

**Dirt Gravel and Low
Volume Road Program**

WEBINAR

DSA Season

**3/18/2021
Starts at 9am**

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Steve Bloser - CDGRS

www.dirtandgravelroads.org

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Audio via Phone if needed: 646-876-9923

Webinar ID: 987 5482 6192



DSA Season Prep

Purpose

- Primer and reminder for DSA placement season starting April 1
- Discussion of new DSA Project Checklist



RESOURCES:

DSA Certification: 2 page DSA certification form

DSA Specification: Material & Placement specs

DSA Handbook: More in depth DSA explanation

- Includes Request for Quote
- more details to come

All can be found on the CDGRS website including this webinar.

DSA RESOURCES:

DSA Handbook: More in depth DSA information

- includes Request for Quote
- www.dirtandgravelroads.org

Municipal DSA Quick Guide.

Municipal Quick-Guide to Driving Surface Aggregate
 The purpose of this document is to briefly outline the requirements and recommendations regarding placement of Driving Surface Aggregate (DSA) through the PA Dirt, Gravel, and Low Volume Road Maintenance Program (DGLVRP). Additional details can be found in the "DSA Handbook". Since the DGLVR Program emphasizes "local control", potential applicants should always check with their local Conservation District for county-specific policies regarding DSA and other aspects of the Program.

Pre-project Logistics (Full Details in chapter 4 of DSA Handbook)

- Notify Conservation District of intent to apply.
- Conduct pre-application site-visit with Conservation District.
- The DGLVR Program focuses on long-term road and environmental improvements. Projects are **Required** to focus on drainage, road base, and environmental issues prior to DSA placement. DSA is NOT required on every project.

Purchasing DSA:

- Normal bidding procedures apply.
- Prevailing Wage applies to DGLVR projects over \$25,000. **Required**
- Sample DSA "Request for Quote" in DSA handbook. Contact local Conservation District to determine any county specific requirements for DSA material or bidding procedures.
- Notify Conservation District once DSA supplier is chosen. **Required** District and/or Program representative will test DSA to ensure it meets Program standards. **Required**

Road Preparation (Full Details in chapter 5 of DSA Handbook)

- Make provisions for road closure if possible (during placement and drying), and notify any residents.
- Drainage and base improvements must be done before DSA placement. **Required**
- Establish proper crown or cross-slope (1/2 to 3/4 inch per horizontal foot (4% - 6% slope)) in the road prior to grading. **Required**
- If adequate crown but is extremely tight, compact the edge of aggregate when possible.

How much DSA should I order?

DSA Needed = (tons)	Road Width (ft)	Road Length (ft)	0.04 8" loose depth compacted to 6"
			0.03 6" loose depth compacted to 4"

Paver Considerations:

- Track pavers are recommended, especially on steeper slopes.
- Paver should be capable of placing entire road width in one pass. Avoid multiple lane placements if possible.
- Paver must be able to match crown or cross-slope previously established in road base (1/2 to 3/4 inch per horizontal foot (4% - 6% slope)). **Required**
- Place DSA in one uniform lift. **Required**

Tailgate Considerations:

- Tailgate material in as uniform of a lift as possible, avoiding large piles.
- Handle the material as little as possible with grader in attempting to establish road shape. Overworking DSA cause it to segregate by size and it will not perform desired.

Full Details in chapter 6 of DSA Handbook)

Compaction requires optimum moisture. **Required**. Insure compaction occurs out. If excess material sticks to the roller drum, it may be too wet and so **Required** before continuing compaction.

Compaction:

- PASSES should be done in static (non-vibratory) mode.
- Vibratory mode when going down steep sections of road or if it brings excess to the surface.
- PASSES from the road edge towards the crown.
- PASSES down from both sides, but do not "straddle" the crown with the roller.
- PASSES using a density gauge is recommended, and the cost of testing can be covered by the DGLVRP grant.

chapter 7 of DSA Handbook)

Moisture than other materials and requires special care. Moisture to avoid segregation and insuring special care done when adequate moisture is present during compaction.

Paver placement

Reminder: Aggregates 101 Webinar Available

- Recorded January 2021
- Summary of general aggregate properties
- Summary of commonly used aggregates in PA
- Recording and powerpoint available on CDGRS website

Road Aggregates 101

Purpose

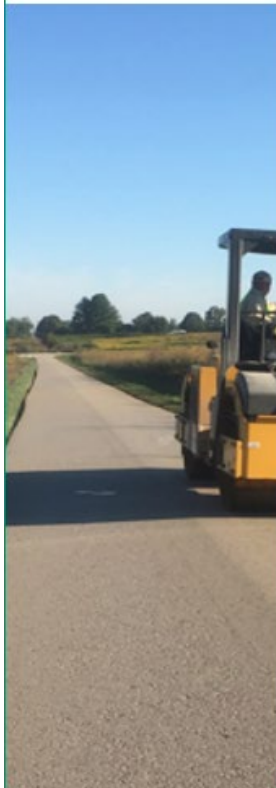
- Introduce the updated “Aggregates 101” technical bulletin.
- Provide an introduction to commonly used road aggregates, especially for new CD staff.



Reminder: “DSA Day” Course Webinar Available

- Recorded February 2021
- In depth DSA course intended for CD’s
- Recording and powerpoint available on CDGRS website

DSA Day



Purpose

- To learn why DSA was created and how it is different from other aggregates
- To learn what DSA is and how it works
- Proper DSA purchase and placement specifications

Reminder: 2020 DSA Changes:

Material

- Slight gradation change to make DSA easier to produce.
- Maximum plasticity index reduced from 6 to 4.

Placement

- Placement Season April through September unless approved by SCC.
- Paver must place DSA in single pass (*paver still not required for jobs less than 1,000 tons*)

DSA Use and Overuse

- When DSA is used as part of a project, it should be the very last phase of the project.
- DSA alone does not constitute a comprehensive DGLVR Program project.



Purchasing DSA with DGLVR Funds:

- DSA must be independently sampled and tested
- 30-day notice time required for testing if CDGRS is doing the sampling.

- Help f
placer
- 30 day notice is a minimum
Notify as soon as supplier is known

 - Supplier needs time to make entire pile
 - Time for sampling
 - Time for testing
 - Potential time for failures

Purchasing DSA with DGLVR Funds:

- **DSA must be independently sampled and tested**
- **30-day notice time required for testing if CDGRS is doing the sampling.**
- **Help from Center is also available for testing or placement on request.**

