



01352 **Sustainable Design Requirements**

This document provides design standards only, and is not intended for use, in whole or in part, as a specification. Do not copy this information verbatim in specifications or in notes on drawings. Refer questions and comments regarding the content and use of this document to the Yale University Project Manager.

CONTENTS

- A. [Summary](#)
- B. [Comprehensive Scope Projects](#)
- C. [Limited Scope Projects](#)
- D. [Minimal Scope Projects](#)

[Sustainable Design Matrix for Limited Scope Projects](#)

Change History

Date	Description of Change	Pages / Sections Modified	Change Approver Initials
7/10/2018	Full document update.	Section 01352, Full Section	CJ

A. Summary

Yale University is committed to the incorporation of sustainable design practices in the design of construction of all size projects on campus. This section describes the goals, strategy and procedures for providing and meeting sustainable design requirements for projects designated by Yale Facilities as **Comprehensive, Limited or Minimal Scope** projects. Note: Each project regardless of scope classification shall follow the required reference documents, including “A Framework for Campus Planning”, including the 2013 “Sustainability Supplement” to the Framework for Campus Planning; “Sustainable Stormwater Management Plan”; and “Water Management Plan” which can be found on the Yale Office of Facilities website. In addition, all projects shall use the Yale Basis of Design tool to document project parameters.

B. Comprehensive Scope Projects

1. System Design and Performance Requirements

- a. Yale University has adopted the Leadership in Energy and Environmental Design (LEED BD+C or LEED ID+C) rating system, administered by the US Green Building Council (USGBC) as the method to help achieve a commitment to sustainable design.
- b. Comprehensive new construction and renovation project designs must meet LEED “Gold” status or higher. Registration with USGBC may occur at any time in the design process, and should be coordinated with the Yale Office of Facilities.
- c. Yale University has outlined several credits listed under **Special Requirements**, below as mandatory areas of compliance for all comprehensive new construction and renovation projects.

2. Submittals

Submit the LEED checklist in the pre-design phase, DD phase and 50% CD phase with those points proposed for project inclusion. Score all designs at each design phase for Yale University’s information.

3. Special Requirements

All sustainable design alternatives shall be presented to the University for their consideration with analyses as described herein. Designers are encouraged to reduce the energy loads, apply the most efficient systems, and look for synergies wherein all systems, building construction, and components will work together to produce overall functionality and environmental performance.

a. Special Requirements

- (1) Required Credits (Note: This currently references credits in Version 4, LEED BD+C: New Construction and Major Renovation and LEED ID+C: Commercial Interiors. These references will be updated as new versions are published and adopted by Yale).

Sustainable Sites

LEED BD+C: Must incorporate Sustainable Sites Rainwater Management Credit. (LEED ID+C: Not Applicable)

Note: This aligns with Yale's Sustainable Stormwater Management Plan that recommends innovative stormwater techniques including bioswales, downspout disconnections, rain gardens, and porous pavement.

(a) Water Efficiency

LEED BD+C: Must incorporate Outdoor Water Use Reduction Credit. (LEED ID+C: Not Applicable)

LEED BD+C: Must incorporate Indoor Water Use Reduction

Note: This aligns with Yale's Water Management Plan that recommends indoor and outdoor water conservation techniques.

(b) Energy and Atmosphere

LEED BD+C and LEED ID+C: Must incorporate Enhanced Commissioning Credit

LEED BD+C and LEED ID+C: Must incorporate Optimize Energy Performance Credit.

Note: This is in addition to achievement of target EUI as defined for the project and documented in the Basis of Design.

(c) Materials and Resources

LEED BD+C and LEED ID+C: Must incorporate Construction and Demolition Waste Management Credit Option 2, reduction of total waste material.

LEED BD+C and LEED ID+ C: Must incorporate Building Life Cycle Impact Reduction Credit. Select Options 1-4 based on project specific scope in coordination with Yale Office of Facilities.

LEED BD+C and LEED ID+C: Must incorporate Building Product Disclosure and Optimization – Material Ingredients Credit, Option 1 Material Ingredient Reporting. Yale further requires that product disclosures meeting this credit shall be Declare Living Building Challenge (LBC) Red List Free.

