SOPREMA®

SUSTAINABLE SOLUTIONS GUIDE

NORTH AMERICAN GUIDE | US EDITION

SUSTAINABLE SOLUTIONS GUIDE

SCOPE

This guide is intended for construction professionals concerned with improving the way of designing, constructing, transforming and renovating buildings and infrastructure, i.e., the built environment.

INTENT

This guide combines all of the products and systems offered by SOPREMA® in the United States that have been identified as solutions for promoting green buildings.

In addition to being diversified, these solutions can contribute to meeting challenges or solving problems related to sustainable development at the building and community levels.

EVOLUTION

This guide will evolve as progress is made in the industry. By focusing on innovation, SOPREMA® seeks to develop its range of products and systems so that they are recognized for their contribution to sustainable development.

This guide will be updated periodically.

INSPIRATION

Beyond technical questions, SOPREMA® has been seeking to optimize the performance of buildings for many years, particularly to improve their comfort, use and durability while reducing the environmental impact of our activities and products.

This work was inspired by the guide “Le futur a commencé” (The Future Has Begun) published by the SOPREMA® GROUP in 2017.

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SUSTAINABLE SOLUTIONS

CONTEXT

Impacts of the Construction Industry

The construction sector is an integral part of society, including for the development of communities and the life of people. Here are some statistics related to the impacts of this industry.

ECONOMY

Historically, the construction industry hasgreatly contributed to the economic development of society. As of today, the activities of this sector bear witness to the prosperity of the nation and organizations. In the United States, this represents:

$1,677 billion
Construction Spending. Seasonally Adjusted Annual Rate. [1].

7.6 million jobs
in the construction sector in Jan 2022 [2].

ENVIRONMENT

However, this same sector is not without effects on the environment. In addition to the waste of resources and energy, there are various forms of pollution generated. In the world:

50% of solid waste
comes from building materials [4].

36% of the energy
consumed worldwide was linked to the construction and operation of buildings in 2017 [5].

60% of the raw materials extracted
from the lithosphere is used for the construction of civil engineering works (20%) and buildings (40%) [3].

40% of greenhouse gas (GHG) emissions
worldwide were related to the construction and operation of buildings in 2017 [5].

HUMAN

The function of buildings and infrastructure is to meet the basic needs of individuals while ensuring namely their health and safety.

In 2020, **56% of the world's population** lived in cities. In the United States, it reached 83% [8].

North Americans spend
87% of their time
inside buildings [6].

The world population reached about
7.7 billion people in 2019. This figure could rise to 8.5 billion by 2030 [7].

Founding of SOPREMA®

Founded in Strasbourg, France, over a century ago, SOPREMA® is a third-generation family company. Today, the company is present in 100 countries, has 101 production sites and 9,700 employees worldwide. In the United States, SOPREMA® has nearly 600 employees and multiple production sites.

RESISTO	CHEM LINK	PERFORMANCE ROOF SYSTEMS	TRP	FURBISH
Acquisition: 1996	Acquisition: 2016	Acquisition: 2018	Acquisition: 2022	Acquisition: 2022

1908 — **1st sales office in North America:** Located in Québec City (QC), the offices are still in use today.

1973 — **Oil Shock**
With the first oil crisis, the entire construction industry becomes aware of the precious nature of this resource and the phenomenon of overconsumption. It is the beginning of the setting up of measures and initiatives aimed at improving energy performance and diversifying energy sources [9].

1978 — **Earth Summit in Rio de Janeiro:** Marked by the adoption of the 27 principles of sustainable development.

1984 — **1st plant in North America:** Located in Drummondville (QC), it manufactures waterproofing membranes.

1992 — **1st plant in USA:** Located in Wadsworth, Ohio. It manufactures superior roofing membranes.

1993 — **SOPRANATURE®:** This brand-new green roof system is dedicated to greening buildings and communities.

1995 — **Kyoto Protocol**
Faced with climate change, more than 38 industrialized countries commit to reducing greenhouse gas (GHG) emissions.

1997 — **ISO 14 001:** A standard in environmental management; SOPREMA® is among the first in its field to comply with it.

2003 — **1st LEED client:** For the first time, SOPREMA® offers products for sustainable building construction. It is the St. John Ambulance headquarters in Edmonton (AB).

2007 — **2nd plant in USA:** Located in Gulfport, Mississippi. It manufactures roofing membranes.

2009 — **MACADEN®:** This equipment allows users to automatically install waterproofing membranes while improving the quality of the installation.

2015 — **1st plant certified LEED® Silver:** It is located in Drummondville (QC) and manufactures polyisocyanurate insulation boards. The building obtains the certification in May 2020.

2016 — **Acquisition of Chem Link:** Located in Schoolcraft, Michigan. It produces ultra-low VOC sealants and adhesives that do not harm installers or building occupants.

Paris Climate Agreement (COP 21)
Faced with the delay in the fight against climate change, all countries, whether developing or developed, commit to reduce their total greenhouse gas (GHG) emissions in order to limit global warming to 36°F (2°C) by the end of the century and mitigate the consequences.

2030 Agenda for Sustainable Development
Adopted by all United Nations Member States in 2015, these describe guidelines to ensure a better and more sustainable future for all.

2017 — **Transparent statements:** As the initiator of the movement in its sector, SOPREMA® discloses environmental product declarations (EPDs) and health product declarations (HPDs) for 141 products.

2018 — **Acquisition of DERBIGUM (currently Performance Roof Systems):** Located in Kansas City, Missouri.

1st zero-waste plant in Canada: Located in Sherbrooke (QC), it manufactures extruded polystyrene insulation boards.

2019 — **ECO³ Granules:** SOPREMA introduces ECO³, smog-reducing granules by 3M, to the low-slope roofing industry.

2022 — **Opened 3rd Building Envelope Supply (BES) Facility:** Located in Carrollton, Texas. Other locations in Doral and Pompano, FL.

Acquisition of Tropical Roofing Products (currently TRP Roofing Products): Located in Hallendale Beach, Florida.

Acquisition of Furbish. Located in Baltimore, Maryland.

SUSTAINABLE DEVELOPMENT APPROACH

Although sustainable development has long been part of SOPREMA's values, it was only in the spring of 2018 that the company initiated a defined approach in North America.

In addition to appointing a Sustainable Development Manager, several initiatives have been taken to structure the process. Here is an overview:

Sustainable Solutions Guide

This guide is part of this approach and addresses the field of collaboration linked to the use of products and systems in buildings.

2019

2022

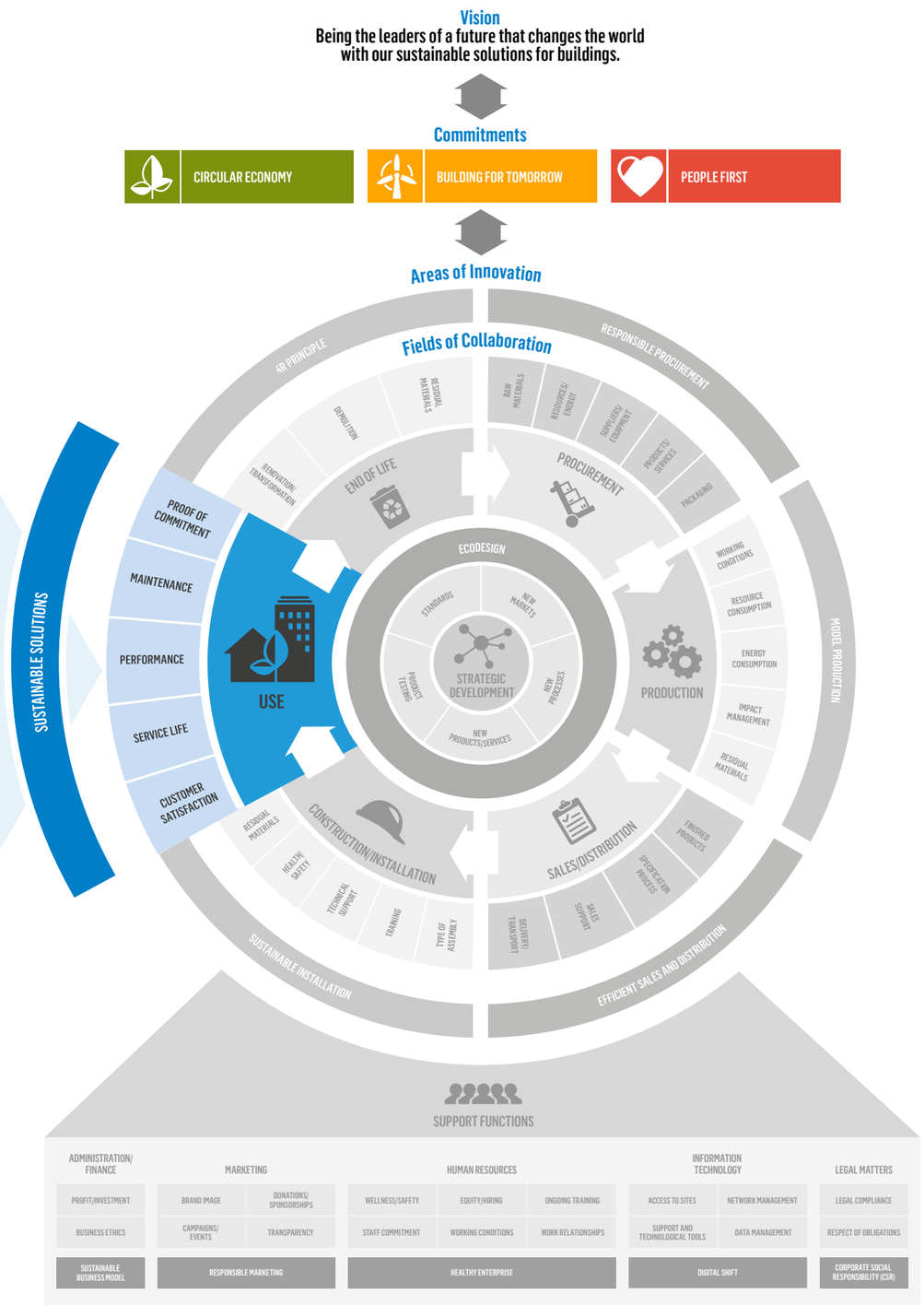
Sustainable Development Policy

Since January 2019, SOPREMA® has had an ambitious sustainable development policy. It is dedicated to strengthening commitments and increasing contributions to improving practices in the construction sector.

Inspired by the lifecycle concept, the approach encompasses all components of the business at all levels and relates to activities as well as products.

SCHEMA OF THE POLICY

This diagram provides a visual reference of the driving force of the sustainable development policy.



WHAT IS A SUSTAINABLE SOLUTION?

Sustainable solutions are based on the desire to durably and systematically solve environmental, social and economic challenges without creating new problems or negatively impacting future generations.

- Increasing the service life of the building.
- Increasing the overall performance of the building.
- Increasing the resilience of the building.
- Ensuring the health and comfort of the occupants.

SOPREMA® has the ambition to expand and diversify its offering in order to support the evolution of sustainable building.

THE CHALLENGE

Whether through building architectural quality or the development of infrastructure, community planning is what characterizes a structure's identity, efficiency and long-term development potential.

Building on the legacy of often overlooked offshoots, the choices made today will determine whether the structure will constitute an investment or, conversely, a burden for current and future generations.

OUR ROLE

Despite the borders, we all share the same planet, which means that we are all responsible for taking action.

It is undeniable, the stakeholders in the construction sector are essential players in sustainable development and their role is decisive in ensuring a better world.

It is therefore imperative for SOPREMA® to offer sustainable solutions enabling them to meet the challenges likely to affect the performance of buildings as well as the quality of life of the occupants.

OUR COMMITMENTS

The solutions presented in this guide contribute to SOPREMA's commitments in terms of sustainable development. A single solution can contribute to sustainable development by meeting several or all of the commitments listed below in various ways.

These commitments are also linked to eight categories of the major United Nations (UN) Sustainable Development Goals (SDGs) that are internationally recognized [10].

ENVIRONMENTAL PROTECTION

Creating of a circular economy protects the environment by limiting the impacts of the company's products throughout their life cycle, strengthening biodiversity and intelligently using resources, energy, raw materials and recycling.

BUILDING TOMORROW

Confident in its expertise in responsible building envelopes, the company offers a range of solutions to address the issues of sustainable construction and energy efficiency. Fully aware of the constant population growth in urban environments, SOPREMA® offers practical solutions (systems, products, etc.) to help develop more responsible, more livable buildings.

PEOPLE FIRST

SOPREMA® makes people the main focus of its strategy, where working conditions, training, respect and trust are vital to engaged employees and key to innovation and long-term growth.

Pierre-Étienne Bindschedler Building, Drummondville (QC)
Credit photo: Bilodeau Baril Leeming Architectes – Nicolas Bilodeau

NOTE TO READERS

The solutions presented in this guide can help improve communities and buildings. However, they do not address the unfavorable components associated with them.

For example, a solution contributing to energy efficiency can improve the thermal performance of the building and the comfort of the occupants. However, it can also negatively affect health and the environment at other stages of its life cycle.

To avoid greenwashing, some products deemed unfavorable are not presented. Remember that this guide is limited exclusively to the use stage, so the reader needs to exercise judgment.

EXPLANATION OF THE GUIDE STRUCTURE

03

WATER MANAGEMENT

1. ISSUE

Each numbered part addresses a sustainable development issue or challenge. This subsection briefly explains the subject.

Water is one of the vital elements for maintaining life. In addition to the waste caused by carelessness regarding the management of this resource, human activities influence hydrological processes, thus compromising its quality. Only 45% nation's 3.5 million miles of rivers and streams were rated good (487,299 out of 1,107,002). Others are either impaired or threatened. [14].Added to this are urban densification, urban sprawl and soil sealing, which intensify and jeopardize the viability of communities. The saturation of wastewater treatment plants (overflows), flood risks, and release of polluted water into natural environments are some of the issues surrounding water management.

- In 2016, $56 billions were lost as a result of flood-related disasters globally. In the US, freshwater flooding averaged $8.2 billions of damages per year over the past 30 years. A 2018 study shows that 41 million Americans live in the flood zone (about 12.5% of US population). [15].

2. SOLUTIONS

This subsection generally discusses solutions to meet challenges or resolve problems related to the issue.

SOLUTIONS

In order to mitigate these problems, it is important to reduce water runoff and further plant vegetation on mineralized surfaces. Offering multiple benefits, greening of buildings and infrastructure is one of the solutions to achieve this.

Whether vertical (wall) or horizontal (roof), green surfaces offer proven technical solutions to absorb, retain and filter rainwater while attenuating the pressure exerted on infrastructures. Control flow systems to retain rainwater are also used.

- For example, a standard roof would have a runoff rate of approximately 81% compared to 40% for a green roof with a 5.9 in (15 cm) substrate [16]. Depending on the type of system and thickness of the substrate, the water retention rate can vary from 40% to 50% in winter and from 70% to 100% in summer [17].

VEGETATED ROOFS: SOPRANATURE®

SOPRANATURE® vegetated roof systems retain and filter rainwater, which is an efficient – and often underused – additional function for the roof.

With their capacity of retaining water in the substrate and allowing evapotranspiration of plants, SOPRANATURE® systems can reduce the risk of flooding and pollution of natural environments.

3. PRODUCTS AND SYSTEMS

This subsection concerns SOPREMA® products or systems identified as a solution.