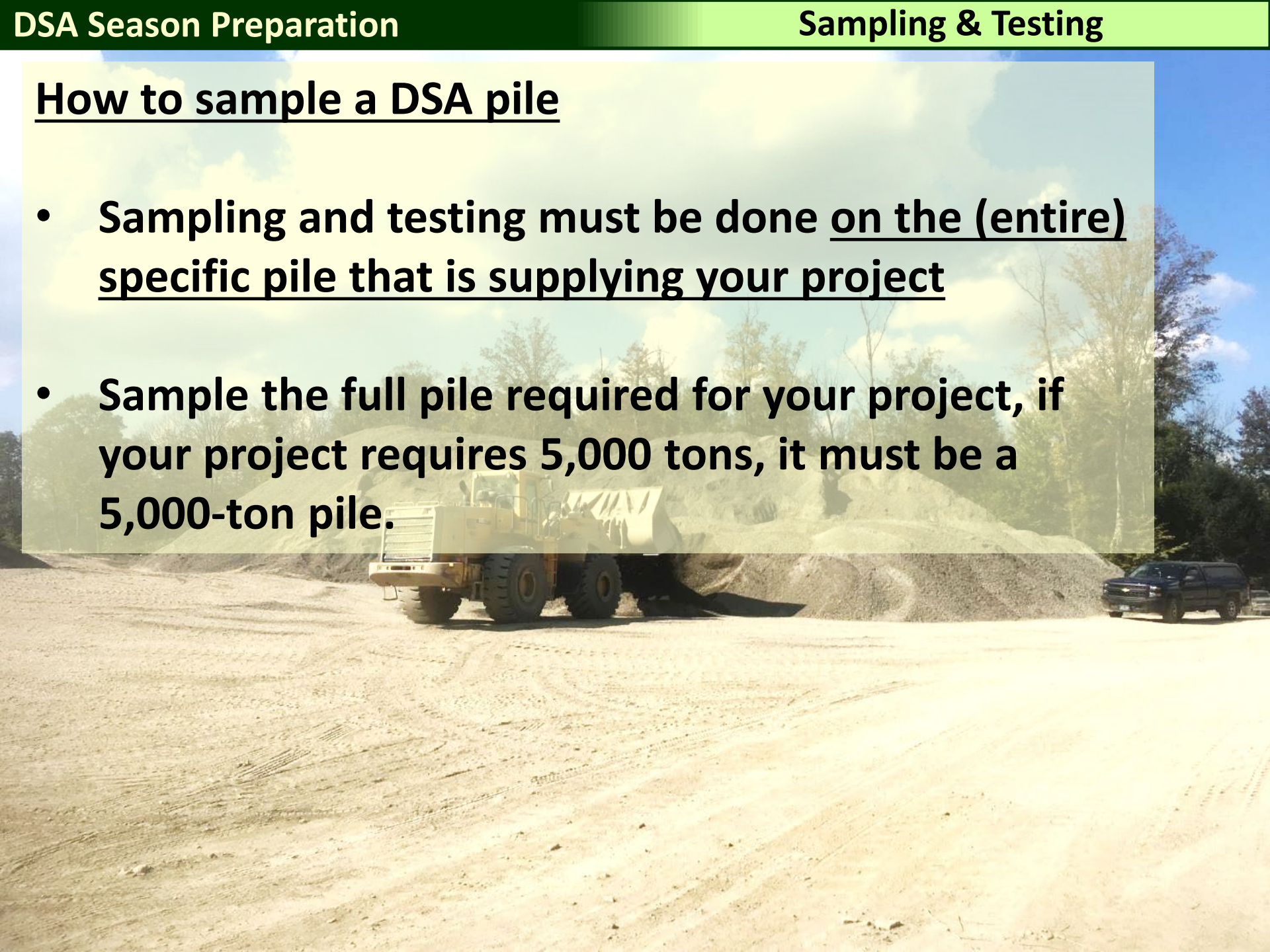
How to sample a DSA pile

- Sampling and testing must be done on the (entire) specific pile that is supplying your project



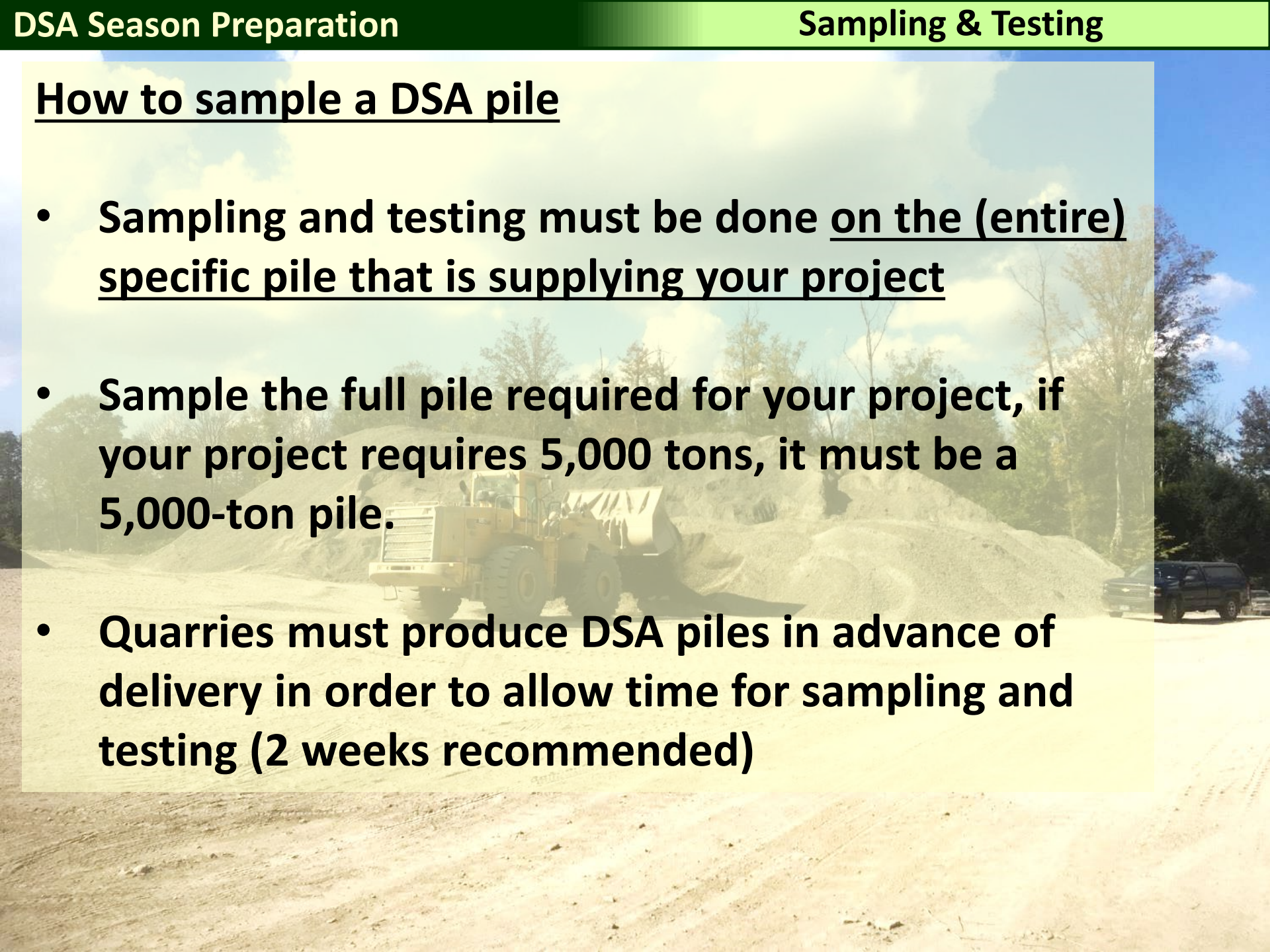
How to sample a DSA pile

- Sampling and testing must be done on the (entire) specific pile that is supplying your project
- Sample the full pile required for your project, if your project requires 5,000 tons, it must be a 5,000-ton pile.

