PROFILOMETER MEASUREMENT OF BRIDGE ROUGHNESS Sixth Progress Report

Research Laboratory Division Office of Testing and Research Research Project R-61 F-65 Research Report No. R-492



Michigan State Highway Department Lansing, February 1965

PROFILOMETER MEASUREMENT OF BRIDGE ROUGHNESS Sixth Progress Report

This is the sixth publication in a continuing series on profilometer measurement of the roughness of bridge decks. A total of 187 bridges have been reported, including those in this report. The first (Research Report No. R-421) described the profilometer equipment, gave procedures for testing and data analysis, and included measurements for 35 bridge projects. The second (Research Report No. R-430) reported measurements for an additional 22 bridge projects, including one structure of a project partially reported in the first report. The third (Research Report No. R-433) reported results for another 34 bridge projects and gave an updated analysis and evaluation of all bridge projects analyzed in this research program through November 1963. In that report, it was observed that as more project data became available, it was increasingly clear that no significant differences in surface roughness exist between handfinished and transverse machine-finished bridge decks. (Research Report No. R-450) reported results for 35 more bridge projects and included an analysis of the effect of the deck beam type used in a bridge's construction on its relative roughness. The fifth progress report (Research Report No. R-469) presented results for a group of 20 bridge projects (23 separate structures).

This sixth report presents results for a new group of 41 bridge projects (49 separate structures). In reporting riding quality, the following tentative roughness classification is used again in this report, expressed in terms of accumulated inches per mile:

Using these categories, the 183 "span-run" values (see Glossary), and the 49 "structure" values (see Glossary), measured for the 41 bridge projects for which test result forms are presented in this report, may be classified as follows:

	Riding Quality									
Finishing Method		Span R	Span Runs			Structures				
Method	Good	Average	Poor	Total	Good	Average	Poor	Total		
Hand	20	62	10	92	6	18	1	25		
Machine	13	5,7	21	91	2	16	6	24		
Total	33	119	31	183	8	34	.7	49		

On page 46, following tabulations for State Highway Department projects, tests are reported for the Bogue St. Bridge in East Lansing which was finished by a longitudinal machine of special interest. This bridge and all its individual spans measured in the "good" category, but these figures are not included in the riding quality table above, since this is not a State trunkline bridge.

GLOSSARY

BRIDGE PROJECT: used in this report series to refer to the Department's standard identification by construction project number, sometimes involving more than one structure. It should be noted that roughness is analyzed and reported in terms of "span run" or "structure" values.

IWP: inner wheel path, in relation to the structure's centerline.

OWP: outer wheel path, in relation to the structure's centerline.

ROUGHNESS: riding quality of the deck lane surfaces, measured in accumulated inches and converted or prorated to inches per mile (in. per mi).

SPAN RUN VALUE: average of wheel path roughness measurements for all lanes of a given span.

STRUCTURE VALUE: roughness measurement (weighted mean) computed from values obtained from all spans and all wheel paths for a particular structure.

WEIGHTED MEAN: for this study, the arithmetic mean computed from individual span run roughness values, weighted according to span length.

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Bridge No. S01 of 03033	Location	North S	hore Drive	over I 96		
Date Measured 9-30-64	Number	of Spans <u>4</u>	Ler	ngth (includi	ng approach	es) <u>426.0</u>
Dual Structures (separate	for each road	way) Y	es	No X		
Single Structure Yes X	No 🔲	Method o	of Finishing	Hand		
E Bound Roadwa	y	District	7			
,		Profilo	meter Roug	ghness Value	- R inches	per mile
Item	Length	Traffic	Lane	Passin	g Lane	Arromago
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	37.2	60	56			58
2	71.4	65	57			61
3	80.4	115	111			113
4	37.0	66	64			65
5						
6						
Weighted Average for	Bridge	82	77			80
w Approach	100.0	60	49			54
E Approach	100.0	72	75			74
Weighted Average for and Approaches	_	74	70			72
W Bound Roadwa	ay	ettina ettimatina on etti etti etti etti etti etti etti ett				
the total control of the third total control of the		Profile	meter Roug	ghness Value	- R inches	per mile
Item	Length	Traffic	c Lane	Passin	g Lane	
	Ü	O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	37,2	53	50			52
2	71.4	46	58			52
3	80.4	64	73	·		68
4	37.0	73	43			58
5	<u> </u>					
6						
Weighted Average for	Bridge	58	60			59
W Approach	100.0	71	51		<u> </u>	61
E Approach	100.0	58	64			61
Weighted Average for and Approaches	_	61	59			60
Remarks Spans and Joint #2, 6 - Construction			to East. J	oint #1, 3,	5, 7, 8 - Ex	mansion;
Concrete Approaches						

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Bridge No. S02 of 03033	Location	I 96 over	71st St.			
Date Measured 9-25-64	Number	of Spans	Lei	ngth (includi	ng approach	es) <u>326.4</u>
Dual Structures (separate	for each road	lway)	es X	No [
Single Structure Yes	No X	Method	of Finishing	<u>Hand</u>		
N_ Bound Roadwa	ıy	District	7			•
	,	Profile	ometer Rou	ghness Value	e - R inches	per mile
Item	Length	Traffi	c Lane	Passin	g Lane	The state of the s
	·	O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	36,7	188	130	122	86	132
2	47.9	213	171	139	125	162
3	41.8	144	128	118	85	119
4						
5						
6						
Weighted Average for	Bridge	183	145	127	100	139
s Approach	100.0	66	61	49	49	56
N Approach	100.0	107	85	54	60	76
Weighted Average for and Approaches	-	124	101	81	72	94
S_ Bound Roadwa	ay		Santaga marmadanan kannana	man de la communicación de la complexión d		 тиминаторы потом предоставления замения
		Profile	meter Roug	ghness Value	- R inches	per mile
Item	Length	Traffi	c Lane	Passin	g Lane	
		O.W.P.	I.W.P.	O. W. P.	I.W.P.	Average
Span 1	36.7	116	114	144	103	119
2	47.9	1 78	97	148	92	129
3	41.8	120	106	82	100	102
4						
5						
6			·		<u> </u>	
Weighted Average for	Bridge	141	105	125	98	117
S Approach	100.0	48	56	45	52	50
N Approach	100.0	81	84	66	63	74
Weighted Average for and Approaches	_	94	84	82	73	83
Remarks <u>Spans and Jo</u> Expansion; #4, 7			n to North.	Joint #1, 2	3, 5, 6, 7	'. 8, 9 <i>-</i>
Concrete Apr		~				

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

ual Structures (separate ingle Structure Yes 2 E Bound Roady	No [- '	Yes of Finishing 7	No X Hand		
		Profile	ometer Rou	ghness Value	- R inches	per mile
Item	Length	Traffi	c Lane	Passin		
		O.W.P.	I, W. P.	O.W.P.	I.W.P.	Average
Span 1	40.6	149	80			114
2	76.3	135	127		·	131
3	76,3	123	109			116
4	37.3	164	81			122
5						
6						
Weighted Average fo	r Bridge	138	106		-	122
Approach						
Approach						
Weighted Average fo	-					
and Approache	7 D		<u></u>	N. S. White and S.		
W Bound Roads				·		
De jaki — ya inganan jaki mulaumi. Mama amikin na munaka mulau amikin da munaka mulau amikin mulau amikin mula		Profile	ometer Roug	Thness Value	e - R inches	per mile
			ometer Roug		l - R inches	
W Bound Roads	way					
W Bound Roads	way	Traffi	c Lane	Passin	g Lane	
W Bound Roads Item	vay Length	Traffi	c Lane	Passin	g Lane	Average
W Bound Roads Item Span 1	Length	Traffi O.W.P.	I.W.P.	Passin	g Lane	Average
W Bound Roads Item Span 1	Length 40.6 76.3	Traffi O.W.P. 114 138	I.W.P. 74 139	Passin	g Lane	Average 94 138
W Bound Roads Item Span 1 2 3	Length 40.6 76.3 76.3	Traffi O.W.P. 114 138 112	C Lane I.W.P. 74 139 138	Passin	g Lane	Average 94 138 125
W Bound Roads Item Span 1 2 3 4	Length 40.6 76.3 76.3	Traffi O.W.P. 114 138 112	C Lane I.W.P. 74 139 138	Passin	g Lane	Average 94 138 125
W Bound Roads Item Span 1 2 3 4 5	Length 40.6 76.3 76.3 37.3	Traffi O.W.P. 114 138 112	C Lane I.W.P. 74 139 138	Passin	g Lane	Average 94 138 125 83
W Bound Roads Item Span 1 2 3 4 5 6	Length 40.6 76.3 76.3 37.3	Traffi O.W.P. 114 138 112 89	C Lane I.W.P. 74 139 138 77	Passin	g Lane	Average 94 138 125
W Bound Roads Item Span 1 2 3 4 5 6 Weighted Average fo	Length 40.6 76.3 76.3 37.3	Traffi O.W.P. 114 138 112 89	C Lane I.W.P. 74 139 138 77	Passin	g Lane	Average 94 138 125 83
W Bound Roads Item Span 1 2 3 4 5 6 Weighted Average fo Approach	Length 40.6 76.3 76.3 37.3 r Bridge	Traffi O.W.P. 114 138 112 89	C Lane I.W.P. 74 139 138 77	Passin	g Lane	Average 94 138 125 83

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Bridge No. <u>S04 of 03033</u>	Location	109th Av	venue over	I 96	· · · · · · · · · · · · · · · · · · ·	
Date Measured 9-29-64	Number	of Spans	Lei	ngth (includi	ng approach	es) <u>334.6</u>
Dual Structures (separate	for each road	way) Y	es 🔲	No X		
Single Structure Yes 🗓	No 🗌	Method (of Finishing	Hand_		
E_ Bound Roadwa	y	District	. 7	•		
Control of the Contro		Profile	meter Rou	ghness Value	e - R inches	per mile
Item	Length	Traffi	c Lane	Passin	g Lane	Average
,		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	35,6	178	208			193
2	82.2	173	189			181
3	81.2	95	107			101
4	35.6	233	255			244
5						
6						
Weighted Average for	Bridge	156	174			165
W Approach	50.0	77	89			83
E Approach	50.0	100 dist 100				
Weighted Average for and Approaches	_	121	135			128
ACCOUNTY OF BEATMEN TO A COUNTY OF THE SECOND STATE OF THE SECOND	umanum variante de la companie de la	нтення в политення в полите		Stant Sunt of motor in the state of the stat		
W Bound Roadwa	ıy	,	·			
	•	Profile	meter Roug	hness Value	- R inches	per mile
Item	Length	Traffic	c Lane	Passin	g Lane	
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	35.6	108	142			125
2	82,2	199	140			170
3	81.2	166	107			136
4	35.6	153	201			177
5						
6						
Weighted Average for	Bridge	167	138			152
W Approach	50.0	50	50			50
E Approach	50.0	63	75			69
Weighted Average for	~					
and Approaches	tion and the second	134	115			124
Remarks <u>Spans and join</u> Expansion; #3 - S			to East. Jo	oint #1, 5 - (Construction	1; #2, 4 -
Bituminous aj	oproaches. U	Inable to re	ad E approa	ch of EB ro	adway.	

