What is LEED?

An electronic handbook
compiled and edited by
Asian Contractor Association
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Asian Contractor Association
4201 Ed Bluestein Blvd.
Austin, TX 78729
www.acta-austin.com
asiancontractor@gmail.com
Tel: 512-926-5400

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What is LEED?

LEED (Leadership in Energy and Environmental Design) is an internationally recognized green building certification system, providing third-party verification that a building or community was designed and built using strategies aimed at improving performance across all the metrics that matter most: energy savings, water efficiency, CO_2 emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts.

Developed by the U.S. Green Building Council (USGBC), LEED provides building owners and operators a concise framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions.

LEED is flexible enough to apply to all building types – commercial as well as residential. It works throughout the building lifecycle – design and construction, operations and maintenance, tenant fitout, and significant retrofit. And LEED for Neighborhood Development extends the benefits of LEED beyond the building footprint into the neighborhood it serves.

LEED provides a point system to score green building design and construction. The system is categorized in five basic areas: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, and Indoor Environmental Quality. Buildings are awarded points based on the extent various sustainable strategies are achieved. The more points awarded the higher the level of certification achieved from Certified, Silver, Gold, to Platinum.

LEED-certified buildings are resource efficient. They use less water and energy and reduce greenhouse gas emissions. As an added bonus, they save money. Learn more about why LEED continues to be the leading benchmark in green building.

Green Building Projects Increasing Worldwide (Megan Ray Nichols)

According to the World Green Building Trends report, from 2015 to 2018 the percentage of global builders with at least 60 percent of their projects certified green will double.

The main motivation behind green construction is to reduce carbon emissions. And the most successful ways to do that revolve around energy usage. Namely, to decrease energy consumption and increase energy efficiency in homes and buildings around the world.

Here's how those goals break down into the top 5 global green building trends this year:

1. Solar Panels in All Shapes and Sizes
The worldwide acceptance of solar as the energy of the future is causing solar technology to get better and cheaper — fast.

-In 2016, India set aside $3 billion of state funding to ensure their capacity for solar power reaches 100 Gigawatts by the year 2022.

-On May 25, 2017, the UK made news when they generated nearly a quarter of their power needs from solar panels.

-And right now, China is smack in the middle of creating the largest solar thermal farm in the world.

Huge, heavy panels with bulky grids are no longer the only options for a solar roof install.

In the U.S., Tesla has already rolled out its new solar shingles — every conscientious, rich American homeowner's dream — while Forward Labs' standing seam metal solar roofing — an option for the more frugal U.S. sector — is set to be released in 2018.

In Australia, Professor Paul Dastoor of the University of Newcastle is performing the final trials on lightweight solar panels made by printing electronic ink onto plastic sheets. These solar panels are cheap to produce and ship and could potentially be a game changer for the solar panel industry.

With this solar technology boom, it makes sense that the next big trend is…

2. Home Energy Storage
"Batteries capable of storing power at utility scale will be as widespread in 12 years as rooftop solar panels are now," estimates Bloomberg New Energy Finance.

And that makes a lot of sense considering the same type of lithium-ion battery used to power an electric vehicle can also be used to store power in the home. This double demand enables manufacturers to increase battery production which drives down prices. And lower prices mean home batteries will be within reach of more people. It's a win-win.

And some major players have already jumped in on the home battery manufacturing opportunity:

-Mercedes-Benz has produced suitcase-sized at-home energy storage for Germany since 2015, but it plans to expand internationally and has recently made the product available to California residents in the U.S.

-Powervault is the No. 1 at home battery manufacturer in the UK.

-ElectrIQ is one of the newest home energy storage manufacturers in the U.S. with a home battery that stores 10 kWh of energy.

Both the Mercedez and ElectrIQ batteries have options for apps to monitor their performance, which ties into the next green building trend:

3. Energy Management Systems
To get the most out of solar panels and batteries, energy management systems (EMSs) are often installed in green homes and businesses. EMSs monitor how much energy a building uses and can automate lighting, power and HVAC systems to ensure optimal energy savings.

For example, The Edge, a building in Amsterdam that won the BREEAM award for offices in 2016, has 30,000 sensors that connect to a smartphone app. This app collects data from office employees and adjusts temperature and lighting according to how many people are inside the building and even keeps track of individual employee's air and lighting preferences.

