

EXHIBIT B, ATTACHMENT NO.4

**NEVADA NATIONAL SECURITY SITE****NNSS ROAD REPAIRS****SPECIFICATION  
FOR  
CHIP SEAL SURFACE TREATMENT**

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Revision 0

**QG3**

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## NNSS ROAD REPAIRS

## CHIP SEAL SURFACE TREATMENT

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This specification uses sections from the Nevada Department of Transportation (NDOT), Standard Specifications for Road and Bridge Construction (2014 Edition). They have not been reformatted to CSI standard format.

SECTION 406 – PRIME COAT  
Revision 0

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**DESCRIPTION**

**406.01.01 General.** This work consists of applying a bituminous material prime coat and sand blotter as required.

**MATERIALS**

**406.02.01 Bituminous Material.** The type and grade of bituminous material shall be MC-70NV.

Submit Bill of Lading and Certificate of Compliance for every load of bituminous material. For content of Bill of Lading see subsection 703.03.01.

The bituminous material shall meet the requirements of Section 703. The bituminous material may be conditionally accepted at the source.

**406.02.02 Sand Blotter.** Sand blotter shall meet the requirements of Subsection 705.03.05. The material may be accepted in stockpile at the source.

**CONSTRUCTION**

**406.03.01 Equipment.** Equipment for heating and applying the bituminous material shall meet the following requirements:

- (a) Capable of heating asphalt evenly.
- (b) Power unit for the pump, and full circulation spray bar adjustable to 4.3 m (14 ft) wide.
- (c) Positive controls including tachometer, pressure gauges, volume measuring device, and calibrated tank, to uniformly apply asphalt within 0.10 L/m<sup>2</sup> (0.02 gal/yd<sup>2</sup>) of the required rate.
- (d) Thermometer for measuring temperatures in the tank.
- (e) Use the correct size nozzles and application pressure for the type and grade of asphalt and speed of distributor. Nozzles shall be free from damage, unclogged, and freely spraying. Nozzles shall be uniformly angled from spray bar such that the spray fans do not interfere with other spray fans. Special end-nozzles or shields installed on the end of the spray bar shall be adjusted to provide clean, uniform application and edges without streaks. Adjust and maintain the spray bar height to provide uniform double or triple lap coverage of bituminous material spread while preventing wind or other distortion.

**406.03.02 Weather Limitations.** Do not apply bituminous material on a wet surface, when the atmospheric temperature is below 10 °C (50 °F), or when weather conditions would prevent the proper construction of the prime coat.

**406.03.04 Application of Bituminous Material.** Uniformly apply the bituminous material in a continuous spread. Treat not more than half of the width of the section when traffic is maintained. Carefully apply bituminous material at the junctions of spreads so that it is not in excess of the specified amount. Squeegee excess bituminous material from the surface. Correct skipped or deficient areas.

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Apply bituminous material at a rate of 0.10 – 0.25 gallons per square yard.

One way traffic may be permitted on the untreated portion of the roadbed. Transfer traffic to the treated portion when the bituminous material has been absorbed by the surface and will not pick up.

When emulsified asphalts are specified for use, apply in two applications. Apply the second application after the first application has set. Do not place plantmix bituminous courses until the prime coat has set.

The temperature of the bituminous materials shall conform to the requirements of the following Table I:

**TABLE I**

| <b>SPRAYING AND MIXING TEMPERATURES OF LIQUID ASPHALTS<br/>AND EMULSIFIED ASPHALTS</b> |                                               |           |                                                                                |           |
|----------------------------------------------------------------------------------------|-----------------------------------------------|-----------|--------------------------------------------------------------------------------|-----------|
| <b>Grade and Type<br/>MC and SC</b>                                                    | <b>Distributor<br/>Spraying Temp. °C (°F)</b> |           | <b>*Pugmill Mixing Temp. °C (°F)<br/>of Liquid Asphalts and<br/>Aggregates</b> |           |
|                                                                                        | Minimum                                       | Maximum   | Minimum                                                                        | Maximum   |
| 70, 70NV                                                                               | 49 (120)                                      | 82 (180)  | 35 (95)                                                                        | 60 (140)  |
| 250                                                                                    | 74 (165)                                      | 104 (220) | 57 (135)                                                                       | 79 (175)  |
| 800                                                                                    | 93 (200)                                      | 124 (255) | 74 (165)                                                                       | 96 (205)  |
| 3000                                                                                   | 113 (235)                                     | 143 (290) | 93 (200)                                                                       | 116 (240) |

| Grade of<br>Emulsified Asphalt                                                | Distributor<br>Spraying Temp. °C (°F) |          | *Pugmill Mixing Temp. °C (°F)<br>of Emulsion and Aggregates |          |
|-------------------------------------------------------------------------------|---------------------------------------|----------|-------------------------------------------------------------|----------|
|                                                                               | Minimum                               | Maximum  | Minimum                                                     | Maximum  |
| CRS-2nv                                                                       | 52 (125)                              | 85 (185) | (Not used for Mixing)                                       |          |
| CQS-1nv                                                                       | 21 (70)                               | 71 (160) | (Not used for Mixing)                                       |          |
| SS-1, CSS-1                                                                   | 21 (70)                               | 71 (160) | 10 (50)                                                     | 71 (160) |
| SS-1h, CSS-1h                                                                 | 21 (70)                               | 71 (160) | 10 (50)                                                     | 71 (160) |
| CMS-2s, CQS-1h                                                                | 21 (70)                               | 71 (160) | 10 (50)                                                     | 71 (160) |
| LMCRS-2h                                                                      | 52 (125)                              | 85 (185) | (Not used for Mixing)                                       |          |
| PMPS, PMPS-h                                                                  | 43 (110)                              | 85 (185) | (Not used for Mixing)                                       |          |
| PMPS-QB, PMPS-FS                                                              | 43 (110)                              | 85 (185) | (Not used for Mixing)                                       |          |
| *The maximum spraying temperature may be used if the aggregate is not heated. |                                       |          |                                                             |          |

**406.03.05 Application of Blotter Material.** When necessary for traffic, spread blotter material in the amounts required to absorb any excess bituminous material.

SECTION 407 – SEAL COAT  
Revision 0

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**DESCRIPTION**

**407.01.01 General.** This work consists of applying a bituminous material seal coat and sand blotter as required.

**MATERIALS**

**407.02.01 Bituminous Material.** The type and grade of bituminous material shall be CSS-1h (Diluted).

Emulsified asphalt (diluted) shall be a mixture of 70% emulsified asphalt and 30% added water by mass. To accomplish this mixing, fill the distributor partly with water and then add the emulsified asphalt. Spray the remaining required water into the tank under pressure and then thoroughly circulate within the distributor.

Submit Bill of Lading and Certificate of Compliance for every load of bituminous material. For content of Bill of Lading see Subsection 703.03.01.

The bituminous material shall meet the requirements of Section 703. The bituminous material may be conditionally accepted at the source.

**407.02.02 Sand Blotter.** Sand blotter shall meet the requirements of Subsection 705.03.05. The material may be accepted in stockpile at the source.

**CONSTRUCTION**

**407.03.01 Equipment.** Equipment for heating and applying the emulsified asphalt shall meet the following requirements:

- (a) Capable of heating asphalt evenly.
- (b) Power unit for the pump, and full circulation spray bar adjustable to 4.3 m (14 ft) wide.
- (c) Positive controls including tachometer, pressure gauges, volume measuring device, and calibrated tank, to uniformly apply asphalt within 0.10 L/m<sup>2</sup> (0.02 gal/yd<sup>2</sup>) of the required rate.
- (d) Thermometer for measuring temperatures in the tank.
- (e) Use the correct size nozzles and application pressure for the type and grade of asphalt and speed of distributor. Nozzles shall be free from damage, unclogged, and freely spraying. Nozzles shall be uniformly angled from spray bar such that the spray fans do not interfere with other spray fans. Special end-nozzles or shields installed on the end of the spray bar shall be adjusted to provide clean, uniform application and edges without streaks. Adjust and maintain the spray bar height to provide uniform double or triple lap coverage of bituminous material spread while preventing wind or other distortion.