4. CONTRIBUTION METRICS

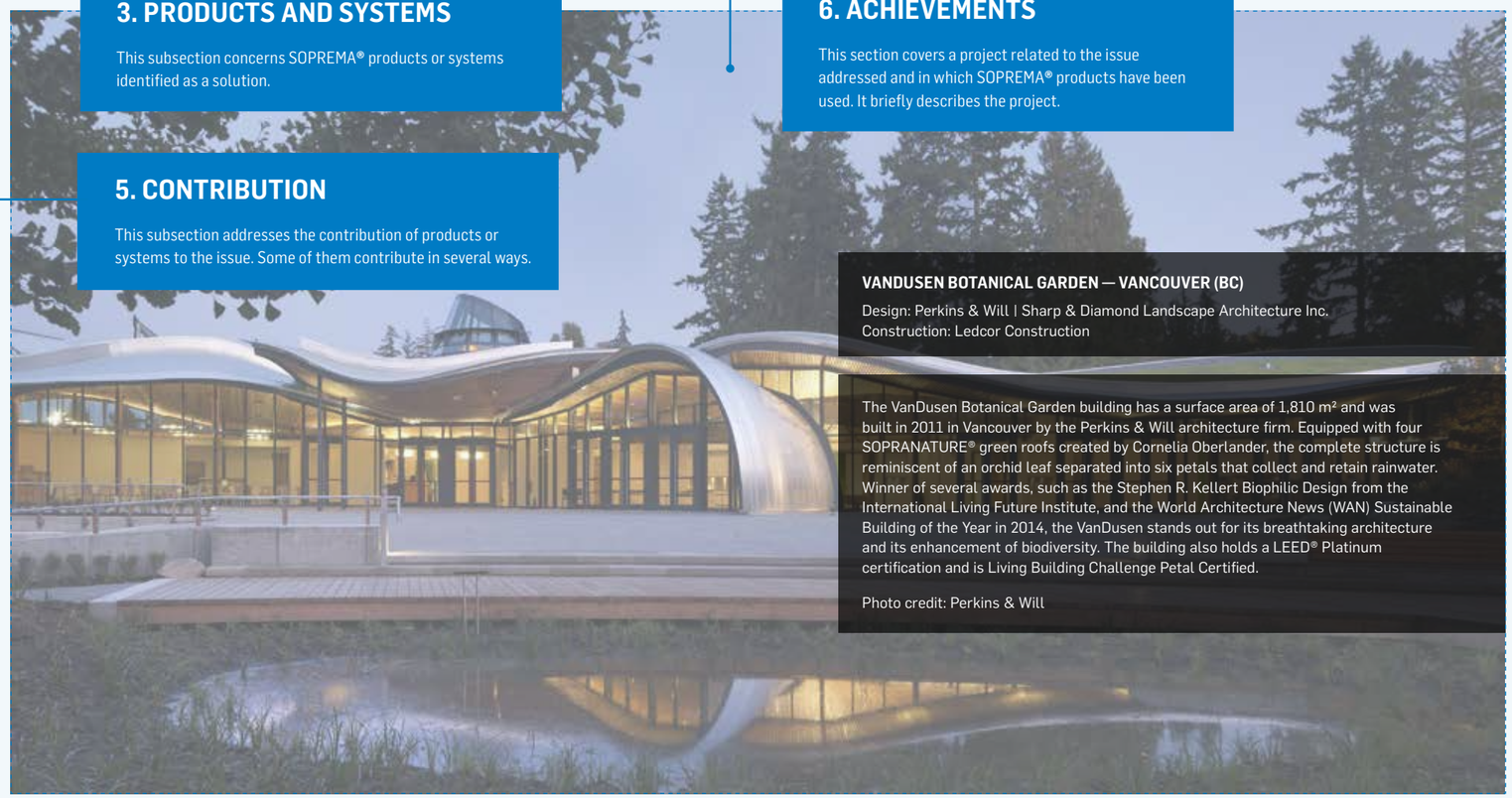
These symbols indicate the type of contribution of the products or systems toward SOPREMA's commitments to sustainable development.

5. CONTRIBUTION

This subsection addresses the contribution of products or systems to the issue. Some of them contribute in several ways.

6. ACHIEVEMENTS

This section covers a project related to the issue addressed and in which SOPREMA® products have been used. It briefly describes the project.



VANDUSEN BOTANICAL GARDEN — VANCOUVER (BC)

Design: Perkins & Will | Sharp & Diamond Landscape Architecture Inc.
Construction: Ledcor Construction

The VanDusen Botanical Garden building has a surface area of 1,810 m² and was built in 2011 in Vancouver by the Perkins & Will architecture firm. Equipped with four SOPRANATURE® green roofs created by Cornelia Oberlander, the complete structure is reminiscent of an orchid leaf separated into six petals that collect and retain rainwater. Winner of several awards, such as the Stephen R. Kellert Biophilic Design from the International Living Future Institute, and the World Architecture News (WAN) Sustainable Building of the Year in 2014, the VanDusen stands out for its breathtaking architecture and its enhancement of biodiversity. The building also holds a LEED® Platinum certification and is Living Building Challenge Petal Certified.

Photo credit: Perkins & Will

01 ECO-SOURCED MATERIALS

Globally, nearly 3 billion tons of raw materials are consumed each year to manufacture construction products [11]. Analysis of trends shows that the use of raw materials should nearly double by 2060 [12].

These figures show that buildings cause a high consumption of resources and energy throughout their life cycle. With the increase in the use of non-renewable resources, it is essential to rethink how construction products are designed. While achieving good value for money, the challenge is to offer high-performance products from renewable resources that are less damaging to health and the environment.

SOLUTIONS

Based on the 4R principle, reduction at the source can be achieved using eco-sourced materials, that is, a material made from recycled or bio-based material. Positioned at the leading edge of a new generation of products manufactured on an industrial scale, SOPREMA® already offers some eco-sourced solutions.

An independent third party has verified the recycled content of the products listed below in accordance with the requirements of ISO 14020/21 and ISO 7000-1135. The product-specific recycled content certificate provides information on pre-consumer and post-consumer recycled content. This excludes the portion related to the recovery of materials in the manufacturing process.

THERMAL INSULATION AND SOUNDPROOFING OF WALLS, FLOORS, CEILINGS AND ATTICS: SOPRA-CELLULOSE (CANADA ONLY)

Composed of 83% recycled paper and cardboard, SOPRA-CELLULOSE products appear as small, gray, smooth fibers. They are odorless and have a low-VOC content. They act as a protective shield to reduce heat and noise transmission.

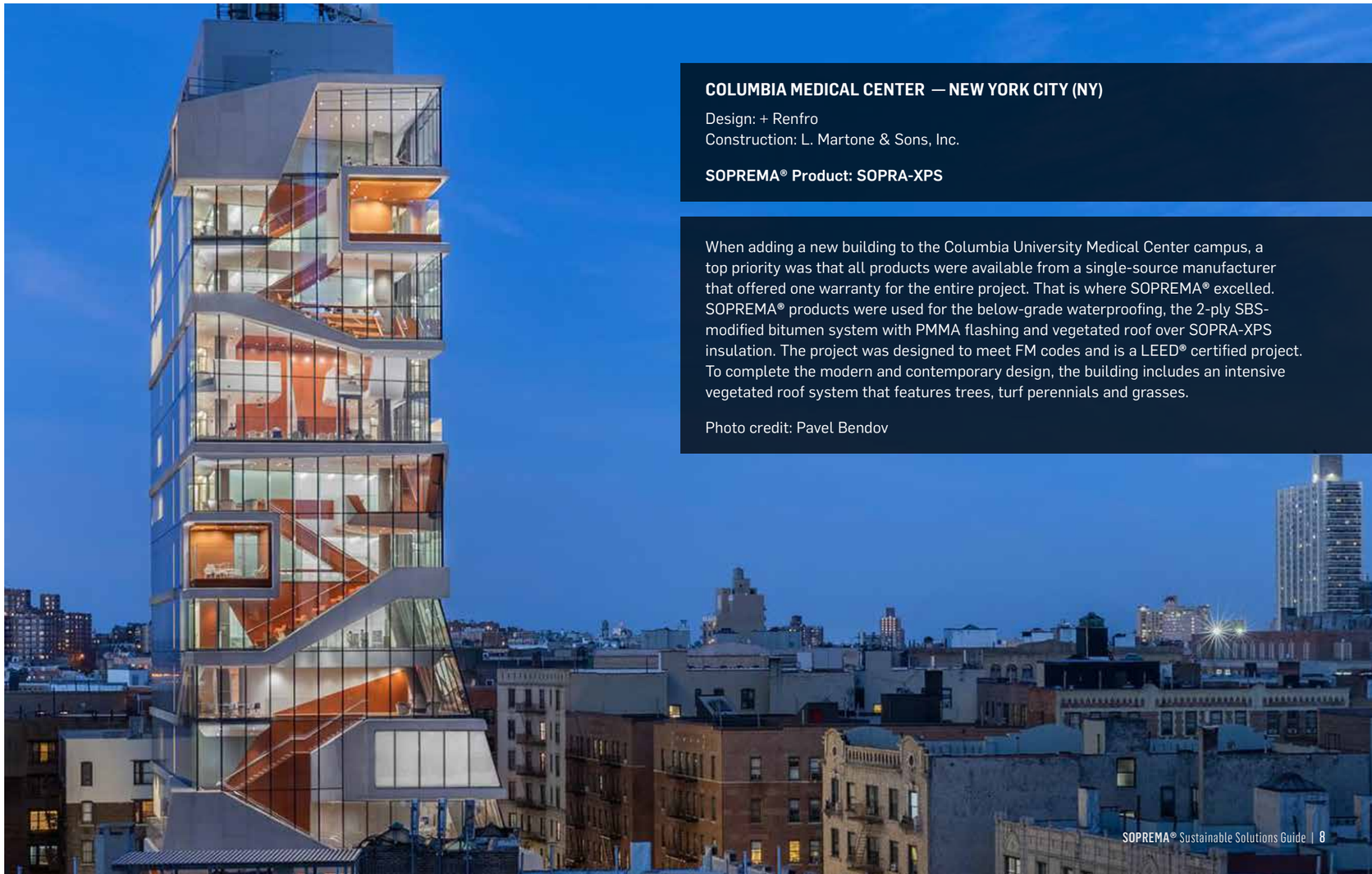
In terms of contribution, SOPRA-CELLULOSE products globally mitigate certain environmental impacts of the building by using recycled materials.

THERMAL INSULATION OF ROOFS, WALLS AND FOUNDATIONS: SOPRA-XPS

Made with up to 70% recycled and recovered polystyrene, SOPRA-XPS products are thermal insulation boards made of rigid extruded polystyrene composed of closed-cell foam. They are mainly used as thermal insulation in walls, foundations and roof assemblies.

In terms of contribution, (relevant) SOPRA-XPS products globally mitigate certain environmental impacts of the building by being made of recycled materials. In addition, both the residues generated and the products are recyclable when they reach the end of their useful life.

In addition, SOPREMA® now uses a new HFO blowing agent to produce SSOPRA-XPS, which has a global warming potential of less than 1 – the lowest in the industry.



COLUMBIA MEDICAL CENTER — NEW YORK CITY (NY)

Design: + Renfro
Construction: L. Martone & Sons, Inc.

SOPREMA® Product: SOPRA-XPS

When adding a new building to the Columbia University Medical Center campus, a top priority was that all products were available from a single-source manufacturer that offered one warranty for the entire project. That is where SOPREMA® excelled. SOPREMA® products were used for the below-grade waterproofing, the 2-ply SBS-modified bitumen system with PMMA flashing and vegetated roof over SOPRA-XPS insulation. The project was designed to meet FM codes and is a LEED® certified project. To complete the modern and contemporary design, the building includes an intensive vegetated roof system that features trees, turf perennials and grasses.

Photo credit: Pavel Bendov

02 BIODIVERSITY

Urban development is putting increasing pressure on biodiversity. Almost 70% of the world's forests are located less than one mile away from a city. Hence, these natural environments are likely to be exposed to the degrading effects of developments, which can reduce biodiversity by 13% to 75% and alter the essential functions of ecosystems (climate regulation, carbon sequestration, water and air filtration, etc.). [13]

Therefore, preserving and enhancing biodiversity is a significant challenge in areas of expanding urbanization. Although the conservation of natural environments is essential, in a development context, the major challenge is undoubtedly to succeed in restoring the ecological functions that were degraded by this phenomenon, namely by integrating nature as a component of the built environment.

The development of biodiversity also requires implementing land-use planning tools such as habitat networks and creating ecological refuges and green infrastructure such as ecological corridors. These components aim to create an ecological network on a territorial scale and ensure ecosystems' longevity in an urban environment.

SOLUTIONS

Creating vegetated buildings is one of the solutions to greening construction and communities. To a certain extent, it allows for the following:

- Enhance and preserve biodiversity from mineralized and often underused surfaces.
- Ensure connectivity with nature and maintain some ecosystem services (ESs).
- Bring construction and nature together; providing environments that promote the development of species and ecosystems.

VEGETATED ROOFS: SOPRANATURE®

SOPRANATURE® vegetated roof systems can help integrate plant diversity and density into the building.

Supporting biodiversity, these systems also promote the creation of living ecosystems. The added vegetation also provides insect, bird and pollinator access to plants, thus contributing to nature conservation in the heart of urban areas disturbed by human activities.

FRÉDÉRIC BACK CULTURE AND ENVIRONMENT CENTER — QUEBEC CITY (QC)

Design: Brière, Gilbert + Associates
Construction: Maurice Lachance Enterprises

SOPREMA® Product: SOPRANATURE®

The Frédéric Back Culture and Environment Center, with an area of 40,000 ft², hosts more than 30 cultural, social and environmental organizations in Quebec (QC). This $4 million project respects several principles of sustainable development while optimizing energy consumption. In addition to using ecological materials, the presence of three SOPRANATURE® green roofs since 2003 puts biodiversity first.

Photo credit: Carl M. Perreault

03 WATER MANAGEMENT

Water is essential for maintaining life. In addition to the waste caused by carelessness regarding the management of this resource, human activities influence hydrological processes, thus compromising its quality. Only 45% of the nation's 3.5 million miles of rivers and streams were rated good (487,299 out of 1,107,002). Others are either impaired or threatened. [14].

Added to this are urban densification, urban sprawl and soil sealing, which intensify and jeopardize the viability of communities. Water management issues surrounding water management include the saturation of wastewater treatment plants (overflows), flood risks and the release of polluted water into natural environments.

- In 2016, $56 billion were lost due to global flood-related disasters. In the United States, freshwater flooding averaged $8.2 billion in yearly damages over the past 30 years. A 2018 study showed that 41 million Americans live in a flood zone (about 12.5% of the U.S. population). [15].

SOLUTIONS

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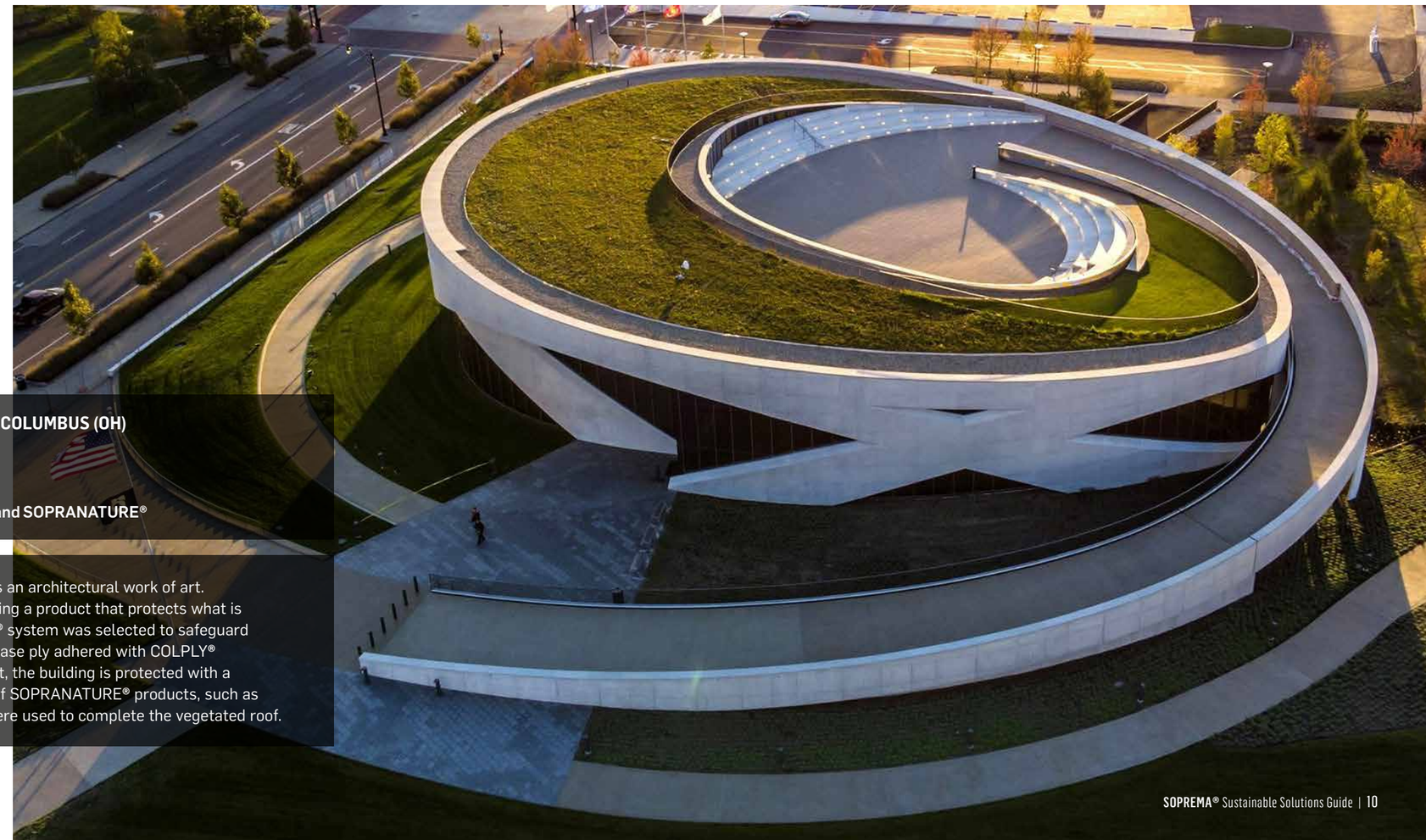


NATIONAL VETERANS MEMORIAL MUSEUM — COLUMBUS (OH)

Design: Design Group Columbus
Construction: Phinney Industrial Roofing

SOPREMA® Products: SOPRALENE®, COLPLY® and SOPRANATURE®

Opened in 2018, the National Veterans Memorial is an architectural work of art. When working on such a significant project, selecting a product that protects what is held inside was important. A complete SOPREMA® system was selected to safeguard this building. From the SOPRALENE® 180 PS 3.0 base ply adhered with COLPLY® EF to the SOPRALENE® Flam 180 FR GR cap sheet, the building is protected with a multiply, redundant system. In addition, a variety of SOPRANATURE® products, such as SOPRANATURE® Root Barrier and Filter Fabric, were used to complete the vegetated roof.

