2018

Cuyahoga Community College Sustainable Renovations Guidelines

Capital, Construction, & Facilities

Cuyahoga Community College

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PREFACE

Cuyahoga Community College's (Tri-C) commitment to its core mission and values includes educating and instilling a sense of responsibility for the quality of our environment. In addition to its academic programs, the College is leading by example through energy conservation initiatives and facilities construction, renovation, maintenance, and operations activities. Tri-C's commitment to sustainability is reflected in the College's capital building projects which have been designed and constructed to be economical, allow for ease of maintenance, and provide exciting, healthy, and inspiring places to learn.

Since 2008, Tri-C has required all major new buildings be constructed using the US Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) rating system, with a minimum goal of a Silver rating. In recent years, Tri-C has invested in four new LEED building projects, with three projects achieving LEED Gold, and one LEED Silver. Additionally, since 2000, Tri-C has invested over $51 million in energy efficiency projects, reducing the college's energy needs in existing buildings by 30% from 2000.

The College does not require the formal process of LEED certification on renovation projects, but does require they follow the sustainability guidelines outlined in this document to reduce the environmental footprint of each project. This document also provides examples of potential strategies for addressing these guidelines. Please note these guidelines serve as a minimum and that specific sustainability opportunities for individual renovation projects may exist that exceed these guidelines. The College's objectives for these guidelines are to consider life cycle cost and value as well as occupant comfort and wellness to make buildings highly effective environments for learning and work.

> *"Development is sustainable when it meets the needs of the present without compromising the ability of future generations to meet theirs."*
> *– United Nations World Commission on Environment and Development, 1987*

> *"Sustainability at Tri-C means achieving the College's educational and community missions with a sense of responsibility for preserving the environment, promoting the economy and improving society as a whole."*
> *- Tri-C sustainability definition, created 2008*

DESIGN PROCESS

The project process should be interactive and collaborative, meeting the project program and budget while integrating sustainable strategies in both design and construction. Sustainability goals should be established and documented at each project's initiation and shared with all project constituents.

Project Kick-off & Sustainability Meeting

Tri-C's Project Manager will be responsible, as the "Champion", to coordinate the sustainable design process with the College's Sustainability Manager and Capital & Construction design and construction team to achieve the project goals.

General Outline of the Process:

1. The Design Team will be given the College's Sustainable Renovations Guidelines to review (this document).
2. Project Kick-Off Meeting
   Involve the College and the consultant design team in a project goal-setting session to incorporate sustainability goals that fit within the project budget. This will also ensure the resulting "green" incorporation is compatible with the expectations and culture of the College, and supportive of the project's programmatic needs.
   a. Review Sustainable Renovation Guidelines (this document).
   b. Highlight known programming opportunities that would enhance or could be integrated with green building features.
3. The design team should include tracking the progress of sustainability goals as a regular agenda item in project progress meetings.

TRI-C SUSTAINABLE BUILDING GOALS

1. Use integrated design to construct climate responsive, energy and resource efficient facilities that achieve ecological and economic benefits by reducing Tri-C's energy and resource consumption.
2. Specify no or low VOC interior finishes and furnishings to create healthy indoor environments conducive to learning and work.
3. Specify renewable, recycled, recyclable, energy efficient, and regionally produced products whenever possible.
4. Lessen the environmental impact of construction by reducing, reusing, repurposing, and recycling construction and renovation waste.
5. Minimize site disturbance and respect the site's biodiversity and ecological systems.
6. Design to enhance stormwater management and water quality on site where practicable.
7. Connect the interior environment with the exterior environment for occupants.

WATER

PRIMARY RENOVATION GOAL

- Reduce potable water use by at least 30% compared to Fiscal Year 2000 baseline, where a baseline exists.

SECONDARY RENOVATION GOALS (if applicable)

- Reduce stormwater runoff by minimizing impervious surfaces, increasing pervious surfaces, or using porous paving materials.
- Reuse stormwater runoff for irrigation.
- Integrate Green Infrastructure Systems to manage stormwater (wetlands, river corridors, and greenways).

STRATEGIES

- **NOTE:** Several new construction projects at the College have reduced or eliminated landscape watering needs and have included stormwater management infrastructure to capture or help treat runoff on-site. Indoor potable water use has been significantly reduced through the use of high-efficiency fixtures. Visit Tri-C's *Green Buildings and Grounds* page for additional details.

