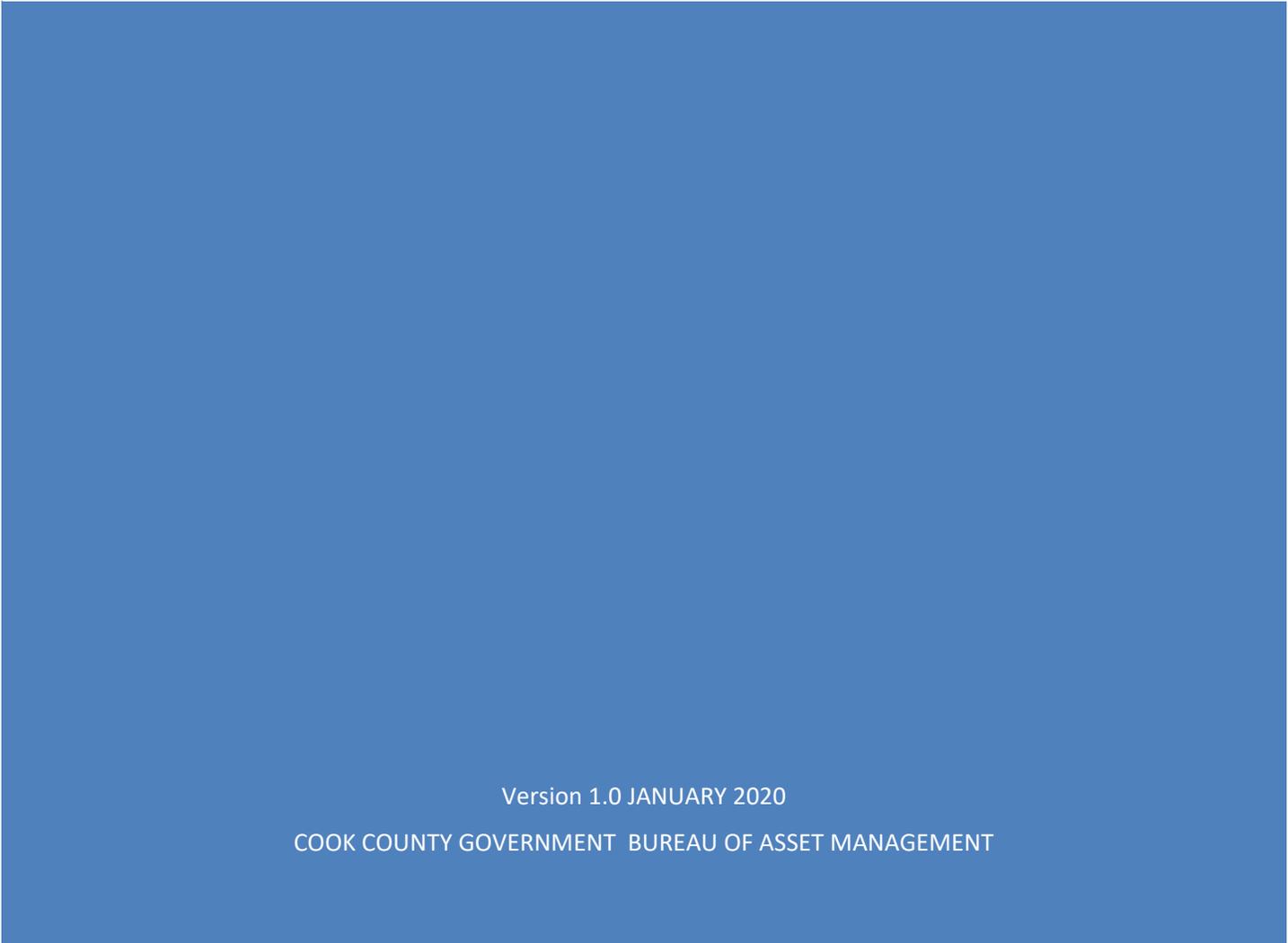




COOK COUNTY GREEN BUILDING STANDARDS

Version 1.0 JANUARY 2020

COOK COUNTY GOVERNMENT BUREAU OF ASSET MANAGEMENT



Cook County has a goal to be carbon neutral by 2050 and is currently creating a strategy to provide 100% renewable energy for its electricity footprint. The County has also implemented the Green Buildings Program. This program looks holistically at the design, space utilization, operations and life cycle impact of County owned properties to become a model for sustainable asset management that minimizes environmental impacts, improves the health and wellness of communities, and increases the value of County assets to optimize taxpayer dollars.

