Gravel Roads

Design and Maintenance

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Unpaved Road Dust Control and Stabilization Treatment Selection Guide

Acknowledgement

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Course outline and timing

- Introduction
  - Design and Maintenance February 2, 2021 (10:00 – 12:30)
  - Gravel Roads Issues
  - Design of a Gravel Road
  - Purpose of the roadway
    - Loads and Traffic
  - Structure
    - Drainage
  - Construction of a Gravel Road
    - Load effect on Materials
    - Compaction

Course outline and timing (Continued)

- Materials February 3, 2021 (10:00 – 12:30)
  - Subgrade Material
    - Types of Material
    - Frost?
  - Unpaved Road Material
    - Traffic and Materials
    - Specifications of materials
    - Testing
  - Maintenance of a Gravel Road

Course outline and timing (Continued)

- Soil Stabilizers (Dust Palliatives) February 4, 2021 (10:00 – 12:30)
  - Different Families of Stabilizers
  - Installing and Maintenance of stabilized roads,

TWO FACTORS WEAR OUT GRAVEL AND DIRT ROADS.

Weather

Traffic

WEATHER

WEATHER **is quite oblivious.**

Water soaking into the roadway grade causes soft spots, rutting and pumping. Water sitting on the roadway surface causes potholes and washboards. Too steep a surface can cause rills and rivulets.

TRAFFIC

From a *TRAFFIC* standpoint, it stands to reason that the more vehicles that travel a roadway, the sooner the road's surface will have to be serviced (usually with a grader). Two vehicles driving in the same path will wear a path twice as fast as the same two vehicles driving in two separate paths. If the road has two or three wheel tracks it will need to be serviced twice as often as the road that has four tracks.

What do people complain about?

POTHOLE

WASHBOARD

3 WHEEL PATHS

Loose Rock

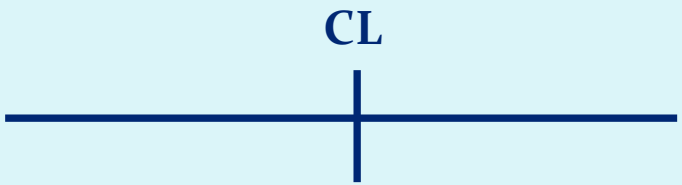
Dust

Seven cost effective suggestions to manage these problems.

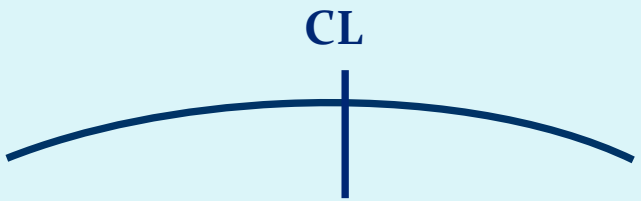
1. ROAD SHAPE

In order to protect the surface of the road from weather-we need to shed the water and provide good drainage.

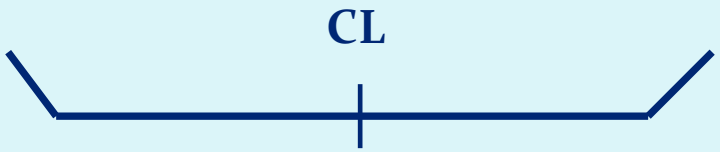
WHAT SHOULD THE SHAPE OF THE ROAD BE?