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Bridge No. S05 of 03033	Location	1 <u>114th Ave</u>	enue over I	96	· · · · · · · · · · · · · · · · · · ·	
Date Measured 9-30-64	Number	of Spans	4 Lei	ngth (includi	ng approach	es) <u>354.0</u>
Dual Structures (separate	for each road	lway) Y	es 🔲	No X		,
Single Structure Yes X	No 🔲	Method	of Finishing	gMachine	<u> </u>	
E Bound Roadwa	ay	District	7			
		Profile	meter Rou	ghness Value	e - R inches	per mile
Item	Length	Traffic	c Lane	Passin	g Lane	A
-		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	55.1	184	101			142
2	71.9	137	139			138
3	71.9	155	118			136
4	55.1	132	118			125
5						
6						
Weighted Average for	Bridge	151	120			136
W Approach	50.0	140	102			121
E Approach	50.0	170	158			164
Weighted Average for and Approaches	-	153	123			138
W Bound Roadw	ay					
		Profile	meter Roug	ghness Value	e - R inches	per mile
Item	Length	Traffic	c Lane	Passing Lane		
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	55.1	89	97		·	93
2	71.9	124	135			130
3	71.9	128	100			114
4	55.1	101	86			94
5						
6						
Weighted Average for	Bridge	113	106			110
W Approach	50.0	156	125			140
E Approach	50.0	123	82			102
Weighted Average for and Approaches	_	120	105			112
Remarks <u>Spans and Join</u> Expansion.		from West t	o East. Jo	int #1, 5 - C	Construction	#2, 3, 4 -
Bituminous Approac	hes.					

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

E.m	101	
PATE		

Bridge No. <u>S06 of 03033</u>	Location	us 31 o	ver I 96			rom (UI)
Date Measured 9-24-64	Number	of Spans4	<u> </u>	ngth (includi	ng approach	es) <u>486.6</u>
Dual Structures (separate	for each road	lway)	Zes 🔲	No X		
Single Structure Yes X	No 🗌	Method	of Finishing	g <u>Machine</u>		
N Bound Roadwa	ay	District	7			
		Profile	ometer Rou	ghness Value	e - R inches	per mile
Item	Length	Traffi	c Lane	Passin	g Lane	A
-		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	44.2	164	130			147
2	99.7	145	134			140
3	98.5	121	116			118
4	44.2	120	109			114
5						
6						
Weighted Average for	Bridge	136	123			130
S Approach	100.0	106	136			121
N Approach	100.0	77	84			78
Weighted Average for and Approache	_	118	118			118
S Bound Roadw	ay		etti olektiin taivataa kan ka	alle Malle Medie de la Silve de Per dens de la constante de l	And the second s	·
		Profile	meter Rou	ghness Value	- R inches	per mile
Item	Length	Traffic	c Lane	Passin	g Lane	
		O.W.P.	I.W.P.	O. W. P.	I.W.P.	Average
Span 1	44.2	126	124			125
2	99.7	138	108			123
3	98.5	145	115			130
4	44.2	141	78			110
5					_	
6						
Weighted Average for	Bridge	139	108			124
S Approach	100.0	79				79
N Approach	100.0	77	86			82
Weighted Average for	~	/	0.4			
and Approaches	S	114	81		<u> </u>	98
Remarks <u>Spans and Jo</u> Expansion; #3, 5					3, 4, 6, 8	, 9 –
Cantilevered Stru		out, 110 - 100	or napansi	VII.		
Concrete Approa		SBTL	- IWP Not	Run.		

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Form	1011
	10 11

ate Measured $9-23-6$	34 Number		$rac{4}{}$ Lei		ng approach	nes) <u>215.4</u>
ıal Structures (separa	'	-	Yes 🗍	No X		,
ngle Structure Yes			of Finishing		<u> </u>	
E Bound Road		Distric		•		
		Profile	ometer Rou	ghness Value	e - R inches	per mile
Item	Length	Traffi	c Lane	Passin	g Lane	A
		O.W.P.	I. W. P.	O.W.P.	I.W.P.	Average
Span 1	35.2	104	102			103
2	72.5	175	87			131
3	72.5	149	122			136
4	35.2	147	119			133
5						
6						
Weighted Average f	for Bridge	153	106			130
Approach						
Approach						
Weighted Average f and Approacl	_					
W Bound Road	dway	<u> </u>				·
W Bound Road	dway	Profile	ometer Roug	ghness Value	e - R inches	per mile
W Bound Road	dway Length		ometer Roug c Lane		e - R inches	·
Item						·
Item		Traffi	c Lane	Passin	g Lane	·
Item	Length	Traffi O.W.P.	c Lane	Passin	g Lane	Average
Item Span 1	Length	Traffi O.W.P. 178	I.W.P.	Passin	g Lane	Average
Item Span 1	Length 35.2 72.5	Traffi O.W.P. 178 182	I.W.P. 122 168	Passin	g Lane	Average 150 175
Span 1 2 3	Length 35.2 72.5 72.5	Traffi O.W.P. 178 182 147	I.W.P. 122 168 137	Passin	g Lane	Average 150 175 142
Span 1 2 3 4	Length 35.2 72.5 72.5	Traffi O.W.P. 178 182 147	I.W.P. 122 168 137	Passin	g Lane	Average 150 175 142
Span 1 2 3 4 5	Length 35.2 72.5 72.5 35.2	Traffi O.W.P. 178 182 147	I.W.P. 122 168 137	Passin	g Lane	Average 150 175 142
Span 1 2 3 4 5 6	Length 35.2 72.5 72.5 35.2	Traffi O.W.P. 178 182 147 188	I.W.P. 122 168 137 131	Passin	g Lane	Average 150 175 142 160
Span 1 2 3 4 5 6 Weighted Average f	Length 35.2 72.5 72.5 35.2	Traffi O.W.P. 178 182 147 188	I.W.P. 122 168 137 131	Passin	g Lane	Average 150 175 142 160
Span 1 2 3 4 5 6 Weighted Average f	Length 35.2 72.5 72.5 35.2 for Bridge	Traffi O.W.P. 178 182 147 188	I.W.P. 122 168 137 131	Passin	g Lane	Average 150 175 142 160
Span 1 2 3 4 5 6 Weighted Average f Approach Approach Weighted Average f	Length 35.2 72.5 72.5 35.2 for Bridge for Bridge hes	Traffi O.W.P. 178 182 147 188	I.W.P. 122 168 137 131	Passin O.W.P.	g Lane I. W. P.	Average 150 175 142 160

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Bridge No. <u>S08 of 03033</u>	Location	M 89 ov	er I 96			
Date Measured 9-23-64	Number	of Spans <u>4</u>	Leı	ngth (includi	ng approach	es) <u>319.2</u>
Dual Structures (separate	for each road	way) Y	es 🔲	No X		
Single Structure Yes X	No 🔲	Method o	of Finishing	Hand Hand		
E Bound Roadwa	ıy	District	7			
. Called the state of the state		Profile	meter Rou	ghness Value	- R inches	per mile
Item	Length	Traffic	c Lane	Passin	g Lane	Avenore
		O.W.P.	I, W. P.	O.W.P.	I.W.P.	Average
Span 1	34.7	169	118			144
2	72.2	101	108			104
3	72.0	177	135			156
4	40.3	195	157			176
5						
6						
Weighted Average for	Bridge	154	127		amminim sel amminim zakolom kilomete (20-aki 19-aki 19-aki 19-aki 19-aki 19-aki 19-aki 19-aki 19-aki 19-aki 19	140
W Approach	50.0	108	84			96
E Approach	50.0	126	121			124
Weighted Average for and Approaches	_	142	120			131
W Bound Roadwa	ay					
		Profile	meter Rou	ghness Value	- R inches	per mile
Item	Length	Traffic Lane		Passing Lane		
		O.W.P.	I.W.P.	O,W.P.	I.W.P.	Average
Span 1	34.7	146	127			136
2	72,2	170	126			148
3	72.0	181	123			152
4	40.3	131	163			147
5						
6						
Weighted Average for	Bridge	163	132			148
W Approach	50.0	137	150			144
E Approach	50.0	124	95			110
Weighted Average for and Approaches	_	153	129			141
	nts numbered	from West	to East. J	oint #1, 5 -	Constructio	n; #2, 3, 4 -
Expansion. Bituminous Approac	had	·				В
Bittiminous Approac	1100.		·		·	

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Bridge No. S01 of 03034	Location	US 31 c	ver I 96			Połm IUII
Date Measured 9-22-64				ngth (includi	ng approach	es) <u>420.7</u>
Dual Structures (separate		_		No X		•
Single Structure Yes x	2		January VIII	Hand	l .	
NB Bound Roadwa		District				
, CE 1/12-2-1-12-1-1-1-1-1-1-1-1-1-1-1-1-1-1-		Profile	meter Rou	ghness Value	e - R inches	per mile
Item	Length	Traffi	c Lane	Passin	g Lane	
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	48.4	193	159			176
2	110.4	155	149			152
3	109.6	125	124			124
4	52.3	129	134			132
5						
6						
Weighted Average for	Bridge	146	140			143
S Approach	50.0	119	131			125
N Approach	50.0	81	135			108
Weighted Average for and Approache	-	135	138			136
SB Bound Roadw	en e	A had not a minimistal common an involvement common	Bermundskehrmonnennssensenskehrmonse up emminek	alan Maliki keraman ada ada Wito manina musu manan ada aran a	Тот постания	
		Profile	meter Rou	ghness Value	e - R inches	per mile
Item	Length	Traffic	c Lane	Passin	g Lane	
		O.W.P.	I.W.P.	O.W.P.	I. W. P.	Average
Span 1	48.4	179	164			172
2	110.4	117	61			89
3	109.6	141	109			125
4	52.3	187	176			182
5						
6	PARTICIPATE OF THE PARTICIPATE O					
Weighted Average for	Bridge	146	112			129
S Approach	50.0	172	124			148
N Approach	50.0	117	107			112
Weighted Average for and Approache	-	146	113	- The second sec	The state of the s	130
Remarks Spans and Joints	s numbered fr	om South to	North. Jo	int #1, 5, 7	- Expansion	; #6, 2 -
Construction; #4 - Steel E						Ramps too
close for 100 ft approache	es.					

