What's in your Gravel??

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NDDOT-Local Government
2017 NACE Conference
Gravel Uses

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

0 Rock (≈1/2” to ≈3/4”)
0 Intermediate aggregate (≈No. 4 to ≈No. 40 sieve)
0 Fines (≈No. 200 sieve and smaller)
  0 Smaller – needs to have a certain amount of PI (Plasticity Index)
0 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
## What does your gravel spec look like now?

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>NDDOT Cl 13</th>
<th>MT Gravel Surfacing</th>
<th>SD/FHWA Gravel Roads Manual</th>
<th>Proposed Gravel Surfacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1”</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>3/4”</td>
<td>70-100</td>
<td>80-90</td>
<td>100</td>
<td>70-100</td>
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<tr>
<td>1/2”</td>
<td></td>
<td>60-80</td>
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<tr>
<td>3/8”</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>No. 4</td>
<td>38-75</td>
<td>50-70</td>
<td>50-78</td>
<td>38-75</td>
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<td>37-60</td>
<td>37-67</td>
<td>22-62</td>
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<td>No. 30</td>
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<td>No. 40</td>
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<td>13-35</td>
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<tr>
<td>No. 200</td>
<td>7-15</td>
<td>4-18</td>
<td>4-15</td>
<td>7-15</td>
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<tr>
<td>PI</td>
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<td>4-12</td>
<td>4-12</td>
<td>4-12</td>
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<tr>
<td>Shale (max %)</td>
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<td></td>
<td>12.0</td>
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<tr>
<td>LA Abrasion (max %)</td>
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<td>40</td>
<td>50</td>
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<tr>
<td>NDDOT 4, Fractured Faces</td>
<td>10</td>
<td></td>
<td></td>
<td>10</td>
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</tbody>
</table>
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
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
Trial Project
How do you make the Transition to good gravel?

0 Changing the specification?
   0 Get NDDOT to change the Cl 13 spec (add PI), or
   0 Get NDDOT to add new Spec (Cl ?) specifically for gravel surfacing, or
   0 Add a plan note in your plans to modify the spec, or
   0 Modify the gravel spec in each county to what works for each county?

0 Do some training on blading/maintenance with the different material!
Questions?

Questions are guaranteed in life; Answers aren't.