North Dakota
Local Technical Assistance Program

Glue for Gravel Roads

January 31, 2020 – Fargo

Dale C. Heglund, PE/PLS, NDLTAP Program Director

Greetings from the North Dakota Local Technical Assistance Team

NDLTAP

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

Sandy Baisch

Retired 2019

How lucky am I to have something that makes saying goodbye so hard. Winnie the Pooh

Amanda Miller

NDLTAP Administrative Secretary

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

Andrew Wrucke

UGPTI Road and Bridge Engineer

Now with City of West Fargo

Jerolyn Swenson

UGPTI Road and Bridge Engineer

Now with Detroit Lakes - MNDOT

Kelly Bergtson, PE

UGPTI Road and Bridge Engineer

Starts February 18, 2020

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

Greetings from the NDLTAP Team

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITU

North Dakota's Local Road Network

97,600 miles

6,600 miles are paved

59,000 miles are gravel surfaced

32,000 miles are unsurfaced

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

1 vehicle

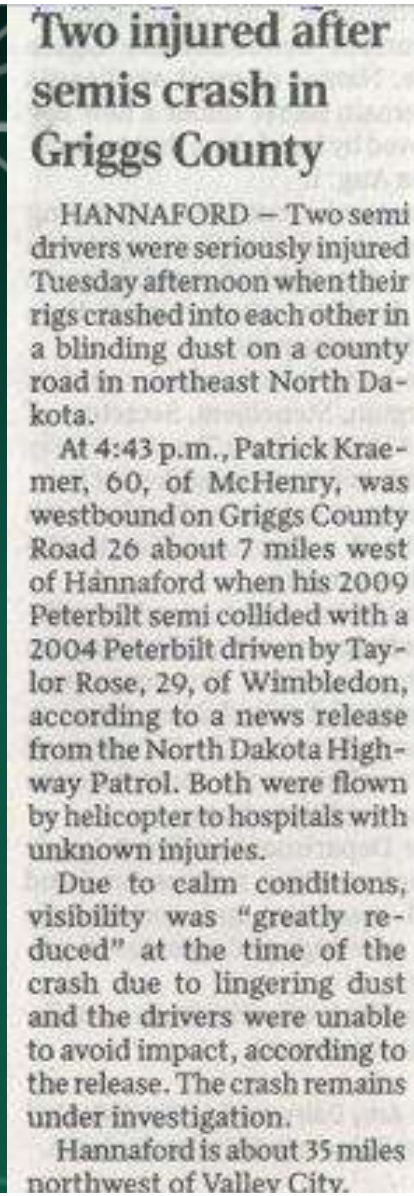
1 year

1 ton dust per mile

Each mile with 100 cars per day - 100 tons of fines per year!

Two semi drivers were seriously injured when their rigs crashed into each other in a blinding dust on a county road.

Both were flown by helicopter to hospitals….



Two injured after semis crash in Griggs County

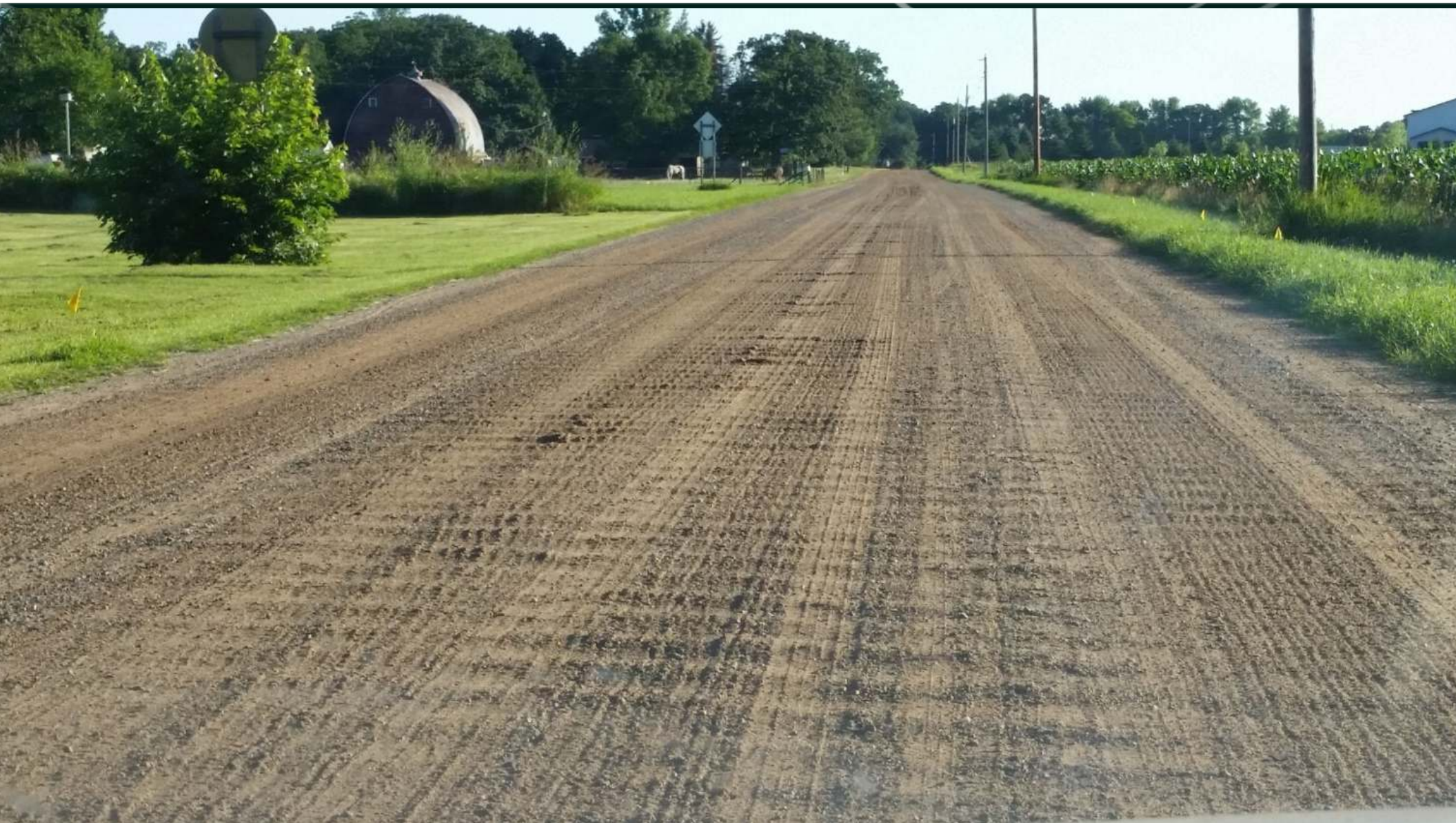
HANNAFORD – Two semi drivers were seriously injured Tuesday afternoon when their rigs crashed into each other in a blinding dust on a county road in northeast North Dakota.

At 4:43 p.m., Patrick Kraemer, 60, of McHenry, was westbound on Griggs County Road 26 about 7 miles west of Hannaford when his 2009 Peterbilt semi collided with a 2004 Peterbilt driven by Taylor Rose, 29, of Wimbledon, according to a news release from the North Dakota Highway Patrol. Both were flown by helicopter to hospitals with unknown injuries.

Due to calm conditions, visibility was "greatly reduced" at the time of the crash due to lingering dust and the drivers were unable to avoid impact, according to the release. The crash remains under investigation.

Hannaford is about 35 miles northwest of Valley City.

