

Redefining Rooftops: Understanding Rooftop Deck Systems



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Redefining Rooftops: Understanding Rooftop Deck Systems

Course Description:

Rooftop decks create valuable living and recreational space for building owners, residents, and clients. Accommodating restaurants, hotels, health-care facilities, and everything from residential to government buildings, rooftop deck systems offer the design flexibility to create versatile, unique outdoor spaces over any structural surface. This course explores the features, surface materials, and design options for rooftop deck systems and provides an overview of recommended planning and installation guidelines.

Learning Objectives:

At the end of this course, participants should be able to:

- Identify the key features of deck supports, including their weight-bearing capacities, durability, and height and slope adjustability, that enable precise deck leveling and a safe, structurally sound rooftop deck.
- Review appropriate installation conditions for rooftop decking systems, and provide installation guidelines to facilitate a durable and level deck installation that meets structural, loading, and building code requirements.
- Discuss the benefits of rooftop deck systems and their site furnishings, including the health benefits to building occupants and the environmental attributes of the materials used.
- Describe customization options for rooftop decking systems, and reference case studies to illustrate how a unique, usable outdoor space can be installed over any structural surface.

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As Shown:
Powder-Coated Aluminum Planter Cube and Rock Tray,
2' x 2' Smooth Ipê Wood Tiles, and Adjustable Pedestals



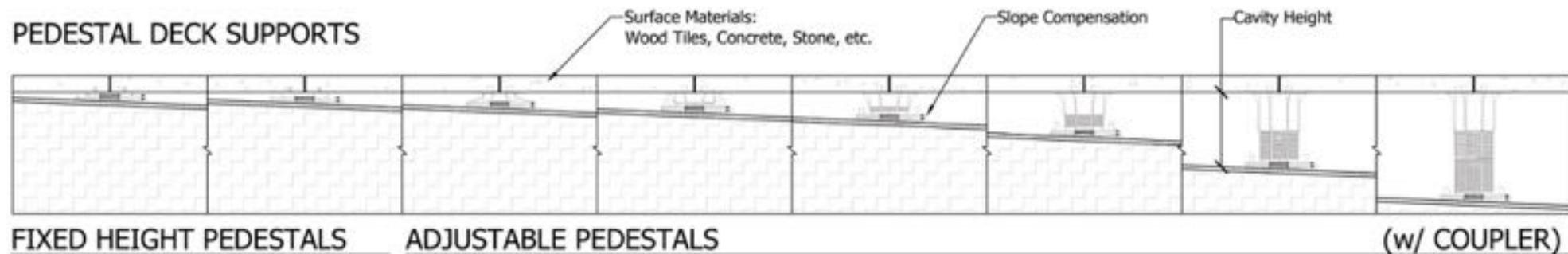
Rooftop Deck Systems Introduction

Location: Partners Healthcare Administrative Campus, Somerville, Massachusetts
Landscape Architect: OJB Landscape Architecture | Architect: Gensler
Photographer: Kyle J. Caldwell

Rooftop Deck Systems: Introduction

Offering tremendous design flexibility coupled with ease of installation, modular rooftop deck systems provide a unique and viable alternative to traditional deck building materials and methods. Deck supports, also known as pedestals, create level surfaces over sloped areas—most “flat” roofs slope at $\frac{1}{4}$ inch per foot for drainage. The pedestals are available in a range of heights and weight-bearing capacities to suit a variety of applications.

Typically, fixed-height pedestals are utilized at a threshold where lower height deck supports are needed (as low as $\frac{1}{8}$ inch). In the example below, as the substrate slopes away from the threshold, adjustable pedestals are used to support the surface material and are adjusted for height (up to 36 inches with bracing) and slope (up to 1 inch per foot slope or 8 percent). When greater cavity heights (space between the substrate and the bottom of the paver or tile) are encountered, couplers can be added to adjustable pedestals, adding up to 4 inches each to the pedestal height. Adjustable pedestals must be braced for stability to accommodate cavity heights in excess of 24 inches, up to a maximum cavity height of 36 inches.



Rooftop Deck Systems: Materials

Rooftop deck systems are used to create outdoor spaces in a variety of applications: rooftop deck terraces, plazas, green roofs, pop-up parks, and water features. The pedestals can support a variety of materials, including wood, concrete, stone, or 2-centimeter porcelain pavers, grating, or even artificial turf to create unique, custom looks. Wood tiles are modular, long lasting, low maintenance, and lightweight. Paver support trays offer a simple way to secure 2-centimeter porcelain tiles to pedestals and fulfill wind uplift requirements.

Some manufacturers offer a wide assortment of site furnishings that may be used on a rooftop deck, including planter cubes, storage benches, and furniture. Architects and designers can incorporate a mix of materials into their project to add dimension and texture to deck areas.

Location: Kimpton Tryon Park Hotel, Charlotte, North Carolina
Architect: Cooper Carry
Photographer: Brad Feinknopf/OTTO



Case Study: Celadon Apartments

The Celadon Apartments at Ninth and Broadway is the latest development by BRIDGE Housing, an affordable housing development company. The high-rise provides more than 250 units of affordable housing to the downtown San Diego area. The apartments have modern amenities and major common areas, including a 15th floor terrace with stunning views of San Diego toward the Bay. Also featured are three shared barbecue areas with an outdoor kitchen and resident garden, providing both building owner and residents with valuable, usable outdoor space.

The shared deck areas were constructed with concrete pavers and 2-foot x 4-foot ribbed ipê wood deck tiles, providing not only an attractive modern space for entertaining but also the solution to turn the sloping rooftop spaces into beautiful, functional environments. Adjustable pedestals support the wood tiles as well as the concrete pavers. Able to support up to 1,250 pounds per pedestal, adjustable pedestals are appropriate for a variety of surface materials. Modern decor and an eco-roof with drought-tolerant plants complete this LEED Silver certified residential high-rise. This installation exemplifies how a rooftop deck can incorporate a variety of surface materials.



Location: Celadon Apartments, San Diego
Architect: SVA Architects & Studio E

Rooftop Deck Systems: Testing

Typically, modular rooftop deck systems can be utilized over any structural surface—structural concrete, rigid insulation, roof membranes, compacted grade, pavement, pool surrounds, or within water features. Manufacturers of rooftop deck systems use nationally accepted criteria and independent testing labs to ensure that their products and systems are accepted by building code authorities across North America.



As Shown: Powder-Coated Aluminum Planter Cube, 2' x 2' Smooth Ipê Wood Tiles, and Adjustable Pedestals

Rooftop deck systems are tested for a range of performance properties, including but not limited to:

- Slip resistance
- Solar reflective index
- Weathering
- Wind uplift
- Seismic design
- Fire – flame spread
- Fire – smoke spread
- Concentrated load
- Uniform load
- Impact load
- Installation temperature
- Janka hardness rating (wood products)
- Longevity

Rooftop Deck Systems: Environmental Attributes

Many rooftop deck system manufacturers are dedicated to providing products that are manufactured in an environmentally sensitive and efficient manner.

For example:

- Deck supports can be made from 20 percent post-industrial recycled material and be 100 percent recyclable.
- Aluminum products such as metal cubes for plantings can be 100 percent recyclable and manufactured with recycled raw materials using 20 percent recycled content and low-VOC finishes and sealants.
- Wood tiles can utilize wood sources* that have been harvested in an environmentally responsible manner, designed to preserve and enhance the economic viability of rainforest hardwoods.

*The Forest Stewardship Council (FSC) is a third-party entity that promotes responsible management of the world's forests. Not only does the program help to preserve the rainforests, but it also increases the value of the wood in the local economy and discourages clearing forests for farming or ranching. FSC certification assures consumers that wood products have positive environmental attributes and are backed by a global system of verification.



Location: Fraser House, Boulder, Colorado

Rooftop Deck Systems: Environmental Attributes

Buildings that include green roofs demonstrate imagination in design and support for green building initiatives to reduce the environmental footprint of the built environment. Green roofs that incorporate a rooftop deck system can expand usable space to include gardens and walkways for pedestrian access.

A rooftop deck may help a building project to earn points under the LEED and SITES rating programs in the following categories:

LEED

- Sustainable Sites
- Energy and Optimization
- Materials and Resources

SITES

- Section 5 – Site Design: Material Selection
- Section 6 – Site Design: Human Health + Well-Being



Location: Cerner Three Trails Campus – North Tower, Kansas City, Missouri
Architect: Gould Evans Associates
Photographer: Alistair Tutton



Deck Supports

Deck Supports: Introduction

Deck supports are designed to elevate and level a variety of surfaces, including granite or concrete pavers, wood tiles, composite materials, fiberglass grating, or conventional joist and plank systems.

Deck designs may use one material or a mix of materials to create unique outdoor environments.



Project: Confidential Global Services Firm, Philadelphia
Architect: Vocon, Cleveland
Contractor: Turner Construction, Philadelphia
Photographer: Halkin Mason, Philadelphia

Deck Supports: Introduction

Deck supports create level surfaces over sloped areas and can be adjusted for height as well as slope. They are commonly available in a range of heights and weight-bearing capacities to suit a variety of applications.

Residential-, commercial-, and industrial-grade deck supports each have different characteristics. The pedestals specified will be dependent not only on the application category but also the support and elevation requirements of the installation. Consult individual pedestal manufacturers for specification and technical assistance.



As Shown: Adjustable Pedestals

Deck Supports: Accessories

Deck support systems can include a variety of components, such as fixed-height and adjustable pedestals, spacer tabs, base levelers, couplers, flexible and rigid shims, fastening kits, floating insulation and foundation bases, joist top accessories, and more.

Deck supports are typically made from durable materials such as high-density polypropylene plastic since it performs best. Polypropylene is impervious to water, mold, and freeze-thaw cycles.



Base Leveler



Rigid Shim



Joist Top Attachment



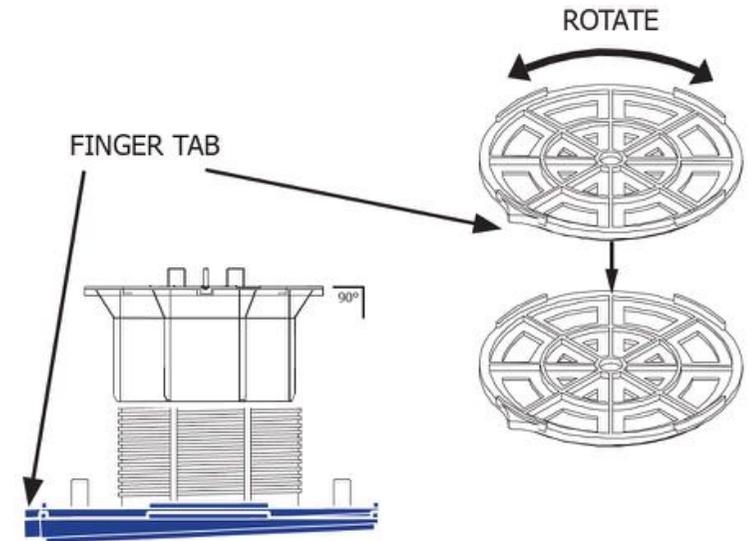
Coupler

Deck Supports: Base Leveling

Deck supports are strongest in an upright vertical position; therefore, the strongest slope compensation method is to level the base of the pedestal. A base leveler keeps a pedestal upright and in a vertical position, perpendicular to the surface material. Note that a pedestal may come with built-in base slope compensation. Two base levelers may be rotated for slopes from zero to ½ inch per foot (4 percent) slope.

Methods for adjusting slope will vary depending on the design of the base leveler. In the example shown here, the finger tabs are both pointed downhill, so the base pieces are rotated for maximum slope compensation. A maximum of four base levelers can be used with the pedestal for a total of 1 inch per foot slope (8 percent). Each additional base leveler adds ¼ inch in height to the pedestal.

Pedestals with self-leveling top pieces will have a dome-shaped bottom that continually levels to site conditions, but this type of slope compensation method can put more stress on the top of the pedestal and may create an unsafe condition as the pedestal tilts with greater slopes.



As shown: Two base levelers used to compensate for ½" per foot (4%) slope

Deck Supports: Spacer Tabs

Deck supports may include precise spacer tab sets that help to maintain uniform paver spacing and allow for deck drainage between pavers. Spacer tab sets are inset atop the deck supports allowing for screw-to-adjust pedestal height adjustments while weight loaded, assuring a perfectly level deck. Spacer tab size should be specified. 3/16-inch spacer tabs are standard for wood tiles, concrete pavers, and paver tray-backed pavers, whereas 1/8-inch spacer tabs are typically used with stone materials. Custom spacer tab sets are available for hexagonal or other irregularly shaped pavers.



3/16" Spacer Tabs



1/8" Spacer Tabs

Deck Supports: Fasteners

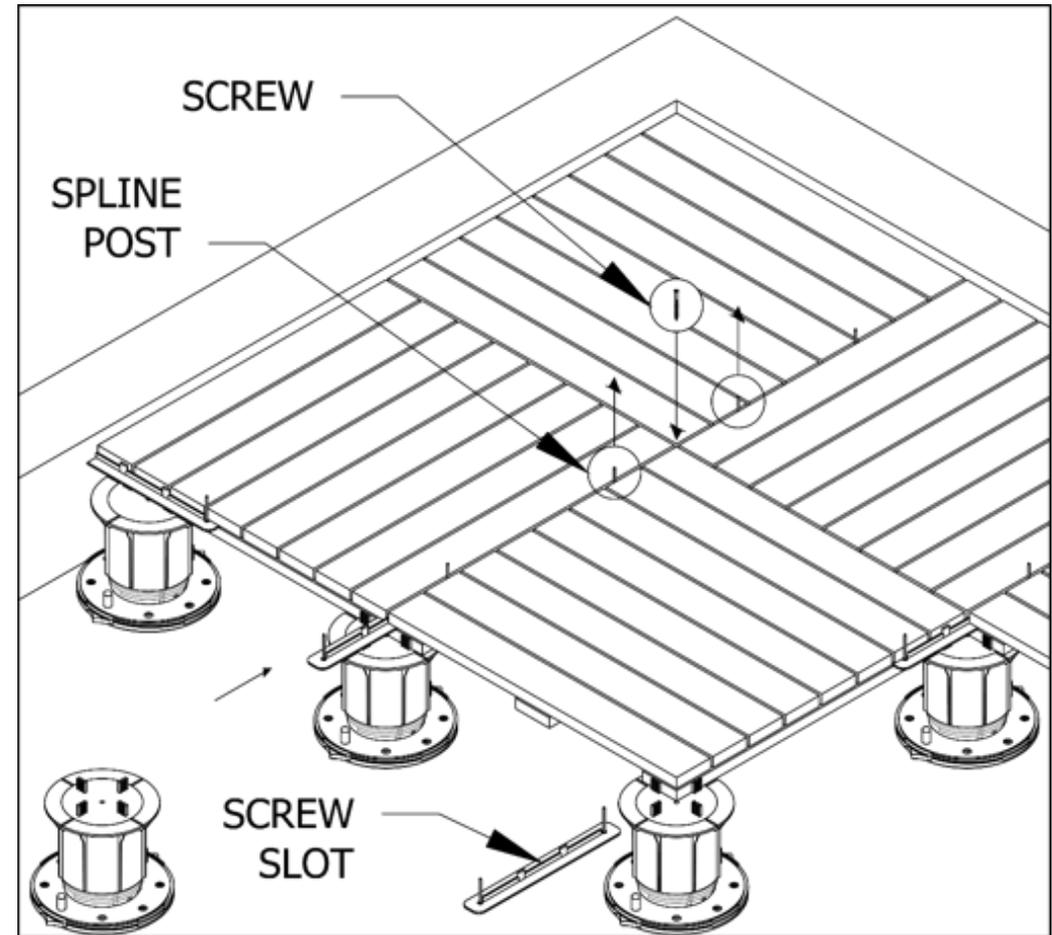
Fastening kits and splines facilitate quick and secure wood tile and paver installations. The fasteners secure pavers to the pedestals without penetrating or damaging the surface material. While the fastening kits and splines are hidden, they can be accessed to allow for the removal of individual pavers if roof maintenance, drain access, or paver replacement is required.