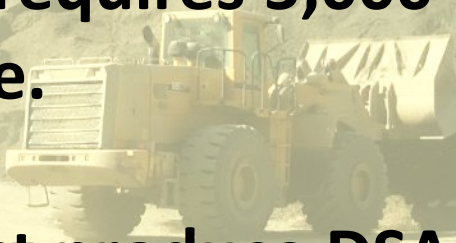


How to sample a DSA pile

- Sampling and testing must be done on the (entire) specific pile that is supplying your project
- Sample the full pile required for your project, if your project requires 5,000 tons, it must be a 5,000-ton pile.
- Quarries must produce DSA piles in advance of delivery in order to allow time for sampling and testing (2 weeks recommended)

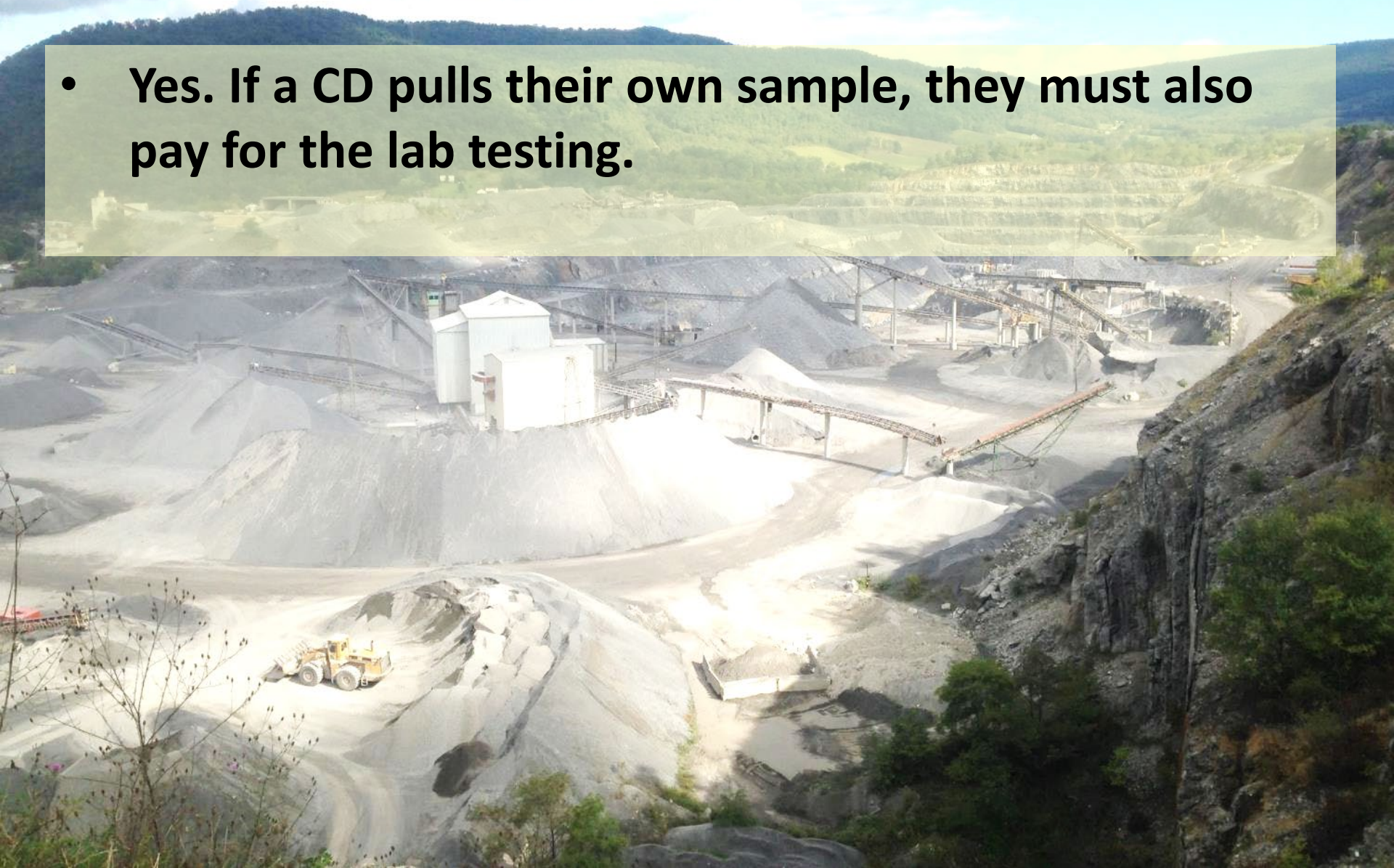


How to sample a DSA pile

- Sampling and testing must be done on the (entire) specific pile that is supplying your project
 - Sample the full pile required for your project, if your project requires 5,000 tons, it must be a 5,000-ton pile.
 - Quarries must produce DSA piles in advance of delivery in order to allow time for sampling and testing
 - Labs can get backlogged in construction season
- 
- A yellow front-end loader is positioned in front of a large, conical pile of light-colored sand or gravel. The background shows a line of trees under a blue sky with scattered white clouds. The scene is set in an open, outdoor area, likely a quarry or a construction site.

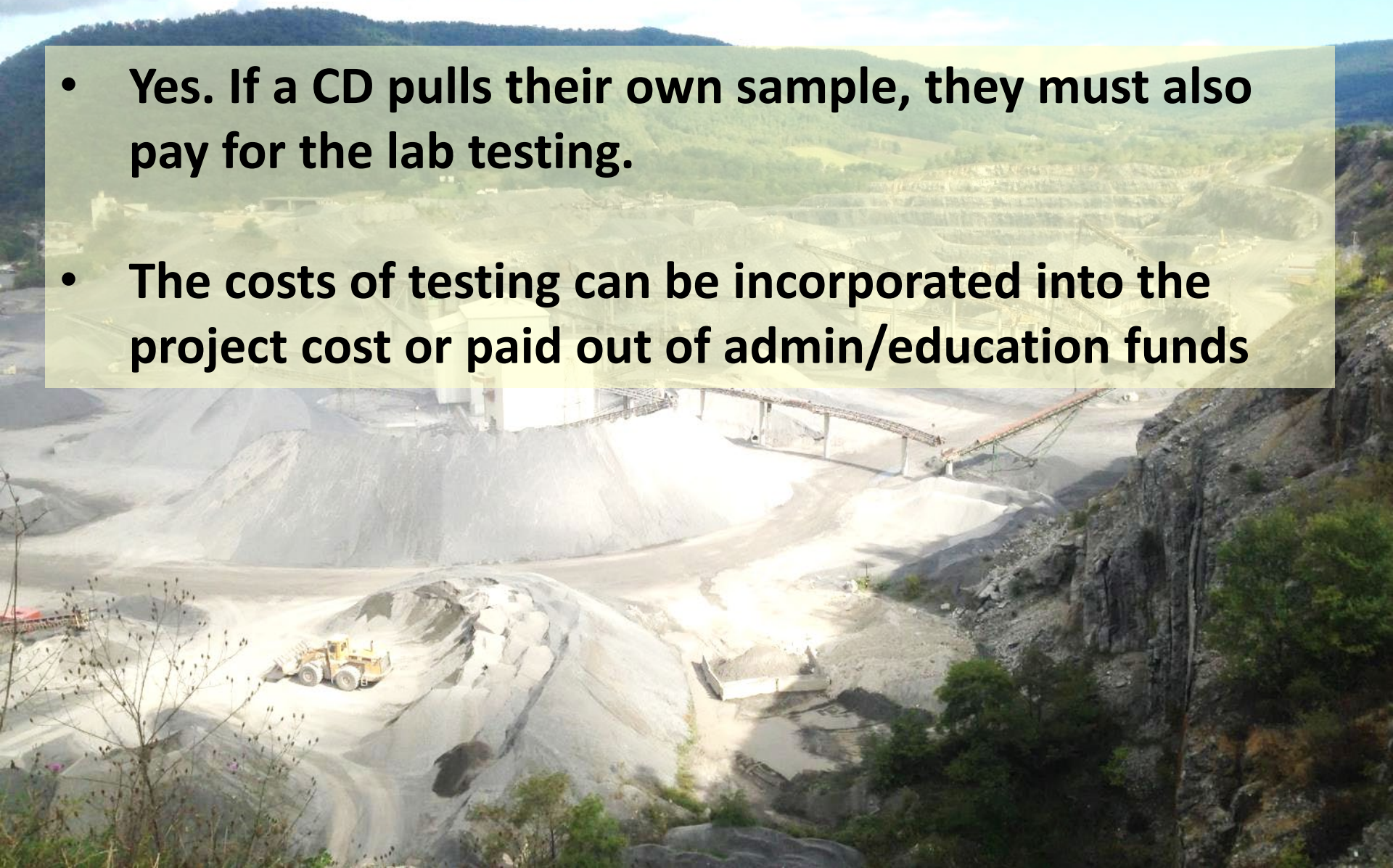
Can a conservation district pull their own sample?

