

## Here are just a few of the many initiatives that made significant contributions enabling Building 701 to again be recognized for excellence in sustainable design

**OPTIMIZE ENERGY EFFICIENCY:** Building 701 is recognized by the U.S. Environmental Protection Agency for demonstrating superior energy performance, earning Energy Star® certification for each year for six consecutive years. It performs better than 80% of peer buildings, ranking it among the Top 25% of energy-efficient buildings in the U.S. **EAc1**



**LED LIGHTING:** Lighting in Building 701 was switched to LED saving more than 82,966 KW hours.

**ON SITE AND OFF-SITE RENEWABLE ENERGY:** 100% of total annual energy budget is offset by purchasing renewable energy – equivalent of removing nearly 4m lbs of CO2 from atmosphere and taking nearly 1,013 cars off road. **EAc4**



**STORM WATER QUALITY CONTROL:** We effectively manage storm water runoff throughout the Campus through well landscaped and manicured retention basins to retain associated stormwater on site. The goal is to control erosion and to minimize the possible pollution of natural water flows. **LEED® SSc6**

**HEAT ISLAND REDUCTION – ROOF:** The roof area is covered with highly reflective roof with .83 reflective value and .88 Emittance, aiding in reducing heat islands. A maintenance program is in place to ensure that all SRI surfaces are cleaned at least every 3 years. **LEED SSc7.2**

**INNOVATION CREDIT FOR ACOUSTICS:** In 2007, Building 701 became the first commercial building to earn an Innovation credit for its superior acoustic design; and in 2014 is recertified to meet this level of performance. Superior acoustic performance is achieved with the combination of sound absorption from Armstrong Optima® 1" thick acoustical ceiling panels (AC 200), sound blocking from the furniture systems (STC 25) and covering background noise with our i-ceilings® sound masking system (48 dBA +/-2dB spatial variation). The result – 29% higher worker satisfaction ratings, improved speech privacy and a quieter, more pleasant place to work. **LEED IOc1.1**

**INDOOR AIR QUALITY BEST MANAGEMENT PRACTICES:** Our IAQ management plan is based on EPAI-BEAM (EPA's "Indoor Air Quality Building Education and Assessment Model") program ensuring that all equipment is maintained and operating properly to provide good indoor air quality for Armstrong's staff and visitors, to reduce energy expenditures, and to minimize negative impacts on the environment. **IEQc1**



**OCCUPANT COMFORT:** 74% of the building occupants participated in the CBE (Center for Built Environment) survey to gain their feedback on occupant comfort and their satisfaction of the building environment. High satisfaction ratings were given for Acoustics, IAQ, Cleanliness and Maintenance. Yearly surveys are conducted to monitor building satisfaction. **IEQ2**

**SUSTAINABLE POLICIES – SOLID WASTE MANAGEMENT:** Our solid waste policy covers all aspects of waste management operations throughout our campus. **MRp2; MRc7,8,9**

**PERFORMANCE MEASUREMENT – BUILDING AUTOMATION AND METERING:** Building HVAC and lighting are controlled for maximum energy efficiency by Johnson Controls® Metasys PMI building automation system. The system is used campus wide to improve efficiencies of building operations resulting in energy savings. The HVAC system uses energy-efficient motors, CFC- and HCFCV-free refrigeration, energy management software, and is zoned into small areas for precise climate control. **EAc3**

**EXISTING BUILDING COMMISSIONING:** The first cycle of commissioning occurred in 1998 when the facility was first constructed; the second for the initial LEED®-EB certification and recommissioning in 2006 to 2007; and third cycle of commissioning in January 2014 for the LEED-EB recertification. HVAC: Perform Re-Commissioning of Building Systems - approximate 10% - 20% total energy when completed. A plan was created identifying opportunities for cost-effective reductions in energy consumption; operating problems and capital improvements all expected to provide ongoing cost savings. **EAc2**

**SUSTAINABLE POLICIES – PURCHASING:** Items purchased for Corporate Campus Bldg 701 follow a strict sustainable purchasing policy. For Electronics, all items must meet Energy Star and EPEAT (Electronic Product Environmental Assessment Tool). All vendors are responsible for providing sustainable options and reduced packaging options for all purchases. **MRp1; MRc1,2,4**

**WATER PERFORMANCE MEASUREMENT:** Water meters measure the total amount of potable water use in the building and associated grounds. Meters include a 4" Neptune compound meter for domestic water for entire building and a 3/4" Sensus meter for the building humidification system. The metered data is read weekly by the boiler operator who records the information which is submitted to the Maintenance CMMS analyst. **WEc1**

Economically profitable, environmentally responsible



**DAYLIGHTING:** The glass and steel building is designed with a shallow floor plan that allows natural daylight to fill more than 55% of the workspace. Interior light shelves reflect sunlight onto Armstrong high light reflectance ceilings to minimize the need for energy-consuming lighting. **IEQc2**

**LIGHT SHELVES:** The building architecture incorporates two light shelves. The exterior light shelves shade the windows, reduce glare and minimize solar heat gain during the summer. The interior light shades reflect sunlight onto the Armstrong high light reflectance ceilings to increase the energy-saving benefits of daylighting. **IEQc2**

**INDIRECT LIGHTING:** To supplement the significant use of daylighting, high light reflectance ceilings, indirect lighting systems, and control systems exceed the requirements of the Illuminating Engineering Society (IES). Lighting energy is reduced to half the nationwide average for comparable office buildings. **IEQc2**