Wind Uplift Resistance Systems

Wind uplift resistance systems are designed for projects in high-wind and hurricane-prone areas or anywhere code requires uplift resistance. These systems can be compatible with wood tiles, paver tray-backed pavers, or kerf-cut concrete or stone pavers.

A wind uplift resistance system may be comprised of several different components. For example, fastening splines are used to secure wood tiles or pavers to the pedestals when protection against wind uplift is required. A perimeter ledger may also be used to increase the system's wind uplift resistance. Consult individual manufacturers for information about their systems.



As Shown: Fastening Spline

Deck Supports: Installation

A rooftop deck system can be one of the most labor- and cost-efficient methods of creating a flat, level deck over a sloped surface. It is very easy to install and, of equal importance, very easy to remove.

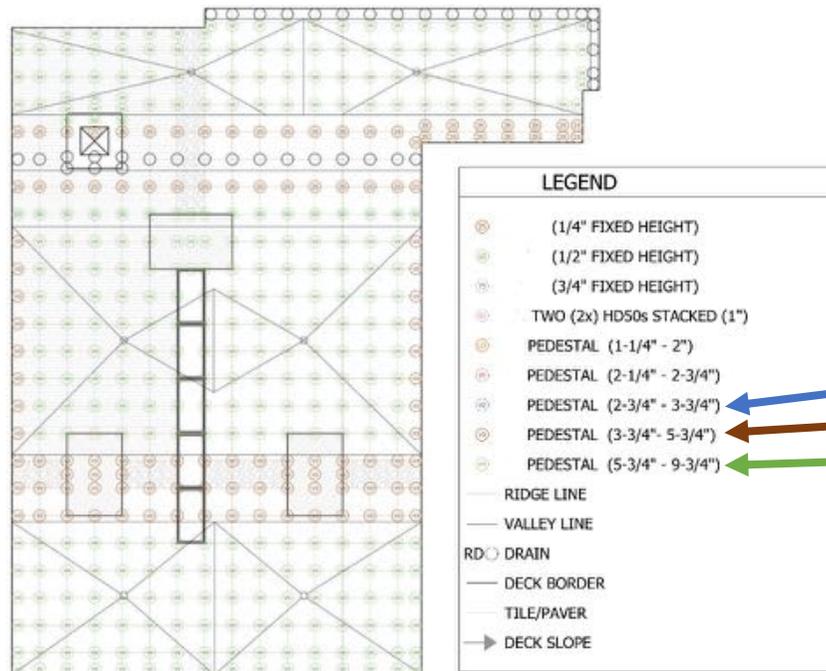
This photo shows the “T” method of installation, which is an efficient screw-to-adjust installation method. Installers can level the deck surface while the supports are loaded—an important consideration when working with heavy pavers. Once the cavity height (space between the substrate and the bottom of the paver or tile) has been determined at all thresholds, drains, and highpoints, a laser level is used to mark the top of pedestal elevation around the deck. Next a T-shaped portion of the new deck is installed, starting from the threshold. Decking on both rows/arms of the “T” are adjusted to the correct height and leveled before proceeding.

Using a gravity system, the supports protect the roofing and waterproofing materials and do not damage or harm the surface below. If roof repairs or access to a drain is needed, it is easy to remove a tile and reinstall it after the maintenance work has been completed.



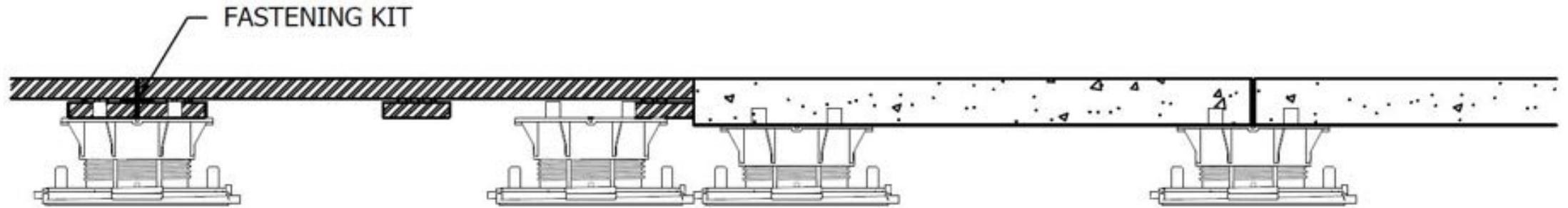
Deck Supports: Ease of Installation

Some manufacturers offer their clients CAD drawings and installation guidelines with color-coded systems that indicate the correct placement of preassembled pedestals. Color-coded systems not only allow a contractor to easily stage an installation, but they also increase installation efficiency, saving both time and money.

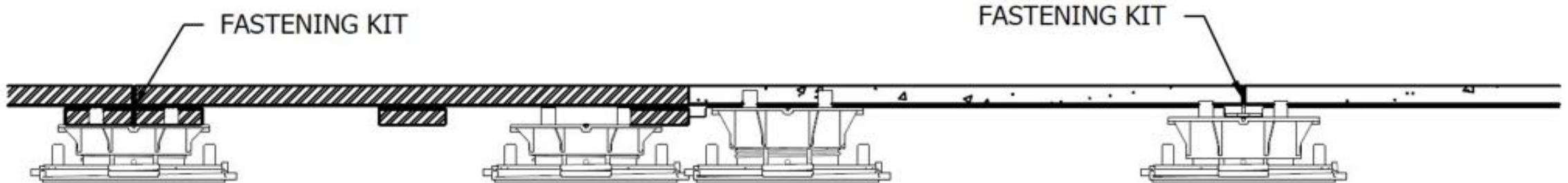


Deck Supports: Surface Material Transitions

Transitions between surface materials must be properly supported. It is necessary to maintain a tight installation and limit the space between the surfaces.



As Shown: Wood Tile with 2" Concrete Paver



As Shown: Wood Tile with Paver Tray Backed 2cm Paver

Case Study: Schmidt Artist Lofts

It was no small feat for St. Paul, Minnesota-based developer Dominion to turn this 147-year-old brewery into a live-work-play community that revitalized its surroundings. A Multi-Family Executive 2015 Adaptive Reuse award winner, the property spent two years being brought back to life with the help of the local Heritage Preservation Commission, the State Historic Preservation Office, and the National Park Service to honor the building's iconic history. Wood deck tiles were selected to enhance this inviting, modern rooftop retreat.

The modular tiles gave the architects design flexibility, and the adjustable pedestals allowed contractors to make adjustments for both height and slope.



Location: Schmidt Artist Lofts, St. Paul, Minnesota
Architect: BKV Group
Photographer: Troy Theis

Case Study: Partner's HealthCare Administrative Campus

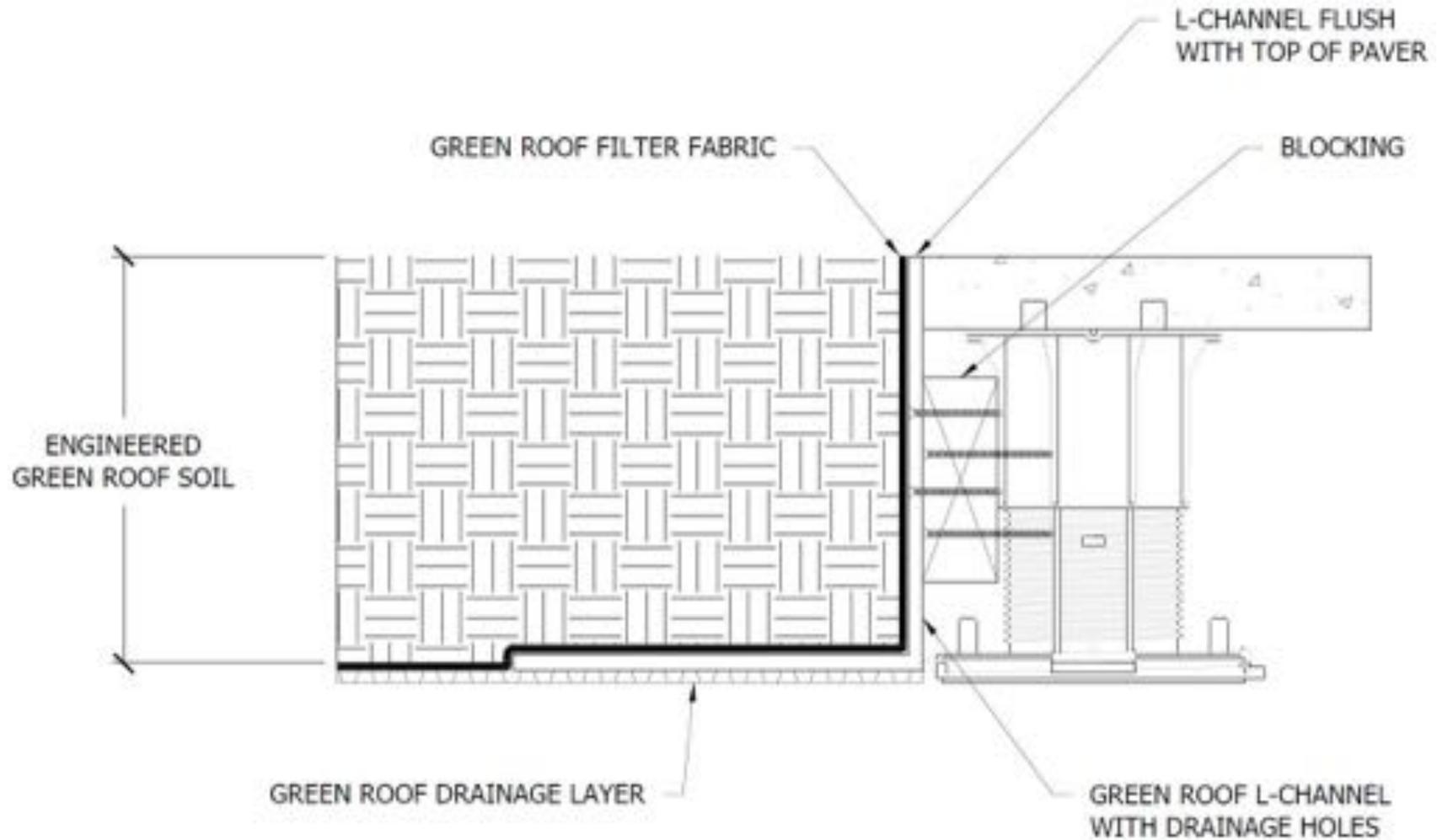
Supported by adjustable pedestals, this rooftop deck provides a seamless transition from the interior cafeteria to the exterior dining and lounge area. Lush with trees and foliage, the deck provides employees and visitors with easy access to the outdoors, fresh air, and sunshine. The manufacturer custom made the 30-inch x 30-inch ipê wood tiles, per OJB Landscape Architecture's request, to align to the typical 5-foot architectural mullion spacing adjacent to the deck, creating an attractive linear design.

Research has shown that spending time outdoors has many health benefits.



Location: Partner's HealthCare Administrative Campus, Somerville, Massachusetts
Landscape Architect: OJB Landscape Architecture | Architect: Gensler
Photographer: Kyle J. Caldwell

Deck Supports: Green Roof Edge Restraint



Case Study: Symphony House Apartments

The ninth floor setback of Symphony House was an underused asset with a 25-year-old roof that needed to be replaced. It was recently transformed into a 12,000-square-foot eco-friendly tenant amenity featuring attractive pavers supported by pedestals, increasing property value for the building owners.

The rooftop deck includes planting areas, trees, shrubs, seating areas, and lighting, creating valuable living and recreational space for residents and their guests.