1. **Minimize Indoor Water Use**
   Select plumbing fixtures and systems built to conserve water, especially those technologies that significantly outperform federal, state and local standards. Consider using the following:
   a. Automatic shut-off controls and flow restrictors on faucets
   b. Low-flow urinals
   c. Pressure-assist and/or dual flush toilets
   d. Low flow showerheads and faucets

2. **Improve Water Management Practices (if applicable)**
   Retain or improve vegetation and pervious areas on the building site to help improve stormwater management. Promote technologies and conservation strategies that recharge groundwater and reduce runoff. Stormwater management should function effectively, preventing flooding, erosion and non-point source pollution. Consider the following strategies where appropriate:
   a. Minimize impervious paved areas and create stormwater recharge beds under porous areas of where practicable.
   b. Create vegetated swales or convert concrete channels to such.
   c. Make use of retention, detention, and other capture systems for use in irrigating lawns, gardens, and athletic fields, or in dry wells to recharge groundwater.
   d. Collect condensation from air conditioning equipment and reuse in cooling towers.
   e. Disperse stormwater across vegetated areas with well-drained soils.
   f. Limit erosion disturbance by minimizing grading and the removal of natural vegetation.

ENERGY

RENOVATION GOALS

- Meet ASHRAE 90.1.2010, with a goal of exceeding this standard if feasible.
- Retrofit lighting systems to the most energy efficient and cost effective technology that fits within the project budget and passes the life-cycle costing analysis.

STRATEGIES

- **NOTE:** Energy efficiency improvements at Tri-C have achieved a 30% reduction in energy consumption in existing buildings since the 2000 baseline year. Visit Tri-C's *Energy, Climate, and Transportation* page for additional details.

1. **Specify energy efficient equipment and appliances**
   Use of energy efficient equipment and appliances result in reduced operating costs for a building. Some examples of energy efficient equipment include:

   a. LED lighting

   b. Equipment and appliances that meet or exceed EPA Energy Star criteria

   c. Energy efficient lab hoods and similar equipment that meet Labs 21 standards.

   d. Occupancy sensors or timers that include photocell-dimming sensors that adjust electric lighting in accordance with occupancy and the amount of natural light, and that provide input to the building management system for HVAC setback.

2. **Optimize the efficiency of mechanical systems**
   When updating mechanical systems, new systems and strategies should be considered compared to traditional heating, ventilating and air conditioning (HVAC) systems. Mechanical system efficiencies should be maximized within the parameters of project budgets and life cycle cost analysis.

3. **Install sub-metering equipment to provide more detailed information about energy use of the specific building or location.**

4. **Consider creating a life cycle cost analysis or "Project Impact Assessment Report" of project options.**
   Utilize Building Life-Cycle Cost (BLCC) software programs used by the Federal Energy Management Program (FEMP) or equal. The output of the program used should provide life-cycle costs, net savings, internal rate of return, and payback period.

5. **Consider performing an energy audit or retro-commissioning of building HVAC systems and building envelope early in the design process to identify opportunities for energy efficiency and building performance improvement.**

MATERIALS & WASTE

PRIMARY RENOVATION GOALS

- Minimize waste generated by construction, renovation, and demolition of buildings and other capital projects.
- Divert at least 75% of project waste for reuse or recycling, with documentation of the results.

SECONDARY RENOVATION GOALS

- Increase resource efficiency
- Reduce consumption of nonrenewable resources

STRATEGIES

- **NOTE:** For construction projects, Tri-C aims to divert 75% or more of construction and demolition (C&D) waste. To date, Tri-C has utilized local C&D haulers and landfills that take single stream C&D waste and sort it for recycling, and has achieved diversion rates of over 90% on several projects. See the LEED Certification case studies on the Eastern Campus Health Careers and Technology building or the Westshore Campus Health Careers and Sciences building as examples.

1. **Recycle and/or salvage nonhazardous construction and demolition debris:**

    a. Develop and implement a project construction waste management plan and submit it to the College's Sustainability Manager that, at a minimum, identifies the materials to be diverted from disposal and whether the materials will be sorted on-site or co-mingled; and identifies haulers and recyclers to handle the designated materials. Preference should be given to specifying in-County haulers that sort the materials for recycling. The diversion total may include materials collected by the Tri-C Asset Management department and handled separately from the C&D stream, including equipment or supplies left behind in areas undergoing renovation.

    b. Designate a specific area or areas on the construction site for segregated or mixed collection of recyclable materials, and track recycling efforts throughout the construction process