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**407.03.02 Weather Limitations.** Do not apply bituminous material on a wet surface, or when atmospheric temperature is below 10 °C (50 °F), or when weather conditions would prevent the proper construction of the seal coat.

**407.03.03 Preparation of Surface.** Clean the entire width of surfacing of all dirt and loose material by sweeping with power brooms supplemented by hand brooms if necessary.

**407.03.04 Application of Bituminous Material.** Uniformly apply the bituminous material in one operation to the entire width of one designated traffic lane at a time.

Apply bituminous material at a rate of 0.13 gallons per square yard.

The temperature of the bituminous material shall conform to Subsection 406.03.04.

Apply the seal coat in such manner as to offer the least inconvenience to traffic and to permit one way traffic without pickup or tracking of the bituminous material.

When a surface treatment is to be applied to the travel lanes, apply the seal coat to the shoulder at least 4 days in advance of the application of the adjacent surface treatment requiring screenings. Apply in such a manner that the joint between the surface treatment and seal coat will present a neat and uniform appearance true to the line shown on the typical cross section.

**407.03.05 Application of Blotter Material.** When necessary for traffic, spread blotter material in the amounts required to absorb any excess bituminous material.

**SECTION 408 – SURFACE TREATMENT**  
Revision 0

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**DESCRIPTION**

**408.01.01 General.** This work consists of an application of bituminous material and cover of screenings applied on a previously compacted and bonded aggregate or bituminous surface.

**MATERIALS**

**408.02.01 Bituminous Material.** The type and grade of bituminous material will be CRS-2h.

Submit Bill of Lading and Certificate of Compliance for every load of bituminous material. For content of Bill of Lading see Subsection 703.03.01.

The bituminous material shall meet the applicable requirements of Section 703. The bituminous material may be conditionally accepted at the source.

**408.02.03 Screenings.** Screenings shall meet the requirements of Subsection 705.03.04, for Grade 2  $\frac{1}{2}$  inch material, and  $\frac{3}{8}$  inch material.

**CONSTRUCTION**

**408.03.01 Distributors.** The distributor shall meet the following requirements:

- (a) Capable of heating asphalt evenly.
- (b) Power unit for the pump, and full circulation spray bar adjustable to 4.3 m (14 ft) wide.
- (c) Positive controls including tachometer, pressure gauges, volume measuring device, and calibrated tank, to uniformly apply asphalt within  $0.10 \text{ L/m}^2$  ( $0.02 \text{ gal/yd}^2$ ) of the required rate.
- (d) Thermometer for measuring temperatures in the tank.
- (e) Use the correct size nozzles and application pressure for the type and grade of asphalt and speed of distributor. Nozzles shall be free from damage, unclogged, and freely spraying. Nozzles shall be uniformly angled from spray bar such that the spray fans do not interfere with other spray fans. Special end-nozzles or shields installed on the end of the spray bar shall be adjusted to provide clean, uniform application and edges without streaks. Adjust and maintain the spray bar height to provide uniform double or triple lap coverage of bituminous material spread while preventing wind or other distortion.

Construct longitudinal joints only on the shoulders, or at the edge of travel lanes.

**408.03.02 Aggregate Spreader.** The aggregate spreader shall be self-propelled and supported by at least 4 wheels equipped with pneumatic tires on 2 axles. Equip the aggregate spreader with positive control so that the required amount of material will be deposited uniformly over the full width of the bituminous material.