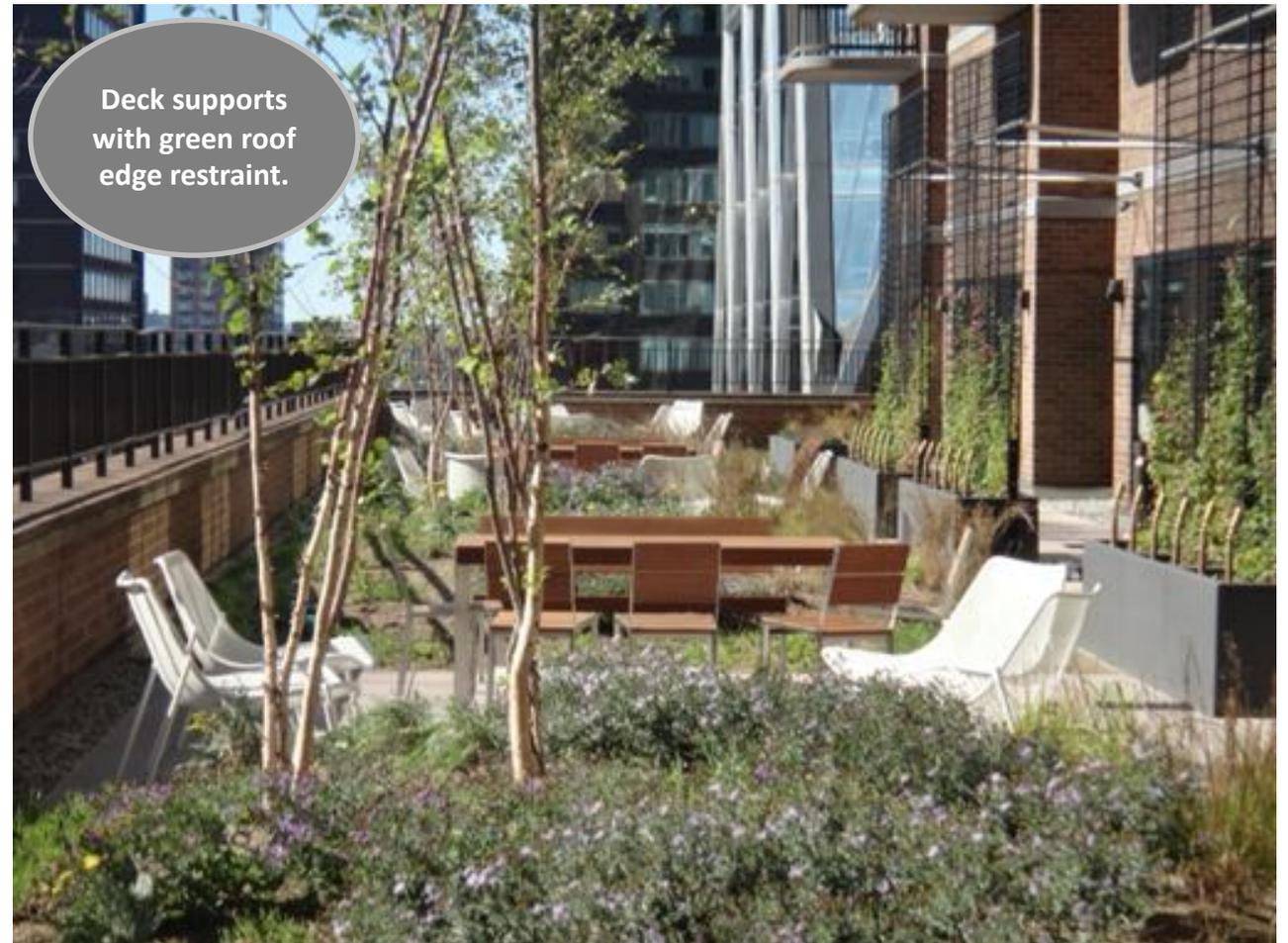


Location: Symphony House Apartments, New York City
Architect: FXFOWLE

Case Study: Symphony House Apartments

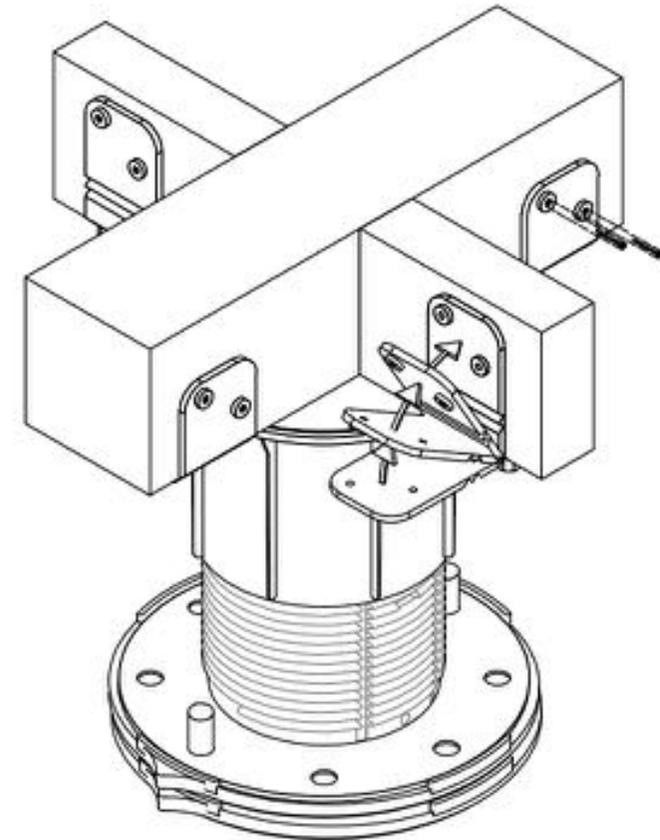
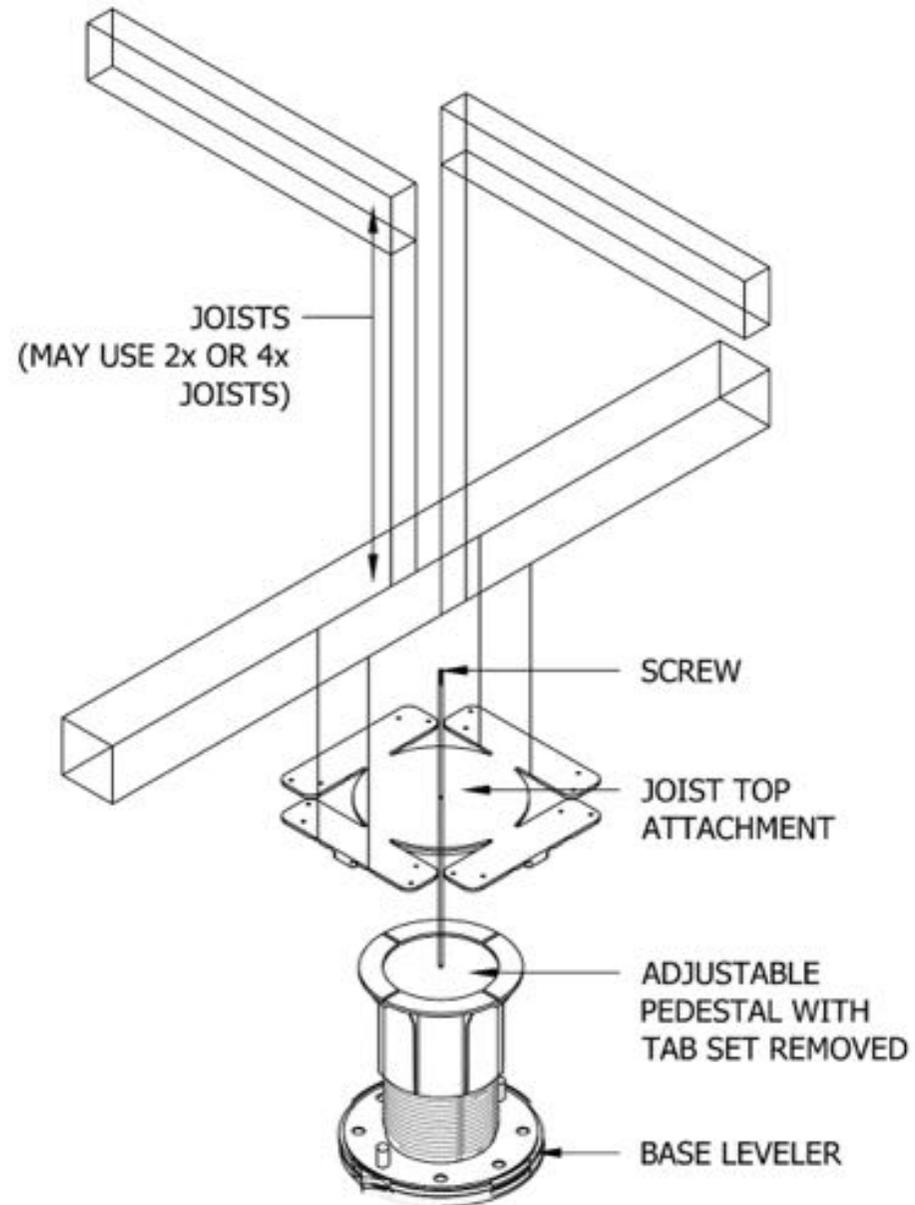
By contouring the roof's landscape and strategically planting tall grasses and river birch trees, unique areas were created for the residents to use and in which they can relax, entertain, and connect with the natural environment.

One of the roof's sustainable initiatives is that it collects and stores rainwater to support the plant life, which in turn reduces the roof's ambient temperature, making the interior space cooler throughout the summer.



Location: Symphony House Apartments, New York City
Architect: FXFOWLE

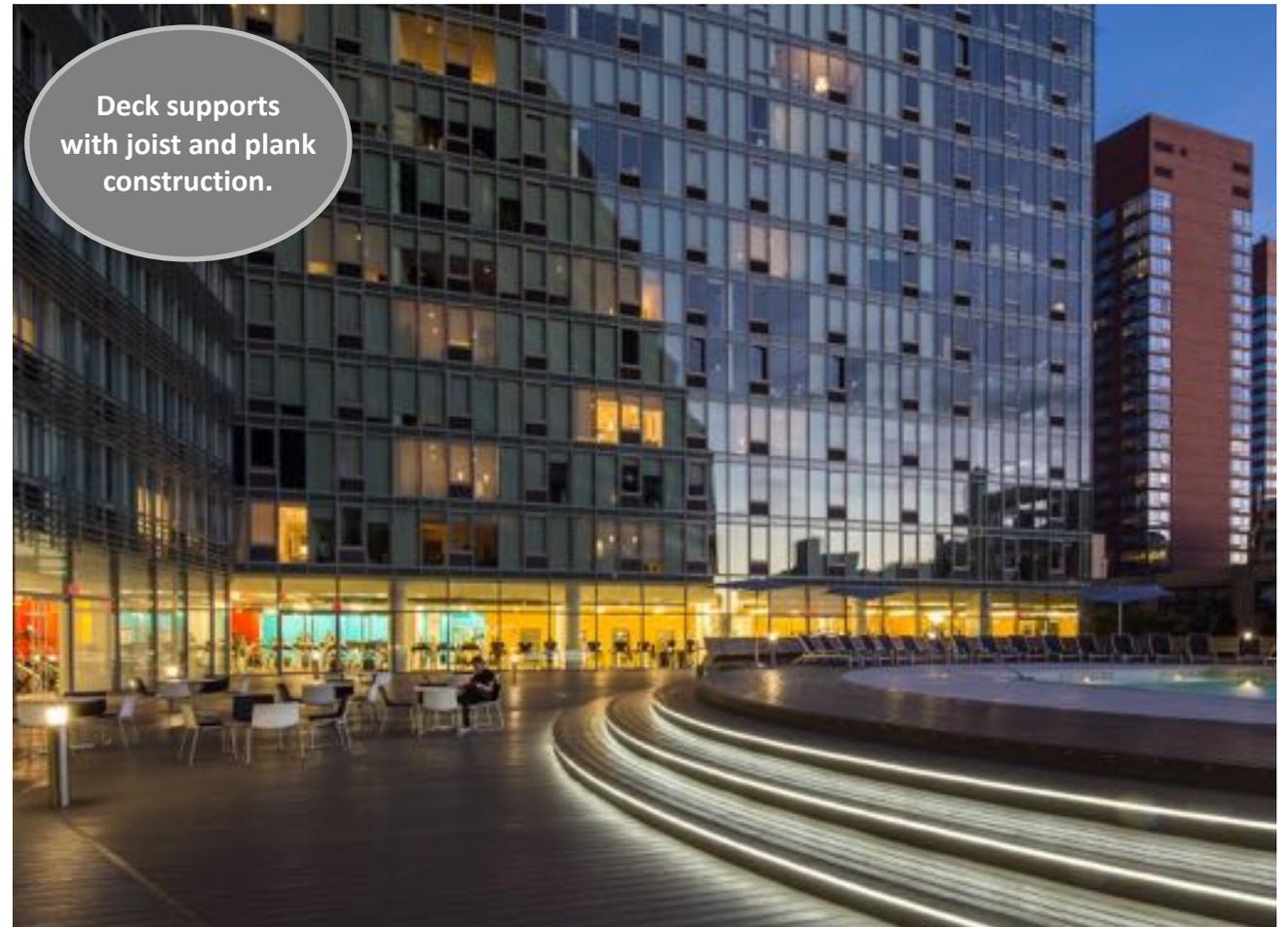
Deck Supports: Joist Tops



Case Study: Mercedes House

In this rooftop deck on an apartment building in New York, adjustable pedestals with a joist top accessory were used. Joists were placed on top of the adjustable pedestals with composite decking. Although composite materials are functional construction materials, when used on top of a roof, they require an airspace underneath them. Note that some municipalities require a fire rating for some or all roof surface materials, so it is necessary to check with the local authority having jurisdiction (AHJ) before a material for the joists is selected.

A close alternative to conventional decking would be large-format wood tiles. Using large-format tiles can provide a more linear appearance and easier roof access.



Location: Mercedes House, New York City
Architect: Leeser Architecture & TEN Arquitectos



Modular Wood Tiles

Location: Partners HealthCare Administrative Campus, Somerville, Massachusetts
Landscape Architect: OJB Landscape Architecture | Architect: Gensler
Photographer: Kyle J. Caldwell

Modular Wood Tiles: Introduction

Wood tiles blend the warm beauty and upscale appearance of real wood with the quality and performance properties, such as durability and low maintenance, of hardwood. Weighing one-third as much as concrete pavers, wood tiles are a good alternative when surface material weight is a considering factor in a rooftop deck design.

Wood tiles can be laid in a parquet or linear pattern or mixed with other materials for unique aesthetics. The rooftop deck above The George Apartments, shown here, uses 2-foot x 2-foot smooth ipê wood tiles laid in a parquet pattern, powder-coated aluminum rock trays, and adjustable pedestals.



Location: The George Apartments, Wheaton, Maryland
Architect: Bonstra | Haresign

Modular Wood Tiles: Materials

When selecting wood tiles, ensure that they are harvested in an environmentally responsible method designed to preserve the economic viability of rainforest hardwoods—for example, South American cumaru, ipê, garapa, massaranduba, and Chinese fused bamboo. Keep in mind that wood is a natural material and can absorb or lose moisture in different climates.

Tropical hardwoods are exceptionally dense, resistant to insects, and can contain a rich variety of graining and coloration. The natural shading and coloration of wood tiles adds to the architectural character and overall visual appeal of the finished product.



Modular Wood Tiles: Advantages

Wood tile systems can include fastening kits that facilitate quick and secure installations. The kit fastens wood tiles to the pedestals without penetrating or damaging the wood and enables the removal of individual wood tiles for routine roof maintenance or repair, as well as drain, pipe, or conduit access and/or tile replacement.

Wood tiles are available in a variety of standard and special order sizes, including 2-foot x 2-foot, 2-foot x 4-foot, 2-foot x 6-foot, 2-foot x 8-foot, and 30-inch x 30-inch. Custom sizes are also available.



As Shown:
Powder-Coated Aluminum Planter Cube,
2' x 2' Smooth Ipê Wood Tiles,
and Adjustable Pedestals

Case Study: Austin Central Library

When it came time for the city of Austin to create a new Central Library, the developers kept community in mind every step of the way. The new 198,000-square-foot building overlooks Lady Bird Lake and features open, airy meeting rooms and a flexible event space that can host readings, lectures, screenings, concerts, or other performances.

The library is crowned by an outdoor rooftop deck that uses 2-foot x 2-foot ipê wood tiles and adjustable pedestals and provides sweeping views of the Austin skyline. The garden rooftop features native plants and a butterfly habitat available for use by both library patrons and guests of special events. The rooftop's aesthetic is meant to mimic the surrounding environment and link the built space with nature.

