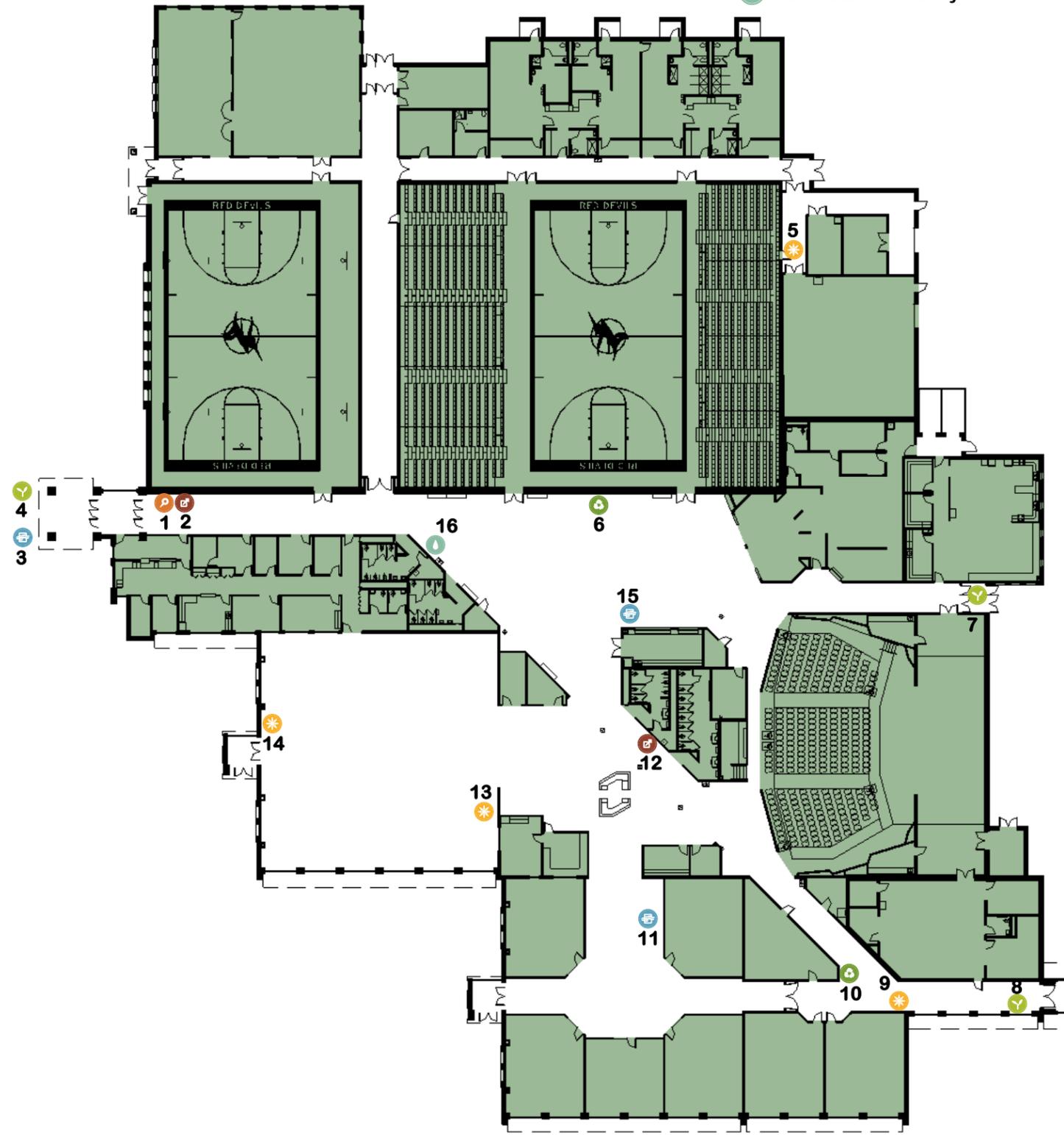


# Erie LEED Walking Tour

- 1. LEED Plaque
- 2. Green Building Education
- 3. Tobacco free campus
- 4. Preferred Parking
- 5. Georexchange
- 6. Recycling
- 7. Stormwater Management Pond
- 8. Open Space/Native Grasses
- 9. Building Envelope
- 10. Regional Materials
- 11. Indoor Air Quality
- 12. Green Cleaning
- 13. Lighting
- 14. Measurement and Verification
- 15. Natural lighting
- 16. Water Efficiency