On divided highways, operate the aggregate spreader against the flow of traffic in order to allow the hauling trucks to enter and leave with the flow of traffic.

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**408.03.03 Rollers.** On a new surface, operate with each aggregate spreader, two pneumatic-tired rollers and one steel-wheel roller. On an old surface, operate no less than three pneumatic-tired rollers and no steel wheel rollers.

The pneumatic-tired roller shall meet the following requirements:

Pneumatic tired rollers shall weigh not less than 9.1 metric tons (10 tons) and be equipped with pneumatic tires of equal size and diameter mounted on 2 axles attached to a rigid frame equipped with a loading platform or body suitable for ballast loading. The minimum width between the outer edges of the outside tires on a given axle is 1.5 m (60 in.). Use tires with satisfactory treads. Space the tires on the rear axle so that the entire gap between adjacent tires on the front axle will be covered by the tread of the rear tires. Uniformly inflate the tires so that the air pressure in the tires will not vary more than 35 kPa (5 psi). Use the tire manufacturer's recommended inflation pressure. Use a minimum tire size of 185 mm x 375 mm (7.5 in. x 15 in.), 4 ply. Fully skirt roller with rigid material to within 25 mm (1 in.) of the pavement surface.

The steel wheel roller shall meet the following requirements:

(a) Breakdown rollers shall be a 2 axle tandem steel wheeled weighing not less than 9.1 metric tons (10 tons) and capable of rolling with or without vibration.

(b) The finish roller shall be a 2 axle tandem steel wheeled weighing not less than 7.2 metric tons (8 tons).

Additional rollers may be required if the aggregate placement rate exceeds the capabilities of the initial rollers.

**408.03.04 Weather Limitations.** Do not spread bituminous material when weather conditions are unsuitable, when rain is imminent, when the pavement surface is wet, when excessive wind causes problems, or when the humidity is higher than 50%. Do not spread bituminous material when the atmospheric temperature is below 18 °C (65 °F), the pavement temperature is below 27 °C (80 °F), or when the pavement temperature is more than 60 °C (140 °F). Do not place screenings if there is a forecast of the atmospheric temperature falling below 2 °C (35 °F) within 24 hours of placement.

**408.03.05 Maintaining Traffic.** When traffic is maintained, do not apply the surface treatment to more than half the width of the traveled way at a time, and keep the remaining half width free of obstructions and open for use by traffic at all times.

Do not place traffic on the newly placed bituminous material and screenings until they have sufficiently set and bonded.

When the newly completed surface treatment is open to public traffic, control traffic by use of flaggers and a pilot car for a period of 6 hours or for such time as deemed necessary as follows:

(a) Station a flagger at the beginning of each newly completed section, to stop oncoming traffic preparatory to piloting operations. Keep the flaggers on duty during the entire control period.

(b) Move traffic control as described above, ahead progressively as the newly completed surface is open to traffic.

**408.03.07 Application of Bituminous Material.** Uniformly apply bituminous material by means of a

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pressure distributor in a continuous spread. The temperature of the bituminous material shall conform to Subsection 406.03.04.

Apply bituminous material at a rate of 0.35 gallons per square yard. If bituminous material penetrates the surface too rapidly, a preliminary application of  $0.45 \text{ L/m}^2$  ( $0.1 \text{ gal/yd}^2$ ) may be required. Move the distributor forward at proper application speed at the time the spray bar is opened. Correct any skipped areas or deficiencies.

Use a strip of building paper at least 0.9 m (3 ft.) in width and with a length equal to that of the spray bar of the distributor plus 0.3 m (1 ft.), at the beginning of each spread. If the cutoff is not positive, the use of paper may be required at the end of each spread. Remove and dispose of the paper in a satisfactory manner.

Move the distributor forward at proper application speed at the time the spray bar is opened. Adjust the distributor speed to coordinate with the chip spreader speed and rolling operations speed to prevent stop-start operations and ensure synchronized forward movement.