**CONTROLLABILITY OF LIGHTING SYSTEMS:** It's simple. When the office workspaces aren't occupied, the lights go off automatically, saving energy. 100% of the offices and workstations have individual control. The combination of occupancy sensors and dual-switch lighting systems minimize the use of artificial light and related heat gain. **IEQc2**

**GREEN CLEANING POLICY:** Our comprehensive green cleaning plan includes environmentally-responsible cleaning, janitorial maintenance, occupant training, isolation of chemical storage, sustainable supplies, use of concentrates from dispensing equipment, disposable housekeeping products, carpet care and floor stripping – all part of the OneSource® GreenSweep™ Program. Daylighting housekeeping, instituted in 2014, saves more than \$150,000 per year in related energy costs. **IEQc3**

**LEED® CERTIFIED DESIGN AND CONSTRUCTION:** Our comprehensive site management plan helps us protect the environment and use resources wisely. That's why the grass is mowed only when necessary, all landscape waste is composted, maintenance equipment meets California emissions standards and is routinely serviced by a licensed mechanic, and operators wear personal protective equipment. **LEED SSc5**

**BUILDING EXTERIOR AND HARDSCAPE MANAGEMENT PLAN:** Our best management practices significantly reduce environmental impacts for equipment maintenance, snow removal, cleaning, and overall campus maintenance and upgrades. Our goal is to eliminate/minimize the impact of potentially harmful chemical release into the air and soil. Our policies outline best practices that are a standard for the entire Armstrong Campus. **LEED SSc2**

## Recognized for excellence

**ALTERNATIVE COMMUTING TRANSPORTATION:** 50% of occupants commute to work using fuel-efficient or hybrid automobiles or via alternative means of transportation, including walking, bicycles, carpools and public transportation. Saving energy going to and from work is as important as on-site energy savings. **LEED SSc4**



**SOLID WASTE MANAGEMENT AUDIT:** 62% of the building's total waste is recycled. This exceeds LEED criteria by 13%. **MRc6**

**WATER EFFICIENT LANDSCAPING:** There is no permanent irrigation system installed on the grounds. Irrigation landscaping and native plantings provide efficiency. **WEc2**

**EDUCATION:** We're committed to sharing the green building features of Building 701 with others through an educational outreach program that includes guided tours of the facility, as well as internal and external communications. We have over 1000 annual visitors. **LEED IOc1.4**

**INDOOR PLUMBING FIXTURE AND FITTING EFFICIENCY:** Indoor plumbing fixtures and fittings comply with the UPC (Universal Plumbing Code) or IPC (International Plumbing Code) and reduce water usage in the building by 45 percent. Low-flow aerators, waterless urinals, and dual-flush toilets have driven greater than 50% reduction from the Existing Building baseline with a savings of 380,000 gallons/yr. **WEc2.**



**IN APRIL OF 2014** the U.S. Green Building Council awarded LEED® for Existing Building Platinum Recertification to Armstrong World Industries – Corporate Headquarters.

Originally earning this distinction in 2007, Armstrong Corporate Headquarters is the first building in Pennsylvania, and among only 17 buildings globally to earn recertification at the highest level possible under USGBC's LEED Existing Buildings: Operations and Maintenance (EBOM) program.

The Leadership in Energy and Environmental Design (LEED) rating system was created by the U.S. Green Building Council to encourage and facilitate the development of more sustainable buildings. LEED-EB rates existing buildings in an effort to promote buildings that are economically profitable, environmentally responsible and healthy, productive places to work.

Built in 1998, as a 'green' building, and continuing nine years later, the Armstrong Corporate Headquarters is a living example of what is possible when you make a serious commitment to building a healthy, sustainable future. We extend these principles to our entire operations and Corporate campus covering over 1 million square feet of building space, 225 acres, 950 employees.



Achieving platinum certification under the LEED rating system for existing buildings means attaining performance goals in each of the following categories:

- SUSTAINABLE SITES
- WATER EFFICIENCY
- ENERGY & ATMOSPHERE
- MATERIALS & RESOURCES
- INDOOR ENVIRONMENTAL QUALITY
- INNOVATION IN UPGRADES, OPERATION & MAINTENANCE

## SUSTAINABLE PRODUCTS:

### Ceilings

- All Ultima® ceiling panels have no-added formaldehyde and meet the CDPH requirements for low emissions.
- High Light Reflectance Ceilings
- High recycled content ceilings
- Suspension systems are made from metal with recycled content.
- All ceilings are recyclable as part of the Armstrong Ceiling Recycling Program.

### Walls

- Environmentally friendly Armstrong WoodWorks® Ekos™ walls are used in a conference room. The walls are made from real wood veneer over a mineral fiber substrate, with no-added formaldehyde, 78% recycled content and recyclable.

### Flooring

- Resilient Flooring: Armstrong Translations™ flooring used in the building is FloorScore™ certified for low VOC emissions according to CA Section 01350.

### Furniture

- Miller furniture systems are designed to evolve as work changes, maintaining high performance. Ethospace® system helps block unwanted noise and contributes to privacy in open office areas. Glass tiles allow more light into the space; open returns and up-mounted storage reduce materials usage and the system is up to 78% recyclable.

### PROJECT CONTRIBUTORS INCLUDE:

- Re:Vision Architecture – LEED Consultant
- Bala Consulting Engineers – Commissioning Agent
- Johnson Controls
- One Source – Green Sweep
- Community Energy
- David Miller / Associates – Civil Engineer
- Gensler – Building Architect
- SKANSKA – Construction Manager



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Armstrong World Industries  
CAMPUS CORPORATE HEADQUARTERS BUILDING 701

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