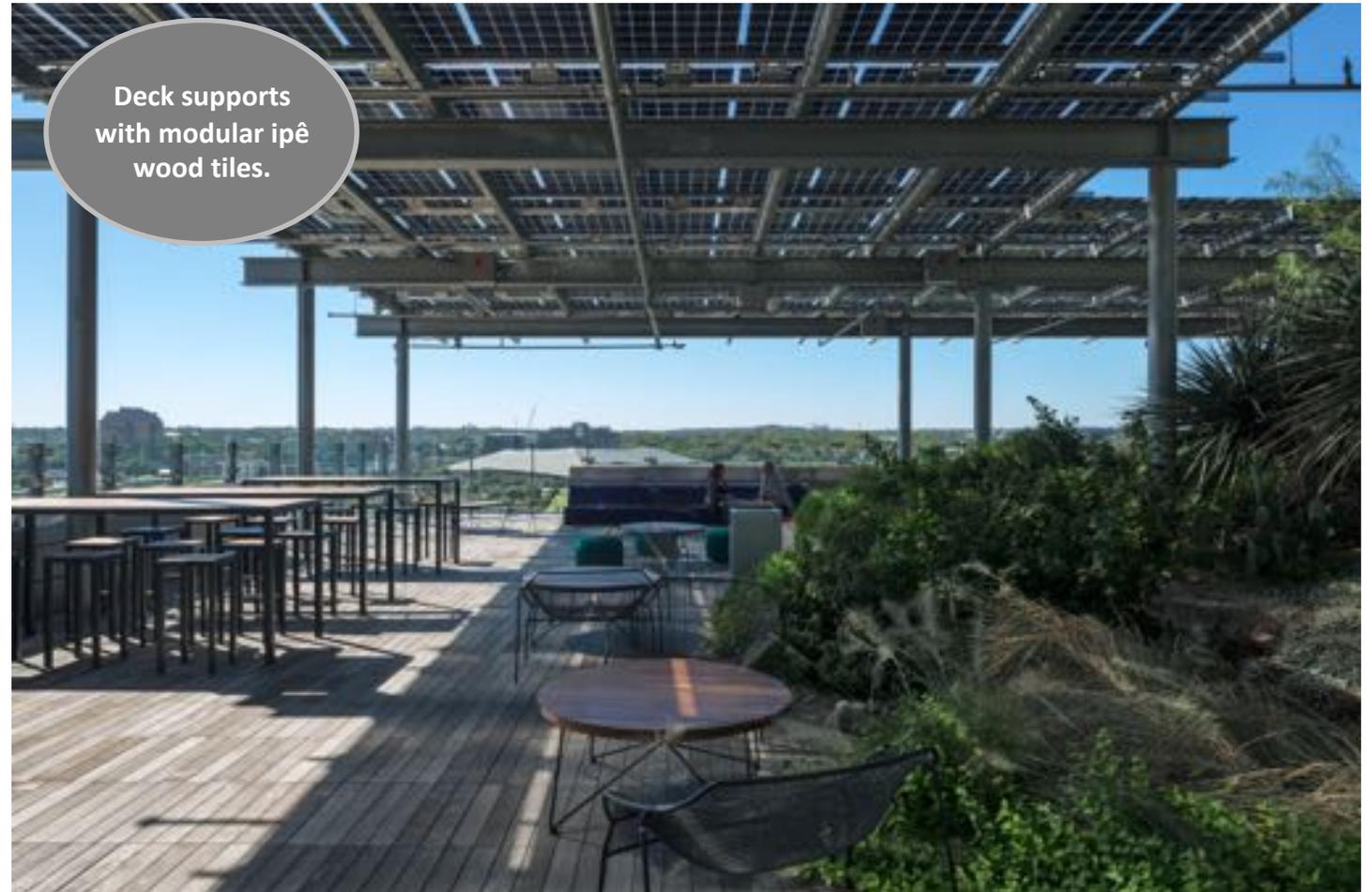


Location: Austin Central Library, Austin, Texas
Architect: Lake|Flato & Shepley Bulfinch
Photographer: Leonid Furmansky

Case Study: Austin Central Library

The rooftop deck support system not only creates an enjoyable outdoor space for library patrons, but it also provides added value by protecting the surface of the roof from damage and solar degradation, all while maintaining a healthy drainage system. The deck support system also helps to reduce cooling loads of the building because it is air permeable.

The library achieved LEED Platinum, the highest LEED certification available in the United States, with the goal of being sustainable for at least 100 years and having the least possible impact on the environment.



Deck supports
with modular ipê
wood tiles.

Location: Austin Central Library, Austin, Texas
Architect: Lake|Flato & Shepley Bulfinch
Photographer: Leonid Furmansky

Case Study: Girls' School of Austin

The Girls' School of Austin is a 12,400-square-foot K–12 education facility and includes a multipurpose building, art and science classrooms, as well as multiple gardens and play areas throughout the campus.

The outdoor learning areas make up more than 60 percent of the campus and include courtyards and rooftop decks. The 400-square-foot rooftop deck, made with 2-foot x 2-foot ipê deck tiles and adjustable deck supports, provides an economical and unique alternative educational space for outdoor learning. The ipê deck tiles are manufactured from long-lasting, responsibly harvested wood remnants, adding to the sustainability of the project.

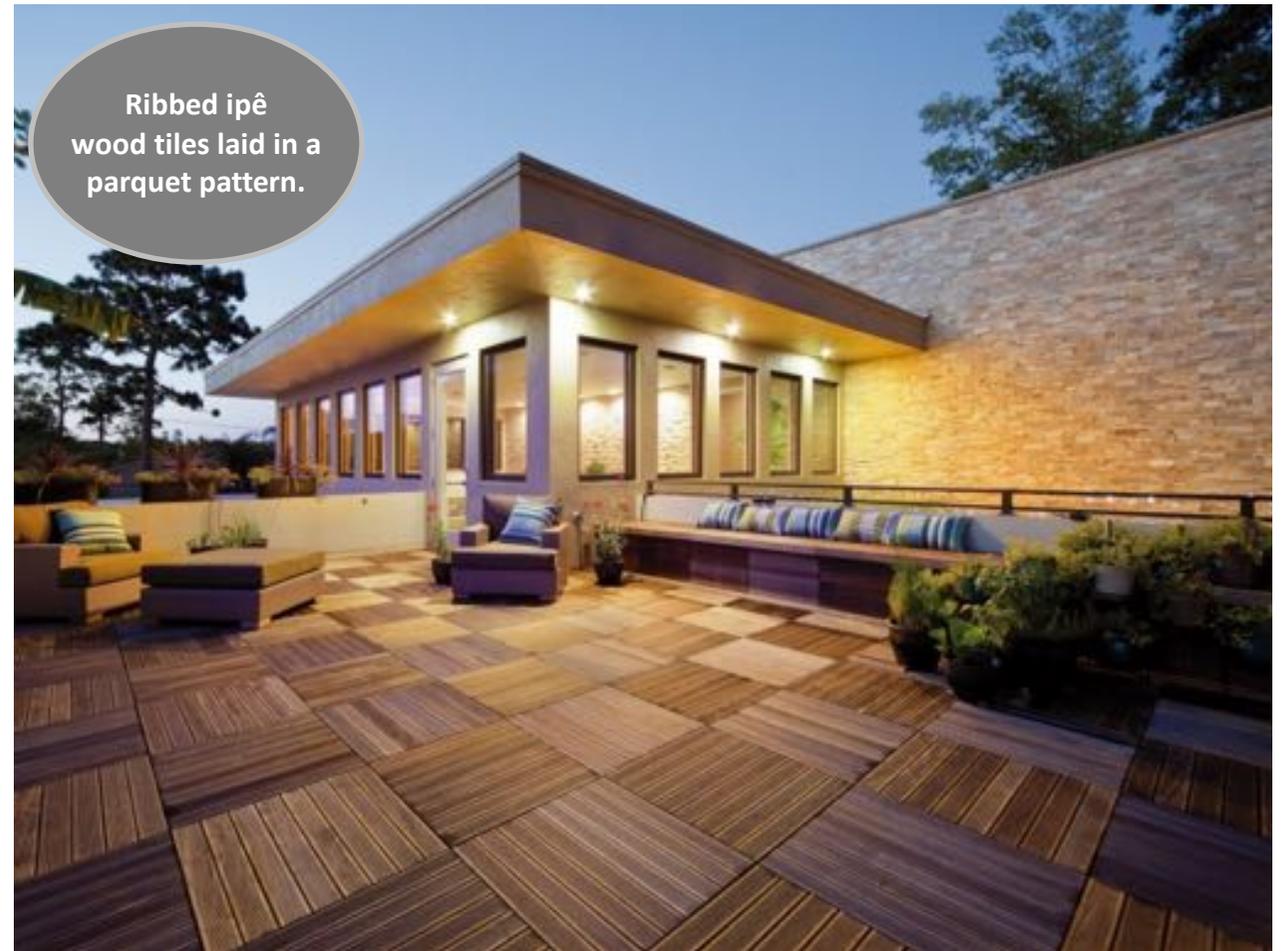
Location: Girls' School of Austin, Austin, Texas
Architect: Haddon + Cowan Architect Collaborative



Case Study: E2 Homes

Pedestal wind uplift systems are designed to resist high-velocity wind zones when installed according to manufacturer's specifications. For example, some manufacturer's have Florida building code approval for their roof paver systems. This approval helps to streamline future project development in Florida by minimizing the need for local jurisdiction reviews.

Wood tiles are modular and allow for uniquely designed layouts. The parquet pattern utilized in this home's rooftop deck gives the wood tiles a varying (versus uniform) appearance. The ribbed wood tiles not only add an element of texture to the design, but they also help diminish the appearance of scuffs or marks. The wood tiles complement this custom home and offer a mix of luxury and design flexibility, enabling them to fit any size or shape of deck.

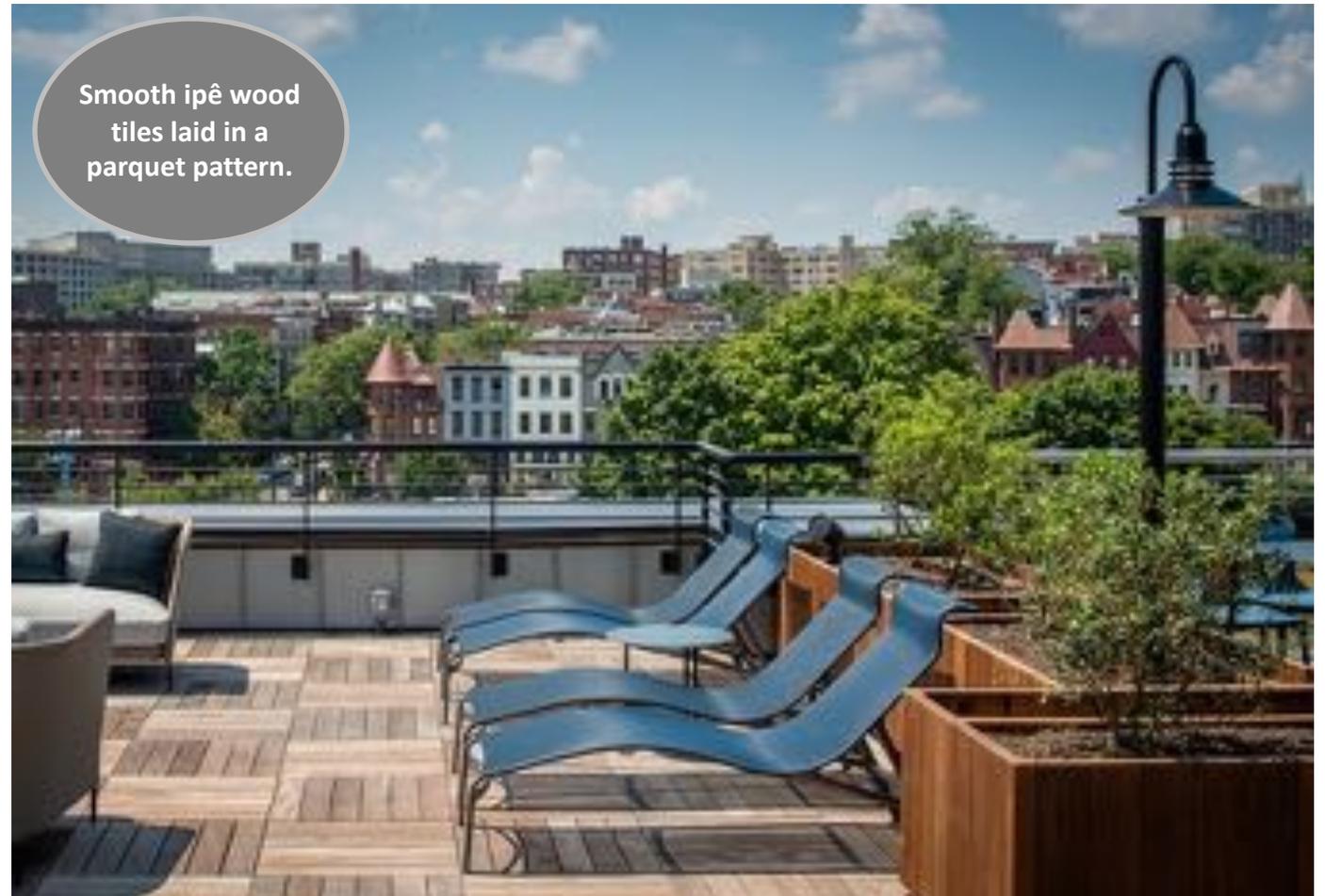


Location: E2 Homes, Evergreen, Florida

Case Study: Reed Row Apartments

Reed Row, located in Washington, D.C., is an apartment community dedicated to luxury living using sustainable products and designed to highlight modern aesthetics. Adjustable pedestals and 2-foot x 2-foot ipê wood tiles laid in a parquet pattern crown the rooftop, transforming it into usable community space, perfect for entertaining. Shady pergolas and furniture all add to the elegance of the hardwood deck tiles.

The recycled content in the deck supports used on the rooftop deck was able to contribute toward earning LEED points, allowing the building to achieve LEED Silver certification.