				
Goal	Goal	Goal	Goal	Goal
Carbon Neutral by 2050	30% water usage reduction by 2025	80% diversion rate by 2050	80% of buildings to incorporate smart building technology by 2025	Create a positive impact on County residents

To further advance Cook County’s Green Buildings Program goals, capital projects will follow the guidelines outlined in this document. Integrating energy efficiency into the design and procurement phases of the project planning process will ensure that impacts of each project can reduce energy and improve health and wellness of communities.

The following sections provide guidance to design firms for both new construction and renovations. Design professionals will be expected to be familiar with these standards and incorporate the components that are applicable to their specific project.

The following requirements should be applied to all capital projects. Deviations from these requirements should be discussed with the project team prior to implementation and should be approved by the authorized representative from Cook County.

Not all sections will apply to all projects. The design team shall agree upon which sections apply to each project during the project kick-off.

GENERAL REQUIREMENTS

Integrative Design Process

The County prefers the use of an integrative design process for all capital projects. At a minimum, the design team should draw participants from the end-user group, the design and construction team, and the facilities maintenance team. Depending on the scope of the project, other groups to be engaged could include:

- Bureau of Technology
- Department of Facilities maintenance
- Energy Manager
- Commissioning agent
- Procurement
- Mechanical, electrical, or civil engineer
- Landscape architect
- Building managers

As early as practical and preferably before schematic design, conduct an integrated design charrette with the project team as defined above. The goal is to optimize the integration of green strategies the support the Green Buildings Program across all aspects of building design, construction and operations, drawing on the expertise of all participants.

Workplace Design Strategy

Cook County has adopted workplace strategy design guidelines to provide more efficient and effective workplace design to accommodate employee work habits and technology. These guidelines can be found here: (To be added)

Net Zero Design

Cook County has a goal to be carbon neutral by 2050. All new construction and major renovation projects should have a goal to generate more energy than they consume. This process will focus on not only the production of energy but also the reduction of energy usage in the building design, using both active and passive strategies. To facilitate this process, consultant teams should follow a performance-based design and construction process. As part of the integrative design process, design teams shall set an energy use intensity (EUI) performance target for the project prior to or during schematic design. The first goal should always be net zero or net zero ready, and only deviate from this when the design team and County representatives have determined that it is not feasible. This target shall be based on the building type, with data gathered from the following locations.

Energy Star Target Finder - <https://portfoliomanager.energystar.gov/pm/targetFinder>

High Performance Building Database - <https://bpd.lbl.gov>

CBECS - <https://www.eia.gov/consumption/commercial/>

ComEd New Construction Program – www.comed.com/newconstruction

Other sources are encouraged as determined by members of the design team and County representatives.

Using this data, the design team, along with Cook County representatives, shall set a target EUI for the project. This goal shall be communicated to all stakeholders and updated at every stage of the design process.

Window-to-wall ratio

The maximum window to wall ratio for any elevation shall be 40%. The 40% is for each elevation, and elevations may not be aggregated to increase the glazing on a single elevation while decreasing the glazing on another elevation.

Daylighting

All regularly occupied spaces shall have access to daylight. Interior rooms shall have glazing that allows occupants access to views. Exceptions to this are storage rooms, mechanical rooms, janitor's closets, and restrooms.

A daylighting study shall be conducted as early as possible in the design process to maximize the amount of daylight to supplement artificial light, while minimizing the effects of glare and heat gain. The use of light shelves is encouraged to increase the penetration of daylight into the floorplate.

Solar Ready

Accommodations shall be made on new construction and major renovation projects for the eventual installation of a photovoltaic system. These preparations shall include:

- Placement of large pieces of rooftop equipment should be as far to the north side of the roof as feasible to maximize the open roof area with southern exposure.
- Provide (2) 2" metal conduits from the roof to the main electrical switchgear. Conduit shall be flashed and capped at the roof to create a watertight condition. Conduit shall not be run on the exterior of the building elevations.
- Landscaping along the southern elevation shall not cast shadows on the roof when at maturity.

