TRADEMARK
concrete systems inc
DECORATIVE CONCRETE CONTRACTORS

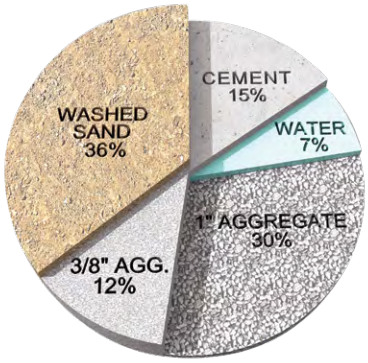
Creating Award-Winning Decorative Concrete in California since 1997

SUSTAINABILITY

Concrete is the world's most widely used building material. Trademark Concrete Systems, Inc. is committed to doing our part to inform the designing community about the many ways that concrete construction can be more sustainable.

WHAT'S IN CONCRETE AND WHAT CAN BE DONE TO INCREASE ITS SUSTAINABILITY?

What can we do within this "typical" concrete mix or paving applications to make concrete more sustainable?



HOW CAN WE USE LESS CEMENT?

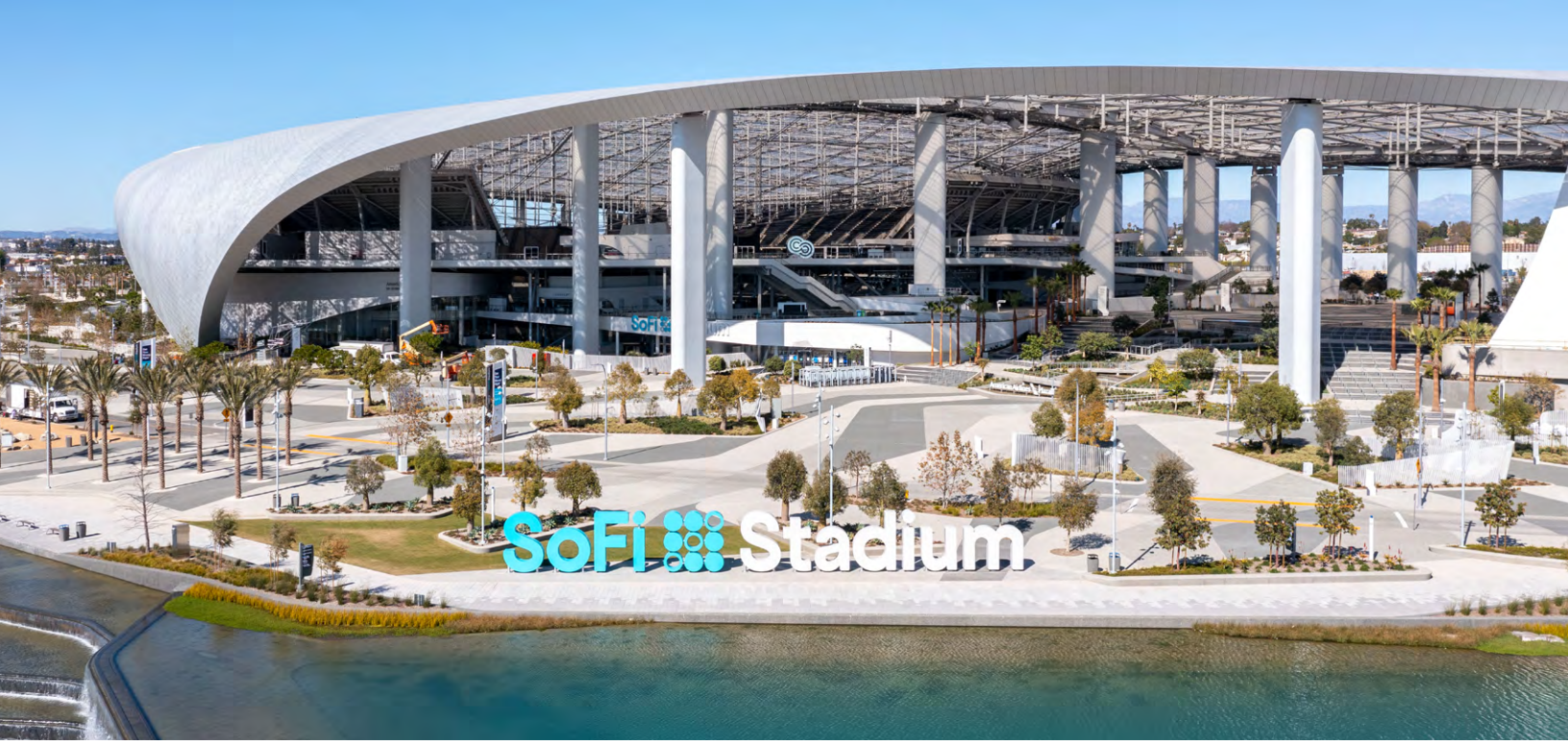
- **Consider lowering the compressive strength (psi) of the concrete mix.** Is a higher compressive strength required? A 2500psi mix may be sufficient for the curb, wall, paving, or stairs.
- **Replace 15 to 20% of the cement with fly ash in non-decorative uses such as footings.** Fly Ash is a byproduct that results from coal-fired power plants. You can use fly ash in decorative concrete but it can vary in color and have visual inconsistencies so that needs to be considered.
- **Replace 25% to 50% of the cement with slag cement.** Slag Cement is a recovered material from the iron production process; it can reduce a portion of the Portland cement in a given mix design. Also, it's lighter in color and this can be advantageous to increase SRI.
- **Utilize Type 1L Cement, where available, to reduce carbon content by 10%.** Type 1L cement can be a plug-and-play option to reduce embodied carbon by 10%.
- **Use larger percentage of larger aggregates whenever possible.** Many contractors use a larger percentage of small (3/8") aggregates and WCS (washed concrete sand) to make placement of concrete easier. However, you need to use more cement when you have smaller aggregates to ascertain a specified compressive strength.
- **Use admixtures in your mix designs to improve the efficiency of cementitious materials.** For example, a water reducing admixture that reduces water content will result in a reduction of cement content for equivalent slump and strength and a carbon reduction of roughly 10%.

