the environment.

REQUIREMENTS

Tenants agree to source green cleaning and hygiene products that are certified by a third-party certifier, such as, but not limited to:

- GREENGUARD Environmental Institute (UL Environment)
- Ecologo (UL Environment)
- Green Seal
- Recognized by the U.S. Environmental Protection Agency (EPA) Design for the Environment Formulator Program
- Others as approved by the CDA where applicable

SUBMITTALS

Include descriptive narrative on SAM Checklist listing the products meeting the criteria above.

TECHNOLOGY/STRATEGY

Standard Practice

None

Recommended Practice

- Use only environmentally-friendly cleaning and hygiene products.

Best Available Practice

None
CASE STUDIES

Greening of O'Hare and Midway
Chicago Department of Aviation – Chicago, Illinois

The Chicago Department of Aviation has implemented a number of sustainable initiatives at O'Hare and Midway airports including the use of Green Seal certified cleaning products and eliminating the use or aerosol sprays to clean and disinfect airport facilities.

www.explorechicago.org/city/en/about_the_city/green_chicago/green_airport.html
10.0 GREEN INTERIORS

10.4.1 Green Cleaning: High Performance Cleaning

2 points

INTENT

Reduce the exposure of occupants and maintenance personnel to potentially hazardous chemical, biological, and particulate contaminants, which adversely affect air quality, human health, and the environment.

REQUIREMENTS

In addition to SAM Credit 10.3 – Green Cleaning, have in place during the performance period a high performance cleaning program that addresses the following:

- Purchase of cleaning equipment meeting the sustainability criteria outlined in SAM Credit 10.5.2 Green Cleaning: Equipment
- Establishment of standard operating procedures (SOPs) addressing how an effective cleaning and hard floor and carpet maintenance system will be consistently utilized, managed, and audited
- Development of strategies for promoting and improving hand hygiene, including both hand washing and the use of alcohol-based waterless hand sanitizers
- Development of guidelines addressing the safe handling and storage of cleaning chemicals used within the tenant space, including a plan for managing hazardous spills or mishandling incidents
- Development of requirements for staffing and training of maintenance personnel appropriate to the needs of the tenant. Specifically address the training of maintenance personnel in the hazards of use, disposal, and recycling of cleaning chemicals, dispensing equipment, and packaging.
- Provision for collecting occupant feedback and continuous improvement to evaluate new technologies, procedures, and processes

At a minimum, the policy must cover the green cleaning materials that are within the tenant's control.

SUBMITTALS

Include descriptive narrative in the SAM Checklist outlining details of a written high performance cleaning program.
TECHNOLOGY/STRATEGY

Over the performance period, have in place a high performance cleaning program addressing SOPs, sustainable products and equipment, chemical handling and storage, and staff training. Some additional items to consider include:

- Employ cleaning techniques that promote the most efficient use of products such as training on the proper amount of product to use and proper wiping motion for certain tasks.
- Utilize cleaning techniques that promote the most efficient use of electricity such as working through areas and then turning off the lights in those areas and moving to another section instead of having all the lights on throughout the space for the entire shift.
- Provide proper training on supply usage such as when to replace paper products and liners as not to throw away usable product. For example, office trash liners that may need emptying but not replacing when possible.

Standard Practice

None

Recommended Practice

- See Appendix AP-A – Green Product Listing for a listing of products
- Utilize a High Performance Green Cleaning Program

Best Available Practice

None

CASE STUDIES

Green Cleaning
XOCO Restaurant – Chicago, Illinois

XOCO uses green housekeeping and sanitizing items. For example, the hand soap is Green Seal certified, as is the window cleaner, counter cleaner, floor cleaner and warewash cleansers.

http://dinegreen.com/customers/featured.asp?ID=REST11002
10.0 GREEN INTERIORS

10.4.2 Green Cleaning: Equipment

1 point

INTENT

Reduce the exposure of occupants and maintenance personnel to potentially hazardous chemical, biological, and particulate contaminants, which adversely affect air quality, human health, and the environment.

REQUIREMENTS

Implement a program for the use of janitorial equipment that reduces contaminants and minimizes environmental impact. The cleaning equipment program must require the following:

- Vacuum cleaners are certified by the Carpet and Rug Institute “Green Label” Testing Program for vacuum cleaners and operate with a sound level of less than 70dBA
- Carpet extraction equipment used for restorative deep cleaning is certified by the Carpet and Rug Institute’s “Seal of Approval” Testing Program for deep-cleaning extractors
- Powered floor maintenance equipment, including electric and battery-powered floor buffers and burnishers, is equipped with vacuums, guards and/or other devices for capturing fine particulates and operates with a sound level of less than 70dBA
- Propane-powered floor equipment has high-efficiency, low-emissions engines with catalytic converters and mufflers that meet the California Air Resources Board (CARB) or Environmental Protection Agency (EPA) standards for the specific engine size and operate with a sound level of less than 90dBA
- Automated scrubbing machines are equipped with variable-speed feed pumps and on-board chemical metering to optimize the use of cleaning fluids. Alternatively, the scrubbing machines use only tap water with no added cleaning products
- Powered equipment is ergonomically designed to minimize vibration, noise and user fatigue
- Equipment is designed with safeguards, such as rollers or rubber bumpers, to reduce potential damage to building surfaces
- Keep a log for all powered cleaning equipment to document the date of equipment purchase and all repair and maintenance activities and include vendor specification sheets for each type of equipment in use

SUBMITTALS

Include descriptive narrative in the SAM Checklist.
TECHNOLOGY/STRATEGY

Develop, implement and maintain a policy for the use of low-impact powered cleaning equipment. Evaluate the powered cleaning equipment currently being used and make a plan for upgrading to powered cleaning equipment that reduces contaminants within the tenant space and minimizes environmental impact.

Standard Practice

None

Recommended Practice

- Utilize cleaning equipment that are designed to have a reduced environmental impact while maintaining performance of cleaning

Best Available Practice

- Carpet and Rug Institute approved vacuum and carpet cleaning equipment
- Electric and battery-powered floor buffers and burnishers that operate at less than 70dBA
- Low-emissions fossil fuel powered floor cleaning equipment that meets the California Air Resources Board (CARB) or Environmental Protection Agency (EPA) standards for the specific engine size and operate with a sound level of less than 90dBA
- Automated scrubbing machines are equipped with variable-speed feed pumps and on-board chemical metering to optimize the use of cleaning fluids
- Battery-powered equipment is equipped with environmentally preferable gel batteries
- Ergonomically designed equipment
- Equipment is designed with safeguards
- Keep a log for all powered cleaning equipment to document the date of equipment purchase and all repair and maintenance activities and include vendor specification sheets for each type of equipment in use
10.0 GREEN INTERIORS

10.4.3 Green Cleaning: Entryway Systems (Non-Terminal Tenants)

1 point

INTENT

Reduce the exposure of occupants and maintenance personnel to potentially hazardous chemical, biological, and particulate contaminants, which adversely affect air quality, human health, and the environment.

REQUIREMENTS

Utilize permanent entryway systems (grilles, grates, mats) at least 10 feet long in the primary direction of travel to reduce the amount of dirt, dust, pollen and other particles entering the tenant space. Public entryways that are not in use or serve only as emergency exits are excluded from the requirement, as are private offices.

SUBMITTALS

Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

Use grills, grates or mats to catch and hold dirt particles and prevent contamination of the tenant’s interior space. Design exterior stone, brick or concrete surfaces to drain away from regularly used entrances.

At entrances, install low-maintenance vegetation consistent with the requirements of SAM Credit 14.3.1 Landscape Management: CDA Specifications and avoid plants, including trees and shrubs that produce fruit, flowers or leaves that are likely to be tracked into the building. Select plants based on an integrated pest management (IPM) approach to eliminate pesticide applications that could be tracked into the building.

Provide a water spigot and electrical outlet at each public building entrance for maintenance and cleaning.

Standard Practice

None

Recommended Practice

- Use grilles, grates, or mats at entryways
- Install low-maintenance vegetation
- Eliminate pesticide applications
- Provide a water spigot and electrical outlet at each entrance
10.0 GREEN INTERIORS

10.4.4 Green Cleaning: Integrated Pest Management

1 point

INTENT

Preserve environmental integrity while discouraging the presence of pests/wildlife, in an effort to include methods that maintain and encourage high-performance pest management control.

REQUIREMENTS

Use Integrated Pest Management (IPM) Techniques, such as:

- Control dirt, moisture, clutter, foodstuffs, harborage, and building penetrations
- Use baits and traps rather than pesticide sprays where possible
- Avoid pesticide applications for prevention of pests
- Use pesticides only where pests are located
- Use pesticide specifically formulated for targeted pest

AND/OR

Use wildlife deterrent methods in accordance with United States Department of Agriculture - Wildlife Services.

SUBMITTALS

Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

Over the performance period, have in place a wildlife and pest management plan that addresses overall site management, chemicals, and waste. Include such green landscape management practices such as: applying integrated pest management and deterring wildlife habitat.

Integrated pest management (IPM), defined as managing pests (plants, fungi, insects, and/or animals) in a way that protects human health and the surrounding environment that improves economic returns through the most effective, least-risk option.

The IPM plan includes preferred use of nonchemical methods, definition of emergency conditions, and universal notification providing advance notice of not less than 72 hours under normal conditions, and, 24 hours in emergencies before a pesticide, (other than a least-toxic pesticide) is applied in a building or on surrounding grounds that the building management maintains.

Vegetated roofs must be designed and maintained to not attract wildlife or provide habitat.
Standard Practice

None

Recommended Practice

- Apply pesticides only during unoccupied hours
- Ventilate area with significant quantities of outside air during and after applications
- Completely flush space prior to occupancy
- Use more than normal outside air ventilation for some period after occupancy
- Notify occupants prior to occupation
- If applying outside keep away from air intake

Best Available Practice

None
10.0 GREEN INTERIORS

10.5 LEED Certified Design & Construction

1 to 4 Points

INTENT

Promote the incorporation of environmentally sustainable design in building and infrastructure improvements by registering and certifying a project through the LEED certification process and rating system.

REQUIREMENTS

Achieved or located within a space that has achieved certification via any LEED process – Certified, Silver, Gold, or Platinum. Up to 4 points are available for this credit:

<table>
<thead>
<tr>
<th>SAM Credit</th>
<th>Certification Level</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.4.1</td>
<td>Certified</td>
<td>1</td>
</tr>
<tr>
<td>10.4.2</td>
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<td>2</td>
</tr>
<tr>
<td>10.4.3</td>
<td>Gold</td>
<td>3</td>
</tr>
<tr>
<td>10.4.4</td>
<td>Platinum</td>
<td>4</td>
</tr>
</tbody>
</table>

SUBMITTALS

Include descriptive narrative in the SAM Checklist demonstrating that the project has been registered under LEED during the design process. Provide the LEED submittal documentation and final determination. Indicate what level of LEED certification has been achieved after construction.

TECHNOLOGY/STRATEGY

Tenants should retain the LEED documentation from previous certifications. Many of the credit requirements offer operational and sustainability benefits that can be integrated into everyday tenant operations.

Standard Practice

None

Recommended Practice

- Encourage practices that maintain the standards set during the LEED certification process

Best Available Practice

None
10.0 GREEN INTERIORS

10.6 Measurement and Verification

3 Points

INTENT

Provide for the ongoing accountability of energy consumption over time.

REQUIREMENTS

- The M&V period shall cover a period of no less than one year of post-construction occupancy

SUBMITTALS

Include descriptive narrative in the SAM Checklist and M&V Plan.

TECHNOLOGY/STRATEGY

Develop an M&V Plan to evaluate space and/or energy system performance. Characterize the tenant space and/or energy systems through energy simulation or engineering analysis. Install the necessary metering equipment to measure energy use. Track performance by comparing predicted performance to actual performance, broken down by component or system as appropriate. Evaluate energy efficiency by comparing actual performance to baseline performance.

While the IPMVP describes specific actions for verifying savings associated with energy conservation measures (ECMs) and strategies, this Credit expands upon typical IPMVP M&V objectives. M&V activities should not necessarily be confined to energy systems where ECMs or energy conservation strategies have been implemented. The IPMVP provides guidance on M&V strategies and their appropriate applications for various situations. These strategies should be used in conjunction with monitoring and trend logging of significant energy systems to provide for the ongoing accountability of tenant space energy performance.

Standard Practice

None
Recommended Practice

- Install continuous metering equipment for the following end-uses:
  - Lighting systems and controls
  - Constant and variable motor loads
  - Variable frequency drive (VFD) operation
  - Chiller efficiency at variable loads (kW/ton)
  - Cooling load
  - Air and water economizer and heat recovery cycles
  - Air distribution static pressures and ventilation air volumes
  - Boiler efficiencies
  - Indoor water risers and outdoor irrigation

- Develop a Measurement and Verification plan that incorporates the monitoring information from the above end-uses and is consistent with Option B, C or D of the 2001 International Performance Measurement & Verification Protocol (IPMVP) Volume I: Concepts and Options for Determining Energy and Water Savings

- Consider the recommendations included in the Chicago Climate Action Plan

Best Available Practice

- Draft a Measurement & Verification Plan to apply during tenant operation that compares predicted savings to those achieved
10.0  GREEN INTERIORS

10.7  Tenant Space Automation System

1 point

INTENT

Provide information to support the ongoing accountability and optimization of energy performance and identify opportunities for additional energy-saving investments.

REQUIREMENTS

Have in place a computer-based tenant space automation system that monitors and controls key systems that include, but are not limited to:

- Heating
- Cooling
- Ventilation
- Lighting

Have a preventive maintenance program in place that ensures tenant space automation system components are tested and repaired or replaced according to the manufacturer’s recommended interval. Demonstrate that the tenant space automation system is being used to inform decisions regarding changes in operations and energy-saving investments.

SUBMITTALS

Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

Install and/or maintain a tenant space automation system to automatically control key systems. Ensure that relevant staff is adequately trained to use the system, analyze output, make necessary adjustments, and identify investment opportunities to improve energy performance.

Standard Practice

None

Recommended Practice

- Install and utilize a tenant space automation system

Best Available Practice

None
10.0 GREEN INTERIORS

10.8.1 Occupant Controls: Lighting Comfort

1 Point

INTENT

Provide a high level of lighting system control by individual occupants or by specific groups in multi-occupant spaces (e.g., classrooms and conference areas) to promote the productivity, comfort and well-being of occupants.

REQUIREMENTS

Provide individual lighting controls for 90% (minimum) of the tenant space occupants to enable adjustments to suit individual task needs and preferences.

AND

Provide lighting system controls for all shared multi-occupant spaces to enable lighting adjustment that meets group needs and preferences.

SUBMITTALS

Include descriptive narrative and calculations in the SAM Checklist.

TECHNOLOGY/STRATEGY

Ensure the tenant space includes occupant controls for lighting. Strategies to consider include lighting controls and task lighting. Integrate lighting systems controllability into the overall lighting design, providing ambient and task lighting while managing the overall energy use of the space.

Standard Practice

None

Recommended Practice

- Use motion-activated lighting
- Design lighting control systems to take advantage of daylight harvesting to reduce artificial lighting when adequate daylight is available
- Design areas to provide a variety of levels of light and sound in different areas simultaneously
- Provide task lighting or more light switching zones in office areas

Best Available Practice

None
CASE STUDY

Occupant Lighting Controls
Hertz Corporate – North America and Europe

In 2008, Hertz undertook a number of initiatives to manage and reduce energy usage at its locations in North America and Europe. Initial efforts have focused on Quick Hitters that are energy initiatives that can immediately address interior/exterior lighting, HVAC, and process loads (car wash, vacuum systems). Examples include HVAC Thermostat controls, LED exit signs, lighting occupancy controls, photocells, and time clocks.

