

Hot-Mix Asphalt Rideability

SCDOT Designation: SC-M-403 (09/08)

1. SCOPE

- 1.1. The Resident Construction Engineer (**RCE**) will evaluate Hot-Mix Asphalt (HMA) surfaces for a satisfactory ride. If conditions permit and unless otherwise specified in the special provisions, the Materials and Research Engineer will test the HMA surface in accordance with **SC-T-125**.

2. REFERENCED DOCUMENTS

- 2.1. **SC-T-125**, *Measurement of Pavement Rideability using the Dynatest 5051 Mark III Road Surface Profiler*.

3. REQUIREMENTS FOR TESTING

- 3.1. For **SC-T-125** to be used, the following conditions must be met:
- A constant speed of at least 30 miles per hour is maintainable throughout each section that measurements are made.
 - The sections to be tested have a posted speed limit of at least 40 mph.
 - The project has at least 0.5 miles of pavement that may be tested without interruptions or exclusions (such as, but not limited to, bridges, stop signs, railroad crossings, speed limit below 40 mph, or sharp curves posted for less than 30 mph.)

4. REQUIREMENTS FOR NEW CONSTRUCTION

- 4.1. On new roadway projects, the maximum acceptable IRI for each nominal 0.1-mile segment of vehicle lane, when tested in accordance with **SC-T-125**, is 65 inches per mile. When initial measurements are 65 inches per mile or less, payment is based on the original contract unit price per ton of final HMA surface tested according to Table 1, Schedule for Adjusted Payment – New Construction. The pay adjustments apply only to the course of HMA that will constitute the final riding surface.
- 4.2. When the IRI value exceeds 65 inches per mile and the **RCE** determines that the pavement does not have an acceptably smooth ride, correct such deficient sections without additional compensation. The **RCE** may withhold payment for the HMA (or a portion thereof) until the deficiencies have been corrected, and the surface is re-tested and provides an acceptably smooth ride. Obtain written approval of the **RCE** for the method of correcting the surface deficiencies, however *under no circumstances shall the pavement be subject to an artificial heat source over 175°F*. No more than 100% of the contract unit price will be paid for sections where corrective work results in IRI values less than 56 inches per mile. If corrections are not made, then the price adjustment is based on the original contract unit price per ton of the HMA according to Table 1, Schedule for Adjusted Payment. Deduct as a lump sum the total amount of any reduction in payment from monies due.

- 4.3. For each additional increment of 5 inches per mile of roughness above 80 inches per mile, reduce payment by an additional 10% from 80% based on the contract unit price of the HMA final riding surface.
- 4.4. Sections of roadway for which the IRI value is 80 inches per mile or above will be reviewed on an individual basis. If the **RCE** determines that the section is unacceptable, remove the material and replace or overlay it subject to the approval of the **RCE**. Should the **RCE** determine that the material may remain in place and does not require an overlay or other corrective action, a price adjustment will be assessed based on the Schedule for Adjusted Payment.

Table 1. Schedule For Adjusted Payment – New Construction	
Segment IRI (inches/mile)	Price Adjustment – HMA Final Riding Course
Less than 46	105%
46 – 50	103%
51 – 55	101%
56 – 65	100%
66 – 70	95%
71 – 75	90%
76 – 80	80%
Greater than 80	See Paragraph 4.3

5. REQUIREMENTS FOR RESURFACING PROJECTS

- 5.1. When the resurfacing project involves two or more HMA lifts (not including leveling and/or strengthening courses) and/or when the final riding surface is Open Graded Friction Course, the requirements for new construction, as given above in Subsection 4, shall apply. For other resurfacing projects, the existing pavement will be tested by the Department in accordance with SC-T-125 or other method specified in the special provisions before any work is performed and then again on the finished surface.
- 5.2. To ensure attainment of as smooth a ride as possible, improve the original roughness value measured on the existing surface for each 0.1-mile segment of each vehicle lane as shown in Table 2, Rideability Requirements for Resurfacing. Where measurements on the finished surface equal or exceed the acceptable limit shown in Table 2 under the column titled “Repair” for the corresponding initial roughness, correct such sections without additional compensation such that the finished surface has an acceptable rideability. Obtain approval of the RCE for the method of correcting the surface deficiencies. When an acceptably smooth ride is not obtained as outlined herein, the RCE may withhold payment for the HMA (or a portion thereof) until the corrections have been made and the pavement provides an acceptably smooth ride. Final rideability is considered acceptable when the repaired segment has a rideability value less than shown in the “Repair” column. If the final rideability is still greater than the “100%” value after repair, a pay reduction as given in Subsection 5.3 will be taken. Segments requiring repair prior to acceptance are not eligible for payment in excess of 100%.

