

SECTION 01 13 01 – DESIGN GUIDELINES FOR SUSTAINABILITY

PART 1 – GENERAL

1.1 SUMMARY

- A. All projects shall comply with the net zero pledge (Brown standard 01 13 00) and follow high performance design process to guide project design and equipment/system selection. The Office of Sustainability (OS) is available to assist design and construction teams through the process.
- B. New construction and major renovation projects shall be designed and constructed to be at least LEED Silver compliant. LEED Scorecards shall be compiled by a certified LEED professional. Submission for award is not required. The LEED process is important to innovation in sustainability, therefore LEED compliance beyond LEED Silver is highly encouraged.
- C. All new construction and major renovations design teams shall demonstrate how the team has been innovative, creative, and pioneering in incorporating sustainability principles into all aspects of the process. In collaboration with the Office of Sustainability and the LEED process, the team will explore sustainability initiatives beyond those in the LEED process. A strategic and common sense approach is desired encompassing all aspects of the project.
- D. All projects shall specify, design and install equipment and systems that exceed current energy code requirements by 20% (minimum) as predicted by system modelling and equipment ratings. Selection of efficiency measures beyond the 20% minimum shall be guided by life cycle cost (LCC) analysis and not limited by first cost. Contact Office of Sustainability (OS) regarding any questions on this requirement.

1.2 REQUIRED DESIGN DELIVERABLES / DESIGN ANALYSIS BASIS

- A. Design teams, in conjunction with Brown staff in Planning, Design & Construction (PD&C), Facilities Operations (FM-Ops) the Office of Sustainability (OS), and consultants retained by Brown or National Grid will examine options for energy and greenhouse gas (GHG) reduction at every stage of the project.
 1. Planning: Catalog systems to be modified and/or installed during the project which will affect Brown's greenhouse gas footprint. This will include standard GHG sources such as lighting, HVAC, and building shell, but should also include lab gasses where appropriate. Conduct modelling and preliminary life cycle cost (LCC) analysis for options where possible as further described below. Calculate and document preliminary utility cost and GHG impacts prior to project initiation. Provide scope 1 and 2 estimates as required by the Office of Sustainability Data Analyst to project

changes to Brown's GHG reporting in The Climate Registry. Estimates of embedded carbon related to construction materials and activities shall be provided for major projects to allow analysis of the overall life cycle carbon impact of the project.

2. Design:

- a. Conduct additional modelling and LCC analysis where needed to determine appropriate systems for design and construction. Coordinate activities with OS Senior Energy Engineer.
- b. For LCC analyses, coordinate with the designated FM-Ops representative to review the appropriate routine Preventive Maintenance costs and the estimated economic equipment life cycles for each of the options being considered.
- c. Document the basis of design (BOD) to include lowest life cycle cost equipment/systems. If capital budget does not support lowest LCC, BOD shall require formal pricing of options for subsequent consideration by the Principals.
- d. Design teams shall sign National Grid MOU for high performance design (where applicable) and conduct energy charrettes for various building systems.
- e. Specify and approve equipment to meet GHG and efficiency requirements.
- f. If systems do not meet energy targets, or if the lowest LCC equipment or systems are not included, obtain a waiver prior to award for construction.
- g. Scope 3 Embodied Carbon Considerations for all category 1 new construction and category 2 comprehensive renovation projects: Brown University strives to utilize materials with lower embodied carbon than traditional materials wherever possible and feasible within the project budget, such as low carbon cement, cross laminated timber, mass timber, recycled steel and others. Brown University may elect to increase the project budget to allow for lower embodied carbon materials. These alternative lower-carbon materials are to be considered at the planning and design phases of new major construction projects. In order to facilitate decisions on the lower-carbon material alternatives the Architect and/ or their associated sub-consultants are to provide an estimate of embodied carbon for the base-design materials, potential for carbon reduction using different materials, and end of life opportunities, costs, and geographic data for those different materials. At the end of the Design Development phase, or pending the finalization of the lower-embodied carbon materials review process, the Architect shall provide a final model of the total embodied carbon for the project and benchmark this data point to at least three non-Brown University projects of the similar size and complexity.
- h. All design specifications for category 1 new construction and category 2 comprehensive renovation projects are to specifically require the

Contractor and associated Subcontractors to provide Environmental Product Declarations (EPD's) for all materials.