Do not operate the distributor at speeds greater than 8 km/hr (5mph) when applying bituminous material. Limit distributor speed so that the distributor pump does not operate at more than 90% of its total capacity.

Carefully make junctions of spreads to assure a smooth riding surface.

Do not apply bituminous material more than 50 m (150 ft.) in front of the spreader. Cover immediately with screenings.

Do not spread bituminous material more than 150 mm (6 in.) wider than the width covered by the screenings from the spreading device. Do not allow bituminous material to chill, set up, dry, or otherwise impair retention of the screenings.

Park the distributor, when not spreading, so that bituminous materials will not drip on the surface of the traveled way.

The application rate of the bituminous material shall be adjusted as required to obtain 50% to 70% embedment depth.

**408.03.08 Application of Screenings.** Immediately following the application of the bituminous material, spread screenings within 10% of 25 pounds per square yard.

Avoid building raised longitudinal joints. Construct the longitudinal joints by applying the screenings the same width as the bituminous material. Prior to the second pass of the distributor, use a power broom to broom back 100 to 150 mm (4 to 6 in.) of the first pass of the surface treatment to remove any chips that failed to get adequate embedment. Maintain a straight and uniform alignment.

Offset longitudinal joints of successive courses of surface treatment 150 mm (6 in.). Place surface treatment so that final longitudinal joints are constructed at an offset of 150 mm (6 in.) from the final traffic lane lines.

Do not spread bituminous material and screenings over a greater distance than can be rolled and finished within one day's operation.

Provide surface damp screenings at the time of application. Excess water on the aggregate surface will not be permitted.

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Do not operate the spreader at speeds which cause the screenings to roll over after striking the bituminous covered surface.

On two lane travel ways, apply bituminous material and screenings to half of a given roadway at a time and in such a manner that every other days operation brings the limits of the surface treatment to a near common point.

Cover the emulsified asphalt applied to the road surface with screenings before setting or breaking occurs.

In order to eliminate hauling over the new surface treatment, begin screening operations at a point furthest from the material source and work toward the material source. Stagger aggregate delivery truck wheel paths across the travel lane behind the spreader to aide rolling operations. Aggregate delivery trucks shall travel at speeds less than 40 km/hr (25 mph) on the newly constructed surface treatment. Aggregate delivery truck operators shall make gradual stops, starts, and turns.

After the screenings have been spread, carefully remove any piles, ridges, or uneven distribution with flat bottom shovels, or other approved methods to insure against permanent ridges or bumps in the completed surface.

Spread additional screenings by hand in whatever quantities required to prevent picking up by the rollers or traffic.

**408.03.09 Rolling.** Begin rolling immediately behind the screening application to properly embed the screenings in the soft bituminous material. Commence rolling at the outer edge and proceed toward the inner edge on each spread. Continue rolling until the screenings are thoroughly set.

Roller speed shall not exceed 8.0 km/hr (5 mph). Roller stops, starts, and turns shall be made gradually.

Use an approved sequence of rollers and roller patterns.

**408.03.10 Removal of Loose Screenings and Surface Maintenance.** Lightly broom the surface to remove all loose chips approximately 3 hours after the start of the screening application. Do not apply heavy pressure to the broom core which will cause dislodging of chips from the surface. Do not allow traffic on screenings until after the light brooming operations are completed.

Use a minimum of 3 self-propelled power brooms equipped with pressure type distributor spray systems that will ensure uniform application of water for dust control. The brooms shall be capable of removing loose screenings adjacent to barriers (including curbs, gutters, and railings) that prevent screenings from being swept off the pavement. Provide brooms capable of downward pressure adjustment. Do not use gutter or steel-tined brooms.

If operated at night, equip the brooms with tail, stop, and directional lights and an amber strobe light.

Operate brooms at 6 to 9 km/hr (4 to 6 mph).

Apply adequate water during all brooming to control dust.

