

CHAPTER 2 – PRODUCT INSTALLATION

The Seedskadee National Wildlife Refuge (NWR) and Desert Sage Contractors agreed to participate in the full-depth aggregate surface course stabilization study sponsored by CFLHD’s Technology Deployment Program. The incorporation of six brand name dust palliative products took place over the course of three days on 5.43 km (3.37 mi) of two of the main routes into the Seedskadee NWR. These six products were the same ones that were applied in a similar stabilization experiment at the Buenos Aires NWR in south-central Arizona two years earlier. The method used to incorporate the various products into the newly placed aggregate surface course at Seedskadee was very different from that used at Buenos Aires. At Buenos Aires, each product was applied to the roadway materials in windrows; blade mixed, and then compacted with an 11 Mg (12 ton) 9-wheel pneumatic roller to a total stabilized depth of 150 mm (6 in). At Seedskadee, a tiller method, using a CMI 650 pulverizer, mixed the products with the aggregate surfacing material to the full 125 mm (5 in) depth. One other major difference between the two projects was that the Buenos Aires project used a native pit-run surfacing course whereas the Seedskadee roads used specified aggregate surfacing.

**PRODUCT APPLICATION**

The application of the products took place on September 22-24, 2004 at the Dodge Bottoms road and at the Six Mile Hill Road. The Headquarters Parking area and the Hayfarm and Lombard kiosk pullouts were also treated.

Desert Sage Contractors administered the application of the TerraZyme, Lignosulfonate, Perma-Zyme 11X, and Soil Sement. These products were shipped to the project and used by Desert Sage according to the manufacturers’ recommendations without the presence of a product representative. An International 15,000-L (4,000-gal) water truck, a John Deere 772CH Motor Grader and Hamm 2420 steel drum roller were used to introduce and process the material. Valentine Surfacing, Inc. was subcontracted to perform the full-depth processing. They used a



**Figure 4. Photo. CMI 650 pulverizer following water truck.**

CMI 650 pulverizer to mill the aggregate to a 125-mm (5-in) depth and mix in the various products as shown in Figure 4. Desert Mountain Corporation delivered their products (DCA-2000 Caliber and DMC 820 Lignosulfonate/Magnesium Chloride) accompanied by a product representative to oversee the application of their products. They used a 17,000-L (4,500-gal) distributor truck to apply the products. The CMI pulverizer, grader, and roller were then used to process, grade, and compact the treated aggregate.

### Section I (TerraZyme)

The clear concentrate TerraZyme stabilizer was applied in two batches using 19 L (5 gal) of concentrate for each 15,000 L (4,000 gal) of water. Mixing was accomplished by running the mixture through the 100-mm (4-in) hose and back into the water truck through the topside portal. The water truck was then hooked up to the front of the pulverizer where the solution was introduced into the aggregate surface course through liquid dispersion nozzles as it was milled to a 125-mm (5-in) depth. The right lane was processed first, and then the left lane. The middle 0.6 m (2 ft) of the 5.5-m (18-ft) roadway received a double application due to the overlap of the 3-m (10-ft) wide milling machine. The mixture was then graded and rolled for the final appearance as shown in Figure 5.



**Figure 5. Photo. The change from Section I (TerraZyme) to Section II (Lignosulfonate).**

### Section II (Lignosulfonate)

The aggregate surface course was scarified to a 125-mm (5-in) depth with the motor grader while the water truck, which was half full of water, added 8,780 L (2,320 gal) of the Lignosulfonate solution. The water truck then hooked up to the front of the CMI 650 pulverizer where the solution was introduced into the aggregate surface course through liquid dispersion nozzles as it was milled to a 125-mm (5-in) depth. The left lane was processed first, then, the right lane. The middle 0.6 m (2 ft) of the 5.5-m (18-ft) roadway received a double application due to the overlap of the 3-m (10-ft) wide milling machine. The mixture was then graded and rolled.

### Section III (Perma-Zyme 11X)

The clear, concentrated Perma-Zyme stabilizer was applied in two batches using 19 L (5 gal) of concentrate for each 15,000 L (4,000 gal) of water. Mixing was accomplished by running the mixture through the 100-mm (4-in) hose and back into the water truck through the topside portal. The water truck was then hooked up to the front of the pulverizer where the solution was introduced into the aggregate surface course through liquid dispersion nozzles as it was milled to a 125-mm (5-in) depth. The right lane was processed first, and then the left. The middle 0.6 m (2 ft) of the 5.5-m (18-ft) roadway received a double application due to the overlap of the 3-m (10-ft) wide milling machine. The mixture was then graded and rolled.

### Section IV (Soil Sement)

An empty water truck was filled with 9,370 L (2,475 gal) of the Soil Sement stabilizer. It took nearly three hours to empty the nine 1,040-L (275-gal) containers of the polymer emulsion into the water truck. The batch was topped off with 5,700 L (1500 gal) of water. The water truck was then hooked up to the front of the pulverizer where the solution was introduced into the aggregate surface course through liquid dispersion nozzles as it was milled to a 125-mm (5-in) depth along the middle 3 m (10 ft) of the 3.7-m (12-ft) roadway. The mixture was then graded and rolled.

### Section V (DCA – 2000 Caliber)

The 3.7-m (12-ft) wide roadway was watered, the top 50 mm (2 in) of the road scarified, and then the Caliber stabilizer applied using the Desert Mountain distributor truck at a rate of 3 L/m<sup>2</sup> (0.75 gal/yd<sup>2</sup>). After allowing the solution to marinate for approximately twenty minutes, the CMI pulverizer was used as shown in Figure 6 to thoroughly mix the product into the aggregate surface course to a 125-mm (5-in) depth. The 3.7-m (12-ft) wide roadway was then graded and rolled, at which time a topical application of the solution was sprayed at a rate of 1 L/m<sup>2</sup> (0.25 gal/yd<sup>2</sup>).



**Figure 6. Photo. 650 CMI pulverizer mixing Caliber product into Section V.**

**Section VI (DMC – 820 Lignosulfonate/Magnesium Chloride)**

The 5.5-m (18-ft) wide roadway was watered as shown in Figure 7, the top 50 mm (2 in) of the road scarified with the motor grader, and after watering again, the Mag/Lig mixture was applied with the Desert Mountain distributor truck at a rate of 3 L/m<sup>2</sup> (0.75 gal/yd<sup>2</sup>). After allowing the solution to marinate for approximately twenty minutes, the CMI pulverizer was used to thoroughly mix the product into the aggregate surface course to a 125-mm (5-in) depth. This section was processed one lane at a time, and then the entire 5.5-m (18-ft) roadway was graded and rolled. This was followed by a topical application of the solution sprayed at a rate of 1 L/m<sup>2</sup> (0.25 gal/yd<sup>2</sup>).



**Figure 7. Photo. Distribute truck applying DMC-820 Ligno/Mag to Section VI.**