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THE DSA ISSUE II

In the Spring of 2007, the Center published a popular “DSA-focused” newsletter (available on Center’s website under “news”). While DSA has not changed, many issues affecting DSA have, so we thought it was time to revisit a Driving Surface Aggregate Issue of the Newsletter for 2011.

Aggregate Supply Shortages

One of the growing realities in the post “Marcellus world” that many of us live in is that “sometimes there just isn’t enough stone”. With well pads, new roads, and road maintenance, many quarries across northern and western Pennsylvania are producing aggregate at full capacity and still can’t keep up. An explosion of small “startup” quarries have been springing up everywhere in order to meet the added demands. What does this mean for DSA? First of all, it means that prices are going up because of supply/demand issues and because of DSA’s specific requirements. The Center has recently seen DSA quotes approaching $50/ton in some of the more remote areas of the state. Secondly, it means that DSA quality and consistency is beginning to suffer as many quarries struggle to keep up with stone orders.

DSA Maintenance

One of the advantages of placing a thick lift of DSA on a road is the ability to easily maintain it in the future. Be aware, however, that DSA is different from other “loose” aggregates. DSA should always be graded when wet, preferably with a carbide tooth grader blade, and followed by compaction. The Center has more details on DSA maintenance in the form of Technical Bulletins on our website at www.dirtandgravelroads.org under “Resources > DSA.”

What is DSA?

New to the Dirt and Gravel Road Program? Driving Surface Aggregate (DSA) is an aggregate specification designed for use as a surface wearing course for unpaved roads. It is designed to achieve maximum compacted density and to resist erosion. For more information, look under “Resources > DSA” on the Center’s website at: www.dirtandgravelroads.org.

Be sure to check out the Center’s new website. Now with online workshop registration: www.dirtandgravelroads.org

Made possible through the support of:

Black & White Where’s the Color? Since this issue is “text-heavy” with few critical images, it is printed in grayscale to reduce printing costs. Color print in future issues will depend on content.
DSA Quality Control

Owed in large part to the aggregate shortages described on the front page, the Center has seen the Quality of DSA from some suppliers suffer over the last two years (even from large suppliers with DSA experience). Many times Center staff have been called out to a job because “the DSA did not work.” In almost every case, the failure has been due to either substandard DSA, the passing off of another product as DSA, or improper base preparation or aggregate placement. An ounce of prevention is worth a pound of cure. To insure aggregate quality, the Center continues to recommend that you visit and work with the quarry prior to aggregate placement. Center staff are available to accompany you to visit the Quarry before the aggregate is sent to the job. It is a lot easier to deal with potential problems at the quarry before the stone reaches your jobsite.

DSA Testing Options

Consider using an independent lab to test the aggregate to insure it will perform as expected. When using an independent laboratory for analyzing DSA, there are two recommended tests:

1) Hydrometer test & Plasticity Index, (~$200). This test will determine the type of material (clay vs. crushed rock) that makes up the aggregate fines.
   • The Sieve Analysis with Wash, shows the percentages of the material passing the five sieve sizes. These gradations should fall within the corresponding specification range for each sieve size. (While sieve analysis can be done alone, it is already done as part of the Hydrometer test)

2) The Standard Proctor Analysis, (~$145) determines the optimum moisture and maximum density for the specific material. On-site compaction testing can be conducted by a lab technician, (~$50/hour). Information obtained from the Proctor analysis is used to calibrate a Nuclear Density Meter, which uses a probe inserted through the DSA just after placement. Moisture content of the material is measured, along with maximum density after compaction. Maximum densities of 95% or better (of theoretical maximum density determined during proctor test) should be realized on the aggregate in the field.

The cost of the DSA testing above can be included as part of Program grant applications under "Project Expenditures." When you are spending $10,000 to $40,000 on DSA, the ~$350 - $500 in up-front testing seems like a bargain compared to remediating an inferior aggregate job.

What Should You Do to Insure Quality DSA?

• Visit the quarry. Talk with the quarry early (2 weeks before job) to make sure they understand DSA. Inspect the pile and look for problems before your job begins.
• Spend the money for DSA testing described above. It is an allowable contract expense in the Program and could save you money and headaches in the future.
• If you need help with a DSA placement, or help with the recommended testing above, contact the Center for assistance. (give us as much lead time as possible)
• Get a current "DSA Certification" from the Quarry with the first delivered load.
• Take random aggregate samples during DSA placement. These samples may prove valuable if performance issues arise on the road in the future.
Clay Fines & Plasticity

Fine material (minus #200 sieve) is a critical component of DSA that holds the rest of the stone together. The fine material in DSA is required to be composed of crushed rock fines, with no silt or clay being added. While clay may be a desirable component of aggregate in some arid regions of the country for its water retention properties, the Center has found that in Pennsylvania’s humid climate, clay causes more problems in the form of soft roads and dust than do fines made from crushed rock. One of the more common reasons that aggregates fail to meet the DSA classification is the inclusion of clay fines. In order to get a better handle on the issue of clay in aggregate, the Center is looking into adding a Plasticity Index (PI) to the DSA specification. PI can be correlated to the amount of clay fines in the aggregate, and is the best available testing for clay. The Center hopes that setting a PI standard will provide a quantitative basis for testing DSA for clay. PI testing is done in conjunction with the hydrometer analysis described on the left.

Case Study: Lebo Road, Potter County

When delivered and placed correctly over a properly prepared base, DSA should perform well with little or no maintenance for years. The Center has seen many cases of DSA lasting for 5 years or more without maintenance.