NDSU



Gravel Road Problems & Consequences

Problem	Consequence of Problem		
	Gravel Loss & Budget	Road User Safety, Cost & Inconvenience	Public Health
Dusting	x	x	x
Wash Boarding	x	x	
Raveling	x	x	
Rutting	x	x	
Potholing		x	

The #1 problem with a gravel road:

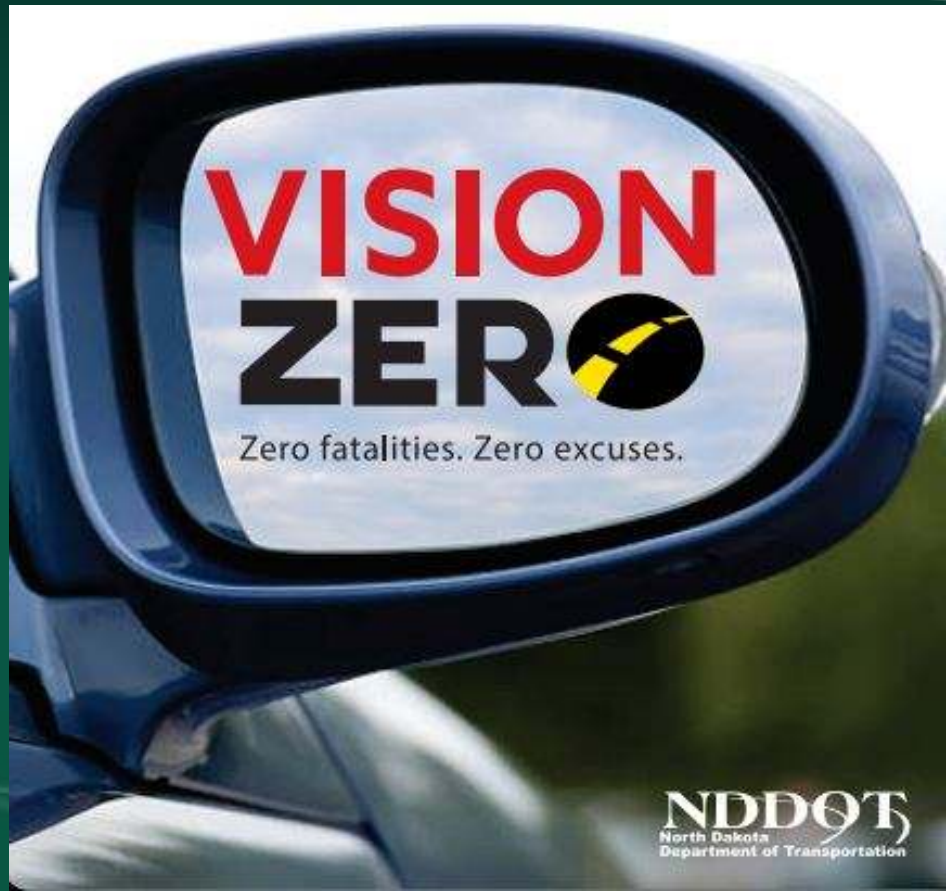
It’s not a paved road!

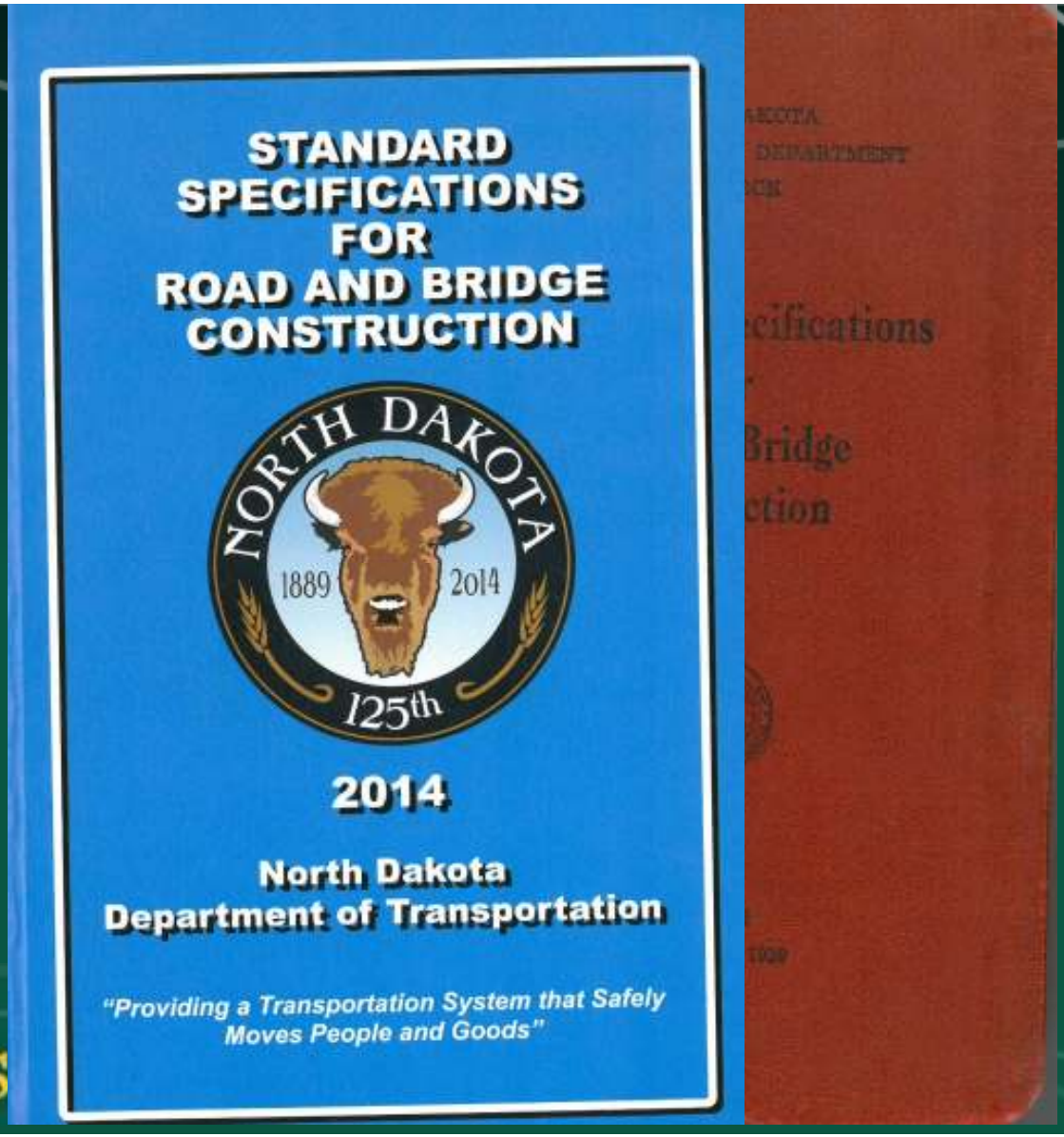
Better Gravel – Better Roads

NDSU | NDLTAP

GRAVEL ROAD WARRIOR

NDSU | UPPER GREAT PLAINS TRANSPORTATION INSTITUTE
NORTH DAKOTA LOCAL TECHNICAL ASSISTANCE PROGRAM





Remember When…

Institutional Knowledge

NDS

Gravel Road Surfacing

The North Dakota DOT maintains only PAVED ROADS. As such, the DOT uses gravel for pavement base and shoulder material. They typically specify:

Cl 5 Gravel – drainable base material that is placed beneath a paved surface. Water that passes through pavement cracks enters the Cl 5 base. Since the Cl 5 base has limited fine material, water easily drains to the outer edge of the roadway rather than progressing down into the subgrade. By keeping the subgrade (i.e., natural soil foundation) dry the NDDOT maximizes the roadway's load carrying capacity.

Cl 13 Gravel – shouldering material for highways. Cl 13 shoulder material is essentially a Cl 5 material with more fine material allowed (i.e., a dirty Cl 5). The fine material provides a reduction in water passage and allows sensible utilization of pit materials.

NDSU


WANTED
Good
Gravel

Too much coarse rock, lacking coarse sands – will ravel badly

Too much coarse sand, too little rock, will washboard badly

Good gravel surfacing (good representation of sizes to fill voids, high enough minus #200 to create road crust, will hold chlorides well

2/7/2020

Sieve Size	NDDOT Cl 13	Montana Gravel Surfacing	SD & FHWA Gravel Roads Manual	Sample County Spec	Proposed ND Gravel Surfacing
3"					
1-1/2"					
1"	100	100		100	100
3/4"	70-100	80-90	100	90-100	70-100
1/2"		60-80			
3/8"				50-90	
No. 4	38-75	50-70	38-75	35-80	38-75
No. 8	22-62	37-60	37-67		22-62
No. 10				20-70	
No. 30	12-45				12-45
No. 40		13-35	13-35	10-40	
No. 200	7-15	4-18	4-15	8-15	7-15
PI		4-12	4-12	4-12	4-12
Shale (max %)	12.0				12.0
LA Abrasion (max %)	50				50
NDDOT 4, Fractured Faces	10				10