New construction and major renovation projects shall incorporate bird-safe building materials and design features, including, but not limited to, those recommended by the City of Chicago's "Bird-Safe Building Design Guide for New Construction and Renovation," the City of Toronto's "Bird-Friendly Development Guidelines," and New York City Audubon's "Bird-Safe Building Guidelines."

Biophilia

Designers are encouraged to incorporate biophilic components into the design of spaces to enhance employee and visitor experiences within the space. Elements could include the use of natural materials in finishes or the incorporation of naturally occurring patterns in the space.

Landscaping

All landscaping shall use native plant species. Turf areas that require regular maintenance is discouraged. Permanent irrigation systems are prohibited. Plans to maintain plants until viability shall be included in the landscape drawings.

Native plantings should follow the Forest Preserve District of Cook County native seed policy. <http://fpdcc.com/downloads/policies/FPCC-Seed-Source-Policy-062718.pdf>

Bike racks that hold a minimum of 10 bikes shall be located within 100 feet of the main building entrance.

Indoor Air Quality

Finishes and Finish Materials

All adhesives and sealants used on the interior of the building (i.e., inside of the weatherproofing system) must comply with the following requirements as applicable to the project scope.

All regularly touched surfaces shall be non-porous and allow for easy cleanup.

Bathroom floors shall be terrazzo flooring with coved joints between wall and floor.

Spaces that produce fumes, store chemicals, or use chemicals shall be isolated to reduce contaminating adjacent spaces. This can be accomplished through negative pressure, separate exhaust, etc.

No Smoking is allowed within 50 feet of any building entrance or fresh air intake. Signage shall be prominently displayed near each entrance and air intake.

No smoking is allowed on any Cook County Health and Hospitals campus or property. Signage shall be prominently displayed throughout the campus and/or property. See appendix for language and additional details.

All paints and coatings wet-applied on site must meet the applicable VOC limits of the California Air Resources Board (CARB) 2007, Suggested Control Measure (SCM) for Architectural Coatings, or the South Coast Air Quality Management District (SCAQMD) Rule 1113, effective June 3, 2011.

Adhesives, Sealants and Sealant Primers must comply with the latest amendments to the South Coast Air Quality Management District (SCAQMD) Rule 1168, latest edition.

Aerosol Adhesives must comply with Green Seal Standard for Commercial Adhesives GS-36 requirements, latest edition.

In addition, the following requirements shall be met.

Ceramic, Porcelain, Laminate and Vinyl Flooring	Floor Score, Green Squared, or GreenGuard Rated
Carpet	NSF 140 Gold certification and Green Label Plus ≥10% post-consumer recovered content Wall-to-wall carpeting is prohibited
Gypsum Board	GreenGuard Gold certification
Acoustical Ceiling Tiles	Meets California DPH Section 01350 standard for low VOC materials Total recycled content ≥20% Environmental Product Declaration Available

Indoor Air Quality during Construction

The AOR/EOR shall prepare and make part of the construction documents, an Indoor Air Quality Construction Plan, that will include:

- Provide walk-off mats at all entrances to the construction area
- All mechanical vent openings **not in use** during construction shall be sealed until the equipment is made operational.
- Protect stored on-site and installed absorptive materials from moisture damage.
- Sweep site daily to minimize spread of construction debris
- Keep the work area dry so porous materials do not absorb moisture.
- If permanently installed air handlers are used during construction, filtration media must be used at each return air grille that meets the criteria below. Replace all filtration media immediately prior to occupancy.
 - Filtration media with a minimum efficiency reporting value (MERV) of 8 as determined by ASHRAE Standard 52.2-1999 or equal
- Use safety meetings, signage, and subcontractor agreements to communicate the goals of the Indoor Air Quality Construction Plan.
- No smoking is allowed on site during construction

Mechanical, Electrical and Plumbing

Plumbing

The following performance requirements should be met:

Toilets	1.28 gallons/flush, Tank type to meet EPA Water Sense Standards
Urinals	.125 gallons/flush
Lavatory Faucet	Un-metered - 0.5gpm at 60 psi
Lavatory faucet	Metered – 0.20 gallons per cycle
Kitchen Faucets	1.8 gpm at 60psi
Showerheads	2.0 gpm at 80 psi, Water Sense Labeled
Water Heaters	Thermal efficiency \geq 88%

For the Department of Corrections and other detainee facilities, these standards do not apply to holding cells or other areas where detainees are held.

