

**SECTION 321**

contract unit price. If the asphalt binder content deviates by more than  $\pm 0.40\%$  from the mix design target value, the deficient area will be evaluated within the subplot by coring at maximum intervals of 100 feet from the deficient sample. The asphalt content of the original deficient sample will be averaged with the asphalt binder content of the cores taken for re-evaluation to determine compliance with the acceptance requirements. If the resulting average of the asphalt binder content deviates by more than  $\pm$

0.40% from the mix design target value, then Table 321-4 shall apply to the subplot. Additional cores may be required to define the limits of the deficient area, and shall not be used for re-evaluating acceptance.

<b>TABLE 321-4</b>		
<b>ASPHALT BINDER CONTENT ACCEPTANCE AND PENALTIES</b>		
<b>Deviation from that permitted</b>	<b>When the contracting agency is the owner: Payment Reduction (\$ per ton of asphalt concrete)</b>	<b>When the contracting agency is not the owner (i.e. permits): Corrective Action</b>
Over 0.0 to 0.1% points	\$2.00	EA (see 321.10.6)
Over 0.1 to 0.2% points	\$6.00	EA (see 321.10.6)
Over 0.2% points	Removal* or EA per 321.10.6	Removal* or EA per 321.10.6

<b>TABLE 321-4</b>		
<b>ASPHALT BINDER CONTENT ACCEPTANCE AND PENALTIES</b>		
<b>Deviation from that permitted</b>	<b>When the contracting agency is the owner: Payment Reduction (\$ per ton of asphalt concrete)</b>	<b>When the contracting agency is not the owner (i.e. permits): Corrective Action</b>
<b>Over 0.2% <u>above</u> that permitted</b>	<b>Removal* or EA</b>	<b>Removal* or EA</b>
<b>Over 0.1% to 0.2% <u>above</u> that permitted</b>	<b>\$6.00</b>	<b>EA</b>
<b>Over 0.0% to 0.1% <u>above</u> that permitted</b>	<b>\$2.00</b>	<b>EA</b>
<b>Within permitted range</b>	<b>Full Payment</b>	<b>No Corrective Action</b>
<b>Over 0.0% to 0.1% <u>below</u> that permitted</b>	<b>\$2.00</b>	<b>EA</b>
<b>Over 0.1% to 0.2% <u>below</u> that permitted</b>	<b>\$6.00</b>	<b>EA</b>
<b>Over 0.2% <u>below</u> that permitted</b>	<b>Removal* or EA</b>	<b>Removal* or EA</b>

**NOTES: \*The Contractor shall remove and replace the entire subplot that is deficient  
EA = Engineering Analysis per Section 321.10.6**

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If the laboratory air voids fall within a range of 2.8% to 6.2%, the asphalt concrete will be paid for at the contract unit price. If the laboratory air voids are outside of this range, the deficient area will be evaluated within the subplot by coring at maximum intervals of 100 feet from the deficient sample. The laboratory air voids of the original deficient sample will be averaged with the laboratory air voids obtained from each of the cores taken for re-evaluation to determine compliance with the acceptance requirements. If the resulting average of the laboratory air voids is outside the indicated range, then Table 321-5 shall apply to the subplot. Additional cores may be required to define the limits of the deficient area, and shall not be used for re-evaluating acceptance.

<b>TABLE 321-5</b>		
<b>LABORATORY VOIDS ACCEPTANCE AND PENALTIES</b>		
<b>Laboratory Air Voids (Measured at <math>N_{des}</math> or 75 blows as applicable)</b>	<b>When the contracting agency is the owner: Payment Reduction (\$ per ton of asphalt concrete)</b>	<b>When the contracting agency is not the owner (i.e. permits): Corrective Action</b>
Less than 1.5%	Removal* or EA per 321.10.6	Removal* or EA per 321.10.6
1.5-2.0%	\$2.50	EA (see 321.10.6)
2.1-2.7%	\$1.00	EA (see 321.10.6)
2.8-6.2%	Full Payment	No corrective action
6.3-6.9%	\$1.00	EA (see 321.10.6)
7.0-8.0%	\$2.50	EA (see 321.10.6)
Greater than 8.0%	Removal* or EA per 321.10.6	Removal* or EA per 321.10.6

<b>TABLE 321-5</b>		
<b>LABORATORY VOIDS ACCEPTANCE AND PENALTIES</b>		
<b>Laboratory Air Voids (Measured at <math>N_{des}</math> or 75 blows as applicable)</b>	<b>When the contracting agency is the owner: Payment Reduction (\$ per ton of asphalt concrete)</b>	<b>When the contracting agency is not the owner (i.e. permits): Corrective Action</b>
<b>Less than 1.5%</b>	<b>Removal* or EA</b>	<b>Removal* or EA</b>
<b>1.5-2.0%</b>	<b>\$5.00</b>	<b>EA</b>
<b>2.1-2.7%</b>	<b>\$2.00</b>	<b>EA</b>
<b>2.8-6.2%</b>	<b>Full Payment</b>	<b>No Corrective Action</b>
<b>6.3-6.9%</b>	<b>\$2.00</b>	<b>EA</b>
<b>7.0-8.0%</b>	<b>\$5.00</b>	<b>EA</b>
<b>Greater than 8.0%</b>	<b>Removal* or EA</b>	<b>Removal* or EA</b>

**NOTES: \*The Contractor shall remove and replace the entire subplot that is deficient  
EA = Engineering Analysis per Section 321.10.6**

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<b>TABLE 321-8</b>		
<b>PAVEMENT DENSITY PENALTIES</b>		
<b>Limits of In-place Air Voids for lift thicknesses greater than 1.5 inches</b>	<b>When the contracting agency is the owner:</b>	<b>When the contracting agency is not the owner (i.e. permits):</b>
	<b>Payment Reduction (\$ per ton of asphalt concrete)</b>	<b>Corrective Action</b>
8.1% to 9.0%	\$4.00	EA
9.1% to 10.0%	\$6.00	EA and Type II Surry Seal
10.1% to 11.0%	Removal* or EA per 321.10.6	Removal* or EA per 321.10.6
Greater than 11.0%	Removal	Removal

\*Notes: The Contractor shall remove and replace the entire subplot that is deficient. Removal for In-place Air Voids greater than 11.0% is not eligible for Section [321.10.6](#).