- Yes. If a CD pulls their own sample, they must also pay for the lab testing.



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- The costs of testing can be incorporated into the project cost or paid out of admin/education funds



Can a conservation district pull their own sample?

- Yes. If a CD pulls their own sample, they must also pay for the lab testing.
- The costs of testing can be incorporated into the project cost or paid out of admin/education funds
- Sampling and testing can also be done, free of charge, by the Center's DSA Clearinghouse (more details on that later)

How to collect a DSA sample...

- Sampling from a stockpile should always be done using a loader to separate out small sampling pile(s).



How to collect a DSA sample...



- Sampling from a stockpile should always be done using a loader to separate out small sampling pile(s).
- As the sampler, it is your job to **witness the sample pile(s) being created** from the DSA stockpile that will be used on the job.

How to collect a DSA sample...



- Sampling from a stockpile should always be done using a loader to separate out small sampling pile(s).
- As the sampler, it is your job to **witness the sample pile(s) being created** from the DSA stockpile that will be used on the job.
- Sampling is equally as important as the testing, and the sampler shall use every precaution to obtain samples that will show the nature and condition of the materials which they represent. A “representative” sample.

How to collect a DSA sample...

- Use loader to re-blend the segregated material on the outside of the pile.



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- After blending, reenter the pile with the Loader and obtain a fully loaded bucket.



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- Exit the pile and empty the bucket to form a small sampling pile at the base of the stockpile



How to collect a DSA sample...

- Use loader to re-blend the segregated material on the outside of the pile.
- After blending, reenter the pile with the Loader and obtain a fully loaded bucket.
- Exit the pile and empty the bucket to form a small sampling pile at the base of the stockpile
- Using the loader, create a flat surface (sampling pad) by dragging the bucket back across the small pile.



How to collect a DSA sample...

- Mentally divide the flat sampling pad into four quadrants and sample equally from each quadrant. Avoid sampling within 1 foot of the pad edge and take care to avoid previous shovel holes.



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- Mentally divide the flat sampling pad into four quadrants and sample equally from each quadrant. Avoid sampling within 1 foot of the pad edge and take care to avoid previous shovel holes.
- Collect the samples by fully inserting a square shovel into the flat pile as vertically as possible. Roll back the shovel and lift the material off the pile slowly to avoid material rolling off the shovel.



How to collect a DSA sample...

- Mentally divide the flat sampling pad into four quadrants and sample equally from each quadrant. Avoid sampling within 1 foot of the pad edge and take care to avoid previous shovel holes.
- Collect the samples by fully inserting a square shovel into the flat pile as vertically as possible. Roll back the shovel and lift the material off the pile slowly to avoid material rolling off the shovel.
- After collection, confirm with the quarry that the sampling met their requirements before leaving.



How much do I need for a sample?

Proctor, gradation, plasticity



(2) $\frac{3}{4}$ full 5-gallon buckets (Minimum)

- More buckets necessary depending on pile size and required tests
- Too much sample is always better than not enough

How much do I need for a sample?

One additional bucket each for Soundness
And LA Abrasion if needed



pH testing is rare and can be run with
minimal material

How much do I need for a sample?

One bucket (sample) should be pulled for
Every 500 tons of material



- A 2500-ton pile should consist of a 5-bucket sample no matter how many tests will be run
- Each sample should come from a separate layout pile

How much do I need for a sample?

- On large piles, this will be an extremely large sample.
- Most quarries have a sample splitter in their lab
- Use this to reduce the sample size to what is needed for the testing



https://www.certifiedmtp.com/gilson-sp-1-universal-sample-splitter/?gclid=CjwKCAiAsOmABhAwEiwAEBR0ZvyrEzdrzs8ZTSlluh2pwaglMEoDoD046GxAOYXnflkiOVTVDfTgaRoCzSEQAvD_BwE

How much do I need for a sample?

- Sometimes the lab technician will want to pull their own companion sample. (common)
- They may or may not want to run the combined sample through the splitter. That is their choice. (rare)



https://www.certifiedmtp.com/gilson-sp-1-universal-sample-splitter/?gclid=CjwKCAiAsOmABhAwEiwAEBR0ZvyrEzdrzs8ZTSlluh2pwaglMEoDoD046GxAOYXnflkiOVTVDfTgaRoCzSEQAvD_BwE

Lab Testing

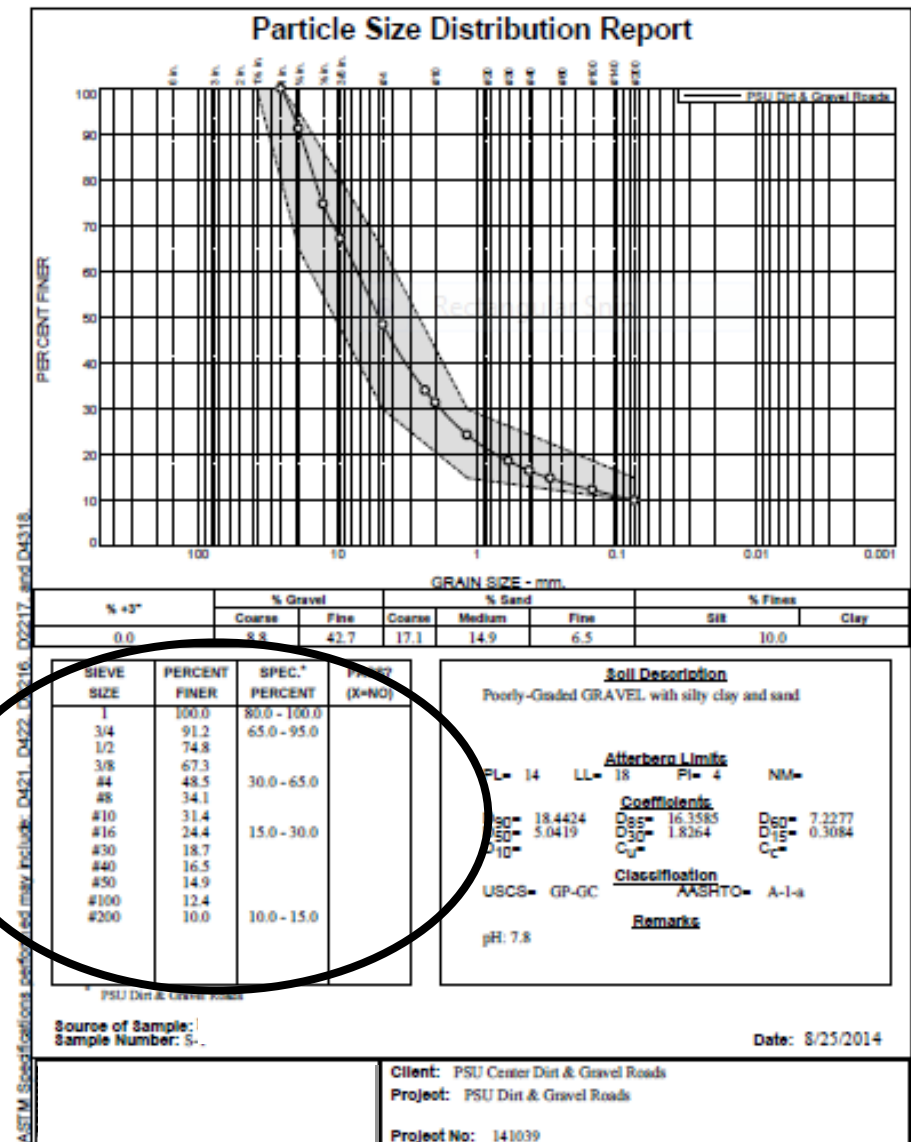
- Interested in sampling your own DSA?
- Let us know. We can share logistics of sample delivery or shipping, testing, etc.