- 5.3. If the final rideability measurement for a segment is less than the value shown in Table 2 under the column titled "Repair" for the corresponding initial rideability, but is greater than the value shown in the column titled "100%", the payment for the HMA tonnage in that segment will be reduced to 95% of the unit price. HMA tonnage subject to price adjustment is based on the original plan quantity for the HMA as shown on the typical section. The total amount of any reduction in payment is deducted as a lump sum from monies due.
- 5.4. If the final rideability measurement for a segment is less than or equal to the value shown in Table 2 under the column titled "100%" for the corresponding initial rideability, but is greater than the value shown in the column titled "102%", full payment is made at the unit price for the HMA tonnage in that section.
- 5.5. If the final rideability measurement for a segment is less than or equal to the value shown in Table 2 under the column titled "102%" for the corresponding initial rideability, but is greater than the value shown in the column titled "105%", then the HMA tonnage subject to price adjustment for that segment is based on the original plan quantity for the HMA as shown on the typical section. Payment for HMA tonnage for that segment will be made at 102% of the unit price.
- 5.6. If the final rideability measurement for a segment is less than or equal to the value shown in Table 2 under the column titled "105%" for the corresponding initial rideability, then the HMA tonnage subject to price adjustment for that segment is based on the original plan quantity for the HMA as shown on the typical section. Payment for HMA tonnage for that segment will be made at 105% of the bid unit price.

Table 2. – Rideability Requirements for Resurfacing

Initial Ride	105%	102%	100%	Repair
< 60	11	31	60	75
60	11	31	60	75
61	11	31	61	76
62	11	31	62	77
63	11	31	63	78
64	12	32	64	79
65	12	32	65	80
66	12	32	66	81
67	12	32	67	82
68	12	32	68	83
69	13	33	69	84
70	13	33	70	85
71	13	33	71	86
72	13	33	72	87
73	13	33	73	88
74	13	33	74	89
75	14	34	75	90
76	14	34	76	91
77	14	34	77	92
78	14	34	78	93
79	14	34	79	94
80	15	35	80	95
81	15	35	81	96
82	15	35	82	97
83	15	35	83	98
84	15	35	84	99
85	15	35	85	100
86	16	36	86	101
87	16	36	87	102
88	16	36	88	103
89	16	36	89	104
90	16	36	90	105
91	17	37	90	105
92	17	37	90	105
93	17	37	91	106
94	17	37	91	106
95	17	37	91	106
96	17	37	91	106
97	18	38	91	106
98	18	38	91	106
99	18	38	92	107
100	18	38	92	107
101	18	38	92	107
102	19	39	92	107
103	19	39	92	107
104	19	39	93	108
105	19	39	93	108
106	19	39	93	108
107	19	39	93	108
108	20	40	93	108
109	20	40	93	108
110	20	40	94	109
111	20	40	94	109
112	20	40	94	109
113	21	41	94	109
114	21	41	94	109
115	21	41	95	110
116	21	41	95	110
117	21	41	95	110

Initial Ride	105%	102%	100%	Repair
118	21	41	95	110
119	22	42	95	110
120	22	42	95	110
121	22	42	96	111
122	22	42	96	111
123	22	42	96	111
124	23	43	96	111
125	23	43	96	111
126	23	43	97	112
127	23	43	97	112
128	23	43	97	112
129	23	43	97	112
130	24	44	97	112
131	24	44	97	112
132	24	44	98	113
133	24	44	98	113
134	24	44	98	113
135	25	45	98	113
136	25	45	98	113
137	25	45	99	114
138	25	45	99	114
139	25	45	99	114
140	25	45	99	114
141	26	46	99	114
142	26	46	99	114
143	26	46	100	115
144	26	46	100	115
145	26	46	100	115
146	27	47	100	115
147	27	47	100	115
148	27	47	101	116
149	27	47	101	116
150	27	47	101	116
151	27	47	101	116
152	28	48	101	116
153	28	48	101	116
154	28	48	102	117
155	28	48	102	117
156	28	48	102	117
157	29	49	102	117
158	29	49	102	117
159	29	49	103	118
160	29	49	103	118
161	29	49	103	118
162	29	49	103	118
163	30	50	103	118
164	30	50	103	118
165	30	50	104	119
166	30	50	104	119
167	30	50	104	119
168	31	51	104	119
169	31	51	104	119
170	31	51	105	120
171	31	51	105	120
172	31	51	105	120
173	31	51	105	120
174	32	52	105	120
175	32	52	105	120
176	32	52	106	121