04 HEAT ISLANDS

As they are accentuated by climate change, heat waves are increasing in duration, frequency and intensity. Moreover, the building structure, the densification of human activities and the mineralization of surfaces make urban environments even more favorable to heat islands.

- Temperatures in urban areas can be up to 50°F (10°C) higher than in the peripheral regions [18]. Replacing nature (forests, marshes, fields, etc.) with infrastructure (buildings, urban networks, roads, etc.) contributes to heat absorption. Urban areas, therefore, reach higher temperatures.

There are numerous effects of heat waves on urban environments. In addition to influencing the thermal performance of buildings, extreme temperature variations increase energy consumption. Moreover, problems related to air pollution and heat stress entail risks to the health of populations [19].

SOLUTIONS

Thus, building envelope materials should not excessively absorb the heat generated by solar radiation. Here are some examples of solutions to achieve this:

- Heat can be reflected toward the sky with coatings having a high albedo level (0.60 to 0.90) [20].
- Heat can be absorbed by plants. Evapotranspiration of plants and the shade they provide help regulate the temperature [17].

HEAT REFLECTIVITY OF ROOFS: SOPRALENE®/ELASTOPHENE®

SOPRALENE®/ELASTOPHENE® products are self-adhesive cap sheet membranes with a strong composite reinforcement and a surface covered with bright white SG reflective granules.

In terms of contribution, the reflectivity of SOPRALENE®/ELASTOPHENE® membranes attenuates the heat absorption on the roof.

VEGETATED ROOFS: SOPRANATURE®

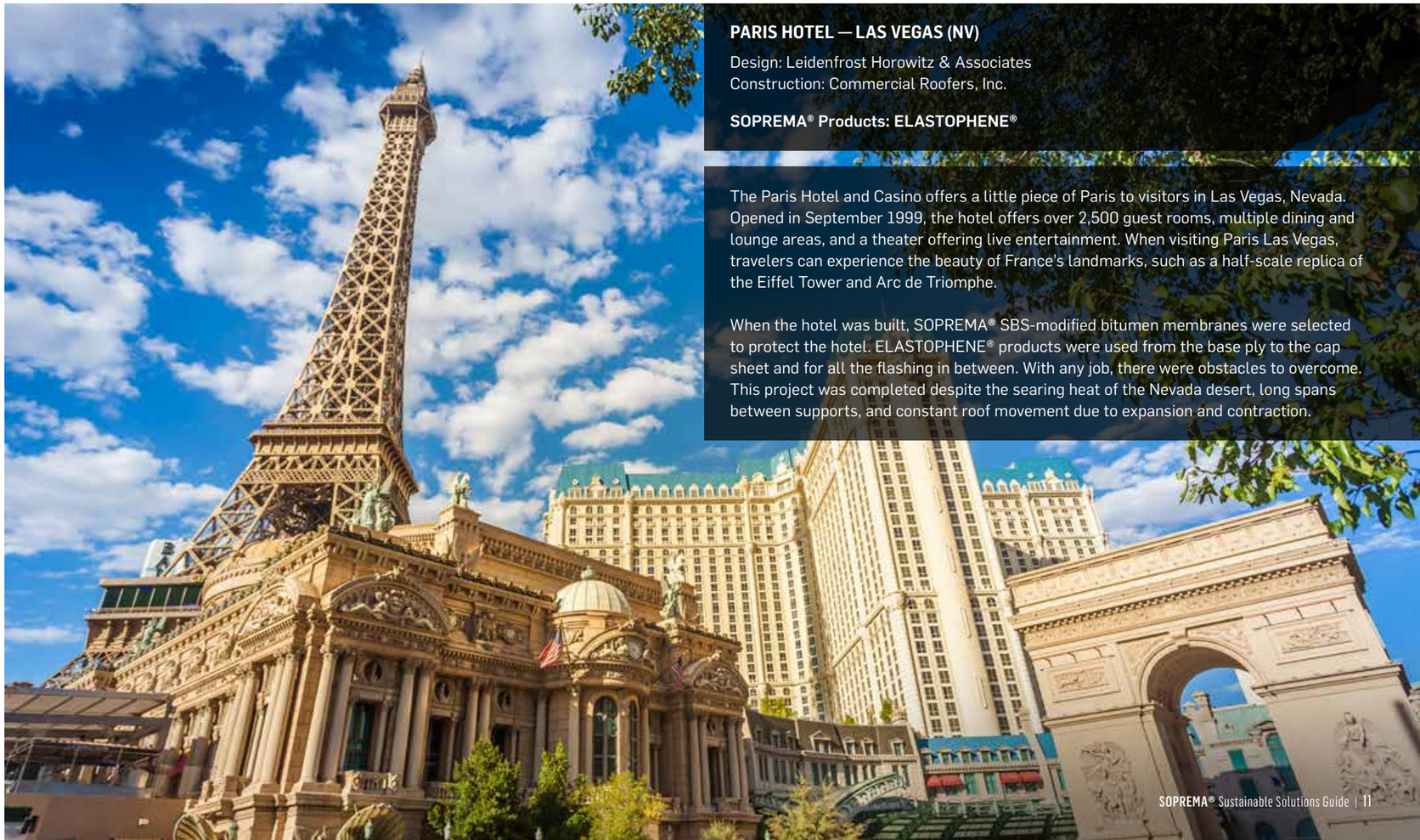
SOPRANATURE® vegetated roof systems provide shade, absorb solar radiation and emit coolness.

With their capacity to retain water in the substrate and allow evapotranspiration from plants, SOPRANATURE® systems can naturally regulate the temperature. Plants also help reduce air pollution by oxygenating living environments.

HEAT REFLECTIVITY OF ROOFS: SENTINEL®

SENTINEL® membranes contain thermoplastic polyvinyl chloride (PVC) and a non-woven polyester reinforcement. They are used in single-ply roofing systems.

In terms of contribution, the reflectivity of SENTINEL® membranes attenuates the absorption of heat on the roof.



PARIS HOTEL — LAS VEGAS (NV)

Design: Leidenfrost Horowitz & Associates
Construction: Commercial Roofers, Inc.

SOPREMA® Products: ELASTOPHENE®

The Paris Hotel and Casino offers a little piece of Paris to visitors in Las Vegas, Nevada. Opened in September 1999, the hotel offers over 2,500 guest rooms, multiple dining and lounge areas, and a theater offering live entertainment. When visiting Paris Las Vegas, travelers can experience the beauty of France's landmarks, such as a half-scale replica of the Eiffel Tower and Arc de Triomphe.

When the hotel was built, SOPREMA® SBS-modified bitumen membranes were selected to protect the hotel. ELASTOPHENE® products were used from the base ply to the cap sheet and for all the flashing in between. With any job, there were obstacles to overcome. This project was completed despite the searing heat of the Nevada desert, long spans between supports, and constant roof movement due to expansion and contraction.

05 AIR POLLUTION

Human activities, such as internal combustion motors used in transportation and industrial operations, release polluting components into the environment. These are generally solid particles, soluble particles or gases. They constantly interact while being affected by the intensity of human activities and weather conditions.

In high concentrations, contaminants like fine particles ($PM_{2.5}$), nitrogen oxide (NO and NO_2), ozone (O_3), sulfur dioxide (SO_2) and carbon monoxide (CO) can compromise the health of communities. Although it can vary depending on pollutant concentration or a person's sensitivity and exposure time, air pollution generally causes respiratory and cardiovascular problems [21].

SOLUTIONS

Beyond reduction at the source and measures to control pollutant emissions, air pollution problems can be mitigated by focusing on urban greening strategies. To a certain extent, the vegetalization of buildings is one of the solutions, as it removes some contaminants from the air by acting as carbon sinks and oxygenating living environments.

VEGETATED ROOFS: SOPRANATURE®

SOPRANATURE® vegetated roof systems can reduce outdoor air pollution to a certain extent through plant photosynthesis.

The best-known example is the ability of plants to transform carbon dioxide (CO_2) into oxygen (O_2).

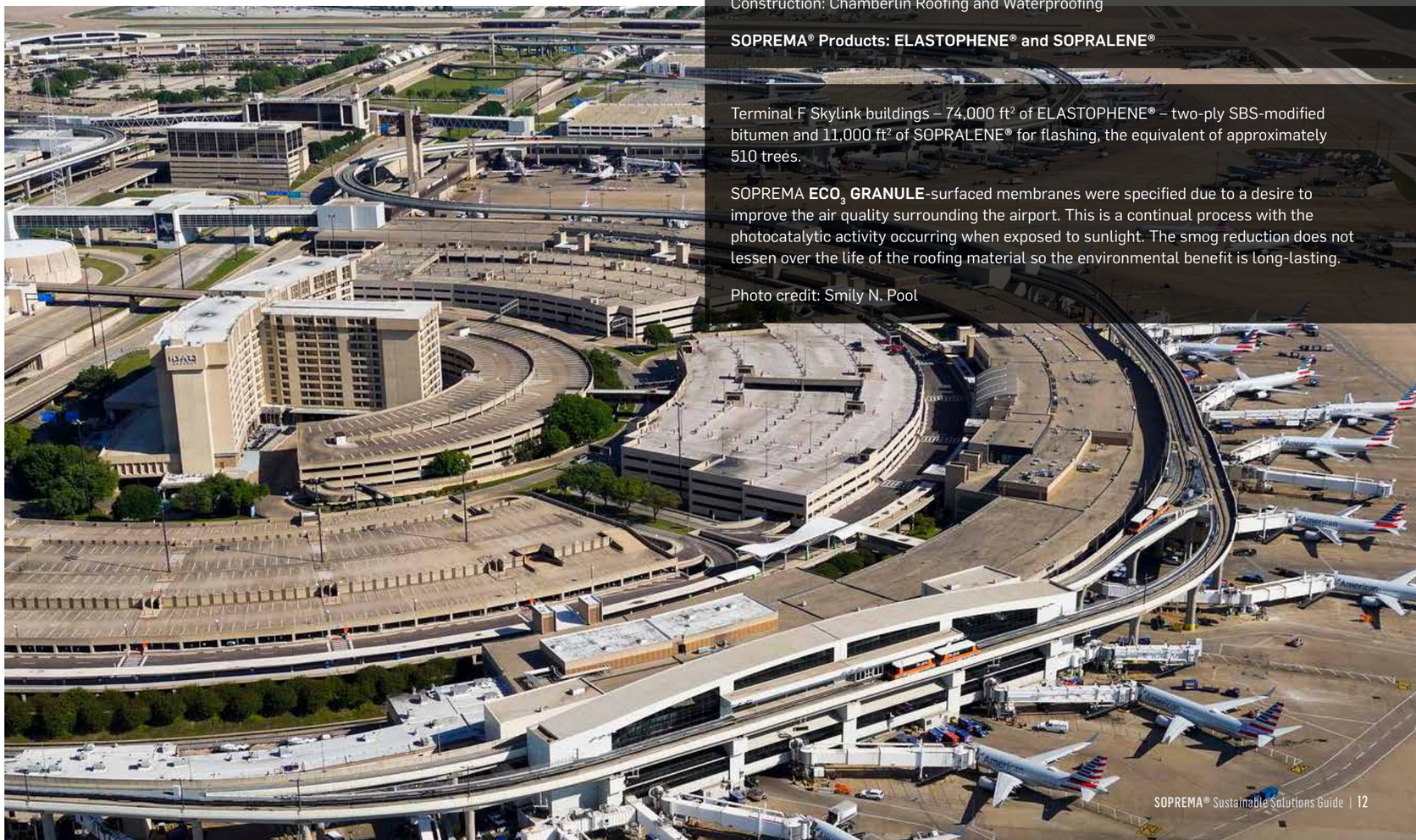
SMOG REDUCTION: ECO_3

SOPRALENE®/ELASTOPHENE® products are cap sheet membranes with a strong composite reinforcement and a surface covered with ECO_3 granules. In terms of contribution, SOPRALENE®/ELASTOPHENE® membranes convert the smog NO_x molecules to clean the air.

3M™ Smog-reducing Granules are ceramic-coated minerals designed to have smog-reducing capability. SOPREMA's **ECO_3 GRANULE**-surfaced membranes utilize this technology for low-slope roofing applications.

These roofing granules are designed with a surfacing photo-catalytic coating that transforms nitrogen oxide (NOx) into water-soluble ions that are then washed away by rainwater, having the same smog-reducing effect as trees.

A 20,000 ft² (1,859 m2m²) roof covered with **ECO_3 GRANULE**-surfaced membranes can to offset approximately 8,000 miles worth of car emissions yearly. **That is the power of 120 trees!**



DALLAS FORT WORTH AIRPORT — DALLAS (TX)

Design: PGAL Inc., Addison, TX
Construction: Chamberlin Roofing and Waterproofing

SOPREMA® Products: ELASTOPHENE® and SOPRALENE®

Terminal F Skylink buildings – 74,000 ft² of ELASTOPHENE® – two-ply SBS-modified bitumen and 11,000 ft² of SOPRALENE® for flashing, the equivalent of approximately 510 trees.

SOPREMA **ECO_3 GRANULE**-surfaced membranes were specified due to a desire to improve the air quality surrounding the airport. This is a continual process with the photocatalytic activity occurring when exposed to sunlight. The smog reduction does not lessen over the life of the roofing material so the environmental benefit is long-lasting.

Photo credit: Smily N. Pool

06 INDOOR AIR QUALITY

Everyone is exposed to pollutants in indoor air. Air pollution comes from multiple sources, including dust, certain cleaning products, carbon dioxide released by the occupants' breathing, pathogenic germs, and volatile organic compounds (VOCs) in some furniture and construction materials.

- High emission rates of VOCs can affect comfort and compromise the health of individuals. Short-term exposure to high concentrations can also lead to respiratory problems, headaches and irritation of the eyes, nose and throat. Most VOCs give off an odor, but not smelling anything doesn't mean there is no exposure. Some VOCs are harmful at concentrations below their detection threshold [22].

SOLUTIONS

In the case of construction products, measures can be taken to reduce exposure to VOCs indoors by carrying out an intensive purge of the building air at the end of the work. However, this does not eliminate the potentially harmful effects on health and the environment. Selecting products that have ultra-low VOCs or have a low emission rate is more efficient in ensuring the quality of indoor air.

INSULATION PRODUCTS: GREENGUARD GOLD CERTIFIED

GREENGUARD certification establishes chemical emission limits. It certifies that the product contributes to reducing the risk of exposure to toxic chemicals and to promoting the creation of healthier indoor environments [23].

Strict health criteria seek low levels of total VOC emission to guarantee that the products are acceptable in facilities like schools and hospitals.

The following insulation products meet the criteria:

- SOPRA-CELLULOSE
- SOPRA-ISO
- SOPRA-XPS

ULTRA-LOW VOC LIQUID WATERPROOFING: ALSAN® TRAFIK RS

ALSAN® TRAFIK RS is a liquid water-proofing product with ultra-low VOC and longevity in the field. It is a water-reactive polymethyl methacrylate (PMMA) used as a waterproofing membrane for concrete parking decks.

Applying these products can help optimize the use of available space, particularly while ensuring the durability of underground parking garages.

ULTRA-LOW VOC GENERAL PURPOSE SEALANT: SOPRAMASTIC™ SP1

SOPRAMASTIC™ SP1 is a moisture-cured polyether sealant used in approved multi-ply membrane and flashing assemblies. With ultra-low VOC and no odor, they do not alter indoor air quality and are great for any project.

