

# Bar D Ranch Roads

Transitioning from the past to a *solid* future

Created for Bar D Ranch Owners by:

Bill Hooper - President

# BAR D RANCH ROADS

## Transitioning from the past to a *solid* future.

- This presentation describes our strategy for providing durable long-term road improvements.
- Previous attempts to fix our roads by only spreading road base have too often resulted in choosing an expensive temporary fix that is null and void the next year. A more permanent solution is needed to guarantee acceptable access to Bar D properties.
- This presentation was a forethought over many months of personal observation as a full-time ranch owner, listening to other owners, seeking local Park County officials' expertise, asking pit owners, moving gravel/dirt in certain areas and working with those with actual 'in the dirt' expertise in building roads.
- This phase 1 project was designed to get a snapshot of what may be required out of a road segment and the associated cost for other areas on Bar D Ranch.
- Cost in doing this has changed considerably over the last year for several reasons (fuel, etc).
  - A one size fits all assessment would be in error
  - Any effort to build a strategy using any other County related data points would be in error.

# Bar D Ranch Roads

## Past/Current road conditions

- Bar D roads were poorly designed from the onset, and most have continued to deteriorate over the years.
- Road conditions vary throughout their lengths due to multiple factors including geography and weather.
  - Example: Undulations on either side of the road can and do change how the road reacts to weather and usage.
- What is good for one segment is not necessarily helpful or prudent for another.
- Road conditions can vary within every quarter/segment mile. These differences are caused by changes in the unique geographical features adjacent to each segment.
- Our Ranch roads require expertise for assessment of snow accumulation patterns, snow removal strategies, and protection of road surfaces during winter maintenance operations.

# Bar D Ranch Roads

## Past road condition/s and applied 4-minus

- Years and areas where 4" minus has been applied:
  - Around 2010:  
Down on South Park Drive and over the "loop" section of Reinecker RR;
  - 2002-2003:  
short spots on Clark and RRR
  - Around 1996:  
Clark to RRR/R Court.
- Degradation by recent rains illustrates why a strategic 4" minus application is so necessary.
- Some owners have expressed their support for the current efforts and strategy being employed on the main roads. They are hoping for similar improvements near their properties.
- No other large sections or main connectors have been done since 1996.



# Bar D Ranch Roads

## Past & Current road conditions

- Lack of a solid base has caused too much of the current problematic road conditions.
  - Base is ***not*** defined by “the top drivable layer”, it is defined by what exists (subgrade) several inches (4-6”+) below the surface, in some cases:
    - Bar D Ranch – feet.
  - In some areas this 4” minus was installed but is now in danger of being destroyed due to proper lack of maintenance.
- Most road areas on the ranch have no subgrade; only dirt of several different types; some of which is a volcanic. This is slime when wet.
- We have a former Park County road maintainer/builder with extensive experience and expertise in constructing roads.
  - Juan Cera/Uno Trucking.
  - His resume and credentials are impeccable and highly respected in this area.
- Without a solid subgrade, any past and future monies spent will have been wasted. New material will end up being lost in the underlying mud or pushed several feet to either side of the road due to improper snow removal.
  - Adding Class 6 (3/4”) road base as a remedy:
    - This is a complete waste of money. Applying material without a solid sub-grade will degrade it into dust that will be pushed into the ditches.
    - Those who live on the ranch full time are acutely aware of dust trails left daily by vehicles travelling at speeds beyond 25 mph.
- Bar D Ranch now has the unique opportunity to address the substandard road conditions by laying in crushed 4” minus to build up a proper sub-grade.
  - The Schofield pit in Alma, Colorado has it and agreed to crush it explicitly to our specifications.

# According to many Park County expert sources, the four primary causes of wash-boarding are:

- ✓ driving habits
- ✓ lack of moisture
- ✓ poor road material quality and experience in application and maintenance
- ✓ and lack of crown on the road surface.