11601 Wilshire – Los Angeles

Extensive site renovation to an existing 24-story office building. Trademark provided all the exterior decorative concrete work surrounding the building including 1,300 linear feet of cast-in-place planter walls and over 7,000 square feet of honed seeded aggregate paving which highlight the buildings new amenity spaces.

The Audrey Irmas Pavilion – Los Angeles

The structure features three main spaces, a red event space, green chapel, & the project's focal point – a blue sunken garden at the indoor atrium with blue concrete paving and a cast-in-place blue concrete bench. Trademark provided the interior colored polished concrete flooring and extensive exterior EcoCast® sand finish paving, stairs, and cast-in-place walls.



REDUCING OUR CARBON MARK ON CALIFORNIA

SoFi Stadium – Inglewood

Our crews installed over 720,000 square feet of decorative concrete paving; the design consisted of three unique colors and textures. Trademark completed all the decorative concrete at the perimeter of this massive project; including EcoCast® textured cast-in-place paving, walls, curbs, & stairs over an 18-month time period in 2019 and 2020.

Academy Museum of Motion Pictures (AMMP) – Los Angeles

Trademark installed over 33,000 square feet of interior concrete topping slabs for exhibition spaces, over 37,000 square feet of exterior EcoCast® textured cast-in-place paving, and several other decorative concrete elements throughout this iconic project on Los Angeles' famed "Museum Row."

USE LESS STEEL AND LUMBER

In the January 2006 ACI publication of Concrete International, an article entitled "Expansion Joints in Exterior Concrete Pavements" states the following: "When contraction joints are properly spaced, the use of expansion joints should be limited to the role of isolating the slab from other structures or fixed objects." In the early years, we would see drawings that included isolation (expansion) joints at 20' on center each way or in walkways every 10' on center. This created a checkerboard pattern that was not necessary and did not help from a design or construction aspect.

Trademark has long recommended forming in lanes when placing concrete as a sustainable approach. Placing concrete in lanes, and not a checkerboard, lessens the use of lumber, foam, and steel dowels – this saves natural resources and lessens CO^2. The Trademark Handbook, available to you, clarifies decorative concrete construction with details, photos, and shop drawings. Please see below for additional information.

INCREASE THE SOLAR REFLECTANCE INDEX (SRI)

Solar Reflectance Index is a measurement of the solar reflectance and thermal emissivity of materials, and is an indicator of how hot the material is likely to become when solar radiation is present on the surface. The lower the SRI, the hotter a material may become in direct sunlight.