## Erie High Charter School



*Awarded LEED Gold by U.S. Green Building Council\**



Building Footprint: 87,750 ft<sup>2</sup>  
 Building Construction Budget: \$16,855,349  
 Building Population: 281  
 Construction Dates: 2009-2010

Architect: PBA Architects, PA  
 Structural Engineer: Mauler Engineering, LLC  
 Mechanical, Electrical, & Plumbing Engineer: Henderson Engineers, Inc.  
 Civil Engineer: Cook, Flatt & Strobel Engineers, PA  
 Landscape Architect: Brian Hollis Landscape Architect  
 Sustainability Consultant: Earthly Ideas LLC  
 Construction Manager: Crossland Construction Company, Inc.  
 Commissioning Agent: Allied Laboratories



# Project Notes

## Site and Water

**Site Selection & Orientation:** Built on a previously developed site, the building layout was arranged to take advantage of daylighting and reduce the impact on the site.

**Alternative Transportation:** The parking lot's capacity does not exceed the minimum local zoning requirements and the lot includes preferred parking spaces for carpools and low-emitting and fuel-efficient vehicles.

**Protect and Restore Habitat:** In addition to protecting natural areas during construction for open space, some areas that were disturbed during construction were planted with a Conservation Reserve Program (CRP) native grass mix that was selected for its local suitability after extensive research by students.

**Open Space:** The District chose to leave undisturbed and conserve an area east of the Vocational Building (around and including the retention/detention pond) equal to 750,778 square feet for the life of the school building. This amount of protected and restored open space significantly exceeds the building footprint, which earned an innovation credit for the project.

**Stormwater:** This project enhanced an existing pond area to provide a retention/detention basin that receives stormwater runoff from the majority of the developed site. The pond's purpose is to provide retention storage and treat small storm runoff. These management measures allowed the peak rate and quantity of stormwater discharge from the developed site to not exceed those of the undeveloped site.

**Landscaping:** The landscape was designed with no irrigation system. All plant materials selected (native grass seed and Bermuda grass seed and sod) are native or adapted to the region and require no supplemental watering after the first year of establishment.

**Water Usage in the Building:** Selection of low-flow toilets, ultra low-flow urinals, ultra low-flow faucets with automatic sensor operation, low-flow kitchen faucets, and low-flow showerheads resulted in a 41.8 percent savings over baseline fixture performance requirements of the Energy Policy Act of 1992.

**Heat Island Effect:** Roofing and paving materials reject solar heat to reduce thermal gradient differences between developed and undeveloped areas to minimize impact on microclimate and habitat.

**Exterior Lighting:** Designed to minimize exterior light trespass and reduces sky-glow for improved night sky viewing ability by use of light fixture shielding, light fixture placement, "full cut-off" type light fixtures, and controls. The use of fewer highly efficient light fixtures minimizes energy costs.

## Community Connections

USD 101 wanted Erie High Charter School to be an integrated part of the community by allowing the building to be used for non-school events and functions. The auxiliary gym, weight room, wrestling room, commons, and auditorium along with restrooms off the commons are accessible for after-hours use.

## Energy & Atmosphere

**Energy:** Erie High Charter School's energy simulation model demonstrated a 53.2 percent reduction in energy cost per year between the design building model and the code minimum base model.

**Lighting:** Daylight sensors in the PBL house can reduce and turn off electric lighting when daylight is sufficient. Occupancy sensors in classrooms, offices, locker rooms, commons, weight room, and wrestling room also include a photocell for daylight on/off control of light fixtures.

**Building Envelope:** Double-pane, tinted, low-e glass in thermally broken aluminum frames for vision glazing with fixed shading devices, translucent structural composites for daylight glazing, masonry walls with continuous insulation, insulation below the highly reflective roof, and slab perimeter insulation were used to improve the building's envelope and set a path for long-term energy efficiency.