- Vehicle speed greatly contributes to wash-boarding; according to many experts with years of ‘boots in the dirt’ building roads.
- **Places where drivers routinely accelerate rapidly or break hard are also particularly prone to corrugation — so one way to reduce wash-boarding is to simply lower the speed limit.**
- Protracted periods of dry weather can also lead to wash-boarding, as arid conditions cause the crust that forms on the surface of gravel roads to loosen and become more susceptible to reshaping by passing tires.
- Conversely, if a gravel road doesn’t have the appropriate crowned road profile, water won’t be able to drain properly. Water will then accumulate in depressions and ripples in the road, which will in turn be deepened by passing traffic.
- Local experts explain that using current/high-quality road material can help mitigate or forestall some of these common wash-boarding issues.
  - **NOTE:** Selecting material made up of the right mixture of stone, sand, and fines — and with the necessary **binding** characteristic — will resist corrugation and go a long way towards reducing wash-boarding in the long-term.

## EXAMPLE OF LOCAL COST COMPARISON:

- Maverick Excavating, Fairplay, CO, has been doing this type of work since 1984.
- They charge \$50 a foot just to scrape and grade the road, then dump and grade out  $\frac{3}{4}$  base.
- **To address our .25 mile, stretch from the center cattle guard to the hill, they would charge \$66K. Many owners would agree this is not an option.**

Bill Hooper has met with the pit owner, Levi Schofield, to get his professional opinion. Bar D chose to use 4" minus, which is synonymous with 3" road base.

**SCHOFIELD  
EXCAVATION**

Hector Placer Pit, ID 05-05080  
Material Pricing 2022

970-471-6049

52212 Colorado Highway 9  
Alma, CO 80420

**NO ADDED FEES INCLUDING FUEL  
SURCHARGES AND INVIROONMENTAL FEE.  
Sales tax will be applied to taxable jobs.**

Material	Retail Price
3/4"Screened Rock	\$11.75/Ton
3/4"Road Base	\$9.50/Ton
3"Road Base	\$9.00/Ton
Concrete Sand/Septic Sand	\$21.00/Ton
3/4" Washed Rock	\$21.00/Ton
3/8" Washed Rock	\$21.00/Ton
Boulders 12"	\$25.00/Ton
Boulders 2ft-3ft	\$40.00/Ton
Boulders 3ft-4ft	\$50.00/Ton
Cobble 2"-4"	\$21.00/Ton
Cobble 3"-6"	\$21.00/Ton
Silty Clay	\$5.00/Ton
Pit Run	\$7.25/Ton
Clean Concrete Dump Fee	\$60.00 EndDump/ \$45.00 Tandem
Clean Asphalt Dump Fee	\$35.00 EndDump/ \$25.00 Tandem
Clean Dirt Dump Fee(No trash or wood)	\$30.00 EndDump/ \$20.00 Tandem
Clean Topsoil Dump Fee(No trash or wood)	\$30.00 EndDump/ \$20.00 Tandem

PO Box 612, Gypsum CO 81637  
Office 970-524-3478



Schofield pit – Crushing for 4 minus base *specifically* for our road project





As a comparison: One Bar D owner **ordered 2 loads of ¾ base totaling \$900** from the Heartland pit.

- That owner shared that they wished he had talked to me days prior as he would have leveraged the 4-minus strategy.

Date Range 6/1/2022 to 6/29/2022  
 Material Range 106-3 to 106-3  
 Customer Range 203 to 203  
 Weights Reported in Tons  
 Directions: Both