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Bridge No. <u>S01 of 03111</u>	Location	102nd	<u>Avenue ove:</u>	r <u>US 131</u>		
Date Measured 10-1-64	Number	of Spans	Leı	ngth (includi	ng approach	nes) <u>309.6</u>
Dual Structures (separate	for each road	way) Y	es 🔲	No X		
Single Structure Yes X	No [Method	of Finishing	g <u>Hand</u>		
W Bound Roadwa	y	District	; 7			
Control of the Contro		Profile	meter Rou	ghness Value	e - R inches	per mile
Item	Length	Traffi	c Lane	Passin	g Lane	Arronomo
		O.W.P.	I.W.P.	O. W. P.	I.W.P.	- Average
Span 1	34.0	80	68			74
2	70.8	54	64			59
3	70.8	85	62			74
4	34.0	99	97			98
5						
6						
Weighted Average for	Bridge	76	69			72
W Approach	50.0	120	88			104
E Approach	50.0	89	102			96
Weighted Average for and Approaches	-	85	77			81
E Bound Roadwa	ay			-		
		Profile	meter Roug	ghness Value	- R inches	per mile
Item	Length	· Traffic Lane		Passin	g Lane	A STANLAR STAN
400000 The second secon		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	34.0	87	84			86
2	70.8	64	64			64
3	70.8	92	60			76
4	34.0	138	89			114
5						
6						
Weighted Average for	Bridge	89	70			80
W Approach	50,0	101	89			95
E Approach	50.0	189	174			182
Weighted Average for and Approaches	_	107	90			99
Remarks Spans and Joint Expansion.	ts numbered f	from West t	o East. Jo	ints #1, 5 -	Constructio	n: #2, 3, 4 -
Bituminous Approach	nes.					10
	· · · · · · · · · · · · · · · · · · ·				···	-13-

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

E	10	1	٠

Bridge No. <u>S02 of 11014</u>	Location	LaPorte	a Road over	194		Porm 1011
Date Measured 9-1-64					ng annroach	340 7
Dual Structures (separate		-	Yes 🗍	No X	ng approact	les) <u> </u>
Single Structure Yes X	1 40000000	• ,	of Finishing	***************************************		
N_Bound Roadwa	San Control of the Co	Distric	_	9		· · · · · · · · · · · · · · · · · · ·
				mbrogs Walne	n Dinahaa	
				ghness Value	The second secon	l ber mie
Item	Length		c Lane		g Lane	Average
	- Annah anna anna anna anna anna anna ann	O.W.P.	I.W.P.	O.W.P.	I.W.P.	· ·
Span 1	34.0	125	59			92
2	85.9	88	69		·	78
3	85.8	106	99			102
4	35.0	102	99			100
5						
6						
Weighted Average for	Bridge	102	83			92
S Approach	50.0	111	136			124
N Approach	50.0	136	141			138
Weighted Average for and Approaches	-	108	99			104
S Bound Roadwa	ay	A CAMBRICA DE LA CAMBRICA DEL CAMBRICA DE LA CAMBRICA DEL CAMBRICA DE LA CAMBRICA	mana centra mana katang (27 mg 1999) ya magazarini maja 1922 kawa	NAVIVERS O CORRESPONDENT AND CONTINUES OF A SECURITION OF THE SECURITIES OF THE SECURITION OF THE SECU	н доступности по под под под под под под под под под	в ³ финански поси се
And the state of t		Profile	meter Roug	ghness Value	- R inches	per mile
Item	Length	Traffi	c Lane	Passin	Passing Lane	
* .		O.W.P.	I.W.P.	O. W. P.	I.W.P.	Average
Span 1	34.0	145	160			152
2	85.9	70	75			72
3	85.8	73	71			72
4	35.0	118	81	·		100
5						100
6						
Weighted Average for	Bridge	89	86		<u> </u>	88
s Approach	50.0	160	153			156
N Approach	50.0	96	100			98
Weighted Average for and Approaches		100	98			99
Remarks Spans and joi #2, 4 - Steel Expa Bituminous a	insion.	from South	to North.	Joint #1, 3,	5 - Constru	action;

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Bridge No. <u>R01 of 111111</u>	Location	1 <u>I 196 ov</u>	<u>ver Paw Pav</u>	w River	· 	<u> </u>
Date Measured 9-2-64	Number	of Spans _3	Lei	ngth (includi	ng approach	ues) <u>301.4</u>
Dual Structures (separate	for each road	lway) 3	Yes X	No		
Single Structure YesS_Bound Roadwa		Method District	of Finishing 7	<u>Hand</u>		
		Profile	ometer Rou	ghness Value	- R inches	per mile
Item	Length	na n	c Lane	Passin	years and the same	and the state of
iteni	Tengui	O.W.P.	I.W.P.	O. W. P.	I.W.P.	Average
Span 1	67.0	93	83	82	83	85
2	67.4	114	131	114	98	114
3	67.0	110	130	130	132	126
4						
5						
6						
Weighted Average for	Bridge	106	115	109	104	108
S Approach	50.0	78	89	125	117	102
N Approach	50.0	121	120	194	170	151
Weighted Average for and Approaches	_	104	111	126	118	115
N_ Bound Roadwa	ay					
		Profile	meter Rou	ghness Value	- R inches	per mile
Item	Length	Traffic Lane		Passin	g Lane	өрдө — — на өндөдөгүн башуунай чашка ашу а калиянын адаалыны калагыны ка
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	67.0	140	152	159	155	152
2	67.4	117	121	100	123	115
. 3	67.0	153	165	185	186	172
4						
5						
6						
Weighted Average for	Bridge	137	146	148	155	146
S Approach	50.0	123	122	185	132	140
N Approach	50.0	189	200	173	202	191
Weighted Average for and Approaches	~	143	151	158	159	153
Remarks Spans and jo Steel Expansion.					4 - Constr	ruction; #3 –
Tar spotted.						-15-
Bituminous a	approaches.					-10-

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Bridge No. <u>S06 of 11111</u>						
Date Measured 10-1-64			Lei	ngth (includi	ng approach	es) <u>232.5</u>
oual Structures (separate t	for each road		Yes	No X		
ingle Structure Yes X	No 🔙		of Finishing	Machine _		
E Bound Roadwa	У	District	t 7	300000	· · · · · · · · · · · · · · · · · · ·	
		Profile	ometer Rou	ghness Value	- R inches	per mile
Item	Length	Traffi	c Lane	Passin	g Lane	Average
		O.W.P.	I.W.P.	O,W.P.	I.W.P.	Average
Span 1	42.3	118	94			106
2	74.6	189	152			170
3	73.3	136	133			134
4	42.3	80	101			90
5						
6	,					
Weighted Average for	Bridge	140	126			133
Approach						
Approach						
						1
Weighted Average for and Approaches	•					
Weighted Average for						
Weighted Average for and Approaches		Profile	ometer Rou	ghness Value	e – R inches	per mile
Weighted Average for and Approaches			ometer Rou c Lane	-	e – R inches	
Weighted Average for and Approaches W Bound Roadwa	ny			-	·	per mile Average
Weighted Average for and Approaches W Bound Roadwa	ny	Traffi	c Lane	Passin	g Lane	
Weighted Average for and Approaches W Bound Roadwa	Length	Traffi O.W.P.	c Lane	Passin	g Lane	Average
Weighted Average for and Approaches W Bound Roadwa Item Span 1	Length	Traffi O.W.P.	I, W, P.	Passin	g Lane	Average
Weighted Average for and Approaches W Bound Roadwa Item Span 1	Length 42.3 74.6	Traffi O. W. P. 122 157	I.W.P. 105 140	Passin	g Lane	Average 114 148
Weighted Average for and Approaches W Bound Roadwa Item Span 1 2 3	Length 42.3 74.6 73.3	Traffi O. W. P. 122 157 170	I.W.P. 105 140 146	Passin	g Lane	Average 114 148 158
Weighted Average for and Approaches W Bound Roadwa Item Span 1 2 3 4	Length 42.3 74.6 73.3	Traffi O. W. P. 122 157 170	I.W.P. 105 140 146	Passin	g Lane	Average 114 148 158
Weighted Average for and Approaches W Bound Roadwa Item Span 1 2 3 4 5	142.3 74.6 73.3 42.3	Traffi O. W. P. 122 157 170	I.W.P. 105 140 146	Passin	g Lane	Average 114 148 158
Weighted Average for and Approaches	142.3 74.6 73.3 42.3	Traffi O. W. P. 122 157 170 110	I.W.P. 105 140 146 75	Passin	g Lane	Average 114 148 158 92
Weighted Average for and Approaches W Bound Roadwa Item Span 1 2 3 4 5 6 Weighted Average for	142.3 74.6 73.3 42.3	Traffi O. W. P. 122 157 170 110	I.W.P. 105 140 146 75	Passin	g Lane	Average 114 148 158 92
Weighted Average for and Approaches W Bound Roadwa Item Span 1 2 3 4 5 6 Weighted Average for Approach	142.3 74.6 73.3 42.3 Bridge	Traffi O. W. P. 122 157 170 110	I.W.P. 105 140 146 75	Passin	g Lane	Average 114 148 158 92
Weighted Average for and Approaches W Bound Roadwa Item Span 1 2 3 4 5 6 Weighted Average for Approach Approach Weighted Average for	Length 42, 3 74.6 73, 3 42, 3 Bridge Bridge	Traffi O. W. P. 122 157 170 110 146	C Lane I, W, P. 105 140 146 75	Passin O.W.P.	g Lane I, W, P.	Average 114 148 158 92 135

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Bridge No. X01 of 11111	Location	1 196 ov	er C & O R	R		
Date Measured 9-3-64	Number	of Spans	_3 Lei	ngth (includi	ng approach	ies) <u>246.0</u>
Dual Structures (separate	for each road	lway)	Yes X	No 🗌		·
Single Structure Yes	No X	Method	of Finishing	Machine		
N_Bound Roadwa	ay .	Distric				
Constitution of the second sec		Profile	ometer Rou	ghness Value	e - R inches	per mile
Item	Length	Traffi	c Lane	Passin	g Lane	A
		O.W.P.	I. W. P.	O.W.P.	I.W.P.	Average
Span 1	48.5	154	125	154	114	137
2	49.0	110	127	121	109	117
3	48.5	97	100	99	95	98
4						
5						
6						
Weighted Average for	Bridge	120	117	125	106	117
S Approach	50.0	140	148	158	155	150
N Approach	50.0	68	57	107	129	90
Weighted Average for and Approaches	_	114	111	128	121	118
S_ Bound Roadwa	ıy					
		Profile	meter Roug	hness Value	- R inches	per mile
Item	Length	Traffic	c Lane	Passin	g Lane	<u> </u>
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	48.5	134	122	100	85	110
2	49.0	139	135	174	172	155
3	48.5	177	145	144	133	150
4						
5						
6					-	
Weighted Average for	Bridge	150	134	139	130	138
S Approach	50.0	155	109	_77	98	110
N Approach	50.0	93	82	88	116	95
Weighted Average for and Approaches	0	139	119	116	121	124
Remarks <u>Spans and Joi</u> Tar spotted.	nts numbered	Lfrom South	to North.	Joint #1, 2,	3. 4 - Cons	struction.
Bituminous Ap	oproaches.					