**HVAC:** Heating and cooling are provided by a vertical, closed loop geothermal and water-to-air heat pump system. The direct expansion refrigerant system's thermal storage is the earth, which maintains a relatively constant temperature year round. The well field transfers heat to the earth in the summer and extracts heat from the earth in the winter. Heat pumps distribute warm or cool air to condition the interior spaces. Dedicated outside air heat pumps condition raw outside air with energy recovery wheels to supply code compliant ventilation with reduced energy consumption.

**Commissioning:** The project employed this quality-control process to ensure the fundamental building systems were planned, installed, and calibrated to operate as intended by the design team for the District's long-term benefit.

**Measurement and Verification:** To provide a method of tracking energy goals, Erie High Charter School will implement a plan to meter and analyze energy consumption and building performance during the first year of occupancy.



## Indoor Environmental Quality

**Tobacco-Free District:** Students led an effort to convince the School Board to pass a Tobacco Policy that made the entire District free of tobacco products and associated marketing.

**Acoustics:** A combination of wall, roof, door, and window design, material selection, and mechanical system measures provided classrooms and core learning spaces with acoustical performance for background noise, noise from outside of spaces, and sound absorption within spaces to minimize reverberation.

**Indoor air quality (IAQ) monitoring:** CO<sub>2</sub> sensors located in all regularly occupied areas increase ventilation air from the dedicated outside air equipment when needed to help sustain long-term occupant health and well-being.

**Construction IAQ:** To help sustain the comfort and well-being of construction workers and building occupants, the construction team implemented a combination of HVAC protection, source control, moisture control, housekeeping, and scheduling measures.

**Low-Emitting Materials:** Low-toxicity building products such as adhesives and sealants, paints and coatings, and carpeting were used to reduce the quantity of indoor air contaminants and provide a healthier working and learning environment.

**Pollutant Source Control:** The airlock vestibules contain special carpet to capture dirt and particulates from entering the building. Areas with chemical use (custodial closets) are physically separated from other spaces and have appropriate ventilation and exhaust.

**Thermal Comfort:** Each classroom is provided with its own temperature, humidity, and CO<sub>2</sub> monitoring and adjustments.

**Daylighting:** Over 95 percent of all classroom and core learning spaces and over 76 percent of the non-classroom, regularly occupied spaces have extensive daylighting from windows, tubular skylights, translucent structural composites used for vertical glazing and overhead skylights.

## Materials and Resources

**Occupant Recycling:** Easily accessible containers and separate storage areas serve the recycling needs of the entire building, allowing for recycling of the following materials: paper, corrugated cardboard, glass, plastics, and metals. An area dedicated to collection and storage of plant-based landscaping debris is also provided.

**Recycled Content Materials:** To reduce the impacts of extraction and processing of virgin materials and support closing the loop for recycling, recycled content materials used include the following: steel rebar, fly ash in concrete, concrete masonry units, brick, roof joists and deck, structural steel, steel studs and track, particleboard, roofing, gypsum board, toilet partitions, and wire mesh partitions.

**Regionally Extracted Materials:** To reduce transportation impacts and support regional businesses, regionally extracted materials (those manufactured and whose raw materials are extracted within a 500-mile radius of the jobsite) used include the following: concrete, concrete masonry units, cast stone, brick, and gypsum board.

**Construction Waste Management:** A successful waste management program diverted 76.3 percent or 117.9 tons of the construction waste from landfills. Recycled materials included wood, cardboard, plastic, Styrofoam, metal, brick, and concrete.

\* The LEED® (Leadership in Energy and Environmental Design) Green Building Rating System is the nationally accepted benchmark for the design, construction and operation of high performance green buildings.



## Innovation and Design Process

**Green Building Education:** The Erie High Charter School project will educate its students and staff and the public about sustainable design and the impact of buildings on the environment. In addition to this green building profile, a comprehensive signage program was developed with plans for a future self-guided tour.

**Green Cleaning:** A comprehensive green cleaning program was implemented to reduce the exposure of building occupants and maintenance personnel to potentially hazardous chemical contaminants that adversely impact air quality, occupant well-being, and the environment.