Remove and dispose of excess screenings which will interfere with drainage.

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Complete surface to a uniform appearance and free from ruts, humps, depressions or irregularities due to an uneven distribution of bituminous material or screenings. Repair unacceptable areas. Provide repair crew personnel specifically designated and dedicated to performing the necessary repairs.

After the application of screenings, lightly broom and maintain the surface for a period of 4 days.

Perform the light brooming to remove loose screenings prior to the end of each day's work or as the first order of work on the morning following application of screenings. Perform the initial brooming between sunrise and 10:00 a.m. Broom the entire surface that has had screenings applied to it on the previous day. Completely remove all loose screenings from the paved roadway surface. Perform a second brooming within 48 hours after the initial brooming. Additional brooming shall be required as often as necessary between the first and fourth day after applying screenings to maintain the surface free of loose screenings. At the end of 4 days after applying screenings, remove any excess screenings from all paved areas. Perform sweeping or brooming of the surface treatment in such a manner that the screenings set in the bituminous material will not be displaced. Do not excessively broom the surface.

Maintain the surface for the 4 day period by spreading additional screenings to absorb any free bituminous material, to cover any areas deficient in screenings, and to eliminate surface irregularities. If approved, clean sand may be used in lieu of screenings to cover any excess bituminous material which comes to the surface. Do not use roadside material for this purpose.

**SECTION 703 – BITUMINOUS MATERIALS**  
Revision 0

**SCOPE**

**703.01.01 Materials Covered.** This specification covers the quality of asphalt cement, cutback asphalt, and emulsified asphalt.

**PHYSICAL PROPERTIES AND TESTS**

**703.03.01 Bill of Lading and Certificate of Compliance.** A bill of lading and certificate of compliance shall be submitted for every load of bituminous material.

The bill of lading shall include the following data:

1. Date of shipment and shipping point.
2. Car initials and number of truck transport delivery ticket number.
3. Destination and consignee.
4. National Security Technologies, LLC (NSTEC) contract number (or purchase order number, if applicable).
5. Type, grade, quantity, and temperature of material loaded.
6. Signature of shipper or authorized representative.

**703.03.03 Cutback Asphalts.** Liquid asphalts are produced by fluxing an asphaltic base with suitable petroleum distillates. Medium curing products are designated by the letters MC. Slow curing products are designated by the letters SC. Liquid asphalt shall conform to Table I for the grade specified.

**MEDIUM CURING CUTBACK ASPHALTS**

| TEST                                                                                 | TEST METHOD | MEDIUM CURING PRODUCT |                       |                        |                          | ALLOWABLE TOLERANCE (a) |
|--------------------------------------------------------------------------------------|-------------|-----------------------|-----------------------|------------------------|--------------------------|-------------------------|
|                                                                                      |             | MC-70NV               | MC-250                | MC-800                 | MC-3000                  |                         |
| Flash point, °C (°F)                                                                 | AASHTO T79  | 38 Min.<br>(100 Min.) | 66 Min.<br>(150 Min.) | 66 Min.<br>(150 Min.)  | 66 Min. (150 Min.)       | 8 °C (15 °F)            |
| Kinematic Viscosity @ 60 °C, mm <sup>2</sup> /s (140 °F, cSt)                        | AASHTO T201 | 70-250<br>(70-250)    | 250-500<br>(250-500)  | 800-1600<br>(800-1600) | 3000-6000<br>(3000-6000) | (a)                     |
| Water, mass %                                                                        | AASHTO T55  | 2.0 Max.              | 0.2 Max.              | 0.2 Max.               | 0.2 Max.                 | 0.1                     |
| <b>Distillation: Distillate, % by volume of total distillate to 360 °C (680 °F):</b> |             |                       |                       |                        |                          |                         |
| to 225 °C (437 °F)                                                                   | AASHTO T78  | 25 Max.               | 10 Max.               | —                      | —                        | 1                       |
| to 260 °C (500 °F)                                                                   | AASHTO T78  | 20-70                 | 15-55                 | 35 Max.                | 15 Max.                  | 1                       |
| to 316 °C (600 °F)                                                                   | AASHTO T78  | 65-95                 | 60-87                 | 45-80                  | 15-75                    | 1                       |
| <b>Residue from distillation to 360 °C (680 °F):</b>                                 |             |                       |                       |                        |                          |                         |
| Volume % by difference                                                               | AASHTO T78  | 55 Min.               | 67 Min.               | 75 Min.                | 80 Min.                  | 1                       |