10.0 GREEN INTERIORS

10.8.2 Occupant Controls: Thermal Comfort

1 Point

INTENT

Provide a high level of thermal comfort system control by individual occupants or by specific groups in multi-occupant spaces (i.e. classrooms or conference areas) to promote the productivity, comfort and well-being of occupants.

REQUIREMENTS

Provide individual comfort controls for 50% (minimum) of the occupants to enable adjustments to suit individual task needs and preferences. Operable windows can be used in lieu of comfort controls for occupants of areas that are 20 feet inside of and 10 feet to either side of the operable part of the window. The areas of operable window must meet the requirements of ASHRAE 62.1-2010 paragraph 5.1 Natural Ventilation.

AND

Provide comfort system controls for all shared multi-occupant spaces to enable adjustments to suit group needs and preferences.

Conditions for thermal comfort are described in ASHRAE Standard 55-2004 to include the primary factors of air temperature, radiant temperature, air speed and humidity.

SUBMITTALS

Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

Ensure tenant space and systems have comfort controls to allow adjustments to suit individual needs or those of groups in shared spaces. ASHRAE Standard 55-2004 identifies the factors of thermal comfort and a process for developing comfort criteria for tenant spaces that suit the needs of the occupants involved in their daily activities. Control strategies can be developed to expand on the comfort criteria to allow adjustments to suit individual needs and preferences.

These strategies may involve system designs incorporating operable windows, hybrid systems integrating operable windows and mechanical systems, or mechanical systems alone. Individual adjustments may involve individual thermostat controls, local diffusers at floor, desk or overhead levels, or control of individual radiant panels, or other means integrated into the overall space, thermal comfort systems, and energy systems design. In addition, designers should evaluate the closely tied interactions between thermal comfort (as required by ASHRAE Standard 55-2004) and acceptable indoor air quality (as required by ASHRAE Standard 62.1-2010, whether natural or mechanical ventilation).
Standard Practice

None

Recommended Practice

- Provide individual thermal controls for occupants

Best Available Practice

- Provide underfloor air distribution systems with individual diffusers for office spaces
- Provide ceiling fans or natural ventilation to increase air movement
- Provide humidification in HVAC systems serving office
- For spaces with humidification, install humidistsats in addition to thermostats
10.0 GREEN INTERIORS

10.9 Thermal Comfort: Employee Verification

1 Point

INTENT

Provide for the assessment of thermal comfort over time.

REQUIREMENTS

Agree to implement a thermal comfort survey of employees within a period of 6 to 18 months after occupancy. This survey should collect anonymous responses about thermal comfort in the tenant space including an assessment of overall satisfaction with thermal performance and identification of thermal comfort-related problems. Agree to develop a plan for corrective action if the survey results indicate that more than 20% of occupants are dissatisfied with thermal comfort. This plan should include measurement of relevant environmental variables in problem areas in accordance with ASHRAE Standard 55-2004.

SUBMITTALS

Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

ASHRAE Standard 55-2004 provides guidance for establishing thermal comfort criteria and the documentation and validation of performance to the criteria. While the standard is not intended for purposes of continuous monitoring and maintenance of the thermal environment, the principles expressed in the standard provide a basis for design of monitoring and corrective action systems.

Standard Practice

None

Recommended Practice

None

Best Available Practice

None

CASE STUDY

Benchmarking Building Quality
University of California – Berkley, California

At the Center for Built Environment at the University of California, Berkeley, they created a standardized environmental quality assessment survey that measures employees’ satisfaction
with their workplace environment quickly and at a low price. A standard set of core questions is used to measure satisfaction with environmental factors such as indoor air quality, thermal comfort, and acoustics. The survey has been used to evaluate the performance of 22 buildings in the United States.

11.0 WATER MANAGEMENT

11.1 Utility Meter Data

4 points

INTENT

Increase water efficiency within tenant spaces to reduce the burden on municipal water supply and wastewater systems.

REQUIREMENTS

Provide water meter data (if available). Use water meter data to compile water use and report data on a periodic basis, e.g. annually at a minimum.

SUBMITTALS

Provide numerical data, e.g. annual consumption, for the narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

Where possible install water meters to measure a tenant space’s domestic water use.

Meter data will be used to determine water use reduction in SAM Credit 11.3, Option 1. Gather meter data for one full year. This first year reported will act as the baseline for subsequent years.

Standard Practice

- Comply with CDA/OMP Specification 15410 – Plumbing Fixtures

Recommended Practice

- Track water consumption using metering
- Install water meters to track tenant space water use (submetering)

Best Available Practice

- Track water consumption using submetering for one or more of the following:
  - Irrigation
  - Indoor plumbing fixtures
  - Cooling towers
  - Domestic hot water
  - Process water
11.0 WATER MANAGEMENT

11.2 Water Management Plan

2 points

INTENT

To reduce the use of water while promoting continuity of information to ensure that water-efficient operating strategies are maintained and provide a foundation for training employees and continuous improvement.

REQUIREMENTS

At a minimum, use the following form to document the following:

- Develop a systems narrative that briefly describes current practices, the plumbing systems and equipment in the tenant space. The systems narrative must include all the systems using water, including at a minimum; restroom and kitchen plumbing fixtures, food service equipment (e.g. ice makers), other process related water use systems.
- Describe what conservation initiatives have been implemented to reduce the consumption of water.

SUBMITTALS

Include descriptive narrative in the SAM Checklist as well as a copy of the Water Management Plan.

TECHNOLOGY/STRATEGY

For a tenant space to operate successfully, the tenant’s staff must understand the space’s current performance, critical metrics must be established, and steps to improve performance must be developed.

Inspect all existing fittings or fixtures to ensure they are operating properly. Make any repairs needed to bring all fixtures into good working order or permanently turn off water supply to nonfunctional units.

Implement a fixture and fitting replacement and retrofit policy specifying that all newly installed toilets, urinals, private lavatory faucets, and showerheads that are eligible for labeling be WaterSense labeled. For a listing of WaterSense labeled products visit http://www.epa.gov/watersense/product_search.html.

For building water use, confirm that calculations are up to date. Demonstrate that all applicable purchases meet the requirements of the fixture and fitting replacement and retrofit policy.

Standard Practice

None
Recommended Practice

- Develop a Water Management Plan for the tenant space

Best Available Practice

- Continuously improve upon and require that all employees are trained on the merits and policies contained within the Water Management Plan.

CASE STUDY

Water Management Planning
U.S. Department of Energy Y-12 National Security Complex

A water assessment at the Y-12 National Security Complex in Oak Ridge, Tennessee, provided a comprehensive understanding of current water-consuming equipment and applications while identifying key areas for efficiency improvement.

http://www1.eere.energy.gov/femp/pdfs/y12_lessonslearned.pdf
WATER MANAGEMENT PLAN TEMPLATE
SAM Credit 11.2

Tenant Information

Date

Tenant

Owner

Address/Location

Contact Person

Phone

Email

**Water Management Survey**

All questions apply to systems under the tenant’s control and/or within the space being evaluated.

<table>
<thead>
<tr>
<th>1. Does tenant have separately metered water utility?</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. If yes, what is annual water usage?</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Gal/yr</td>
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<td></td>
<td>From <strong><strong><strong><strong><strong>/</strong></strong></strong></strong></strong> to <strong><strong><strong><strong><strong>/</strong></strong></strong></strong></strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Month/Year</td>
<td>Month/Year</td>
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<tr>
<td>3. Fixture Inventory (input quantity of each unit):</td>
<td>Number</td>
<td>Flow rate</td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Toilets/Water Closet</td>
<td></td>
<td></td>
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<tr>
<td>b. Urinals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Lavatories</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Faucets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Water Fountains</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Fixture Inventory (input quantity of each unit) (cont’d):</td>
<td>Number</td>
<td>Flow rate</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>f.</td>
<td>Pre-Rinse Spray Valves</td>
<td></td>
</tr>
<tr>
<td>g.</td>
<td>Other (List)</td>
<td></td>
</tr>
<tr>
<td>h.</td>
<td>Other (List)</td>
<td></td>
</tr>
<tr>
<td>i.</td>
<td>Other (List)</td>
<td></td>
</tr>
<tr>
<td>4. Water Using Appliances and Equipment (List)</td>
<td>Number</td>
<td>ENERGY STAR (Y/N)</td>
</tr>
<tr>
<td>a.</td>
<td>e.g. Dishwasher, Model ###</td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td>e.g. Ice Maker, Model ###</td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Conservation Techniques – e.g. rainwater harvesting, gray water reuse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Education and Training – If yes, please describe</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>a.</td>
<td>Water Conservation Signage</td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td>Employee Training - Water Conservation</td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td>Customer Education - Water Conservation</td>
<td></td>
</tr>
<tr>
<td>7. Please share any additional information you think is pertinent.</td>
<td></td>
<td>(Please use additional pages as necessary to complete)</td>
</tr>
</tbody>
</table>
11.0 WATER MANAGEMENT

11.3 Water Use Reduction

1 to 10 points

INTENT

Further increase water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems.

REQUIREMENTS

OPTION 1

Employ strategies described in CDA/OMP Specification 15410.

AND

Using one year’s worth of meter data, calculate reduction compared to baseline data (data from first review).

Additional water reductions beyond the baseline set by the 1st year data water usage will be awarded credits based on the following table:

<table>
<thead>
<tr>
<th>SAM Credit</th>
<th>Building and Process Water Reduction</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.3.1</td>
<td>5%</td>
<td>1</td>
</tr>
<tr>
<td>11.3.2</td>
<td>10%</td>
<td>2</td>
</tr>
<tr>
<td>11.3.3</td>
<td>15%</td>
<td>3</td>
</tr>
<tr>
<td>11.3.4</td>
<td>20%</td>
<td>4</td>
</tr>
<tr>
<td>11.3.5</td>
<td>25%</td>
<td>5</td>
</tr>
<tr>
<td>11.3.6</td>
<td>30%</td>
<td>6</td>
</tr>
<tr>
<td>11.3.7</td>
<td>35%</td>
<td>7</td>
</tr>
<tr>
<td>11.3.8</td>
<td>40%</td>
<td>8</td>
</tr>
<tr>
<td>11.3.9</td>
<td>45%</td>
<td>9</td>
</tr>
<tr>
<td>11.3.10</td>
<td>50%</td>
<td>10</td>
</tr>
</tbody>
</table>

Example: A tenant collected and recorded water meter data from two years ago and designated this period as the baseline water usage. The annual water use for the baseline year was 100,000 gallons. In the subsequent year, due to water efficiency upgrades and improvements, the tenant was able to lower water usage
for this period to 80,000 gallons. This calculates to a 20% improvement over the baseline and therefore 4 points are awarded.

OR

OPTION 2

Create an inventory of all the water use improvements and upgrades that tenant has undertaken to improve their water efficiency prior and during the performance review.

A point will be awarded for each of the improvements. Up to 6 points may be awarded by achieving any of the following measures:

<table>
<thead>
<tr>
<th>Technology/Strategy</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-flow toilets (&lt;1.6 gal/flush)</td>
<td>1</td>
</tr>
<tr>
<td>Low-flow urinals (&lt;1.0 gal/flush)</td>
<td>1</td>
</tr>
<tr>
<td>Waterless toilets and urinals</td>
<td>1</td>
</tr>
<tr>
<td>Low-flow kitchen and lavatory faucets (&lt;0.5 gal/min)</td>
<td>1</td>
</tr>
<tr>
<td>Low-flow pre-rinse spray valves (&lt;1.6 gal/min)</td>
<td>1</td>
</tr>
<tr>
<td>Automatic sensors for faucets and flushing</td>
<td>1</td>
</tr>
<tr>
<td>Water meters for submetering</td>
<td>1</td>
</tr>
<tr>
<td>Replace potable water for non-potable water applications with collected process water or rainwater (e.g. cisterns, rain barrels)</td>
<td>1</td>
</tr>
<tr>
<td>ENERGY STAR dishwasher</td>
<td>1</td>
</tr>
<tr>
<td>ENERGY STAR washing machine</td>
<td>1</td>
</tr>
</tbody>
</table>

SUBMITTALS

Include descriptive narrative and calculations in the SAM Checklist.

TECHNOLOGY/STRATEGY

WaterSense™-certified fixtures and fixture fittings should be used where available. Use high-efficiency fixtures (water dispensers, water closets and urinals) and dry fixtures such as composting toilet systems to reduce the potable water demand. Consider the use of alternate on-site sources of water, such as rainwater, stormwater, or air conditioner condensate, and graywater for non-potable applications such as toilet and urinal flushing, as approved by the manufacturer, and custodial uses.
**Standard Practice**

None

**Recommended Practice**

- Use high-efficiency fixtures and valves, such as automatic sensors, aerators on lavatories and dual-flush toilets

**Best Available Practice**

- Dry fixtures such as composting toilets and waterless urinals to reduce wastewater volumes

**CASE STUDIES**

**Water Use Reduction**

**Founding Farmers Restaurant – Washington D.C.**

Founding Farmers Restaurant in Washington DC utilizes waterless urinals and low-flow valves in their restrooms. They also use an ENERGY STAR dishwasher and spray valve. Their sustainable plumbing and fixture equipment saved at least 193,168 gallons of water compared to a conventional restaurant design in 2009.


**Water Efficiency**

**XOCO Restaurant – Chicago, Illinois**

XOCO uses upwards of 40% less water in its operation in comparison to a comparable standard restaurant of its size. To achieve this, we installed the following water conserving equipment and fixtures:

- Low-flow, dual flush toilets.
- Low flow rinse valve for warewash that uses less than 1.28 gallons per minute (gpm).
- ENERGY STAR Rated Dishwashing machine
- High efficiency water heater
- Low flow water aerators make faucets use less than 1.0 gpm.

[www.rickbayless.com/restaurants/sustainability.html](http://www.rickbayless.com/restaurants/sustainability.html)
12.0 ENERGY MANAGEMENT

12.1 Utility Meter Data

4 points

INTENT

Monitor, track and report utility data to reduce environmental and economic impacts associated with excessive energy use.

REQUIREMENTS

Provide energy meter data (if available). Use energy meter data to compile energy use and report data on a periodic basis, e.g. annually at a minimum.

SUBMITTALS

Provide numerical data, e.g. annual consumption, for the narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

Where possible install electric and/or gas meters to measure a tenant space’s energy consumption.

Meter data will be used to determine energy use reduction in SAM Credit 12.4. Gather meter data for one full year. This first year reported will act as the baseline for subsequent years.

Standard Practice

None

Recommended Practice

- Install utility meters where applicable
- Track and record energy usage

Best Available Practice

- Install submeters wherever possible
12.0 ENERGY MANAGEMENT

12.2 Energy Management Plan

2 points

INTENT

To reduce energy use while promoting continuity of information to ensure that energy-efficient operating strategies are maintained and provide a foundation for training employees and continuous improvement.

