What's in your Gravel??

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Gravel Uses

- Base material?
- Drains?
- Foundation support?
- Driving surfacing?

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Surface Characteristics

- What do most of your gravel roads look or act like?
  - Do they have a lot of “float” on them?
  - Are they wash boarded?
  - Is there rutting?
  - Does it look like the dust bowl of the 1930’s under traffic?
  - Are they packed tight on the surface?

Physical Properties

- What is gravel made of?
  - Rock
    - Rounded
    - Fractured faces
  - Sand
    - Blow sand
    - Crushed or natural fractured sand (FAA)
  - Fines (minus 200 Sieve)
    - Silt
    - Clay (PI)
    - Topsoil
  - Shale
  - Scoria

What should a good Gravel have for a driving Surface?

- Rock (≈1/2” to ≈3/4”)
- Intermediate aggregate (≈No. 4 to ≈No. 40 sieve)
- Fines (≈No. 200 sieve and smaller)
  - Smaller – needs to have a certain amount of PI (Plasticity Index)
- Maybe an Additive?

Benefits of good gravel

- Reduced Maintenance costs
  - Less blading
  - Less spot graveling
  - Reduced wash boarding to fix
- Reduced long term capital expenditures
  - Gravel purchases
  - Equipment
  - Dust suppressants
- Reduced Dust
- Better driving surface
- Safer

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What does your gravel spec look like now?

Sieve Size	NDDOT Cl 13	MT Gravel Surfacing	SD/FHWA Gravel Roads Manual	Proposed Gravel Surfacing
1”	100	100		100
3/4”	70-100	80-90	100	70-100
1/2”		60-80		
3/8”				
No. 4	38-75	50-70	50-78	38-75
No. 8	22-62	37-60	37-67	22-62
No. 10				
No. 30	12-45			12-45
No. 40		13-35	13-35	
No. 200	7-15	4-18	4-15	7-15
PI		4-12	4-12	4-12
Shale (max %)	12.0			12.0
LA Abrasion (max %)	50		40	50
NDDOT 4, Fractured Faces	10			10

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How do you make the Transition to good gravel?

- Change your specification and start using it, or
- Need to try it first
  - Get someone else to pay for it
    - Like the Air Force

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Trial Project

- Defense Access Road Program
  - Funding for maintenance of TE Routes
  - 300 miles of gravel roads in 8 Counties in ND
  - FHWA works with the Air Force
  - NDDOT typically manages the projects
- 2016 Graveling project
  - 40 miles in 5 counties
  - Modified Cl 13 specified
    - PI requirement of 4-9
  - FHWA and the Air Force will monitor the project

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Trial Project

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How do you make the Transition to good gravel?

- Changing the specification?
  - Get NDDOT to change the Cl 13 spec (add PI), or
  - Get NDDOT to add new Spec (Cl ?) specifically for gravel surfacing, or
  - Add a plan note in your plans to modify the spec, or
  - Modify the gravel spec in each county to what works for each county?
- Do some training on blading/maintenance with the different material!

Questions?

Questions are guaranteed in life; Answers aren't.

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