MICHIG STATE HIGHWAY Office of Testing Research Labora

Approach Approach Weighted Average for Bridge

MICHIGAN STATE HIGHWAY DEPARTMENT Office of Testing and Research Research Laboratory Division	PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65 Form 1011							
Bridge No. S02 of 23152	Location	Location I 96 (EB) over M 43						
Date Measured 2-11-64					ng annaoah	211 9		
Dual Structures (separate		-		No X	ng approach	ies, alla		
Single Structure Yes X		• .	***************************************	ري Machine	•			
E Bound Roadwa	Annual Control of the	District	_					
		1		ghness Value	- Rinches	ner mile		
Ψ,	_					T per mile		
Item	Length		c Lane		Lane	Average		
		O.W.P.	I.W.P.	O. W. P.	I.W.P.			
Span 1	50.0	186	187	114	125			
2	35.0	139	164	169	162			
3	91.0	240	232	196	182			
4	35.2	188	200	236	227	·		
5								
6								
Weighted Average for	Bridge	207	208	199	187			
Approach						ATTACAMENT OF THE CORNEL AND		
Approach	į į							
Weighted Average for and Approaches	_	202	205	179	172			
E Bound Roadwa	ay					,		
•		Profile	meter Roug	hness Value	- R inches	per mile		
Item	Length	Traffi	c Lane	Passin	g Lane	g data minimum di bishi shi bishi bishi pengga mananamana za arawana		
		O.W.P.	I.W.P.	O.W.P.	I. W. P.	Average		
Span 1	50.0			113	105	139		
2	35.0			173	149	160		
3	91.0			144	142	190		
4	35.2			182	165	200		
5								
6								
Weighted Average for	Bridge			159	149	185		

and Approaches 148 138 174 Remarks__ Joints and spans numbered from West to East. Joint #1, 2, 4 - Expansion; #3, 6 -Construction; #5 - Steel Expansion. Cantilevered structure. -18-Bituminous Approaches. HPR Project Special Request Measurement.

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Page 27th Project 61 E-65

Research Project 61 F-65

Bridge No. X03 of 33045	Location	I 496 SB o	ver C&O RI	R and Trowb	ridge Road	7 0 111 10 11
Date Measured 5-27-64				ngth (includi		es) <u>505.0</u>
Dual Structures (separate				No x		,
Single Structure Yes x	No	Method	AND DESCRIPTION OF THE PARTY OF	Mach	ine	
S Bound Roadwa	48 minutes	District				
		Profile	meter Roug	ghness Value	e - R inches	per mile
Item	Length	Traffi	c Lane	Cente	r Lane	Typer (1,000 A (A tallege Left + 1,000 Callege - A tallege A tallege Callege Callege - Food Callege Callege Callege - Food C
		O.W.P.	I.W.P.	O. W. P.	I.W.P.	Average
Span 1	114.0	174	163	1111	119	
2	112.0	125	108	85	99	
3	79.0	94	141	157	132	
4						
5						
6						
Weighted Average for	Bridge	135	137	113	115	
South Approach	100.0	129	80	76	63	OMA SE TRANSPORTE DE LA CONTRACTOR DE LA PROPRENCIA DE LA PROPRENCIA DE LA CONTRACTOR DE LA
North Approach	100.0	120	125	163	93	
Weighted Average for and Approaches	•	131	123	116	100	
S Bound Roadwa	ay	19 kole anagogottusi mis jiras posisindi art va 1, amon hakat	Barrian (1994) (1994) (1994) (1994) (1994) (1994) (1994) (1994) (1994) (1994) (1994) (1994) (1994) (1994) (199	нова постоя и што в 4-км то	Construction of the Market page of the Construction of the Constru	Control of the Contro
		Profile	meter Roug	hness Value	- R inches	per mile
Item	Length	Traffic	Lane	Passing Lane		уналіт і піталі і піталі і піталі (наўвуна у праводиналі піталі подавальня піталі піталі піталі піталі піталі
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	114.0			119	104	132
2	112.0		•	129	99	108
3	79.0			107	140	128
4						
5					_	
6						
Weighted Average for	Bridge			120	111	122
South Approach	100			101	101	92
North Approach	100			173	209	147
Weighted Average for and Approaches	_			127	129	121
Remarks Spans and Joints		om South to	North. Joi	nt #1, 3, 6	- Constructi	on; #2, 5, 7,
8 - Expansion; #4 - Steel Concrete approaches.			·			
5) c co m za c du c						

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

ridge No. <u>B02 of 33171</u> ate Measured <u>5-27-64</u>	Number	of Spans <u>4</u>	Lei	ngth (includi	ng approach	es) <u>471. 2</u>
al Structures (separate	and the same of th		Tes	No x		
ngle Structure Yes x			of Finishing	g <u>Hand</u>		
SBound Roadw	ay	District	8			Falmon - Add Son
		Profile	meter Rou	ghness Value	e - R inches	per mile
Item	Length	Traffi	c Lane	Cente	r Lane	Avenege
with charges where the contract and the		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	56.4	205	176	160	156	
2	86.9	152	119	71	94	
3	86.5	87	78	93	74	
4	41.4	111	113	101	142	
5						
6				ļ		
Weighted Average for	r Bridge	136	117	101	108	
S Approach	100.0	92	109	97	102	
N Approach	100.0	132	95	93	112	
Weighted Average for and Approache	_	126	110	98	108	
S_ Bound Roady	vay					
	1-11-11-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	Profile	meter Rou	ghness Value	e - R inches	per mile
Item	Length	Traffi	c Lane	Passing Lane		
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	56.4	·		195	168	177
2	86.9			110	101	108
3	86.5			92	97	87
4	41.4			114	145	121
5						
6						
Weighted Average for	r Bridge			123	120	118
S Approach	100.0			88	74	94
N Approach	100.0		<u></u>	101	74	101
Weighted Average for and Approache	_			111	101	109
emarks <u>Spans and Join</u> Construction; #3, 5 - St Concrete appro	eel Expansion		North. Jo	int #1, 4, 7.	, 8 – Expans	sion; #2, 6

MICHIGAN STATE HIGHWAY DEPARTMENT

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS

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Office of Testing and Research Research Laboratory Division				ULT TABUL Project 61		5 1011
Bridge No. S11 of 3901	4Location	US 131	NB over "	D'' Avenue		Form 1011
Date Measured 10-1-64					ng approach	es) <u>310.2</u>
Dual Structures (separate	e for each road	lway) Y	es 🔲	No X		
Single Structure Yes	No 🗌	Method o	of Finishing	g <u>Hand</u>		
N Bound Roady	vay	District	7			
. EXECUTION OF THE PROPERTY CONTROL OF THE CONTROL OF T	Sample of the control	Profile	meter Roug	ghness Value	- R inches	per mile
Item	Length	Traffic	c Lane	Passin	g Lane	A
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	35.4	51	71	105	102	82
2	40.8	115	98	86	74	93
3	34.0	51	78	108	70	77
4						
5						
6				·		
Weighted Average fo	r Bridge	75	83	99	82	85
S Approach	100.0	102	122	114	102	110
N Approach	100.0	95	102	91	89	94
Weighted Average fo and Approache	-	90	102	101	90	96
Bound Roads	way					
		Profile	meter Roug	ghness Value	- R inches	per mile
Item	Length	Traffic	c Lane	Passin	g Lane	
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1				***************************************		
2						
3						
4						
5						
6						
Weighted Average fo	r Bridge			1		
Approach						
Approach						
Weighted Average fo and Approach	-				THE PROPERTY OF THE PROPERTY O	
Remarks Spans and J	oints numbered	from South	to North.	Joint #1, 2,	3, 5, 6, 8,	9, 10 -
Expansion; #4, 7	 Construction. 					
Concrete Approach	ies.					

#4, 8 - Construction; #5, 7 - Steel Expansion.

Cantilever structure.

Concrete approaches.

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Form 1011

-22-

ridge No. <u>B01 of 41024</u> ate Measured <u>7-17-64</u>					ng approach	eg) 640 3
nte Measured <u>1-11-04</u> nal Structures (separate			winnerson.	No T	ng approach	.co)
ngle Structure Yes	g promotes	0 ,	Street Ve II and A	Machine		
W Bound Roadw	-	District				
and the second s		Profile	ometer Roug	ghness Value	e - R inches	per mile
Item	Length	Traffi	c Lane	Passin	g Lane	A *** *** *** *** *** *** *** *** *** *
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	110.5	91	109	92	93	96
2	109.3	118	130	112	106	116
3	110.5	85	101	84	85	89
4	110.0	102	90	103	99	98
5						
6						
Weighted Average for	Bridge	99	107	98	96	100
W Approach	100.0	142	134	132	134	136
E Approach	100.0	131	146	76	115	117
Weighted Average for and Approache	_	111	118	100	105	108
E Bound Roadw	'ay					
		Profile	ometer Roug	ghness Value	e - R inches	per mile
Item	Length	Traffi	Traffic Lane		Passing Lane	
		O.W.P.	I.W.P.	O.W.P.	I. W. P.	Average
Span 1	110.5	153	118	118	121	128
2	109.3	160	157	135_	136	147
3	110.5	132	146	126	142	136
4	110.0	138	111	119	126	124
5						
6						
Weighted Average for	Bridge	146	133	124	131	134
W Approach	100.0	110	121	96	106	108
E Approach	100.0	173	153	80	132	134
	Bridge		1	1	1	

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

E	10	1	١

Bridge No. <u>S09 of 41025</u>	Location	n <u>I 96 WB</u>	over I 96 F	B. E of Gra	nd Rapids	, one 1011
Date Measured 7-14-64	Number	of Spans	3 Le	ngth (includi	ng approach	es) <u>402.2</u>
Dual Structures (separate	e for each road	dway) Y	es 🔲	No x		
Single Structure Yes X	No 🗌	Method	of Finishing	<u>Hand</u>		
W Bound Roady	vay	District	5			
		Profile	meter Rou	ghness Value	e - R inches	per mile
Item	Length	Traffi	c Lane	Passin	g Lane	Avonogo
		O.W.P.	I.W.P.	O, W. P.	I.W.P.	Average
Span 1	49.6	171	141	121	127	140
2	90.3	174	150	129	116	142
3	62.3	159	122	148	130	140
4	`					
5						
6						
Weighted Average fo	r Bridge	169	139	133	123	141
W Approach	100.0	81	96	110	120	102
E Approach	100.0	86	88	118	132	106
Weighted Average fo and Approache	_	126	116	123	125	122
Bound Roady	vay					The state of the s
Colonia y y y y y y y y y y y y y y y y y y y		Profile	meter Roug	ghness Value	- R inches	per mile
Item	Length	Traffic	c Lane	Passin	g Lane	A
- MININIA		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1						
2						
3						
4				<u> </u>		
5						
6						
Weighted Average fo	r Bridge					
Approach						
Approach						<u> </u>
Weighted Average fo and Approache	_					
Remarks Spans and Joint #3, 6 - Construction; #5	ts numbered fr - Steel Expans	com West to	East. Join	t #1, 2, 4, 7	', 8, 9 - Ex	pansion;
Concrete approx						