Initial Ride	105%	102%	100%	Repair
177	32	52	106	121
178	32	52	106	121
179	33	53	106	121
180	33	53	106	121
181	33	53	107	122
182	33	53	107	122
183	33	53	107	122
184	33	53	107	122
185	34	54	107	122
186	34	54	107	122
187	34	54	108	123
188	34	54	108	123
189	34	54	108	123
190	35	55	108	123
191	35	55	108	123
192	35	55	109	124
193	35	55	109	124
194	35	55	109	124
195	35	55	109	124
196	36	56	109	124
197	36	56	109	124
198	36	56	110	125
199	36	56	110	125
200	36	56	110	125
201	37	57	110	125
202	37	57	110	125
203	37	57	111	126
204	37	57	111	126
205	37	57	111	126
206	37	57	111	126
207	38	58	111	126
208	38	58	111	126
209	38	58	112	127
210	38	58	112	127
211	38	58	112	127
212	39	59	112	127
213	39	59	112	127
214	39	59	113	128
215	39	59	113	128
216	39	59	113	128
217	39	59	113	128
218	40	60	113	128
219	40	60	113	128
220	40	60	114	129
221	40	60	114	129
222	40	60	114	129
223	41	61	114	129
224	41	61	114	129
225	41	61	115	130
226	41	61	115	130
227	41	61	115	130
228	41	61	115	130
229	42	62	115	130
230	42	62	115	130
231	42	62	116	131
232	42	62	116	131
233	42	62	116	131
234	43	63	116	131
235	43	63	116	131
236	43	63	117	132
237	43	63	117	132

Initial Ride	105%	102%	100%	Repair
238	43	63	117	132
239	43	63	117	132
240	44	64	117	132
241	44	64	117	132
242	44	64	118	133
243	44	64	118	133
244	44	64	118	133
245	45	65	118	133
246	45	65	118	133
247	45	65	119	134
248	45	65	119	134
249	45	65	119	134
250	46	66	119	134
251	46	66	119	134
252	46	66	119	134
253	46	66	120	135
254	46	66	120	135
255	46	66	120	135
256	47	67	120	135
257	47	67	120	135
258	47	67	121	136
259	47	67	121	136
260	47	67	121	136
261	48	68	121	136
262	48	68	121	136
263	48	68	121	136
264	48	68	122	137
265	48	68	122	137
266	48	68	122	137
267	49	69	122	137
268	49	69	122	137
269	49	69	123	138
270	49	69	123	138
271	49	69	123	138
272	50	70	123	138
273	50	70	123	138
274	50	70	123	138
275	50	70	124	139
276	50	70	124	139
277	50	70	124	139
278	51	71	124	139
279	51	71	124	139
280	51	71	125	140
281	51	71	125	140
282	51	71	125	140
283	52	72	125	140
284	52	72	125	140
285	52	72	125	140
286	52	72	126	141
287	52	72	126	141
288	52	72	126	141
289	53	73	126	141
290	53	73	126	141
291	53	73	127	142
292	53	73	127	142
293	53	73	127	142
294	54	74	127	142
295	54	74	127	142
296	54	74	127	142
297	54	74	128	143
298	54	74	128	143

Initial Ride	105%	102%	100%	Repair
299	54	74	128	143
300	55	75	128	143
301	55	75	128	143
302	55	75	129	144
303	55	75	129	144
304	55	75	129	144
305	56	76	129	144
306	56	76	129	144
307	56	76	129	144
308	56	76	130	145
309	56	76	130	145
310	56	76	130	145
311	57	77	130	145
312	57	77	130	145
313	57	77	131	146
314	57	77	131	146
315	57	77	131	146
316	58	78	131	146
317	58	78	131	146
318	58	78	131	146
319	58	78	132	147
320	58	78	132	147
321	58	78	132	147
322	59	79	132	147
323	59	79	132	147
324	59	79	133	148
325	59	79	133	148
326	59	79	133	148
327	60	80	133	148
328	60	80	133	148
329	60	80	133	148
330	60	80	134	149
331	60	80	134	149
332	60	80	134	149
333	61	81	134	149
334	61	81	134	149
335	61	81	135	150
336	61	81	135	150
337	61	81	135	150
338	62	82	135	150
339	62	82	135	150
340	62	82	136	151
341	62	82	136	151
342	62	82	136	151
343	62	82	136	151
344	63	83	136	151
345	63	83	136	151
346	63	83	137	152
347	63	83	137	152
348	63	83	137	152
349	64	84	137	152
350	64	84	137	152
351	64	84	138	153
352	64	84	138	153
353	64	84	138	153
354	64	84	138	153
355	65	85	138	153
356	65	85	138	153
357	65	85	139	154
358	65	85	139	154
359	65	85	139	154