REQUIREMENTS

The Energy Management Plan should highlight the tenants’ plan for each of the following:

1. Measure - collecting data and analyzing total consumption for establishing an energy usage baseline.

2. Fix the basics - Fixing the basics typically consists of efforts, such as installing low-energy-consumption devices.

3. Automate - Ongoing energy-efficiency improvements can be achieved by automating and regulating building systems. Measures such as schedule-based lighting control and occupancy sensors automatically turn lights on only when they are needed in commercial buildings, while HVAC control regulates heating and cooling at optimal levels, which can change from day to day. More importantly, however, these measures facilitate an active approach to energy management, because they can be adjusted based on new energy-efficiency opportunities that arise in the future.
   a. Timers
   b. Sensors
   c. Occupancy Controls
   d. HVAC
   e. Building Information Systems

4. Monitor and control - A strategic energy management plan also helps ensure that initial energy and cost savings don’t erode over time. Power meter installations, monitoring services, energy-efficiency analysis, energy bill verification, and implementation of an enterprise energy management (EEM) system can all help achieve this end.

SUBMITTALS

Include descriptive narrative in the SAM Checklist as well as a copy of the Energy Management Plan.
TECHNOLOGY/STRATEGY

For a tenant space to operate successfully, the tenant’s staff must understand the space’s current performance, critical metrics must be established, and steps to improve performance must be developed.

Inspect all existing devices or fixtures to ensure they are operating properly. Make any repairs needed to bring all fixtures into good working order or permanently turn off electrical supply to nonfunctional units.

Implement a fixture and fitting replacement and retrofit policy specifying that all newly installed devices, equipment and light bulbs are Energy Star or more energy efficient than those they are replacing.

Demonstrate that all applicable purchases meet the requirements of the fixture and fitting replacement and retrofit policy.

Standard Practice

None

Recommended Practice

• Develop an Energy Management Plan for the tenant space

Best Available Practice

• Continuously improve upon and require that all employees are trained on the merits and policies contained within the Energy Management Plan.

CASE STUDY

Energy Management Planning
One Earth Food Group – Corporate Strategic Energy Management Plan

The One Earth Food Group Continuous Energy Improvement Program focuses on understanding how the company uses energy and developing ways to reduce energy costs. The Energy Management Plan identifies the tasks necessary for the Continuous Energy Improvement Program to maintain consistent progress and achieve its goals.

# ENERGY MANAGEMENT PLAN TEMPLATE

**SAM Credit 12.2**

## Tenant Information

<table>
<thead>
<tr>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenant</td>
</tr>
<tr>
<td>Owner</td>
</tr>
<tr>
<td>Address/Location</td>
</tr>
<tr>
<td>Contact Person</td>
</tr>
<tr>
<td>Phone</td>
</tr>
<tr>
<td>Email</td>
</tr>
</tbody>
</table>

## Energy Management Survey

All questions apply to systems under the tenant’s control and/or within the space being evaluated.

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Does tenant have separately metered energy utility?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. If yes, what is annual energy usage?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Electricity</td>
<td>kWh/yr</td>
<td></td>
</tr>
<tr>
<td>From <em><strong><strong><strong>/</strong></strong></strong></em> to <em><strong><strong><strong>/</strong></strong></strong></em>_</td>
<td>Month/Year</td>
<td>Month/Year</td>
</tr>
<tr>
<td>b. Gas</td>
<td>Btu/yr</td>
<td></td>
</tr>
<tr>
<td>From <em><strong><strong><strong>/</strong></strong></strong></em> to <em><strong><strong><strong>/</strong></strong></strong></em>_</td>
<td>Month/Year</td>
<td>Month/Year</td>
</tr>
<tr>
<td>3. Lighting Fixture Inventory (input quantity of each unit):</td>
<td>Number</td>
<td>Wattage</td>
</tr>
<tr>
<td>----------------------------------------------------------</td>
<td>--------</td>
<td>---------</td>
</tr>
<tr>
<td>a. e.g. T8 fluorescent lamps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. e.g. CFL recessed lights</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Other (List)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Other (List)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. Electrical Appliances (List)</th>
<th>Number</th>
<th>ENERGY STAR (Y/N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. e.g. Dishwasher, Model ###</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. e.g. Ice Maker, Model ###</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Other (List)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Other (List)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. Office Equipment (List)</th>
<th>Number</th>
<th>ENERGY STAR (Y/N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. e.g. Printer/Copier, Model ###</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. e.g. Computer, Model ###</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Other (List)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Other (List)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. Gas Appliances and Equipment (List)</th>
<th>Number</th>
<th>ENERGY STAR (Y/N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. e.g. Oven/Range, Model ###</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. e.g. Water Heater, Model ###</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Other (List)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Other (List)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7. Mobile Equipment/Vehicle Fuel Usage (input quantity of each unit):</th>
<th>Number</th>
<th>Fuel Type</th>
<th>Fuel Usage/ Mileage</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. e.g. Lawn Mowers, Model ###</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. e.g. Forklifts, Model ###</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Other (List)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Other (List)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Other (List)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
8. Renewable Energy Sources – e.g. solar hot water heating, photovoltaics

9. Largest Energy User (list system, equipment, etc. with the largest consumption of energy – electric and/or gas)

10. Conservation Techniques – e.g. anti-idling, occupancy sensors, etc.

11. Education and Training – If yes, please describe
   a. Energy Conservation Signage
      Yes  No
   b. Employee Training - Energy Conservation
      Yes  No
   c. Customer Education - Energy Conservation
      Yes  No

12. Please share any additional information you think is pertinent.

(Please use additional pages as necessary to complete)
12.0 ENERGY MANAGEMENT

12.3 Energy Use Reduction

1 to 10 points

INTENT

Further increase energy efficiency within buildings to reduce the burden on local utilities.

REQUIREMENTS

OPTION 1

Using one year's worth of meter data, calculate reduction compared to baseline data (data from first review).

Energy reduction beyond the baseline set by 1st year data energy usage will be awarded credits based on the following table:

<table>
<thead>
<tr>
<th>SAM Credit</th>
<th>Energy Reduction</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.3.1</td>
<td>5%</td>
<td>1</td>
</tr>
<tr>
<td>12.3.2</td>
<td>10%</td>
<td>2</td>
</tr>
<tr>
<td>12.3.3</td>
<td>15%</td>
<td>3</td>
</tr>
<tr>
<td>12.3.4</td>
<td>20%</td>
<td>4</td>
</tr>
<tr>
<td>12.3.5</td>
<td>25%</td>
<td>5</td>
</tr>
<tr>
<td>12.3.6</td>
<td>30%</td>
<td>6</td>
</tr>
<tr>
<td>12.3.7</td>
<td>35%</td>
<td>7</td>
</tr>
<tr>
<td>12.3.8</td>
<td>40%</td>
<td>8</td>
</tr>
<tr>
<td>12.3.9</td>
<td>45%</td>
<td>9</td>
</tr>
<tr>
<td>12.3.10</td>
<td>50%</td>
<td>10</td>
</tr>
</tbody>
</table>

Example: A tenant collected and recorded electric meter data from two years ago and designated this period as the baseline electric usage. The annual electric use for the baseline year was 100,000 kWh. In the subsequent year, due to energy efficiency upgrades and improvements, the tenant was able to lower energy usage for this period to 80,000 kWh. This calculates to a 20% improvement over the baseline and therefore 4 points are awarded.

OR
OPTION 2

Create an inventory of all the energy improvements and upgrades that tenant has undertaken to improve their energy efficiency prior to and during the performance review.

A point will be awarded for each of the improvements. Up to 6 points may be awarded by achieving any of the following measures:

<table>
<thead>
<tr>
<th>Measure</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED lighting</td>
<td>1</td>
</tr>
<tr>
<td>CFL lighting</td>
<td>1</td>
</tr>
<tr>
<td>Halogen or induction lamps</td>
<td>1</td>
</tr>
<tr>
<td>High efficiency T8 and T5 lamps</td>
<td>1</td>
</tr>
<tr>
<td>Lighting sensors or timers</td>
<td>1</td>
</tr>
<tr>
<td>Organize circuiting of lighting and systems so</td>
<td>1</td>
</tr>
<tr>
<td>that individual areas are separately controlled</td>
<td></td>
</tr>
<tr>
<td>relative to daylight and heating/cooling zones</td>
<td></td>
</tr>
<tr>
<td>Motion sensors/occupancy sensors in stairs,</td>
<td>1</td>
</tr>
<tr>
<td>restrooms, storage rooms, equipment rooms and</td>
<td></td>
</tr>
<tr>
<td>office space</td>
<td></td>
</tr>
<tr>
<td>High-efficiency motors and variable-speed</td>
<td>1</td>
</tr>
<tr>
<td>pumping systems</td>
<td></td>
</tr>
<tr>
<td>ENERGY STAR furnaces, exhaust fans, ceiling fans,</td>
<td>1</td>
</tr>
<tr>
<td>and air conditioners</td>
<td></td>
</tr>
</tbody>
</table>

SUBMITTALS

Include descriptive narrative and calculations in the SAM Checklist.

TECHNOLOGY/STRATEGY

Select ENERGY STAR rated equipment, optimize HVAC systems and lighting, and implement an energy management plan that reduces energy consumption. Any strategies that reduce energy consumption should be considered that will impact the results of this credit. Additional points can be obtained using strategies as outlined in the other credits of this section.

Standard Practice

None
Recommended Practice

- Use high-efficiency equipment, fixtures, appliances, and lighting
- Maintain an energy management plan that addresses off-hour usage, timers, and/or sensors

Best Available Practice

None
12.0 ENERGY MANAGEMENT

12.4.1 Optimize Energy Performance: Lighting Power

1 to 5 Points

INTENT

Achieve increasing levels of energy conservation beyond the referenced standard to reduce environmental and economic impacts associated with excessive energy use.

REQUIREMENTS

Reduce connected lighting power density below that allowed by ANSI/ASHRAE/IESNA Standard 90.1-2010 (with errata but without addenda) using either the space-by-space method or by applying the tenant’s lighting power allowance to the entire tenant space.

The points awarded for reducing lighting power density below the standard are as follows:

<table>
<thead>
<tr>
<th>SAM Credit</th>
<th>Lighting Power Density Reduction Below the Standard</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4.1.1</td>
<td>15%</td>
<td>1</td>
</tr>
<tr>
<td>12.4.1.2</td>
<td>20%</td>
<td>2</td>
</tr>
<tr>
<td>12.4.1.3</td>
<td>25%</td>
<td>3</td>
</tr>
<tr>
<td>12.4.1.4</td>
<td>30%</td>
<td>4</td>
</tr>
<tr>
<td>12.4.1.5</td>
<td>35%</td>
<td>5</td>
</tr>
</tbody>
</table>

SUBMITTALS

Include descriptive narrative and calculations in the SAM Checklist.

TECHNOLOGY/STRATEGY

Ensure the connected lighting power maximizes energy performance. If possible, consider a computer simulation model to assess the performance and identify the most cost-effective energy measures.

Standard Practice

None

Recommended Practice

Consider the following for tenant spaces:

- Provide energy efficient lighting systems including LED, fluorescent lighting, solar lighting
• Use LED lighting, wherever applicable
• Use CFL lighting, wherever applicable
• Utilize energy saving halogen or induction lamps
• Utilize high efficiency T8 and T5 lamps
• Use a computer simulation model to assess energy performance and identify the most cost effective energy measures

Best Available Practice
None

CASE STUDY

Energy Efficient Burger King
Burger King – Waghäusel, Germany

The eco-friendly design developed in cooperation with Wirsol Solar AG (Baden-Württemberg) utilizes state-of-the-art technologies and renewable energy to power one-third of the restaurant’s energy consumption, thus reducing energy costs by 45% and the emission of CO₂ by more than 120 metric tons every year.

The 20/20 design is complemented with the latest eco-friendly technologies and energy efficient construction elements including:

• Interior heat recovery ventilation system that cools and heats the restaurant, saving 73% of energy consumption per year
• Long-lasting interior and exterior LED bulbs saving more than 55% of energy consumption annually
• Excess heat loss is captured to generate hot water, conserving 50% of energy usage annually
• A wind turbine contributing up to 2,500 kWh to the restaurant’s power supply was added to the traditional exterior BK® logo sign
• Photovoltaic and wind energy systems that save up to 45% of electricity annually
• More than 720 solar photovoltaic modules generate over 53,500 kWh of electricity per year, which equals the annual consumption of five U.S. households
• A solar-powered electric vehicle charging station for hybrid cars
• A rainwater reclamation system for outside irrigation

In addition, the restaurant kitchen features the revolutionary Duke Flexible Batch Broiler, which maximizes cooking flexibility while reducing gas consumption and related costs by 52 percent electricity consumption and costs by 90 percent. All BURGER KING® restaurants in North America have installed this new broiler and the international rollout is expected to be completed by the end of 2012.

www.restaurantnewsresource.com/article46521.html
12.0 ENERGY MANAGEMENT

12.4.2 Optimize Energy Performance: Lighting Control

1 to 3 Points

INTENT

Achieve increasing levels of energy conservation beyond the referenced standard to reduce environmental and economic impacts associated with excessive energy use.

REQUIREMENTS

Up to 3 points may be awarded by achieving any of the following measures:

<table>
<thead>
<tr>
<th>Technology/Strategy</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Daylight controls for daylight areas</strong>: Install daylight responsive controls in all regularly occupied daylit spaces within 15 feet of windows and under skylights. Daylight controls must switch or dim electric lights in response to the presence or absence of daylight illumination in the space.</td>
<td>1</td>
</tr>
<tr>
<td><strong>Daylight controls for 50% of the lighting load</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Install Occupancy Sensors for 75% of the connected lighting load</strong></td>
<td>1</td>
</tr>
</tbody>
</table>

SUBMITTALS

Include descriptive narrative and calculations in the SAM Checklist.

TECHNOLOGY/STRATEGY

Ensure the connected lighting power maximizes energy performance.

Standard Practice

None

Recommended Practice

- Provide energy efficient lighting systems including LED, fluorescent lighting, solar lighting and the use of lighting sensors or timers
- Organize circuiting of lighting and systems so that individual areas may be separately controlled relative to daylight and heating/cooling zones
- Provide motion sensors/occupancy sensors in stairs, restrooms, storage rooms, equipment rooms and office space unless life safety is compromised
- Optimize lighting controls for energy savings and function
Best Available Practice

- Integrate lighting systems with Tenant Space Automation System (see SAM Credit 10.6)
12.0 ENERGY MANAGEMENT

12.4.3 Optimize Energy Performance: HVAC

3 to 6 Points

INTENT

Achieve increasing levels of energy conservation beyond the referenced standard to reduce environmental and economic impacts associated with excessive energy use.

REQUIREMENTS

OPTION 1

Implement one or both of the following strategies:

- Equipment Efficiency: (3 pts)
  Install heating, ventilation and air conditioning (HVAC) systems that comply with the efficiency requirements outlined in the New Buildings Institute’s Advanced Buildings™ Core Performance™ Guide Sections 1.4: Mechanical System Design, 2.9: Mechanical Equipment Efficiency and 3.10: Variable Speed Control. These sections provide guidance on how to design mechanical systems in an energy efficient manner.

- Appropriate Zoning and Controls: (3 pts)
  Zone spaces to meet the following requirements:
  - Every solar exposure must have a separate control zone
  - Interior spaces must be separately zoned
  - Private offices and special occupancies (conference rooms, kitchens, etc.) must have active controls capable of sensing space use and modulating the HVAC system in response to demand

OR

OPTION 2

Reduce design energy cost compared with the energy cost budget for regulated energy components described in the requirements of ANSI/ASHRAE/IESNA Standard 90.1-2010 (with errata but without addenda) and

OPTION 2: PATH 1 (3 pts)

Demonstrate that HVAC system component performance criteria used for tenant space are 15% better than a system in minimum compliance with ANSI/ASHRAE/IESNA Standard 90.1-2010 (with errata but without addenda).
or

OPTION 2: PATH 2 (6 pts)

Demonstrate that HVAC system component performance criteria use for tenant space are 30% better than a system that is in minimum compliance with ANSI/ASHRAE/IESNA Standard 90.1-2010 (with errata but without addenda).