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Bridge No. <u>B02 of 44031</u>						· · · · · · · · · · · · · · · · · · ·
Date Measured <u>7-2-64</u>				Annual Control	ng approach	es) <u>146.7 </u>
Dual Structures (separate	for each road		Contract of the Contract of th	No x		
Single Structure Yes 🗓			of Finishing	Machine		
S Bound Roadwa	ay	District	6	on and the state of the state o		
		Profile	meter Rou	ghness Value	- R inches	per mile
Item	Length	Traffic	c Lane	Passin	g Lane	Average
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	
Span 1	46.7	178	213	, ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;		195
2						
3						
4						
5						
6						
Weighted Average for	Bridge	178	213			195
S Approach	50.0	133	156			144
N Approach	50.0	249	235			242
Weighted Average for and Approache		187	201	g medicana ng saway sa sawaka sayi kalaka 1882 ka ka sawaka sa sawaka sa sa		194
N Bound Roadw	ay		- No dimensional proposado con interessor de la contracta de l		·	
		Profile	ometer Rou	ghness Value	e - R inches	per mile
Item	Length	Traffi	c Lane	Passin	g Lane	A
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	46.7	122	120			121
2						
3						
4						<u> </u>
5						
6						
Weighted Average for	Bridge	122	120	·		121
S Approach	50.0	139	137			138
N Approach	50.0	116	163			139
Weighted Average for and Approache		126	141			133
Remarks <u>Spans and Joir</u> Bi tuminous ap		from South	to North	foint #1, 2 -	Construction	n.

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Form	1011

Bridge No. B02 of 50051	Location	US 25 ov	er Clinton	River		
Date Measured 7-6-64					ng approach	es) 469.9
Dual Structures (separate				No x		
Single Structure Yes X	and the same of th			<u>Machine</u>		
N Bound Roadwa	(Section and Control of Control o	District				
Ellichengung gegen einstellen der der Zichte ber dech der Liebber		Profile	meter Rou	ghness Value	e - R inches	per mile
Item	Length	Traffic	c Lane	Passin	g Lane	A
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	83.6	178	157	156	164	
2	101.9	209	224	163	185	
3	84.4	241	220	192	220	
4						
5						
6						
Weighted Average for	Bridge	209	202	170	189	
N Approach	100.0	102	119	164	117	
S Approach	100.0	123	98	150	99	
Weighted Average for and Approaches	_	168	162	165	155	
N Bound Roadwa	ay			v		
		Profile	meter Rou	ghness Value	e - R inches	per mile
<u>Item</u>	Length	Traffic Lane		Passin	g Lane	A
		O.W.P.	I, W. P.	O.W.P.	I.W.P.	Average
Span 1	83.6			155	133	146
2	101.9			166	196	190
3	84.4			265	254	232
4						
5						
6						
Weighted Average for	Bridge			194	195	193
N Approach	100.0			141	103	123
S Approach	100.0			125	102	116
Weighted Average for and Approaches	_			168	155	162
Remarks Spans and Joint	s numbered f	rom South t	o North. J	oint #1, 2, 4	., 7, 8, 9 -	Expansion;
#3, 6 - Construction; #5 -	Steel Expans	sion.				
Cantilevered st		**************************************			W- 10-1 - 1 - 1	-25-
Concrete approx	30hAC					

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Bridge No. <u>S29 of 50111</u>	Location	<u>M 59 ov</u>	ver I 94		<u></u>	
Date Measured 7-7-64	Number	of Spans	4 Lei	ngth (includi	ng approach	nes) <u>425.6</u>
Dual Structures (separate	for each road	iway) Y	es 🔲	No X		w n
Single Structure Yes X	No 🗌	Method o	of Finishing	g <u>Machine</u>		
E_Bound Roadwa	y	District	9			
Committee in the property of the party of th	The state of the s	Profile	meter Rou	ghness Value	e – R inches	per mile
Item	Length	Traffic	c Lane	Passin	g Lane	Average
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	36.3	143	192			168
2	71.5	135	163			149
3	81.5	156	192			174
4	36.3	183	134			158
5						
6						
Weighted Average for	Bridge	152	173	944.		162
W Approach	100.0	69	79			74
E Approach	100.0	94	85			90
Weighted Average for and Approaches	_	118	130			124
W Bound Roadwa	ау					
		Profile	meter Rou	ghness Value	- R inches	s per mile
Item	Length	Traffic	c Lane	Passin	Passing Lane	
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	36.3	144	151			148
2	71.5	99	106			102
3	81.5	197	207			202
4	36,3	190	188	<u> </u>		189
5						
6						
Weighted Average for	Bridge	156	163			160
W Approach	100.0	99	84			92
E Approach	100.0	112	104			108
Weighted Average for and Approaches	•	132	130			131
Remarks Spans and jos Expansion; #4, 8	ints numbered – Constructi				3, 5, 7, 9,	10, 11 -
Concrete app		Commence of the Commence of th				-26-
Cantilowarad	Construction	1				-40-

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

- -27-

Bridge No. <u>B07 of 73051</u>	Location	M 13 ov	er Cass Riv	ver		Form 1011
Date Measured 7-1-64					ng approach	nes) 489 5
Dual Structures (separate				No X	8 PP - C - C - C	
Single Structure Yes X	5		of Finishing	and the state of t		
N_ Bound Roadwa		District				
	The second secon	1		ghness Value	- R inches	per mile
Item	Length				g Lane	
Itoni	Toug vi	O.W.P.	I.W.P.	O. W. P.	I. W. P.	Average
Span 1	64.6	202	183			192
2	65.1	134	108			121
3	65.6	195	150			172
4	64.5	191	132			162
5	65,2	145	143			144
6	64.5	186	172			179
Weighted Average for		175	148			162
s Approach	50.0	144	187		of the state of th	166
N Approach	50.0	180	154		, , , , , , , , , , , , , , , , , , , ,	167
Weighted Average for and Approaches	-	186	153			170
SBound Roadw	ay					
		Profile	meter Roug	ghness Value	- R inches	per mile
Item	Length	Traffi	c Lane	Passin	g Lane	patertik tillmid åt tillminde min min min perpenyery gygga y varamet et stavener et e
		O.W.P.	I.W.P.	O. W. P.	I.W.P.	Average
Span 1	64.6	202	157			180
2	65.1	171	126			148
3	65.6	218	200			209
4	64.5	181	168			174
5	65.2	178	150			164
6	64.5	158	132			145
Weighted Average for	Bridge	185	156			170
S Approach	50.0	177	256	***************************************		216
N Approach	50.0	205	156			180
Weighted Average for and Approaches		186	166			176
Remarks Spans and joi			to North.	Joint #1, 6	- Construct	ion; #2, 3, 5
Expansion; #4 - S	teel Expansio	n.				

Bituminous Approaches.

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Bridge No. <u>B01 of 77111</u>	Location	I 94 over	Belle River	?		
Date Measured 7-8-64	Number	of Spans	3 Lei	ngth (includi	ng approach	es) <u>382.0</u>
Dual Structures (separate			conomicación	No [
Single Structure Yes X	No 🗌	Method o	of Finishing	Machine		
N Bound Roadwa	ıy	District	; 9			
		Profile	meter Rou	ghness Value	e - R inches	per mile
Item	Length	Traffic	c Lane	Passin	g Lane	
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	60.5	165	185	117	158	156
2	61.1	164	123	118	172	144
3	60.6	162	168	229	225	196
4						
5						
6						
Weighted Average for	Bridge	164	159	155	185	166
S Approach	100.0	56	75	86	85	76
N Approach	100.0	123	105	106	101	109
Weighted Average for and Approaches	-	125	123	124	137	127
S Bound Roadw	ay	and Carteria Carte in Action (Carteria Carteria Carteria Carteria Carteria Carteria Carteria Carteria Carteria	polytopogomeni miniminina miniminina manazara za zazara za zazara za zazara za zazara za zazara za zazara za z			
		Profile	ometer Rou	ghness Value	- R inches	per mile
Item	Length	Traffi	c Lane	Passin	g Lane	9877
		O,W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	60.5	165	133	82	82	116
2	61.1	106	130	95	143	118
3	60.6	120	136	89	138	121
4						
5						
6						
Weighted Average for	Bridge	130	133	89	121	118
S Approach	100.0	63	87	67	77	74
N Approach	100.0	54	79	105	94	83
Weighted Average for and Approache	_	93	107	87	103	98
Remarks Spans and Join	ts numbered	from South	to North. J	oints #1, 2,	3, 5, 6, 8.	9, 10 -
Expansion; #4, 7 - Constr						
Concrete appro				<u>.</u>		00

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Bridge No. <u>B02 of 77111</u>	Location	I 94 over	<u>Pine River</u>			
Date Measured 7-22-64	Number	of Spans	Len	gth (includi	ng approach	nes) <u>403.3</u>
Dual Structures (separate	for each road	way)	es x	No 🔲		
Single Structure Yes	No x	Method	of Finishing	Machine		
N Bound Roadwa	ay	District	9			
		Profile	ometer Roug	hness Value	e - R inches	per mile
Item	Length	Traffi	c Lane	Passin	g Lane	Average
		O.W.P.	I.W.P.	O, W, P.	I.W.P.	Average
Span 1	64.0	135	135	88	125	121
2	76.0	160	138	122	143	141
3	63.3	130	117	98	127	118
4						
5						
6						
Weighted Average for	Bridge	143	131	104	132	128
S Approach	100.0	96	105	98	94	98
N Approach	100.0	150	108	117	138	128
Weighted Average for and Approache	_	133	118	106	124	120
S Bound Roadw	ay					
		Profile	ometer Roug	hness Value	- R inches	s per mile
Item	Length	Traffic Lane		Passing Lane		are parameter and the second seco
		O.W.P.	I, W. P.	O.W.P.	I.W.P.	Average
Span 1	64.0	193	124	110	143	142
2	76.0	140	103	145	125	128
3	63.3	125	90	125	139	120
4						
5						
6						
Weighted Average for	Bridge	152	106	128	135	130
S Approach	100.0	101	119	127	173	130
N Approach	100.0	129	147	195	212	171
Weighted Average for and Approache	_	134	119	144	164	140
Remarks Spans and Join	nts numbered	from South	to North. J	oint #1, 2,	3, 5, 8, 9,	10 – Expansio
#4, 7 - Construction; #6 -	- Steel Expans					
Cantilever stru						29-

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Bridge No. <u>S01 of 77111</u>	Location	Meisner	Rd over I 9	4		
Date Measured 7-7-64	Number	of Spans <u>4</u>	Le	ngth (includi	ng approach	nes) <u>283.9</u>
Dual Structures (separate	for each road	way) Y	res []	No X		
Single Structure Yes X	No 🗌	Method	of Finishing	gHand_		
E Bound Roadwa	.y	District	9			
. Other control contro	Militaria in a managa ya	Profile	meter Rou	ghness Value	e - R inches	per mile
Item	Length	Traffi	c Lane	Passin	g Lane	
		O.W.P.	I. W. P.	O.W.P.	I. W. P.	- Average
Span 1	41.8	139	124			132
2	100.0	167	114			140
3	101.6	149	105			127
4	40.5	117	108			112
5						
6						
Weighted Average for	Bridge	149	111			130
Approach						
Approach						
Weighted Average for and Approaches	-	148	111			130
W_Bound Roadwa	ıy					
		Profilometer Roughness Value - R inches per mil				
Item	Length	Traffic Lane		Passin	g Lane	ALIGERATURA (SA SA S
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	41.8	129	91			110
2	100.0	130	113			121
3	101.6	140	87			114
4	40.5	104	96			100
5						
6						
Weighted Average for	Bridge	130	98			114
Approach						
Approach		- "				
Weighted Average for	Bridge					
and Approaches	and a second	130	98			114
Remarks Spans and joi	nts numbered	from West	to East. J	oint #1, 3 -	Steel Expar	sion; #2 -
Expansion.						
Cantilevered					·	
Tar and chip	approaches to	oo rough to	run.			