Another example is Honda's smart home in the U.S. which has an experimental home EMS that communicates with the electrical grid to create optimal energy performance.

And with all this technology to make a home "smart," we can't forget the wisest green construction process:

4. Passive Building Design
Passive building designs help minimize energy consumption by reducing the need for electrical lighting and temperature control in the first place.

How? By using advanced design techniques that allow for maximum amounts of natural daylight to come in, while restricting heat loss in the winter and reducing heat gain in the summer.

And one element of passive design that has a big impact in temperature control is what goes on the roof.

Green roofs play an important part in helping regulate the temperature inside and outside of many passive buildings and homes. The plants and soil systems put in place help insulate the building in the winter and shade it in the summer.

And the perfect complement to passive design is…

5. Sustainable Building Materials
Reclaimed wood and recycled materials are high on the list of sustainable building supplies. But there's also a lot of innovation happening in the world of eco-friendly concrete.

Why is making concrete green so important?

Because it's the world's most used construction material and it's responsible for producing copious amounts of CO_2. There are several concrete alternatives out there such as AshCrete, Ferrock and HempCrete — but the most recent buzz is self-healing concrete.

This concrete is supplemented with bacteria that when exposed to moisture will become active and grow limestone that will fill any cracks that happen over time. This is a big deal since no added concrete is needed to maintain it.

Luckily for us, this worldwide trend of creating green building solutions will grow along with the burgeoning demand for better ways to sustain our planet.

Maybe soon the term "green building" won't be needed because all building practices will be sustainable.

Seventeen Trends for Sustainable Homes in 2017 (Janelle Sorensen)

#1 Home Automation
Have you heard of the Internet of Things? It's the internetworking of physical devices that allows them to send and receive data. The applications range from health care and transportation to environmental monitoring and, yes – homes. "Smart homes" are quickly becoming the norm in sustainable building. The pros at Pearl Remodeling write, "It seems like these days people expect to be able to turn on their coffee and pre-heat their ovens on the way home. With today's technology, there is almost nothing you CAN'T control remotely. We don't see any reason for a decline in that home design trend, in fact, quite the opposite." Expect to see even more smart devices on the market in 2017, in all price ranges, that will do things like control and automate heating, lighting, and HVAC systems, and even appliances such as refrigerators, ovens, washers, and dryers that can use Wi-Fi for remote control and monitoring.

#2 The Color "Greenery"
Each year, the Pantone Color Institute chooses a Color of the Year and 2017's is Greenery. "This is the color of hopefulness, and of our connection to nature," said Leatrice Eiseman, the executive director of the Pantone Color Institute. Sounds perfect to include in a home built with nature in mind! Pantone considers it nature's neutral shade that can be paired up with numerous colors, textures, and patterns. Try Greenery in your home office for a boost of creativity and productivity in all of your projects this year.

#3 Smart Windows
Just like other smart home features, smart windows are designed to be intuitive. As Stephanie Walden writes on Mashable, "Imagine a world in which your home's windows will be controllable via smartphone or even

simple gesture, straight *Harry Potter*-style. Heat-sensor window treatments will automatically close or open depending on a homeowner's ideal temperature preferences. Not only will you gaze through your window to the outside world, but you'll also be able to virtually interact with your home environment, pane by translucent pane."

#4 Reclaimed Materials
Reclaimed materials are rescued from their landfill destiny and given a new life. As Norton Homes predicts,

"Sustainability is gaining popularity everywhere in home design, and what better way to go green than reusing building materials? Reclaimed wood does more than help the environment; it gives you an interior look with plenty of character. Every grain in the wood tells its own story, and older wood has more strength than a freshly cut piece of lumber. It's not just wood you can reuse – old metal trunks can transform into coffee tables, headlights can become headlamps and nearly anything cylindrical can be your next pot for flowers. Not only can these items look good, they are packed with charm you won't necessarily get with a non-custom new buy."