SUBMITTALS

Include descriptive narrative and calculations in the SAM Checklist.

TECHNOLOGY/STRATEGY

Ensure the HVAC system components maximize energy performance. Review compliance options to determine the most appropriate approach. Option 1 provides a more prescriptive approach to recognizing energy-efficient HVAC design, while Option 2 is performance based.

Standard Practice

None

Recommended Practice

- Provide high-efficiency motors and variable-speed pumping systems
- Utilize ENERGY STAR furnaces, exhaust fans, ceiling fans, and air conditioners

Best Available Practice

- Evaluate under floor air distribution systems in office-type spaces
- Evaluate “green walls” for tenant space
- Utilize premium efficiency motors where applicable

CASE STUDY

HVAC Initiatives
Hertz Corporate – North America and Europe

In 2008, Hertz undertook a number of initiatives to manage and reduce energy usage at its locations in North America and Europe. Initial efforts have focused on Quick Hitters that are energy initiatives that can immediately address interior/exterior lighting, HVAC, and process loads (car wash, vacuum systems). Examples include HVAC Thermostat controls, LED exit signs, lighting occupancy controls, photocells, and time clocks.

12.0 ENERGY MANAGEMENT

12.4.4 Optimize Energy Performance: Equipment & Appliances

1 to 3 Points

INTENT

Achieve increasing levels of energy conservation beyond the referenced standard to reduce environmental and economic impacts associated with excessive energy use.

REQUIREMENTS

For all ENERGY STAR qualified equipment and appliances installed in the tenant space, points will be awarded based on the following percentages by pieces of equipment:

<table>
<thead>
<tr>
<th>SAM Credit</th>
<th>ENERGY STAR Qualified Equipment*</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4.4.1</td>
<td>50%</td>
<td>1</td>
</tr>
<tr>
<td>12.4.4.2</td>
<td>75%</td>
<td>2</td>
</tr>
<tr>
<td>12.4.4.3</td>
<td>100%</td>
<td>3</td>
</tr>
</tbody>
</table>

*As a percentage of ENERGY STAR eligible equipment
Excluded are HVAC, lighting and building envelope products.

This requirement applies to appliance, office equipment, electronics and commercial food service equipment. Excluded are HVAC, lighting and building envelope products.

SUBMITTALS

Include descriptive narrative and calculations in the SAM Checklist.

TECHNOLOGY/STRATEGY

Select energy-efficient equipment and appliances, as qualified by the EPA’s ENERGY STAR Program ([https://www.energystar.gov](https://www.energystar.gov)).

Standard Practice

None

Recommended Practice

Consider the following for tenant spaces:

- Provide high-efficiency motors and variable-speed pumping systems
- Provide ENERGY STAR compliant equipment and appliances such as:
  - Dishwashers
  - Water Heaters
- Washing machines
- Dryers
- Refrigerators
- Walk-in refrigerators
- Freezers
- Ranges
- Computers
- Printers
- Copiers
- Phones
- Televisions
- Steamers
- Fryers
- Hot food holding cabinets
- Ice machines
- Convection ovens
- Combination ovens
- Griddles
- Broilers

- Provide other high efficiency equipment and appliances such as:
  - Hand Dryers
  - Food warmers
  - Charbroilers
  - Grills
  - Registers
  - Power strips

**Best Available Practice**

None
12.0 ENERGY MANAGEMENT

12.5 Green Power

2 Points

INTENT

Encourage the development and use of grid-source, renewable energy technologies on a net zero pollution basis.

REQUIREMENTS

Engage in at least a 2-year renewable energy contract to provide at least 35% of the space’s electricity from renewable sources, as defined by the Center for Resource Solutions Green-e Energy product certification requirements.

OPTION 1 – DETERMINE THE BASELINE ELECTRICITY USE

Use the annual electricity consumption from the results of the subparts of SAM Credit 12.1 Utility Meter Data

OR

OPTION 2 – ESTIMATE BASELINE ELECTRICITY USE

Use the U.S. Department of Energy Commercial Buildings Energy Consumption Survey database to determine the estimated electricity use.

SUBMITTALS

Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

Determine the energy needs of the space and investigate opportunities to engage in a green power contract. Green power is derived from solar, wind, geothermal, biomass or low-impact hydro sources. Visit www.green-e.org/energy for details about the Green-e program. The power product purchased to comply with credit requirements need not be Green-e certified. Other sources of green power are eligible if they satisfy the Green-e program’s technical requirements. Renewable energy certificates (RECs), tradable renewable certificates (TRCs), green tags and other forms of green power that comply with Green-e’s technical requirements can be used to document compliance with this section.

Standard Practice

None
**Recommended Practice**

- Determine the City of Chicago’s Green Power requirements for the task/project and investigate opportunities to engage in a green power contract with the utility
- Visit [www.green-e.org](http://www.green-e.org) for details about the Green-e program

**Best Available Practice**

None

**CASE STUDIES**

**Energy Efficient Burger King**

*Burger King – Waghausel, Germany*

The eco-friendly design developed in cooperation with Wirsol Solar AG (Baden-Württemberg) utilizes state-of-the-art technologies and renewable energy to power one-third of the restaurant’s energy consumption, thus reducing energy costs by 45% and the emission of CO₂ by more than 120 metric tons every year.

The 20/20 design is complemented with the latest eco-friendly technologies and energy efficient construction elements including:

- Interior heat recovery ventilation system that cools and heats the restaurant, saving 73% of energy consumption per year
- Long-lasting interior and exterior LED bulbs saving more than 55% of energy consumption annually
- Excess heat loss is captured to generate hot water, conserving 50% of energy usage annually
- A wind turbine contributing up to 2,500 kWh to the restaurant’s power supply was added to the traditional exterior BK® logo sign
- Photovoltaic and wind energy systems that save up to 45% of electricity annually
- More than 720 solar photovoltaic modules generate over 53,500 kWh of electricity per year, which equals the annual consumption of five U.S. household
- A solar-powered electric vehicle charging station for hybrid cars
- A rainwater reclamation system for outside irrigation.

In addition, the restaurant kitchen features the revolutionary Duke Flexible Batch Broiler, which maximizes cooking flexibility while reducing gas consumption and related costs by 52 percent electricity consumption and costs by 90 percent. All BURGER KING® restaurants in North America have installed this new broiler and the international rollout is expected to be completed by the end of 2012.

[www.restaurantnewsresource.com/article46521.html](http://www.restaurantnewsresource.com/article46521.html)
Waste to Energy
Los Angeles International Airport – Los Angeles, California

In 2001, Los Angeles International Airport launched a pilot program to test the conversion of food waste to energy. Over 8,000 tons of food waste produced each year at Los Angeles International Airport was used to produce methane gas which was then recycled and turned into electricity. This complex process involves food being ground up and mixed with water, creating a slurry, which is then heated up into methane gas and carbon dioxide. Eventually this was transferred offsite to an adjacent power generation plant and converted into electricity.

www.wasteage.com/mag/waste_los_angeles_airport/

AND

http://articles.latimes.com/2001/jul/08/local/me-20039
13.0 WASTE STREAM MANAGEMENT

13.1 Prerequisite 1 – Waste Source Separation

Required

INTENT

Determine the overall generation of various wastes produced and reduce ongoing waste and toxins generated by the tenant.

REQUIREMENTS

Separate all solid waste refuse into, at a minimum, the following three waste types and have a solid waste service provider that properly handles and disposes the separated waste streams:

- Recyclables: Cardboard, clean paper, glass, metals, plastic
- Compostables: Organic food waste, food waste contaminated paper and plastic that is certified by the Biodegradable Products Institute (BPI) or meets ASTM D6400 and/or ASTM D6868
- Non-Recyclables/Non-Compostables (Landfill Waste): Any residual waste not meeting the above two waste types

SUBMITTALS

Include descriptive narrative in the SAM Checklist outlining the types of waste, collection locations, and anticipated weights and/or volumes, if known (see SAM Credit 13.4).

TECHNOLOGY/STRATEGY

Work with your waste hauler or service provider to collect and analyze information on the amounts and types of waste generated by the facility.

Standard Practice

None

Recommended Practice

- Use source-separation to conduct a waste audit (see SAM Credit 13.4) as a baseline for evaluating future recycling efforts. Analyze the results of the audit and identify targets for expanding the tenant’s recycling program. Evaluate the capturing and recycling of specific wastes.

Best Available Practice

- Create a Five Year Action Plan outlining waste reduction methods that will be undertaken in the coming years.
13.0 WASTE STREAM MANAGEMENT

13.2 Prerequisite 2 – Surplus Food Sent to Local Organizations

Required

INTENT

Increase tenant’s social responsibility by donating surplus food to local hunger relief organizations.

REQUIREMENTS

Unused (wrapped and packaged) food that would otherwise be discarded should be donated to local food banks. Tenants should follow the organization’s guidelines as to the storage, preparation and donation of food.

SUBMITTALS

Include descriptive narrative on SAM Checklist detailing the amount of unused food that was donated and to which organizations.

TECHNOLOGY/STRATEGY

Efforts need to be undertaken to ensure that waste generated at airports does not all ultimately end up in area landfills. Food scraps and unused food account for a large portion of an airport’s waste stream. Creative waste solutions to minimize contributions to airports are needed, especially for perishable foods.

Tenant should donate unused food products to a local food bank, shelter, etc. The Good Samaritan Food Donation Act offers protection to citizens, businesses and nonprofit organization that proceed in good faith to donate, recover and distribute excess food. It promotes food recovery by limiting liability to acts of gross negligence or intentional misconduct (such as donating food from which others have already become ill) and absent these, donors and others shall not be subject to civil or criminal liability arising from the nature, age, packaging or condition of apparently wholesome food or apparently fit grocery products received as donations.

Standard Practice

None

Recommended Practice

- Donate surplus food to a local organization. Below is a sample list of representative organizations but not limited to:
  - Feeding America (http://feedingamerica.org/)
  - Food Donation Connection (www.foodtodonate.com)
  - Greater Chicago Food Depository (www.chicagosfoodbank.org)
CASE STUDY

Food Donation Program
Seattle – Tacoma Airport – Seattle, Washington

In 2006, Sea-Tac began a food donation program, facilitating food-service concession's donation of unsold food to local food banks. Donated food is deposited nightly into designated airport coolers, which are check each morning by the food bank. More than 30,000 pounds of food have been donated to local food banks since the program's inception.

13.0 WASTE STREAM MANAGEMENT

13.3 Prerequisite 3 – Elimination of Petroleum Based Plastic Bags

Required

INTENT
Reduce the amount of plastic that is distributed and ultimately disposed within the terminals.

REQUIREMENTS
Vendor will do away with the use of petroleum based plastic bags in favor of bags that are more environmentally friendly.

SUBMITTALS
Include descriptive narrative on SAM Checklist detailing the alternate option given to customers in place of petroleum based plastic bags.

TECHNOLOGY/STRATEGY

Due to the negative environmental effects there have been international movements to discourage the use of petroleum based plastic bags. Plastic bags use up natural resources, consume energy to manufacture, create litter, choke marine life and add to landfill waste.

Standard Practice
• Ask the customer if they require a bag instead of giving bags to every customer

Recommended Practice
• Implement the use of post-consumer recycled paper bags or reusable bags

Best Available Practice
• Offer the use of biodegradable plastic bags

CASE STUDY

Plastic Shopping Bag Ban
San Francisco, California

In 2007 San Francisco's Board of Supervisors voted to become the first in the United States to prohibit petroleum based plastic checkout bags in large markets and pharmacies. The ban still allows for the use of biodegradable plastic and recycled paper and is aimed to reduce the volume of bags given away by supermarkets. The ban prevented an estimated 100 million plastic bags from ending up in the area landfills and in 2010 the city expanded the ban it to include all retailers stores from using petroleum based plastic bags.

www.treehugger.com/files/2007/03/san_francisco_t_1.php
13.0 WASTE STREAM MANAGEMENT

13.4 Waste Stream Audit

4 points – Required for CT-OM Mentor Certification

INTENT

Determine the overall generation of various wastes produced and reduce ongoing waste and toxins generated by the tenant.

REQUIREMENTS

Conduct a waste stream audit of the tenant’s entire ongoing consumables waste stream for the performance period. Use the initial audit to establish a baseline that identifies the types of waste making up the waste stream and the amounts of each type by weight and volume.

As part of the waste stream audit, tenant will analyze their waste stream to determine weights and volumes of the following categories:

- Items for offsite disposal or incineration
- Items for composting
- Items for recycling

SUBMITTALS

Include descriptive narrative and calculations in the SAM Checklist outlining the types of waste and the weight and/or volumes. Refer to the EPA’s website for waste audit worksheets.


TECHNOLOGY/STRATEGY

Understanding waste production patterns is an important first step to waste reduction. Work with your waste hauler or service provider to collect and analyze information on the amounts and types of waste generated by the facility.

Standard Practice

None

Recommended Practice

- Use the results of the waste audit as a baseline for evaluating future recycling efforts. Analyze the results of the audit and identify targets for expanding the tenant’s recycling program. Evaluate the capturing and recycling of specific wastes.
Best Available Practice

- Create a Five Year Action Plan outlining waste reduction methods that will be undertaken in the coming years.

CASE STUDIES

Tenant and Contractor Obligations
Brisbane International Airport – Brisbane, Australia

The Brisbane Airport Corporation (BAC) uses the activities/nature of business of tenants to determine an overall risk rating for a site. As part of an overall annual or biannual tenant audit, based on the tenant environmental risk category, the BAC inspects; waste minimization practices, segregation of waste and recycling, storage of waste, and Monitoring & Reporting of wastes.


Waste Research
Ben & Jerry’s Ice Cream

The program began when a group of employees dove into the company’s dumpsters to evaluate the amount and type of waste generated by the company. Their “research” gave them three types of trash to focus on: plastic, paper, and cardboard. They began shipping their plastic ingredient buckets to Vermont Republic Industries to be recycled and reused. Ben & Jerry’s production crew purchased a baler which helped in recycling cardboard to be used by paper broker companies. Through these measures, within one year of the inception of the plan, the company had already saved $17,000 in hauling and landfill costs.

13.0 WASTE STREAM MANAGEMENT

13.5 Waste Management Plan

2 points

INTENT

To reduce the waste generated by the tenant and hauled to and disposed of in landfills and incinerators.

REQUIREMENTS

Maintain a waste reduction and recycling program that reuses, recycles, or composts waste.

SUBMITTALS

Include descriptive narrative in the SAM Checklist as well as a copy of the Waste Management Plan.

TECHNOLOGY/STRATEGY

For a tenant space to operate successfully, the tenant’s staff must understand the space’s current performance, critical metrics must be established, and steps to improve performance must be developed.

Standard Practice

None

Recommended Practice

- Develop an Waste Management Plan for the tenant space

Best Available Practice

- Continuously improve upon and require that all employees are trained on the merits and policies contained within the Waste Management Plan.
# WASTE MANAGEMENT PLAN TEMPLATE

**SAM Credit 13.2**

## Tenant Information
- **Date**
- **Tenant**
- **Owner**
- **Address/Location**
- **Contact Person**
- **Phone**
- **Email**

## Waste Management Survey
All questions apply to systems and waste under the tenant’s control and/or within the space being evaluated.