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| <b>Tests on Residue from Distillation:</b>  |             |                      |                      |                      |                      |     |
|---------------------------------------------|-------------|----------------------|----------------------|----------------------|----------------------|-----|
| Viscosity @ 60 °C, Pa.s<br>(140 °F, poises) | AASHTO T202 | 30-120<br>(300-1200) | 30-120<br>(300-1200) | 30-120<br>(300-1200) | 30-120<br>(300-1200) | 7%  |
| Ductility @ 25 °C (77 °F), 5 cm/min, cm     | AASHTO T51  | 100 Min.             | 100 Min.             | 100 Min.             | 100 Min.             | 30% |
| Solubility, %                               | AASHTO T44  | 99.0 Min.            | 99.0 Min.            | 99.0 Min.            | 99.0 Min.            | 0.1 |

(a) Below 3000 = 1.5%, 3000 to 6000 = 2.0%, above 6000 = 8.9%

**703.03.04 Emulsified Asphalt.** Emulsified asphalt shall conform to Tables II and III for the type and grade specified.

When tolerances are expressed in terms of percent, the allowable deviation is calculated as the indicated percentage at the upper or lower specification limit, whichever is applicable. CRS-2h values in below table from 2001 Edition of Standard Specifications for Road and Bridge Construction.

**CATIONIC EMULSIFIED ASPHALTS**

| TEST (b)                                      | TEST METHOD | RAPID SETTING |           | SLOW SETTING |           | ALLOWABLE TOLERANCE (a) |
|-----------------------------------------------|-------------|---------------|-----------|--------------|-----------|-------------------------|
|                                               |             | CRS-2h        | CRS-2nv   | CSS-1        | CSS-1h    |                         |
| Saybolt Furol Viscosity @ 50 °C (122 °F), sec | Nev. T759   | 110-400       | 150-450   | 20-100       | 20-100    | None                    |
| Residue, % by mass (c)                        | Nev. T759   | 65 Min.       | 65 Min.   | —            | —         | 1                       |
| Storage Stability, 24 hr, %                   | Nev. T759   | 1 Max.        | 1 Max.    | 57 Min.      | 57 Min.   | 0.5                     |
| Demulsibility, %                              | Nev. T759   | 40 Min.       | 40 Min.   | 1 Max.       | 1 Max.    | 5%                      |
| Sieve, %                                      | Nev. T759   | 0.10 Max.     | 0.10 Max. | 0.10 Max.    | 0.10 Max. | 0.03                    |
| pH                                            | AASHTO T200 | —             | —         | 2.0 Max.     | 2.0 Max.  | None                    |
| Particle Charge                               | Nev. T759   | Pass          | Pass      | —            | —         | None                    |
| Oil Distillate, % by volume of emulsion       | Nev. T759   | 3 Max.        | 3 Max.    | Pass         | Pass      | None                    |
| <b>Tests on Residue from Distillation:</b>    |             |               |           |              |           |                         |
| Penetration @ 25 °C (77 °F), 100 g, 5 sec     | Nev. T759   | 100-250       | 60-100    | 100-250      | 40-90     | 7%                      |
| Solubility, %                                 | AASHTO T44  | 97.5 Min.     | 97.5 Min. | 97.5 Min.    | 97.5 Min. | 0.1                     |
| Ductility @ 25 °C (77 °F), 5 cm/min, cm       | AASHTO T51  | 40 Min.       | 40 Min.   | 40 Min.      | 40 Min.   | 10%                     |
| <b>Tests on Diluted Emulsion:</b>             |             |               |           |              |           |                         |
| Residue, % 70% and 30%                        | Nev. T759   | —             | —         | 40 min.      | 40 Min.   | 1.0                     |