Plasticity Index

Clay

The Glue that holds the rocks and sand together

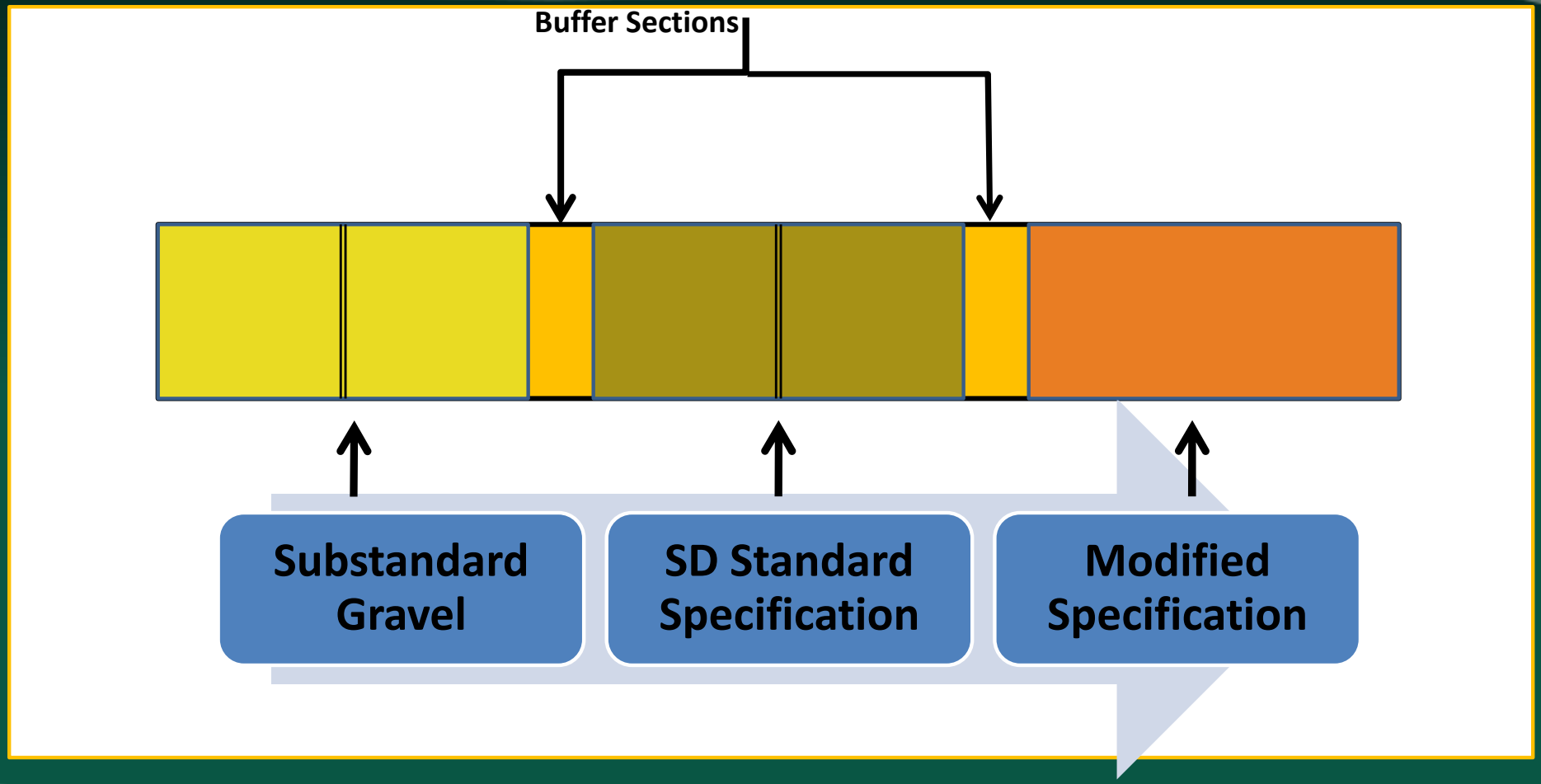
SDDOT/SDLTAP Surface Gravel Study

Brookings Site:

Constructed in 2011

Observed in 2012, 2013, 2014 & 2015

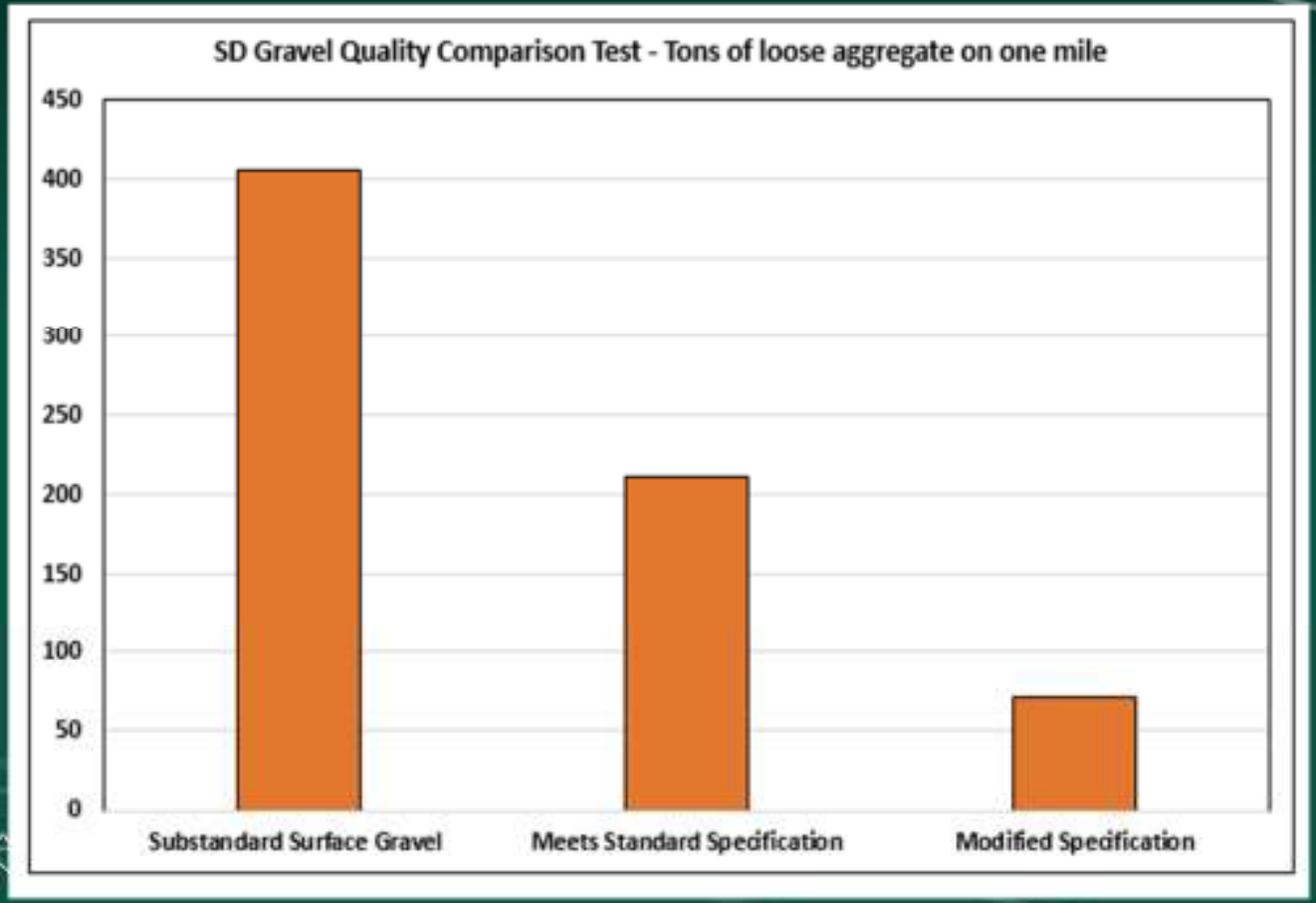
South Dakota Gravel Study



Road mixing natural clay to get a high quality surface gravel

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUT

Volume of loose aggregate measured in a dry season was the biggest difference in the test sections.