### SOLID WASTE

1. **Solid Waste Management Company** (list all that apply)

2. Do you receive waste generation reports from waste hauler?  
   - Yes
   - No

3. If yes, what is annual solid waste generation?  
   - lb/hr  
   - From: month/year  
   - To: month/year

4. If yes, what is annual solid waste recycled?  
   - lb/hr  
   - From: month/year  
   - To: month/year

5. If yes, what is annual solid waste composted?  
   - lb/hr  
   - From: month/year  
   - To: month/year
6. Indicate with an X in the appropriate column the types of recyclable/compostable solid wastes generated:

<table>
<thead>
<tr>
<th>Source Separated</th>
<th>Single-Stream</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Cardboard/cardstock</td>
<td></td>
</tr>
<tr>
<td>b. Aluminum</td>
<td></td>
</tr>
<tr>
<td>c. Steel</td>
<td></td>
</tr>
<tr>
<td>d. Glass</td>
<td></td>
</tr>
<tr>
<td>e. Paper</td>
<td></td>
</tr>
<tr>
<td>f. Plastics</td>
<td></td>
</tr>
<tr>
<td>g. Compostable waste (incl. food waste)</td>
<td></td>
</tr>
<tr>
<td>h. Coffee Grounds</td>
<td></td>
</tr>
<tr>
<td>i. Other (list)</td>
<td></td>
</tr>
</tbody>
</table>

7. Does tenant have a designated recycling/composting area? Describe location:

---

**LIQUID WASTE**

1. Liquid Waste Management Company (list all that apply)

2. Do you receive waste generation reports from waste hauler? Yes   No

3. If yes, what is annual liquid waste generation? gal/yr or lb/yr

   From:  
   To:  

   month/year  
   month/year

4. List liquid waste types that are recycled – e.g. grease, motor oil

5. Does tenant have a designated recycling area? Describe location:
## SPECIAL WASTE

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Does tenant have universal waste management plan for safe disposal of batteries, paints, solvents, electronics, mercury-containing lamps, printer cartridges, etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. List all types of universal wastes above and include quantities disposed/recycled, if known:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Does tenant have a designated universal waste recycling area? Describe location:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Other Waste Management Questions

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is tenant’s largest waste sources/products:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Waste Reduction Techniques – e.g. bulk purchasing, manufacturer take-back programs, donation programs, etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Education and Training – If yes, please describe</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Waste Minimization/Recycling Signage</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Employee Training – Waste Management</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Customer Education – Waste Management</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>
4. Has tenant performed a third-party waste audit? If yes, describe results:

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

5. Does tenant track waste generation, recycling, and disposal quantities? If yes, indicate if and where results are reported – e.g. website, documents.

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

6. Describe goals for waste reduction over time – e.g. waste reduction initiatives.

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

(Please use additional pages as necessary to complete)
13.0 WASTE STREAM MANAGEMENT

13.6 Waste Reduction

1 to 10 points

INTENT

Further increase solid waste reduction within buildings to reduce the burden on landfills and minimize emissions due to transport.

REQUIREMENTS

OPTION 1

Using one year's worth of data based on the waste stream audit, calculate reduction compared to baseline data (data from first review, waste audit) of waste sent to landfill.

Waste reduction beyond the baseline set by 1st year data will be awarded credits based on the following table:

<table>
<thead>
<tr>
<th>SAM Credit</th>
<th>Reduction of waste sent to landfill (by percent)</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.6.1</td>
<td>5%</td>
<td>1</td>
</tr>
<tr>
<td>13.6.2</td>
<td>10%</td>
<td>2</td>
</tr>
<tr>
<td>13.6.3</td>
<td>15%</td>
<td>3</td>
</tr>
<tr>
<td>13.6.4</td>
<td>20%</td>
<td>4</td>
</tr>
<tr>
<td>13.6.5</td>
<td>25%</td>
<td>5</td>
</tr>
<tr>
<td>13.6.6</td>
<td>30%</td>
<td>6</td>
</tr>
<tr>
<td>13.6.7</td>
<td>35%</td>
<td>7</td>
</tr>
<tr>
<td>13.6.8</td>
<td>40%</td>
<td>8</td>
</tr>
<tr>
<td>13.6.9</td>
<td>45%</td>
<td>9</td>
</tr>
<tr>
<td>13.6.10</td>
<td>50%</td>
<td>10</td>
</tr>
</tbody>
</table>

Example: A tenant collected and recorded waste disposal data from two years ago and designated this period as the baseline waste disposal. The annual amount of waste that was disposed in landfills for the baseline year was 100 tons. In the subsequent year, due to waste reduction initiatives, the tenant was able to lower waste disposal for this period to 80 tons. This calculates to a 20% improvement over the baseline and therefore 4 points are awarded.
OR

OPTION 2

Create an inventory of all the waste reduction initiatives that tenant has undertaken to reduce solid waste prior to and during the performance review.

A point will be awarded for each of the initiatives. Up to 6 points may be awarded by achieving any of the following measures:

<table>
<thead>
<tr>
<th>Technology/Strategy</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utilize trash compactors or bailers</td>
<td>1</td>
</tr>
<tr>
<td>Repurpose or reuse products or materials program</td>
<td>1</td>
</tr>
<tr>
<td>Bulk purchasing, reduced packaging</td>
<td>1</td>
</tr>
<tr>
<td>Oil and grease recycling</td>
<td>1</td>
</tr>
<tr>
<td>Coffee grounds composting or recycling program</td>
<td>1</td>
</tr>
<tr>
<td>Electronic waste recycling program</td>
<td>1</td>
</tr>
</tbody>
</table>

SUBMITTALS

Include descriptive narrative and calculations in the SAM Checklist.

TECHNOLOGY/STRATEGY

Maintain an effective recycling program that at a minimum addresses the traditional recyclables (paper, metal, glass, and plastic) Determine effective strategies for addressing other waste products which might include composting, for organic wastes, or reuse or repurposing for wood or other building materials. Waste reduction strategies including purchasing in bulk to reduce packaging waste or elimination of disposable products should also be considered.

Standard Practice

- Employ traditional recycling (paper, metal, glass, and plastic)

Recommended Practice

- Compost organic wastes such as food scraps and landscaping waste
- Reuse or repurpose building materials
- Donate unused inventory to charities
- Make waste materials available to other entities through a warehouse or sharing program
• Employ purchasing strategies that reduce waste volume, e.g. bulk purchases

**Best Available Practice**

None
13.0 WASTE STREAM MANAGEMENT

13.7 Storage and Collection of Recyclables

1 point – Required for CT-OM Mentor Certification

INTENT

Facilitate the reduction of waste generated by tenant space occupants that is hauled to and disposed of in landfills.

REQUIREMENTS

Provide an easily accessible dedicated area or areas that serve the tenant space for the collection and storage of materials for recycling, including paper, corrugated cardboard, glass, plastics and metals. An area should also be dedicated to collection and storage of compostable food waste, if applicable.

SUBMITTALS

Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

Ensure that within the tenant space there is an area for recyclable collection and storage that is appropriately sized and located in a convenient area. These areas would likely be designed and sized differently depending on the ultimate use and waste stream of the facility (e.g., office, airlines, concessionaires, etc.) Identify local waste handlers and buyers for glass, plastic, office paper, e-waste, newspaper, cardboard, metals, fluids, fixtures, and organic wastes. Instruct employees, occupants, and contractors on the recycling procedures. Consider employing cardboard balers, aluminum can crushers, recycling chutes and other waste strategies to further enhance the recycling program.

Standard Practice

- Designate an area for recyclable collection and storage that is appropriately sized and located in a convenient area
- Instruct employees, users and occupants on recycling procedures

Recommended Practice

- Investigate and incorporate collection rooms for recycling streams that make sense for each tenant space
- Coordinate recyclable waste collection with hauler capability
- Recycle the following waste, whenever feasible:
  - Aluminum
  - Glass
  - Paper, newspapers, magazines and cardboard
- Carpet
- Wood (pallets/crates, etc.)
- Food waste/grease and compostables
- Organic waste and compostables
- Gas & oil filters
- Motor oil and Anti-freeze
- Scrap metal
- Batteries
- Light bulbs
- Toner cartridges
- Tires
- Electrical wiring
- Electronics including monitors

**Best Available Practice**

- Employ cardboard balers, aluminum can crushers, recycling chutes and other technologies to enhance the recycling program

**CASE STUDIES**

**In-Store Recycling**  
**Ben & Jerry’s Ice Cream**

In each of the stores, there are built-in wooden bins to collect the plastic spoons used by patrons. In fact, some regular customers now bring their plastics from other restaurants in the area to have Ben & Jerry’s recycle them.

[www.mwcog.org/environment/recycling/hotel/mentor/BEN.HTM](http://www.mwcog.org/environment/recycling/hotel/mentor/BEN.HTM)

**In-Terminal Recycling**  
**Oakland International Airport – Oakland, California**

On Earth Day 2002 Oakland Airport launched a recycling program to divert discarded newspapers and magazines, and office paper away from landfills. There are currently over 35 recycling stations throughout the terminals. Bins are located adjacent to trash receptacles and encourage greater recycling by identifying the types of acceptable material through visuals on the top and sides of each station. The goal of the Airport is to divert over 50% of the post-consumer trash from landfills.

[www.flyoakland.com/noise/environmental_recycle.shtml](http://www.flyoakland.com/noise/environmental_recycle.shtml)
13.0 WASTE STREAM MANAGEMENT

13.8 Track and Report Recycling Activity

2 points

INTENT

Determine the types and amounts of recyclable waste and determine strategies for reducing and diverting additional waste from landfills.

REQUIREMENTS

Retain periodic recycling reports to be summarized for the performance review period. Note that this is a waste audit for the recyclables stream. Types of waste to be tracked include:

- Glass – bottles and other containers
- Metal – aluminum and steel containers, foil
- Plastic – bottles, containers, packaging, bags
- Paper – office paper, bags, cup sleeves, cup carriers, non-thermal receipt tape, customer checks, newspaper, magazines
- Cardboard – cardstock, display boards, corrugated fiberboard, paperboard
- Rubber – tires
- Fats, Oils, and Grease
- Other (specify what items are recycled)

SUBMITTALS

Include descriptive narrative and calculations in the SAM Checklist outlining the types of waste and volumes recycled.

TECHNOLOGY/STRATEGY

Standard Practice

- Track recycling activity over time. Use the report to identify seasonal swings in recycling rates and program costs and benefits.

Recommended Practice

None

Best Available Practice

- Provide the results of the recycling reports to the community and other interested stakeholders
CASE STUDY

Recycling Activity
Delta Air Lines

Delta Air Lines posts monthly recycling statistics through online newsletters, posters and materials displayed in flight attendant lounges.

13.0 WASTE STREAM MANAGEMENT

13.9.1 Organic Byproduct Recycling: Coffee Grounds

4 Points

INTENT

Facilitate the reduction of waste generated by tenant space occupants that is hauled to and disposed of in landfills.

REQUIREMENTS

Implement a coffee grounds collection program that provides a means of separating grounds from the rest of the waste stream and finding other uses for the waste.

SUBMITTALS

Include descriptive narrative on SAM Checklist detailing the collection and disposal of coffee grounds from the tenant space.

TECHNOLOGY/STRATEGY

With the implementation of increased security at airports, passengers are spending an increased amount of time at the airport and in turn creating more waste. In conjunction with the Airport, tenants should commit to reducing the amount of waste that eventually arrives at the landfills.

The weight of used coffee grounds can significantly impact the cost of waste removal. Though the use of creative solutions, the coffee grounds can instead be used for composting/fertilizer needs or insect control.

Standard Practice

None

Recommended

- Collect the used coffee grounds and sell to a third part as a commodity. Permits and EPA approval may be required depending on the tenant’s location.

Best Available

- Re-use coffee grounds onsite as soil additives. Permits and EPA approval may be required depending on the tenant’s location.
CASE STUDIES

Coffee Grounds for Insect Control
HMS Host/Starbucks/Charlotte - Douglas International Airport – Charlotte, North Carolina

In November 2008 Airport staff began pouring used coffee grounds, collected from Airport Tenants, on fire ant mounts to assist with the control. As of March 2009 the grounds were successful in eradicating 15-20 very large fire ant mounds that had been created over airfield lighting and had become a safety concern. The Airport was also working with environmental experts explore the use of coffee grounds for further insect control.

Charlotte – Douglas International Airport, “Recycled Coffee Grounds Snuff Out Airfield Fire Ants” Airport Update March 5, 2009: 2

Coffee Composting
Seattle – Tacoma International Airport – Seattle, Washington

The Port of Seattle has implemented a program where a local composting company collects the used recycled coffee grounds from more than 55 specialty coffee shops, restaurants and lounges at the Sea-Tac Airport. The grounds are then mixed with lawn cuttings and yard waste from the home in the City of Seattle. To complete the cycle the Port purchases compost from the composting company for use in airport landscaping, and as grass fertilizer.

http://www.flyingcompass.com/Washington/Seattle/a-142.html
13.0 WASTE STREAM MANAGEMENT

13.9.2 Organic Byproduct Recycling: Fats, Oils and Grease

2 Points

INTENT

Facilitate the reduction of waste generated by tenant space occupants that is hauled to and disposed of in landfills.

REQUIREMENTS

Tenant would install and maintain used cooking oil/liquid grease collection equipment and participate in a grease recycling program. Tenants are solely responsible for all costs associated with the interception, collection and appropriate disposal of fats, oils and grease generated by their operations on the premise.

SUBMITTALS

Include descriptive narrative on SAM Checklist detailing the type, amount and process/company used to convert the fats, oils and grease.

TECHNOLOGY/STRATEGY

With the implementation of increased security at airports, passengers are spending an increased amount of time at the airport and in turn creating more waste. In conjunction with the Airport, tenants should commit to reducing the amount of waste that eventually arrives at the landfills.

New technological advances are now allowing items that previously used to be discarded to now be re-purposed. A prime example is grease from concessionaires and flight kitchens that can be converted into biofuels than can be used by the company or sold to other parties.

Standard Practice

None

Recommended

- Collect the used fats, oils and grease and sell to a third part as a commodity

Best Available

None
CASE STUDY

Grease Trappings
Portland International Airport – Portland, Oregon

Airport restaurants are collecting the used cooking oil and grease, 20,000 gallons in 2008, and it is being converted into biodiesel and base products for other industries.

www.flypdx.com/PDFPOP/Pub_Portside_Summer_08.pdf
13.0 WASTE STREAM MANAGEMENT

13.10 Deplaned Waste

1 to 5 Points

INTENT

Facilitate the reduction of waste generated from aircraft that are hauled to and disposed of in landfills.

REQUIREMENTS

Up to 5 points may be awarded by achieving any of the following measures by an airline locally:

<table>
<thead>
<tr>
<th>Technology/Strategy</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recycling of Glass, Aluminum, Mixed Paper, Plastics</td>
<td>1</td>
</tr>
<tr>
<td>Composting of Food Waste (including coffee grounds)</td>
<td>1</td>
</tr>
<tr>
<td>Repurposing of Goods (including magazines, newspapers, pillows, blankets)</td>
<td>1</td>
</tr>
<tr>
<td>Donation of Surplus Food to Local Organizations</td>
<td>2</td>
</tr>
</tbody>
</table>

These points are in addition to points earned in other similar SAM Credits of this section. While the tenant may undertake the above Technologies/Strategies at other airports, for the purposes of this credit activities only apply to operations at CDA Airports.