#5 Whole Home Water Filtration
Adding a complete water filtration system to your home is a 2016 trend that will carry over into 2017, say the talk show hosts of The Real Estate Report. Rising health concerns and water crises in the news have sparked people's desire to check out how their water quality measures up and to take precautions to protect and improve it. Healthy living is gaining in prominence, too, and clean water is a key ingredient.

#6 Bringing The Outdoors In
2017 is about taking notes from nature and incorporating them into your home. According to the interior design pros at Turn Style, "The idea of bringing the outdoors inside has gained popularity over the last few years. In 2017, we can expect interior design to take organic inspiration to the next level. Expect wicker furniture pieces, stone coffee tables, and terracotta walls to take over home interiors. There will be a movement towards rough edges, natural finishes, and organic patterns on all pieces of furniture. Straight lines and geometric shapes are on their way out, so look to the outdoors for inspirations in 2017. Also, be sure not to forget the real thing! Stock up on vases and pots, because living plants such as

olive trees, aloe vera, and English ivy will complement other design elements for the upcoming year."

#7 Efficient Spaces
As homeowners increasingly realize that less *can* be more with a smaller home, the need for multifunctional design is becoming more important than ever. Turn Style's pros state that having rooms that are practical yet allow for downtime, aka "escapism," is a big thing this year. Get the most out of your space by turning little nooks and crannies into a mini hideaway or use convertible furniture to transform a room's purpose completely. And, if you're considering putting an addition on your home, instead of adding to the footprint, remodel with space-efficiency in mind to be more sustainable.

#8 Healthy Homes
Considering how much time we spend in our homes, a home that supports good health should be our first priority. As it turns out, going green has plenty of benefits for more than just the planet. Research shows that green buildings have a hugely positive impact on the health (mental and physical) of the lucky people who live and work there. Going green means improving indoor air quality, making use of natural lighting, and using eco-friendly materials — all of which contribute to your happiness, health, and productivity.

The main reason why green homes are healthier: They have excellent indoor air quality. Going green means using low- or zero-VOC paints and materials, eliminating respiratory and immune system distress commonly associated with traditional buildings. Plus, green homes typically sport excellent ventilation systems — a steady flow of fresh air into the home means no build-up of stale and polluted air. Tightened building envelopes are another feature that makes green buildings healthier. A tighter seal means less airborne irritants, like allergens and dust. Learn more:

#9 Daylight Harvesting
American Classic Homes asked some pros what their home trend predictions are for 2017 and daylight harvesting was high on the list.

"One of the biggest trends we see continuing to increase is daylight harvesting. Daylight harvesting maximizes natural light, helping

to enhance efficiency and productivity, while maintaining the aesthetic appeal of your space. Motorized shades can be a tremendous aid to maximizing how you use (and conserve) daylight, especially when those shades or blinds are integrated into a smart home automation system. On a sunny day, the space uses less artificial light. On a cloudy day, the interior lights will brighten to create the ideal work environment. These shading systems also protect furniture, fine art, rugs, and even wood surfaces, from the sun's damaging UV rays."

#10 Repurposed Materials
Giving old objects a completely new purpose is a quirky design trick that means less waste and more fun items for your home. Designer Sabrina Smelko writes, "Making things for your home by hand is always in-style, but in particular, I'm seeing more and more re-purposing of existing pieces rather than building things completely from scratch. It adds character, history, and charm to any space. Research your area for local actions, flea markets, antique stores and salvage shops and pay them a visit! And don't think you have to completely transform the pieces you find. Don't underestimate the power of subtlety. Respect the piece, don't fuss with it too much, and let it shine. Case in point: The gorgeous sliding barn door made from a salvaged entry door as seen in Fixer Upper, or the old windows which were placed behind a bed acting as a headboard."

#11 Cork
"Cork may be best known for its history with wine and the office pinboard, but in reality, it is an incredibly green and versatile product when applied to interiors," writes Angela Fedele**. "**Today, many design projects are directed by ethical and sustainable initiatives and architects and designers are choosing cork as a leading building and interiors material. Aesthetically cork, like hardwood timber floors, has a raw and timeless appeal as it is sourced from nature itself. No piece is the same, offering a multitude of grain, texture and color finishes." Cork can be sustainably produced (since just the outer bark of the trees get harvested) and can earn points for your Energy Star or LEED building project. Plus, it's antimicrobial, absorbs toxins, and is supportive to your feet, making for an extra healthy home.