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

ate Measured <u>8-25-64</u> ual Structures (separate fingle Structure Yes X N Bound Roadwa	or each road	lway) Y	es [] of Finishing	No X		
осилизмости предострукция на прина на прина на предоставления на прина на предоставления на прина на предостав На прина на прина на прина на прина на прина на предоставления на прина на пределения на прина на предоставлен	ur ar ezi e en e	Profile	meter Roug	ghness Value	e - R inches	per mile
Item	Length	Traffic	c Lane	Passin	g Lane	A TOTAL CONTROL OF THE PROPERTY OF THE PROPERT
	J	O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	52,0	112	105			108
2	92.4	135	142			138
3	99.5	157	168			162
4	57.7	101	98			100
5						
6						
Weighted Average for	Bridge	132	136			134
Approach						
Approach						
			7			
Weighted Average for and Approaches	-			a to the estanding which estands in the control of	The state of the s	A CHARGOSIAN SISSEMANION CONTROL SISSESSA AND AND AND AND AND AND AND AND AND AN
-			· ·			
and Approaches		Profile	ometer Rou	ghness Value	e - R inches	per mile
and Approaches			ometer Roug	- 	e - R inches	
and Approaches S Bound Roadwa	ay			- 		per mile Average
and Approaches S Bound Roadwa	ay	Traffi	c Lane	Passin	g Lane	er i den men den er en
and Approaches S Bound Roadwa Item	ty Length	Traffi	c Lane	Passin	g Lane	Average
and Approaches S Bound Roadwa Item Span 1	Length	Traffic O.W.P.	I.W.P.	Passin	g Lane	Average
and Approaches S Bound Roadwa Item Span 1	Length 52.0 92.4	Traffic O.W.P. 140 125	I.W.P. 149 146	Passin	g Lane	Average 144 136
and Approaches S Bound Roadwa Item Span 1 2 3	Length 52.0 92.4 99.5	Traffic O.W.P. 140 125 221	I.W.P. 149 146 196	Passin	g Lane	Average 144 136 208
and Approaches S Bound Roadwa Item Span 1 2 3 4	Length 52.0 92.4 99.5	Traffic O.W.P. 140 125 221	I.W.P. 149 146 196	Passin	g Lane	Average 144 136 208
and Approaches S Bound Roadwa Item Span 1 2 3 4 5	Length 52.0 92.4 99.5 57.7	Traffic O.W.P. 140 125 221	I.W.P. 149 146 196	Passin	g Lane	Average 144 136 208
and Approaches S Bound Roadwa Item Span 1 2 3 4 5 6	Length 52.0 92.4 99.5 57.7	Traffic O.W.P. 140 125 221 155	I.W.P. 149 146 196 147	Passin	g Lane	Average 144 136 208 151
and Approaches S Bound Roadwa Item Span 1 2 3 4 5 6 Weighted Average for	Length 52.0 92.4 99.5 57.7	Traffic O.W.P. 140 125 221 155	I.W.P. 149 146 196 147	Passin	g Lane	Average 144 136 208 151
and Approaches S Bound Roadwa Item Span 1 2 3 4 5 6 Weighted Average for Approach	1 Length 52.0 92.4 99.5 57.7 Bridge Bridge	Traffic O.W.P. 140 125 221 155	I.W.P. 149 146 196 147	Passin	g Lane	Average 144 136 208 151

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Bridge No. <u>S03 of 77111</u>	Location	I IVIUIUI	um ru. ove	1 1 34		
Date Measured 8-24-64					ng approach	nes) <u>301.6</u>
Dual Structures (separate	for each roa	dway) Y	es 🔲	No X		·
Single Structure Yes X	No 🗌	Method o	of Finishing	<u>Machine</u>		
N Bound Roadw	ay	District	9			
		Profile	meter Roug	ghness Value	e – R inches	per mile
Item	Length	Traffic	c Lane	Passin	g Lane	Average
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	52.0	171	168			170
2	92.4	157	140			148
3	99.5	157	113			135
4	57.7	111	113			112
5						
6						ļ
Weighted Average for	Bridge	151	131			141
Approach						
Approach				1	1	
Approach Weighted Average for and Approache	-					
Weighted Average for	S					
Weighted Average for and Approache	S	Profile	ometer Roug	ghness Value	e - R inches	s per mile
Weighted Average for and Approache	S	200-0-101-101-0-101-101-101-101-101-101-	ometer Roug		e - R inches	
Weighted Average for and Approache S Bound Roadw	s vay	200-0-101-101-0-101-101-101-101-101-101-	W-10-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1			s per mile Average
Weighted Average for and Approache S Bound Roadw	s vay	Traffi	c Lane	Passin	g Lane	
Weighted Average for and Approache S Bound Roadw Item	ay Length	O.W.P.	c Lane	Passin	g Lane	Average
Weighted Average for and Approache S Bound Roadw Item Span 1	s vay Length 52.0	O.W.P.	I.W.P.	Passin	g Lane	Average
Weighted Average for and Approache S Bound Roadw Item Span 1	Length 52.0 92.4	O.W.P. 128 143	I.W.P. 130 138	Passin	g Lane	Average 129 140
Weighted Average for and Approache S Bound Roadw Item Span 1 2 3	Length 52.0 92.4 99.5	Traffic O.W.P. 128 143 179	I.W.P. 130 138 175	Passin	g Lane	Average 129 140 177
Weighted Average for and Approache S Bound Roadw Item Span 1 2 3 4	Length 52.0 92.4 99.5	Traffic O.W.P. 128 143 179	I.W.P. 130 138 175	Passin	g Lane	Average 129 140 177
Weighted Average for and Approache S Bound Roadw Item Span 1 2 3 4 5	Length 52.0 92.4 99.5 57.7	Traffic O.W.P. 128 143 179	I.W.P. 130 138 175	Passin	g Lane	Average 129 140 177
Weighted Average for and Approache S Bound Roadw Item Span 1 2 3 4 5 6	Length 52.0 92.4 99.5 57.7	Traffic O.W.P. 128 143 179 161	I.W.P. 130 138 175 191	Passin	g Lane	Average 129 140 177 176
Weighted Average for and Approache S Bound Roadw Item Span 1 2 3 4 5 6 Weighted Average for	Length 52.0 92.4 99.5 57.7	Traffic O.W.P. 128 143 179 161	I.W.P. 130 138 175 191	Passin	g Lane	Average 129 140 177 176
Weighted Average for and Approache S Bound Roadw Item Span 1 2 3 4 5 6 Weighted Average for Approach	Length 52.0 92.4 99.5 57.7 Bridge	Traffic O.W.P. 128 143 179 161	I.W.P. 130 138 175 191	Passin	g Lane	Average 129 140 177 176
Weighted Average for and Approache S Bound Roadw Item Span 1 2 3 4 5 6 Weighted Average for Approach Approach Weighted Average for and Approache	Length 52.0 92.4 99.5 57.7 Bridge Bridge	Traffic O.W.P. 128 143 179 161	I.W.P. 130 138 175 191	Passin O.W.P.	g Lane I.W.P.	Average 129 140 177 176

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Bridge No. S04 of 77111	Location	St. Cla	ir Highway	over I 94		
Date Measured 8-26-64				ngth (includi	ng approache	es) <u>517.0</u>
Dual Structures (separate				No X		
Single Structure Yes X	No	Method o	of Finishing	Machine_		
E_Bound Roadwa	.y	District	9			
	Control and Control of	Profilo	meter Rou	ghness Value	- R inches	per mile
Item	Length	Traffic	Lane	Passing Lane		Augrana
		O.W.P.	I.W.P.	O.W.P.	I. W. P.	Average
Span 1	54.0	84	111			98
2	105.0	115	131			123
3	104.0	128	139			134
4	54.0	147	162			154
5						
6						
Weighted Average for	Bridge	119	135			127
W Approach	100.0	64	62			63
E Approach	100.0	68	79			73
Weighted Average for and Approaches		99	110			104
W_ Bound Roadw		eelleen teen teen teen teen teen teen te	Минуль-типопология поструктов на поструктов на поструктов на поструктов на поструктов на поструктов на пострукт	иссий постольный удо-ифента в на сень не техностина с	all de Section de Section de La Section de L	М - ««——————————————————————————————————
egyppossagus sa mana mana mana mitih Albaha iliza di zigi di zigi yep popus a mana manaka kamilika di kizi zigi ya ku zi yep popus a mana manaka kamilika di kizi zigi ya ku zi yep popus a mana manaka kamilika di kizi zigi ya ku zi yep popus a mana manaka kamilika di kizi zigi ya ku zi yep popus a mana manaka kamilika di kizi zigi ya ku zi yep popus a mana manaka kamilika di kizi zigi ya ku zi yep popus a mana manaka kamilika di kizi zi yep popus a mana manaka kamilika di kizi zi yep popus a manaka kamilika kamilik		Profile	meter Rou	ghness Value	e - R inches	per mile
Item	Length	Traffi	c Lane	Passir	g Lane	de de la
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	54.0	99	75			87
2	105.0	134	110			122
3	104.0	111	81			96
4	54.0	154	137			146
5						
6						
Weighted Average for	Bridge	124	99			112
W Approach	100.0	53	49			51
E Approach	100.0	95	93			94
Weighted Average for and Approache		104	88			96
Remarks <u>Spans and jo</u> Steel Expansion.	oints numbere	d from Wes	t to East.	Joint #1, 3,	5 - Constru	ction; #2, 4 -
Concrete app	oroaches.				· · · · · · · · · · · · · · · · · · ·	

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Bridge No. S05 of 77111	Location	Palms Ro	l over I 94			
Date Measured 7-9-64	Number	of Spans4	Lei	ngth (includi	ng approach	es) <u>333.0</u>
Dual Structures (separate	for each road	way) Y	es 🔲	No x		
Single Structure Yes 🗵	No 🗌	Method o	of Finishing	<u>Machine</u>	-	······································
S Bound Roadwa	ıy	District	9			
		Profile	meter Rou	ghness Value	- R inches	per mile
Item	Length	Traffic	Lane	Passin	g Lane	Average
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	1110100
Span 1	71.0	130	191			160
2	90.6	207	202			204
3	91.0	234	199			216
4	70.4	174	177			176
5						
6						
Weighted Average for	Bridge	190	193			192
S Approach	50.0	112	125			118
N Approach	50.0	132	116	-		124
Weighted Average for and Approaches	-	174	176			175
N Bound Roadw	ay					
		Profile	meter Roug	ghness Value	- R inches	per mile
Item	Length	Traffic	c Lane	Passin	g Lane	A
		O.W.P.	I.W.P.	O, W. P.	I.W.P.	Average
Span 1	71.0	157	176			166
2	90.6	177	171			174
3	91.0	200	214			207
4	70.4	175	178			176
5						
6						
Weighted Average for	Bridge	179	186			182
S Approach	50.0	111	119			115
N Approach	50.0	118	107		The state of the s	112
Weighted Average for and Approaches	~	163	168			166
Remarks <u>Spans and Joints</u> <u>Steel Expansion; #3 - Exp</u> <u>Bituminous appr</u>	ansion.	om South to		`.	onstruction	-34

Concrete approaches.