SUBMITTALS

Include descriptive narrative on the SAM Checklist.

TECHNOLOGY/STRATEGY

Even with an airport-wide recycling program in place, there is the challenge of capturing recyclables from aircraft at the airport. Waste collection is the responsibility of the flight attendants, airline cleaning crew and flight kitchens but it is often a secondary concern to their other duties. Typically there is only limited time to clean the aircraft during turn-arounds and limited space for collection in-flight. A conscious effort by the airline must be taken for an aircraft recycling program to be a success.

Due to the limited amount of time that can be devoted to deplaned waste, the tenant should first identify the types of materials that will be collected. Some examples include, but are not limited to:

- Glass bottles
- Aluminum cans
- Plastic cups
- Plastic bottles
- Paper/newspaper/magazines
- Pillows
- Blankets
- Coffee grounds
- Surplus meals/snacks

It is best to use a single stream process to minimize the amount of time flight attendants will spend executing the program. By collecting all recyclables and storing them apart from waste that will be sent to the landfill, it allows for service crews to separate the recycled deplaned waste once it is unloaded from the aircraft.

**CASE STUDIES**

**In-Flight Recycling**
**Delta Airlines**

Early attempts by Delta to recycle on flights had failed because, among other reasons, the flight attendants were not convinced that the material they collected was actually being recycled on the ground. To educate the flight attendants and assure them that their efforts were worthwhile, Delta created materials to show the recycling process and the goals of the program. They also developed a set of activities to support “continuous education.” Continuous education is provided by materials displayed in flight attendant lounges, as well as through online newsletters and posters with monthly recycling statistics displayed in the break rooms.

In 2009, Delta’s In-Flight Recycling program diverted over 2 million pounds (1,000 tons) of aluminum, mixed paper and plastic from domestic flights serving 29 cities. Delta continues to recycle an average of 1 million individual aluminum cans each month. In-Flight Recycling has fully funded the building of two Habitat for Humanity Homes (Atlanta in 2008 and Cincinnati in 2009) and will have a similar opportunities in 2010.


**PDX Periodicals Reuse for Education Program**
**Portland International Airport – Portland, Oregon**

As part of the PDX Periodicals Reuse for Education Program initiated in 2004, schools receive packages of periodicals during the school year which may include magazines from international flights.

Airline Pillow Recycling
Oakland International Airport – Oakland, California

Oakland International Airport is one of the first airports in the nation to participate in a pillow recycling program. Instead of being discarded, the pillows are used as insulation or as material in making furniture.

www.airports.org/aci/aci/file/ACI_Priorities/Environment/TRACKER%20FILE_Airport%20environment%20initiatives.pdf
13.0 WASTE STREAM MANAGEMENT

13.11 Repurposing of Goods

2 Points

INTENT

Promote the reuse of materials, equipment and products to reduce demand for virgin materials and reduce waste, thereby lessening impacts associated with the extraction and processing of virgin resources.

REQUIREMENTS

Whenever possible, identify items that can be donated, salvaged, refurbished or reused by a third party. This credit can also be achieved by utilizing donated, salvaged, refurbished or used items from an outside party.

SUBMITTALS

Include descriptive narrative on SAM Checklist detailing the types of products that were donated and to whom.

TECHNOLOGY/STRATEGY

Salvage and donation are important waste prevention strategies, since they reduce the need for the purchase and manufacture of new products and help keep materials out of landfills. Identify opportunities to incorporate salvaged materials into daily operations. Consider salvaged materials such as cabinetry and furniture, pumps, motors, electrical panels, fixtures and tanks.

The tenant may also identify items that can be sold or donated to other users. Consider items such as appliances, carpet, shelving, displays, and non-perishable inventory

Standard Practice

None

Recommended Practice

Tenants should identify items for reuse and donate the goods:

- Egg cartons, strawberry baskets, poster board, and other materials can be sent to schools or daycare centers for use in arts and crafts activities
- Collect magazines, newspapers, and books from international passengers and donate them to local educational facilities that teach foreign languages, senior centers, and/or united service organizations
- Guest hangers no longer suitable for use can be repurposed to local dry cleaners
- Linens, towels, blankets, soap, shampoo, uniforms, and used furniture can be donated to a local shelter
- Flowers that were used for banquets and celebrations can be sent to a local hospice or hospital

**Best Available Practice**

None

**CASE STUDIES**

**Donation of Unused Materials**
**Ben & Jerry’s Ice Cream**

Plastic tubs/buckets and popsicle sticks are donated to school groups for use in crafts and gardening, and to greenhouses, where popsicle sticks serve as plant markers.

[www.mwco.org/environment/recycling/hotel/mentor/BEN.HTM](http://www.mwco.org/environment/recycling/hotel/mentor/BEN.HTM)

**PDX Periodicals Reuse for Education Program**
**Portland International Airport – Portland, Oregon**

As part of the PDX Periodicals Reuse for Education Program initiated in 2004, schools receive packages of periodicals during the school year which may include magazines from international flights.

13.0 WASTE STREAM MANAGEMENT


2 Points

INTENT

Reduce the amount of plastic that is sold and ultimately disposed within the terminals.

REQUIREMENTS

Tenants should implement the use of reusable mugs, containers or organic material bottles in place of plastic bottles to reduce the amount of waste generated.

SUBMITTALS

Include descriptive narrative on SAM Checklist detailing the type of containers being sold in place of plastic bottles.

TECHNOLOGY/STRATEGY

At various concessionaire locations there is usually an abundance of plastic bottles being sold, primarily once passengers have cleared the security checkpoints. In an attempt to reduce the amount of plastic bottles that are not recycled by passengers, vendors can offer the sale of beverages in reusable containers or bottles that are made of organic materials.

Standard Practice

None

Recommended Practice

- Offer the sale of beverages in reusable containers

Best Available Practice

- Various options are available which are made from organic materials in place of plastic. These organic bottles look and feel similar to traditional plastic water bottles but offer a more environmentally friendly option.
13.0 WASTE STREAM MANAGEMENT

13.12.2 Reduction of Plastic Waste: Biodegradable Trash Bags

1 Point

INTENT

Reduce the amount of plastic that are sold and ultimately disposed within the terminals.

REQUIREMENTS

Tenants should use only biodegradable trash bags that once at a landfill break down at a faster rate than traditional trash bags.

SUBMITTALS

Include descriptive narrative on SAM Checklist detailing type of biodegradable trash bag used.

TECHNOLOGY/STRATEGY

Even given other initiatives to reduce the amount of waste, there inevitably will be waste generated that ends up in the area landfills. The combination of reducing the amount of waste sent to landfills and using trash bags that break down in the landfills will help decrease the massive amounts of garbage that are created.

The process behind the biodegradation occurs in two parts. First the plastic is oxidized, then microorganisms consume the plastic leaving behind "refuse" which is a reusable biomass which is both environmentally friendly and does not contain harmful toxins. All products then biodegrade and find their way into the waterways and the soil.

Biodegradable bags can be purchased at prices similar to the traditional trash bags used by many. However not all biodegradable bags break down in landfill conditions; some bags require oxygen to decompose.

Plastics are certified as biodegradable if they comply with ASTM D6954.

Standard Practice

None

Recommended Practice

- Eliminate the use of traditional plastic bags. Biodegradable bags will break down into CO2 and water when it is exposed to UV light, moisture, heat and microorganisms

Best Available Practice

None
14.0 VENUE SPECIFIC CONSIDERATIONS

14.1 Heat Island Reduction

1 point

INTENT

Minimize impacts of the existing roofs and pavements that cause the heat island effect (thermal gradient differences between developed and underdeveloped areas).

REQUIREMENTS

Use any combination of the following strategies:

- Convert 50% of the site’s hardscape area (including roads, sidewalks, courtyards, and parking lots)
  - Provide shade through an existing tree canopy or within five (5) years of landscape installation - landscaping (trees) must be in place at the time of review
  - Have paving materials with a Solar Reflective Index (SRI) of at least 29 and implement a maintenance program that ensures these surfaces are cleaned at least every two years to maintain good reflectance and minimums
  - Have an open-grid pavement system (that consists of at least 50 percent open area)

AND/OR

- Convert 50% of the roof area using roofing materials that have one of the following characteristics
  - Use roofing materials having a Solar Reflectance Index (SRI) equal to or greater than the values in the table below for a minimum of 75% of the roof area. Implement a maintenance program that ensures all SRI surfaces are cleaned at least every two years to maintain good reflectance.

<table>
<thead>
<tr>
<th>Roof Type</th>
<th>SRI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-Sloped Roof</td>
<td>78</td>
</tr>
<tr>
<td>Steep-Sloped Roof</td>
<td>29</td>
</tr>
</tbody>
</table>
  - Vegetated green roof

SUBMITTALS

Include descriptive narrative and calculations in the SAM Checklist.
TECHNOLOGY/STRATEGY

Employ strategies, materials and landscaping techniques that reduce heat absorption of exterior materials. Use shade (calculated at 10 a.m., 12 noon, and 3 p.m. on the summer solstice [June 21] that will be used as the effective shaded area) from native or adapted trees and large shrubs, vegetated trellises or other exterior structures supporting vegetation. Consider the use of new coatings and integral colorants for asphalt to achieve light-colored surfaces instead of blacktop. Position photovoltaic cells to shade impervious surfaces.

Consider installing high-albedo roofs to reduce heat absorption. SRI is calculated according to ASTM E 1980. Reflectance is measured according to ASTM E 903, ASTM E 1918 or ASTM C 1549. Emittance is measured according to ASTM E 408 or ASTM C 1371. Product information is available from the Cool Roof Rating Council website, at www.coolroofs.org. Also, visit the ENERGY STAR website, www.energystar.gov, to research compliant products.

Unless the reflectance is determined directly through in-situ testing, the following default SRI values are to be used:

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>SRI</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Conventional &quot;gray&quot; concrete</td>
<td>35</td>
</tr>
<tr>
<td>Old (weathered) “gray” concrete</td>
<td>19</td>
</tr>
<tr>
<td>New “white” concrete</td>
<td>86</td>
</tr>
<tr>
<td>Old (weathered) “white” concrete</td>
<td>45</td>
</tr>
<tr>
<td>New Asphalt</td>
<td>0</td>
</tr>
<tr>
<td>Old Asphalt</td>
<td>6</td>
</tr>
</tbody>
</table>

Standard Practice

- White roofs are currently the standard for new construction on airport property. These are acceptable; however, SRI decreases with the age of the roof. Unless a cleaning program is in place, the benefits of white roofs diminish over time. For this reason, along with the benefits of stormwater management, the construction of vegetated green roofs is encouraged.

Recommended Practice

- Maximize light colored/high albedo pavement, such as Portland Concrete Cement (PCC), for roadways, parking lots, sidewalks and plaza areas. Reflectance must be a minimum of 0.3 (‘White’ portland cement – 0.7 to 0.8, typical PCC – 0.35 to 0.5, typical asphalt pavement – 0.05 (new) to 0.15 (over 5 years)). On an annual basis, test the pervious areas to verify the SRI standard is met as well as to depict improvement.
- Install a vegetated green roof
• Evaluate and utilize an ENERGY STAR compliant roofing system, such as aluminum coating and light-colored coatings. Thermoplastic and white Polyvinyl chloride (PVC) roofing systems meet these standards.

**Best Available Practice**

• Install trees consistent with CDA/OMP Specification 02905 – Sustainable Airport Landscaping, and for any proposed plant species not listed, consult an FAA certified airport biologist to ensure the plants will not attract wildlife.
• Implement a creative combination of the above strategies to reach this goal. For example, a task/project can provide five (5) percent shading of dark colored impervious surfaces and 25 percent light colored/high albedo pavement to achieve this goal.
• Install open grid pavement for surface lots and site pavement
• Install light-colored permeable pavers and concrete
• Install “green walls” for building façade

**CASE STUDY**

FedEx Cargo Facility Green Roof
O'Hare International Airport – Chicago, IL

The new FedEx Cargo Facility green roof at the O'Hare International Airport in Chicago is the largest free-standing building vegetated roof in the central United States at 170,000 square feet. This project required utilization and coordination of an uplift-resistant and rapidly executed green roof design due to the active runway status of the O'Hare facility.

14.0 VENUE SPECIFIC CONSIDERATIONS

14.2 Stormwater Management

4 points

INTENT

Limit disruption of natural water hydrology by reducing impervious cover, increasing on-site infiltration, reducing or eliminating pollution from stormwater runoff, and eliminating contaminants by enhancing the current operating system.

REQUIREMENTS

Reduce impervious surfaces totaling at least 5% of your total site area by converting to permeable surfaces. Those surfaces can include, but are not limited to:

- Permeable asphalt / concrete
- Permeable pavers
- Aggregate materials
- Turf or landscaped areas

OR

Nonstructural techniques such as, but not limited to:

- Rain gardens
- Vegetated swales
- Disconnection of imperviousness
- Rainwater recycling

SUBMITTALS

Include descriptive narrative and calculations in the SAM Checklist. Up to 4 points can be achieved by accomplishing the strategies above in a significant manner.

TECHNOLOGY/STRATEGY

Maintain natural stormwater flows by promoting infiltration. Maintain procedures that include ongoing monitoring of any installed features that assist in stormwater irrigation, pervious paving, and other measures to minimize impervious surfaces. Any strategies used should discourage wildlife habitat. Reuse stormwater volumes generated for non-potable uses such as landscape irrigation, vehicle washing or building exterior washing.
Standard Practice

- Follow Chicago Department of Aviation’s Best Management Practices.

Recommended Practice

- Install rain gardens, vegetated swales, disconnection of imperviousness, and rainwater recycling
- Evaluate curb breaks and drainage ditches, and/or bioswales
- Install landscape to reduce runoff (See SAM Credit 14.3.1 Landscape Management: CDA Standards)
- Install cisterns or rain barrels

Best Available Practice

- Encourage use of permeable pavement, where applicable
- Where potential for contamination exists, the use of these technologies must be weighed carefully to prevent larger contaminant issues, such as infiltration of ground water
14.0 VENUE SPECIFIC CONSIDERATIONS

14.3.1 Landscape Management: CDA Specifications

1 point

INTENT

Preserve ecological integrity; enhance natural diversity and aesthetics, while supporting high-performance spaces and integration into the surrounding landscape.

REQUIREMENTS

Currently follow the requirements of the CDA 02905 “Sustainable Airport Landscaping” specifications.

AND

Reuse or compost landscape waste, as applicable.

SUBMITTALS

Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

Maintain landscape that is aesthetically pleasing and at the same time, low maintenance, ecologically and financially sustainable yet does not compromise airport security and aircraft safety. Over the performance period, have in place a low-impact plan that addresses overall site management, chemicals, fertilizers, and landscape waste. Include such green landscape management practices such as, but not limited to:

- Providing proper training methods to current employees
- Discouraging wildlife habitat
- Removing or not installing invasive plants
- Using drought tolerant plants

Standard Practice

None

Recommended Practice

- Avoid clustering shrubs and trees
- Avoid fruit and palatable seed producing plants
- Use native and low maintenance plants with special consideration for vegetated green roofs
- Minimize use of high maintenance grass areas, lawns and annual plants
• Establish areas of high and low landscape maintenance areas. Group plants with similar water-use needs by determining which areas of the site should receive a higher level of care than others and, during drought periods, more irrigation. Coordinate these areas with the irrigation plan in SAM Credit 14.3.5 Landscape Management: Irrigation.