Lab Testing

- Material must be tested by an independent lab (with no affiliation with the quarry or placement contractor) before delivery
- The testing lab must be currently certified by AASHTO, USACE, or PennDOT
- Per the SCC specification, DSA shall not be placed without pre-delivery sampling and testing. This testing is key to catching any potential problems with the aggregate BEFORE it is placed.

Lab Testing

- Example of lab results
- The lab looks at more sieves than just those in the specification
- This gives us a very clear snapshot of what is in the pile



Lab Testing

Lot-dependent tests: **run on every pile**

- **Gradation** (size distribution)
- **Plasticity** (clay content)

Periodic test: **Proctor** (gives optimum moisture and max dry density)

Source-dependent tests: **rarely needed**

- **Toughness** (LA Abrasion)
- **pH**
- **Soundness** (resistance to freeze/thaw)

What happens if a sample fails?

Gradation

- If it's close to meeting the spec., re-sample and re-test. This is a common practice.
- If it fails a second time, a new pile will have to be made

The DSA spec:

Passing Sieve	Lower %	Higher %
1½ inch	100	-
¾ inch	65	97
#4 (¼ ")	30	65
#16 (1/16 ")	15	30
#200(1/200 ")	10	15*

SIZE FRACTION	MASS RETAINED	INDIVIDUAL PERCENT RETAINED	PERCENT PASSING
2"	0.0	0.0	100.0
1.5"	0.0	0.0	100.0
1"	856.0	8.1	91.9
¾"	866.0	8.2	83.6
½"	1192.1	11.3	72.3
⅜"	802.8	7.6	64.7
#4	1522.1	14.5	50.2
#8	1096.0	10.4	39.8
#16	751.0	7.1	32.6
<#16	3428.6		
<#200		WASH LOSS	13.3

Spec: 15-30

**Gradation run
on every pile**

What happens if a sample fails?

Plasticity

- If plasticity fails, a new pile needs to be made after discussion of production methods
- Some quarries may never meet this part of the spec.

LIQUID / PLASTIC LIMITS OF SOIL - ASTM D 4318 DSA from

**Plasticity run
on every pile**

LIQUID LIMIT	22
PLASTIC LIMIT	15
PLASTICITY INDEX	7

Maximum allowable PI is 4 (or 2 if fines are 15-17%)

What happens if a sample fails?

LA Abrasion

- Find a new supplier. This property is a quality of the rock formation.
- Its possible a new seam of rock at the quarry may perform better. Let quarry test it first.

**Maximum allowable
abrasion loss is 40%**

**Toughness
rarely run**

LOS ANGELES ABRASION - AASHTO T 96					
2A from			Quarry		
A GRADING					
SIZE FRACTION	MASS	TOTAL MASS	MASS (+#12) AFTER	MASS LOSS	PERCENT LOSS
1 1/2" x 1"	1257.9	5012.5	2995.9	2016.6	40.2
1" x 3/4"	1251.4				
3/4" x 1/2"	1251.0				
1/2" x 3/8"	1252.2				

What happens if a sample fails?

Soundness:

- Find a new supplier. This property is a quality of the rock formation.
- Its possible a new seam of rock at the quarry may perform better. Let quarry test it first.

**Maximum allowable
soundness loss is
20%**

**Soundness
rarely run**

SODIUM SULFATE SOUNDNESS - PTM 510 m DSA from 4000 tons							
SIZE FRACTION	MASS BEFORE	# OF PCS	MASS AFTER	# OF PCS	PERCENT LOSS	STANDARD GRADING	CORRECTED LOSS
1" x 3/4"	1501.2	106	735.2	58	51.0	0.368	18.8
3/4" x 3/8"	1001.8		532.2		46.9	0.369	17.3
3/8" x #4	300.1		123.4		58.9	0.263	15.5
TOTAL PERCENT LOSS							51.6

What happens if a sample fails?

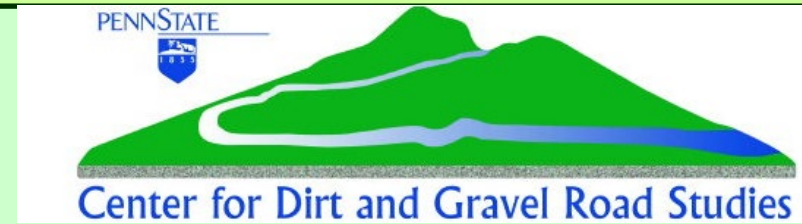
pH- Find a new supplier (one and done in most cases).

pH = 5.1, per EPA S-846 Method 9045

DSA SPEC: pH between 6 and 12.45

pH rarely run

DSA Clearinghouse

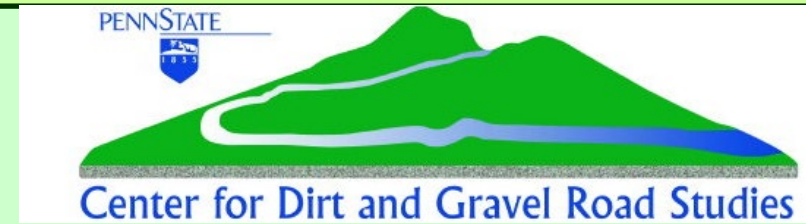


PURPOSE

- Provide a central point of contact between conservation districts and DSA suppliers.
- Provide DSA testing services when needed.
- Provide DSA education to conservation districts.
- Provide a central repository of DSA testing and placement data for the state to serve as a reference and avoid duplication of testing.

DSA Clearinghouse

DISTRICT RESPONSIBILITY



- Contact the Center for Dirt and Gravel Road Studies when a potential DSA supplier is chosen, at least 30 days before desired placement date.
- Notification of DSA supplier selection to the DSA Clearinghouse Handbook, or other appropriate source.
- If districts choose to conduct their own testing, they should maintain a comprehensive statewide database and avoid duplicate testing.

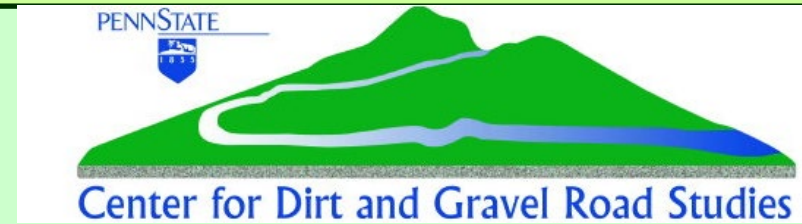
30 day notice is a minimum

Notify as soon as supplier is known

- Supplier needs time to make entire pile
- Time for sampling
- Time for testing
- Potential time for failures

DSA Clearinghouse

DISTRICT RESPONSIBILITY



- Contact the Center for Dirt and Gravel Road Studies when a potential DSA supplier is chosen, at least 30 days before desired placement date.
- Notification can be made utilizing the DSA Purchase Notification Form, provided in Appendix D in the DSA Handbook, or on the Center's website.
- If districts choose to sample their own DSA, they should share testing results with the Center in order to provide a more comprehensive statewide database and avoid duplicate testing.

DSA Notification: CD portion

PA Dirt, Gravel, and Low-Volume Road Maintenance Program

Driving Surface Aggregate (DSA) Purchase Notification Form

This form is for Conservation Districts to provide notice to the PSU Center for Dirt and Gravel Road Studies (CDGRS) of upcoming DSA placement projects. The top portion of this form is to be completed and returned to dirtandgravel@psu.edu or fax: 814-863-6787.