(2) Additional Prerequisites and Credits

(a) Water Efficiency

LEED BD+C Building Level Water Metering Prerequisite. Designers shall consult with the Yale Office of Facilities during Schematic Design on meeting the metering and data sharing commitment of this prerequisite.

(b) Energy and Atmosphere

LEED BD+C and LEED ID+C Advanced Energy Metering Credit. This credit is not required; however, all projects shall incorporate metered building energy consumption and diagnostic tools to evaluate system operations. Yale Utilities & Engineering shall indicate criteria for metering for each project.

(c) Indoor Environmental Quality

LEED BD+C and LEED ID+ C: Environmental Tobacco Smoke

Control Prerequisite. Yale is working towards becoming a tobacco free campus. Designers shall consult with the Yale Office of Facilities during Schematic Design on meeting this prerequisite.

(d) Innovation

LEED BD+C and LEED ID+ C: Innovation Credits: Yale University encourages the pursuit of Innovation Credits through strategies not addressed in the LEED rating system, achievement of a LEED Pilot Credit, or Exemplary Performance

4. Salvageable Building Components

Design Consultant, with review by Facilities Project Manager and Planner to identify salvageable building components and determine their reuse by Yale or qualified salvage vendor.

5. Salvageable Furniture and Equipment

Facilities Project Manager and Planner with TR&S to evaluate existing furniture and equipment for potential storage and re-use on other projects

6. Sustainability Workshops

a. Eco- Charrette occurs in the first weeks after a project's kick off meeting with update meetings every phase thereafter, incorporating full team participation including:

- (1) Yale representatives from multiple groups including Planning and/or Project Management, Utilities & Engineering, Facilities Operations, Office of Sustainability.
- (2) Consultants including the Architect, Sustainability Engineer, MEP Engineer, Civil Engineer, Geotechnical Engineer, Landscape Architect, Structural Engineer, Lighting Consultants, Waste Management Consultant, Cost Estimator, Construction Manager.

- b. Topics to include but not limited to:
 - (1) A Framework for Campus Planning, Sustainability Supplement: Project team shall review “ A Framework for Campus Planning, Sustainability Supplement” and consider all applicable recommendations for integration into proposed project.
 - (2) Basis of Design: review criteria and approaches to systems design and basis of the project’s energy usage goal.
 - (3) LEED Rating Systems Evaluation, including design strategies for meeting LEED Gold Certification
 - (4) Yale Special Requirements as outlined above.
 - (5) Salvageable Building Components
 - (6) Salvageable Furniture and Equipment

7. Archive Sustainability Documents

After LEED certification has been awarded, provide a compilation of all LEED documentation that was submitted to USGBC on-line plus all supporting analyses in the form of a bookmarked PDF file. Provide the following:

- a. LEED Submittal File: The full LEED documentation that was submitted to the USGBC for the project.
- b. LEED Final Report: The final report from USGBC that states each credit and describes what was earned and the final rating achieved with commentary from the USGBC reviewer regarding the design team responses.
- c. Energy Modeling Reports: Energy Modeling Reports that were prepared to analyze energy strategies for the project.
- d. Additional Supplements: Additional information, reports, studies etc. that provide insight into why decisions were made.

C. Limited Scope Projects

1. Systems Design and Performance Requirements

No LEED certification is required but sustainable goals will be considered throughout the design process and will be tracked on the [Sustainable Design Matrix](#) (a modified LEED scorecard) which can be found on the Yale Office of Facilities website. The matrix is the means to measure the level of compliance with the Limited Scope Project Standard. The Sustainable Design Matrix identifies sustainable attributes that are priorities for the University. It is expected that all applicable pre-requisites and/or credits are achieved or attempted in the design of the project. Note that Yale has identified credits in both BD+C and ID+C rating systems and limited scope projects may meet credits from both rating systems. See C.4 for requirements related to construction methods. (Note: This currently references credits in Version 4, LEED BD+C: New Construction and Major Renovation and LEED ID+C: Commercial Interiors. These references will be updated as new versions are adopted by Yale.)

