



Slurry Seal Case Study

Project:
Punta Arenas, Chile

Problem:
Slurry roads at tip of South America in
40 degree weather and high winds.

Solution:
Type Two Fine Road Slurry Seal

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When a customer buys a RoadSaver slurry machine, if they need assistance CPM staff goes to their place of business and gives them training and instruction on the use and maintenance of slurry equipment.

Last year, when a customer in South America requested such guidance for their newly acquired RoadSaver, Gordon Rayner was more than happy to send training staff to Chile to give assistance. He expected the project to be in or near Santiago, "a beautiful city with ideal slurry weather." However, their project turned out to be at the "end of the earth."

The company, Navarrette Y Diaz Cumsille is located in Santiago, Chile, but their upcoming project



was to be at Punta Arenas, at the bottom of South America, almost at the South Pole. There were no roads from Santiago to Punta Arenas and no way to get there by land from Chile because of glaciers. Gordon was also informed that one of the main attractions at Punta Arenas is Penguins. He was further advised that there were only three weeks of summer there, with temperatures sometimes reaching 50 degrees, with a constant wind of 30 to 40 knots.

The project was beginning to

sound like a real challenge. Founded in 1848, Punta Arenas was originally a military garrison and prison. During the California Gold Rush it proved convenient for shipping. Ships from Boston and San Francisco would meet



at this remote port to trade. When the Gold Rush ended, the Punta Arenas economy became more dependent on animal products, and by the turn of the century over 2 million animals grazed the territory's natural grasslands.

As the largest port for thousands of miles, Punta Arenas attracts ships from a large South Atlantic fishery as well as Antarctic research and tourist vessels. But now, ships began to arrive with a new cargo - CSS-1h Slurry Seal Emulsion. The emulsion came to Punta Arenas the same way the RoadSaver II did, by way of ships through the Straits of Magellan. The emulsion was delivered to large square holding tanks moved in for storage at their stockpile. The project itself was 40 kilometers of two-lane road, fairly flat and straight, outside Punta Arenas.

The aggregate was made nearby (about 40 km away) by Navarrette Y Diaz. Making aggregate in these latitudes was

a real challenge. The wind in that part of the world never stops and the fines were very hard to control with the constant wind.

To accomplish the needed gradations, the aggregate was crushed in various sizes and then blended in a machine that has an electronically metered loader bucket which picks up measured amounts from each of three plies of aggregate. The materials were then deposited into a drum, which blended the material in a manner similar to a concrete mixer. The finished aggregate was then delivered to the stockpile where it was hand screened and loaded into the RoadSaver II.

Water was trucked the 50 kilometers from the water treatment plant. It presented some minor challenges as the pH varied from 5.0 to 7.2 during any given day.

The RoadSaver II was delivered by ship to Punta Arenas and driven to the work location. With all the materials and the RoadSaver now on hand, the crew performed a calibration



under the guidance of Angel Arenas, Quality Control Engineer for Navarrette Y Diaz. The RoadSaver was set to deliver the proportions called for in the mix design and work began. The machine operator, Amador

Agurto, had previously worked as an asphalt plant (hot mix) operator and had never seen slurry before. He received initial training from CPM on the RoadSaver prior to the machine being shipped from Santiago. With the natural feel and intuitiveness of the Road Saver joystick controls, Amador was soon placing slurry at 4 tons a minute. This was important as long shuttles (as much as 20 km each way) and short hours made production time very limited.



They were fortunate to have a latex modified cationic emulsion which offered the stability needed for ocean shipment and yet allowed reasonable set times. During the time Francis and Alex were there, the weather was really difficult as temperatures seldom got above 5 to 7 Celsius (40 to 45 degrees F.) for more than an hour or two. With a constant hard wind, storms would blow in suddenly and then disappear just as quickly Francis and Alex made their first purchase, new winter jackets for "summer" use.

Weather conditions restricted the daily hours of placing slurry and with only one slurry machine on the job, combined with the long shuttles, production was limited to about 130 tons per day.

The slurry was placed over a tack coat of CSS- 1 spread at 600 Grams/Sq. Meter (. 13 Gallons per Sq. Yard), at 8mm in thickness. Cement was used as an accelerator at .8% and with the help of winds, even with the cold temperatures, set times of under an hour were achieved.

Vehicle traffic was not a major problem, although occasional large herds of sheep made sweeping the road "difficult," Other livestock obstacles included emus and llamas (The penguins never became a roadway problem, since they prefer the water and build burrows in grass).

Teaching a new crew the principles of slurry seal at the earth's edge added new challenges. As Francis related, "The aggregate fines were constantly under attack by the never ending wind so we had to cover the stockpile to prevent fines loss. Each new load of recycled water had a new pH and we were constantly keeping an eye on that. Set times were critical because it would seem nice one minute and a storm would move in the next. This is the first time I ever had to wear a parka while laying slurry."

CPM is fortunate to have Francis Cardoza, who speaks and understands basic Spanish, and Alex Garcia, who is fluent in Spanish. With their years of slurry/microsurfacing operation and supervisory experience, Francis and Alex combined to transfer this knowledge to this new crew. Francis taught machine operations and crew techniques. Alex worked with Jorge Leiva, the engineer in charge of the overall project, and Angel Arenas, the quality control engineer, on construction procedures, material specifications, slurry chemistry and logistics. "Logistics," related Alex, "becomes a whole new subject when your emulsion is being delivered by ship!"

Dependability in equipment became critical here too. With glaciers, penguins, logistics, supply problems, winds, cold and stormy weather, this crew faced a lot of obstacles. But one problem they didn't have was the RoadSaver.

When the training was over and the crew was performing on their own, Francis and Alex had only one item left on their list to accomplish. A visit to the home of the Magellanic Penguin colony to have their picture taken with the penguins. This was for proof after all, who would believe that they taught slurry at the end of the earth?