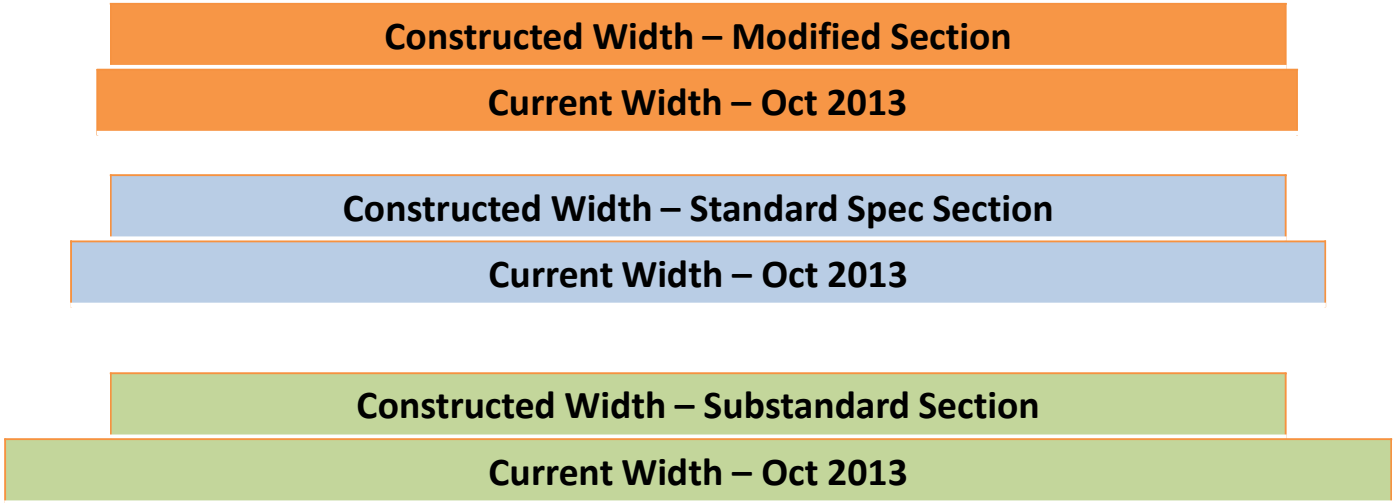


NDSU

Corrugation was a problem on the substandard section. No corrugation on the modified section.

Substandard section – aggregate moved outward over 4 ft since

Change in Roadway Surface Width
Constructed Width – 21.5 ft on all sections



Current width ranges from 22 ft on modified section (top bar) to 25.25 ft on substandard section (bottom bar)

One of the biggest challenges was finding gravel that meets the modified SDDOT Specification: "Shall have minimum plasticity index (PI) of seven". (Even higher minimum was considered in project planning)

The modified section in the spring after construction

- **Blade maintenance**

Substandard section – 4 times

Modified section - once

- **Resistance to change**

- Meeting basic SDDOT standard surface gravel specification reduces loose aggregate by 1/3 to 1/2.
- 405 tons of loose aggregate on substandard section and only 71 tons on modified section.
- No corrugation ever observed on standard or modified material.

GLUE FOR GRAVEL ROADS

Making Gravel Roads Great Again

Clay, Cutting Edges & Dust Suppressants

(6 hours Road Scholar Credit)

April 30, 2019 (Tuesday) 9 a.m.– 4 p.m. CST
STANLEY, ND – Mountrail County Highway Dept., 8103 61st St. NW

May 1, 2019 (Wednesday) 9 a.m. – 4:00 p.m. CST
GRAND FORKS, ND – Sheriff's Dept., 5205 Gateway Drive

May 2, 2019 (Thursday) 9a.m. – 4 p.m. PM CST
JAMESTOWN, ND – ND Farmers Union Office Bldg., 1415 12th Ave. SE

Registration Deadline: 1 week prior to workshop

Class limit: 30 attendees – $50 Registration Fee (includes printed training materials and instructor fees)

(Refreshment breaks provided by Roadworx/Lunch provided by DMC Wear Parts)

Learn how to add nature's glue to existing gravel surfacing and "Make Gravel Roads Great Again!" Specifying good gravel is tough enough, but how can we make poor and tired gravel perform better? While even the best of gravels can't match the year-round qualities of asphalt, we can sweeten the mix and make them better with a small percentage of clay.

Steve Monlux, PE and low volume road consultant, will share the secrets of adding a very small percentage of clay to hold gravel surfacing together. You'll find out why clay is nature's glue for gravel surfacing.

Terry Maier, BASE ONE, will show us how a base stabilizer can be used to enhance our roadway system.

Dale Heglund, NDLTAP will review gravel surfacing test sections and new performance prediction programs. No glue/clay results in washboarding, dust, float, safety hazards and high maintenance costs. What's holding your gravel together?

Kelly McCollam, DMC Wear Parts, will demonstrate new quick-change cutting edge technologies that makes easy work of cutting road surfaces and blending clay into the mix.

Todd Pendleton, Roadworx, will show us how to apply magnesium chloride and explain how clay binder in gravel surfacing enhances dust treatments.

NDSU | UPPER GREAT PLAINS TRANSPORTATION INSTITUTE
NORTH DAKOTA LOCAL TECHNICAL ASSISTANCE PROGRAM

Gravel Quality 3 P's:
Prospecting, Production & Performance

April 28, 2020 (Tuesday) 9:00 – 4:00 PM Central
Location – Cass County (tentative)

April 29, 2020 (Wednesday) 9:00 – 4:00 PM Central
Location – McHenry County (tentative)

April 30, 20120 (Thursday) 9:00 – 4:00 PM Mountain
Location – Stark County (tentative)

Registration Deadline: 1 week prior to workshop | **Class limit: 30 attendees – $50 Registration Fee**
(Refreshment breaks and lunch will be provided)

Learn tips on how to find and evaluate gravel sources, making realistic specifications, how owners and suppliers working together provide quality results, and adding clay (nature's glue) to gravel surfacing. Participants from the class will leave with the working knowledge on how to improve gravel performance and life.

Crushing good gravel can be a challenge, but how can we make existing poor and tired gravel perform better? While even the best of gravels can't match the year-round qualities of asphalt, we can sweeten the mix and make them better with a small percentage of clay.

- Hands on review of sand, silt and clay.
- Identify the causes of gravel road deficiencies – wash boarding, dust, float, rutting, etc..
- The value of Gravel testing.
- Clay is the glue. Review test for fine materials in gravel.
- Ways to lower bids for gravel
- Best practices for gravel road maintenance.
- Best practices for gravel sampling, testing and acceptance
- Develop options to improve existing gravel quality – production, stockpiles and road surfaces.
- Better gravel – better roads. Better roads – safer roads. Safer roads – save lives. With nearly 60,000 miles of gravel roads, the class is meant to help us create better, safer roads.
- Learn how to "Make Gravel Roads Great Again!"

Steve Monlux, PE and LVR Consultant, will help us to better understand all aspects of gravel, from prospecting to roadway maintenance. What is good gravel? How can we balance gravel quality with local resources? How can we solve gravel deficiencies?

Dale Heglund, NDLTAP, will review gravel surfacing test sections, performance prediction programs, surface selection tools, and sample specifications.

Rob Rebel, Knife River Corporations North Central Regional Vice President – Aggregate, will provide prospecting tips, review production practices and share ways to enhance gravel quality.

This is a **must** attend training for anyone that touches gravel or gravel roads. Motor grader operators, county road superintendents, county and township officers, contractors, and gravel suppliers.

Need help? Contact us at **ndltap@ugpti.org** or 701-328-9855

NDSU | NDLTAP

GRAVEL ROAD WARRIOR

Gravel Roads
60,000 miles

NDDOT Special Provision – Gravel Surfacing SP 714(14)

Sieve Size Or Testing Method	Aggregate Gravel Surfacing Percent passing or Test Limit
1"	100
¾"	70 – 100
No. 4	38 – 75
No. 8	22 – 62
No. 30	12 – 45
No. 200	7 - 15
Plasticity Index (PI)	3 - 9
ND T 113, Shale (max %)	12.0%
AASHTO T 96, L.A. Abrasion (max %)	50%
NDDOT 4, Fractured Faces[1]	10%

Plastic Index Adjustment Factor.