2. Submittals

The Design Team will submit the Sustainable Design Matrix at the mid-point of Schematic Design and at the end of all design phases as an attachment to the Basis of Design. The Yale Project Manager to review and signoff. If a project is out of compliance, an explanation is required in the Remarks column of the Matrix with attachments submitted as backup as needed.

3. Materials and Products Standards

Designers shall provide product and materials specifications that preferentially select resource, energy saving and healthy building materials and design features.

4. Construction Methods

The following construction methods must be followed where applicable:

- a. Construction and Demolition Debris:
 - (1) LEED BD+C and ID+C MR Credit Construction and Demolition Waste Management, Option 1, Path 2 : Divert 75% and four material streams.

- b. Air Quality:
 - (1) LEED BD+C and ID+C EQ Credit: Construction Indoor Air Quality Management Plan
 - (2) LEED BD+C and ID+Q EQ Credit: Indoor Air Quality Assessment
- c. Construction Activity Pollution Prevention
 - (1) LEED BD+C SS Prerequisite 1: Construction Activity Pollution Prevention

5. Salvageable Building Components and Furnishings

- a. Design Consultant, with review by Facilities Project Manager and Planner to identify salvageable building components and determine their reuse by Yale or qualified salvage vendor.
- b. Salvageable Furniture and Equipment:
- c. Facilities Project Manager, Planner, and TR&S to evaluate existing Furniture and Equipment for potential storage and reuse on other projects.

6. Salvageable Furniture and Equipment

Facilities Project Manager, Planner, and TR&S to evaluate existing furniture and equipment for potential storage and re-use on other projects.

7. Verification

Constructor is required to sign project Sustainability Matrix attesting that the provisions in the matrix have been provided as per the Contract Documents.

8. Archive Sustainability Documents

After project is complete, submit a copy of the updated and final Sustainable Design Matrix, as an attachment to the Basis of Design. This Matrix will document achieved sustainable design attributes of the project.

D. Minimal Scope Projects

No LEED certification is required. Sustainable attributes will be documented through the Sustainable Design Matrix as described in D. 5 below..

1. Yale Sustainable Products List

The Yale Sustainable Products List provides information on approved products

typically used on Minimal scope projects. The Sustainable Products List can be found on the Yale Office of Facilities website. Substitutions may be made if approved by Yale Project Manager with products or methods that achieve the same or greater sustainable attributes.

2. Construction Methods

The following construction methods must be followed where applicable:

- a. Construction and Demolition Debris:
 - (1) LEED BD+C and ID+C MR Credit Construction and Demolition Waste Management, Option 2: Reduction of Total Waste Materials
- b. Salvageable Building Components, Furniture and Equipment:
 - (1) Per project requirements if needed, similar to requirements for Limited Scope Projects
- c. Air Quality
 - (1) LEED BD+C and ID+C EQ Credit: Construction Indoor Air Quality Management Plan
 - (2) LEED BD+C and ID+Q EQ Credit: Indoor Air Quality Assessment
- d. Construction Activity Pollution Prevention:
 - (1) LEED BD+C SS Prerequisite 1: Construction Activity Pollution Prevention

3. Salvageable Building Components

Design Consultant, with review by Facilities Project Manager and Planning Office to identify salvageable building components and determine their reuse by Yale or qualified salvage vendor.

4. Salvageable Furniture and Equipment

Facilities Project Manager and TR&S to evaluate existing furniture and equipment for potential storage and re-use on other projects

5. Sustainable Design Matrix

Sustainable design and construction attributes will be considered throughout the design process and be tracked on the Sustainable Design Matrix which can be found on the Yale Office of Facilities website. Design Team shall submit the Matrix

to the Yale Project Manager at the end of the CD Phase indicating the products, systems, and materials specified that contribute to a sustainable project outcome. The Construction Manger shall submit the Matrix at construction completion with close out documents verifying the installation of specified products, systems, and materials and use of required construction methods. The Sustainable Design Matrix shall reflect the applicable recommendations considered by the Design Team from “A Framework for Campus Planning, Sustainability Supplement” .

6. Archive Sustainability Documents

After project is complete, submit a copy of the updated and final Sustainable Design Matrix which was used throughout the design and construction process to track sustainable attributes of the project, (see D. 5 above).