Cracks on deck filled with Apoxy-Resin.

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

	~	District		4		Form 1011
Bridge No. S06 of 77111						. 506 4
Date Measured 7-10-64				downstrakelije (CD)	ng approach	es) <u>586.4</u>
Dual Structures (separate	for each road		es	No X		
Single Structure Yes 🗴	Sandara d			<u> Machine</u>		
E Bound Roadwa	ıy	District	, 9			
772		Profile	meter Rou	ghness Value	- R inches	per mile
Item	Length	Traffi	c Lane	Passin	g Lane	
2.0		O.W.P.	I.W.P.	O, W. P.	I.W.P.	Average
Span 1	57.5	246	203			224
2	116.6	193	183			188
3	39.6	102	86			94
4	115.4	274	244	<u> </u>		259
5	57.4	248	174			211
6						
Weighted Average for	Bridge	224	193			208
W Approach	100.0	125	77			101
E Approach	100.0	113	72			92
Weighted Average for and Approaches	-	188	152		THE RESERVENCE AND THE PROPERTY OF THE PROPERT	170
W Bound Roadw	ay					
		Profile	ometer Rou	ghness Value	e - R inches	per mile
Item	Length	Traffi	c Lane	Passin	g Lane	nay manusina na manana manana manana manana na manana na manana manana manana manana manana manana manana mana
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	57.5	202	201			202
2	116.6	262	219			240
3	39.6	100	89			94
4	115.4	169	219			194
5	57.4	179	191			185
6						
Weighted Average for	Bridge	196	199			198
W Approach	100.0	94	84			89
E Approach	100.0	97	92			94
Weighted Average for and Approache	Bridge	162	161			162
Remarks Spans and Join	ts numbered		o East. Jo	int #1,2,3,7	,8,11,12,13	B – Expansion:

Cantilevered Construction.

-35-

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Bridge No. <u>S08 of 77111</u>	Location	Rattle Ru	ın Ra over 1	94		
Date Measured 7-10-64	Number	of Spans	<u>4</u> Ler	ngth (includi	ng approach	es) <u>219.6</u>
Dual Structures (separate i	for each road	way) Y	es 🗌	No x		
Single Structure Yes X	No 🚺	Method	of Finishing	<u> Machine</u>		
W Bound Roadwa	у	District	; 9			
Committee Commit	apampa manga manggapan mendendadahan dadak dadak dadak dadak dadak dadak dari dadak dari dadak dari dadak dada	Profile	meter Roug	shness Value	- R inches	per mile
Item	Length	Traffi	c Lane	Passin	g Lane	
		O.W.P.	I.W.P.	O. W. P.	I.W.P.	Average
Span 1	36.6	119	110			114
2	73.3	158	135			146
3 .	72.5	180	123			151
4	37.2	163	100			132
5						
6		,				
Weighted Average for	Bridge	162	122			142
Approach						
Approach						-
Weighted Average for and Approaches						
E Bound Roadwa	ay					
		Profile	ometer Rou	ghness Value	- R inches	per mile
Item	Length	Traffic Lane		Passin	Passing Lane	
	_	O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	36.6	96	67			81
2	73.3	184	125			154
3	72,5	119	119			119
4	37.2	179	108			144
5						
6					ĺ	
Weighted Average for	Bridge	148	113			130
Approach					<u> </u>	
Approach						
Weighted Average for and Approaches	-					
Remarks Spans and Join	ts numbered	from West 1	to East. Jo	int #1, 3 - S	teel Expans	ion; #2 -
Expansion.	ahoa					
Gravel approa					" "	-36-
Cantine vereu C	OTTO OT MODITALI.					

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

ngle Structure Yes X E Bound Roadw	and decompositely	Distric	t 7			
V # (V # V # V # V # V # V # V # V # V #		Profil	ometer Rou	ghness Value	e - R inches	s per mile
Item	Length	Traffi	c Lane	Passin	g Lane	Arronomo
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	38,6	153	223			188
2	73.6	118	123			120
3	73.6	108	113			110
4	34.8	228	196			212
5						
6						
Weighted Average for	Bridge	133	142			138
Approach	90-000-000-000-000					
Thhroacu			<u> </u>		J	
Approach						
	•	· ·				
Approach Weighted Average for	S					
Approach Weighted Average for and Approache	S	Profil	ometer Rou	ghness Value	e - R inches	s per mile
Approach Weighted Average for and Approache	S	n=	ometer Rou		e - R inches	
Approach Weighted Average for and Approache W Bound Roady	yay	n=	X			
Approach Weighted Average for and Approache W Bound Roady	yay	Traffi	c Lane	Passin	g Lane	
Approach Weighted Average for and Approache W Bound Roadw	/ay Length	Traffi	c Lane	Passin	g Lane	Average
Approach Weighted Average for and Approache W Bound Roadw Item Span 1	Length	Traffi O.W.P.	I.W.P.	Passin	g Lane	Average
Approach Weighted Average for and Approache W Bound Roadv Item Span 1	Length 38.6	Traffi O.W.P. 133 84	I.W.P. 151 93	Passin	g Lane	Average
Approach Weighted Average for and Approache W Bound Roady Item Span 1 2 3	Length 38.6 73.6 73.6	Traffi O.W.P. 133 84 84	Lane I.W.P. 151 93 90	Passin	g Lane	Average 142 88 87
Approach Weighted Average for and Approache W Bound Roadw Item Span 1 2 3 4	Length 38.6 73.6 73.6	Traffi O.W.P. 133 84 84	Lane I.W.P. 151 93 90	Passin	g Lane	Average 142 88 87
Approach Weighted Average for and Approache W Bound Roady Item Span 1 2 3 4 5	Length 38.6 73.6 73.6 34.8	Traffi O.W.P. 133 84 84	Lane I.W.P. 151 93 90	Passin	g Lane	Average 142 88 87
Approach Weighted Average for and Approache W Bound Roadw Item Span 1 2 3 4 5 6	Length 38.6 73.6 73.6 34.8	Traffi O.W.P. 133 84 84 234	Lane I.W.P. 151 93 90 175	Passin	g Lane	Average 142 88 87 204
Approach Weighted Average for and Approache W Bound Roady Item Span 1 2 3 4 5 6 Weighted Average for	Length 38.6 73.6 73.6 34.8	Traffi O.W.P. 133 84 84 234	Lane I.W.P. 151 93 90 175	Passin	g Lane	Average 142 88 87 204

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Farm	1	n	1	

Bridge No. <u>\$02 of 80012</u>	Location	1 <u>I 96 o</u> v	ver 32nd Av	enue		7 (11)
Date Measured 9-8-64					ng approach	es) <u>208.6</u>
Dual Structures (separate				No 🔲		
Single Structure Yes	No X	Method	of Finishing	g <u>Machin</u>	<u> </u>	
N Bound Roadwa		District	7			
		Profile	ometer Rou	ghness Value	e - R inches	per mile
Item	Length	Traffi	c Lane	Passin	g Lane	A
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	33.5	145	126	108	85	116
2	41.6	76	65	59	49	62
3	33.5	97	91	96	104	97
4						
5						
6						
Weighted Average for	Bridge	104	92	86	77	90
S Approach	50.0	82	115	114	74	96
N Approach	50.0	101	93	104	96	98
Weighted Average for and Approaches	•					
S Bound Roadw			denomina sirra arra arra arra de est	ber [©] erraturi kan er kulentu — komunaturan antara	A CONTRACTOR OF THE PROPERTY O	exm2-2-4
Dottilu Roadw	ay I	D 6:1-		.1	13 · 1	<u> </u>
				ghness Value		per mile
Item	Length	Traffic	c Lane	Passin	g Lane	Average
ac-pressure and a second a second and a second a second and a second a second and a second and a second and a		O, W. P.	I.W.P.	O.W.P.	I.W.P.	11,000
Span 1	33.5	96	114	119	101	108
2	41.6	52	64	62	90	67
3	33.5	76	84	111	84	89
4						
5						
6						
Weighted Average for	Bridge	73	86	95	92	86
S Approach	50.0	148	150	102	92	123
N Approach	50.0	110	105	129	93	109
Weighted Average for and Approaches	Bridge	100	106	104	92	100
Remarks Spans and joint Expansion. Thick, narro						on; #2, 3 - y only)38-

Bituminous Approaches.