We can use various materials including slag cement and white cement within a concrete mix, or, we can apply light colors to the concrete surface with color hardener. A higher SRI value lowers the heat-island effect.

TRADEMARK ECOCAST® SUSTAINABLE SERIES BAR

Order your Trademark EcoCast® Sustainable Series bar today! We will provide samples and explanations of the ingredients within that make these finishes sustainable.

Sustainability Series - Samples 1 through 6 utilizes varying components to decrease carbon content.

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Our new Bay Area showroom/office is located at 2045 Martin Avenue #203, Santa Clara, CA 95050. Email: info@trademarkconcrete.com to check out our showroom!

Let us know if we can be of service on your current or future projects! I can be reached at jen@trademarkconcrete.com with any questions or comments. All of us at Trademark Concrete Systems look forward to working with you.

Jen Packer
Trademark Concrete Systems

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GUIDE TO INCORPORATING & SPEC'ING SUSTAINABLE CONCRETE

Because many of these ideas are new to certain markets, we've compiled a checklist to help designers tackle reducing the GWP of their site concrete.

THE GOALS FOR ANY PROJECT SHOULD BE:

- *Optimize Your Mix Design*
- *Utilize Portland-Limestone Cements*
- *Increase SCM Utilization*
- *Improved Testing and Acceptance*
- *Update Performance Specifications*

The Grand – Los Angeles, CA

Most of the private property public spaces within the new Frank Gehry development, The Grand, located in the heart of Downtown Los Angeles, utilize slag cement for both flatwork and walls. Covering an entire city block, the change from a Type II/V Portland cement to a blended Type II/V Portland cement-slag mix reduced the GMP by close to 10%. In contrast, the public right-of-way still requires the use of Type II/V Portland cement.

CHECKLIST AT KICKOFF OF DESIGN

1. **SCM and types of cement other than Type II/V vary from batch plant to batch plant and from region to region.** In order to understand what is available to your specific project, we recommend reaching out to Trademark Concrete to establish what batch plants would be viable and what they offer. If we can be engaged right from the beginning, we can help tackle what your options are before you even start your design.
2. **Once your design team understands what's available, we recommend sitting down with the entire design team to establish the GWP reduction goals of the entire project.** For example, when the structural engineer is going to use Type 1L for the majority of their structure but it isn't available at the local batch plants, the quantity required may push batch plants to provide it as a market demand. This allows civil engineers and landscape architects to piggy back on the larger structural requirement and utilize Type 1L for the smaller quantities of site concrete.
3. **Once there is an understanding of the GWP reduction options, it's time to request samples to understand the aesthetic impact.** Different types of cement can look different from the standard gray Type II cement. Reducing cement by adding SCMs (fly ash, slag) can also impact the aesthetics. Integral colors are typically based on a gray cement base and colors will look different if slag or a Type 1L lighter cement are being specified. Understanding the aesthetic impacts through sampling with Trademark will define potential GWP reductions with owner buy in and an understanding of cost impacts to the project.
4. **Another design team push can be limiting "over design" of concrete mixes.** If a pedestrian walkway is deemed acceptable at 3,000 psi, could it be acceptable at 2,500 psi? This is a question to ask the engineering firm(s) on the project. For every 100 psi reduction, GWP can be potentially decreased by 1.5% (500 psi reduction = 7.5% GWP reduction). Trademark Concrete is happy to help review specifications and provide feedback.
5. **PSI reduction should be carried through construction.** When reviewing a mix design, a higher psi and lower water/cement ratio than required isn't always better. If the specifications require a minimum 2,500 psi concrete, don't automatically approve a 4,000 psi mix design. A higher psi and lower water/cement ratio will often result in more cement in the mix, which **increases** the GWP. Trademark is happy to review the specifications and the geotechnical report in the design stage and have a discussion with you. Compressive strength and the water/cement ratio should both be reviewed and compared to the geotechnical report; in addition, reviewed with the structural and/or civil engineer.