End of Section

Limited and Minimal Scope Sustainability Matrix

Issued 2018/06

The Sustainability Matrix is supplemental to the Yale Basis Of Design (BOD) document and tracks sustainability as aligned with University priorities. The Sustainability Matrix and supporting documentation shall be submitted as an attachment to the BOD. Both USGBC LEED V4 Building Design & Construction (BD+C) and Interior Design and Construction (ID+C) rating systems are to be referenced. It is expected that all prerequisites and credits applicable to the scope are attempted. Check NA (not applicable) if the requirement falls outside the scope of work.

Project Name: _____ S.F. _____ Limited or Minimal Scope: _____ Date: _____

Priority Prerequisite & Credit Requirement			Limited	Minimal	Q: Achieved?	Q: If No, why not achieved?	
Rating	Category & Name		Guidance				
ID+C	IPc	Integrative Process Credit	<u>Energy-Related Systems</u> : Assess two potential options for each applicable system listed under this ID+C Credit. <u>Water-Related Systems</u> : Perform a preliminary water analysis as detailed in this ID+C Credit.	Yes	No		
BD+C	WEp	Outdoor Water Use Reduction Prerequisite	Reduce outdoor water use through Option 1: No Irrigation Required or Option 2: Reduced Irrigation calculated as per this BD+C Prerequisite.	Yes	Yes		
ID+C	WEp	Indoor Water Use Reduction Prerequisite	<u>Building Water Use</u> : meet reductions for fixtures and fittings as defined in the ID+C Prerequisite. <u>Appliance and Process Water Use</u> : meet requirements as defined in the ID+C Prerequisite.	Yes	Yes		
ID+C	WEc	Indoor Water Use Reduction Credit	Reduce water use beyond the baseline reduction cited above under the ID+C Water Efficiency Indoor Water Use Reduction Prerequisite.	Yes. See Design Std.	Yes. See Design Std.		
ID+C	EAp	Fundamental Commissioning Prerequisite	<u>Systems</u> : Commission mechanical, electrical, plumbing, renewable energy and exterior enclosure systems and assemblies as per this LEED Prerequisite. <u>Activities</u> : Perform all Commissioning activities per this prerequisite. <u>Operations and Maintenance Plan</u> : Prepare the O&M Plan meeting the requirements of this LEED ID+C Prerequisite.	Yes	No, see Std. Section 01810 General Comm.		
ID+C	EAp	Minimum Energy Perf. Prerequisite		Yes	Yes		
ID+C	EAp	Fundamental Refrigerant Management Prerequisite	<u>New Systems</u> : Do not use chlorofluorocarbon (CFC)-based refrigerants in new heating, ventilating, air-conditioning, and refrigeration (HVAC&R) systems. <u>Existing Small HVAC&R Units</u> : Meet requirements as per this ID+C Prerequisite.	Yes	Yes		
ID+C	EAc	Enhanced Commissioning Credit	In addition to meeting the requirements of the Fundamental Commissioning Prerequisite cited above, complete the Option 1 Enhanced Commissioning process activities as per this Credit.	Yes	No		
ID+C	EAc	Optimize Energy Performance Credit	<u>Energy Performance</u> : Establish energy performance targets beyond the baseline of the Minimum Energy Performance Prerequisite through either Option 2: Prescriptive Compliance per this ID+C Credit or Option 1: Energy Simulation.	Yes, see below	Yes, see below		
			<u>Base Building Systems</u> : Comply with ASHRAE recommendations for Opaque Building Envelope and Glazing Building Envelope and HVAC Equipment Efficiency as per this ID+C Credit.	Yes	Yes		
			<u>HVAC Systems</u> : Provide zoning and controls as detailed in this ID+C Credit.	Yes	Yes		
			<u>Interior Lighting Power</u> : Reduce lighting power density as detailed in this ID+C Credit.	Yes	Yes		
			<u>Interior Lighting Controls</u> : Install daylighting controls and/or occupancy sensors as detailed in this ID+C Credit.	Yes	Yes		
			<u>Equipment and Appliances</u> : Install ENERGY STAR equipment and appliances as detailed in this ID+C Credit.	Yes	Yes		