Partitions shall be textured plastics and contain at least 25% recycled content. Metal partitions and smooth finishes are not allowed. Color shall be a light tone.

Equipment

All equipment specified in the building should be Energy Star rated if available. If an Energy Star rating is not available, total cost of ownership should be evaluated for at least 3 alternatives. The evaluation should incorporate first cost, anticipated energy usage, any maintenance costs, and any potential disposal costs. The evaluation period shall be the anticipated useful life of the piece of equipment. Evaluations should be completed using the form in the Appendix and included as part of the construction documents and/or specifications.

Heating, Cooling and Pumping Equipment

For new construction projects, the target EUI shall drive the selection of the HVAC and pumping equipment.

For replacement of existing equipment, the following standards shall be incorporated.

- New heating and cooling units should be the most efficient available on the market.
- The minimum qualifications should meet the minimum requirements to qualify for rebates through the ComEd, People's Gas, or Nicor energy efficiency programs.
- New equipment will be tied into the building automation system.
- Variable frequency drives and fans will be used.

- A total cost of ownership analysis will be done for at least 3 different models of equipment. The initial cost, expected energy use, and expected maintenance costs shall be evaluated over the expected life of the equipment. See form in Appendix.

Lighting

Access to daylight should be a design priority on all projects. When possible, daylight should be used to reduce the need for artificial light.

All new lighting fixtures to be LED and should meet the following requirements.

- Minimum efficacy of 110 lumens/watt
- Color temperature of 4000K indoor, 3000K outdoor fixtures
- L70 rating at 60,000 hours
- CRI ≥ 85
- Fully dimmable (Except accent or specialty fixtures)

Light levels

- All light levels should meet the current average illuminance recommendations of the Illuminating Engineering Society (IES), but should not exceed these levels by more than 10%. Light levels shall be met with initial lumen output.
- Outdoor light levels should average 2 fc with a max. to min. ratio of 3:1. If security is a concern, increase light level average to 3 fc.
- Outdoor light fixtures shall provide shielding along all project boundaries to reduce light trespass to less than 0.1 fc average as measured at the property line and 0.01 average fc 10' outside the property line.
- No outdoor light fixture shall emit light above a line horizontal to the light source.
- No up-lighting is allowed without approval from the County.
- Controls shall be provided to dim outdoor lights to 50% between 11 PM and 5 AM.
- Outdoor lighting operation shall adjust to changing daylight conditions.

Lighting Controls

Lighting controls shall be provided to allow for timed on/off for all general lighting. In addition, the following controls should be implemented. Multiple controls may be required for some spaces, and lighting engineer should select best applicable technology.

Building or Space Type	Application	Control
All Buildings ≥10,000 SF	Habitable spaces including parking garages	Demand responsive control to lower building lighting power

		by 15%
All	Common area spaces with glazing >24 SF	Multi-level daylighting controls for daylight zones
All	Corridors and stairwells	Automatic occupancy sensor per space, reduce power by at least 50%
All	Regularly un-occupied spaces	Automatic full shut off occupancy sensor with override
All	Regularly occupied spaces without glazing	Automatic full shut off occupancy sensors with partial-ON activation
All	Regularly occupied spaces with glazing >24 SF	Vacancy sensors with Manual-ON activation
Warehouse	Aisles and Open areas	Occupant sensor per aisle and open area with full shut-off
Parking garages		Occupancy sensors that reduce power by 50%

Commissioning and Retro-commissioning

Commissioning should occur if your project meets any of the following requirements:

- Is a new construction project greater than 20,000 SF
- In a major renovation, impacts the heating, ventilating, and air conditioning systems, lighting controls system, building automation system, renewable energy systems and domestic hot water system
- The AOR/EOR shall create a commissioning plan as part of the construction documents. A Cx specification listing all equipment to be included in the commissioning plan.

The commissioning agent shall execute the following tasks.

- At least one design review, at a time determined by the project team
- Submittal reviews of all equipment in the Cx scope of work
- Conduct site visits during installation of Cx specified equipment
- Observation of major equipment startup
- Preparation of functional checklists and execution
- Training review and O & M Manual review

- Seasonal testing
- 10-month warranty inspection.
- In addition, monitoring based commissioning shall occur for a period of 1 year after substantial completion for new construction projects over 20,000 SF or major renovations of the mechanical systems on projects greater than 20,000 SF.