**Schofield Excavation - Hector Pit**

6/29/2022  
2:12:15 PM

### Material Usage

Date	Number	Truck ID	Quantity	Net	Material \$	Delivery \$	Misc \$	Tax \$	Total \$
Outgoing									
106-3 - 3" Road Base									
203 - Bar D Ranch									
6/22/2022	2026491	UNO	14.56	0.00	\$131.04	\$0.00	\$0.00	\$6.42	\$137.46
6/22/2022	2026492	UNO	14.22	0.00	\$127.98	\$0.00	\$0.00	\$6.27	\$134.25
6/22/2022	2026493	UNO	14.60	0.00	\$131.40	\$0.00	\$0.00	\$6.44	\$137.84
6/22/2022	2026494	UNO	14.35	0.00	\$129.15	\$0.00	\$0.00	\$6.33	\$135.48
6/22/2022	2026495	UNO	15.22	0.00	\$136.98	\$0.00	\$0.00	\$6.71	\$143.69
6/22/2022	2026496	UNO	14.60	0.00	\$131.40	\$0.00	\$0.00	\$6.44	\$137.84
6/22/2022	2026497	UNO	14.07	0.00	\$126.63	\$0.00	\$0.00	\$6.20	\$132.83
6/22/2022	2026498	UNO	14.06	0.00	\$126.54	\$0.00	\$0.00	\$6.20	\$132.74
6/27/2022	2026540	UNO	14.22	0.00	\$127.98	\$0.00	\$0.00	\$6.27	\$134.25
6/27/2022	2026539	UNO	14.51	0.00	\$130.59	\$0.00	\$0.00	\$6.40	\$136.99
6/27/2022	2026538	UNO	14.76	0.00	\$132.84	\$0.00	\$0.00	\$6.51	\$139.35
6/27/2022	2026537	UNO	14.90	0.00	\$134.10	\$0.00	\$0.00	\$6.57	\$140.67
6/27/2022	2026536	UNO	15.50	0.00	\$139.50	\$0.00	\$0.00	\$6.84	\$146.34
6/27/2022	2026535	UNO	15.21	0.00	\$136.89	\$0.00	\$0.00	\$6.71	\$143.60
6/27/2022	2026534	UNO	14.98	0.00	\$134.82	\$0.00	\$0.00	\$6.61	\$141.43
6/27/2022	2026533	UNO	15.20	0.00	\$136.80	\$0.00	\$0.00	\$6.70	\$143.50
6/28/2022	2026546	UNO	14.60	0.00	\$131.40	\$0.00	\$0.00	\$6.44	\$137.84
6/28/2022	2026547	UNO	14.74	0.00	\$132.66	\$0.00	\$0.00	\$6.50	\$139.16
6/28/2022	2026548	UNO	14.29	0.00	\$128.61	\$0.00	\$0.00	\$6.30	\$134.91
6/28/2022	2026549	UNO	13.35	0.00	\$120.15	\$0.00	\$0.00	\$5.89	\$126.04
6/28/2022	2026550	UNO	14.98	0.00	\$134.82	\$0.00	\$0.00	\$6.61	\$141.43
6/28/2022	2026551	UNO	14.98	0.00	\$134.82	\$0.00	\$0.00	\$6.61	\$141.43
6/28/2022	2026552	UNO	15.03	0.00	\$135.27	\$0.00	\$0.00	\$6.63	\$141.90
6/28/2022	2026553	UNO	14.38	0.00	\$129.42	\$0.00	\$0.00	\$6.34	\$135.76
<b>203 - Bar D Ranch Totals</b>			<b>351.31</b>	<b>0.00</b>	<b>\$3,161.79</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$154.94</b>	<b>\$3,316.73</b>
<b>106-3 - 3" Road Base Totals</b>			<b>351.31</b>	<b>0.00</b>	<b>\$3,161.79</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$154.94</b>	<b>\$3,316.73</b>
<b>Total Tickets: 24</b>									
<b>Outgoing Totals</b>			<b>351.31</b>	<b>0.00</b>	<b>\$3,161.79</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$154.94</b>	<b>\$3,316.73</b>

**SCHOFIELD**  
**EXCAVATION**

970-524-3478  
 PO Box 612  
 Gypsum, CO 81637

**Statement**

Date
7/1/2022

To:
Bar D Ranch PO Box 259 Como, CO 80432

Schofield pit invoice for Week 1 and 2 of road project from cattle guard to lower slopes of hill

		Amount Due	Amount Enc.
		\$3,316.73	
Date	Transaction	Amount	Balance
06/22/2022	Bar D Ranch- INV #3848. Orig. Amount \$1,092.13. SMS Tickets From 06/22/22 To 06/22/22	1,092.13	1,092.13
06/27/2022	INV #3869. Orig. Amount \$1,126.13. SMS Tickets From 06/27/22 To 06/27/22	1,126.13	2,218.26
06/28/2022	INV #3879. Orig. Amount \$1,098.47. SMS Tickets From 06/28/22 To 06/28/22	1,098.47	3,316.73
			Amount Due
			\$3,316.73

For Copies of Invoices  
 please contact  
 Janice@schofex.com



154305

CUSTOMER'S ORDER NO.	DEPARTMENT	DATE 6-28-22
NAME Bar D RANCH		
ADDRESS Bar D RANCH-ATTN, Bill Hooper President		
CITY, STATE, ZIP		

