



PAVEMENT RECYCLING SYSTEMS

Utilizes Cold Central Plant Recycling for the City of Glendale Improvement Project on Central Avenue and Adjacent Streets

By: Brian Hoover

If you have spent any time in Glendale, you know just how busy Central Avenue can be. It is a four-lane major arterial street running through the business district that maintains an average daily traffic volume of 43,000 vehicles per day. When a slightly more than one-mile strip of roadway like this needs to be repaved, you better be prepared. This major arterial street had been planned for widening to support The Americana on Brand and the Glendale Galleria. Plans to add bike lanes had also been noted for several years. Since the development of The Americana,

the pavement had deteriorated significantly due to construction traffic and increased deliveries. As a major entrance to the City, Central Avenue required significant rehabilitation.

A pavement investigation conducted as a part of the design process revealed a weakened asphalt pavement. Additionally, an existing Portland cement concrete slab that ran almost half the length of the project was discovered underlying the existing asphalt pavement. Because this concrete section was located 2 inches below the asphalt, there was significant concern that the

existing two-inch layer of old asphalt concrete (AC) on top of the Portland cement concrete slab would be unstable. Because of the condition of the existing asphalt and the presence of the concrete slab, it was determined that the AC would have to be removed down to 4-5 inches and replaced with a new asphalt pavement section.

The City of Glendale is always looking for ways to keep their roadways maintained at a price that makes sense to its tax paying residents and they are equally concerned with the impact that each project has on its community,



Above: Stockpiled RAP being processed as CCPR at the recycling site provided by the City of Glendale. After recycling with the engineered emulsion, the asphalt is loaded into trucks for subsequent delivery to the paving operation.

workers, and the environment. They had been watching Pavement Recycling Systems (PRS) perform asphalt recycling processes in other cities for a few years, specifically Cold In-place Recycling (CIR) on jobs in Beverly Hills and Agoura Hills. CIR is a sustainable process that utilizes an "asphalt recycling train" to construct a base course asphalt section without having to remove the asphalt pavement. Kevin Carter, Senior Civil Engineer for the City of Glendale, contacted James Emerson, (APM) of PRS to discuss viable sustainable pavement recycling processes for Central Avenue. "With the necessary removal of 4 to 5 inches of existing pavement, the City needed to investigate all of the options available. We definitely wanted to minimize the impact to traffic and local businesses," says Kevin Carter. "We initially thought of Cold In-Place Recycling, but given the required depths of asphalt rehabilitation, this process was determined to not be feasible for this project. After consulting with contractors and pavement specialists, we determined Cold Central Plant Recycling was the best approach to rehabilitate the pavement."

Like CIR, Cold Central Plant Recycling (CCPR) is an engineered asphalt recycling process that reuses the City's existing asphalt assets in the construction of the new asphalt pavement. PRS worked with Kevin Carter and

other Glendale City officials to come up with a plan that would utilize Cold Central Plant Recycling, while also properly mitigating the current pavement challenges. "The goal was to first reduce the crown by pre-profiling approximately 45,000 square yards of road surface," says Emerson. "The milled asphalt material was then stockpiled on a site provided by the City of Glendale, located just a half a mile away near the 210 Freeway."

The next step included screening, crushing and sizing the Recycled Asphalt Pavement (RAP) and then processing it with an engineered asphalt emulsion in accordance with the mix design conducted by Asphalt Pavement and Recycling Technologies Inc. (APART). The mix design required that the RAP be processed with 3 percent engineered PASS-R emulsion from Western Emulsions. PASS-R is an engineered solvent-free formula used for processing RAP stockpiles in the Cold Plant Recycling process. The design also required 0.5 percent of Portland cement additive, along with 2.5 percent water.

Following the recycling process, Excel Paving out of Long Beach, the general contractor on this job, used their Cedarapids pavers to install 3 to 4 inches of Cold Central Plant Recycled Asphalt base over the PCC and remaining layer of milled asphalt. Next, Excel put down 2 1/2 to 3 inches of hot rubber asphalt overlay (ARHM). In

all, 3,237 tons of recycled asphalt were installed, overlain by 5,160 tons of ARHM, providing for full rehabilitation of the asphalt pavement.