ULTRA-LOW VOC LIQUID WATERPROOFING: COLPHENE® LM BARR

COLPHENE® LM BARR is a single component, 98% solids content, liquid-applied, moisture-curing elastomeric waterproofing membrane for foundations and underground structures.

This product helps improve the thermal performance of a building by waterproofing surfaces and protecting materials from humidity.

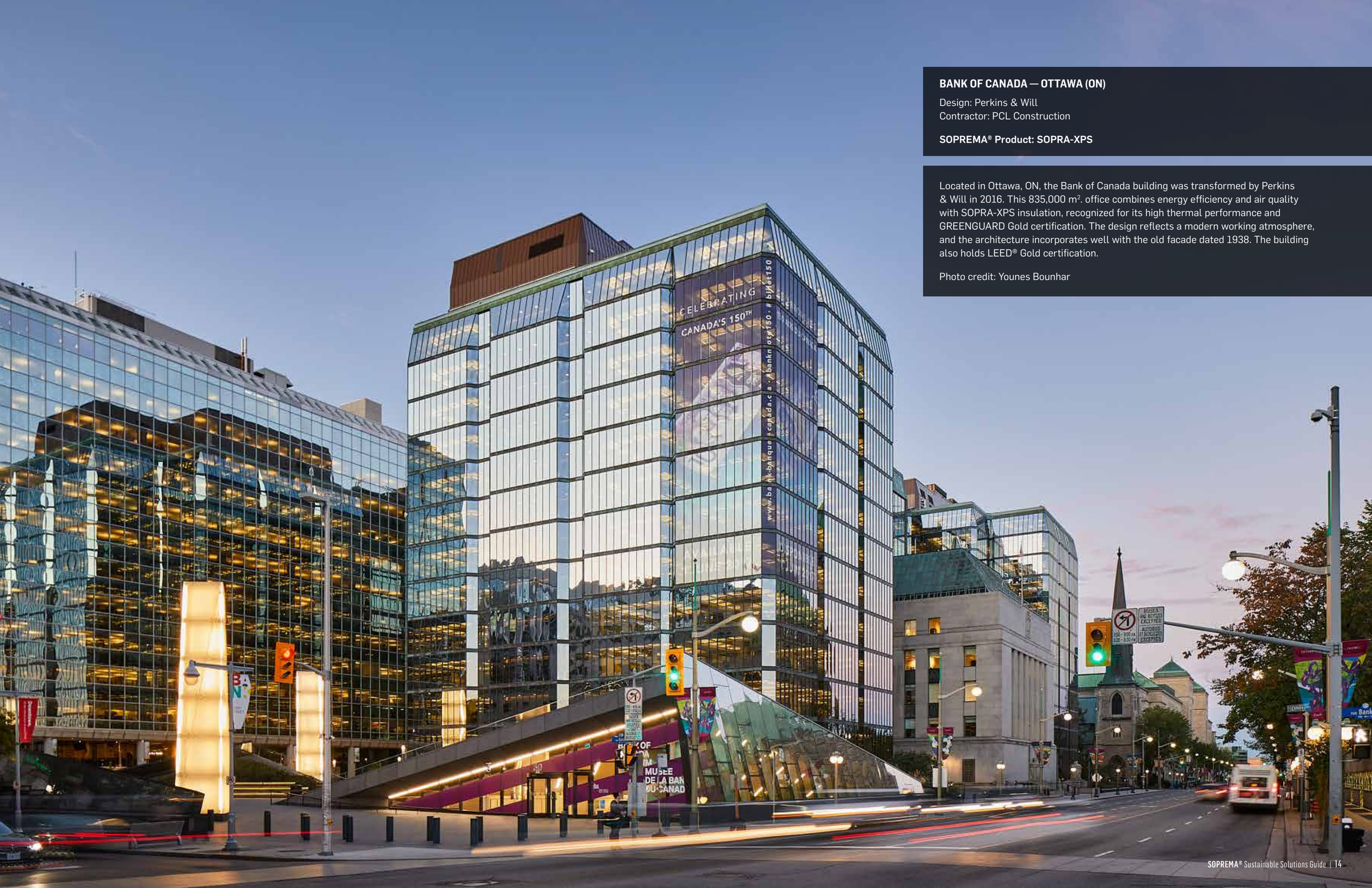
ULTRA-LOW VOC ADHESIVE PRODUCTS: DUOTACK® 365

DUOTACK® 365 adhesive product is a polyurethane-based, low expansion, two-component adhesive used to bond insulation boards, cover boards and thermal barriers.

With ultra-low VOC and no odor, they do not alter indoor air quality.

ULTRA-LOW VOC ADHESIVE PRODUCTS: COLPLY® EF

COLPLY® EF is a moisture-cured polyether adhesive designed for use with an SBS-modified bitumen membrane system. COLPLY® EF Adhesive offers application flexibility on job sites where exposure to VOCs or odor may be a concern. Additionally, the product can be applied to green concrete substrates, expediting the schedule for roofing installation.



BANK OF CANADA — OTTAWA (ON)

Design: Perkins & Will
Contractor: PCL Construction

SOPREMA® Product: SOPRA-XPS

Located in Ottawa, ON, the Bank of Canada building was transformed by Perkins & Will in 2016. This 835,000 m². office combines energy efficiency and air quality with SOPRA-XPS insulation, recognized for its high thermal performance and GREENGUARD Gold certification. The design reflects a modern working atmosphere, and the architecture incorporates well with the old facade dated 1938. The building also holds LEED® Gold certification.

Photo credit: Younes Bounhar

07 ENERGY EFFICIENCY – BUILDING ENVELOPE

The total global floor surface area of buildings in the world reached 2.5 trillion ft² (235 billion m²) in 2016, resulting in growth in final energy consumption. In general, the growth in energy demand increases total global greenhouse gas (GHG) emissions. In 2015, the part of global CO_2 reached 28% for buildings and 11% for the construction industry. However, 82% of the energy consumed to power buildings worldwide is of fossil origin [24].

SOLUTIONS

Beyond the potential savings for the owner, the use of insulation and waterproofing products can reduce the overall energy consumption and, thereby, lower the carbon footprint of a building.

It is important to choose the right type of insulation and waterproofing product to ensure the assembly quality of the building envelope. A guide to help professionals design wall assemblies is also available: **SOPREMA'S FOUNDATION & WALL BROCHURE.**

THERMAL INSULATION AND SOUNDPROOFING OF WALLS, FLOORS, CEILINGS AND ATTICS: SOPRA-CELLULOSE (CANADA ONLY)

Composed of 83% recycled paper and cardboard, SOPRA-CELLULOSE products appear as small, gray, smooth fibers. They are odorless and have a low VOC content. Moreover, they act as a protective shield to reduce heat and noise transmission.

SOPRA-CELLULOSE improves the thermal performance of a building with its insulating properties.

THERMAL INSULATION OF WALLS AND ROOFS: SOPRA-ISO

SOPRA-ISO products are closed-cell polyisocyanurate thermal insulation boards available with several types of coatings, including an organic coating reinforced with fiberglass. They are among the roof and wall insulation materials with the highest thermal resistance.

SOPRA-ISO improves the thermal performance of a building thanks to its insulating properties.

THERMAL INSULATION OF ROOFS, WALLS AND FOUNDATIONS: SOPRA-XPS

Made with upwards of 70% recycled and recovered polystyrene, (relevant) SOPRA-XPS products are thermal insulation boards made of rigid extruded polystyrene composed of closed-cell foam. They are mainly used as thermal insulation in walls, foundations and roof assemblies.

SOPRA-XPS improves the thermal performance of a building thanks to its insulating properties. In addition, the residues generated during manufacturing can be recycled along with the finished goods when they reach the end of their useful life.

VAPOR BARRIER MEMBRANES: SOPRAVAP'R®

SOPRAVAP'R® self-adhesive vapor barrier membranes are used in insulated roofing systems. They are made of bitumen modified with SBS polymers, a trilaminate woven polyethylene facer and a silicone release protection film on the under-face.

They help improve the thermal performance of a building by limiting air infiltration and exfiltration.

AIR BARRIER MEMBRANES: SOPRASEAL®

SOPRASEAL® products are air barrier membranes permeable or impermeable to water vapor for liquid or sheet application. They are designed for wall assemblies.

They help improve the thermal performance of a building by limiting air infiltration and exfiltration.

RESISTO® equivalent: REDZONE products

WATERPROOFING MEMBRANES: COLPHENE®

COLPHENE® liquid or sheet products are waterproofing membranes for foundations and underground structures. Their applications are numerous.

They help improve the thermal performance of a building by waterproofing surfaces and protecting materials from humidity.

RESISTO® equivalent: SELF-ADHESIVE WATERPROOFING MEMBRANE

VEGETATED ROOFS: SOPRANATURE®

SOPRANATURE® vegetated roof systems act as an additional protective layer that prolongs the useful life of the waterproofing system while also increasing the thermal insulation of the surface covered.

They contribute to improving the energy efficiency of the building thanks to their substrate. As it is also considered a carbon sink, plants will transform carbon dioxide (CO_2) into oxygen (O_2).

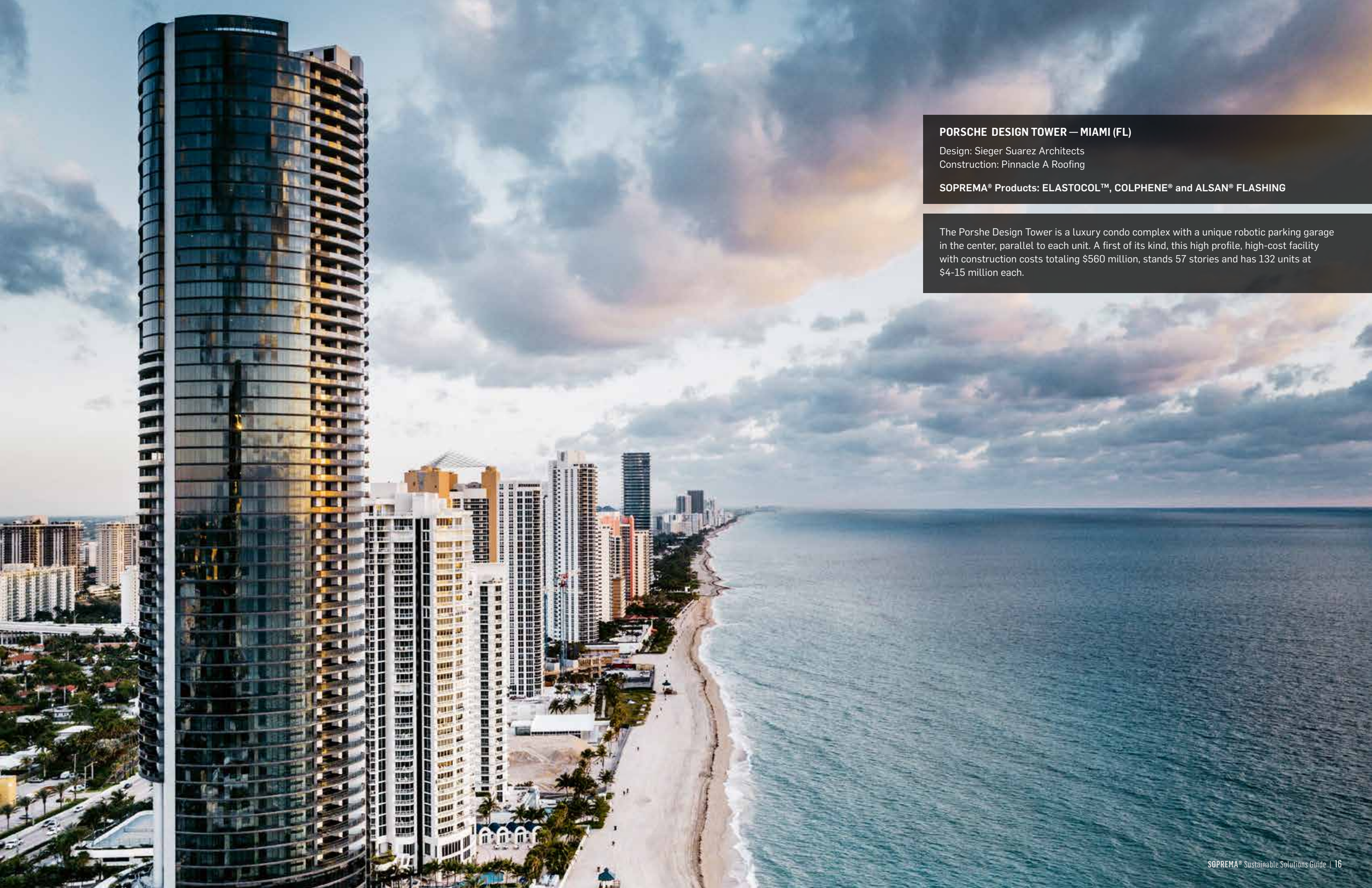
ROOF WATERPROOFING MEMBRANES

As an essential component of the building envelope, waterproofing membranes protect the integrity of the roofing system's base sheet.

In general, the products listed below contribute to the efficiency and performance of the underlayment materials from a long-term perspective:

- ALSAN® RS (LIQUID MEMBRANE)
- ELASTOPHENE®
- SENTINEL®
- SOPRAFLASH™
- SOPRALAP™
- SOPRALENE®
- SOPRAPLY
- SOPRASMART®

Performance Roof Systems equivalents: Derbiflash RS, Derbicolor, Derbigum and Permacool.



PORSCHE DESIGN TOWER — MIAMI (FL)

Design: Sieger Suarez Architects
Construction: Pinnacle A Roofing

SOPREMA® Products: ELASTOCOL™, COLPHENE® and ALSAN® FLASHING

The Porshe Design Tower is a luxury condo complex with a unique robotic parking garage in the center, parallel to each unit. A first of its kind, this high profile, high-cost facility with construction costs totaling $560 million, stands 57 stories and has 132 units at $4-15 million each.

BULLITT CENTER — SEATTLE (WA)

Design: Miller Hull
Consultant: RDH
Construction: Snyder Roofing

SOPREMA® Product: SOPRALENE®

The Bullitt Center is the product of the Bullitt Foundation's vision to promote urban sustainability in Cascadia, the Northwest corner of the United States and the Southwest corner of Canada. The building features many green concepts, including net zero energy and water, composting toilets, toxic-free materials, FSC wood, solar panels, rainwater harvesting and more.

Several SOPREMA® products were installed in this project, including SOPRALENE® Flam 250 FR GR, which is rated for cool roof by CRRC.

Photo credit: Bullitt Center

08

THERMAL COMFORT – BUILDING ENVELOPE

A comfortable and stable interior temperature ensures the well-being of the occupants, protecting the health of those most vulnerable while helping with energy efficiency. Based on the fact that North Americans spend an average of more than 87% of their daily time inside buildings [6], ensuring comfort is essential.

Due to climate change, we can conclude that scorching temperatures will become more frequent and extreme, worsening any heat wave [25]. Logically, the occupants of a building with an inadequate envelope will be more affected by these climatic hazards.

Gaps in a wall assembly can cause air infiltration and exfiltration. Humidity control also plays a part as it is essential to limit the risk of water infiltration and the growth of microbial agents thriving in high humidity, such as mold. For example, thermal bridges can alter the thermal performance of assemblies and increase the risk of condensation on the inside of material surfaces.

SOLUTIONS

Choosing the right type of insulation and waterproofing products is important to ensure the comfort and well-being of building occupants. A guide to help professionals design wall assemblies is also available: **SOPREMA'S WALL & FOUNDATION BROCHURE.**

THERMAL INSULATION OF ROOFS, WALLS AND FOUNDATIONS: SOPRA-XPS

Made with upwards of 70% recycled and recovered polystyrene, (relevant) SOPRA-XPS products are thermal insulation boards made of rigid extruded polystyrene composed of closed-cell foam. They are mainly used as thermal insulation in walls, foundations and roof assemblies.

SOPRA-XPS improves the thermal performance of a building thanks to its insulating properties. In addition, both the residues generated and the products are recyclable when they reach the end of their useful life.

THERMAL INSULATION OF ROOFS, WALLS AND FOUNDATIONS: ALSAN® RS (LIQUID MEMBRANE)

ALSAN® RS offers a complete range of high-performance, flexible, seamless, polyester reinforced liquid-applied polymeric roofing solutions. ALSAN® RS can extend the life of an existing roof installation, limiting the need for tear-off and providing long-term, cost-effective protection against moisture infiltration and other damage.

THERMAL INSULATION OF WALLS AND ROOFS: SOPRA-ISO

SOPRA-ISO products are closed-cell polyisocyanurate thermal insulation boards available with several types of coatings, including an organic coating reinforced with fiberglass. They are among the roof and wall insulation materials with the highest thermal resistance.