3. Construction: Install lowest LCC equipment and systems. Comply with testing and balancing, startup and commissioning requirements as laid out in various Brown standards.

B. Deliverables:

1. New construction and major renovation projects shall be designed and constructed as LEED Silver compliant at minimum – greater than Silver is encouraged. The project design team shall demonstrate reductions in total energy use for the proposed design when compared to an appropriate standard reference design (baseline design) meeting the requirements of State of Rhode Island Energy Conservation Code. The cost budget method of ASHRAE 90.1 is the preferred method to document improved performance of systems exceeding energy code:
 - a. Identify baseline model inputs for the building using baseline (Code minimum) requirements.
 - b. Identify alternate equipment/systems which, when incorporated into the design, provide an increased level of performance over the standard reference design (minimum 20% better than Code).
 - c. Provide initial costs, replacement costs (if any), O&M costs, potential utility incentives, and annual energy consumption.

2. Life Cycle Cost Analysis (LCC): A life cycle cost analysis shall be performed for all major equipment and systems. Energy modelling shall be used as appropriate to determine energy use of various options. Modelling and LCC analysis shall be completed as early as possible in the planning and design process and repeated as necessary to aid in selection of appropriate option by the project Principals. A current version of the High Performance Design workbook (Brown Standard 01 13 02) shall be used. Contact the Senior Energy Engineer in the Office of Sustainability for assistance as needed.
3. Energy Charette: New construction and major renovation projects shall participate in energy charrette early in the design process (typically at schematic design). The Energy Charette shall be scheduled by the Brown Project Manager immediately after award of architect and MEP Engineer of Record contracts.
4. Progress Drawings and Design Submittals: All progress drawings and submittals shall be made available to the Office of Sustainability and their relevant consultants to ensure compliance with high performance design requirements. The Senior Energy Engineer in OS shall review designs and submittals for all lighting and HVAC equipment.
5. Unitary equipment: Unitary equipment ratings shall exceed requirements shown in current IECC code by 20%. Document compliance through submission of confirmed performance ratings. If the minimum target efficiency cannot be achieved, document equipment selection decision using a completed LCC worksheet and/or submit standards waiver request.

1.3 ADDITIONAL REQUIREMENTS

A. Commissioning:

1. Full project commissioning is required for all new construction, major renovation, and retrofit projects involving energy consuming equipment. Commissioning documentation shall include verification of input/output control points and programming logic as well as calibration of field devices.
2. Commissioning should be performed by an independent third-party. The Project Manager can elect to pursue an alternative approach if more appropriate to project scope and requirements. Commissioning agent shall be involved throughout the planning, design, and construction process to include the following phases:
 - a. Commissioning Team Development
 - b. Planning and Predesign
 - c. Design Phase - Submittal/Progress Review
 - d. Construction Phase
 - e. Acceptance Phase - Verification of Performance (Functional

Performance Testing)

f. Warranty Phase

3. The installation contractor and all appropriate sub-contractors shall be available and present as needed during commissioning activities at no further costs to Brown. All costs for commissioning activities shall be included in construction proposals.

B. LIGHTING SYSTEM DESIGN GUIDELINES: Fixtures shall be DLC Premium listed.

C. PLUMBING EQUIPMENT AND SYSTEM DESIGN GUIDELINES:

1. Water meters shall be included for cooling tower make-up water, blow-down and tower drain to allow for sewer abatement readings.
2. Water meters shall be included for irrigation systems to allow for sewer abatement readings.

End of Section