

# diamond grinding roller-compacted concrete pavement

*Santa Fe Springs, California Achieves Smooth, Long-Lasting Pavements with Short Construction Times*

Diamond Ground  
RCC Creates a Safe,  
Quiet, Rideable  
Surface



Roller-compacted concrete (RCC) is increasingly used **on local and arterial roads**, growing beyond its roots as a solution for service roads. The American Concrete Pavement Association (ACPA) **National RCC Explorer** shows significant adoption of RCC for paving local and arterial streets, with many projects currently located in midwestern and southern states.

However, “the use of RCC is on the rise in California, as well,” said Nathan Forrest, technical director, California Nevada Cement Association (CNCA). “Where we used to see it mostly in ports and warehouses, it’s now being used on roads.”

Load transfer is accomplished differently for RCC than for portland cement concrete (PCC) used on high-volume roads, where dowel bars are used to transfer loads between panels and create a long-lasting surface even under frequent heavy traffic loading. RCC relies on aggregate interlock for load transfer, but the strength of concrete still provides a superior service life, even with the kind of loading experienced on low- to mid-volume industrial roads.

Recently, RCC was used to replace severely damaged asphalt on two intersecting streets in Santa Fe Springs, California: Greenstone Avenue and Sunshine Avenue. The CNCA served as a resource for the project team.

“Greenstone Avenue has seen significant development in the last two years,” said Noe Negrete, director of public works, City of Santa Fe Springs Public Works Department. “Not only is there a ready-mix concrete plant and a Federal Express distribution center, but there is a fire station. All the truck traffic associated with these facilities would wear on asphalt pavement. We wanted a 25-plus-year

pavement life, especially considering the needs of the fire station, so we chose concrete. It not only has a life span of fifty years or more but could be installed in less time.”

“We considered a variety of repair solutions, such as full depth reclamation and reconstruction with asphalt,” said Majdi Ataya, president, Onward Engineering, who was a design engineer for the project. “But we knew portland cement concrete would last many decades with little maintenance, so we favored using it.”

With concrete the preferred material, the team looked for ways to mitigate the project cost and arrived at RCC as a solution. The pavement was installed first on Sunshine Avenue, which served as a test strip. In all, 32,000 square yards of RCC were installed across the two roads, with 28,000 of those square yards on Greenstone Avenue. The cost of RCC was \$2.2 million and the total project value was \$3.4 million. The project was completed in early 2020.

Two paving machines were used to speed the work, making two 15-foot-wide passes in each lane to cover the 60-foot road width.

“The time saved using RCC [compared to asphalt] was incredible,” said Negrete. “Within 48 hours, traffic was back on the road. Also, we were able to leave driveways open during construction. Using RCC greatly reduced the impact on business.”

“We used diamond grinding in the travel lanes to correct irregularities in the road profile,” continued Negrete. “It was specified in the contract that the contractor hire a QA/QC professional, and this proved to be invaluable. It set a high standard. The consultant was hands-on, assessing machine operation and more.”



A full blanket grind, as was used on the Santa Fe Springs roadways, is the most effective approach when grinding RCC pavement. Blanket grinding results in:

- **Pavement longevity.** Smooth pavements last longer because there is less dynamic loading. Uneven and bumpy pavements cause vehicles to experience more up-and-down motion.
- **Quiet pavement.** Diamond-ground RCC is one of the quietest pavement textures and is most effective when the entire surface is ground.
- **Safety.** Modern day vehicle traction control systems respond better to homogeneous pavement textures.
- **Aesthetics.** Using a blanket grind as compared to a bump grind is much more attractive.
- **Ride quality.** Diamond-ground surfaces are the most comfortable to ride upon from a motorist's perspective.

"There was a learning curve with this project," said Negrete. "But everyone on the project team got better each day. Everyone quickly got comfortable with the method."

As a result of the city's choice to install diamond ground RCC, Greenstone Avenue now has smooth, drivable pavement that will serve the neighborhood for years to come.

According to John Roberts, executive director of the International Grooving & Grinding Association, "RCC typically requires minimal finishing to be serviceable when used in industrial and low speed settings, although when it is used for roads where the speed of travel exceeds 35 miles per hour, RCC surfaces as installed may not be smooth enough. In these situations, diamond grinding is the appropriate treatment, making the surface smooth, safe and delightful to drive on."



## TEAM MEMBERS:

- City of Santa Fe Springs (Owner)
- California Nevada Cement Association (Consultant)
- Onward Engineering (Design Engineer)



### ABOUT IGGA

The International Grooving & Grinding Association (IGGA) is a non-profit trade association founded in 1972 by a group of dedicated industry professionals committed to the development of the diamond grinding and grooving process for surfaces constructed with Portland cement concrete and asphalt. In 1995, the IGGA joined in affiliation with the American Concrete Pavement Association (ACPA) to form what is now referred to as the Concrete Pavement Preservation Partnership (IGGA/ACPA CP3). The IGGA/ACPA CP3 now serves as the lead industry representative and technical resource in the development and marketing of optimized pavement surfaces, concrete pavement restoration and pavement preservation around the world.