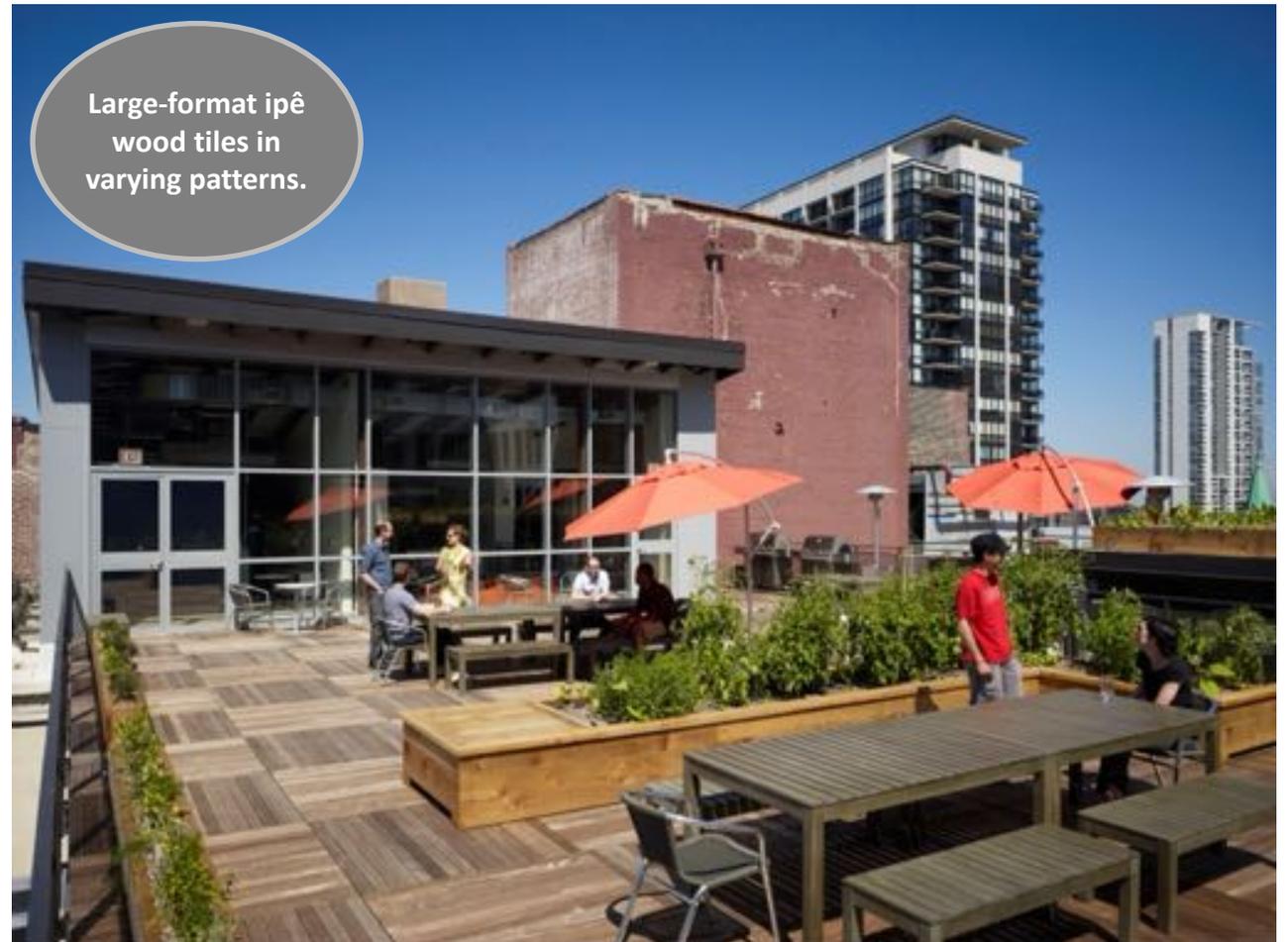
Smooth ipê wood tiles laid in a parquet pattern.

Location: Reed Row Apartments, Washington, D.C.
Architect: R2L:Architects
Photographer: John Cole

Case Study: Ideo Corporate Office

This internationally renowned design firm relocated from its suburban Evanston offices to the West Loop of Chicago. The new office space includes a rooftop addition—a fully accessible, structurally independent rooftop deck that is perfect for outdoor project work and entertaining. The deck consists of 2-foot x 4-foot large-format wood tiles and fixed-height pedestals. Contractors achieved a unique look by installing pairs of 2-foot x 4-foot tiles in a parquet pattern, resulting in what appears to be 4-foot x 4-foot wood tiles.

The rooftop achieved LEED Silver certification, and the recycled content in the deck supports was able to contribute toward earning LEED points.

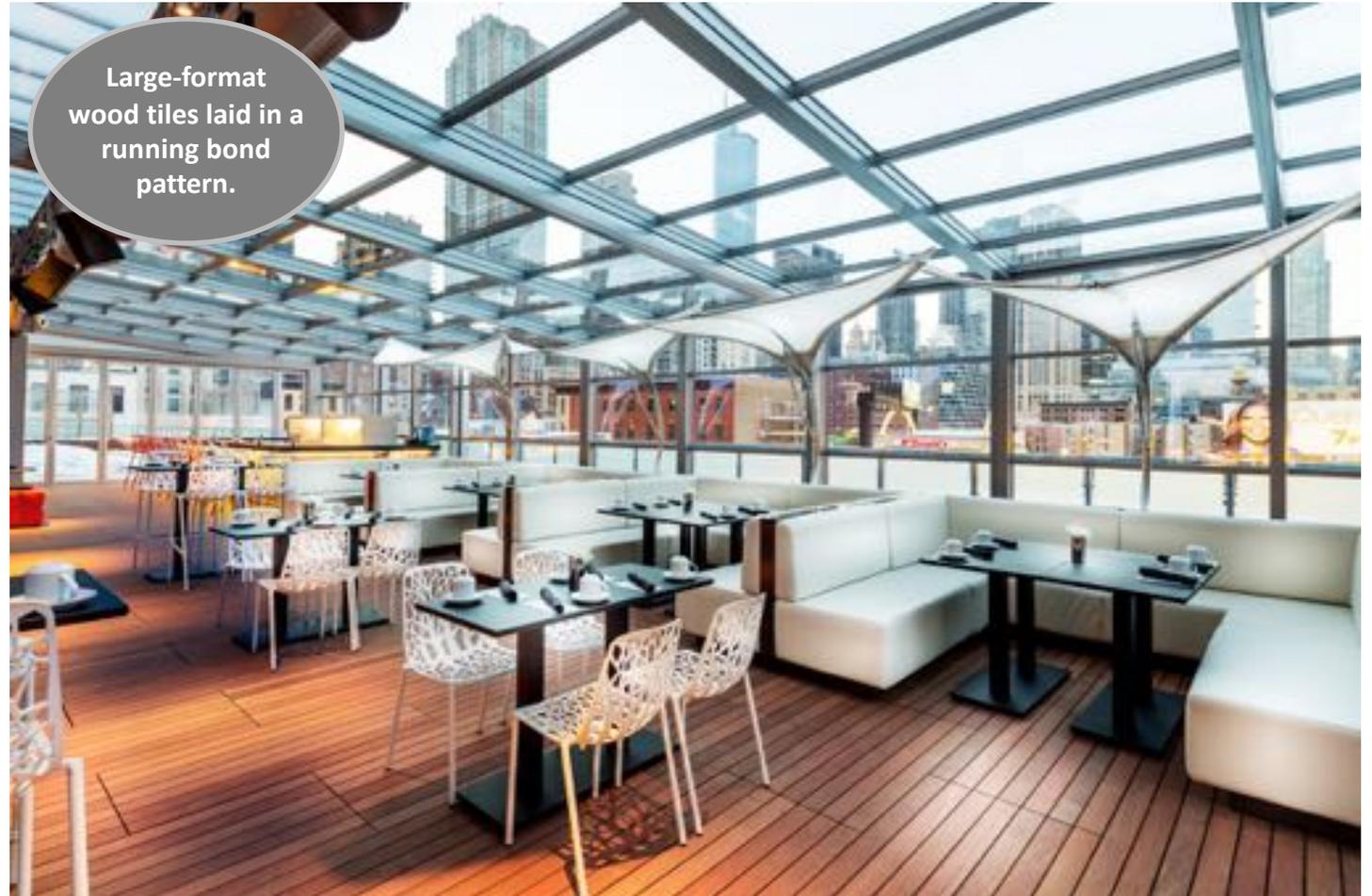


Location: Ideo Corporate Office, Chicago
Architect: Perkins+Will

Case Study: Godfrey Hotel

The Godfrey Hotel, a boutique hotel in the epicenter of trendy River North Chicago, was designed with style and luxury in mind. From the cubist-inspired facade to the staggered truss post-tension design, the entire hotel is design focused.

From the fourth floor, a stunning roofscape yields uninterrupted views of the southern Chicago skyline. The 15,000-square-foot rooftop space with a retractable roof is home to an indoor/outdoor bar that is available for events year-round, a fire pit, shimmering water features, and a video wall. The rooftop space provides an attraction for patrons and differentiates the hotel from the many other lodging choices in the city.

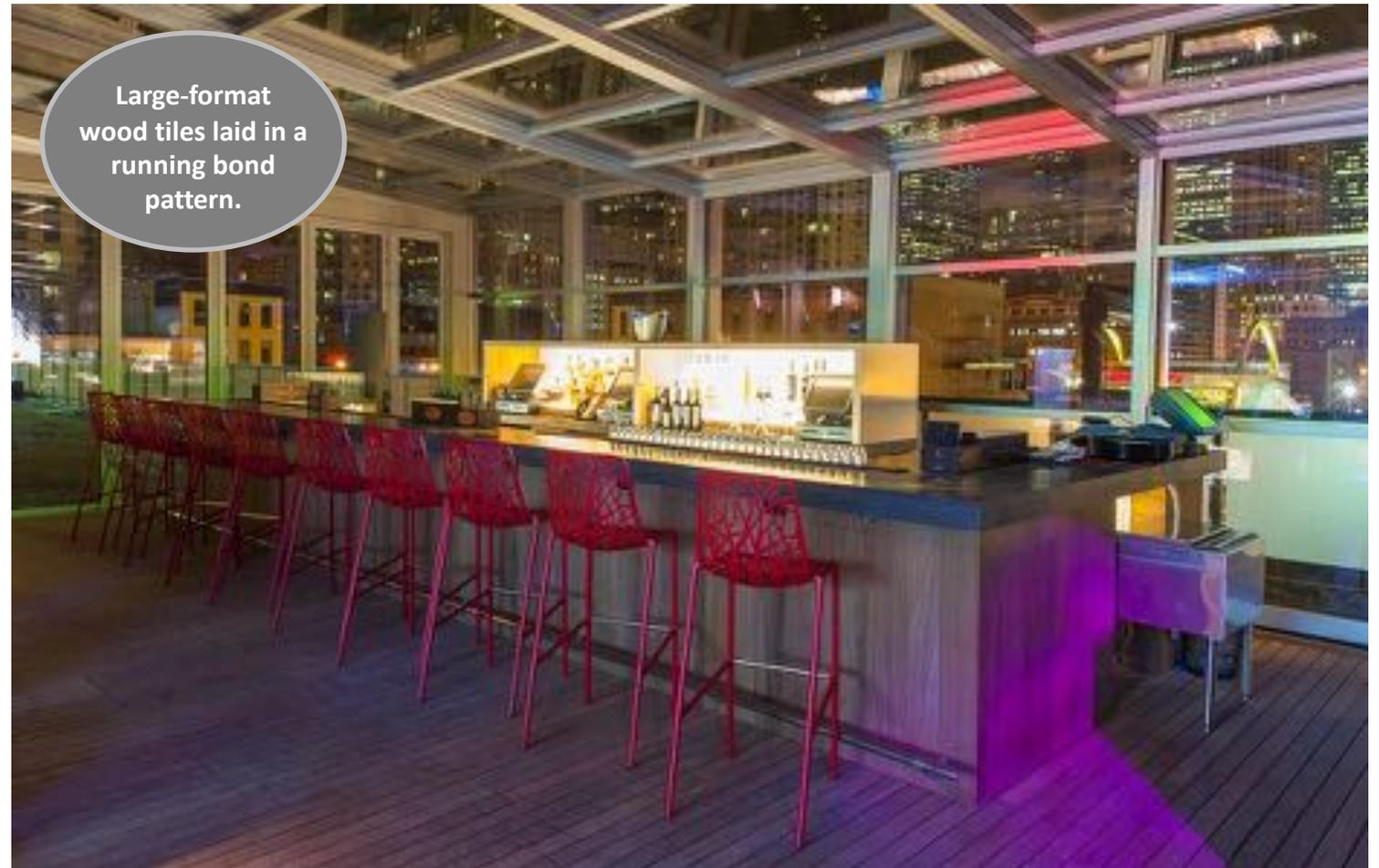


Large-format wood tiles laid in a running bond pattern.

Location: The Godfrey Hotel, Chicago
Architect: Valerio Dewalt Train

Case Study: Godfrey Hotel (continued)

The foundation of this chic space was created using adjustable pedestals and 2-foot x 4-foot smooth ipê wood tiles for the deck surface. The wood tiles complement the modern aesthetics of the space and set the contemporary look, allowing for other modern elements, such as oversized lamp lighting and seating—perfect for sipping drinks at the outdoor bar with a commanding view of Chicago.



Location: The Godfrey Hotel, Chicago
Architect: Valerio Dewalt Train

2-Centimeter Pavers and Paver Trays



2-Centimeter Pavers: Introduction

2-centimeter pavers are a beautiful surfacing option for rooftop environments. Available in a wide variety of sizes with a wood, stone, or concrete appearance, 2-centimeter pavers create aesthetic appeal for rooftop decks, outdoor areas, or pool surrounds.

When installed over deck supports, 2-centimeter pavers should be backed by paver support trays to enhance the impact resistance and provide additional strength for the pavers. The 2-centimeter paver and paver tray system provides weather resistance and protection as well as valuable outdoor space for the building.

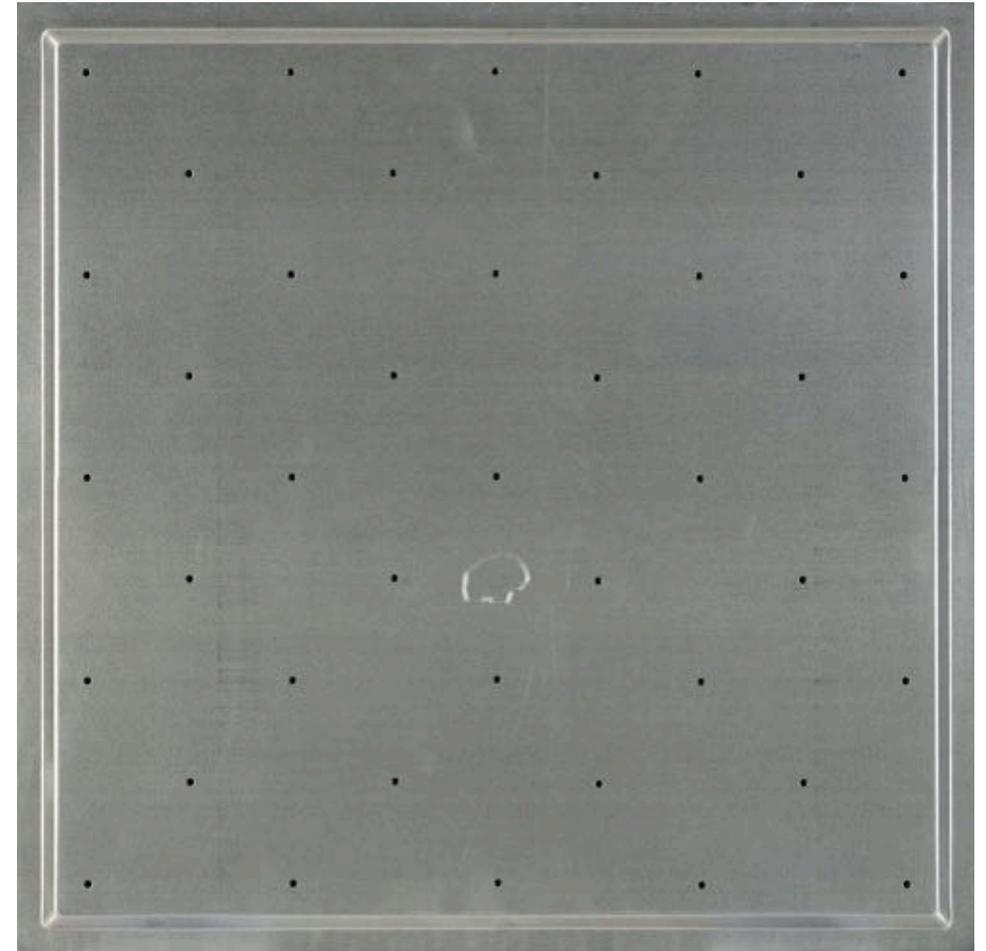


Paver Trays: Introduction

Paver trays provide simple, lightweight, and durable support for 2-centimeter porcelain, natural stone, and concrete pavers. Paver trays made from galvanized steel meet the testing requirements for non-combustible surface materials.