SOLD BY	CASH	C.O.D.	CHARGE	ON ACCT.	MOSE. RETD.	PAID OUT
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QUANTITY	DESCRIPTION	PRICE	AMOUNT
1	6-21-22 11 HILS Grader operation	45/Hr	495.00
2	6-22-22 12.5 HRS Trucking	150/Hr	1875.00
3	6-23-22 11 HILS Grader operation	45/Hr	495.00
4			
5			
6		TOTAL	2865.00
7		TAX	214.87
8			3079.87



RECEIVED BY *Bill Hooper*

- Week 1 of project  
Juan Cera:
- Running Ranch Grader
  - Trucking material in



154306

UNO Trucking

CUSTOMER'S ORDER NO.	DEPARTMENT	DATE
NAME Bar D Ranch		
ADDRESS Bar D Ranch A+N-Bill Hooper President		
CITY, STATE, ZIP Comp, CO.		
SOLD BY	CASH	C.O.D.
CHARGE	ON. ACCT.	MDSE. RETD.
PAID OUT		

QUANTITY	DESCRIPTION	PRICE	AMOUNT
1	6-27-22 11 HRS Trucking	150/Hr	1650.00
2	6-28-22 11 HRS Trucking	150/Hr	1650.00
3	6-29-22 11 HRS Grader operations	45/Hr	495.00
4	6-30-22 3 HRS Trucking	150/Hr	450.00
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16		Total	4245.00
17		TAX	319.00
18		Grand Total	4564.00

RECEIVED BY

*W. Hooper*

Week 2 of project

Juan Cera:

- Running Ranch Grader
- Trucking material in



- **One of the main arteries for Bar D Ranch runs from the middle cattle guard to the hill.**
- **This stretch has not been done correctly for 25+ years.**
- **Based on expert input, it is prudent to address this neglected section now and continue applying material south to the first bench if not over the top of the big hill.**
- **As the next priority, we will improve a section of South Park Drive, as resources permit.**