SOPRA-ISO improves the thermal performance of a building thanks to its insulating properties.

THERMAL INSULATION AND SOUNDPROOFING OF WALLS, FLOORS, CEILINGS AND ATTICS: SOPRA-CELLULOSE (CANADA ONLY)

SOPRA-CELLULOSE products appear as small, gray smooth fibers and comprise 83% recycled paper and cardboard. They are odorless and have a low VOC content. Moreover, they act as a protective shield to reduce heat and noise transmission.

SOPRA-CELLULOSE improves the thermal performance of a building with its insulating properties.

VAPOR BARRIER MEMBRANES: SOPRAVAP'R®

SOPRAVAP'R® self-adhesive vapor barrier membranes are used in insulated roofing systems. They are made of bitumen modified with SBS polymers, a trilaminate woven polyethylene facer and a silicone release protection film on the underface.

They help ensure the thermal comfort of occupants by limiting air infiltration and exfiltration.

AIR BARRIER MEMBRANES: SOPRASEAL®

SOPRASEAL® products are air barrier membranes permeable or impermeable to water vapor, for liquid or sheet application. They are designed for wall assemblies.

They help ensure the thermal comfort of occupants by limiting air infiltration and exfiltration.

RESISTO equivalent: REDZONE products

WATERPROOFING MEMBRANES: COLPHENE®

COLPHENE® liquid or sheet products are waterproofing membranes for foundations and underground structures. Their applications are numerous.

They contribute to the thermal comfort of the occupants by waterproofing surfaces and protecting materials from humidity, especially foundations.

RESISTO® equivalent: SELF-ADHESIVE WATERPROOFING MEMBRANE

VEGETATED ROOFS: SOPRANATURE®

SOPRANATURE® vegetated roof systems act as an additional protective layer that prolongs the useful life of the waterproofing system while also increasing the thermal insulation of the surface covered.

They contribute to ensuring the comfort of occupants thanks to their substrate. This additional component to the building promotes heat retention in winter and emits coolness in summer.

ROOF WATERPROOFING MEMBRANES

As an essential component of the building envelope, waterproofing membranes protect the integrity of the roofing system's base sheet.

In general, the products listed below contribute to the efficiency and performance of the underlayment materials over the long-term perspective:

- ALSAN® RS (LIQUID MEMBRANE)
- ELASTOPHENE®
- SENTINEL®
- SOPRAFLASH™
- SOPRALAP™
- SOPRALENE®
- SOPRAPLY
- SOPRASMART®

Performance Roof Systems equivalents: Derbiflash RS, Derbicolor, Derbigum and Permacool.

METROPOLITAN MUSEUM OF ART — NEW YORK CITY (NY)

Design: WJE Architects
Construction: Eagle One Roofing & High Tech Roofing Co.

SOPREMA® Product: COLPHENE®

The Metropolitan Museum of Art, located in New York City, is the largest museum in the United States and one of the world's largest art galleries. It houses more than two million works of art from artists around the world, ranging from historical paintings and sculptures to modern art. With such a wide array of art, it is one of the most visited art museums in the world.

SOPREMA® was chosen to protect this collection spanning 5,000 years of world culture. Since it was built in 1874, the museum has had many expansions and multiple additions surrounding the original building. SOPREMA® waterproofing products were used during the museum's expansion, including COLPHENE® 3000, to provide a watertight solution for the foundation. This waterproofing system is a flexible, versatile, dependable, roll-type waterproofing membrane.

09

ACOUSTIC COMFORT – SOUNDPROOFING

Whether from infrastructure (highways, airports, railways, etc.), occasional events (construction works, shows, sporting events, etc.) or the surrounding neighborhood (ventilation, cars, pedestrians, etc.), noise can come from multiple sources.

Noise is generally a set of sounds perceived as harmful and annoying. Although it is a subjective concept, frequent and loud noise can affect people's well-being and quality of life. In addition to disturbing someone's concentration, noise can lead to hearing loss, sleep disorders, stress and cardiovascular problems, to name a few [26].

SOLUTIONS

Reducing noise at the source is not always possible. However, several soundproofing solutions applicable to buildings can reduce it. When selecting products, designers must consider the assembly to effectively reduce the transmission of airborne noise (outdoor activities) and indoor noise (conversation, ventilation, pipes, music, impacts, etc.).

SOUNDPROOFING OF FLOORS: INSONOFLOOR

The INSONOFLOOR membrane is made of high-density polyethylene covered with recycled rubber granules. It is designed to soundproof laminated floating floors and other types of flooring, such as hardwood floors or multilayer engineered wood floors.

It helps mitigate the effects of noise and limit its transmission.

SOUNDPROOFING OF WALLS AND CEILINGS: ACOUSTIZOL NG

ACOUSTIZOL NG is composed of polyester fibers laminated on continuous aluminum foil. It is designed for wall and ceiling soundproofing.

It helps mitigate the effects of noise and limit its transmission.

SOUNDPROOFING OF CERAMIC SURFACES: INSONO AF3

INSONO AF3 membranes are composed of self-adhesive elastomeric bitumen with a non-woven polyester reinforcement. A silicone release film protects the back of the membrane. It is applied under mortar and any tile flooring.

It helps mitigate the effects of noise and limit its transmission.

THERMAL INSULATION AND SOUNDPROOFING OF WALLS, FLOORS, CEILINGS AND ATTICS: SOPRA-CELLULOSE (CANADA ONLY)

SOPRA-CELLULOSE products appear as small, gray smooth fibers and comprise 83% recycled paper and cardboard. They are odorless and have a low VOC content. They act as a protective shield to reduce heat and noise transmission.

They reduce noise and limit its propagation while ensuring thermal insulation.

VEGETATED ROOFS: SOPRANATURE®

SOPRANATURE® vegetated roof systems, whether intensive, semi-intensive or extensive, can absorb impact noise (rain, hailstones, etc.) and airborne noise. The noise transmission loss of the roof is around 5 dB and varies depending on the substrate thickness.

The system's plant substrate helps mitigate the effects and propagation of noise while increasing thermal insulation.

L'ÉTOILE — QUÉBEC (QC)

Design: PMA Architects
Construction: Ogesco Construction

SOPREMA® Product: INSONOFLOOR (CANADA ONLY)

The L'Étoile project in Quebec, built in 2012 and valued at $100M, is 320,000 ft² and includes nearly 260 condominiums. INSONOFLOOR products were used to soundproof floors, ensure acoustic quality and increase the comfort of the occupants. The building also has a green roof of more than 10,000 ft². The architecture firm PMA Architects created a building with a modern and upscale shape while keeping the heritage of the old monastery on the outside of the structure.

Photo credit: SOPREMA®

10 SPACE OPTIMIZATION

Urban sprawl exerts significant pressure on the environment (loss of natural habitats and agricultural lands, soil sealing, etc.), on the economy (devitalization of older neighborhoods, increase in infrastructure service and maintenance costs, etc.) and on the health of the population among others, since they generally create dependence on cars (air pollution from transportation, sedentary lifestyle, etc.). In addition to influencing lifestyles, urban sprawl generally comes with inefficient land use [27].

In these conditions, space optimization seems to be a major challenge, particularly in communities seeking to limit the expansion of their urban perimeter or in those seeking to continue their development within an already limited space.

Density and compactness are among the means to ensure the viability of local shops and services while limiting urban sprawl [28].

- Density is characterized by the number of people, dwellings or activities on an area of a territory. For communities, high density allows the recouping of investments linked to infrastructure, equipment and public services.
- Compactness is the way the land is occupied, and interactions are promoted among the people. The structure of a neighborhood, or even a building, can encourage individuals to support local businesses or to participate in community activities.

SOLUTIONS

A wide range of options can help limit a building footprint. In addition to optimizing the use of available space, these options are also synonymous with added value by creating useful, attractive, inspiring or dynamic places. Building parking lots underground or adding a terrace, a garden or a playground on the roof are some known options.

WATERPROOFING OF FLOORS, PARKING DECKS, BALCONIES AND TERRACES: ALSAN® TRAFIK RS

ALSAN® TRAFIK RS offers a complete range of high-performance, flexible, seamless, polyester reinforced liquid-applied polymeric waterproofing products. ALSAN® TRAFIK RS is composed of polymethyl methacrylate (PMMA) based resins that offer rapid set times and result in a tough and durable trafficable surface.

This ultra-low VOC product is ideal for waterproofing floors and parking garages.

VEGETATED ROOFS: SOPRANATURE®

SOPRANATURE® vegetated roof systems offer various possibilities for creating additional functional space on a roof (terrace, garden, vegetable garden, etc.).

Applying these systems can help optimize the use of available space while promoting nature directly on the building. Shared spaces allow the strengthening of social solidarity by becoming places fostering meetings and leisure activities.

WATERPROOFING OF ROOF: SOPRASOLAR FIX EVO TILT (CANADA ONLY)

The SOPRASOLAR FIX EVO TILT system consists of photovoltaic panel supports for flat or low-slope roofs.

The system makes it possible to link the panel and the cap sheet membrane without penetrating it, which could compromise the waterproofing system of the roof.

WATERPROOFING OF FLOORS AND PARKING DECKS: TRAFIKROCK (CANADA ONLY)

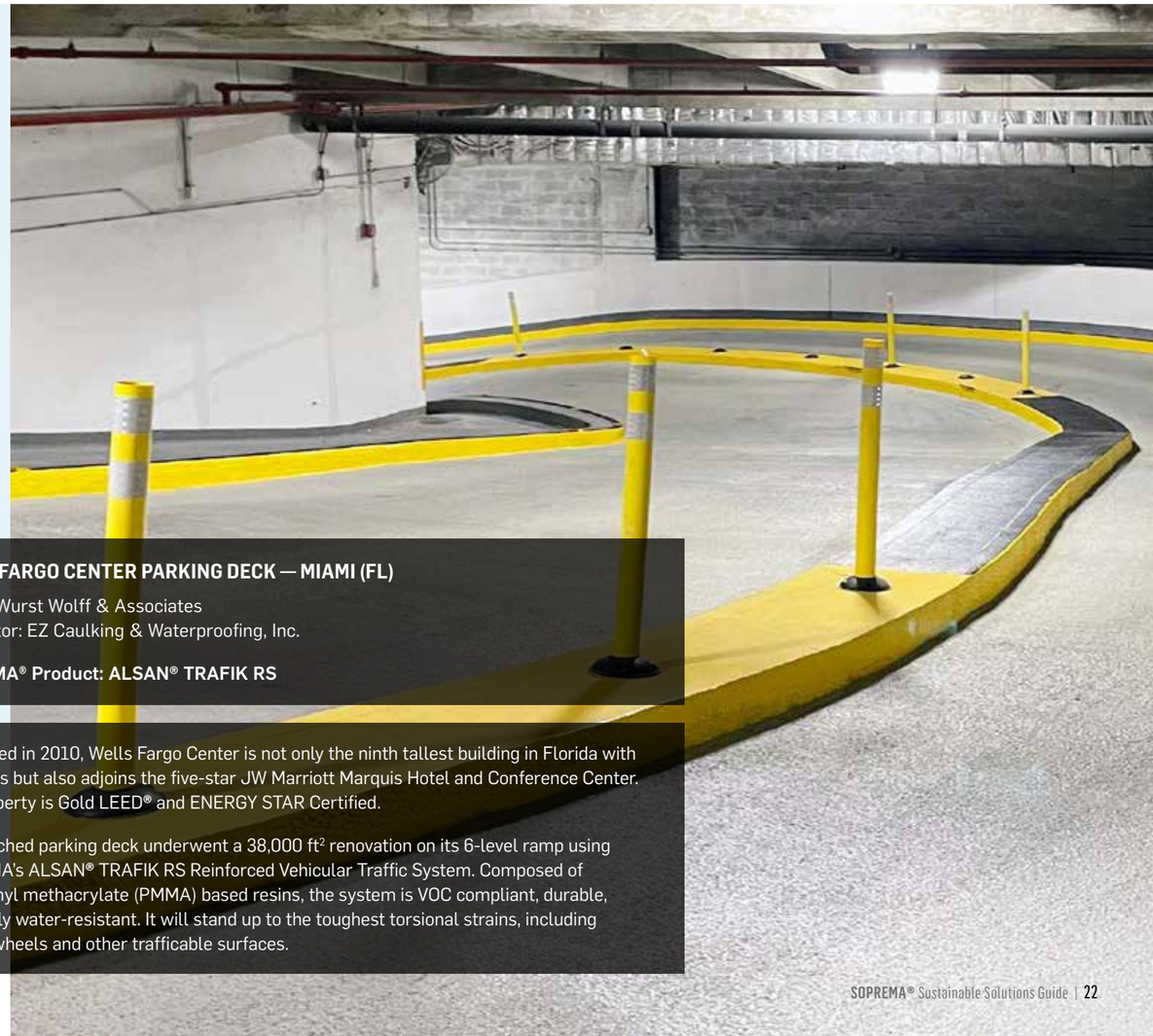
TRAFIKROCK thermo-welded membrane is composed of SBS-modified bitumen and a non-woven polyester reinforcement designed to ensure the waterproofing of parking structures.

Applying this product can help optimize the use of available space, particularly while ensuring the durability of underground parking garages.

WATERPROOFING OF BALCONIES AND TERRACES: COLPHENE®

COLPHENE® liquid or sheet products are waterproofing membranes for foundations and underground structures. They can also be integrated into the design of balconies, playgrounds or terraces.

Applying these products can help optimize the use of available space while adding value. Shared spaces allow the strengthening of social solidarity by becoming places fostering meetings and leisure activities.



WELLS FARGO CENTER PARKING DECK — MIAMI (FL)

Design: Wurst Wolff & Associates
Contractor: EZ Caulking & Waterproofing, Inc.

SOPREMA® Product: ALSAN® TRAFIK RS

Completed in 2010, Wells Fargo Center is not only the ninth tallest building in Florida with 47 stories but also adjoins the five-star JW Marriott Marquis Hotel and Conference Center. This property is Gold LEED® and ENERGY STAR Certified.

The attached parking deck underwent a 38,000 ft² renovation on its 6-level ramp using SOPREMA's ALSAN® TRAFIK RS Reinforced Vehicular Traffic System. Composed of polymethyl methacrylate (PMMA) based resins, the system is VOC compliant, durable, and highly water-resistant. It will stand up to the toughest torsional strains, including turning wheels and other trafficable surfaces.

11 FOOD PRODUCTION

Globalization, combined with the improvement of practices related to food preservation, has contributed significantly to diversifying and increasing the food supply. However, this has led to a loss of nearby food sources, resulting in compromised freshness, an increased risk of waste and a spike in the amount of CO_2 from product transportation from the land to the plate.

- For example, almost 58% of the food production in Canada is wasted at various levels. However, 77% of the waste happens before the consumer level, that is to say, from production (24%), processing (34%), industry (13%), as well as distribution and retail (6%). This would mean that 23% of the waste comes from consumers, namely households (14%) as well as hotels, restaurants and institutions (9%) [29].

Basically, part of the solution lies in initiatives to reduce waste across the value chain. By focusing on shorter travels, the geographic proximity of food can be increased while ensuring its monetary accessibility and reduction of environmental impacts. Citizen movements like urban agriculture are increasingly evident in communities and transforming consumer habits.

VEGETATED ROOFS: SOPRANATURE®

SOPRANATURE® vegetated roof systems, whether modular or intensive, can encourage various forms of urban agriculture.

They help support food production, depending on the season and the type of layout. In addition to increasing the proximity and freshness of food, local cultivation can also support biodiversity, particularly pollinating insects.

SOLUTIONS

Used to meet the aspirations of consumers concerned about making more sustainable decisions, several solutions can create spaces suitable for food production, namely by using underused surfaces such as roofs. For example, the neighborhood or the building can include a garden with beehives that produce honey or a vegetable garden growing fresh food, such as edible herbs, fruits and vegetables.

IGA® (GROCERY STORE) — MONTREAL (QC)

Architects: NEUF
Farmers: LA LIGNE VERTE

SOPREMA® Product: SOPRANATURE®

GA (Independent Grocers Alliance) is Canada's largest group of independent grocerst. In 2017, IGA Extra Famille Duchemin installed a 25,000 ft² green roof garden that produces over 30 varieties of organic vegetables and over 600 jars of honey from eight beehives. It is not only the largest organic green roof garden but also the very first grocery store to sell organic produce grown on its very own roof in Canada.

The vegetables are grown using lightweight soil with the SOPRANATURE® Green Roof system. A unique design is that water is recovered from the store's dehumidification system and used as irrigation rather than the hydroponic systems that are more commonly used elsewhere on rooftops. The store also saves energy because the garden insulates the roof from the outside temperature. The store is LEED® Gold-certified.