The paver support trays are designed to enhance the impact resistance and provide additional strength to paver surface materials. Paver trays can be adhered to the desired surface pavers on site before or during installation.

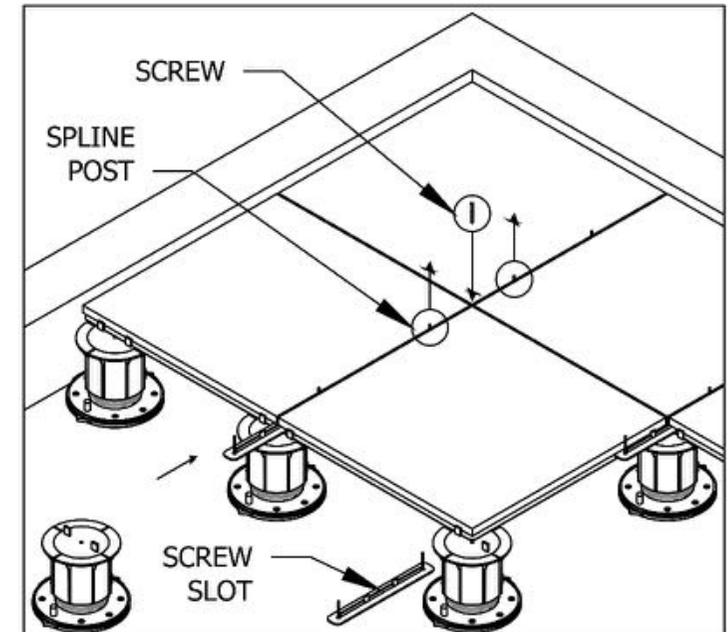
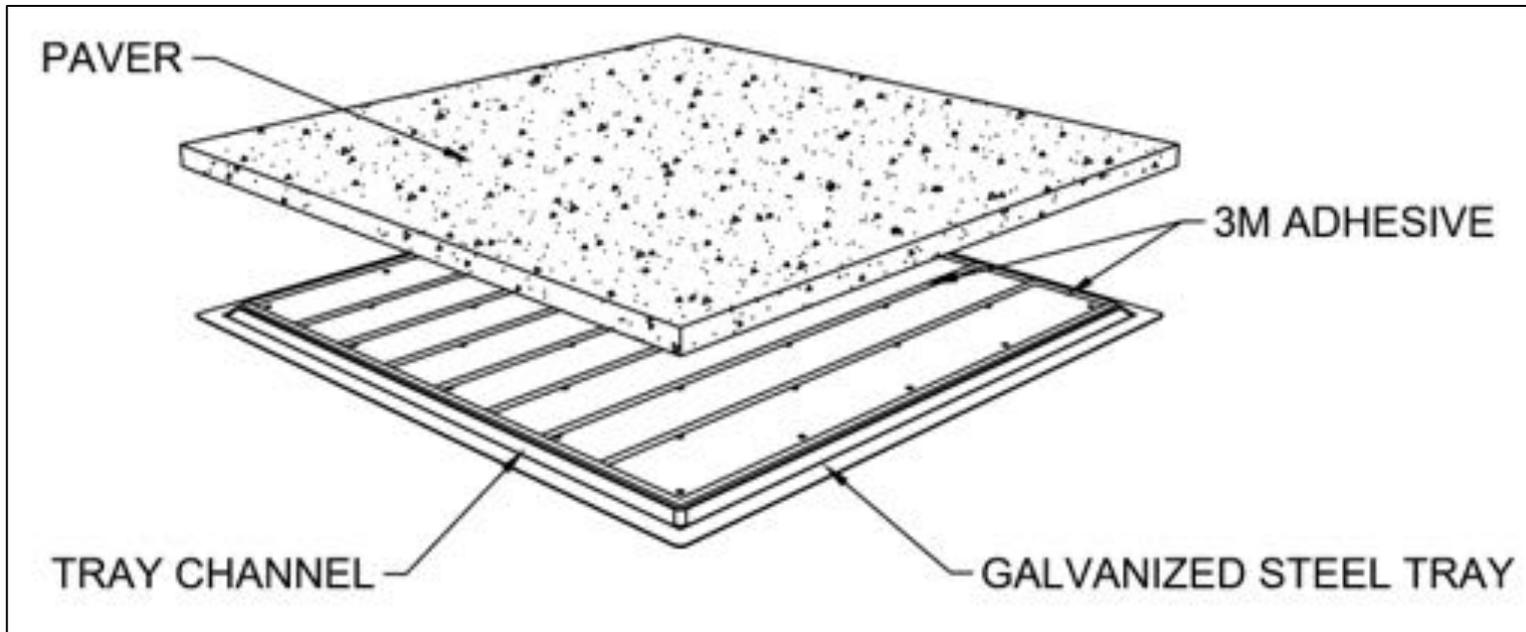
They are available in a wide variety of standard sizes, including 24-inch x 24-inch, 24-inch x 18-inch, 24-inch x 16-inch, 24-inch x 12-inch, 20-inch x 20-inch, and 18-inch x 18-inch. Paver trays can be combined to accommodate larger-format pavers. Consult individual manufacturers for recommended configurations.



As Shown: 24" x 24" Paver Tray

2-Centimeter Pavers and Paver Trays: Materials

The channel created by the paver tray allows a hidden spline fastening system to secure the paver tray to pedestals. The paver tray-backed paver can be removed for routine roof maintenance, drain access, or replacement. The removable fastener splines provide increased stability and wind uplift resistance.



2-Centimeter Pavers and Paver Trays: Installation

Detailed installation instructions, CAD details, and specifications for paver trays can be obtained from individual manufacturers. Paver trays can be adhered to the desired surface pavers on site before or during installation. If the paver tray assemblies are assembled before installation, they should be stacked until the installation begins. The “T” method of installation is recommended.



Case Study: Rooftop Decking System Manufacturer's Headquarters

This rooftop of the headquarters of a leading rooftop decking system manufacturer, located at the site of the historic Sears warehouse in Denver, installed paver tray-backed 2-foot x 2-foot 2-centimeter pavers, adjustable pedestals, red powder-coated aluminum planter cubes, and a wind uplift resistance system.

The rooftop deck offers scenic views of downtown Denver as well as the Rocky Mountains.

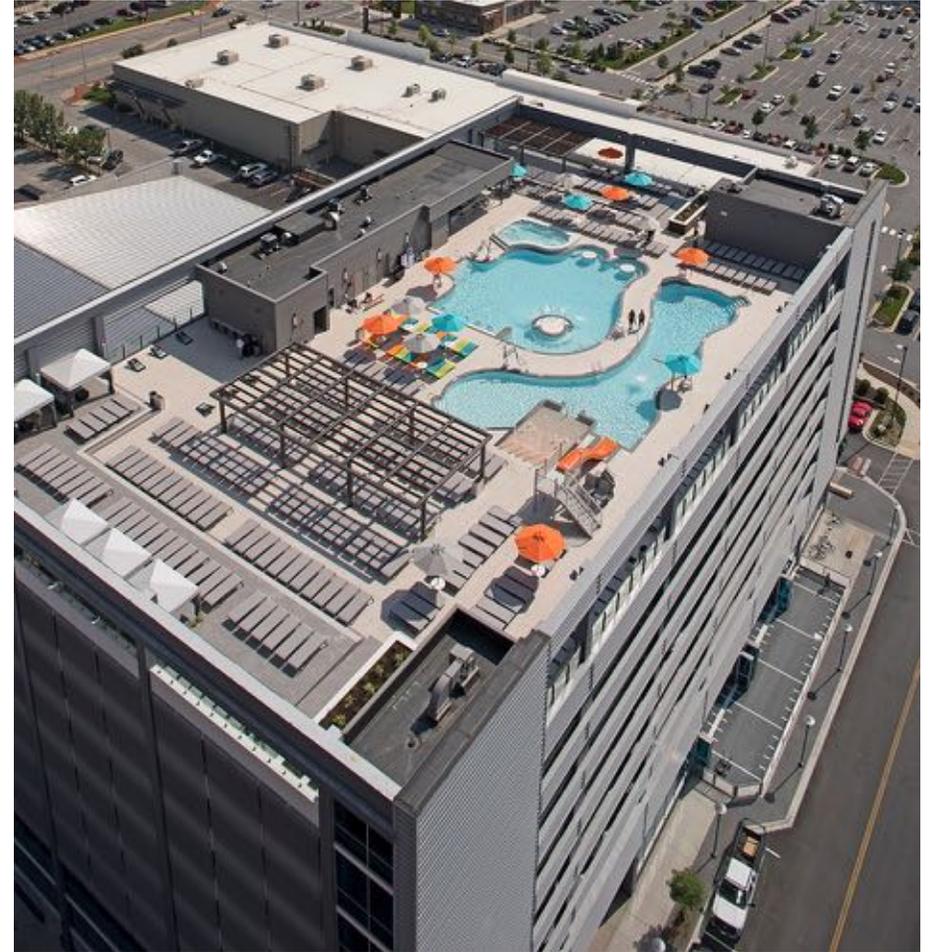


Location: Manufacturing & Office Headquarters, Denver

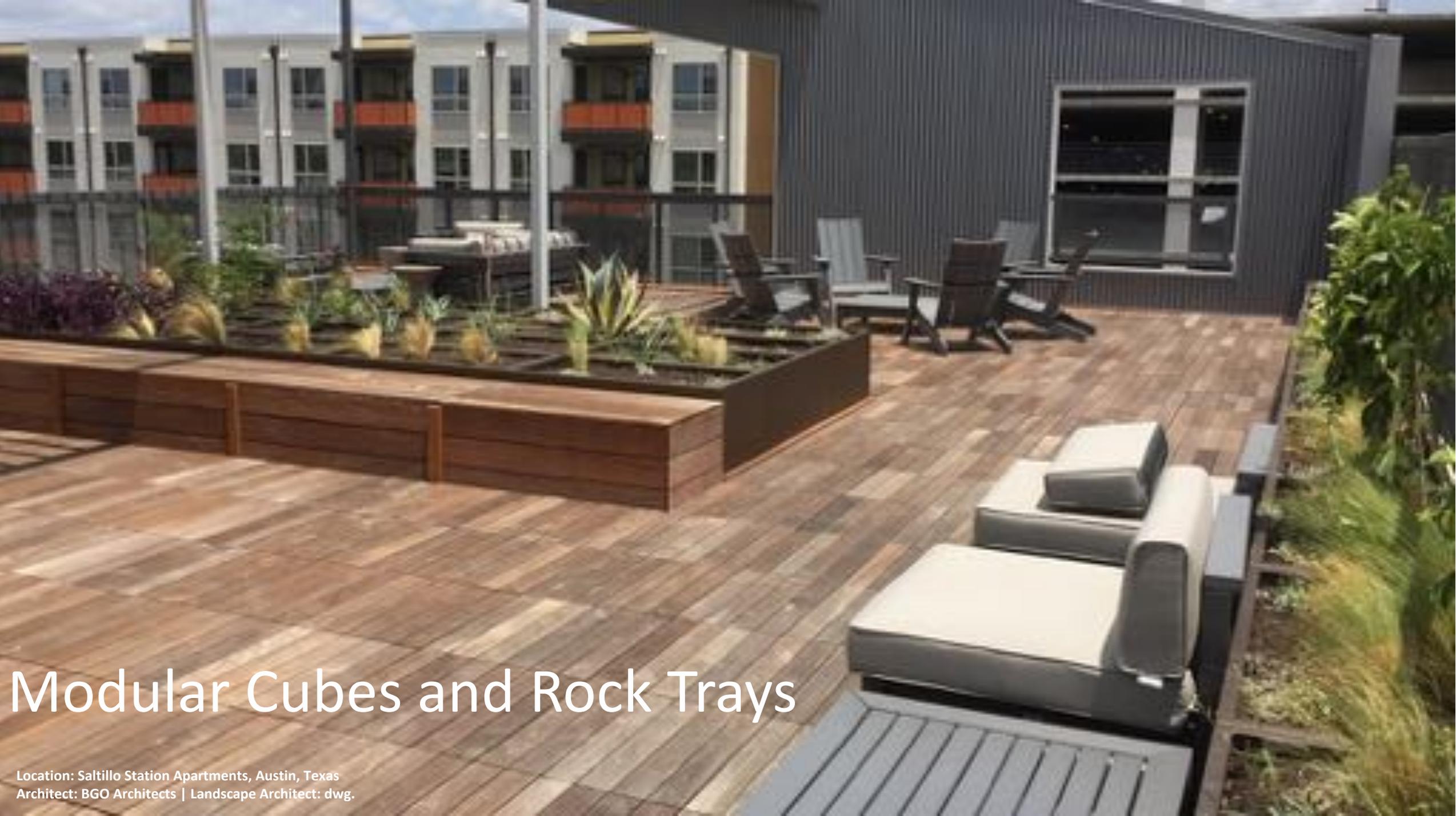
Case Study: Merritt Athletic Club

The Merritt Athletic Club recently underwent \$20 million in renovations. It contains a running track, racquetball and basketball courts, and a gym. The crown jewel of the renovations is the 25,000-square-foot rooftop deck, located on top of the new fitness area and six floors of parking. The deck includes a children's pool, an adults-only pool, and a hot tub. The deck also features a full bar and restaurant complete with 360-degree views of the city. During colder months, the deck area can be used to host gym members watching a Ravens or Orioles game.

The deck was constructed using adjustable pedestals and 2-centimeter pavers backed by paver trays. The paver tray system not only offers a simple and lightweight paver backing to enhance the structural integrity of the pavers, but it also allows for design flexibility and functionality in the space.



Location: Merritt Athletic Club, Baltimore
Architects: Merritt Cos. & Merritt Construction Services
Photographer: Alian Jaramillo

A modern rooftop deck with wooden decking, modular planters, and outdoor furniture. The deck is furnished with a large sectional sofa with light-colored cushions and a dining table with chairs. A raised planter bed with various plants is visible. The background shows a multi-story apartment building.

Modular Cubes and Rock Trays

Location: Saltillo Station Apartments, Austin, Texas
Architect: BGO Architects | Landscape Architect: dwg.