The Engineer will determine the PI content adjustment factor using the Table

Table 1	
PI Average	Pay Adjustment Factor
> 9.1	Non Acceptance
7.1 – 9.0	1.0
4.0 – 7.0	1.05
3.0 – 3.9	1.0
2.0 - 2.9	0.85
< 1.9	Non Acceptance

Pit Information

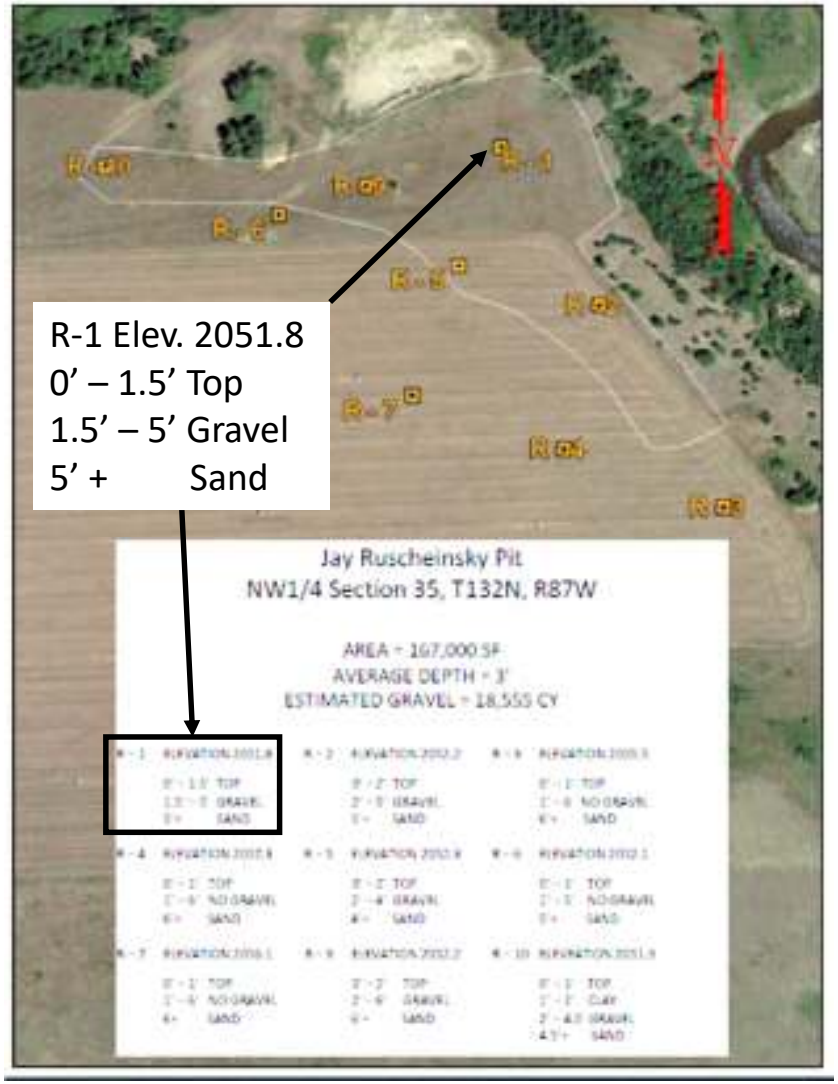
Location	Name	Quantity
SW 1/4, Sec. 29, T134N, R86W	Zimmerman	25,000 CY
NW 1/4, Sec. 35, T132N, R87W	Ruscheinsky	15,000 CY
		Total 40,000 CY

Grant County reserves the right to modify the overall quantity and the quantity provided at each location.

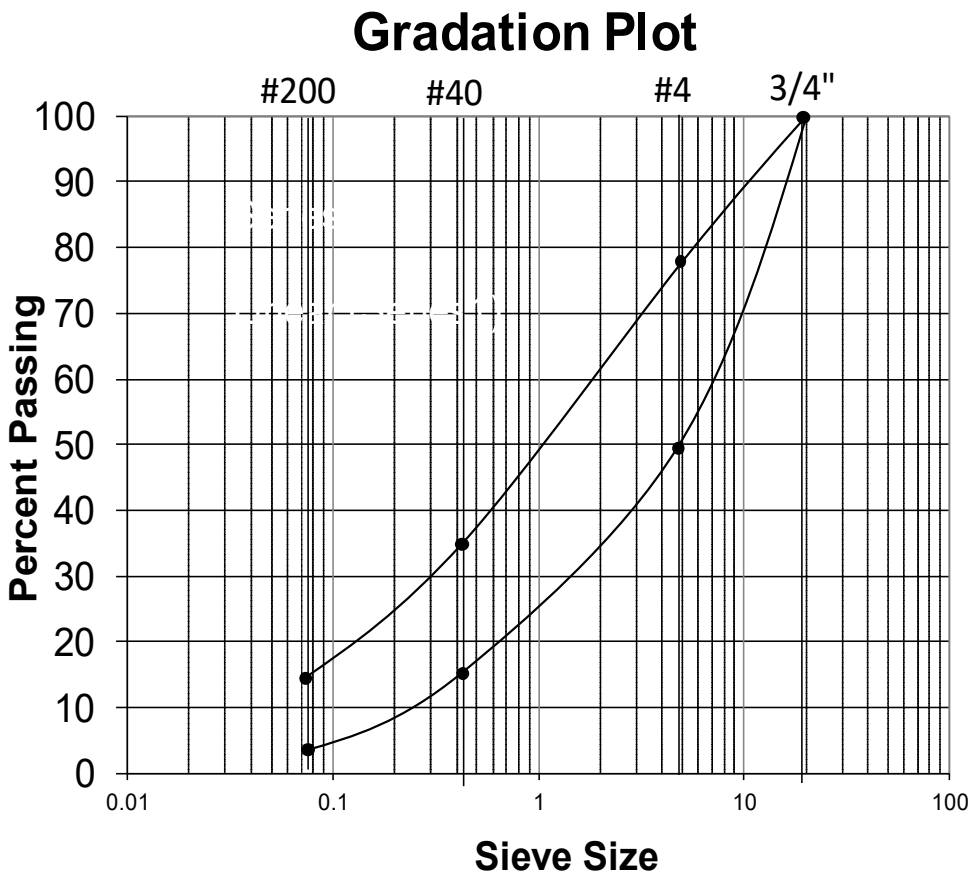
This statement may raise bids because contractor cannot base bid off of the 40,000 CY. What if they change to 20,000 CY?

The approach shown below is an option to help the bidder.

Pit	Bid Option A	Bid Option B	Bid Option C
Zimmerman	15,000 CY	20,000 CY	25,000 CY
Ruscheinsk	10,000 CY	12,500 CY	15,000 CY



