



JWA (John Wayne Airport): One of Those Defining Moments

January 20, 2009

CALIFORNIA — John Wayne Airport (JWA), a prominent, Los Angeles regional facility which is tightly surrounded by high density commercial and residential areas and perched at the edge of the Pacific Ocean, recently completed reconstruction of its primary runway. Kimley Horn & Associates, Inc. provided project administration and engineering while Butier Engineering, Inc. provided construction management. The contractor, All American Asphalt, Inc., provided construction supervision, materials, labor and equipment for the building of the project

Primary work included coring the top three inches of aged pavement on the 5,700 foot main runway then re-paving the area with a PG 76-10 overlay. Included in the specification was the requirement for protecting 68,000 square yards of runway shoulder and aprons with a protective coating which was:



1. **Waterborne**
2. **Environmentally clean (no VOC's, no HAP's, no toxins or carcinogens and no PAH's)**
3. **Fuel resistant**
4. **'Skid neutral' or better**
5. **Insoluble to rain within 1 hour of curing**
6. **Able to cure at night @ 50°F in less than six hours**

Those requirements set standards that only new innovation could solve, no product currently existed that would meet these guidelines.

Due to its neighborhood proximity the Airport is regularly closed between the hours of 11:00 p.m. and 6:00 a.m. This presented the challenge of developing and installing a coating that could be placed and would achieve full cure within this time window so heavy jet traffic could, uninterrupted, perform all normal activities. Since the contract penalty for interrupting normal JWA activities was **\$10,000 per minute**, the decision process for selecting a coating which met all the requirements, especially those of the curing window was, to say the least, characterized by heightened drama.

Ramsey Oil, Inc. a division of All American Asphalt, Inc. would install the coating. Paul Snow, Ramsey's crew manager, was tasked with coordinating night time field test applications of coating alternatives; which were then evaluated by JWA representatives. After considering many options provided through the All American management team the head of procurement, John Todorovich, concurred with the JWA representatives that the product supplied by Ecostar Science & Technology, Inc. (a Lockheed Martin, Corp. spin-off) was the best choice. That product was Carbon Plex H-25; manufactured under an Ecostar license by Delta Trading, Inc. of Bakersfield, CA.

The installation of the coating was scheduled for late December 2008 but 40° F night time temperatures left little margin for error, i.e. the Carbon Plex emulsion, which has exhibited the quality of fully curing down to that temperature, had only been tested at John Wayne at night time with 50°F temperatures. The job was pushed to after the holidays with a "GO" set for the evenings of January 8th and 9th. Everyone was 'antsy' to wrap up this project after the months of coating study; even if it meant going in the middle of the winter, at night. The weather report for those dates was for rising temperatures and clear skies, with possible 'Santa Anna' winds which would provide excellent drying conditions. Everyone felt comfortable with pulling off this last critical phase of the Project.

Seven thousand gallons of the "Cold Cure" version of the Carbon Plex H-25 was prepared, then diluted 25% and shipped to the job site; ready to use. A light tower rigged, 2,000 gallon Bearcat distributor truck was readied, together with three mobile light tower



platforms. Against the back drop of jet engine roar the Ramsey Oil crew put on their 'game face' and huddled in the staging area at the pre-installation tailgate meeting with four JWA engineers and two inspectors. Air and pavement temperatures were in the low 50's F. The table was set for finishing the project except for one 'fly in the ointment' - FOG. Wet fog was peppering the faces of all the men; and there was not a flutter of a breeze to move it. The big question was, "Should we scrub the mission or push on?" Paul Snow, who had the most experience with the Carbon Plex felt a cautious start was possible; paying close attention to the 'break' time. The plan was to install a short run of the H-25, time the cure and then decide whether to 'step on the gas' or scrub the effort for the night. Tension was high with everyone's blood pressure ramping up. The JWA engineers and inspectors then present, huddled to consider the cautious start proposal, then concurred with the All American crew manager; but their trepidation could be summed up with one unnamed individual stating that "If this application goes sideways you are going to see me hanging from the top of that (nearby) 100 foot eucalyptus tree."

At 10:45 p.m. the gates were opened and the convoy of trucks was escorted out through the fog hovering over the main runway. As the Carbon Plex H-25 does not need to be heated to cure under night time conditions, minimal heat (110° F) was used to encourage drying. At 11:07 p.m. the first twelve foot swath began at 0.10-0.12 gal/sq yd spread rate. When the Bearcat operator 'dropped the hammer' and disappeared into the fog on its first mile plus run every eye at the start line leaned forward under the glare of the light tower to glean information from the flow pattern and color change of the freshly placed coating.

The entire span of runway pavement surface had been saw cut with three eighths inch deep grooves at one inch on center. A special characteristic of the Carbon Plex H-25 is its rapid 10:1 (static/shear thin) viscosity rise after being pumped and sprayed. In less than one second from hitting the pavement the static viscosity is nearly restored; assuring a significant resistance to puddling in the grooves. On this foggy night it was performing as designed, with virtually no uneven film thickness between the pavement surface and the groove bottoms.

At this point other good things began to happen. Before the Bearcat returned painting its second twelve foot swath, a black hue began to show in the over spray zone. The Carbon Plex emulsion was breaking!! Even with the atmospheric vapor content above the surface being at or near saturation the exothermic reaction designed into the "Cold Cure" version of H-25 was kicking in and forcing the micronized emulsion water component to volatize. By the time the distributor truck returned a collective "whew" had begun to set in. The blood pressures of about two dozen hard working men were rapidly falling. Mental resignation letters were being shredded. The JWA engineers granted that the installation could proceed. By 1:45 a.m. the entire 640,000 s.f. was coated and curing at a predictable pace. At about 3:30 a.m. the entire job was drivable; even though the fog had actually worsened at times. No champagne was opened but everyone associated with the effort felt as though it may have been appropriate; as the first critical stage of the job had been accomplished.





There are three distinct stages to the life cycle of this type of pavement preservation.

Stage One had achieved complete success. The coating was installed and cured in the allotted time and under the conditions prescribed. Curing had progressed to a film sufficiently tough to resist tire displacement as well as becoming water fast with no chance of re-emulsification.

Stage Two came the next morning when all the 'normal' people who have jobs which allow them to stay at home at night, could come out and witness the heavy jets trafficking over the fresh, shiny black coating. Most importantly, like some clean room entry mat, the jets then would roll over the three foot wide, white thermoplastic stripe defining the runway, without one hint of any tracking!! "Yeah team" could be read on the face of each early morning inspector as they knew 'they' had made the right decision(s). The performance was analogous to the test sites which, incidentally, were done without the benefit of fog.

Stage Three will be to watch the product perform over the coming months and years; to see how well it endures under the insult of hot jet exhaust, unspent J5 vapor, salty fog and a hot Southern California solar bake.

While the immediate reward is "**No Penalties**" there is also an intangible yield to this type of project. That yield is the feeling of deep satisfaction within every professional associated with this effort; of thoughtfully and vigorously pushing the envelope and succeeding to achieve against unusual challenges. We are also relieved to report that the next morning's sun brightly shone on the 100 foot tall eucalyptus revealing no more weight in its branches than it bore the previous day!

William Coe
President, Ecostar Science and Technology, Inc.

One of Those Defining Moments

There are instances when years of research and hard work showcase innovations that will leave a large footprint, moments that define a new era.



Reprinted with permission from Ecostar by
Carbonyte Systems, Inc. 916-387-0316 www.carbonyte.com

Carbonyte Systems, Inc. 916-387-0316 www.carbonyte.com