

## **Putney Field House Design & Environmental Highlights**

### **Design Process**

- Collaborative design on 16,800 sq. ft. with students and faculty, board of trustees, design team, and construction manager
- Students integrated into process throughout design

### **Site**

- Tight-knit, pedestrian-friendly campus infill development
- Bike storage and changing rooms provided
- Exceeds local zoning open space requirements
- Storm water design promotes infiltration, captures and treats runoff beyond national standards
- White reflective roof to reduce “heat island” effect
- Significant light pollution reduction with effective selection of interior and exterior lighting fixtures
- Highly-reflective site concrete to reduce heat island effect of site improvements

### **Water Usage**

- No irrigation
- Low-water fixtures and composting toilets minimize water usage

### **Energy**

- Reduced carbon footprint by 100%
- 25-year carbon dioxide reduction of 1,077,516 pounds
- 25-year sulfur dioxide reduction of 4,564 pounds
- 25-year nitrogen oxides reduction of 1,802 pounds
- Projected net-zero energy on yearly basis with 36.8 KW of solar-tracking photovoltaics in field next to building
- Energy usage modified to be approximately 45% of that allowed by Vermont Energy Code
- All lighting on occupancy and daylighting sensors
- All ventilation on occupancy and carbon dioxide sensors
- Air to air heat pump system selected is more efficient than current ground source systems
  - Ground source at +/- 2.3 COP (coefficient of performance)
  - Air to air heat pump at +/- 2.7 COP
- Heat recovery on building exhaust air
- Automatic natural ventilation (windows on automatic night time flushing)
- Building envelope
  - Super-insulated envelope with:
    - R20 under slab insulation
    - R20 foundation wall insulation
    - R45 walls
    - R 60 roofs
    - R5 fiberglass windows (triple insulated, low-e, operable units—U value of 0.19)

- Sky lighting for approximately 40% of floor area
- Detailing to avoid air infiltration and thermal bridging

### **Materials & Resources**

- 20% fly ash in concrete reduces carbon footprint on a pound per pound basis
- Construction waste management with 75% diverted from disposal
- More than 50% of wood Forest Stewardship Council (FSC) certified (sustainably harvested)
- Use of 20% recycle materials such as steel used in steel framing and light-gauge wall framing
- Low or nearly no VOC (volatile organic compound) paints, finishes, and adhesives used throughout project
- Local materials such as site-harvested wood used in public areas
- No chlorofluorocarbons (CFCs)

### **Indoor Environment Quality**

- Natural ventilation, operable windows, and no air conditioning
- Formaldehyde-free composite woods
- Meets ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) indoor air quality standards
- CO2 monitoring for indoor air quality