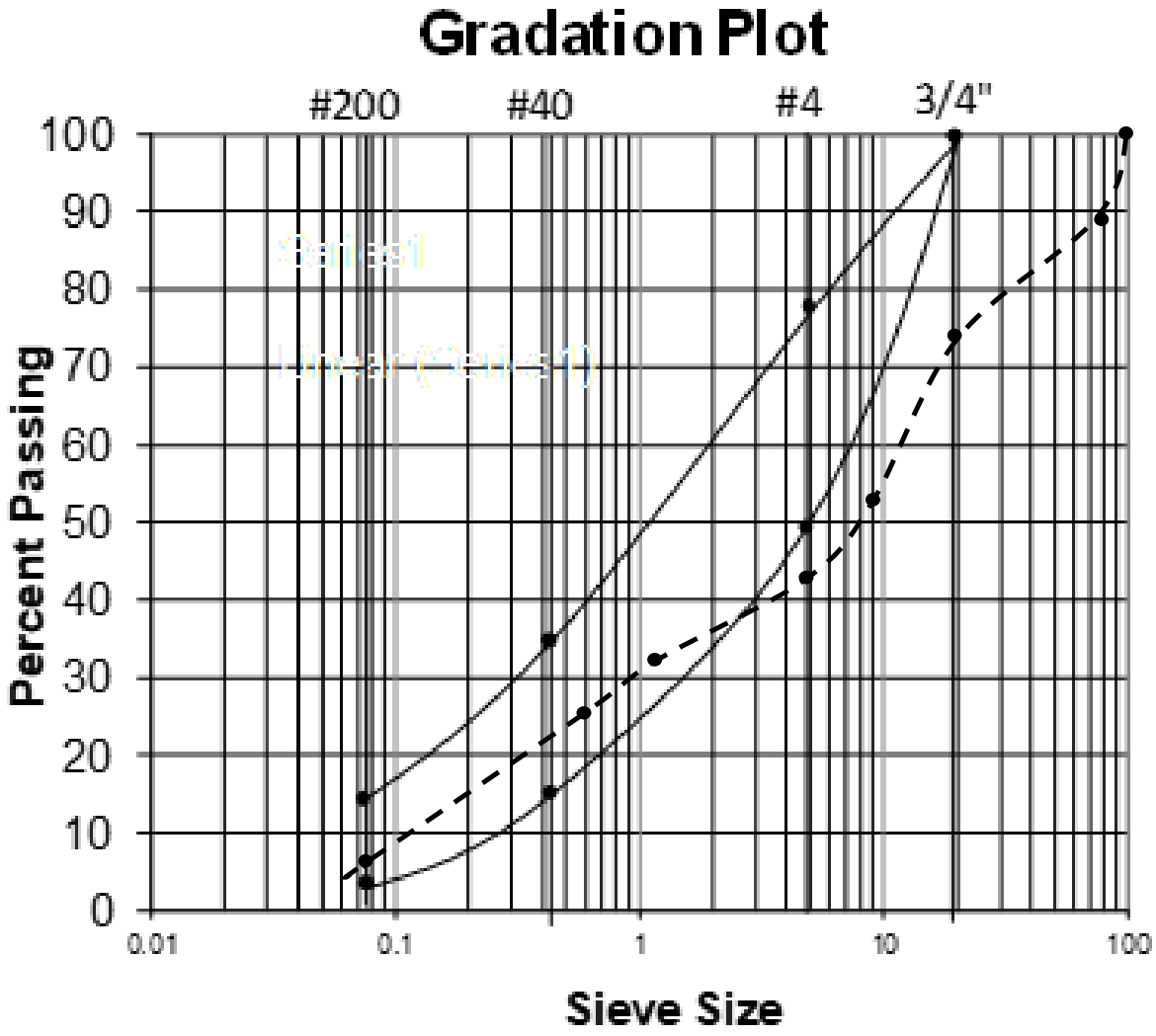
Gradation and Quality Requirements



Sieve Size	Surface Gravel % Passing
3/4"	100
No. 4	50-78
No. 8	37-67
No. 40	13-35
No. 200	4-15
Shale (max %)	12.0
LA Abrasion (max %)	50
Fractured Faces **	10

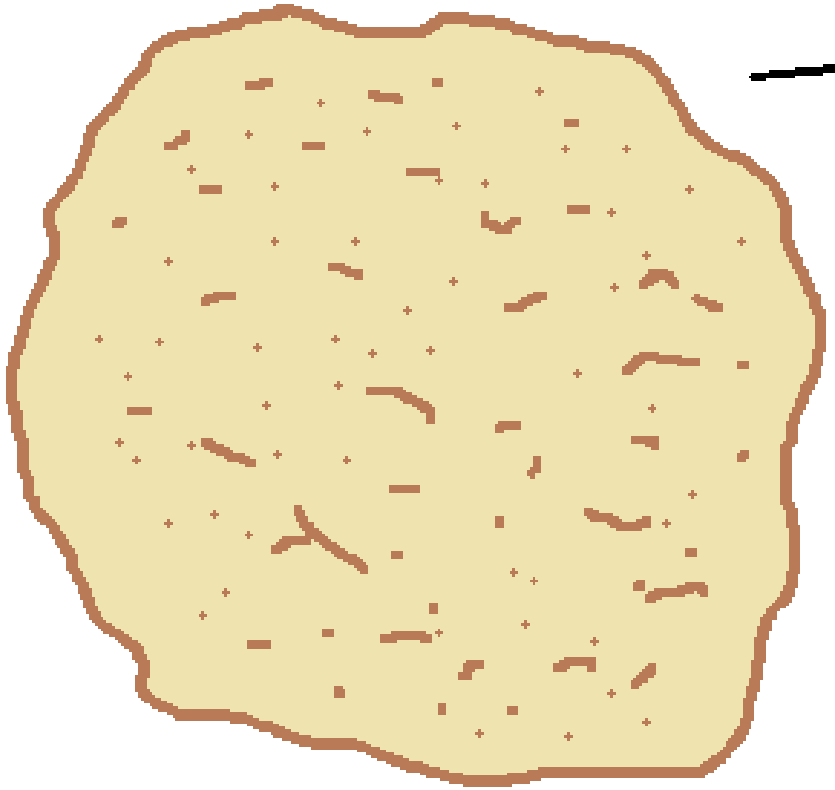
Ruscheinsky Pit Tests

Sieve Size	Ruschienski Pit		
	R-2	R-9	Average
4"	100	100	100
3"	89	88	89
3/4"	78	69	74
3/8"	58.0	47	53
#4	46	39	43
#30	28	25	27
#200	6.0	7.1	6.6



NDSU UPPER G
TRANSP

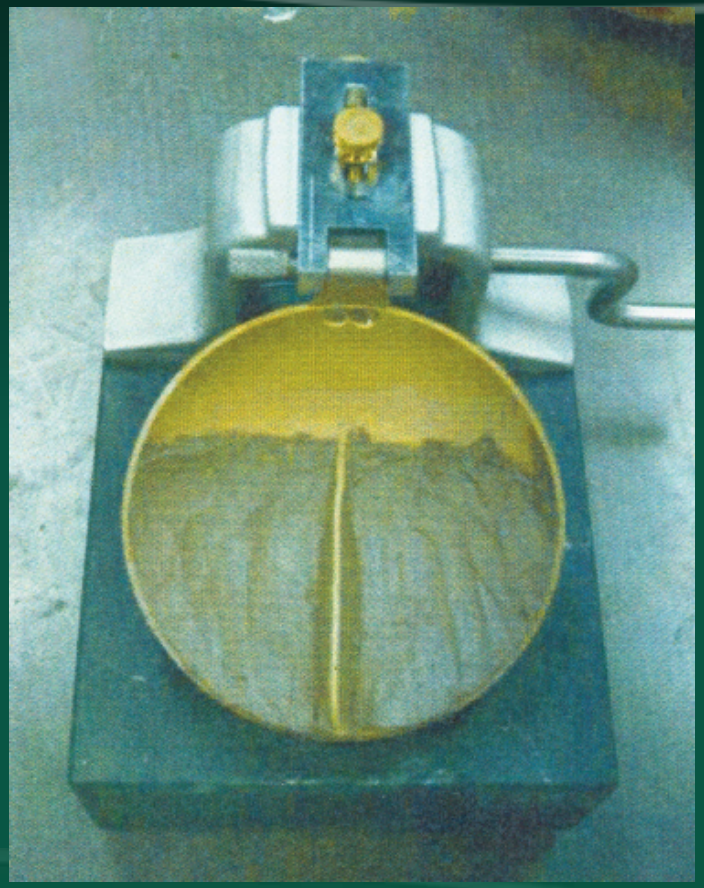
PI – Cohesiveness
Sand Equivalent
Hydrometer



Sand Particle
2.0 - 0.05 mm

Silt Particle
0.05 to 0.002 mm

Clay Particle
smaller than
0.002 mm



PI=LL-PL

Ribbon Video and Simple Checks

PI Control Samples

https://www.youtube.com/watch?v=GWZwbVJCNec


angle of repose

NDSU UPPER TRANS

UNPAVED ROAD CHEMICAL TREATMENT SELECTION TOOL

UCPRC City and County Pavement Improvement Center

Home | Instructions | Treatment Selection | Results Interpretation | About

WELCOME TO THE UCPRC'S UNPAVED ROAD CHEMICAL SELECTION TOOL SITE

Language & Units
(•) English ( ) Spanish
(•) US ( ) SI

There are millions of kilometers/miles of unpaved roads around the world managed by numerous authorities, land owners, and public and private organizations. Common to all of these roads are unacceptable levels of dust, poor riding quality and/or impassability in wet weather, and expensive maintenance and gravel replacement activities. Over the last 100+ years, a range of different chemical treatments have been developed to overcome these issues. Most of these are proprietary, which can complicate selection of an appropriate treatment for a specific set of conditions. There is also no single product that will solve all problems under all conditions.

Loss of fines (as dust) on an untreated road

A procedure has therefore been developed to guide practitioners in the selection of an appropriate treatment. This procedure, based on the 1999 US Forest Service Guide (*Dust Palliative Selection and Application Guide*), and updated with new research and experience, factors traffic, climate, material properties, and road geometry into the most appropriate treatment selections for a given set of input values. The procedure is based on the philosophy of using chemical treatments to keep good roads in good condition, rather than attempting to use chemical treatments to "fix" bad roads. This unpaved road chemical treatment selection tool and information related to it is fully described in the UCPRC guideline entitled "Guidelines for the Selection, Specification, and Application of Chemical Dust Control and Stabilization Treatments on Unpaved Roads." This web-based chemical treatment selection tool can be considered as a companion to the guideline.