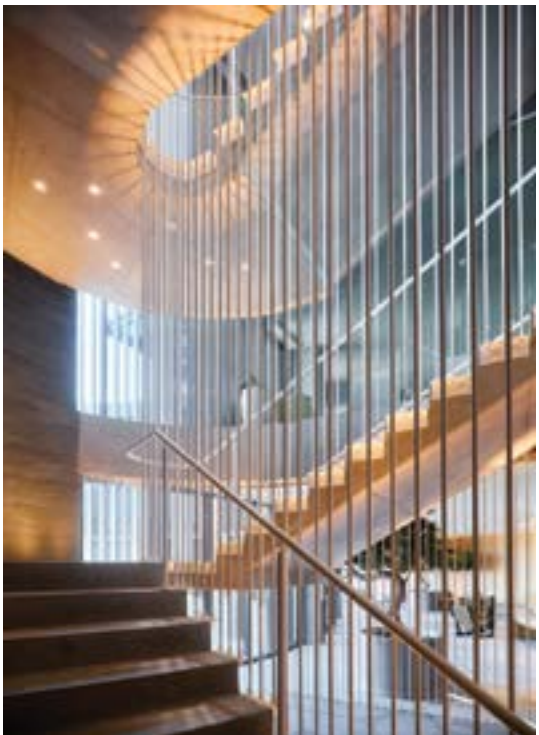
SoFi Stadium – Inglewood, CA

SoFi Stadium is an example of a project that installed a GMP reducing option, primarily for color purposes. The use of Orca rock and aggegate at the stadium was an aesthetic decision as it made the contrasting dark concrete panels darker. Concrete with Orca aggregates benefit from the density, shape and surface texture of the aggregate particles producing high performance structural properties with the lowest possible cement contents and admixture use, thus reducing the GMP of the decorative concrete sitework. As an aggregate, Orca rock, supplied from Canada, is much darker and more consistent in color than the local sands and aggregates found in the Los Angeles Basin.

SUSTAINABLE CONCRETE FOR CALIFORNIA

Alila Marea Beach Resort – Encinitas, CA

Concrete in interior spaces used to be a design challenge but in recent years, quality finished exposed concrete has become a high end selection. The main curving stairs at the Hyatt Alila Marea Beach Resort, located in Encinitas, CA, are a prime example of utilizing decorative concrete and GMP reductions at the same time. By using Type 1L cement, Trademark Concrete was able to provide a lighter, brighter focal point that related to the surrounding metal and stone cladding while reducing the global warming potential. The smooth trowel stairs are exposed on all four sides and are not only an engineering feat but also a beautiful example of a lower carbon cement alternative.



LCI – Irvine, CA

GMP reductions don't need to come in big moves. Simple adjustments like selecting Type 1L cement instead of Type II/V Portland cement (the common cement choice in SoCal) for all sidewalks can help reduce the carbon footprint of the decorative concrete while also helping the heat island effect by increasing the SRI value. At LCI in Irvine, CA, utilitarian sidewalks were poured using Type 1L at limited cost impact to the project. As can be seen in the photo above, Type 1L is lighter than the Type II/V cement curb.

GLOSSARY OF TERMS

LCA – Life Cycle Assessment / Analysis
Quantitative review (typically of an entire project, not just site concrete) against a benchmark in order to realize goals and considers emissions during every stage, from extraction of raw materials through the construction process, also known as *cradle to gate.*

GWP – Global Warming Potential
For our purposes, LCAs utilize GWP as a unit of measure and is typically expressed in terms or carbon dioxide equivalents. The main goal for most projects is to reduce their GWP. Our series of sustainability bars reflects GWP reduction methods and their aesthetic impacts.

EPD – Environmental Product Declaration
Product specific certified declaration that provides relevant environmental information and should be in accordance with ISO standards. Specific EPDs can be used to garner more carbon reductions as they can be tailored to project specifications (psi, aggregates, and type of cement) and should be coordinated between the design team and the construction team. Governed by ISO 14025 and by the Concrete Product Category Rule (for concrete EPDs only).

CarbonCure™
This is a technology used at batch plants that introduces recycled carbon dioxide into fresh concrete in order to reduce GWP. It undergoes a mineralization process and will become permanently embedded. More information can be found here: **https://www.carboncure.com/**

Advancement™
This is a line of more sustainable cement products produced by CalPortland, a top manufacturer of cement and concrete in California. The product line includes utilizing Type 1L (a limestone based cement) and Pozzolan (not to be confused with fly ash, a byproduct of power plants). More information can be found here: **https://advancement.calportland.com/**

SCM – Supplemental Cementitious Materials
These are materials that can be used to reduce cement that don't have a large carbon footprint. Examples are Fly Ash and Slag.

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