**SECTION 705 – AGGREGATES FOR BITUMINOUS COURSES**  
Revision 0

**SCOPE**

**705.01.01 Materials Covered.** This specification covers the quality and size of local mineral materials and commercial mineral fillers used in bituminous courses.

**REQUIREMENTS**

**705.02.01 General.**

The mineral aggregate shall be clean, hard, durable, and free from frozen lumps, deleterious matter, and harmful adherent coatings. Crush and incorporate material between the sizes of the 250 mm (10 in.) in largest dimension and larger than the maximum size specified for a given product, into that specified finished product. Do not produce other products simultaneously by "bleeding off" aggregates.

**705.02.02 Deficiencies.** If the product of any deposit is deficient in the fraction passing the 4.75 mm (No. 4) sieve, additional filler from other approved deposits meeting the physical requirements may be added. Add the additional material to the drier in a uniform manner from a separate stockpile. If the added material is a commercial mineral filler, uniformly feed it directly to the plant. Do not construe this as a waiver of any of the requirements contained herein.

**PHYSICAL PROPERTIES AND TESTS**

**705.03.04 Screenings.** The screenings shall conform to the following requirements:

**TABLE 1**

| Percent Passing by Mass |                        |         |                       |
|-------------------------|------------------------|---------|-----------------------|
|                         | 12.5 mm (1/2 in.) Size |         | 9.5 mm (3/8 in.) Size |
| Sieve Size              | Grade 1                | Grade 2 |                       |
| 12.5 mm (1/2 in.)       | 100                    | 100     | —                     |
| 9.5 mm (3/8 in.)        | 90-100                 | 50-80   | 100                   |
| 4.75 mm (No. 4)         | 15-35                  | 0-15    | 20-45                 |
| 2.36 mm (No. 8)         | —                      | 0-5     | —                     |
| 1.18 mm (No. 16)        | 0-4                    | —       | 0-6                   |
| 75 µm (No. 200)         | 0-2                    | 0-2     | 0-2                   |

| Project Control Tests   | Test Method | Requirements                |
|-------------------------|-------------|-----------------------------|
| Sieve Analysis.....     | Nev. T206   | Above                       |
| Sampling Aggregate..... | Nev. T200   | —                           |
| Fractured Faces .....   | Nev. T230   | 90% Min. (2 Fractures Min.) |
| Cleanliness Value.....  | CALIF. 227  | 65% Min.                    |
| Stripping Test .....    | Nev. T209   | Satisfactory                |

**SECTION 705 – AGGREGATES FOR BITUMINOUS COURSES**  
Revision 0

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| Source Requirement Test            | Test Method | Requirements |
|------------------------------------|-------------|--------------|
| Percentage of Wear (500 Rev.)..... | AASHTO T96  | 37% Max.     |

**705.03.05 Sand Blotter.** The sand shall conform to the following requirements:

**TABLE II**

| Sieve Size        | Percent Passing by Mass |
|-------------------|-------------------------|
| 12.5 mm (1/2 in.) | 100                     |
| 4.75 mm (No. 4)   | 90-100                  |
| 1.18 mm (No. 16)  | 30-75                   |
| 75 µm (No. 200)   | 0-12                    |

| Project Control Tests    | Test Method | Requirements |
|--------------------------|-------------|--------------|
| Sieve Analysis.....      | Nev. T206   | Above        |
| Sampling Aggregate.....  | Nev. T200   | —            |
| Organic Impurities ..... | AASHTO T21  | —            |