The photo on the left shows loss of fines on an untreated road while the photo on the right shows the results of applying a fines preservation treatment.

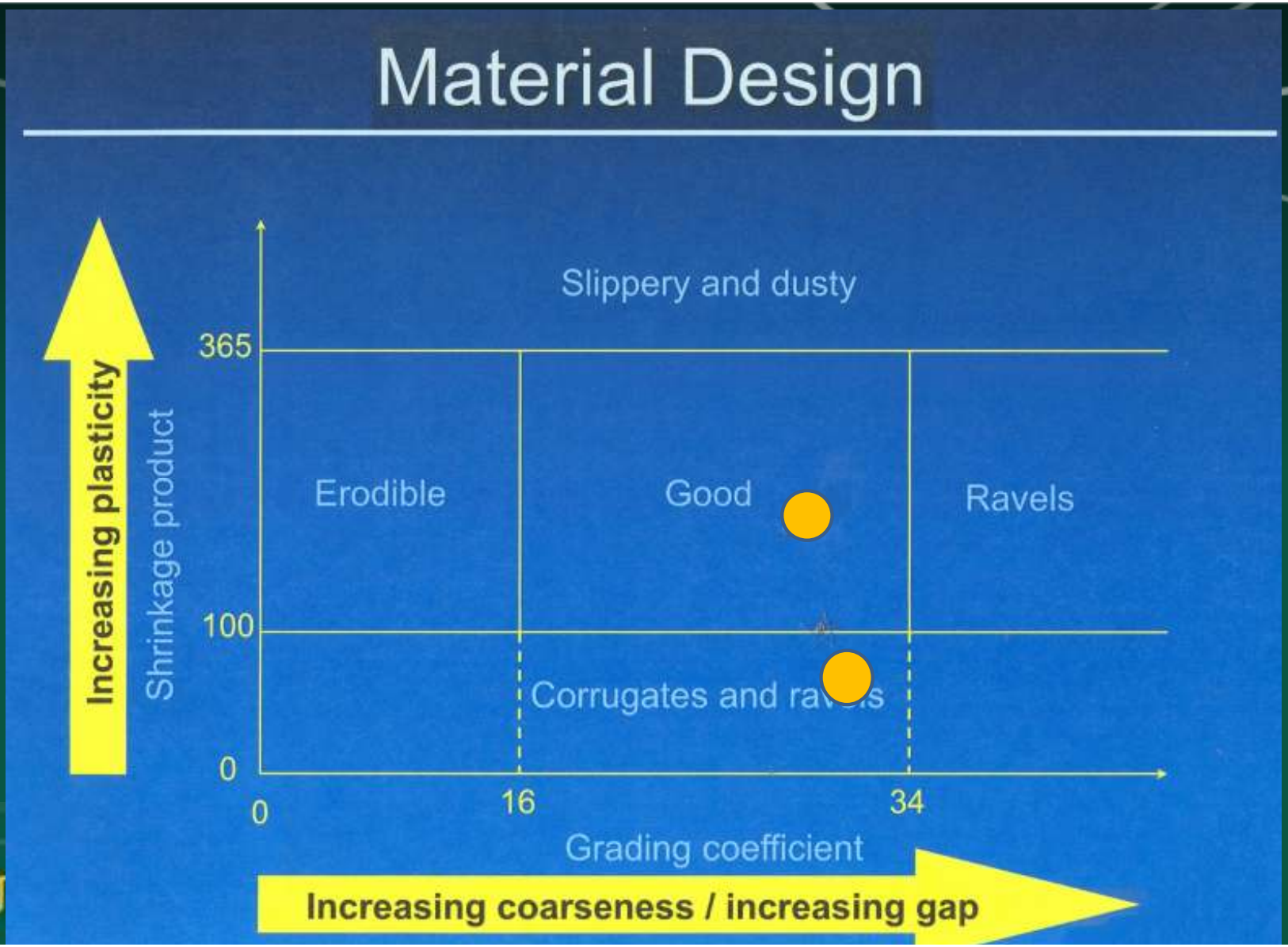
Stable fines preservation on a treated road

Disclaimer

This unpaved road chemical treatment selection procedure has been developed to guide selection of an appropriate treatment. It is based on the experience of practitioners and documented field experiment results. It is a guide only and does not replace engineering practice and judgment. Before initiating a treatment program, users should check actual performance for their particular materials and conditions with appropriate laboratory performance tests and/or short field experiments and/or seek guidance from other experienced practitioners and treatment suppliers. The University of California does not endorse the use of any specific product for dust control and stabilization of unpaved roads. In no event shall the University of California be liable to any party for

NDSU

Material Design



NDSU

Unpaved Road Chemical Treatment Selection Tool

UCPRC City and County Pavement Improvement Center

Home | Instructions | Treatment Selection | Results Interpretation | About

Road ID 57 **Details** Good County North Dakota

Material Test Results

%Passing 1"	100	%Passing #40	30
%Passing #4	70	%Passing #200	18
%Passing #8	56	PI (or BLSx2)	3

Objective

- Short-term dust control (spray-on)
- Long-term fines preservation (spray-on)
- Long-term fines preservation (mix-in)
- Long-term stabilization (mix-in)

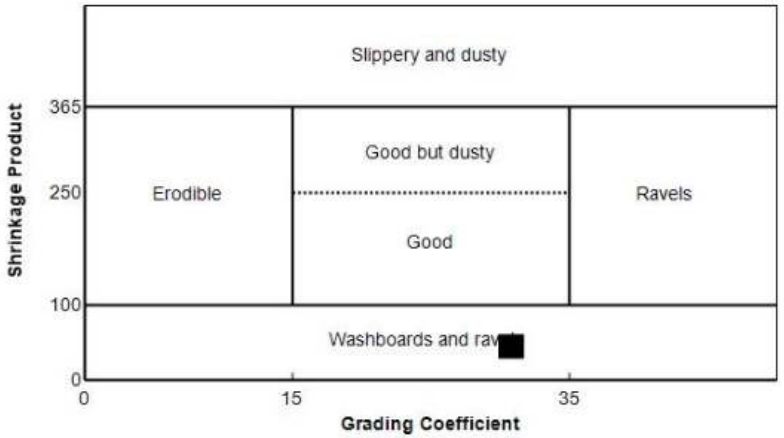
Roadway Parameters

Traffic (AADT): < 100 | Climate: Dry

- [x] More Than 10% Trucks
- [ ] Steep Grades
- [ ] Sharp Curves

Compute Ratings | Environmental & Other Influences

Predicted Material Performance for Untreated Road



Treatment Ratings

Treatment	TR	CL	PI	FC	HV	SG	SC	Rating
Synthetic Fluid + Binder	1	1	1	1	1	0	0	1.0
Petroleum Resin	1	1	1	1	2	0	0	2.0
Synthetic Polymer	1	1	1	1	2	0	0	2.0
Asphalt Emulsion	1	1	1	2	2	0	0	2.2
Magnesium Choride	2	2	2	2	1	0	0	2.4
Lignosulfonate	2	1	2	2	2	0	0	2.4
Tall Oil	2	1	2	2	2	0	0	2.4
Concentrated Liquid Stabilizer	1	1	3	2	1	0	0	3.0
Clay Additive	1	1	2	3	2	0	0	3.0
Calcium Chloride	2	3	2	2	2	0	0	3.1
Sodium Chloride Brine	2	3	2	2	2	0	0	3.1
Water	3	3	3	3	3	0	0	NA
Water + Surfactant	3	3	3	3	3	0	0	NA
Glycerin Based	3	3	3	3	3	0	0	NA
Molasses/Sugar	3	3	3	3	3	0	0	NA
Plant Oil	3	3	3	3	3	0	0	NA
Base Oil	3	3	3	3	3	0	0	NA
Synthetic Fluid	3	3	3	3	3	0	0	NA

TR: Traffic; **CL:** Climate; **PI:** Plasticity; **FC:** Fines Content; **HV:** More Than 10% Trucks
SG: Steep Grades; **SC:** Sharp Curves; **Rating:** Treatment Performance Ratings

Suppliers | Print

PERMA-ZYME®

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE


07/27/2017

Gravel Roads Maintenance Cost

Potential Savings Per Mile

$8,077.50

	DustGard	Untreated
Aggregate Replacement Cost	$2,340.00	$5,827.50
Maintenance Cost	$3,720.00	$10,560.00
Cost of DustGard	$2,250.00	$0.00
Total	$8,310.00	$16,387.50