• Do not apply chemicals within 25-feet (at a minimum) of a body of water

Best Available Practice

• Conduct soil testing as necessary to determine the amount of nutrients needed for a healthy landscape
14.0 VENUE SPECIFIC CONSIDERATIONS

14.3.2 Landscape Management: Landscape Equipment

1 point

INTENT

Preserve ecological integrity; enhance natural diversity and aesthetics, while supporting high-performance spaces and integration into the surrounding landscape.

REQUIREMENTS

Use non-gasoline powered landscape equipment.

SUBMITTALS

Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

By eliminating the use of gasoline or other fossil fuels, the tenant is able to reduce the air pollution impacts and greenhouse gas emissions. Depending on the technology, noise pollution can also be reduced.

Standard Practice

None

Recommended Practice

- Use electric mulching and/or electric mowers

Best Available Practice

- Use solar or propane powered mowers
14.0 VENUE SPECIFIC CONSIDERATIONS

14.3.3 Landscape Management: Fertilizer Use

1 point

INTENT
Preserve ecological integrity; enhance natural diversity and aesthetics, while supporting high-performance spaces and integration into the surrounding landscape.

REQUIREMENTS
Ban the use of phosphorus fertilizers.

AND

Use non–synthetic fertilizer only as needed for establishment of new vegetation. For established vegetation, minimize use of fertilizer to only those cases where absolutely necessary.

SUBMITTALS
Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

Due to the over usage and nature of phosphates in synthetic fertilizers and detergents, increasing amounts have been entering into waterways. In an effort to reduce the degradation of local waterways, phosphorus use should be banned.

For established vegetation, fertilizer use should be eliminated. However, if the soil lacks the nutrients to produce healthy vegetation, the tenant may need to supplement the nutrients with the appropriate non-synthetic fertilizer, only as needed.

Standard Practice

None

Recommended Practice

- Conduct soil testing as necessary to determine the amount of nutrients needed for a healthy landscape and apply only the amount needed to supplement existing nutrient levels
- Use organic and natural products such as, but not limited to:
  - Grass clippings/mulch
  - Compost
  - Coffee grounds
  - Commercial organic fertilizers
  - Seaweed
- Animal manure
  - Use non-potable hot water for weed control to eliminate vegetation in pavement cracks in place of herbicides
  - Do not apply pesticides or fertilizers before an expected rainfall (unless specified within the manufactures recommendations)
  - Do not apply chemicals within 25-feet (at a minimum) of a body of water

Best Available Practice

- Eliminate fertilizer and herbicide use altogether
14.0 VENUE SPECIFIC CONSIDERATIONS

14.3.4 Landscape Management: Landscape Waste

1 point

INTENT

Preserve ecological integrity, enhance natural diversity and aesthetics, while supporting high-performance spaces and integration into the surrounding landscape.

REQUIREMENTS

Reuse or compost all landscape waste on-site.

SUBMITTALS

Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

Over the performance period, prevent the removal of landscape waste from the airport to off-site (off-airport) disposal locations. Use mulching and composting to provide material for other landscape uses within the tenant space.

Any onsite composting of landscape waste must address wildlife concerns and not promote wildlife activity.

Standard Practice

None

Recommended Practice

- Utilize mulching mowers to significantly reduce landscape waste generation, fertilizer needs, and water consumption through retention of organic matter

Best Available Practice

- Establish a centralized landscaping composting facility
- Use compost for tenant landscaping needs
14.0 VENUE SPECIFIC CONSIDERATIONS

14.3.5 Landscape Management: Irrigation

1 to 3 points

INTENT

Preserve ecological integrity; enhance natural diversity and aesthetics, while supporting high-performance spaces and integration into the surrounding landscape.

REQUIREMENTS

Reduce potable water or other natural surface or subsurface resource consumption for irrigation compared with current conventional means. If the building does not have separate water metering for irrigation systems, the water-use reduction achievements can be demonstrated through calculations.

Up to 3 points may be awarded by achieving any of the following measures:

<table>
<thead>
<tr>
<th>Technology/Strategy</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irrigation controls (e.g., soil moisture sensors, weather data-based controller)</td>
<td>1</td>
</tr>
<tr>
<td>Rain water harvesting and graywater (e.g., rain barrels and cisterns)</td>
<td>2</td>
</tr>
<tr>
<td>No irrigation (through plant selection/landscape xeriscaping)</td>
<td>3</td>
</tr>
</tbody>
</table>

**Potable water:** Water suitable for drinking that meets or exceeds EPA drinking water standards; it is supplied from wells or municipal water systems.

SUBMITTALS

Include descriptive narrative in the SAM Checklist.

TECHNOLOGY/STRATEGY

Specify water-efficient, climate-tolerant native or adapted plantings. Implement or maintain high-efficiency irrigation technologies, such as micro-irrigation, moisture sensors, or weather data-based controllers. Feed irrigation systems with captured rainwater, graywater (on-site or municipal), municipally reclaimed water, or on-site treated wastewater. Consider not operating an irrigation system. Consider use of xeriscaping principles in arid climates.

Standard Practice

None
Recommended Practice

- No irrigation system
- Drought tolerant plants
- Utilize vegetation which may be acceptable for site use (native and/or low-maintenance), with special consideration for vegetated green roofs
- Minimized use of high maintenance grass areas, lawns and annual plants
- Established areas of high and low landscape maintenance areas. Group plants with similar water-use needs by determining which areas of the site should receive a higher level of care than others and, during drought periods, more irrigation. Higher maintenance areas should be located around the major building entries and high traffic areas. Lower maintenance areas should be located on low traffic areas, buffer zones and service areas.

Best Available Practice

- Have a soil and climate analysis to determine the appropriate landscape strategy
- Evaluation of stormwater and/or graywater cisterns for capturing rainwater from all new roofs for irrigation
- If irrigation system is installed, a soil moisture monitoring system is present to reduce reliance on manual control and timed devices, as well as for detecting leaks
- Have incorporated the use of recycled and treated wastewater for the use of irrigation
14.0 VENUE SPECIFIC CONSIDERATIONS

14.4 Rainwater Harvesting

2-12 Points

INTENT

Further increase water efficiency within tenant space to reduce the burden on municipal water supply and wastewater systems.

REQUIREMENTS

Tenant should collect rainwater and implement a harvesting system with intended use(s) for the rainwater.

Up to 12 points may be awarded by achieving any of the following measures:

<table>
<thead>
<tr>
<th>Technology/Strategy</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter and log your rainwater harvesting system</td>
<td>1</td>
</tr>
<tr>
<td>Use harvested rainwater for any portion of your total irrigation needs</td>
<td>2</td>
</tr>
<tr>
<td>Use harvested rainwater for greater than 50% of your irrigation needs</td>
<td>3</td>
</tr>
<tr>
<td>Use harvested rainwater in place of other potable water uses, such as, but not limited to flushing of water closets and urinals, exterior building cleaning, and vehicle washing</td>
<td>6</td>
</tr>
</tbody>
</table>

**Potable water:** Water suitable for drinking that meets or exceeds EPA drinking water standards; it is supplied from wells or municipal water systems.

SUBMITTALS

Include descriptive narrative on SAM Checklist detailing the system used.

TECHNOLOGY/STRATEGY

Rainwater harvesting systems can vary in complexity and sophistication, but in every system must utilize some basic common elements. A catchment area will intercept the rainfall and a barrel, cistern or other vessel will store the collected rainwater.

Rooftops provide an ideal environment for the catchment and a downspout running can be used for conveyance between the catchment area and the cistern.

Water collected from rain harvesting can be used to irrigate landscaping, in the cleaning of building exteriors and for vehicle washing.
Standard Practice
None

Recommended Practice
- Use rainwater collected to irrigate landscaping or wash down building exteriors

Best Available Practice
- Make use of the collected rainwater by incorporating into vehicle washing or flushing water closets and urinals

CASE STUDY
Consolidated Rental Car Facility
Nashville International Airport – Nashville, Tennessee

The Consolidated Rental Car Facility at the Nashville International Airport features on-site refueling and car wash services. The facility incorporates sustainable practices including the use of recycled and captured rainwater for washing rental cars.

https://www.flynashville.com/ground-transportation/Pages/rental-car-facility.aspx
14.0 VENUE SPECIFIC CONSIDERATIONS

14.5 Water Efficient Vehicle Washing

1 to 8 Points

INTENT

Limit or eliminate the use of potable water or other natural surface or subsurface resources available on or near the project site for vehicle washing.

REQUIREMENTS

Up to 8 points may be awarded by achieving any of the following measures:

<table>
<thead>
<tr>
<th>Technology/Strategy</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Install low volume, high pressure sprayer nozzles on water hoses</td>
<td>1</td>
</tr>
<tr>
<td>Log vehicle washing and meter vehicle wash systems separately to measure water</td>
<td>1</td>
</tr>
<tr>
<td>Recycle more than 50% of wash water during vehicle washing</td>
<td>3</td>
</tr>
<tr>
<td>Recycle all wash water during vehicle washing</td>
<td>3</td>
</tr>
</tbody>
</table>

*Potable water:* Water suitable for drinking that meets or exceeds EPA drinking water standards; it is supplied from wells or municipal water systems.

SUBMITTALS

Include descriptive narrative on SAM Checklist detailing the system in place to reuse the water.

TECHNOLOGY/STRATEGY

Reduce potable water or other natural surface or subsurface resource consumption for vehicle washing compared with current conventional means. If the tenant does not have separate water metering for vehicle washing systems, the water-use reduction achievements can be demonstrated through calculations.

Tenants are encouraged to implement systems where water is recycled on-site or sent to water treatment facility where it is treated and sent back to the tenant’s facility. Tenant, through a reclaim system, can collect and reuse water from carwash operations.

**Standard Practice**

None
Recommended Practice

- Low volume, high pressure sprayer nozzles on water hoses
- Keep a log of vehicle washing water use
- Capture wash water for re-use (cistern)
- Practice indoor vehicle washing

Best Available Practice

- Treat wash water for re-use

CASE STUDY

Water Reduction Strategies
San Francisco International Airport – San Francisco, California

San Francisco Mayor Ed Lee has asked San Francisco residents, businesses and agencies to reduce water by 10 percent. SFO is extending that commitment to 15 percent by taking a variety of steps, including collaborating with Rental Car companies to reduce water. Other measures include:

- Providing a Water Wise Evaluation for all tenants; evaluating plumbing fixtures and practices
- Serving water at restaurants only when requested
- Reducing dead-end water line flushing and flushing for fire protection systems
- Reducing frequency of sidewalk hosedown
- Reaching out to all Airport tenants to inform them of the 10 percent voluntary reduction goal
- Eliminating fire truck Water Cannon Salutes

http://www.flysfo.com/community-environment/water-conservation

Consolidated Rental Car Facility
Nashville International Airport – Nashville, Tennessee

The Consolidated Rental Car Facility at the Nashville International Airport features on-site refueling and car wash services. The facility incorporates sustainable practices including the use of recycled and captured rainwater for washing rental cars.

https://www.flynashville.com/ground-transportation/Pages/rental-car-facility.aspx
14.0 VENUE SPECIFIC CONSIDERATIONS

14.6 Alternative Fuel Vehicles

1 to 4 Points

INTENT

Reduce emissions from airport vehicles to improve the local air quality. For the installation of alternative fuel infrastructure see SAM Credit 14.7.

REQUIREMENTS

As part of their day-to-day business operations, tenant should operate clean fuel vehicles in place of gas powered vehicles used to support the business (not personal vehicles). Points will be awarded as follows:

<table>
<thead>
<tr>
<th>SAM Credit</th>
<th>Percentage of Fleet</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.6.1</td>
<td>25%</td>
<td>1</td>
</tr>
<tr>
<td>14.6.2</td>
<td>50%</td>
<td>2</td>
</tr>
<tr>
<td>14.6.3</td>
<td>75%</td>
<td>3</td>
</tr>
<tr>
<td>14.6.4</td>
<td>100%</td>
<td>4</td>
</tr>
</tbody>
</table>

Alternative fuel vehicles include electric, compressed natural gas (CNG), biodiesel (B20 and higher), propane, hydrogen, hybrid (fuel/electric), etc. Flex fuel and E-85 fueled vehicles do not qualify for this credit.

SUBMITTALS

Include descriptive narrative on SAM Checklist detailing the alternative fuel vehicles used.

TECHNOLOGY/STRATEGY

Airport-related activities result in the emission of a host of air pollutants that adversely affect public health and the environment. While emissions from the largest source pollutant, aircraft, are declining due to the implementation of stringent regulations, emissions from other airport sources, still contribute to the total air pollution burden associated with airports.

Standard Practice

None

Recommended Practice

- Tenants are encouraged to identify and incorporate any other measures that may assist in reducing air quality emissions. For example, many clean vehicle options now exist including, electric, compressed natural gas (CNG), hybrid (fuel/electric), etc.
Best Available Practice
None

CASE STUDY

Compressed Natural Gas Vehicles
Baltimore-Washington International Airport – Baltimore, Maryland

Currently, low-floor 40 ft. Neoplan, buses operate daily, ferrying passengers from the airport terminal to the consolidated rental car facility. The airport reports that the buses have operated successfully with no major CNG-fuel related problems and with a good reception by the public. As of 2006, the total project expenditure of $1.125 million represents the incremental costs for the CNG buses ($45,000 per vehicle).


Propane Powered Vehicles
Port Columbus International Airport – Columbus, Ohio

The Port Columbus International Airport took the initiative to convert diesel shuttle buses into propane powered vehicles when faced with new regulations. This conversion reduced greenhouse emissions and the levels of hydrocarbons that are released into the environment. Making the transition to propane auto-gas also provided a more enjoyable atmosphere for employees and passengers by reducing the noise level of the running motors.

14.0 VENUE SPECIFIC CONSIDERATIONS

14.7 Alternative Fuel Infrastructure

3 to 6 Points

INTENT

Reduce emissions from airport vehicles to improve the local air quality.

REQUIREMENTS

Tenant should provide infrastructure to power alternative fuel vehicles used in place of gasoline powered vehicles. The infrastructure should be available for employees’ personal vehicles used for commuting and/or vehicles used for day-to-day business operations (fleet vehicles).

Infrastructure includes electric vehicle charging stations, or access to other alternative fuels, including but not limited to propane, CNG, biodiesel, etc. Points will be awarded as follows:

<table>
<thead>
<tr>
<th>Technology/Strategy</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide alternative fuel infrastructure for use by employees for personal vehicles</td>
<td>3</td>
</tr>
<tr>
<td>Provide alternative fuel infrastructure for business or fleet vehicles</td>
<td>3</td>
</tr>
</tbody>
</table>

SUBMITTALS

Include descriptive narrative on SAM Checklist detailing the infrastructure provided.

TECHNOLOGY/STRATEGY

Increasing oil prices, depletion of natural resources, and the accumulation of greenhouse gas emissions have led individuals to look into alternative means of fueling vehicles. As alternative fuels become more prevalent, it is important to provide alternative fueling stations delivering fueling options to the consumer.