#12 Smart Appliances
Smart homes, smart windows, and – yes – smart appliances. "The 'smart' or 'connected' home was a key theme at IFA 2016 [consumer electronics fair]," writes Alyn Griffiths for Interior Design.

"With leading brands demonstrating how products including refrigerators, ovens, dishwashers, and even coffee makers can be controlled remotely using smartphone apps.

Novelties presented at the fair included the iQ700 fridge-freezer from Siemens, which photographs the interior every time the door is closed so users can check which groceries might be required during their next shopping trip. Sharp unveiled a series of smart appliances, including an oven with a temperature probe that allows users to remotely monitor the status of their cooking, and a washing machine that lets them adjust the temperature and spin cycle.

Buttons and dials are increasingly being replaced by touch-control panels incorporated into appliances with sleek designs and uninterrupted surfaces. Miele's ArtLine collection features handleless fronts that open by tapping or touching, while a knock on the front of LG's Instaview fridge transforms its entire surface from opaque to translucent so users can monitor contents without opening. The surface also functions as a touchscreen panel running the Windows 10 operating system.

The health of both people and the environment proved another major trend this year, with a particular focus on hygiene, nutrition, freshness of foods, and shelf life. Grundig translated their 'Respect Food' concept into refrigerators that control temperature, humidity, and lighting to enhance the longevity of foods and reduce waste."

#13 Natural Materials & Textures
Along the same lines as bringing the outdoors in, 2017 will be full of natural materials and textures. Although we saw some of it in 2016, expect it to continue on a greater scale. Design Campus sees organic materials like rattan, abaca, and bamboo becoming "the next huge hit for graceful interiors." These textures offer a whimsical, cozy feel that goes along with the nature-inspired color palettes of the year.

#14 Tiny House Villages
What happened to the oversized American Dream home? Well, it looks like they're being taken over by tiny houses, villages of them. The movement to downsize drastically is both sustainable and cost-effective – and it's caught on in a big way. "According to researchers at Kansas State University, tiny house villages are environmentally friendly, they promote a sense of community, they encourage healthy lifestyles and habits, and they're a safe and affordable housing option for the masses, writes Jessica Mattern for *Country Living*. "For all of these reasons, the experts are hoping that tiny house villages will spread across the country in the near future." Learn more:

#15 Sustainable Landscaping
Extend sustainability outside your home this year by making your yard environmentally friendly. While a perfectly manicured grass lawn was once the ideal, 2017 is bringing native, drought-tolerant, low-maintenance plants to replace some of that turf, says Borst Landscape & Design. By creating a less rigid landscape with these types of trees, shrubs, and plants, you can help conserve water, fertilizer, and pesticides – plus help support local wildlife. Learn more:

#16 Solar & Wind Power
Installing renewable energy systems in your home isn't an anomaly anymore, as more people opt for solar and wind driven systems over fossil fuels. Falling prices have given people greater accessibility to these types of alternative energies, plus numerous PR campaigns have educated us on all of the benefits. Solar panels and community solar gardens are already huge, but wind is a major upcoming residential player considering that small wind electric systems are "one of the most cost-effective home-based renewable energy systems," according to the U.S. Department of Energy. Learn more:

#17 Prefabs
"Prefabs" or prefabricated homes were originally popular in the early 1900s when modern building was first becoming mainstream (Sears sold them in their catalog!), and now they're back with a bang. "Prefab homes often get a bad rap for being cheap or tacky, but in recent years, they have started making a comeback, not only for their affordability but also for their eco-friendly and stylish designs," writes Brittney Reynolds for Laurel and Wolf Interior Design. "Ranging in all shapes and sizes from

traditional to postmodern, sophisticated prefab homes are available to order on sites such as Landmark Home, Shelter Kit, Vipp Shelter, and P.A.T.H. Often constructed from recycled materials, today's prefab houses are made up of modules (a set of standardized parts) that are pieced together one by one to create the whole picture — a home."

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4201 Ed Bluestein Blvd., #2105, Austin, TX 78721
Tel: 512-926-5400
www.acta-austin.com
asiancontractor@gmail.com

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