2. **Reduce the Consumption of Natural Resources**
   Wherever possible, salvage reusable materials from existing buildings that are to be demolished or remodeled. Owner has first right of refusal for construction or demolition salvage. Encourage on-site reuse of scrap and surplus materials. Consider the use of the following types of materials whenever possible:

    a. Salvaged materials

    b. Remanufactured materials

    c. Recycled-content materials and products (post-consumer is preferable to materials with pre-consumer content)

    d. Reusable, recyclable, and biodegradable materials

    e. Crushed brick and concrete for use as aggregate for both the base and mix for new concrete and asphalt pavement systems

    f. Materials made from renewable sources (such as wheat, cotton, cork, bamboo and other materials that replenish themselves faster than demand for their extraction)

    g. Wood from sustainably-managed forests certified in accordance with the rules of the Forest Stewardship Council (FSC)

3. **Select Materials with Low Life-Cycle Cost**
   "Life-cycle cost" refers to the amortized total cost of a product. This includes "first cost" capital expenditures, installation, operation, maintenance, and disposal costs discounted over the lifetime of the material. Use materials that have the lowest environmental impact, particularly those that are used in greatest quantities during construction. Assessment tools such as ATHENA, BEES and LEED provide life-cycle methodologies.

4. **Use Regionally Manufactured Materials with Low Embodied Energy Content**
   Purchasing materials produced within Ohio and neighboring states minimizes energy waste and pollution related to transporting materials over great distances, while supporting the regional economy. Consider the embodied energy content when selecting materials.

INDOOR ENVIRONMENTAL QUALITY

RENOVATION GOALS

- Provide and maintain healthy indoor air in College buildings.
- Specify and document the use of low-emitting adhesives and sealants, paints and coatings, and composite wood and agrifiber products.
- Specify and document the use of low-emitting carpet or flooring systems (primary materials and adhesives) and furniture made using recycled content or from rapidly renewable materials.
- Monitor air quality during renovation and demolition to avoid contamination from carcinogens or other known health hazards.

STRATEGIES

- **NOTE:** To enhance indoor environmental quality, Tri-C's LEED certified buildings have taken advantage of daylight, used low or no VOC materials, had indoor air quality plans for construction, and have provided occupant control of lighting systems. See Tri-C's LEED Case Studies on the *Green Buildings and Grounds* page for additional details.

1. **Use no VOC or low VOC-emitting materials**
   Specify and select low to no off-gassing or VOC (Volatile Organic Compound) emitting materials, such as furniture systems, office/classroom equipment, upholstery, ceiling tiles, paints, flooring or carpet and adhesives.

2. **Use recycled content or rapidly renewable materials**
   Specify and select materials and products with the highest-percentage recycled content feasible to reduce the use of virgin materials, such as furniture systems and carpet or other flooring systems. If using virgin materials, preference should be given to products produced using rapidly renewable materials, such as bamboo or cork.

3. **Use strategies to improve indoor air quality and maximize thermal comfort**
   Control air pollutants and maximize thermal comfort by exceeding current ASHRAE standards and implementing alternative ventilation strategies.

   a. Isolate sources of pollution to zones where contaminants are generated

RENOVATION MINIMUM REQUIREMENTS CHECKLIST

SITE

- [ ] Create site-specific preparation protocols to minimize unnecessary site disturbance and respect the site's biodiversity and ecological systems (if applicable)

WATER

- [ ] Reduce potable water use by at least 30% from FY 2000 baseline by selecting from Tri-C's preferred list of fixtures (or similar performing fixtures)

ENERGY

- [ ] Meet ASHRAE 90.1.2010, with a goal of exceeding this standard if feasible
- [ ] Retrofit lighting systems to the best available technology

MATERIALS & WASTE

- [ ] Divert at least 75% of project waste for reuse or recycling

INDOOR ENVIRONMENTAL QUALITY

- [ ] Specify and use low-emitting materials:
  - [ ] Adhesives & Sealants
  - [ ] Paints & Coatings
  - [ ] Composite Wood & Agrifiber Products
- [ ] Specify and use low-emitting, recycled content, or rapidly renewable materials:
  - [ ] Carpet or Other Flooring Systems
  - [ ] Furniture

OTHER RESOURCE LINKS

- Tri-C Sustainability information and plans
- ASHRAE 90.1.2010 standard
- Harvard Green Building Standards
- USGBC
- Sustainable Sites Initiative
- Architecture 2030 Challenge
- Living Building Challenge
- US EPA Energy Star Buildings
- Labs 21 Toolkit
- The Indoor Air Quality Guide: Best Practices for Design, Construction and Commissioning