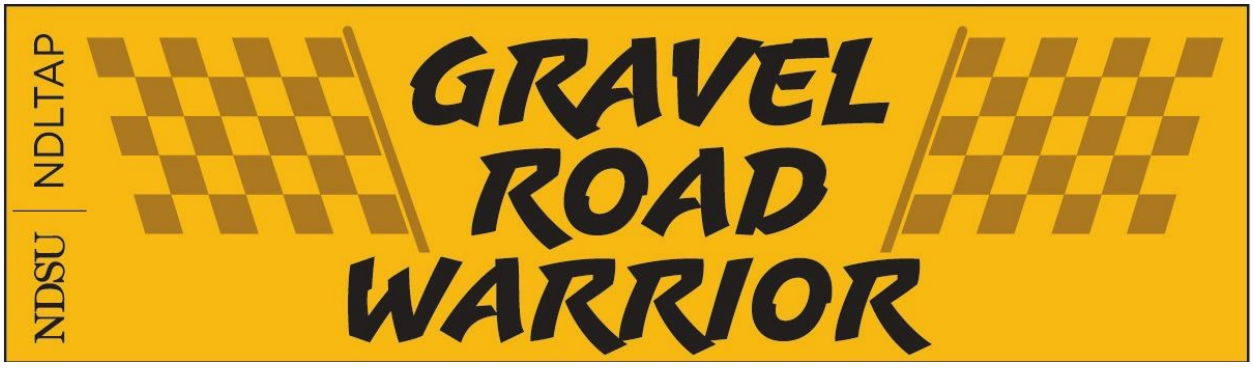
Gravel Surfacing – New Specification

By Dale C. Heglund, NDLTAP



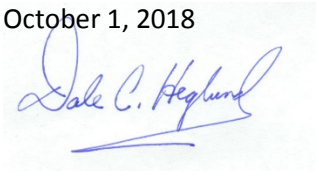
In 2014, NDLTAP launched an effort to improve gravel roads in the state. With approximately 60,000 miles of local county, township and city gravel roadway miles in the state, the need to provide outreach became a core focus item for the NDLTAP team. Blade training was developed to help operators understand the need for a 4% cross slope (i.e., twice the slope of a paved road), the importance of binder in quality gravel, roadway shape, equipment technologies, motor grader maintenance, gravel road failure mechanisms, pretend blading and much more. Special thanks to Bryon Fuchs, Justin Ramsey and Eric Gaasland, NDDOT team members, for their efforts to create the new Gravel Surfacing specification.

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%

Continuous improvement, a way of life for local leaders.

October 1, 2018



NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION

GRAVEL SURFACING

DESCRIPTION

This work consists of furnishing and placing aggregate as a roadway surface course.

EQUIPMENT

Equipment	Section
Tow-Type Pneumatic-Tired Rollers	151.01 A.2
Self-Propelled Pneumatic-Tired Rollers	151.01 A.3
Water Trucks	152.01 B
Aggregate Trucks	152.01 C

MATERIALS

A. General.

Sieve Size Or Testing Method	Aggregate Gravel Surfacing Percent passing or Test Limit
1”	100
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[1]Minimum weight percentage allowable for the portion of the aggregate retained on a No. 4 sieve having at least 1 fractured face.

The Engineer’s testing procedures will follow Section 302 of the Field Sampling and Testing Manual. Frequencies will follow this specification.

B. Acceptance of Aggregate.

1. Gradation.

The Engineer will collect three samples for each 1,000 tons of material placed, except when more than 1,000 tons are placed in a day. If more than 1,000 tons are placed in a day, the Engineer will collect three samples for that day’s placement. If the aggregate fails to meet the specified gradation, the Engineer will apply a price reduction as specified in Section 302.06 B, “Contract Price Adjustments”.

Do not incorporate additional aggregate if two consecutive lots deviate from the specified gradation. Restart placement operations after taking corrective actions and passing a gradation test.

2. Plasticity Index (PI).
The Engineer will collect three samples for each 5,000 ton lot of material produced. If a fractional lot is less than 1,500 tons it will be included in the previous lot. The Engineer will determine the PI.

The Engineer will average the results of the tests to determine the PI for the lot of material. If the PI for the lot is below 2.0 or above 9.0, the Engineer will reject the material. If the PI is between 2.0 and 9.0, the Engineer will implement the cost adjustment factors in Table 1.

If the material represented by a PI lot is subject to a unit price reduction for gradation, shale content, or both, the highest cost adjustment factor for that will be applied for PI is 1.0.

3. Miscellaneous Properties.
The Engineer will collect three samples for each 10,000 ton lot of material produced. If a fractional lot is less than 2,500 tons it will be included in the previous lot. The Engineer will determine shale content and the number of fractured faces.

If the material fails to meet the requirement for fractured faces, make corrections to the stockpile before incorporating additional material into the work.

If the material exceeds the maximum shale content by less than 3 percentage points, the Engineer will apply a price reduction as specified in Basis of Payment B, “Contract Price Adjustments”. The Engineer will reject the material if the maximum shale content is exceeded by 3 or more percentage points.

CONSTRUCTION REQUIREMENTS

A. Stockpiling Aggregate.
In addition to the requirements of Section 106.05, “Stockpiling Aggregate and Salvaged Materials”, do not operate equipment on stockpiles that will remain the property of the Department.

B. Placement and Compaction.

1. General.
Place aggregate in lifts not exceeding 6 inches of compacted material.

Uniformly mix aggregate placed in windrows before spreading.

Compact aggregate, utilizing pneumatic-tired rollers, until the surface is tightly bound and shows no rutting or displacement occurs under the roller operation.

2. Limitations.
Do not place material on frozen subgrade.

When the roadway is open to traffic, the following limitations apply:
- The maximum windrow length is three miles; and
- Spread material within 48 hours of placing the material in a windrow.

METHOD OF MEASUREMENT

The Engineer will measure, completed and in place, as specified in Section 109.01, "Measurement of Quantities".

BASIS OF PAYMENT

A. General.

Spec and Code	Pay Item	Pay Unit
350 - 0500	Gravel Surfacing	Ton
350 - 0501	Gravel Surfacing	Cubic Yard
350 - 0600	Stockpiled Gravel Surfacing	Ton
350 - 0601	Stockpiled Gravel Surfacing	Cubic Yard

Such payment is full compensation for furnishing all materials, equipment, labor, and incidentals to complete the work as specified.

B. Contract Price Adjustments.

1. General.
The Engineer will determine contract price adjustments by multiplying the applicable adjustment factor by the contract unit price for the aggregate and the amount of material in the lot represented by the test.

If contract price adjustments are warranted in more than one category, a contract price reduction will be applied for each area of deficiency.

2. Aggregate Gradation Adjustment Factor.
The Engineer will determine the aggregate gradation adjustment factor if aggregate base does not meet the specified gradations for all required samples, as calculated:

$$\text{Aggregate Gradation Adjustment Factor} = 5 \times \text{Sum of deviations from range limits on all sieves}$$

3. Shale Content Adjustment Factor.
The Engineer will determine the shale content adjustment factor if the limits for shale are exceeded, as calculated:

$$\text{Shale Content Adjustment Factor} = 5 \times (\text{Average of 3 Samples} - \text{Allowable Percentage})$$

4. Plastic Index Adjustment Factor.

The Engineer will determine the PI content adjustment factor using the Table 1.

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