CONTACTS

Entity

Person

Phone

E-mail

Cons. District:

Grant Recipient:

Quarry

Placement Cont.:

PLACEMENT DETAILS

Tons DSA to be placed: _____ tons

Estimated Placement Date: _____

Est. Total DSA Costs: \$ _____

Placement Method:

Motor-paver

Other:

Road Name(s) / #(s): _____

If the Center for Dirt and Gravel Road Studies is to perform DSA testing, the Conservation District must provide at least 30 days notification before expected placement. This will allow the Center to coordinate with the quarry and perform any quality control steps necessary prior to and during placement. This could include lab testing for plasticity index, gradation, proctor (for maximum dry density and optimum moisture content), LA Abrasion, pH, soundness, and field testing for moisture and compaction, as well as site visits during placement. If a Conservation District chooses to sample and test a DSA stockpile they should share the testing results with the Center to improve records statewide. This completed form is to be included with the certification from the quarry in the project file. Any entity producing DSA must obtain the components from a source or quarry that complies with the SCC DSA Standard and Specifications. **Quarries cannot be certified for DSA, only specific stockpiles of DSA can be certified.**



dcm35@psu.edu

DSA Notification: CDGRS portion

PA Dirt, Gravel, and Low-Volume Road Maintenance Program

CENTER USE ONLY:

Date Notification Received: _____ Received by: _____

Discussed with CD: YES / NO _____

Discussed with Quarry: YES / NO _____

Visited Quarry: YES / NO _____

Testing Completed: YES / NO _____

Tests Performed: PI __, Gradation __, Proctor __, LA Abrasion __, ph. __, Soundness __, Other _____

Results reviewed with CD: YES / NO _____

Results within SCC DSA spec: YES / NO _____


Completed By: _____ Date Completed: _____

with the certification from the quarry in the project file. Any entity producing DSA must obtain the components from a source or quarry that complies with the SCC DSA Standard and Specifications. **Quarries cannot be certified for DSA, only specific stockpiles of DSA can be certified.**

DSA Clearinghouse

POTENTIAL SERVICES PROVIDED

- Visiting and talking with quarries and CD to ensure they understand the DSA requirements.
- Collecting samples from the quarry and performing testing to ensure DSA meets all material requirements before delivery and placement.
- Providing contractor education on DSA.
- Providing **on-site assistance** during DSA placement.
- Education of Conservation District staff on DSA sampling, testing, and placement.
- Troubleshooting.
- Identifying potential DSA suppliers if you are having trouble finding DSA in your area



Get on the schedule as far out as possible.

NEW DSA Project Checklist/Walkthrough for CDs

- 3-pages
- Sent in webinar reminder
- Posted online

Surface Aggregate Project Checklist for Conservation Districts
This document is intended to serve as a guide for Conservation Districts to plan and implement successful Surface Aggregate (DSA) placement as part of a DGLVR project. This is intended as a guide and is not a list of required actions. Items listed as required below are defined in policy or the DSA specification.

Application

Drainage and base first: The DGLVR Program's focus is on long-term road and environmental improvements. Projects are Required to address any drainage, road base, and environmental issues prior to DSA placement. DSA is NOT required on every project. If used, DSA should be the LAST part of a project after all potential drainage and base improvements have been made.

Meet with municipality, preferably on-site to discuss prior to application submittal:

- Discussion points:
 - **Timing:** application, drainage work, lab testing, placement dates, placement window (April-Sep). Consider letting large fill projects settle for a season before placing DSA (could place DSA as a second contract, local decision up to CD)
 - **Details:** Proposed project length, available budget, DSA depth, width, thickness, and tonnage. Use of paver, required for placements of 1,000 tons or more.
 - **Potential suppliers and placement contractors**
 - **Road preparation:** in addition to drainage, what road surface prep (fill, grading) will need to be done prior to placement, and who will be responsible.
 - **Compaction:** Will compaction testing be utilized (costs can be built into grant application)?

How much DSA should I order?

DSA Road Width x Road Length x 0.04 8" loose depth compacted to 8" 0.03 6" loose depth compacted to 6"

2/3/21

- **Too Wet:** If excessive water is running out of the delivery truck and the material is too wet. Ideally, over wet material should not be placed. If over wet material is placed, and road opening may need to be delayed depending on weather conditions.
- **Too Dry:** If material is too dry to compact, resulting in a reduced lifespan for the material. Material that segregates and is impossible to compact, although not required, is the preferred method to determine aggregate moisture. It is easier to send wet/dry trucks back with testing.
- **Making Adjustments:** Contact the quarry to make adjustments to moisture. Take several trucks before adjustments at the quarry are seen on the road. Send trucks back or visit the quarry to discuss.

Final Road Preparation: Grading and establishing final crown (week of placement). Establishment of paving notches and keys to support edge of DSA placement (day of placement).

Equipment: Ensure paver and rollers meet specification and contract requirements. Paving required to be done in one pass and compacted with min 10-ton vibratory roller.

Material Slips: Define who will be collecting material slips from delivery trucks.

Road Logistics: Discuss potential for road closure, road signs or flagging needs.

Compaction: Schedule on-site compaction testing if desired

With quarry during material production and just before placement.

job on their schedule and do they have the appropriate amount of DSA. Ensure that the quarry understands the DSA specification.

Ensure the material will be at proper moisture and well mixed BEFORE it is loaded into trucks. Consider talking to loader operator.

Ensure quarry is performing moisture tests to monitor pile.

Ensure quarry that the material certification must arrive with the first load on each day of

DSA Season Preparation



DSA Season Prep

- **What is the DSA Project Checklist?**
- Pre-application
- Pre-Project logistics
- ~30 days prior to placement
- Final Preparations
- DSA Placement

What is the DSA Project Checklist?

- A guide for CD's to plan and implement successful DSA placements as part of a DGLVR project
- Informational only: no NEW required actions.
- Any existing **required** actions are noted as such

Driving Surface Aggregate Project Checklist for Conservation Districts

*This document is intended to serve as a guide for Conservation Districts to plan and implement successful Driving Surface Aggregate (DSA) placement as part of a DGLVR project. This is intended as a guide and is not meant as a list of required actions. Items listed as **required** below are defined in policy or the DSA specification.*

Pre-Application

- **Drainage and base first:** The DGLVR Program's focus is on long-term road and environmental improvements. Projects are **Required** to address any drainage, road base, and environmental issues prior to DSA placement. DSA is NOT required on every project. If used, DSA should be the LAST part of a project after all potential drainage and base improvements have been made.
- **Meet with municipality, preferably on-site to discuss prior to application submittal:**
 - Discussion points:
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 - **Details:** Proposed project length, available budget, DSA depth, width, thickness, and tonnage. Use of paver, **required** for placements of 1,000 tons or more.

DSA Season Preparation



DSA Season Prep

- What is the DSA Project Checklist?
- **Pre-application**
- Pre-Project logistics
- ~30 days prior to placement
- Final Preparations
- DSA Placement

Drainage and base first!!



- DSA is not required on every project
- Program focus is on long-term road and environmental improvements
- **Projects are required to address any drainage, road base, and environmental issues prior to DSA placement**

Meet with the municipality

- **Suggested** An on-site pre-application meeting with the municipality helps to ensure a quality application
- **Discussing Topics:**
 - **Timing:** Application, drainage work, placement date(s), placement season, time for production and testing, etc
 - **Details:** Project length, DSA depth, width, tonnage, available budget, paver, etc
 - **Potential suppliers & placement contractors**
 - **Road preparation:** Drainage, surface prep (fill/grading), etc
 - **Compaction:** Will compaction testing be utilized?

Material Calculation

The formula below is a general guide to the amount of DSA needed based on width, depth, and length of placement.

How much DSA should I order?