With the popularity of alternative fuel vehicles, especially CNG powered taxis and buses, an airport environment provides an ideal location for fueling infrastructure due to the large number of vehicles accessing the site. Although CNG and electric are two common alternatives, others such as biofuels, LPG, hydrogen, etc. should also be encouraged to help drive the market where feasible. Fleet vehicles which are prevalent at airports are well suited to providing at least a startup market for these alternative fuels.

Standard Practice

None

Recommended Practice
- Tenants are encouraged to provide infrastructure to power alternative fuel vehicles used in place of gasoline powered vehicles.

**Best Available Practice**

None

**CASE STUDIES**

**Electric Vehicle Fleet**
**Seattle-Tacoma International Airport – Seattle, Washington**

Seattle-Tacoma International Airport received a $5 million grant from the U.S. Department of Energy to become the first airport in the United States to fully electrify their fleet of 650 ground support vehicles. They are in the process of adding electric charging stations on the ramp for airplane ground support equipment which will replace 200 gas and diesel vehicles. The project is expected to save more than 400,000 gallons of fuel per year and reduce emissions by more than 4,500 metric tons per year.

[http://www.portseattle.org/Environmental/Air/Airport-Air-Quality/Pages/default.aspx](http://www.portseattle.org/Environmental/Air/Airport-Air-Quality/Pages/default.aspx)

**Electric Vehicle Fleet**
**Frankfurt Airport – Frankfurt, Germany**

In 2012, Frankfurt Airport (Fraport) launched a program sponsored by the Federal Ministry of Transport, Building, and Urban Development to work towards the electrification of their vehicle fleet. By the end of 2015, they aim to have tested 42 electric vehicles in everyday operation at the airport and install 15 intelligent charging stations. This project will eliminate 500 tonnes of CO2 each year when comparing emissions to diesel vehicles.

14.0 VENUE SPECIFIC CONSIDERATIONS

14.8 Green Restaurant Certification

5 Points

INTENT

Encourage the green efforts of concessions and tenants.

REQUIREMENTS

Acquire certification from any of the following:

- Green Restaurant Association
- Green Seal, Green Seal Standard GS-55
- Others as approved by the CDA

SUBMITTALS

Include documentation from the third-party certifier on tenant’s certification.

TECHNOLOGY/STRATEGY

In order to attain certification, tenants must undertake an assessment by one of the third-party certifiers above. Key areas addressed by these programs will typically include:

- Water efficiency
- Waste reduction and recycling
- Purchasing policies
- Sustainable Food
- Energy
- Disposables
- Training and communication

Standard Practice

None

Recommended Practice

- Undergo Green Restaurant Association’s assessment and achieve certification
- Undergo Green Seal GS-55 assessment and achieve certification
- Undergo other third-party restaurant certification approved by CDA
Best Available Practice
None

CASE STUDY
Certified Green Restaurant
Frontera Grill – Chicago, Illinois

Frontera Grill has earned over 198 GreenPoints to become a 3 Star Certified Green Restaurant, and has made exceptional environmental progress by offering locally sourced ingredients and using alternative fuel vehicles. The renowned chef, Rick Bayless, owns additional Certified Green Restaurants throughout Chicago, including Topolobampo and XOCO.

http://www.examiner.com/article/chicago-is-home-to-most-4-star-certified-green-restaurants-the-country
15.0 INNOVATION FOR CONCESSIONS & TENANTS – Operations & Maintenance

15.1 – 15.3 Innovation for Concessions & Tenants

1 to 3 Points

INTENT

Provide tenants the opportunity to achieve exceptional performance above the requirements set by the Sustainable Airport Manual Green Airplane Rating System and/or innovative performance not specifically addressed by the Sustainable Airport Manual.

REQUIREMENTS

In writing, identify the intent of the proposed innovation credit, the proposed requirement for compliance, and the proposed submittals to demonstrate compliance, and the approach (strategies) that might be used to meet the requirements.

Up to three points are available for this credit:

<table>
<thead>
<tr>
<th>SAM Credit</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.1</td>
<td>1</td>
</tr>
<tr>
<td>15.2</td>
<td>1</td>
</tr>
<tr>
<td>15.3</td>
<td>1</td>
</tr>
</tbody>
</table>

SUBMITTALS

Include descriptive narrative in the SAM Checklist following the criteria in the Requirements section above.

TECHNOLOGY/STRATEGY

Substantially exceed a SAM performance credit such as energy performance or water efficiency and/or apply strategies or measures that demonstrate a comprehensive approach and quantifiable environment and/or health benefits.

Refer to LEED Credit Interpretation Results (CIRs) or the Innovation in the LEED Design Credit Catalog\(^6\) for potential strategies that may be considered for innovation. The SRP will review proposed innovations by the concessionaire or tenant on a case by case basis.

\(^6\) Available at [www.usgbc.org](http://www.usgbc.org).
15.0 INNOVATION FOR CONCESSIONS & TENANTS

15.4 Community/Cultural Responsibility

1 to 3 Points

INTENT

Promote specific social and cultural initiatives considered to be important to the sustainability of the airport environment and surrounding community.

REQUIREMENTS

A point will be awarded for each of the initiatives listed below that are promoted and organized by the tenant up to a maximum of 3 points:

- Industry Award – Tenant has received an industry award for their sustainability initiatives.
- Green Certification – Tenant has achieved a green certification from an industry organization, e.g. Green Restaurant Association, Green Seal, SAM Green Airplane Rating, LEED certified project, ISO 14001, etc.
- Employee Wellness Program – Have in place a program that encourages good health. Programs that maintain good health include but are not limited to health club memberships, incentivized programs for weight loss or to quit smoking, access to yoga, meditation, tai chi, zen gardens, bicycles for employees at work, etc.
- Employee Training and Education Programs – Have in place programs that promote employee opportunities for any type of continued education.
- Carpooling Incentives – Provide incentives to employees for carpooling.
- Community Outreach and Volunteerism Programs
- Cultural Programs – Promote and organize programs that display or present local art, performers, and culture and make accessible to the travelling public and/or airport community regarding culture, art, community connectivity, etc.
- Other Community/Cultural Programs

SUBMITTALS

Include descriptive narrative and calculations in the SAM Checklist. Indicate in the narrative which of the above technologies and strategies are being included in the project and, where applicable, indicate where these items are shown in the drawings or specifications.

TECHNOLOGY/STRATEGY

Organize and implement initiatives or programs not listed above that have a social or cultural impact on the travelling public, employees, and/or surrounding communities.
CASE STUDIES

Outreach & Involvement
Alaska Airlines

In addition to their corporate giving programs, Alaska Airlines and Horizon Air encourage their employees to be involved in their communities and offer multiple programs. Under the Dollars for Doers program, employees are acknowledged for their hard work for making a difference in the communities they serve. Employees are given $10 for every hour they volunteer (up to $1,000 per year) to be donated to the organization for which they volunteer. In addition, their Matching Gift Program, Alaska and Horizon will match their employees contributions to nonprofit institutions or organizations which meet their corporate giving guidelines.


Plane Pull
HMS Host – Chicago, Illinois

In September 2012, HMS Host competed in and helped sponsor the 4th Annual Law Enforcement Torch Run Plane Pull to benefit the Special Olympics of Illinois. The contest featured 34 teams of up to 20 members playing tug of war with a UPS A300 aircraft (weighing more than 190,000 lbs.). This fun and competitive event raised both money and awareness for the Special Olympics of Illinois and their sports training and competition programs.

15.0 INNOVATION FOR CONCESSIONS & TENANTS


1 to 3 Points

INTENT

Promote specific technologies and strategies considered to be important to the sustainability of the airport environment.

REQUIREMENTS

A point will be awarded for each of the strategies or technologies listed below that are utilized by the tenant up to a maximum of 3 points:

- Green Walls – Use green, vegetated wall systems, interior or exterior, if applicable. Green walls used for interior spaces must be designed for the improvement of indoor air quality as well as aesthetics.
- Alternative Water Heating – Use demand, tankless, instantaneous or solar water heating technology
- Advanced Wastewater Treatment – Utilize on-site wastewater treatment systems to treat sanitary sewage waste. Treated waste may be reused for irrigation, process water, or toilet flushing in accordance with relevant regulations and technologies.
- Kinetic Energy Systems/Power Regeneration Systems – Use kinetic energy systems for the generation of electricity. Point is achieved for any system that converts a portion of electricity from kinetic or mechanical energy.
- Waste to Energy Systems – Use solid or liquid wastes to generate electricity. Examples may include but are not limited to anaerobic digestion, refuse derived fuel for power generation, methane capture, etc.
- Net Zero Programs, such as energy use, waste reduction, etc.
- Biological systems, such as the use of vermiculture (worms), raising bees for honey, algae for fuel, etc.
- Exemplary Performance – Significantly exceed the requirements of any credit.
- Other

SUBMITTALS

Include descriptive narrative and calculations in the SAM Checklist. Indicate in the narrative which of the above technologies and strategies are being included in the project and, where applicable, indicate where these items are shown in the drawings or specifications.
TECHNOLOGY/STRATEGY

Organize and implement initiatives or programs not listed above that have a social or cultural impact on the travelling public, employees, and/or surrounding communities.

- Green Walls – Vegetated green wall systems can result in significant air conditioning savings. Vegetated green wall systems on exterior of building envelope can reduce wall surface temperatures by as much as 18°F (depending on which direction it is facing), which also results in significant air conditioning savings, while reducing the heat island effect. In interior applications, green or living walls can help regulate indoor temperatures, humidity, and air quality. Green walls fall into two categories:
  - Green facades (outside): Made up of climbing plants growing directly on a wall
  - Living walls (inside): Modular panels often made of steel containers, geotextiles, irrigation systems, growing medium and vegetation

- Alternative Water Heating – Alternative water heating for the purposes of this credit includes two types of technologies – instantaneous and solar thermal:
  - Instantaneous hot water heating technology uses include demand, instantaneous, or tankless water heaters. Demand water heaters heat water directly without the use of a storage tank thus avoiding the standby heat losses associated with conventional storage tank water heaters. When a hot water tap is turned on, cold water is heated directly by a gas burner or an electric element as it passes through the unit. As a result, demand water heaters deliver a constant supply of hot water not limited by the volume of a storage tank.
  - Water heating – Solar thermal hot water heating technology uses a solar collector which is simply a heat exchanger designed to convert the sun’s radiant light energy into thermal energy to be stored for later use. This collector uses optics and parabolic concentration technology to heat the fluid media passing through the selectively coated tubing manifold. The fluid media is circulated, via a pump, through the collector and into a storage tank located within the home/building.

- Advanced Wastewater Treatment – Onsite wastewater treatment is the collection, treatment and disposal or reuse of wastewater at or near the location in which the waste is generated. Onsite wastewater treatment systems provide preliminary, primary, secondary and tertiary treatment. The methods of treatment can vary but generally accomplish the same task. Systems are designed to be reliable and self-sufficient, however, the labor required to operate the system may be the largest expense. This, of course, is often integrated into standard facilities operation and management. Health, safety, and liability issues must be addressed early in the design process. Costs associated with the installation of these systems are generally offset by decrease in water demand, utility fees, or governmental grants.
• Kinetic Energy/Power Regeneration Systems – This class of systems converts kinetic energy or mechanical energy into electricity. There are a number of systems that accomplish this, the most common application being regenerative braking common in many hybrid vehicles. In this case, braking energy that would normally be lost as heat friction is instead converted to electricity and stored in a battery. Other systems include piezoelectric systems that convert pressure or vibration from, for example, footsteps or vehicle traffic to electricity.

• Waste-to-Energy (WTE) Systems – These systems create energy in the form of electricity or heat from the incineration of a waste product. Most WTE systems produce electricity directly through combustion of a waste product, or produce a combustible fuel through the decomposition of a waste product. In the latter case, the typical systems are anaerobic decomposition of organic wastes, such as in landfills or sewage treatment digesters. Other direct combustion waste products may be derived from a nearby manufacturing industry, such as a saw mill (wood waste) or other flammable solid. In either case, the pollutants emitted must be addressed for this system to be effective.

• Net Zero Programs – These may include water, energy, or waste. In essence, the loop is closed – there are no inputs or outputs of a given operation for a given stream, be it water, waste, or energy.
  o Water reuse is achievable depending on demand and regulatory environment and may employ such technologies as graywater reuse, rainwater harvesting.
  o Net zero energy has been proven for buildings where energy demand is produced onsite typically through photovoltaics of wind turbines and through energy conservation techniques.
  o Net zero waste systems are more typical of a manufacturing process but there may be potential applications in construction materials for example.

• Biological Systems – This category is a catch-all for systems that use living organisms to produce a beneficial commodity. The commodity is considered beneficial if it provides a use that has environmental, financial, or social benefits. This can include apiaries for the production of honey or vermiculture for the disposal of organic wastes.

• Exemplary Performance – When achieving a high level of compliance with any of the previous credits, the SRP will evaluate any claims that go significantly above and beyond the requirements of any SAM credit. For example, for SAM Credit 9.5 – Sustainable Food and Consumer Products, the highest threshold achievable is 40%, however if the sustainable food and consumer products of a given tenant exceed 80%, an exemplary performance point may be claimed.

• Other innovative technologies can be presented and will be evaluated by the SRP for final approval.
16.0 MONITORING & REPORTING

16.1 Prerequisite 1 – Documenting Sustainable Measures

Required

INTENT

Track, document, report and promote the CDA’s Green Commitment and encourage tenants airport-wide to join the movement.

REQUIREMENTS

Identify a primary contact person for all sustainability-related tracking and communications.

AND

Complete the SAM Checklist in accordance with chapter guidelines.

SUBMITTALS

Complete the SAM Checklist. Include and submit the completed checklist, and submit any progress reports/annual reports that support this credit.

TECHNOLOGY/STRATEGY

Track operating costs to identify any positive impacts related to the sustainable performance improvements to the building and its operations. At a minimum include water, electricity and waste management data to document operating costs on an ongoing basis. Use this data to optimize consumption and waste from operations and identify potential areas of improvement in future checklist and performance periods.

Standard Practice

None

Recommended Practice

None

Best Available Practice

- Document overall operating costs (i.e., water/electricity/recycle) for the previous five years (or length of occupancy, whichever is shorter) and track changes in overall operating costs over the performance period. Document operating costs and financial impacts of all aspects of SAM CT implementation on an ongoing basis.
16.0 MONITORING & REPORTING

16.2 Ongoing SAM Certification

4 Points

INTENT

Track, document, report and promote the CDA’s Green Commitment and encourage tenants airport-wide to join the movement.

REQUIREMENTS

Complete a periodic SAM evaluation occurring no more than 24 months from any prior SAM evaluation (unless otherwise allowed by the SRP) for the subject tenant or space. Each subsequent SAM CT-OM checklist submittal will be awarded points if the above criteria are met for that submittal period. The first SAM evaluation will not earn these points.

SUBMITTALS

Complete the SAM Checklist on a period, ongoing basis. Include and submit the completed checklist, and submit any progress reports/annual reports that support this credit.

TECHNOLOGY/STRATEGY

Track operating costs to identify any positive impacts related to the sustainable performance improvements to the building and its operations. At a minimum include water, electricity and waste management data to document operating costs on an ongoing basis. Use this data to optimize consumption and waste from operations and identify potential areas of improvement in future checklist and performance periods.

Standard Practice

None

Recommended Practice

None

Best Available Practice

- Document overall operating costs (i.e., water/electricity/recycle) for the previous five years (or length of occupancy, whichever is shorter) and track changes in overall operating costs over the performance period. Document operating costs and financial impacts of all aspects of SAM CT implementation on an ongoing basis.