12 BIOPHILIA

Despite the efforts at the design level to make living environments comfortable and attractive, nature is often neglected, thus depriving occupants of its benefits related to health and well-being.

- A study from the University of Oregon found that 10% of employee absences could be attributed to architecture offering no connection to nature [30].

Therefore, in a context where multiple owners and organizations adopt initiatives to increase their capacity to attract and retain talent, several concepts such as biophilia are becoming increasingly well known.

- Biophilia can be summed up as the love of the living world and the innate tendency for humans to seek a connection with nature and living beings [31]. In architecture, this translates into a design that integrates or imitates the conditions of a natural environment for the benefit of the occupants.

SOLUTIONS

Several studies show that the presence of plants positively impacts individuals' performance, health and well-being. Increasing people's connection with nature, namely by promoting the use of natural light and by integrating nature into the living environment, would, therefore, have several benefits.

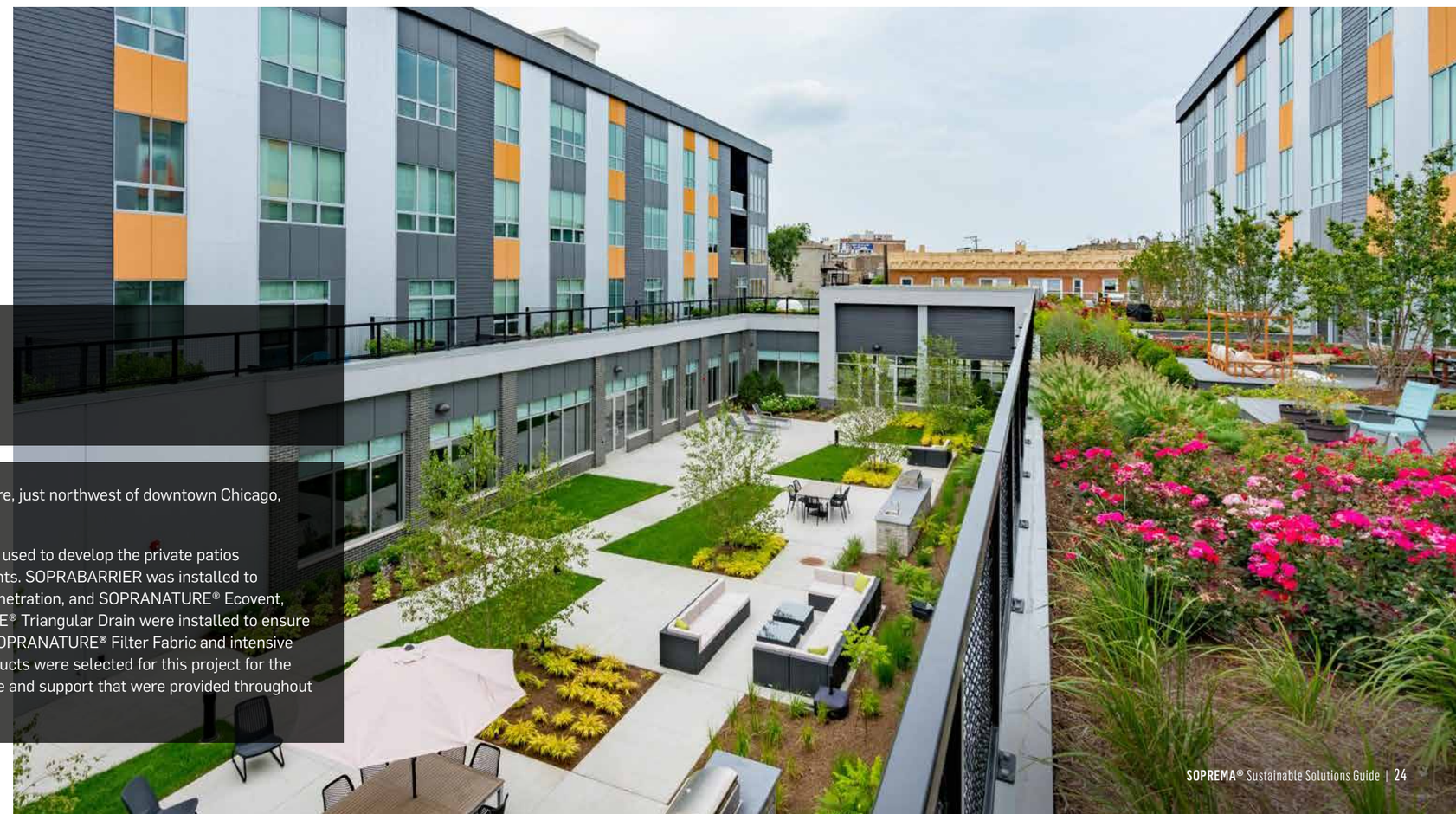
- In addition to increasing an employee's sense of well-being by 15%, a nature-oriented workplace makes them more productive (6%) and more creative (15%) [32].
- A high plant density would shorten patients' time to recover from the stress by 60% [33].
- The presence of greenery would improve the attention level of children in class while stimulating their ingenuity and their imagination [34].

If nature can't be found near buildings, it is still possible to benefit from its restorative effects by growing vegetation on buildings.

VEGETATED ROOFS: SOPRANATURE®

SOPRANATURE® vegetated roof systems can help directly integrate plant diversity and density into the building.

They help increase the connection of individuals with nature to the extent that the space is visible or accessible.



MODE APARTMENTS — CHICAGO (IL)

Design: Antunovich Associates
Construction: Donlay Roofing & Construction

SOPREMA® Product: SOPRANATURE®

The MODE Apartments, located in Logan Square, just northwest of downtown Chicago, offers residents luxurious living inside and out.

SOPREMA's SOPRANATURE® product line was used to develop the private patios and common areas that are available to residents. SOPRABARRIER was installed to protect the underlying membrane from root penetration, and SOPRANATURE® Ecovent, SOPRANATURE® Drain Box and SOPRANATURE® Triangular Drain were installed to ensure proper drainage during heavy rainfall. Lastly, SOPRANATURE® Filter Fabric and intensive media completed the system. SOPREMA® products were selected for this project for the well-known durability, quality and expert advice and support that were provided throughout the process.

AESTHETICS

Architecture characterizes the personality of a building, a neighborhood and a community. The aesthetics of the building contributes not only to its image, but also to people's happiness. Although subjective to individuals, architectural beauty can even influence the attractiveness and the sense of belonging to the structure. Architectural quality is, therefore, essential to enhancing the built environment. It also creates value.

- A British study found that properties with a "distinctive" architecture would be 18.6% more valuable than those that are "not distinctive" [35].

Architecture, which often evolves drastically, is a factor of innovation in the construction industry. It motivates stakeholders to improve and develop solutions to meet the expectations of architects and their collaborators. What if the product, while being functional, also embellished the structure?

VEGETATED ROOFS: SOPRANATURE®

SOPRANATURE® vegetated roof systems can improve the aesthetics of a building or even of a neighborhood and a community with the presence of plants.

They enhance and increase the attractiveness of living environments by highlighting some architectural elements in harmony with nature.

SOLUTIONS

Integrating the vegetated surfaces directly on the building holds a major place among the multiple solutions to help materialize ideas and encourage innovation in architecture. In addition to beautifying the living environment, vegetated systems have several benefits for owners and communities. Some surface coatings such as flooring can be added to this list of aesthetic solutions.

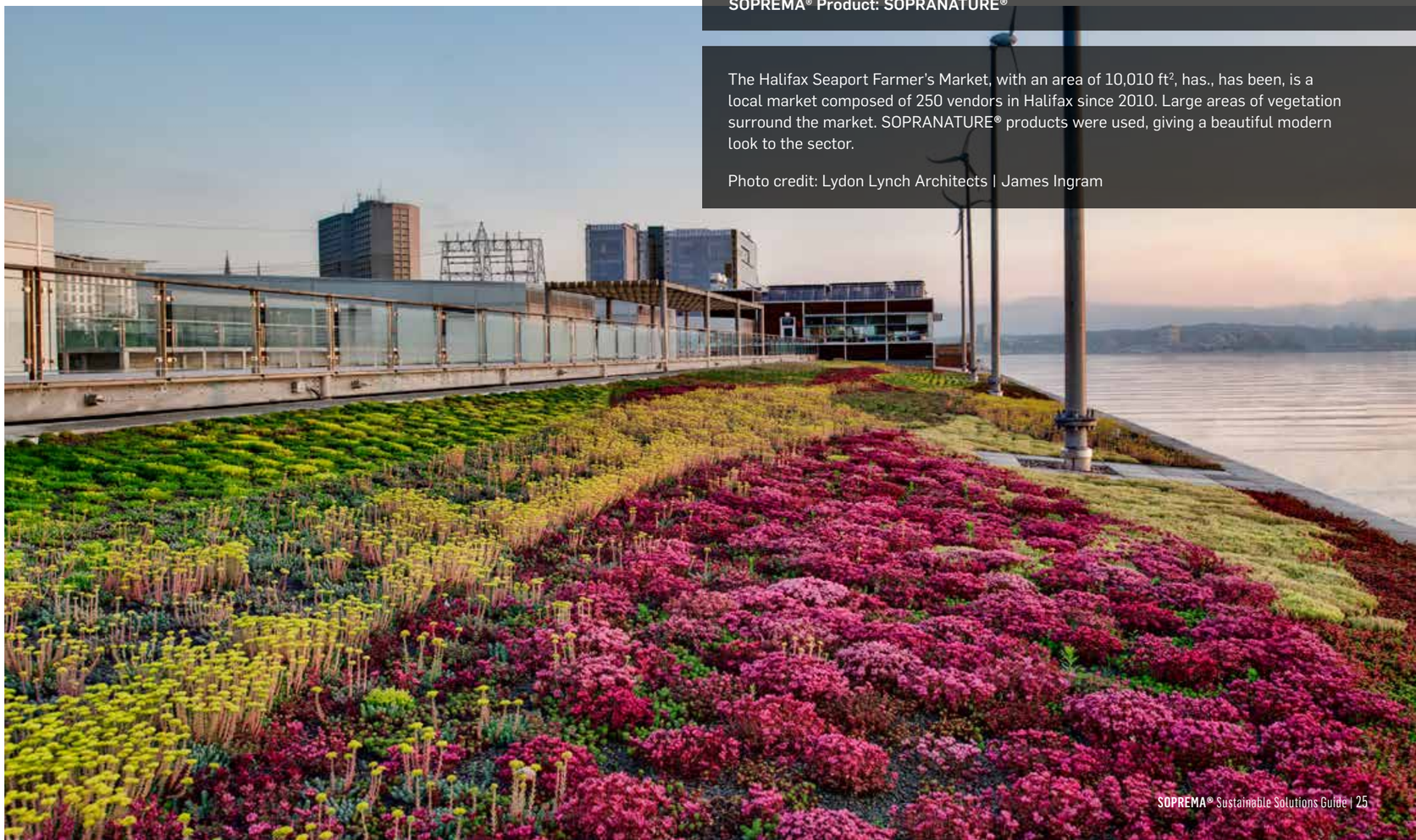
HALIFAX SEAPORT FARMER'S MARKET — HALIFAX (NS)

Design: Lydon Lynch Architects
Construction: RCS Construction and Flynn CANADA

SOPREMA® Product: SOPRANATURE®

The Halifax Seaport Farmer's Market, with an area of 10,010 ft², has., has been, is a local market composed of 250 vendors in Halifax since 2010. Large areas of vegetation surround the market. SOPRANATURE® products were used, giving a beautiful modern look to the sector.

Photo credit: Lydon Lynch Architects | James Ingram



BUILT HERITAGE

Each era reports the evolution of how construction is done. Throughout history, the major factors in building evolution have been the accessibility of materials, the acquisition of technical knowledge and the standardization of construction practices and material manufacturing processes. In addition, climatic and socio-economic conditions are also taken into consideration. All of these elements allow observers to interpret the history of a community through its architecture and urban planning.

Several emblematic structures have an exceptional value justifying their preservation for present and future generations. In addition, preserving the built heritage has several benefits, particularly in terms of natural resource use and energy savings, as there is no need to rebuild. New developments can jeopardize the conservation of built heritage.

- More than 20% of historic or heritage buildings in Canada were destroyed between 1970 and 2000 [36].

The owner or the regulatory requirements can ensure the sustainability of buildings, but only to the extent that they are adequately maintained. Some structures must be renovated to be safe and less energy-consuming. Despite conservation efforts, it is essential to highlight this heritage so that the stakeholders recognize its uniqueness.

SOLUTIONS

Several solutions exist to preserve and enhance the built heritage, but their implementation must not alter the unique architectural elements of the building. In other words, the challenge is to improve the building while preserving its exceptional cultural character. This is why solutions must be varied and adapted to the needs of professionals.

All SOPREMA® and RESISTO® products in this guide can contribute to preserving and enhancing the built heritage in different ways or at different levels. However, choosing the right solution according to the work's challenges is essential.

QUÉBEC CITY ARMORY (VOLTIGEURS DE QUÉBEC ARMOURY) — QUÉBEC (QC)

Design: A49 | DFS | STGM
Construction: Pomerleau, Inc. | Toitures Falardeau

SOPREMA® Product: ELASTOPHENE®, SOPRALENE® AND SOPRAFLASH™

A true icon of Canadian architectural heritage with a new modern and sustainable perspective, the Québec City Armory (Voltigeurs de Québec Armoury) was rebuilt in 2018 following a fire in 2008. The building was reconstructed to maintain and restore the historical components, so ELASTOPHENE®, SOPRALENE® and SOPRAFLASH™ products were used. This building uses geothermy, energy-efficient lighting, as well as recycled and regional materials. Winner of a Wood Design & Buildings Award in 2018 and the Action Patrimoine 2019 prize, the Voltigeurs Armory is a remarkable project that truly highlights its heritage.

Photo credit: Jonathan Robert

SUSTAINABILITY – WARRANTIES

When considering the useful life of a building, operating and maintenance costs can become much higher (5% to 30% per year) than the initial investment cost. However, this part of the owner's investment will, to a large extent, be determined by the technical and architectural choices made during the design of the building. Optimizing costs over the life of the building will influence the sustainability of the structure.

Using products with a longer service life reduces costs over time and mitigates the overall impact the building has on the environment. Additionally, preventative maintenance is an essential element to consider to ensure the desired sustainability for your building.

SOLUTIONS

The warranties offered by product manufacturers generally reflect the functional durability of those products. SOPREMA® offers several warranty options, depending on the type of products selected for use. Warranties are available for roofing, walls and foundations, as well as bridges, tunnels, parking decks and other civil engineering structures.

The following examples only discuss roofing warranties. They are intended for use with roofing assemblies constructed of conventional or inverted modified SBS membranes, modified APP membranes, synthetic membranes and PMMA liquid-applied membranes. The life of the warranty will vary depending on the assembly, but typical terms are from 5 to 20 years.

Something all SOPREMA® roof warranties have in common is that they cover SOPREMA® products that are included in a properly installed, maintained and cared for roof assembly. The essence of the warranty is to assure that the SOPREMA® membranes will remain watertight for the life of the warranty. The owner and its designer decide what level of protection they feel comfortable with.

NOTE TO READERS

The warranty programs offered by SOPREMA® and RESISTO® do not increase the durability of the materials or the building, but the requirements and conditions giving access to a warranty help to ensure the quality of installation and prevent some risks of degradation in the assembly or system. Some programs even promote the replacement of system components, which can reduce, postpone or even avoid the waste of materials and energy that a complete installation would otherwise cause.

RESISTO's warranties are not covered in this guide. Details are available online.

LIMITED WARRANTY

When a meritorious claim is asserted against this warranty, the owner will receive either a replacement product or a refund of its purchase price.

STANDARD WARRANTY

When a meritorious claim is asserted against the warranty, the owner will receive the labor and material necessary to make the products watertight again.

PLATINUM WARRANTY

Under a platinum warranty, in addition to covering leaks resulting from product defects, the warranty also has the potential to cover leaks attributable to the workmanship of the installing contractor. As always, the key consideration is that the products have been included in a properly installed, maintained and cared for roof assembly. When a meritorious claim is asserted against this warranty, the owner will receive the labor and material necessary to make the products watertight again.