Modular Cubes and Rock Trays: Introduction

Modular cubes can be used as planters or for seating and storage. They integrate seamlessly with pedestal rooftop deck systems—instead of installing a wood tile or paver, a modular cube can be installed in its place. Cubes used for planters contain drainage holes and irrigation sleeves for easy plant maintenance. They also do not require an additional liner.

Rock trays can also be installed in place of a wood tile or paver. They provide design flexibility and can add dimension and texture to deck areas.



Modular Cubes and Rock Trays: Materials

Modular cubes can be made from powder-coated aluminum, stainless steel, corten, or hardwoods such as ipê or cumaru. Typically, rock trays are fabricated from powder-coated aluminum. Depending on the manufacturer, custom colors may be available.

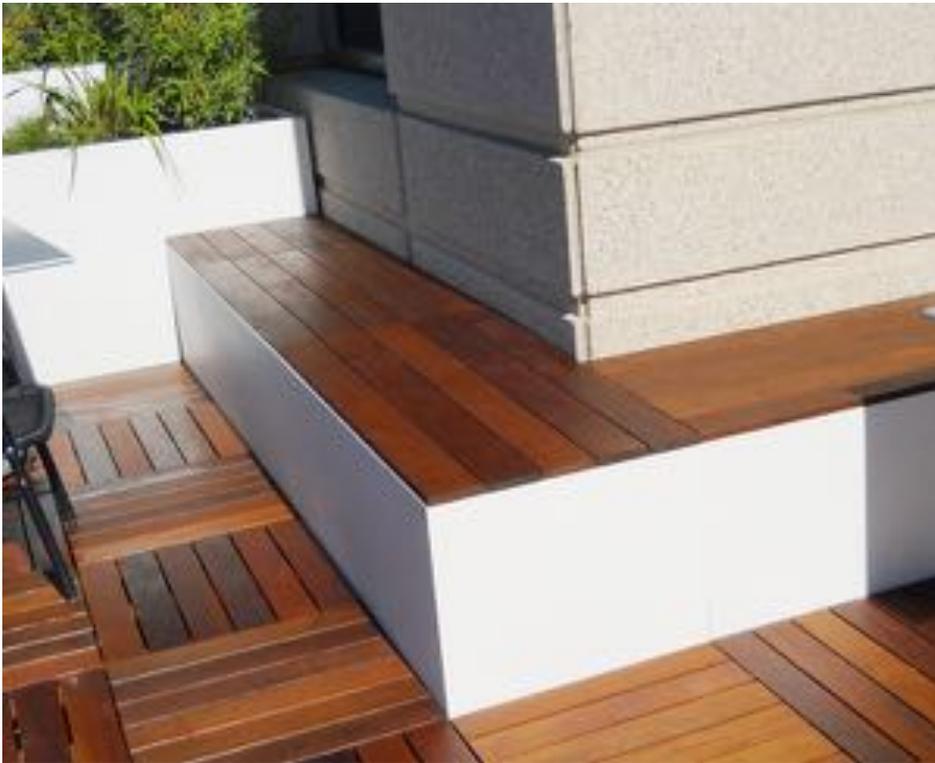
Powder-coated aluminum planter cubes that contain recycled content are recyclable and have been finished with low-VOC paints and sealants, which may contribute to a building project's ability to earn points under LEED and SITES certifications.



Location: New Pershing Apartments, Los Angeles

Modular Cubes: Variety of Uses

The rooftop deck on the Apple Corporate Office in Sunnyvale, California, uses 2-foot x 2-foot smooth ipê wood tiles, adjustable pedestals, and 2-foot x 2-foot and 2-foot x 4-foot white powder-coated aluminum cubes of various heights. The modular cubes provide planting areas, and additional cube tops provide storage and seating for the rooftop patrons.

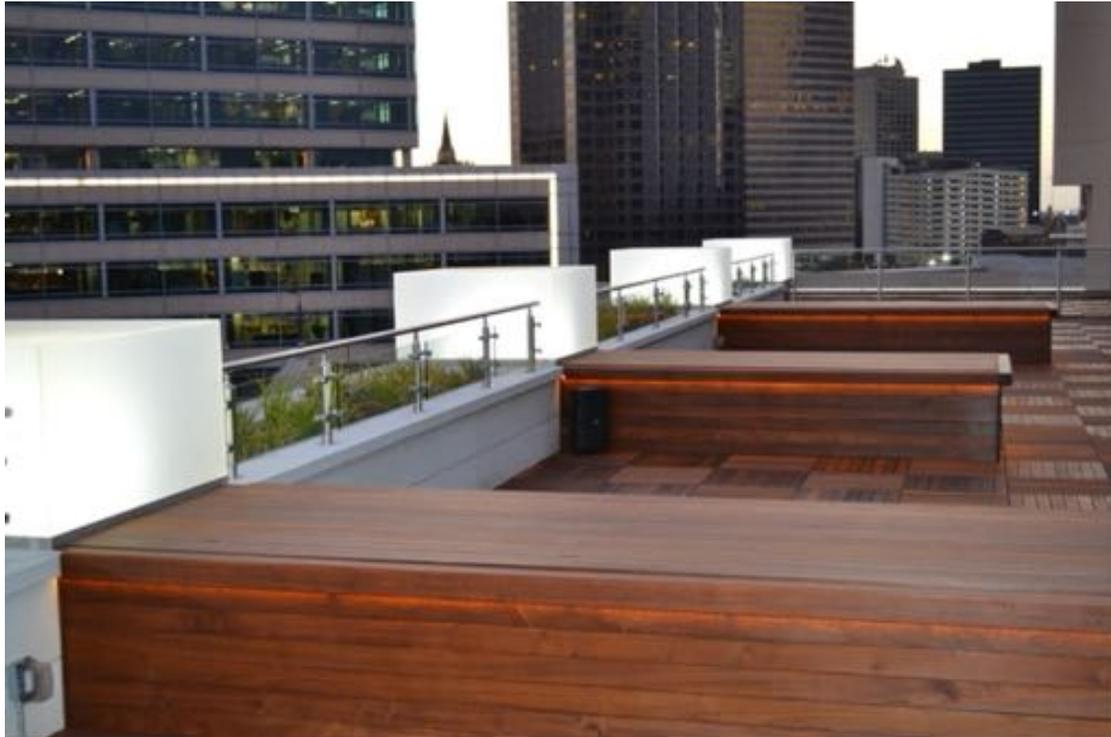


Location: Apple Corporate Office, Sunnyvale, California



Modular Cubes: Lighting

Located near Victory Park in downtown Dallas, the rooftop deck above Oncor's Corporate Headquarters allows for dramatic views of the city. The deck was built with custom lighted ipê cubes and ipê wood tiles. The custom cubes include recessed lighting to enhance the ambiance of the environment and improve visibility and safety under low light conditions.



Location: Oncor Corporate Headquarters, Dallas



Case Study: Dealer.com Corporate Headquarters

A 135,000-square-foot manufacturing building was transformed into a LEED certified corporate headquarters for Dealer.com, a company that develops online marketing solutions for the automotive industry. The expansion and renovation project included a rooftop deck.

The deck uses wood tiles and adjustable pedestals and includes a miniature golf course, a solarium, and containers to grow vegetables to supply the company's cafe. The terraces were created as spill-out spaces for employees, providing valuable and functional outdoor space that benefits employee morale, health, and well-being.



Location: Dealer.com Corporate, Burlington, Vermont
Architect: Scott + Partners

Case Study: Four Seasons Hotel

The Four Seasons Hotel in Washington, D.C., is world-renowned for its luxury accommodations. In 2009, the hotel had the opportunity to add an addition and create its largest suite. The 3,500-square-foot Royal Suite boasts a gourmet kitchen, three bedrooms, a fireplace, an oversized limestone and marble bathroom, an AV system, and a private rooftop terrace.

The spacious 1,000-square-foot terrace uses ipê wood tiles and adjustable pedestals. Modular cubes are used as planters for trees and flowers. The terrace allows for a scenic view of surrounding Georgetown and can be sectioned off for private events or security reasons.



Location: Four Seasons Hotel, Washington, D.C.
Architect: Sowinski Sullivan Architects

Case Study: New York City Pop-Up Park

In an attempt to create more open space at Pearl and Broad in New York's Financial District, community businesses joined forces to create an innovative, temporary mini-park. This pop-up park extends off the curbside over what were once four parking spaces. It is open to the general public but was financed by adjacent establishments to create curb appeal and provide seating along crowded sidewalks.

Adjustable pedestals allowed for the creation of a level, smooth decking surface over the uneven and sloping street. The creative, landscaped border uses custom-sized planter cubes with railings between each planter. The installation hardware for a pop-up park decking system is designed to allow for simple dismantling and seasonal storage.



Location: Pop-Up Park, New York City

Case Study: Cedar Rapids Pop-Up Park

The city of Cedar Rapids had been hoping to enliven sidewalks along its popular Third Street, but narrow sidewalks and inadequate space had posed a problem in the past. Pop-up parks were just the solution! The removable 20-foot x 8-foot platforms are comprised of wood tiles, planters, and adjustable pedestals to fit inside a parallel parking spot.

Each pop-up park has six planters spaced around the platform with cable rail fencing around the perimeter to separate pedestrians from traffic. The removable platforms can be easily assembled during warm summer months when outdoor dining and activities are at their peak and disassembled in the winter and stored. The modular deck system has low installation and maintenance costs and increases the visibility of local businesses, creating interest and space for their patrons to enjoy.



Location: Pop-Up Park, Cedar Rapids, Iowa
Architect: Seth Gunnerson

A wide-angle photograph of a modern architectural courtyard. The courtyard is enclosed by multi-story glass-walled buildings. The ground is paved with large, light-colored rectangular tiles. In the center, there is a long, narrow planter box filled with dark gravel and a tall, yellow, feathery plant. To the right, a large, abstract, golden-brown sculpture sits on a dark, cylindrical base. The sky is clear and blue, and the overall atmosphere is bright and clean.

Project Design to Completion

Location: Faculty of Law Library, University of British Columbia, Vancouver
Architects: Diamond & Schmitt Architects and PFS Studio
Contractor: T. Moscone & Brothers

Project Design: Requirements

1. Architectural Plan
2. Roofing/Drainage Plan
3. Height and Slope Information

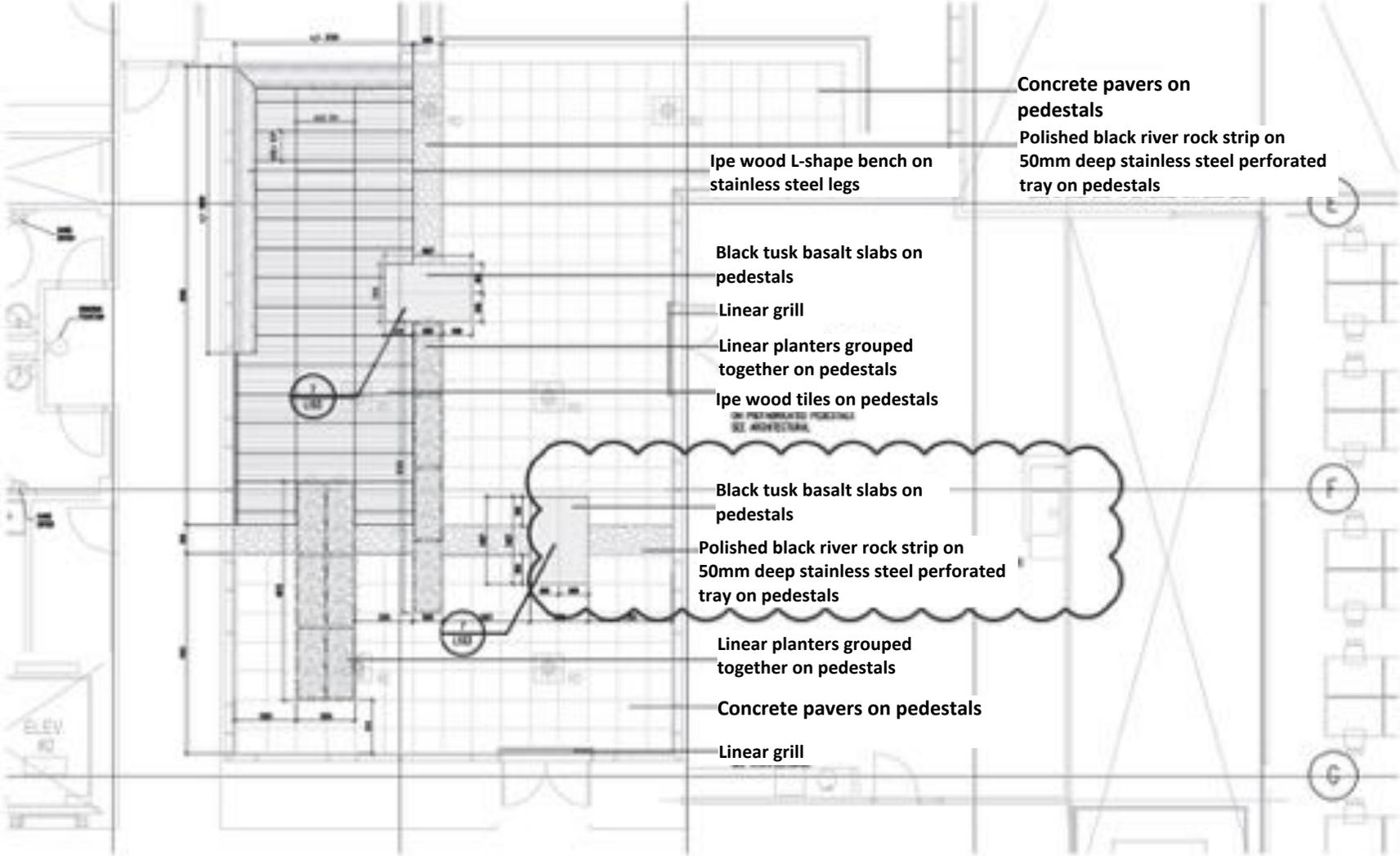
Note that each project has different information available to provide to create a takeoff. Speak to your manufacturer about getting a takeoff for your specific project needs.



Location: Faculty of Law Library, University of British Columbia, Vancouver
Architects: Diamond & Schmitt Architects and PFS Studio
Contractor: T. Moscone & Brothers

Architectural Plan

An architectural plan of a rooftop deck project shows the layout of the paver, planters, and other deck features, including the types of materials to be used.