Project Name: _____

Scope: _____

Date: _____

Priority Prerequisite & Credit Requirement				Limited	Minimal	Q: Achieved?	Q: If No, why not achieved?
Rating	Category & Name		Guidance				
ID+C	MRp	Storage & Collection of Recyclables Prerequisite	Provide dedicated, accessible, areas for collection and storage of recyclable materials as detailed in this ID+C Prerequisite.	Yes	Yes		
ID+C	MRC	Interiors Life-Cycle Impact Reduction Credit	Meet requirements of Option 1: Interior Reuse, Option 2: Furniture Reuse and/or Option 3: Design for Flexibility as detailed in this ID+C Credit.	Yes	No, see Std. Sect. 01532 Salv. F&E		
ID+C	MRC	Environmental Product Declarations Credit	Achieve Option 1 Environmental Product Declarations by using at least 20 products that meet the criteria of this ID+C Credit. In addition Yale requires that these materials be Declare Living Building Challenge Red List Free	Yes	No		
ID+C	MRC	Construction & Demo Waste Mgmt. Credit	Achieve Option 1, Path 2: Divert 75% and Four Material Streams as detailed in this ID+C Credit.	Yes	Yes		
ID+C	EQp	Minimum IAQ Performance Prerequisite	Meet Ventilation and Monitoring Requirements for Mechanically Ventilated Spaces and Naturally Ventilated Spaces as detailed in this ID+C Prerequisite.	Yes	Yes		
ID+C	EQc	Enhanced IAQ Strategies Credit	Demonstrate indoor air quality improvements beyond the Minimum IAQ Performance Prerequisite requirements cited above. For mechanically ventilated spaces, naturally ventilated spaces or mixed-mode systems, meet reqm'ts. for Entryway Systems, Interior Cross Contamination Prevention, Filtration, Natural Ventilation Design Calculations, Mix-mode Design Calculations as applicable & detailed in this ID+C Credit.	Yes	No		
ID+C	EQc	Low Emitting Materials Credit	<u>Achieve Option 1: Product Category Calculations:</u> Compliance with emissions and content standards for 3 of the 6 categories of materials by volume or cost as detailed in Table 1 for this ID+C Credit. Categories include (1) Interior Paints and Coatings, (2) Interior Adhesives and sealants, (3) Flooring, (4) Composite Wood, (5) Insulation & (6) Furniture.	Yes	Yes		
ID+C	EQc	IAQ Assessment Credit	<u>Comply with Option 1 or 2.</u> Option 1 Flush Out: Complete outdoor air flush out Before Occupancy or During Occupancy as detailed in the Credit. Option 2 Air Testing: Demonstrate that contaminant levels do not exceed maximum concentration levels through air testing as detailed in this ID+C Credit.	Yes	Yes		
ID+C	EQc	Thermal Comfort Credit	Comply with Thermal Comfort Design Option 1 and Thermal Comfort Control Option 2. as detailed in this ID+C Credit.	Yes	Yes		
ID+C	EQc	Interior Lighting Credit	<u>Option 1 Lighting Controls:</u> Comply with requirements for shared multi-occupant spaces. <u>Option 2 Lighting Quality:</u> Use strategies detailed under this ID+C Credit as applicable.	Yes	Yes		
ID+C	EQc	Daylight Credit	Demonstrate access to daylight in regularly occupied spaces through either Option 1 Simulation, Option 2 Simulation or Option 3 Measurement, as detailed in this ID+C Credit.	Yes	No		
ID+C	INc	Innovation	Attempt a pilot credit, innovation credit, and/or exemplary performance as detailed in this ID+C Credit.	Yes	Yes		
BD+C	SSp	Construction Activity Pollution Prevention	Create and implement an erosion and sedimentation control plan to reduce pollution from construction activities by controlling soil erosion, waterway, sedimentation, and airborne dust as detailed in this BD+C Prerequisite.	Yes	Yes		
ID+C	EQc	Construction IAQ Mgmt. Plan Credit	Implement an IAQ Management Plan for the project's construction phase and pre-occupancy as detailed in this ID+C Credit.	Yes	Yes		