DSA Needed =	Road Width	x	Road Length	x	0.04 for 8" loose compacted to 6"
(tons)	(ft)		(ft)		0.03 for 6" loose compacted to 4½"

DSA Season Preparation

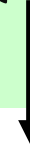


DSA Season Prep

- What is the DSA Project Checklist?
- Pre-application
- **Pre-Project logistics**
- ~30 days prior to placement
- Final Preparations
- DSA Placement

Bidding

- Municipalities should follow their standard purchasing, bidding, and payment procedures.
- Prevailing wage applies to contracted labor when the total value of the project exceeds \$25,000
- An editable DSA Request for Quote is available on the Center's website if needed



REQUEST FOR QUOTE (RFQ)

DELIVER, PLACE, AND COMPACT DRIVING SURFACE AGGREGATE (DSA)

(ROAD NAME(S) & ID #)

(NAME OF MUNICIPALITY & COUNTY)

1. SCOPE OF WORK:

_____ (hereinafter referred to as "Owner"), requires services to deliver, place and compact approximately _____ tons of DSA, to

(Project Location – describe exact location of placement)

RFQ: use is optional: editable version on CDGRS website

REQUEST FOR QUOTE (RFQ)

DELIVER, PLACE, AND COMPACT DRIVING SURFACE AGGREGATE (DSA)

(ROAD NAME(S) & ID #)

(NAME OF MUNICIPALITY & COUNTY)

1. SCOPE OF WORK:

_____ (hereinafter referred to as "Owner"), requires services to deliver,
place and compact approximately _____ tons of DSA, to

(Project Location – describe exact location of placement)

2. CONTRACT TASKS:

A. Work shall include, but is not necessarily limited to, the furnishing of all labor, superintendence, materials, tools and equipment, miscellaneous items and performing all work necessary to complete all construction to the satisfaction of, and subject to the approval of, the Owner.

3. STATE CONVERSATION COMMISSION (SCC) DSA SPECIFICATIONS:

A. All components of the aggregate mix are to be derived by crushing parent rock material. Contractors **must provide a properly executed SCC DSA Certification Form (attached)** at the time their bid is submitted committing that they can provide DSA material that meets the

Once placement contractor and supplier are determined...

- Schedule target placement date, and a potential back-up date in case of delays. Allow as much time as possible for quarry to make material, sampling and testing. (*Sampling delays, lab back-ups/failures*)
- **DSA Sampling**: Quarries do not have blanket approval to supply DSA. The full pile of DSA to be used on the job is required to be sampled and tested by a third-party lab prior to placement
- The pile is approved once passing lab results are obtained

DSA Sampling

- **CD Sampling:**
 - CD's may sample DSA for their projects
 - Contact CDGRS for information, training, or details on how to sample, where to send it, or how to interpret results
 - Other entities may also be contracted for sampling
 - Admin/Edu funds can be used to cover these costs, or the municipality can pay and be reimbursed through the grant
- **CDGRS Sampling:**
 - Contact the CDGRS DSA Clearinghouse to schedule required sampling and testing of pile at least 30 days prior to desired placement date.
 - Cost of initial sampling and testing services will be covered by CDGRS

DSA Season Preparation



DSA Season Prep

- What is the DSA Project Checklist?
- Pre-application
- Pre-Project logistics
- **~30 days prior to placement**
- Final Preparations
- DSA Placement

Pre-Construction Meeting

Highly Recommended An on-site pre-construction meeting with the placement contractor and the municipality helps to ensure a quality project by getting everyone on the same page

Pre-Construction Meeting Discussion Points

Trucking Logistics:

- Truck routes
- Number of trucks
- Staging areas (material & equipment)
- Turnaround for trucks to reduce backup length.



Pre-Construction Meeting Discussion Points

Final Road Preparation

- Grading and establishing crown cross-slope (week of placement)
- Establishment of paving notches and keys (just prior to placement)



Pre-Construction Meeting Discussion Points

Equipment

- Ensure paver and roller to be used meet Program and contract requirements
- Paving **must** be done in one pass (full road width) and compacted with a minimum 10-ton vibratory roller



Pre-Construction Meeting Discussion Points

Material Slips

- Define who will be collecting material slips from delivery trucks
- Material slips should be retained in project file



Pre-Construction Meeting Discussion Points

Road Logistics

- Potential road closures
- Need for road construction/safety signs?
- Need for flaggers?



Pre-Construction Meeting Discussion Points

Compaction Testing (optional)

- Discuss use of third party or contractor compaction testing if desired
- Measures actual moisture content of material
- helps for sending wet/dry trucks back
- Also measures percent compaction



Quarry/Supplier Meeting

Highly Recommended Consider meeting with quarry or supplier during production and just before placement

- Make sure production is on schedule and amount is adequate for sampling/completion of project
- Ensure quarry understanding of..
 - SCC DSA specification
 - Importance of adequate mixing
 - Importance of proper moisture
 - Consider talking to loader operator as well as QC technician



Quarry/Supplier Meeting

Highly Recommended Consider meeting with quarry or supplier during production and just before placement

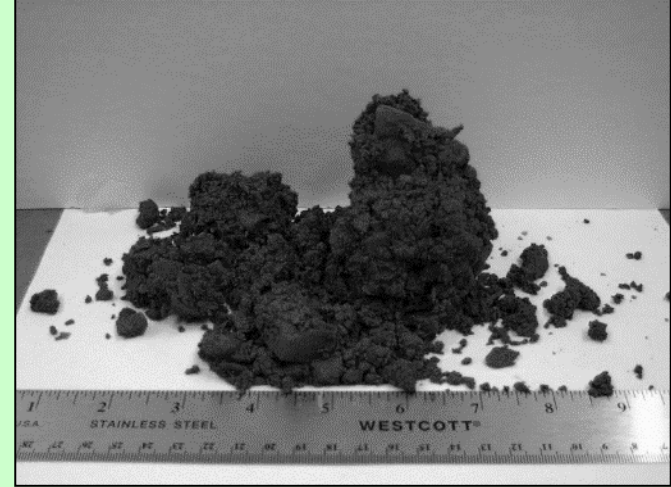
- Make sure production is on schedule and amount is adequate for sampling/completion of project
- Ensure quarry understanding of..
 - SCC DSA specification
 - Importance of adequate mixing
 - Importance of proper moisture
 - Consider talking to loader operator as well as QC technician
- Make sure quarry is doing moisture testing to monitor pile
- Reminder about material cert. on first load delivered



Remember the old DSA Moisture field “test”?

Unable to make ball.
Aggregate falls apart.

TOO DRY



Aggregate forms wet,
mushy unstable ball.

TOO WET



Aggregate forms tight
ball that stays together.

**JUST
RIGHT!**



DSA Moisture field “test”

Unable to make ball.
Aggregate falls apart

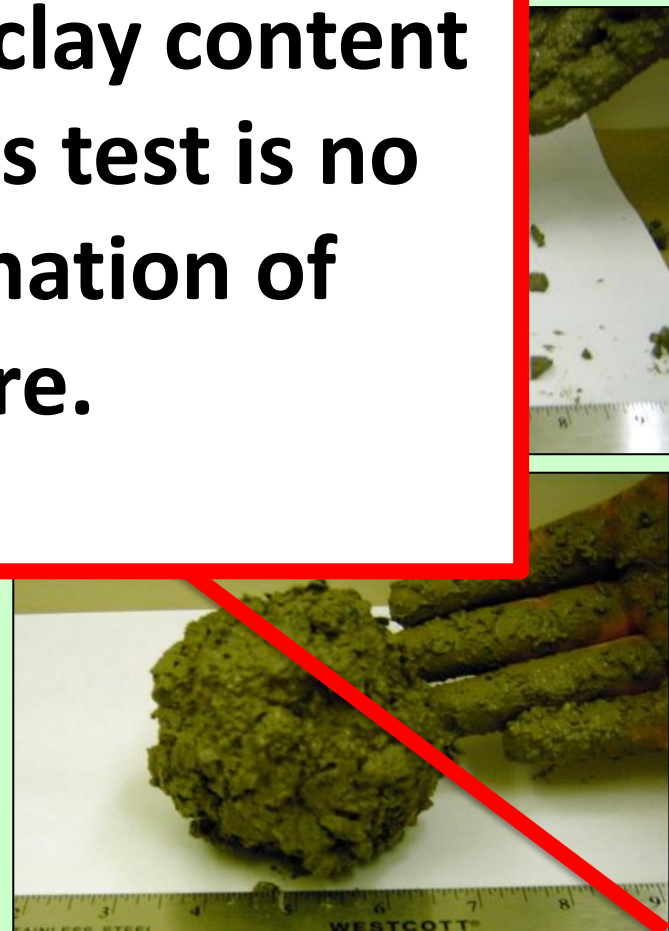
TOO DRY



With the reduction of the clay content
in DSA over the years, this test is no
longer a good approximation of
optimum moisture.

