

Utah

Millard County Road Department
P. O. Box 187
Delta, Utah 84624

Contact Person : W. Thayne Henrie

PROBLEM STATEMENT:

Maintaining approximately 2500 miles of gravel roads in Millard County in a smooth and safe condition is a major challenge. The public is consistently demanding a better job of our maintenance operations than we can afford with our current budget. With gravel road maintenance costs running high, we needed to find a better way to the job than we were currently doing.

SOLUTION:

In 1998 after attending the Utah T2 Center Gravel Road Maintenance Workshop we decided to apply the principles we learned to our gravel roads. We started by constructing the existing roadbed to a four percent (4%) crown section. After doing this we placed a four inch lift of crushed gravel road base and added water to near optimum moisture content. The crushed gravel was then compacted with a steel wheel roller to maximum density. Care was exercised so as to maintain the 4% crown throughout the tangent sections and appropriate super elevations in the curves. With the roads well prepared, we then applied magnesium chloride (Dust Guard) a dust palliative and road base stabilizer to the surface. The magnesium chloride was applied at a rate of 0.5 gallons per square yard.

The first year (1998) we graded and treated 32 miles of our most frequently traveled roads using these procedures. In 1999 we treated an additional 50 miles of gravel roads using the same procedures. Reference photographs 1-4 showing the equipment and procedures used.

When we first started using the magnesium chloride, the material alone cost approximately \$1800.00 per mile to treat a 26 feet wide road. The second year we started using our own employees and equipment to apply the magnesium chloride at a savings of \$ 250.00 per mile. This decreased our costs and allowed us to treat short sections on an as needed basis.

BENEFITS & COSTS:

We are still relatively new at using these gravel road stabilization procedures, however, the roads we have treated are holding up very well. Now, instead of grading some of our roads once a month and in some cases once a week, we now only grade the roads treated with magnesium chloride once a year. This results in significant savings to our road budget.

As a result, this year (2000) we were able to upgrade eight miles of our previously treated roads with a double chip seal. On these roads we chose to reduce the existing 4% crown by cutting it to 2% crown, adding moisture and re-compacting the road base. After doing this we again applied magnesium chloride (0.5 gal./sq. yd.), and allowed the road base to cure for about a week. A latex modified asphalt emulsion (PASS Chip Retention) was applied at a rate of 0.5 gallons per square yard in each application. A one-half inch maximum size chip was used for both layers of the double chip. We have had better results by waiting a day before applying the top lift. This allows the asphalt emulsion time to fully cure and enables us to broom off any excess chips before applying the top lift. We rolled the chips down with a pneumatic roller. The cost of doing this work averages about \$8,000.00 per mile for a two lane roadway. We estimate the total cost to be about half what it would cost to pave the same road.

Our overall savings have been significant using the above outlined gravel road maintenance procedures. The citizens of the County are very complimentary about the condition of the roads we have treated the past three years. They are very supportive of our magnesium chloride treatment and chip seal program. The following photograph shows a recently completed section of road.



Grader Cutting Road Bed to 4% Crown Section.



Roller Compacting Road Base Prior to Application of Magnesium Chloride.



Road Bed Properly Compacted and Prepared for Magnesium Chloride Treatment.



Distributor Truck Applying Magnesium Chloride at 0.5 Gallons per Square Yard.



Road Section Immediately After Treatment
(Constructed in June of 1998)



Road Section A Year After Treatment



MILLARD CO. CHIP SEAL PROGRAM

(July of 2000)

- RE-GRADED MAGNESIUM CHLORIDE GRAVEL ROAD SECTION 5/6/00
- CROWN REDUCED TO 2%
- WATERED & RE-COMPACTED
- RE-TREATED WITH 0.5 GAL./SQ. YD. MAGNESIUM CHLORIDE
- DOUBLE CHIP SEAL (0.5 GAL./SQ. YD. LATEX MODIFIED EMULSION - PASS CR & 1/2 " CRUSHED GRAVEL CHIP)