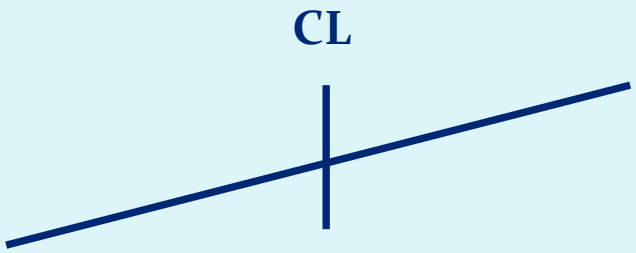
Flat - Shape



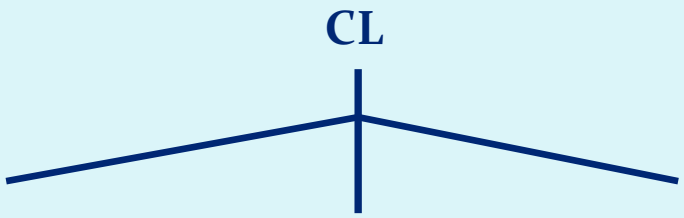
Parabolic - Crown



U - Shape

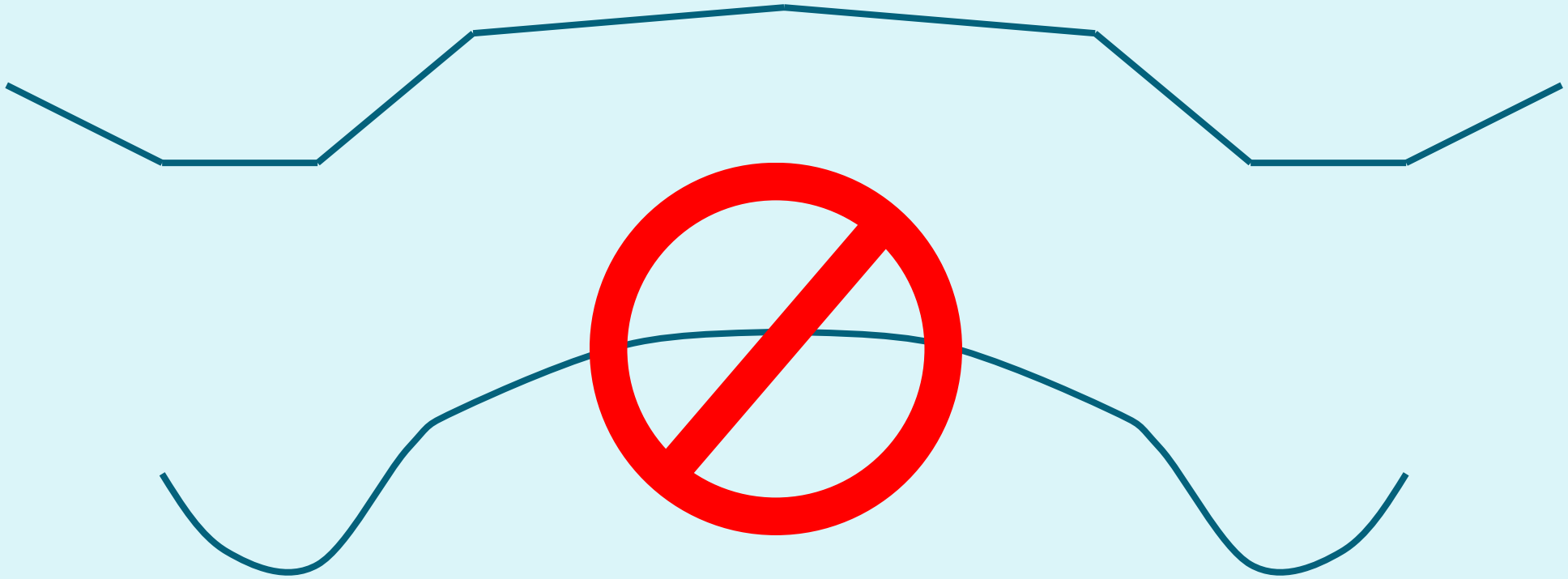


IN or OUT - Slope



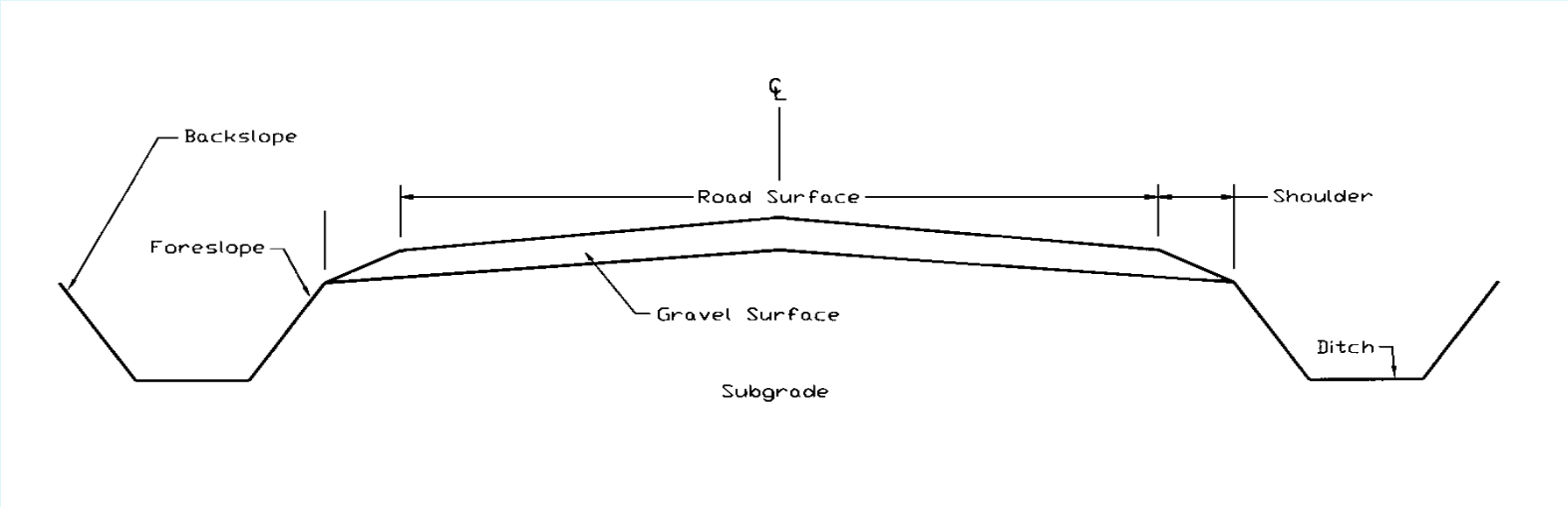
A - Shape

What is Your Mental Picture of Correct Roadway Shape?



Maintaining Gravel Roads

- Understanding correct shape of the roadway cross-section is the most important knowledge an operator can possess.
- Gravel roads constantly change shape!!! Operators and supervisors have to deal with this.




GRAVEL ROAD MAINTENANCE:
MEETING THE CHALLENGE
PLAY ALL
INTRODUCTION
CORRECT ROADWAY SHAPE
SHAPING THE ROADWAY
GOOD SURFACE GRAVEL
DUST CONTROL
ADDITIONAL RESOURCES

2. Four Wheel Paths

This is necessary so that the intervals between maintenance can be minimized. When only two or three wheel paths are used, a road will wear out twice as fast as four wheel paths.

3. Centerline

As basic as it sounds, the centerline must be in the middle of the road. This facilitates the construction, maintenance and proper gravel thickness across the entire roadway. The grader operator MUST be aware of this in the construction of the road, in the lying of the gravel, and in the subsequent maintenance.

4. Cross Slope

A consistent grade allows the driver to maintain a steady pressure on the steering wheel and enables him/her to drive down the right lane easily as he/she was trained to do. To achieve this end, the *cross slope* MUST be predetermined and adhered to throughout the agency. The importance of using a simple tool called a SLOPEMETER, which allows the *cross slope* to be kept within one-half percent of the predetermined grade, should be emphasized.

5. Parallel Roadway Edges

The opposite edges of the road must be parallel to the centerline and to each other. In other words, the road width and the lane width must be constant. Roads and lanes of varying width will confuse the driver. The driver, when in doubt or threatened tends to drive down the middle.

6. Driveway Intimidation

Does the driveway meet the road or does the road meet the driveway? In many cases the road does meet the driveway, causing the driver to make adjustments to his/her steering wheel which he/she finds uncomfortable. So the vehicle moves back to the center of the road.

7. Roadside Intimidation

This is caused by objects such as mailboxes, trees, power poles, fences, improperly place delineators, speed or warning signs as well as more subtle objects such as bushes, weeds or high grass. To avoid these hazards, traffic again moves to the middle of the road.

What are the three most important things to remember about gravel roads?

- Materials
- Drainage
- Shape