Lebo Road, a State Forest road in Potter County (right), had two miles of DSA placed on it in May of 2006. The road was graded for the first time in June of 2011. While daily traffic on Lebo road is light, it does see it fair share of fishing and hunting traffic, and hosts a “road rally” car race each year.

Lebo road is also the site of the Center’s sediment reduction study. The study showed sediment reductions from DSA compared to the existing road of 75% after one month, 90% after one year, and 96% after two years. Study details at www.dirtandgravelroads.org under “research”.

Other News

- **Program Funding:** The Center continues to work to secure additional Program funding through the PA Keystone Transportation Funding Coalition. Additional Program funding may come from the comprehensive transportation funding package that was delivered to Governor Corbett on August 1st.

- **Low Volume Roads Conference:** Center staff just returned from the 10th International Low Volume Roads Conference in Orlando. The Center has also been selected as the host for the 11th Conference in Pittsburgh in 2015.

- **QAQCs:** The Program will start its second round of Quality Assurance / Quality Control District visits with Venango, Mifflin, and Susquehanna in 2011. Look for more details on the topics above and others in the future.

-Steve Bloser (CDGRS)
The two-day ESM training covers many aspects of road maintenance and focuses on practices to reduce maintenance costs and environmental impact from unpaved roads.

Have questions or want to schedule an ESM training? Want to receive future newsletters?
Contact Kathy Moir at:
1-866-No-To-Mud
(1-866-668-6683)
dirtandgravel@psu.edu
www.dirtandgravelroads.org

Two-Day ESM Training Schedule

**Fayette**: Aug 16-17       **Franklin\Cumberland**: Oct 18-19

**Columbia**: Nov 15-16

2012 Trainings are currently open for scheduling.

Contact the Center to register for a training, or to discuss hosting one (814-865-5355).

Other Events

**SCC meetings**: September 13th, Hbg: November 15th, Hbg.

**2011 Dirt and Gravel Maintenance Workshop**: September 27-28, Wilkes-Barre, PA

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The Center’s Annual Maintenance Workshop showcases “Environmentally Sensitive Maintenance Practices” for Dirt and Gravel Roads. The Workshop involves classroom presentations and field trips to potential, active, and completed road project sites. The Workshop is designed with Conservation Districts, Townships, and Forestry personnel in mind, although anyone involved in PA’s Dirt and Gravel Road Maintenance Program, and any other “low-volume road maintenance professionals” are encouraged to attend.

**AGENDA**

The 2011 agenda is shaping up to be very “field heavy” because of the great number of worthwhile sites in the nearby area. A more detailed agenda is available online (see “Registration” section below for website).

**Tuesday, September 27**

Introductory Session Tuesday morning will be followed by brief class session. Due to the large number of field sites, buses will be departing late morning with bag lunches for attendees. Field sites include several in-progress and completed Dirt and Gravel Road Projects, and a stop at a local wind farm access road. A vendor reception and pig-roast dinner will be held at the Woodlands that evening.

**Wednesday, September 28**

After a “Peer-to-Peer Hot Topics” session over breakfast in the morning, attendees will hit the road for a field trip to the Marcellus Shale region to view and discuss road impacts from the gas industry. A catered lunch will be provided in the field. The field trip will return to the Woodlands by 2:30 so attendees can hit the road early.

**REGISTRATION**

- **Online Registration:** Workshop details and registration are online this year. Go to the Center’s website at [www.dirtandgravelroads.org](http://www.dirtandgravelroads.org), and click on “2011 Workshop Registration” in the top right corner. Credit cards are now accepted for registration!
- No multipage workshop announcement will be sent this year since information is all online.
- **Reserve your hotel with The Woodlands directly** (570-824-9831, more info, directions, maps, etc. on registration website, be sure to mention “Dirt and Gravel” for reduced hotel rate).
- If you cannot register online, you can use the back of this form.
- **2011 Workshop Registration Fees** (covers all facility, meals, and bus costs):
  - **PA Program Affiliation:** (cost for Townships, Districts, State, etc. subsidized by D&G Program)
    - $230 if registering by August 31st
    - $250 if registering after August 31st
  - **Private Entity or Vendor:** $460

This is the final printed notice for the 2011 workshop! Hope to see you there!

**CREDITS:** The Workshop will carry Continuing Education Credits (or PDHs) from the PSU College of Engineering. The Workshop will also count as a RE-certification for anyone who has already attended the 2-day ESM training.
Registration is available online this year. We encourage you to use the online registration site. If you are unable to do so, feel free to complete the form below and fax it to Kathy Moir at 814-863-6787. (copy this page for multiple attendees)

For Online Registration: go to www.dirtandgravelroads.org, then click on “2011 Workshop Registration” in the top right corner.

First Name: ___________________________ Last Name: ___________________________
Title: ___________________________ Affiliation: ___________________________
Address: ___________________________ City/St/Zip: ___________________________
Phone ___________________________ Fax: ___________________________
*E-Mail (print clear, used for future contact): ___________________________

Check one:

☐ Township, District, or State Entity ($230 before Aug 31st, $250 after Aug 31st)
☐ Private Entity, Vendor, or Out of State Entity ($460)

Payment:

Paying by Check: Checks made out to “Penn State University” should be sent to:
Kathy Moir
Center for Dirt and Gravel Road Studies
215 Transportation Research Building
University Park, PA, 16802

To register, fax this page to Kathy Moir at 814-863-6787, or send this page with check to address on left.

*credit cards can only be accepted through online registration

Hotel reservations should be made directly with the Woodlands or other nearby hotels. The Woodlands can be reached at 570-824-9831. Be sure to mention “Dirt and Gravel” for reduced hotel rate.