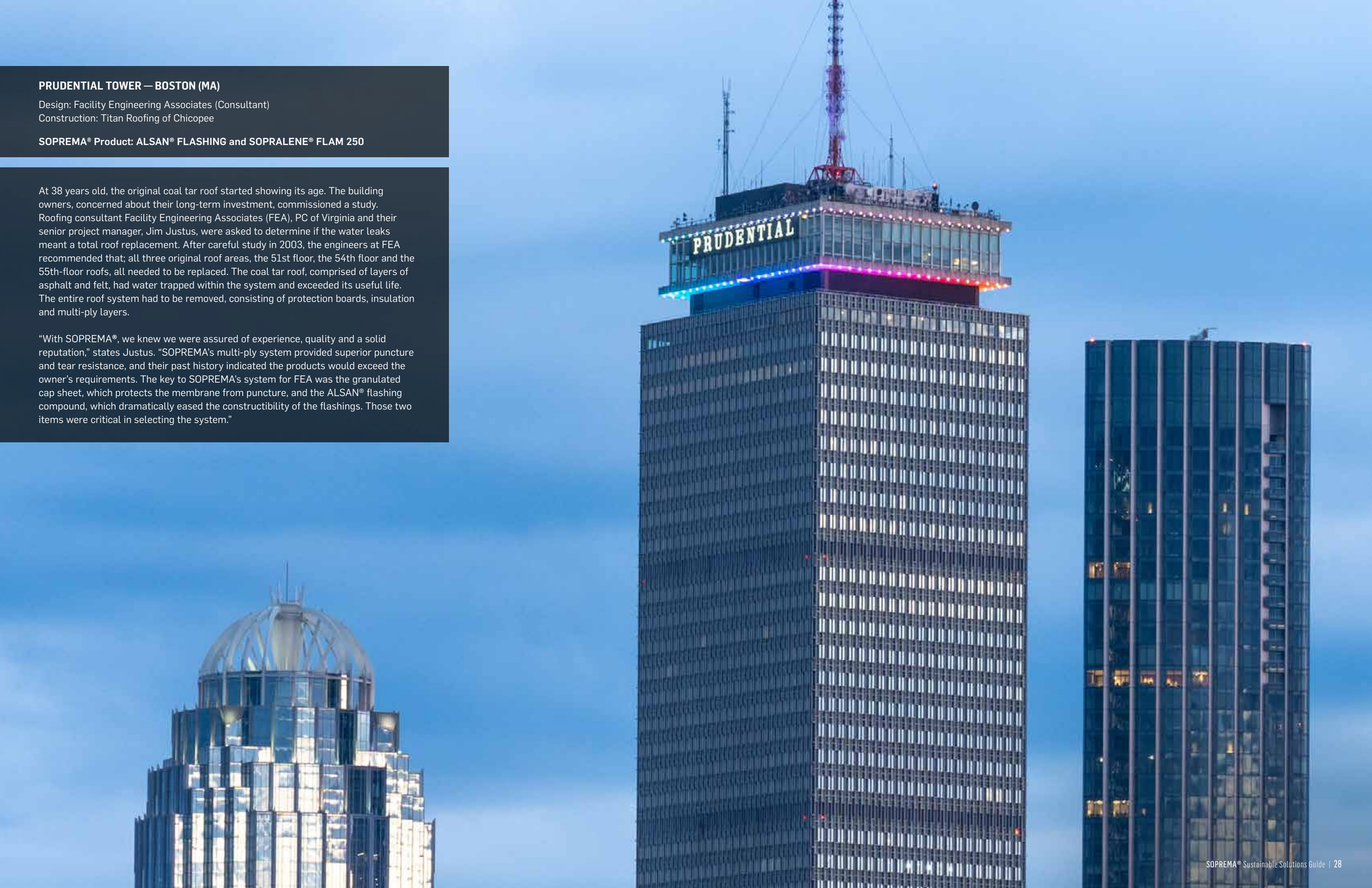
PRUDENTIAL TOWER — BOSTON (MA)

Design: Facility Engineering Associates (Consultant)
Construction: Titan Roofing of Chicopee

SOPREMA® Product: ALSAN® FLASHING and SOPRALENE® FLAM 250

At 38 years old, the original coal tar roof started showing its age. The building owners, concerned about their long-term investment, commissioned a study. Roofing consultant Facility Engineering Associates (FEA), PC of Virginia and their senior project manager, Jim Justus, were asked to determine if the water leaks meant a total roof replacement. After careful study in 2003, the engineers at FEA recommended that; all three original roof areas, the 51st floor, the 54th floor and the 55th-floor roofs, all needed to be replaced. The coal tar roof, comprised of layers of asphalt and felt, had water trapped within the system and exceeded its useful life. The entire roof system had to be removed, consisting of protection boards, insulation and multi-ply layers.

"With SOPREMA®, we knew we were assured of experience, quality and a solid reputation," states Justus. "SOPREMA's multi-ply system provided superior puncture and tear resistance, and their past history indicated the products would exceed the owner's requirements. The key to SOPREMA's system for FEA was the granulated cap sheet, which protects the membrane from puncture, and the ALSAN® flashing compound, which dramatically eased the constructibility of the flashings. Those two items were critical in selecting the system."



SUSTAINABILITY – RESURFACING, RECOVERING AND REPAIRS

Whether environmental (weather conditions, materials that make up products, etc.), social (occupant habits, redevelopment of a neighborhood, undesirable use of the building, etc.) or economic (value of investments, lack of maintenance, change in property value, etc.), several factors can influence the service life or justify the demolition of a building.

- Literature reveals that 70% of the buildings would reach the age of 51 to 100 years before being demolished; that is to say, 13% will reach 100 years or more, 38% will stand for 76 to 100 years, and 19% will last for 51 to 75 years [38].
- On average, the useful life of municipal road structures (roads, bridges, tunnels, etc.) is estimated to be 57 years in the United States [39].

These figures show that the service life of a building is relatively long, spanning several decades. It is, therefore, essential to choose products that will help increase the sustainability of the building. The challenge for professionals is to make choices adapted to contextual changes.

SOLUTIONS

Construction costs can be optimized by choosing suitable technical solutions at the design phase. Adapted solutions can also mitigate, put off or even prevent environmental impacts. Designing a structure using technical solutions allowing the replacement of separate components can reduce site waste and consumption of raw materials.

As a form of reduction at the source, resurfacing, recovering and repairs are simple solutions to increase the structure's durability. However, these interventions may require an independent expert report specific to the problem (thermo-graphic or hygrometric analysis) [40].

ROOFING: RESURFACING

Resurfacing includes the installation of a new cap sheet membrane on the existing waterproofing work. Whether they are heat-welded or fastened with adhesives, the compatible membranes are SOPRALENE®, SOPRAPLY, COLPLY® and SOPRASTAR (CANADA ONLY).

Resurfacing can increase the structure's durability while postponing the replacement of all the roofing system components.

ROOFING: RECOVERING

Recovering includes the installation of components of the roofing system, namely the following:

- By adding only cover boards and membranes on top of the existing roofing system.
- By replacing only the existing cover boards, base sheet membrane and cap sheet membrane with new materials.

Recovering can increase the structure's durability while not requiring part of the roofing system components to be replaced.

ROOFING: REPAIRS

Repairs will target the problem (wrinkling, cracks, delamination, water infiltration, etc.) to avoid replacing the entire roof. Resurfacing or recovering are partial works that are generally sufficient.

Repairs can increase the structure's durability while not requiring all of the roofing system components to be replaced.

HARD ROCK® CASINO — ATLANTIC CITY (NJ)

Construction: United States Roofing Inc.

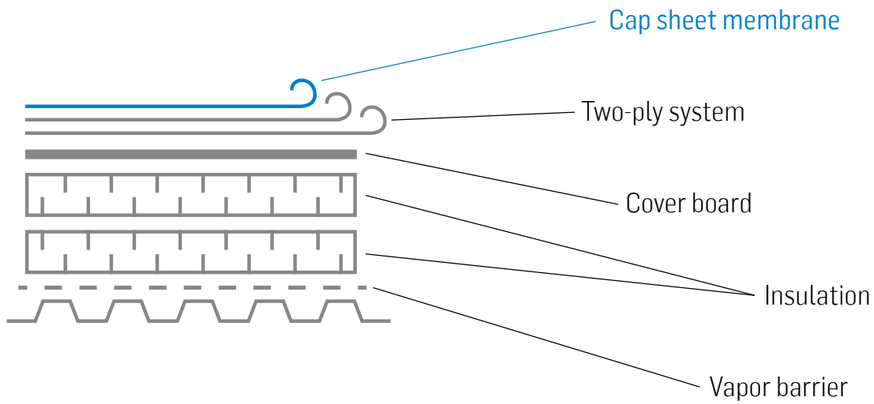
SOPREMA® Product: ALSAN®

The Hard Rock® Casino of the Atlantic City Boardwalk spans over 17 acres and awes guests upon arrival with a giant guitar. The property boasts a variety of musical artifacts and memorabilia for guests to peruse. With over 20 nightlife and dining options on-site, the hotel promises guests entertainment 365 days a year.

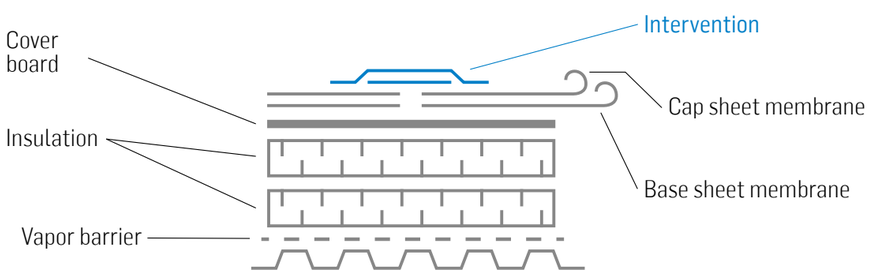
The building that houses the Hard Rock® Casino had an existing SOPREMA® two-ply SBS-modified bitumen roofing system that was installed over 20 years ago. Other than granular loss due to excessive traffic on the roof from repairs and construction over the years, the system was still performing well. Because of this, it was decided to use ALSAN® Coating AC 401 to maintain and extend the existing roof system.

RESURFACING

Legend: — Existing — New

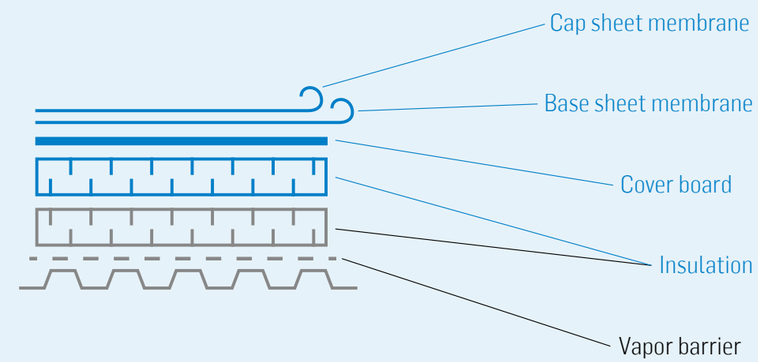


REPAIRS

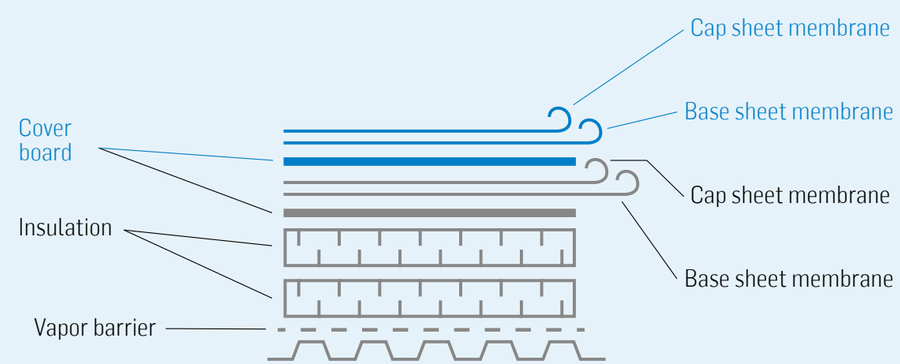


RECOVERING

OPTION 1



OPTION 2



SUSTAINABILITY – GREEN BUILDING CERTIFICATIONS

Shaping the industry since the 2000s, green building certifications generally push stakeholders to go beyond regulatory requirements when it comes to erecting, renovating, dismantling or demolishing a building. Whether their various considerations distinguish them (environmental, economic and social) or the levels of requirements (Certified, Silver, Gold, Platinum, etc.), most certifications generally aim to promote the adoption of best practices to reduce impacts while improving the performance of the building.

The choice of building materials, energy consumption, life cycle, and even the habits of the building's occupants are examples of issues addressed. In addition to increasing the sustainability of a building, these considerations can lead to gains or savings for both the owners and society.

SOLUTIONS

In the United States, several certifications aim to promote green building and sustainable infrastructures, such as Leadership in Energy and Environmental Design (LEED®), WELL Building Standard, Living Building Challenge (LBC), BREEAM, ENERGY STAR, Envision, Passive House® and Zero Carbon Building (ZCB®). In general, these certifications help to ensure the sustainability of a building in relation to the issues they address. In general, these certifications help to ensure the sustainability of a building in relation to the issues they address.

The contribution of SOPREMA's products is discussed in the following certifications:

- Leadership in Energy and Environmental Design (LEED®)
- WELL® Building Standard
- PASSIVE HOUSE®
- Zero Carbon Building (ZCB®)(CANADA ONLY)

CERTIFICATION: LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN (LEED®)

The LEED® certification is awarded according to a scorecard system aimed at granting credits pertaining to several sustainable development issues relating to the building [41].

Depending on the number of credits obtained, the mention Certified, Silver, Gold or Platinum will be assigned. The higher the level, the greater the sustainability of the project.

Several SOPREMA® products can contribute to obtaining LEED® v4 and v4.1 credits.

- See Index – LEED® Certification.

CERTIFICATION: WELL BUILDING STANDARD (WELL®)

The WELL® certification is awarded according to a scorecard system aimed at granting credits pertaining to several issues specific to the health and well-being of the occupants of the building [42].

Depending on the number of credits obtained, the mention Silver, Gold or Platinum will be assigned. A project with a high level means it complies with a high percentage of prerequisites.

Several SOPREMA® products can contribute to obtaining WELL® v2 credits.

- See Index – WELL® Certification.

PASSIVE HOUSE® CERTIFICATION

Passive House certification is based on achieving various levels of energy performance and occupant comfort.

The requirements focus on key principles related to windows, ventilation strategy, thermal insulation, airtightness and thermal bridge reduction of the building. The programs are varied from Classic, Plus and Premium, to name a few. In addition to exceeding building code requirements, some programs consider the contribution of renewable energy [43].

Several SOPREMA® products and systems can contribute to achieving PASSIVE HOUSE® requirements.

- See Index – PASSIVE HOUSE® Certification.

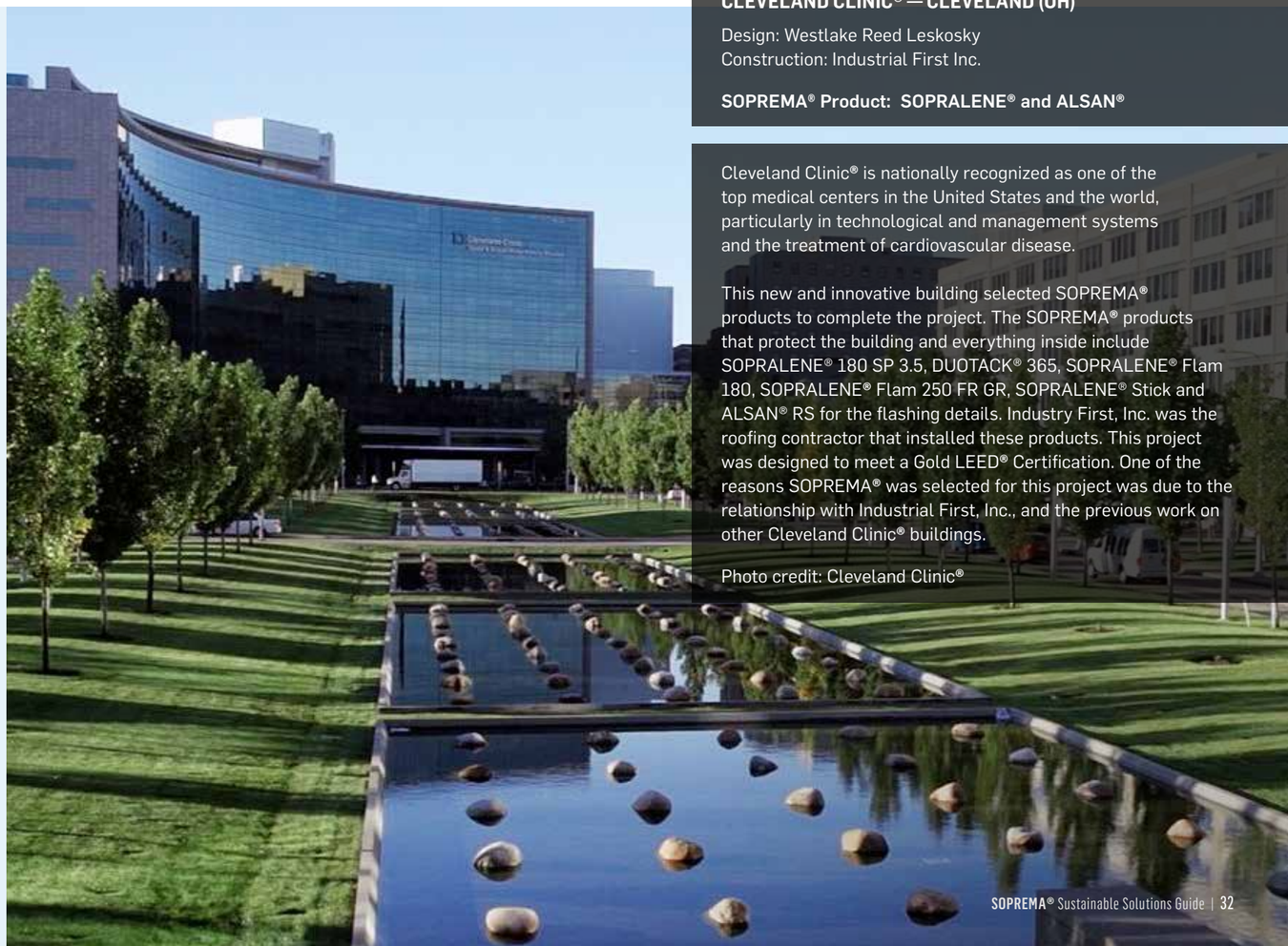
ZERO CARBON BUILDING CERTIFICATION (ZCB®) (CANADA ONLY)

ZCB® certification is based on achieving zero carbon footprint (carbon neutrality) for new and existing buildings.