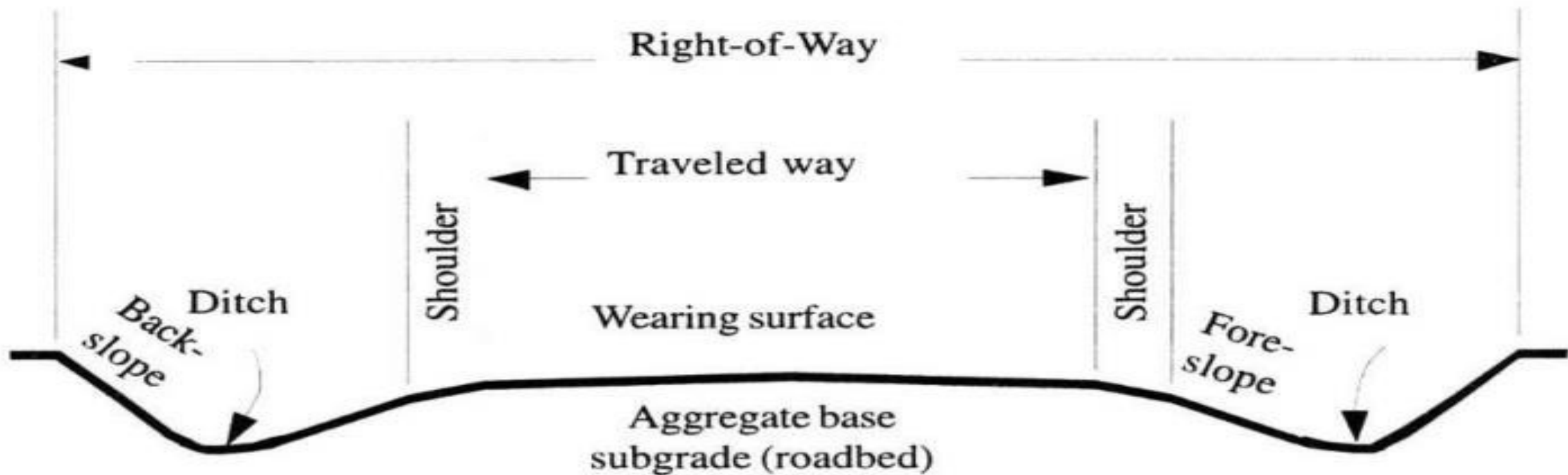




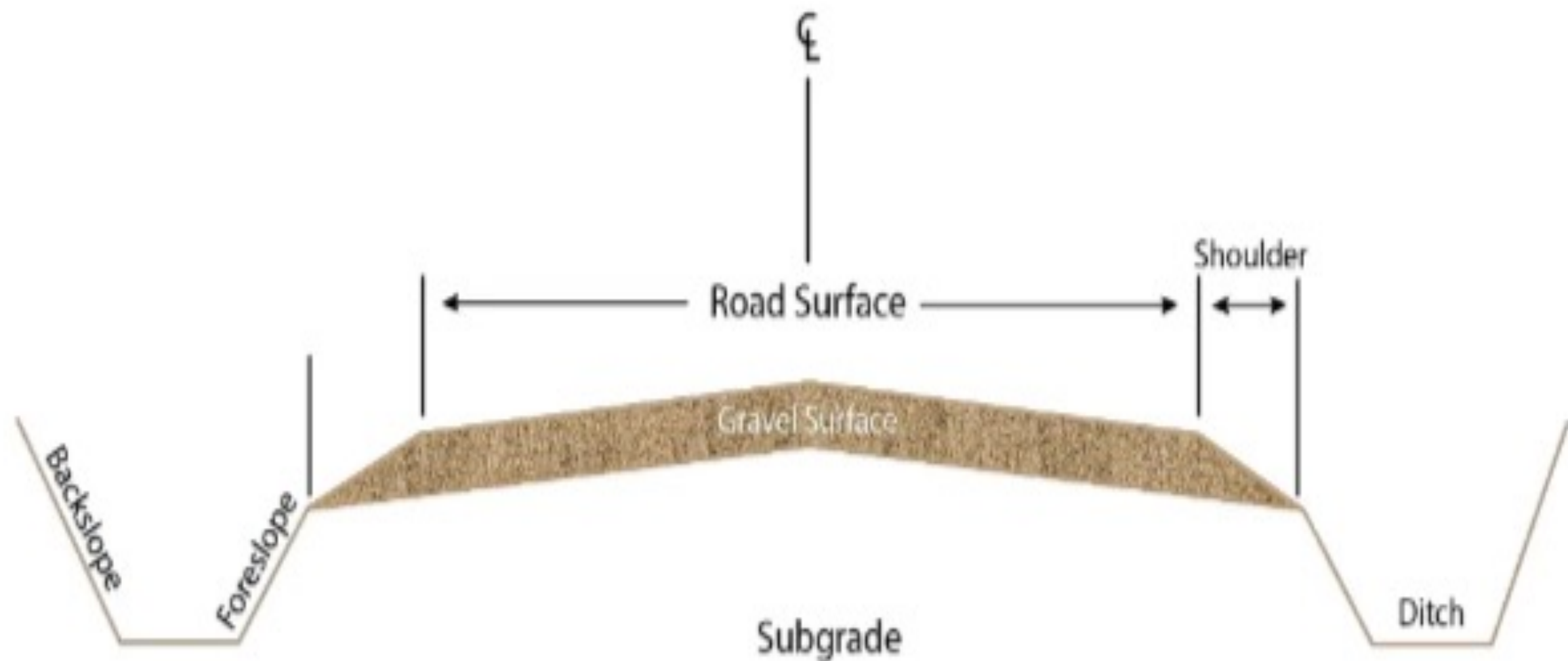




# Typical Gravel Road Section



# Basic Cross Section

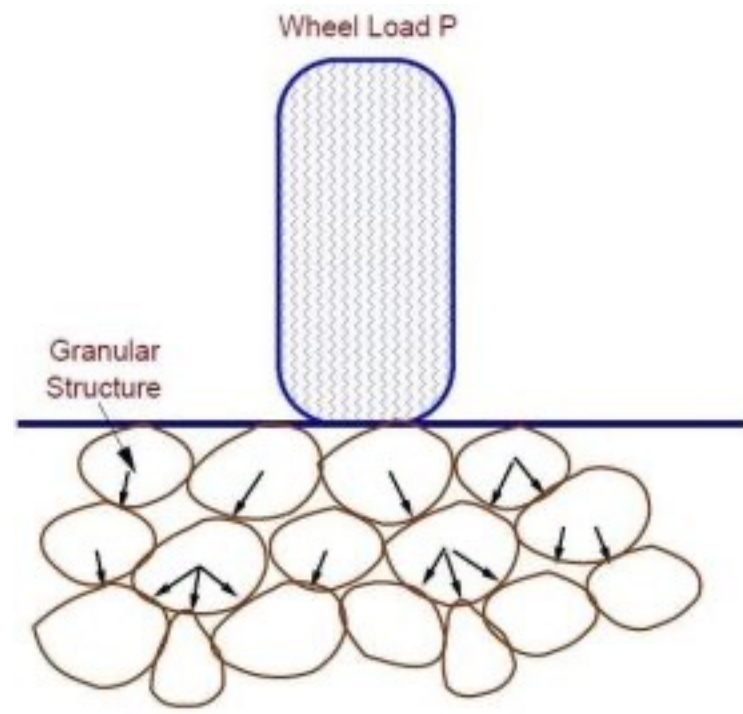


# Gravel Roads Basics

- Drainage
  - A wet road is a weak road
- Structural Strength
  - Each layer must be strong enough to resist the shear stresses applied to it
- Rideability
  - Potholes, Washboards, and Ruts
- Dust Control
- Loose Aggregate
- Safety

# Structural Properties of Roads

- Road Components
  - Surface, Base, Subgrade
- Road Stresses
- Road Materials



Load transfer in granular structure



# Materials

- Gravel surface materials need several characteristics:
  - Strength
    - Rutting Resistance
  - Cohesion and Moisture Retention
    - Aggregate Loss Resistance
    - Washboard Resistance
    - Dust Control

# Crushed v Pit Run Aggregate

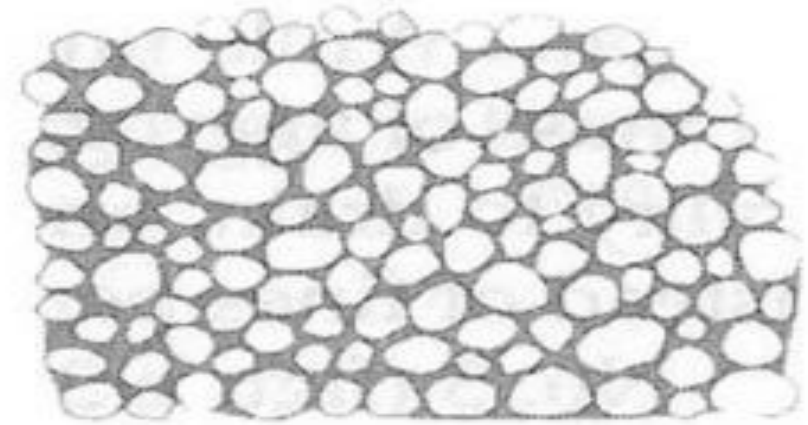
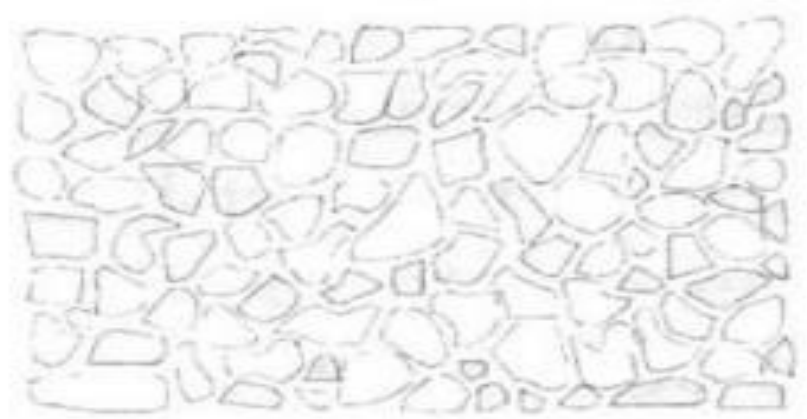


# Crushed v Pit Run Aggregate

Angular



Rounded



Individual pieces fit closely together when mixed and compacted. Voids (air pockets) are reduced.

Rounded shapes don't allow individual pieces to consolidate and interlock. Numerous voids intersperse the particles.

# Three Rules of Drainage

1. Keep water out
2. Get water out
3. Use materials not weakened by water

As always...please share any questions.