Investment Strategies - Alternatives

Agency Cost Parameters Setup

HMA | AST | Gravel | Dust Control | Stabilized Gravel

HMA

INITIAL COST

Total Initial Cost ($/mile): $ 725,115 Initial Costs Calculator

MAINTENANCE COST

Treatment Selection	Treatment Name	Application Times Per Year	Year Interval Between Applications	Application Start Year	Unit Cost (dollars)	Unit Selection
✓	Crack Sealing	1	4	6	10000	per mile
✓	Seal Coat	1	7	3	20000	per mile
✓	Thin Lift OverLay	1	20	20	250000	per mile
✓	Striping and Marking	1	3	3	2000	per mile
✓	Patching/Maintenance	1	3	3	3000	per mile
☐	Other	1	1	1	0	per mile

Reset

Next Surface | Back to Common Parameters Setup | View Analysis Summary | Help

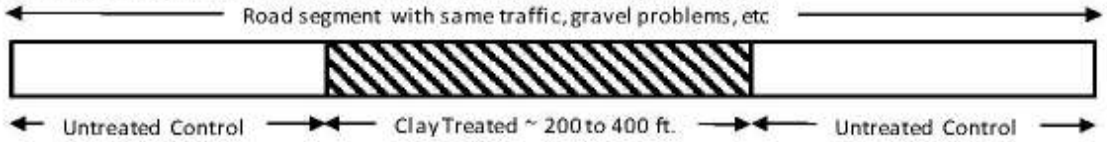
Guide for Adding Bentonite Clay to Gravel Roads with Belly Dump (1-27-2020)

Feedback is desired: stevemonlux@gmail.com Special thanks to Clay (Teton Co ID) & Sparky (Sargent Co ND)

Guide Purpose: Encourage rural road departments to use bentonite clay to reduce washboards, raveling, blading and gravel loss on gravel roads. Show road crew personnel the benefits of clay by comparing gravel problems in clay treated gravel to untreated gravel.

Guide Outline:

- Purchase a 2500 lb. bulk bag of granular bentonite for about $120. A list of bentonite suppliers is shown below.
- Locate a road segment about ¼ mile long that has consistent problems with raveling, wash boarding, dusting, etc. The amount of traffic on this segment should be similar from one end to the other. See diagram below.



- Water and then shape the road to the desired crown.
- Pull about 25 tons of gravel out of the stockpile and dump in a windrow on the pit floor. Spread the bulk bag of Bentonite on top the gravel windrow, then load out the belly dump starting at one end of the windrow.
- Spread the bentonite/gravel mix on about 200 to 400 feet of road. Stake the start and finish of the spread on the road shoulder and get a rough measurement between stakes.
- Note any areas that have bentonite concentrations.

- Blade mix the gravel-bentonite spread with in-place gravel to the depth shown in the table below

Inches of In-place Gravel to Mix with 25 Ton Gravel-Bentonite Blend in Belly Dump					
Road Width, ft	Spread lengths for Gravel/Bentonite Blend, ft (a)				
	100	200	300	400	500
16	4.2	2.1	1.4	1.0	0.8
20	3.3	1.7	1.1	0.8	0.7
24	2.8	1.4	0.9	0.7	0.6
(a) Mix depths with in-place gravel are based on achieving 2% bentonite by weight gravel, assuming one 2500 lb. bulk					

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	ROM-0300(130)	5	1

...TES

302-P04 AGGREGATE SURFACE COURSE CL 13: Provide a Class 13 Aggregate with a Plasticity Index (PI) ranging from 4 to 9 and meets the requirements of Section 816.02, "Miscellaneous Aggregates". The PI is to be determined in accordance with test ND T 90, "Determining the Plastic Limit and Plasticity Index.

A contract adjustment will be administered if the PI is not within the specified range. The Engineer will determine the PI adjustment factor if the limits for PI are exceeded, as calculated:

PI Adjustment Factor = 5 percent x (Average of 3 Samples – Allowable PI)

If the PI is determined to be greater than 12, the material will be rejected.

Spot Repair, Regraveling

Site K-06S
Mountrail County
NW 1/4 Sec 8
T159N
R90W
2.9 miles
Roadway Width 25'
Aggregate Depth 2"
Spot Repair, Regraveling

Site H-02b
Mountrail County
NW 1/4 Sec 19
T 153 N
R 89 W
3.2 miles
Roadway Width 25'
Aggregate Depth 2"
Spot Repair, Regraveling

Site H-05a
Mountrail County
NW 1/4 Sec 23
T 151 N
R 89 W
4.0 miles
Roadway Width 25'
Aggregate Depth 2"
Spot Repair

Site H-05b
Mountrail County
NW 1/4 Sec 23
T 151 N
R 89 W
1.2 miles
Roadway Width 25'
Aggregate Depth 2"
Spot Repair

DESIGNERS

JOB #

NORTH DAKOTA

...MENT OF TRANSPORTATION

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	ROM-0300(130)	21282	1	1

ROM-0300(130)

...au, Burke, Mclean, Mountrail, & Renville Counties

Minot Minuteman Complex Regraveling

GOVERNING SPECIFICATIONS:
2014 Standard Specifications adopted by the North Dakota Department of Transportation and the Supplemental Specifications effective on the date the project is advertised.

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
ROM-0300(130) Minot Minuteman Complex Regraveling	34.6	34.6

Site O-09a
Bottineau County
NW 1/4 Sec 3
T 162 N
R 83 W
3.0 miles
Roadway Width 28'
Aggregate Depth 2"
Spot Repair, Regrading

Site O 09b
Bottineau County
NW 1/4 Sec 3
T 162 N
R 83 W
3.0 miles
Roadway Width 28'
Aggregate Depth 2"
Spot Repair, Regrading

Site O-09c
Bottineau County
NW 1/4 Sec 3
T 162 N
R 83 W
2.2 miles
Roadway Width 28'
Aggregate Depth 2"
Spot Repair, Regrading

“Gravel Preservation” – Tim Horner, PE

Gravel Survey
WDEA Wise Road Project
Better Gravel
Better Maintenance Practices

NDSU

NDSU UPPER GREAT P
TRANSPORTATI

302-P01 AGGREGATE SURFACE COURSE CL 13 (MODIFIED): This item shall be modified as follows:

Class 13 (Modified)	
Sieve Size or Testing Method	Percent Passing or Testing Requirement
1"	100
3/4"	90-100
3/8"	50-90
No. 4	35-65
No. 8	22-55
No. 30	12-45
No. 200	8-15*
% Shale and Soft Rock	Max. 15%
L.A. Abrasion Loss	Max. 15%
Plasticity Index	7-13%
Fractured Faces	10%

*The material passing the #200 sieve should be able to be rolled into a ribbon when moistened, indicating adequate clay material in the fines.

BURLEIGH COUNTY HIGHWAY DEPARTMENT

8100 43RD AVENUE NE
BISMARCK, ND 58503
701-204-7748
FAX 701-204-7749
www.burleighco.com

Dust Control Policy

Approved by the Burleigh County Commission
(February 3, 2014)

OVERVIEW

As the area around the City of Bismarck grows, residents on the township and county roadway system have experienced increases in traffic. It has long been the desire of the Burleigh County Board of Commissioners and the Highway Department to promote the paving of new subdivisions that are developed; however, in older subdivisions and on section line roadways in the growth area, that have not been paved, we are receiving more calls requesting some type of dust control.

The loss of fines (dust) from our gravel roads is not only a nuisance to residents, but it can also be a health hazard to individuals with emphysema or asthma. It also decreases the effectiveness of our gravel by creating greater segregation within our roadway surfacing. This requires us to gravel more often. Chemical treatment of gravel roads with either Calcium Chloride or Magnesium Chloride has been proven to reduce the loss of fines from gravel roadways. In general, Magnesium Chloride has been found most effective in our climate. Other types of chemical treatments have been tested but none have been found as effective as Magnesium Chloride.

It is the Highway Department's desire to implement a Dust Control Policy to help direct the use of chemical treatment of both township and county roadways. The following guidelines would be used in administering the application of dust control chemicals:

OPERATING PROCEDURES

On county roads:
Dust control will be applied to gravel roadways meeting the following criteria:

1) Roadways with Average Daily Traffic (ADT) counts of 200 or greater will receive solid application.

NDS

What is Gravel????

The king can do no wrong…..