

# Broadway Lofts Parking Garage

SAN ANTONIO, TEXAS

SUBMITTED BY MIRACOTE DIVISION OF CROSSFIELD PRODUCTS

Broadway Lofts in San Antonio, Texas, is a highly-visible, intensely scrutinized cornerstone of the revitalization initiative for downtown San Antonio. The property, once called Villaje del Rio, spans three city blocks, and is part of a 350-acre (1.4 km<sup>2</sup>) master plan to reinvigorate the downtown and river area of the city. Unfortunately, the concrete decking of the Broadway Loft's five-level parking garage failed immediately after it was constructed in 2012. During the original construction, fiber was used in lieu of reinforcing steel. Extensive, full-depth cracking developed on every parking level.

In lieu of costly demolition and deck replacement, initially considered the property owner's only option, a novel and much less expensive repair protocol was developed and implemented that involved rebonding of the slabs, strengthening the deck with carbon fiber, and installing a new wearable drive service—all with the parking garage remaining open for tenant use and without the removal of any of the existing concrete.

The Broadway Lofts Parking Garage Project involved the rehabilitation of 240,000+ ft<sup>2</sup> (22,300+



*Broadway Lofts before Rehabilitation*

m<sup>2</sup>) of failed concrete parking deck on all five levels of the pan and beam garage at a fully-occupied, high-profile, 308-unit residential complex. The project incorporated the following repair materials and methods to achieve a functional and aesthetically desirable parking deck rehabilitation:

- Ultra-low viscosity menders custom-formulated for the project were used to rebond slab sections so that the slab functioned as a monolithic unit;
- Deep-penetrating hardeners were employed to achieve appropriate concrete strength and stabilize pH parameters;
- A system of custom-designed carbon fiber staples alternating with custom-designed,

rigid, open-grid carbon fiber strips were embedded to achieve the appropriate slab tension and to stop deflection; and

- A time-tested, heavy-duty overlay system was installed to create a durable and attractive traffic-bearing surface.

Today, some eight months since the completion of the Project (and almost four years since installation of the first on-site test samples), there are no signs of failure of any aspect of the project. For that matter, there are no signs of the repair itself. Broadway Loft's tenants are enjoying a quiet, attractive drive surface on all five garage levels. There is no indication remaining of the damage once thought so severe as to require total deck removal and replacement.



*Crack Measured with Mil Gauge*



*Carbon Fiber Strapping and Stapling Repair*



*Cementitious Overlay Installation Over Strapping and Stapling Repair*



*Applying Cementitious Overlay*



*Concrete Dusting*



*Broadway Lofts Completed Project*

## **Broadway Lofts Parking Garage**

**OWNER**  
**Area Real Estate, LLC**  
*San Antonio, TX*

**PROJECT ENGINEER/DESIGNER**  
**Lundy & Franke**  
*San Antonio, TX*

**REPAIR CONTRACTOR**  
**Surmac, Inc.**  
*Schertz, TX*

**MATERIALS SUPPLIERS/  
MANUFACTURERS**  
**Miracote**  
*Division of Crossfield Products*  
*Rancho Dominguez, CA*

**Fortress Stabilization**  
*Holland, MI*