The CCPR method satisfied all the City's objectives including: lower costs, quick construction, reusing of existing assets, reducing construction traffic, reducing project-related green house gas emissions, and minimizing impacts to the downtown businesses and vehicular traffic. The milling was completed in seven days, while the CCPR was finished in just three shifts. Other rehabilitation methods would have required an additional three weeks of work.

The City of Glendale and other cities and municipalities throughout California have a variety of paving solutions at their disposal. "Other rehabilitation methods would include the milling and removal of 3 to 5 inches of asphalt that would be hauled away to a dumpsite. This would result in higher trucking costs and more emissions," says Emerson. "In addition, a fabric inner layer would more than likely be used at an increased cost. Finally, a 3 to 4 inch base course of conventional hot mix asphalt would be imported and installed prior to placement of a final 2 to 3 inch cap of hot rubber asphalt. More import and export, more emissions and more money. We believe we can achieve the same results with Cold Plant Recycling at a cost savings of 30 to 50 percent from job to job."

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Above: Excel Paving completes the placement, paving, and rolling of CCPR asphalt. The milling was completed in seven days, while the CCPR was finished in just three shifts. Other rehabilitation methods would have required another three weeks of work, increasing the impact on the surrounding businesses and residents.

The City of Glendale was recently recognized by the League of California Cities and the California Association of counties / County Engineers Association of California with the 2014 Outstanding Local Streets and Roads Project Award for the Central Avenue and Adjacent Streets Improvement Project. This award recognizes the achievements made by California cities and counties to preserve and protect the public's investment in the local streets and road system. This project is one of the many ways in which Glendale continues to invest in critical infrastructure to improve the quality and safety of roads in the city. Since this initial project, Glendale has awarded more projects utilizing sustainable asphalt recycling strategies, including the Canada Boulevard Infrastructure Improvement and the Honolulu Avenue Rehabilitation Project.

The benefits of using Cold Plant Recycling on the Central Avenue Project are numerous and included the elimination of 540 truck cycles, resulting in reduced truck traffic and public inconvenience, an estimated 50 percent reduction in greenhouse gases, maximum use of existing city assets, incorporation of tried and true engineering designs, ability to accept traffic immediately after installation,

restoration of proper grade, curb line and slope, reduction in major surface irregularities. In addition, 10,900 tires were saved from the landfill and a 30 to 35 percent cost savings of nearly \$340,000 was achieved when compared to other pavement rehabilitation methods. "Because of reduced budgets, many agencies are not able to maintain their pavement infrastructure in a manner that best serves their constituents. These asphalt recycling strategies provide the agency an engineered and tax-payer friendly alternative that allows them to move forward with pavement rehabilitation projects that they otherwise may not have been able to construct," says Emerson. "Utilizing recycling and sustainable pavement technology is a better choice for our environment. It not only also saves money and energy, but also creates jobs at the mid-level that would otherwise not exist."

For more information on Pavement Recycling Systems and their full range of state-of-the-art recycling solutions to reclaim, preserve and rehabilitate pavement at any stage of the life-cycle, please visit them online at www.pavementrecycling.com or call (800) 966-7774. **CAM**

CENTRAL AVENUE FAST FACTS

- Pavement Removal and Grading of 1,865 cubic yards.
- Pavement Removal (Header Cut 6 feet wide) of 2,135 Linear Feet.
- Pavement Removal (Header Cut 18 feet wide) of 36 Linear Feet.
- Pavement Removal 2 to 3 surface plane of 39,910 square yards.
- Pavement Removal of 3.5 to 4.5 inches of 9,960 square yards.
- Unclassified excavation of 415 cubic yards.
- Overexcavation of subgrade of 57 cubic yards.
- Asphalt Concrete Pavement of 5,465 tons.
- Asphalt Concrete Pavement Temporary of 300 tons.
- Asphalt Rubber Hot Mix Pavement (ARHM) of 5,160 tons.
- Asphalt Rubber Aggregate Membrane (ARAM) of 6,530 square yards.
- Cold Central Plant Recycling (CCPR) Asphalt 3 inches thick of 23,310 square yards.
- Emulsified recycling agent 116 tons.
- Cement additive (CCPR) 35 tons.
- Crushed miscellaneous base 1,425 tons.

Pavement Recycling: the **SECRET** weapon that can improve your pavement condition index.



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