Aggregate forms tight
ball that stays together.

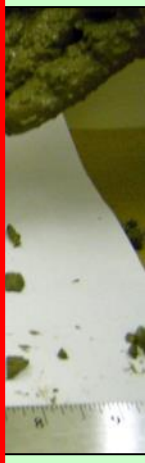
**JUST
RIGHT!**



DSA Moisture field “test”

Unable to make ball.
Aggregate falls apart

TOO DRY



Ag
m

Moisture tests can be done during
production to lock moisture into the pile

Done with drying oven

Aggregate forms tight
ball that stays together.

**JUST
RIGHT!**



DSA Season Preparation



DSA Season Prep

- What is the DSA Project Checklist?
- Pre-application
- Pre-Project logistics
- ~30 days prior to placement
- **Final Preparations**
- DSA Placement

Week of Placement

- Review final logistics with municipality, contractor, supplier, trucking provider to make sure all are on the same page
 - Road prep (crown, base, drainage)
 - Truck routes
 - Staging areas
 - Availability of equipment and personnel

Week of Placement: Check the Weather



Weather and Cancellations:

The DSA specification states: *"If freezing temperatures or precipitation are forecast that may cause the material to freeze, or prevent the material from drying out, placement shall be postponed at the discretion of the road owner, Conservation District, or aggregate supplier."*

It will often be up to the Conservation District to make calls to postpone due to weather.

Day before and Day of Placement

- **Contact municipality, contractor, & quarry to verify placement plan**
 - **Include engineering tech performing compaction testing (if done). Their experience level can vary.**
 - **One last check in can eliminate problems**
 - **Use discussion points from above to tie up any loose ends**
- **Check road for crown, keys, notches, etc.**
 - **Irregularities in the road base will reflect to the surface**

DSA Season Preparation



DSA Season Prep

- What is the DSA Project Checklist?
- Pre-application
- Pre-Project logistics
- ~30 days prior to placement
- Final Preparations
- **DSA Placement**

Day of Placement

- 
- Are transport trucks tarped as required?
 - Did the first load come with a certification?
 - Required
 - Who is collecting load slips?

During placement

Continuously monitor...

- Placement depth, width, & crown/cross-slope
 - It may take several hundred feet to get the paver “dialed in”
 - Yield?



During placement

Continuously monitor...

- Moisture, adequate mixing of material
 - Be alert for changes in consistency
 - Variations can happen throughout the day



During placement

Continuously monitor...

- Trucking logistics
 - # of trucks
 - Turnarounds, routes, flaggers, etc.



Too wet

Water pouring from truck beds

DSA should look like very low-slump concrete



Too dry

Will not compact

Will come apart quickly



During placement

Making adjustments...

- **Contact quarry to make adjustments.**
 - Use truck radios in remote areas
 - Note time of request and compare to load time on tickets
- **Send back trucks if necessary**
 - Once its on the road, its more difficult to fix
- **Visit quarry if necessary**
 - Unforeseen problems like personnel/equipment/moisture issues

During placement

Compaction testing...

Utilizing a nuclear density gauge

- **Not required by Program**
- **Quantitative way to quickly determine**
 - Density (% compaction)
 - Moisture content – to compare to target moisture
- **Having this data can make it easier to send unacceptable loads back to the source**



See DSA Handbook or Full DSA Webinar for details

COMPACTION

DSA Placement

- **Compaction:**

- Compaction should begin when the outer edge of the aggregate begins to dry and become light in color. This could be minutes or hours depending on temperature, sunlight, wind, canopy, and moisture content.
- If excessive material sticks to the drum of the roller, wait for further drying before compaction. In cases where wet material is placed in cold/wet conditions, compaction the following day and beyond is often necessary.
- If you have opted to do compaction testing, compact a small length of DSA for the test to be run. Limit this section to only what is needed for the test if the material is on the wet side.
- **General Compaction Sequence:**
 - **Initial passes over uncompacted DSA should be done in static (non-vibratory) mode.**
 - Subsequent passes should be done in vibratory mode.
 - Do not use vibratory mode when going down steep sections of road or if it brings excessive water and fines to the surface.
 - Overlap passes from the road edge towards the crown.
 - Compact the crown from both sides, but do not “straddle” the crown with the roller.

Thank You! Questions?

Reminder: NEW DSA Project Checklist for CDs

- 3-pages
- Sent in webinar reminder
- Posted online

30 day notice is a minimum

Notify as soon as supplier is known

- Supplier needs time to make entire pile
- Time for sampling
- Time for testing
- Potential time for failures

Surface Aggregate Project Checklist for Conservation Districts
This document is intended to serve as a guide for Conservation Districts to plan and implement successful Surface Aggregate (DSA) placement as part of a DGLVR project. This is intended as a guide and not a list of required actions. Items listed as required below are defined in policy or the DSA specification.

Application

Drainage and base first: The DGLVR Program's focus is on long-term road and environmental improvements. Projects are Required to address any drainage, road base, and environmental issues prior to DSA placement. DSA is NOT required on every project. If used, DSA should be the LAST part of a project after all potential drainage and base improvements have been made.

Meet with municipality, preferably on-site to discuss prior to application submittal:

- Discussion points:
 - **Timing:** application, drainage work, lab testing, placement dates, placement window (April-Sep). Consider letting large fill projects settle for a season before placing DSA (could place DSA as a second contract, local decision up to CD)
 - **Details:** Proposed project length, available budget, DSA depth, width, thickness, and tonnage. Use of paver, required for placements of 1,000 tons or more.
 - **Potential suppliers and placement contractors**
 - **Road preparation:** in addition to drainage, what road surface prep (fill, grading) will need to be done prior to placement, and who will be responsible.
 - **Compaction:** Will compaction testing be utilized (costs can be built into grant application)?

How much DSA should I order?

DSA Road Length x Road Width x Road Depth x 0.04 8" loose depth compacted to 8" 0.03 6" loose depth compacted to 6"

Final Road Preparation: Grading and establishing final crown (week of placement). Establishment of paving notches and keys to support edge of DSA placement (day of placement).

Equipment: Ensure paver and rollers meet specification and contract requirements. Paving required to be done in one pass and compacted with min 10-ton vibratory roller.

Material Slips: Define who will be collecting material slips from delivery trucks.

Road Logistics: Discuss potential for road closure, road signs or flagging needs.

Compaction: Schedule on-site compaction testing if desired

with quarry during material production and just before placement.

Points:

- Job on their schedule and do they have the appropriate amount of DSA.
- Ensure the quarry understands the DSA specification.
- Ensure the material will be at proper moisture and well mixed BEFORE it is loaded into trucks. Consider talking to loader operator.
- Ensure the quarry is performing moisture tests to monitor pile.
- Ensure the quarry that the material certification must arrive with the first load on each day of