The requirements focus on reducing and offsetting the building's greenhouse gas (GHG) emissions. The two main programs focus on building design and renovation (zero-carbon modeling) or the operating performance of an existing building (zero carbon achievement) [44].

Several SOPREMA® products and systems can contribute to achieving ZCB® v1 and v2 requirements.

- See Index – ZCB® Certification.



CLEVELAND CLINIC® — CLEVELAND (OH)

Design: Westlake Reed Leskosky
Construction: Industrial First Inc.

SOPREMA® Product: SOPRALENE® and ALSAN®

Cleveland Clinic® is nationally recognized as one of the top medical centers in the United States and the world, particularly in technological and management systems and the treatment of cardiovascular disease.

This new and innovative building selected SOPREMA® products to complete the project. The SOPREMA® products that protect the building and everything inside include SOPRALENE® 180 SP 3.5, DUOTACK® 365, SOPRALENE® Flam 180, SOPRALENE® Flam 250 FR GR, SOPRALENE® Stick and ALSAN® RS for the flashing details. Industry First, Inc. was the roofing contractor that installed these products. This project was designed to meet a Gold LEED® Certification. One of the reasons SOPREMA® was selected for this project was due to the relationship with Industrial First, Inc., and the previous work on other Cleveland Clinic® buildings.

Photo credit: Cleveland Clinic®

TRANSPARENCY

— ENVIRONMENTAL PRODUCT DECLARATION (EPD)
— HEALTH PRODUCT DECLARATION (HPD)

Growing public awareness shapes organizations' practices, particularly toward transparency, which means disclosing of information of public interest. Unless they are required by law to do so, organizations share information in response to stakeholder expectations or pressure.

Sharing information may not only be a risk for a company's competitiveness, but some information may even be considered sensitive since it can reveal adverse effects on health or the environment. Disclosing certain information may compromise the brand image. However, it can also motivate an organization to improve and reduce the impact of its products. For companies concerned with fully assuming their responsibilities, giving access to information is a real opportunity to learn and innovate.

SOLUTIONS

Transparent declarations do not improve the environmental or health performance of products. In the case of building materials, they support informed decision-making in the design of sustainable buildings. Based on the information disclosed by the manufacturer, both principals and designers can better guide their decision toward products that are less harmful to the environment or people's health. It can also help them better understand a product's effect on a building's overall impact.

There are various types of transparent declarations. However, Environmental Product Declarations (EPDs) and Health Product Declarations (HDPs), to name only two, can be validated by an independent third party to ensure the quality of the information disclosed. These types of declarations can also contribute to obtaining LEED® and WELL® credits.

PRODUCTS COVERED BY AN ENVIRONMENTAL PRODUCT DECLARATION (EPD)

An Environmental Product Declaration (EPD) provides information regarding a product's impact on various environmental factors. It usually summarizes the results of life cycle analysis (LCA) metrics in accordance with the requirements of ISO 14040 Standard.

EPDs help understand and measure products' effect on the structure's overall impact.

Several SOPREMA® products have an EPD.

■ See Index – LEED® Certification.

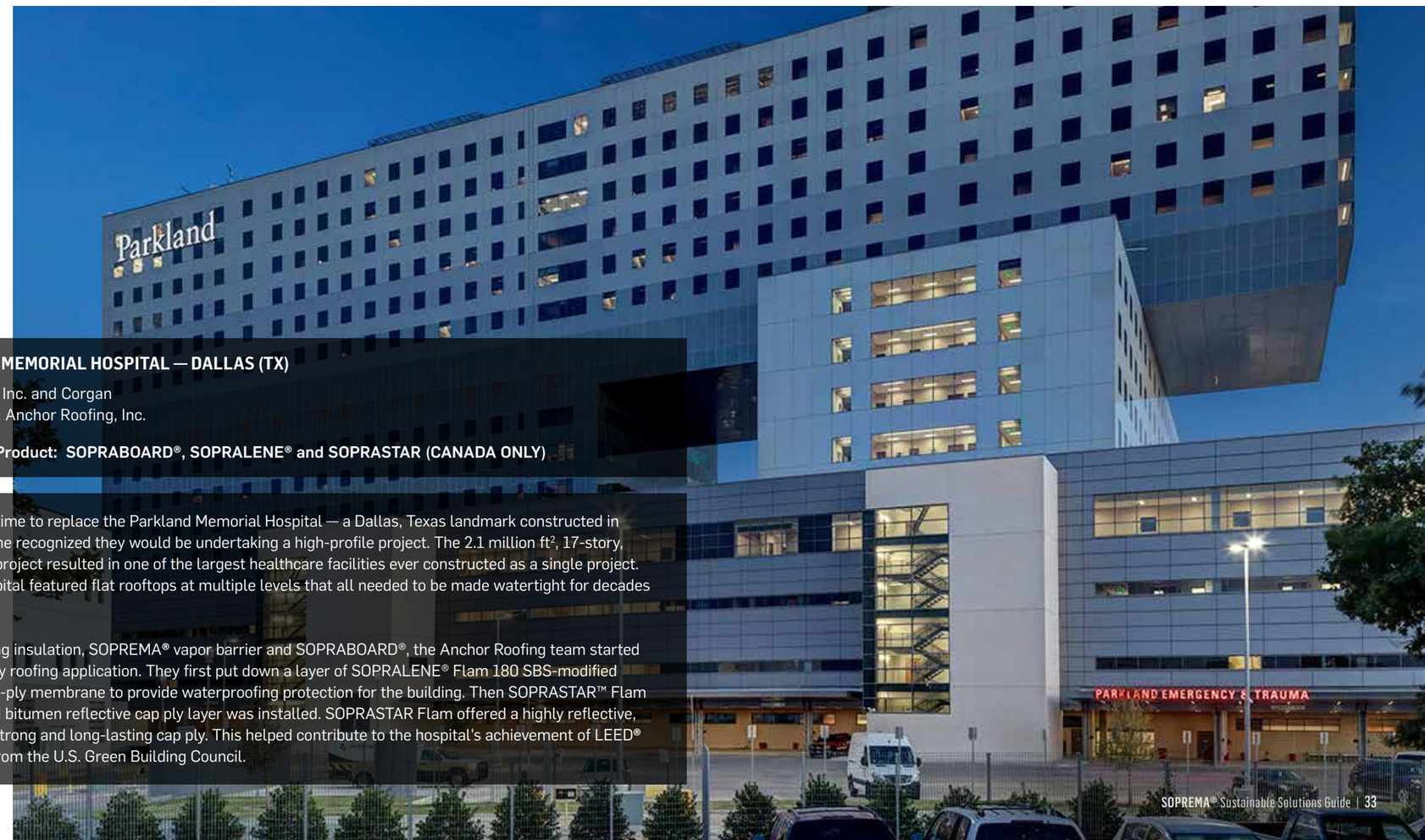
PRODUCTS COVERED BY A HEALTH PRODUCT DECLARATION (HPD)

A Health Product Declaration (HPD) aims to communicate information about the effects a product may have on the health of individuals. It requires disclosing all of the ingredients of a product and includes health risk assessment based on public databases.

HPDs can provide a better understanding and measurement of product impacts on health.

Several SOPREMA® products have an HPD.

■ See Index – LEED® Certification.



PARKLAND MEMORIAL HOSPITAL — DALLAS (TX)

Design: HDR, Inc. and Corgan
Construction: Anchor Roofing, Inc.

SOPREMA® Product: SOPRABOARD®, SOPRALENE® and SOPRASTAR (CANADA ONLY)

When it was time to replace the Parkland Memorial Hospital — a Dallas, Texas landmark constructed in 1954, everyone recognized they would be undertaking a high-profile project. The 2.1 million ft², 17-story, $1.33 billion project resulted in one of the largest healthcare facilities ever constructed as a single project. The new hospital featured flat rooftops at multiple levels that all needed to be made watertight for decades to come.

After installing insulation, SOPREMA® vapor barrier and SOPRABOARD®, the Anchor Roofing team started on the two-ply roofing application. They first put down a layer of SOPRALENE® Flam 180 SBS-modified bitumen base-ply membrane to provide waterproofing protection for the building. Then SOPRASTAR™ Flam SBS-modified bitumen reflective cap ply layer was installed. SOPRASTAR Flam offered a highly reflective, functionally strong and long-lasting cap ply. This helped contribute to the hospital's achievement of LEED® Gold status from the U.S. Green Building Council.

RENEWABLE ENERGIES

Globally, 82% of the energy consumed to power buildings is of fossil origin [24]. In the United States, only 22% of the energy consumed comes from renewable sources versus 78% from fossil fuels in 2020 [45].

In general, fossil fuels, such as oil, natural gas and coal, are more polluting than renewable energy. In addition to being available in limited quantities, these substances result from decomposition processes that take thousands or even millions of years. The extraction, transformation and use of fossil fuels have a lot of environmental issues and are contrary to the main principles of sustainable development. This becomes even more important in the context of growing energy demand.

SOLUTIONS

Renewable energy sources include the production of electricity, heat and fuels that are used sustainably. These include hydro power, wind power, solar power, tidal power, geothermal power and biomass.

The evolution of technology facilitates, more and more, the implementation of sustainable solutions, making it possible to benefit from renewable energy sources. Several of these solutions apply to buildings. These systems help reduce the energy demand toward external sources. Some even manage to design positive energy buildings, i.e., buildings that produce more energy than they consume.

WATERPROOFING OF ROOFS: SOPRASOLAR FIX EVO TILT (CANADA ONLY)

The SOPRASOLAR FIX EVO TILT system consists of photo voltaic panel supports for flat or low-slope roofs.

The system makes it possible to link the panel and the cap sheet membrane without piercing it, which could compromise the waterproofing system of the roof.

JULES VERNE HIGH SCHOOL — VANCOUVER (BC)

Design: Terratek Energy
Construction: Terratek Energy | Mark Kirk Roofing

SOPREMA® Product: SOPRASOLAR (CANADA ONLY)

The installation of a photo voltaic panel system with a total capacity of 106 kW/h has been completed on the roof of Jules Verne High School in Vancouver, BC. A total of 262 photo voltaic panels and 574 SOPRASOLAR FIX EVO PEDESTALS were fitted to supply power for student learning tools. The SOPRASOLAR FIX EVO TILT system was a perfect choice since it ensures a thermal performance superior to competitive mechanically fastened systems while significantly lighter than ballasted systems.

Photo credit: SOPREMA®

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LIST OF SUSTAINABLE SOLUTIONS

LAST UPDATE: 2022-08-16

PRODUCTS

that can contribute to sustainable development in the use of the building or infrastructure lifecycle.

PRODUCTS	MATERIAL / DESCRIPTION		APPLICATION / USE	1 ECO-SOURCED MATERIALS	2 BIODIVERSITY	3 WATER MANAGEMENT	4 HEAT ISLANDS	5 AIR POLLUTION	6 INDOOR AIR QUALITY	7 ENERGY EFFICIENCY – BUILDING ENVELOPE	8 THERMAL COMFORT – BUILDING ENVELOPE	9 ACOUSTIC COMFORT – SOUNDPROOFING	10 SPACE OPTIMIZATION	11 FOOD PRODUCTION	12 BIOPHILIA	13 AESTHETICS	14 BUILT HERITAGE	15 WARRANTY	16 RESURFACING, REHABILITATION AND REPAIR	17 SUSTAINABLE BUILDING CERTIFICATIONS	18 TRANSPARENCY	19 RENEWABLE ENERGIES
ANTIROCK	MEMBRANE	SBS-MODIFIED BITUMEN	CIVIL APPLICATIONS							•	•		•				•	•		•		
COLVENT™	MEMBRANE	SBS-MODIFIED BITUMEN	ROOFING							•	•						•	•	•	•	•	
COLPHENE®	FAMILY INCLUDES: LIQUIDS		WATERPROOFING							•	•		•				•	•	•	•	•	
ELASTOPHENE®	MEMBRANE	SBS-MODIFIED BITUMEN	ROOFING							•	•						•	•	•	•	•	
SOPRALAP™	MEMBRANE	SBS-MODIFIED BITUMEN	ROOFING							•	•						•	•	•	•	•	
SOPRALENE®	MEMBRANE	SBS-MODIFIED BITUMEN	ROOFING							•	•						•	•	•	•	•	
ACOUSTIZOL NG	MEMBRANE	ACOUSTIC	SOUNDPROOFING									•					•	•		•		
INSONOFLOOR	MEMBRANE	INTERIOR FLOORING	SOUNDPROOFING									•					•	•		•		
INSONO AF3	MEMBRANE	SELF-ADHESIVE	SOUNDPROOFING									•					•	•		•		
SENTINEL®	MEMBRANE	PVC	ROOFING				•			•	•						•	•		•		
ALSAN® RS	MEMBRANE	LIQUID	ROOFING				• WHITE ONLY									•	•	•				
ALSAN® Trafik	MEMBRANE	LIQUID	WATERPROOFING						•				•				•	•		•		
COLPHENE® LM BARR	MEMBRANE	LIQUID	WATERPROOFING							•	•											
COLPLY® EF	ADHESIVE	LIQUID	ROOFING							•	•						•	•	•	•	•	
DUOTACK® 365	ADHESIVE	LIQUID	ROOFING						•	•	•						•	•		•		
SOPRABOARD®	COVERBOARD		ROOFING - INSULATION							•	•						•	•		•	•	
SOPRASMART®	COVERBOARD		ROOFING - INSULATION							•	•						•	•	•	•	•	
SOPRASMART ROCK	COVERBOARD		ROOFING - INSULATION							•	•						•	•	•	•		
SOPRA-CELLULOSE (CANADA)	INSULATION		SOUNDPROOFING	•					•	•	•	•					•	•		•	•	
SOPRA-ISO	INSULATION		ROOFING - INSULATION							•	•						•	•		•	•	
SOPRA-XPS	INSULATION		ROOFING & WATERPROOFING	•					•	•	•						•	•		•	•	
SOPRAFLASH™	REINFORCEMENT MATERIAL		WATERPROOFING							•	•						•	•	•	•	•	
SOPRANATURE®	VEGETATIVE ROOF		VEGETATED ROOFING	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•		
SOPRAMASTIC SP1	ADHESIVE		GENERAL PURPOSE							•	•						•	•	•	•	•	
SOPRASEAL®	VAPOR AIR BARRIER		WALLS							•	•						•	•	•	•	•	
SOPRAVAP'R®	VAPOR BARRIER	SBS-MODIFIED BITUMEN	ROOFING							•	•						•	•		•	•	
SOPRASOLAR FIX EVO TILT (CANADA)	SOLAR PANEL PEDESTAL		WATERPROOFING										•				•	•		•		•
SOPRA-SPF (CANADA)	SPRAY FOAM INSULATION		INSULATION							•	•						•	•	•	•		

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