<b>TABLE 321-8</b>		
<b>PAVEMENT DENSITY PENALTIES</b>		
<b>Limits of In-place Air Voids for design lift thicknesses 1.5 inches and greater</b>	<b>When the contracting agency is the owner:</b>	<b>When the contracting agency is not the owner (i.e. permits):</b>
	<b>Payment Reduction (\$ per ton of asphalt concrete)</b>	<b>Corrective Action</b>
Below 3.0%	Removal* or EA	Removal* or EA
3.0% to below 4.0%	\$10.00	EA and Type II Surry Seal
4.0% to 8.0%	Full Payment	No Corrective Action
Greater than 8.0% to less than 9.0%	\$6.00	EA
9.0% to 10.0%	\$10.00	EA and Type II Surry Seal
Greater than 10.0%	Removal* or EA	Removal* or EA

**NOTES:** \*The Contractor shall remove and replace the entire subplot that is deficient.  
 EA = Engineering Analysis per Section 321.10.6  
 Removal for In-place Air Voids greater than 11.0% is not eligible for Section [321.10.6](#).

**321.10.6 Engineering Analysis (EA):** Within 10 working days after receiving notice that a lot or subplot of asphalt concrete is deficient and is found to fall within the “Removal or EA” band per Table(s) [321-4](#), [321-5](#), and/or [321-8](#) the contractor may submit a written proposal (Engineering Analysis) to accept the material in place at the applicable penalties along with possible remediation(s) listed in the “Removal or EA” category. Engineering Analysis can also be proposed for non-removal categories of “Corrective actions” when the contracting agency is not the owner (i.e. permits).

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The Engineering Analysis shall contain an analysis of the anticipated performance of the asphalt concrete if left in place. The Engineering Analysis shall also detail the effect of any proposed corrective action to the material(s) in place as it relates to the in-place material's performance. The Engineering Analysis shall be performed by a professional engineer experienced in asphalt concrete testing and mix designs. If the lot or subplot is submitted for referee testing by the contractor, the ten working days allowed to prepare an engineering will begin upon notification of referee test results.

When an Engineering Analysis recommends that a specific lot or subplot should not be removed, the Engineering Analysis will recommend that the following penalties (Table [321-9](#)) be paid when the contracting agency is the owner, for the specific criteria being reviewed by the EA.

TABLE 321-9		
ENGINEERING ANALYSIS PENALTIES for REMOVAL* LOTS/SUBLOTS LEFT IN-PLACE		
Acceptance Criteria	Acceptance Limits	Penalty When Contracting Agency is the Owner (\$/Ton)
Asphalt Binder Content	Over 0.2% points from that Permitted	\$9.00
Laboratory Air Voids (Measured at $N_{des}$ or 75 blows as applicable)	Less than 1.5% or Greater Than 8.0%	\$3.75
Limits of In-place Air Voids	10.1% to 11.0%	\$9.00

Within 15 working days, the Engineer will determine whether or not to accept the contractor's proposed Engineering Analysis.

### 321.11 REFEREE:

In the event the contractor elects to question the acceptance test results for either asphalt binder content, laboratory air voids, density or a combination thereof for a subplot, the Contractor may make a written request for additional testing of that subplot. Any request for referee testing must describe the contractor's reasons for questioning the validity of the original acceptance results and must clearly describe which set of acceptance tests are in question. The Contractor will engage an independent laboratory (at the Contractor's own expense) who is accredited by AAP in all of the acceptance test methods. The independent laboratory shall be acceptable to the Engineer and shall perform a new set of acceptance tests as required by Section [321.10](#) representing the area or set of tests in question. The results of these determinations will be binding on both the contractor and the agency.

These tests may include asphalt binder content, aggregate gradation, Marshall or Gyratory unit weight, maximum theoretical unit weight, laboratory air voids and in-place air voids (compaction). Samples for referee testing shall come from representative samples obtained from the completed pavement, as directed by the Engineer.

The number of samples taken will be the same as specified in Section [321.10](#). The independent laboratory shall compile the test results and transmit them to both the Engineer and the contractor. The independent laboratory shall include a report signed by an Engineer registered in the State of Arizona, who is experienced in asphalt concrete testing and mix design development. The signed report shall give an opinion that the material evaluated does or does not comply with project specifications, shall clearly describe any deficiencies, and the results will be binding between all parties.

### 321.12 MEASUREMENT:

Asphalt concrete pavement will be measured by the ton, or by the square yard, for the mixture actually used as allowed above, which shall include the required quantities of mineral aggregates, asphalt binder, and mineral admixture. Measurement shall include any tonnage used to construct intersections, roadways, streets, or other miscellaneous surfaces indicated on the plans or as directed by the Engineer.