Building Automation Systems

For all projects, major mechanical and electrical system components should be tied into the existing building automation system.

Building Automation System (BAS) Direct Digital Controls (DDC) shall consist of native BACnet, microprocessor-based, peer-to-peer, networked, distributed devices utilizing the BACnet communication protocol in an open, interoperable system.

If the project does not have a BAS, a direct digital control BAS should be included that can do the following:

- Monitor and alarm all major building mechanical components
- Allow for remote programming, adjustment, troubleshooting and monitoring
- Provide trend data
- Is Bacnet compatible

The BAS shall be modular in nature and comprised of a network of stand-alone DDC devices. The System shall be designed and implemented in such a way that it may be expanded in both capacity and functionality through the addition of DDC Devices, sensors, actuators, etc.

BAS shall be provided with a complete Web enabled operator interface. The Web enabled application shall operate on industry standard PC hardware.

All BAS DDC Devices at all levels shall be fully custom-programmable using the standard Operators Workstation Software.

Training of County staff shall be included in the scope of services for the building automation system.

Submeter Requirements

When possible, electrical panels shall be arranged to enable isolation of major mechanical systems such as lighting, heating and air conditioning, refrigeration and plug loads for sub metering purposes. Submeters shall also be installed across different space types (i.e. separately metering parking structures from building load).

When the project contains multiple tenants, submeters shall be installed for each tenant that capture power consumed within that space. (lighting, plug loads, special equipment, etc.) Whole building heating and cooling loads only need to be sub-metered at the main panels as discussed above.

Please consult with the Energy Management Team in the Bureau of Asset Management if there are any questions regarding submeter installation.

Project Closeout

The following shall be supplied to the Cook County representative at project closeout

- In a tabbed 3 ring binder and a USB drive, provide all warranty information and manuals for finishes and equipment installed in the building. Digital files should be provided as individual files with clear names for each file as well as a single combined PDF with functioning hyperlinks from a table of contents to each section.
- Provide (1) full size set of construction documents and specification books to the building engineer. This set should contain all changes made up to substantial completion.
- Provide one digital copy of the specifications and a full set of building drawings in Autocad. The drawings should reflect all changes made up to substantial completion and should be purges of unused layers and contain no referenced files. Digital files shall be provided on a flash drive only, no CD's.
- Attic stock equaling 5% of installed quantity shall be provided for ceiling tiles, carpet tiles, floor tiles, light fixtures, drivers and paint unless requested otherwise in writing.

Determine All Available Incentives

Each project shall consider available energy efficiency incentives when selecting new equipment. The following resources in coordination with the Cook County Energy Manager can determine if any projects qualify for standard and/or custom incentives based on energy reduced or specific types of equipment introduced.

ELECTRIC

ComEd: <https://www.comed.com/WaysToSave/ForYourBusiness/Pages/PublicSector.aspx>

NATURAL GAS

Nicor: <https://nicorgasrebates.com/Public-facilities>

People's Gas: https://accel.peoplesgasdelivery.com/business/rebates_publicsector.aspx

Appendix 1

Total Cost of Ownership Form

This form can be found in an electronic form at www.cookcounty.gov/xxxxxxx

The fields in yellow need to be filled out by the project team.

1. Provide basic project information.
2. Provide a description or model number for the equipment
3. Provide the expected energy use (kW/therms/both) as well as the anticipated usage.
4. Provide annual average maintenance costs over the useful life. Calculate by adding all maintenance costs divided by the expected life.
5. Use expected life from the tables in Appendix 1. If the item is not listed, use an industry standard. The expected life should be the same for all options.

Cook County Total Cost of Ownership Form		Version 1.0		
Project Name	<input style="background-color: yellow;" type="text"/>	<div style="border: 1px solid gray; padding: 5px; background-color: #f0f0f0;"> *Note: Conversion of watts to kilowatts: 1000W = 1 kW Example: 500 Watts = 500W * $\frac{1kW}{1000W}$ = 0.5 kW </div>		
Project Address	<input style="background-color: yellow;" type="text"/>			
Prepared By	<input style="background-color: yellow;" type="text"/>			
Date	<input style="background-color: yellow;" type="text"/>			
	1			
	2	1	2	3
	3			
	4			
	5			
		\$0.00	\$0.00	\$0.00