Initial Ride	105%	102%	100%	Repair
360	66	86	139	154
361	66	86	139	154
362	66	86	140	155
363	66	86	140	155
364	66	86	140	155
365	66	86	140	155
366	67	87	140	155
367	67	87	140	155
368	67	87	141	156
369	67	87	141	156
370	67	87	141	156
371	68	88	141	156
372	68	88	141	156
373	68	88	142	157
374	68	88	142	157
375	68	88	142	157
376	68	88	142	157
377	69	89	142	157
378	69	89	142	157
379	69	89	143	158
380	69	89	143	158
381	69	89	143	158
382	70	90	143	158
383	70	90	143	158
384	70	90	144	159
385	70	90	144	159
386	70	90	144	159
387	70	90	144	159
388	71	91	144	159
389	71	91	144	159
390	71	91	145	160
391	71	91	145	160
392	71	91	145	160
393	72	92	145	160
394	72	92	145	160
395	72	92	146	161
396	72	92	146	161
397	72	92	146	161
398	72	92	146	161
399	73	93	146	161
400	73	93	146	161
401	73	93	147	162
402	73	93	147	162
403	73	93	147	162
404	74	94	147	162
405	74	94	147	162
406	74	94	148	163
407	74	94	148	163
408	74	94	148	163
409	74	94	148	163
410	75	95	148	163
411	75	95	148	163
412	75	95	149	164
413	75	95	149	164
414	75	95	149	164
415	76	96	149	164
416	76	96	149	164
417	76	96	150	165
418	76	96	150	165
419	76	96	150	165
420	76	96	150	165

Initial Ride	105%	102%	100%	Repair
421	77	97	150	165
422	77	97	150	165
423	77	97	151	166
424	77	97	151	166
425	77	97	151	166
426	78	98	151	166
427	78	98	151	166
428	78	98	152	167
429	78	98	152	167
430	78	98	152	167
431	78	98	152	167
432	79	99	152	167
433	79	99	152	167
434	79	99	153	168
435	79	99	153	168
436	79	99	153	168
437	80	100	153	168
438	80	100	153	168
439	80	100	154	169
440	80	100	154	169
441	80	100	154	169
442	80	100	154	169
443	81	101	154	169
444	81	101	154	169
445	81	101	155	170
446	81	101	155	170
447	81	101	155	170
448	82	102	155	170
449	82	102	155	170
450	82	102	156	171
451	82	102	156	171
452	82	102	156	171
453	82	102	156	171
454	83	103	156	171
455	83	103	156	171
456	83	103	157	171
457	83	103	157	171
458	83	103	157	171
459	84	104	157	171
460	84	104	157	171
461	84	104	157	171
462	84	104	157	171
463	84	104	157	171
464	84	104	157	171
465	85	105	157	171
466	85	105	157	171
467	85	105	157	171
468	85	105	157	171
469	85	105	157	171
470	86	106	157	171
471	86	106	157	171
472	86	106	157	171
473	86	106	157	171
474	86	106	157	171
475	86	106	157	171
476	87	107	157	171
477	87	107	157	171
478	87	107	157	171
479	87	107	157	171
480	87	107	157	171
481	88	108	157	171

Initial Ride	105%	102%	100%	Repair
482	88	108	157	171
483	88	108	157	171
484	88	108	157	171
485	88	108	157	171
486	88	108	157	171
487	89	109	157	171
488	89	109	157	171
489	89	109	157	171
490	89	109	157	171
491	89	109	157	171
492	90	110	157	171
493	90	110	157	171
494	90	110	157	171
495	90	110	157	171
496	90	110	157	171
497	90	110	157	171
> 497	91	111	157	171