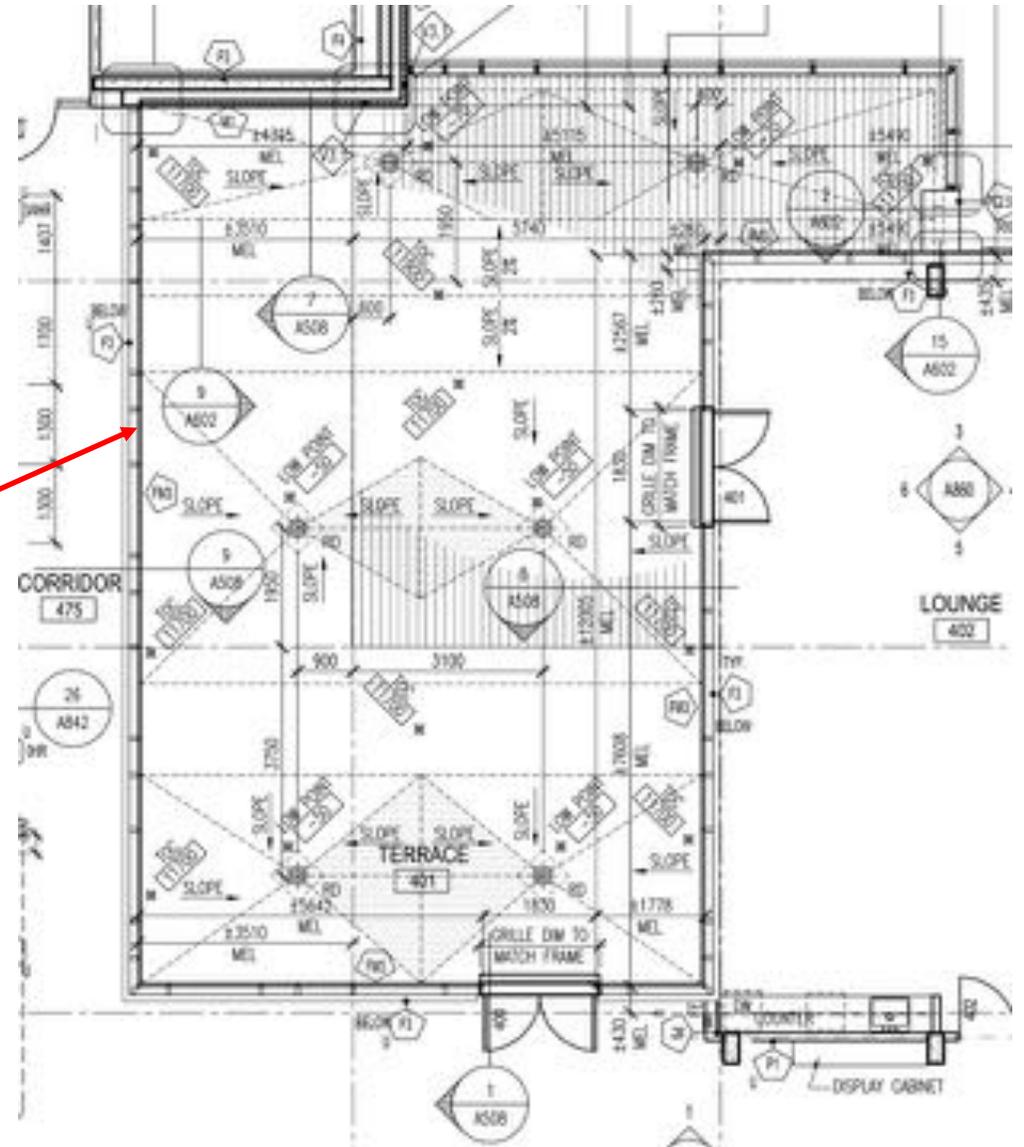
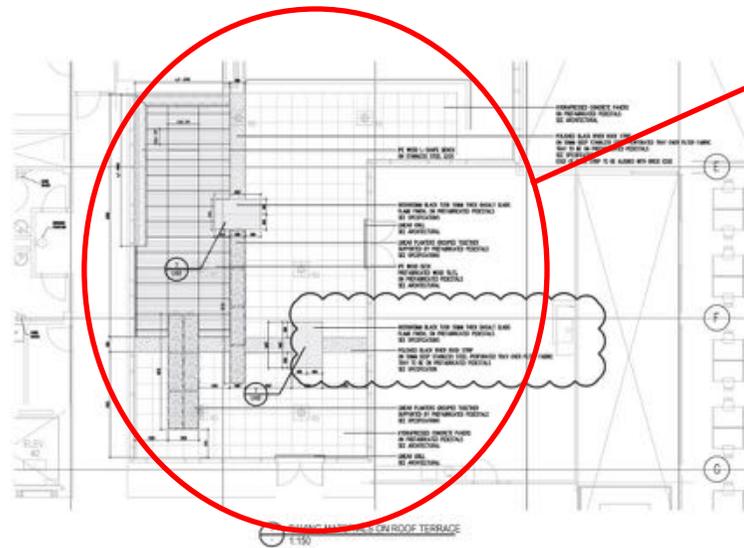


PAVING MATERIALS ON ROOF TERRACE
1:150

Location: Faculty of Law Library, University of British Columbia, Vancouver
Architect: Diamond & Schmitt Architects and PFS Studio
Contractor: T. Moscone & Brothers

Roofing/Drainage Plan

A roofing/drainage plan can be used alongside section details from the architectural drawings to determine what pedestal heights are required where.

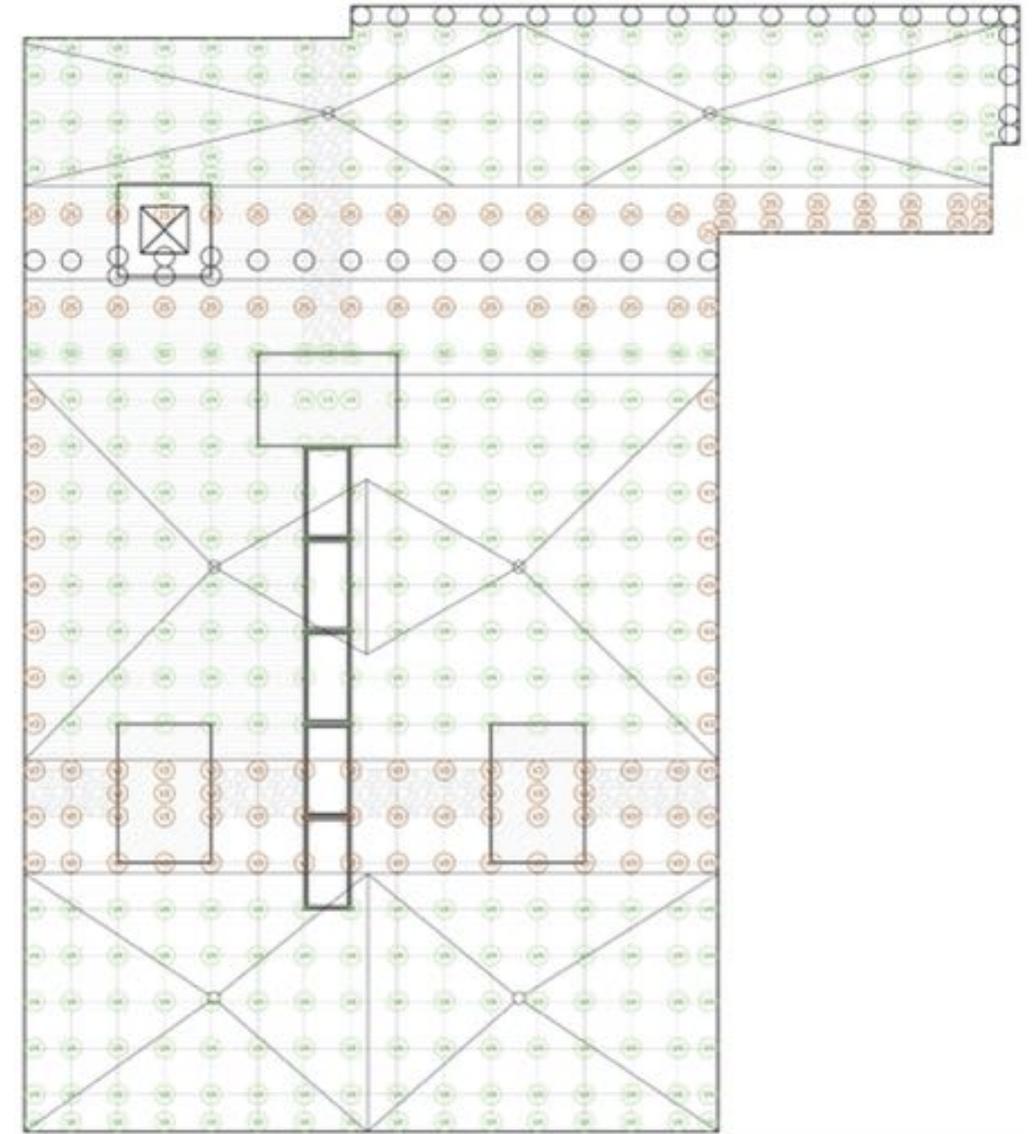


Location: Faculty of Law Library, University of British Columbia, Vancouver
Architect: Diamond & Schmitt Architects and PFS Studio
Contractor: T. Moscone & Brothers

CAD Drawing

Shown here is a pedestal layout. A manufacturer will provide installation details, important notes, and material quantity counts and, as mentioned earlier, may include a color-coded layout of the pedestals to be used.

LEGEND	
	(1/4" FIXED HEIGHT)
	(1/2" FIXED HEIGHT)
	(3/4" FIXED HEIGHT)
	TWO (2x) HDS0s STACKED (1")
	PEDESTAL (1-1/4" - 2")
	PEDESTAL (2-1/4" - 2-3/4")
	PEDESTAL (2-3/4" - 3-3/4")
	PEDESTAL (3-3/4" - 5-3/4")
	PEDESTAL (5-3/4" - 9-3/4")
	RIDGE LINE
	VALLEY LINE
	RD ○ DRAIN
	DECK BORDER
	TILE/PAVER
	DECK SLOPE



Location: Faculty of Law Library, University of British Columbia, Vancouver
Architect: Diamond & Schmitt Architects and PFS Studio
Contractor: T. Moscone & Brothers

Project Completion: University of British Columbia, Law Library

This dramatic rooftop courtyard at the University of British Columbia mixes surface materials, including concrete pavers, wood tiles, stone accent pavers, rock trays, planter cubes, and a sculpture to create a wonderful outdoor space. Saving both time and money, the rooftop deck system is labor and cost effective, and the adjustable pedestals are durable enough to not only hold up a variety of surface materials but also withstand the harsh Canadian winters.



Location: Faculty of Law Library, University of British Columbia, Vancouver
Architects: Diamond & Schmitt Architects and PFS Studio
Contractor: T. Moscone & Brothers

Before and After: Corrigan Station

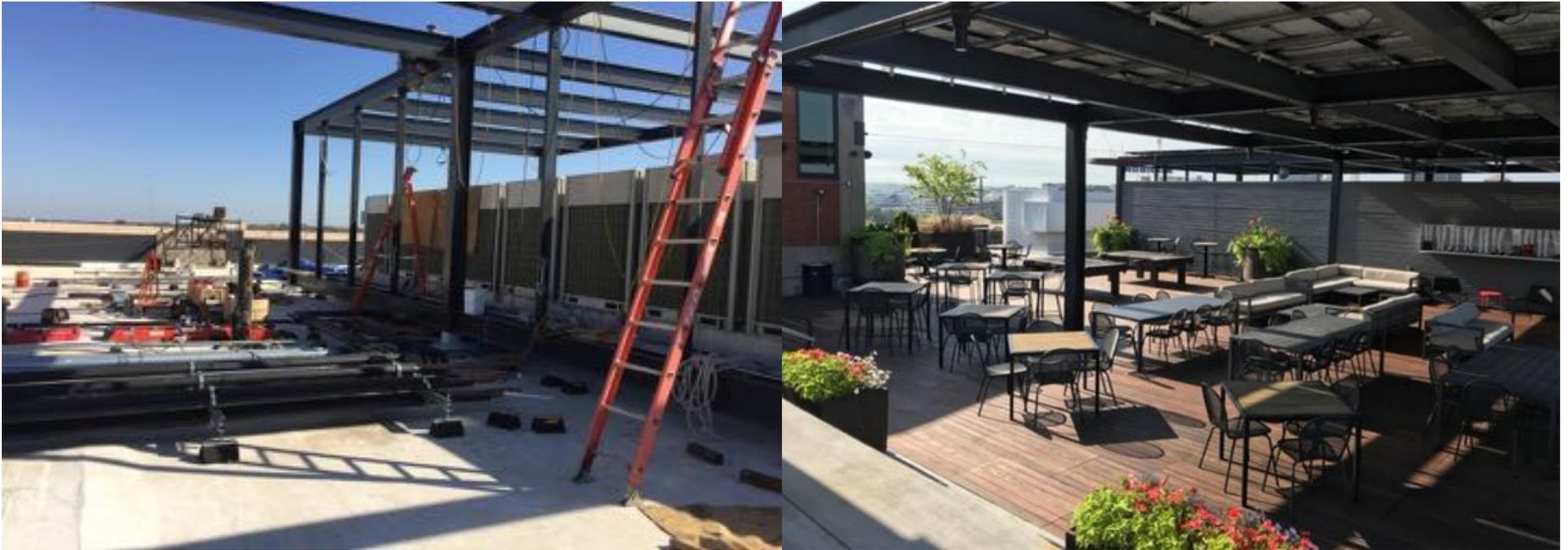
Corrigan Station is a repurposed former garment factory in Kansas City, Missouri. Four floors of the building were transformed into private offices and co-working spaces, and the roof was converted into a full amenity deck.



Location: Corrigan Station, Kansas City, Missouri
Architect: Helix/Blackbird Design Studio

Before and After: Corrigan Station

The rooftop deck of this mixed-use office building uses 2-foot x 4-foot ribbed ipê wood tiles and modular cubes installed over adjustable pedestals.



Location: Corrigan Station, Kansas City, Missouri
Architect: Helix/Blackbird Design Studio

Location: Partners HealthCare Administrative Campus, Somerville, Massachusetts
Landscape Architect: OJB Landscape Architecture | Architect: Gensler
Photographer: Kyle J. Caldwell



Selecting Rooftop Deck Systems

Features and Factors to Consider

There are a variety of deck support systems available. Here are some important features and factors to consider when selecting an adjustable deck support system:

- Adequate weight-bearing capacity for the project
- Bottom slope leveling mechanism for pedestal stability and adjustability when loaded
- Tab widths that provide the correct spacing for the installation
- Surface material selection (e.g., wood tiles, 2-centimeter pavers, concrete, stone, paver trays, or site furnishings)
- Ease of installation (e.g., color-coded systems with layout drawings that indicate the correct placement of preassembled pedestals)
- Support throughout the process from the design phase through to installation (from the designer all the way to the contractor)
- Product testing, cut sheets, specifications, installation details, CAD details, BIM files, etc.



As Shown:
2' x 2' Smooth Ipê Wood Tiles and Adjustable Pedestals

This concludes the American Institute of Architects Continuing Education Systems Course.



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Questions or concerns about the content of this course should be directed to the program instructor.

Location: 21c Museum Hotel, Oklahoma City | Photographer: Mike Schwartz
Architects: Deborah Berke Partners & Hornbeek Blatt Architects | Original Architect: Albert Kahn