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Bridge No. <u>S03 of 80012</u>	Location	I 96 ove	r 20th Aven	ue		
Date Measured 9-10-64	Number	of Spans	Lei	ngth (includi	ng approach	es)
Dual Structures (separate			emmunolon.	No [
Single Structure Yes	No X	Method o	of Finishing	S <u>Hand</u>	· · · · · · · · · · · · · · · · · · ·	
N Bound Roadwa	y	District	7			
, manufacture and the second s	222	Profile	meter Rou	ghness Value	- R inches	per mile
Item	Length	Traffic	c Lane	Passin	g Lane	Average
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	34.3	79	126	124	82	103
2	42.9	64	81	76	89	78
3	34.3	95	87	109	135	106
4	·					
5						
6						
Weighted Average for	Bridge	78	97	101	101	94
S Approach	50.0	102	120	116	112	112
N Approach	50.0	99	89	99	132	105
Weighted Average for and Approaches	_	89	100	104	111	101
S Bound Roadw	ay	ший на при н				
		Profile	ometer Rou	ghness Value	- R inches	per mile
Item	Length	Traffi	c Lane	Passing Lane		A
	·	O.W.P.	I.W.P.	O, W. P.	I.W.P.	Average
Span 1	34, 3	159	84	101	141	121
2	42.9	114	69	110	97	98
3	34.3	108	119	130	164	130
4					·	
5						
6						
Weighted Average for	Bridge	126	89	113	131	115
S Approach	50.0	73	63	95	106	84
N Approach	50.0	81	57	65	83	72
Weighted Average for and Approache	_	103	75	98	114	98
Remarks <u>Spans and jo</u> Expansion.	ints numbere	d from Sout	h to North.	Joint #1, 4	- Construct	ion; #2, 3 -
	approaches.	·····				

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Bridge No. S01 of 80013						9977 /
Date Measured 9-24-64	Number			the state of the s	ng approach	es) <u>337.4</u>
Dual Structures (separate i	or each road	<i>5</i>	Choice and the Control of the Contro	No X	3	
Single Structure Yes X	No [of Finishing	Hand	<u></u>	,
EB Bound Roadwa	У	District	. 7			
		Profilo	meter Roug	ghness Value	- R inches	per mile
Item	Length	Traffic	Lane	Passin	g Lane	Average
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	TA OT 020
Span 1	39.9	154	130			142
2	77.1	123	92			107
3	78.1	57	44			50
4	42.3	83	49			71
5						
6						
Weighted Average for	Bridge	99	77			88
W Approach	50.0	107	124			116
E Approach	50.0	82	72			77
Weighted Average for and Approaches	-	98	83			90
WB Bound Roadwa	ay	nolijina menemenene enemene verde karalija i	1			
·		Profile	meter Rou	ghness Value	e - R inches	per mile
Item	Length	Traffic Lane		Passing Lane		Avionomo
		O.W.P.	I.W.P.	O.W.P.	I. W. P.	Average
Span 1	39.9	210	152			181
2	77.1	107	103			105
3	78.1	83	93			88
4	42.3	162	104			133
5	<u></u>					
6						
Weighted Average for	Bridge	126	108			117
W Approach	50.0	134	84			104
E Approach	50.0	165	126			146
Weighted Average for and Approaches		133	107			120
Remarks Spans and Joints Expansion; #3 - Steel Exp		om West to	East. Join	it #1, 5 - Co	nstruction;	#2,4-
Bituminous approach						

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Form	1011	

Bridge No. S02 of 80013	Location	n <u>Phoenix</u>	Avenue ov	er I 96		
Date Measured 9-30-64	Number	of Spans	Le	ngth (includi	ng approac	hes) <u>338.</u> 6
Oual Structures (separate	for each road	iway)	Zes 🔲	No X		
ingle Structure Yes X	No 🗌	Method	of Finishing	Hand		
EBound Roadw	ay	District				
		Profile	ometer Rou	ghness Value	e - R inche:	s per mile
Item	Length	Traffi	c Lane	Passir	g Lane	Average
- Walland		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	38.6	110	70			90
2	81.2	61	61		·	61
3	80.2	50	55			52
4	38.6	128	89			108
5						
6						
Weighted Average for	Bridge	76	65			70
W Approach	50.0	129	70			100
E Approach	50.0	113	85			99
Weighted Average for and Approache	_	89	69		ger skiftighen	79
W Bound Roadw	ay					
		Profile	meter Rou	ghness Value	- R inches	s per mile
Item	Length	Traffic	c Lane	Passin	g Lane	**************************************
		O.W.P.	I.W.P.	O.W.P.	I. W. P.	Average
Span 1	38.6	94	59			76
2	81.2	65	68			66
3	80.2	88	65			76
4	38.6	85	104			94
5						
· 6						
Weighted Average for	Bridge	81	71			76
W Approach	50.0	146	93			120
E Approach	50.0	100	99			100
Weighted Average for and Approache	_	93	79			86
emarks <u>Spans and Joi</u> Expansion; #3 – Ste Bituminous Approac	_		to East. Jo	oint #1, 5 - 0	Constructio	n; #2, 4 -

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Bridge No. <u>\$04 of 80013</u>	Location	M 140 c	over I 96			
Date Measured 9-29-64	Number	of Spans	Ler	ngth (includi	ng approach	es) <u>584.3</u>
Dual Structures (separate	for each road	way) Y	es 🔲	No X		
Single Structure Yes X	No	Method (of Finishing	Hand		
S Bound Roadwa	y	District				
woodstagesterrapertranstation immediaterrapertra	**************************************	Profile	meter Roug	ghness Value	e - R inches	per mile
Item	Length	Traffic	c Lane	Passin	g Lane	A
		O.W.P.	I. W. P.	O, W. P.	I.W,P.	Average
Span 1	80.3	85	82			84
2	114.4	119	87			103
3	112.6	120	139			130
4	77.0	107	113			110
5						
6	4444					
Weighted Average for	Bridge	110	106			108
S Approach	100.0	70	73			72
N Approach	100.0	109	112			110
Weighted Average for and Approaches	_	103	102			102
7.1			1		1	<u> </u>
N Bound Roadwa			Annual Annua	and the second s	destribution and the second processing an appropriate group of the second second second second second second se	
Control of the Contro		Profile	ometer Rou	chness Value	e - R inches	per mile
Control of the Contro			ometer Roug		e - R inches g Lane	
N Bound Roadwa	ay					per mile Average
N Bound Roadwa	ay	Traffic	c Lane	Passin	g Lane	
N Bound Roadwa	Length	Traffic	Lane I.W.P.	Passin	g Lane	Average
N Bound Roadwa Item Span 1	Length	Traffic O.W.P.	I.W.P.	Passin	g Lane	Average
N Bound Roadwa Item Span 1	Length 80, 3 114, 4	Traffic O.W.P. 162 138	I.W.P. 137 108	Passin	g Lane	Average 150 123
N Bound Roadwa Item Span 1 2 3	80, 3 114, 4 112, 6	Traffic O.W.P. 162 138 128	I.W.P. 137 108 132	Passin	g Lane	Average 150 123 130
N Bound Roadwa Item Span 1 2 3 4	80, 3 114, 4 112, 6	Traffic O.W.P. 162 138 128	I.W.P. 137 108 132	Passin	g Lane	Average 150 123 130
N Bound Roadwa Item Span 1 2 3 4 5	80, 3 114, 4 112, 6 77, 0	Traffic O.W.P. 162 138 128	I.W.P. 137 108 132	Passin	g Lane	Average 150 123 130
Item Span 1 2 3 4 5 6	80, 3 114, 4 112, 6 77, 0	Traffic O.W.P. 162 138 128 124	I.W.P. 137 108 132 130	Passin	g Lane	Average 150 123 130 127
Item Span 1 2 3 4 5 6 Weighted Average for	80,3 114,4 112,6 77.0	Traffic O.W.P. 162 138 128 124	I. W. P. 137 108 132 130	Passin	g Lane	Average 150 123 130 127
Item Span 1 2 3 4 5 6 Weighted Average for S Approach	80, 3 114, 4 112, 6 77, 0 Bridge 100, 0 100, 0 Bridge	Traffic O.W.P. 162 138 128 124 137 88	1. W. P. 137 108 132 130 125 78	Passin	g Lane	Average 150 123 130 127 131 83
Item Span 1 2 3 4 5 6 Weighted Average for S Approach N Approach Weighted Average for	80, 3 114, 4 112, 6 77, 0 Bridge 100, 0 100, 0 Bridge	Traffic O.W.P. 162 138 128 124 137 88 74	1. W. P. 137 108 132 130 125 78 67 107	Passin O.W.P.	g Lane I. W. P.	150 123 130 127 131 83 70
Item Span 1 2 3 4 5 6 Weighted Average for g Approach N Approach Weighted Average for and Approaches	Length 80, 3 114, 4 112, 6 77, 0 Bridge 100, 0 100, 0 Bridge sts numbered	Traffic O.W.P. 162 138 128 124 137 88 74 118	1. W. P. 137 108 132 130 125 78 67 107	Passin O.W.P.	g Lane I. W. P.	150 123 130 127 131 83 70

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Bridge No. X01 of 80013	Location	I 96 over	NYC RR & I	Black River		1 Om 101
Date Measured 9-11-64					ng approach	es) <u>537.0</u>
Oual Structures (separate f			-	No		
Single Structure Yes	No X	Method o	of Finishing	Hand	<u>d</u>	
N Bound Roadwa	Commission	District	7			
The Chairlein is named a paper oppose and the Spirit Chairlein Cha		Profile	meter Roug	hness Value	e - R inches	per mile
Item	Length	Traffi	c Lane	Passin	g Lane	A
		O.W.P.	I.W.P.	O. W. P.	I.W.P.	Average
Span 1	76.4	115	97	156	189	139
2	86.7	186	152	110	103	138
3	87.2	111	132	148	129	130
4	86.7	146	141	110	130	132
5						
6						
Weighted Average for	Bridge	140	132	130	136	135
S Approach	100.0	74	79	76	92	80
N Approach	100.0	89	92	87.	96	91
Weighted Average for and Approaches	-	118	114	115	120	117

S	Bound	Roadway

		Profilometer Roughness Value - R inches per mile				
Item	Length	Traffic Lane		Passing Lane		A
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	76.4	101	104	137	140	120
2	86.7	118	140	101	83	110
3	87.2	141	146	109	101	124
4	86.7	102	114	149	140	126
5						
6						
Weighted Average for	Weighted Average for Bridge		127	124	115	120
S Approach	100.0	83	102	79	83	87
N Approach	100.0	174	172	181	188	179
Weighted Average for Bridge and Approaches		121	131	126	123	125

Remarks Spans and Joints numbered from South to North. Joint #1, 2, 5, 6, 8, 9, and 10 -Expansion; #3, 7 - Construction; #4 - Steel Expansion.

Concrete approaches.

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Form 1011

1

Bridge No. <u>S24 of 82251</u>							
Date Measured <u>6-24-64</u>	Number	of Spans	<u>4</u> Ler	ngth (includi	ng approach	es) OWP = 511	
Dual Structures (separate	for each road	iway) Y	es 🔲	No X		IWP = 514	
Single Structure Yes x	No 🗌	Method	of Finishing	g <u>Hand</u>			
SBound Roadw	ay	District	10				
, OCT-information recovery country or the representation of the state		Profilometer Roughness Value - R inches per mile					
Item	Length	Traffi	c Lane	Passin	Passing Lane		
		O.W.P.	I, W. P.	O.W.P.	I.W.P.	Average	
Span 1	43.6	172				172	
2	89.6	165				165	
3 .	89,0	138				138	
4	88.8	157				157	
5							
6			***				
Weighted Average for	: Bridge	156				156	
Approach	100.0	96				96	
Approach	100.0	201				201	
Weighted Average for Bridge and Approaches		153				153	
S Bound Roadw	/ay						
		Profilometer Roughness Value - R inches per mile					
Item	Length	Traffic Lane		Passir	Passing Lane		
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average	
Span 1	43.8		163			163	
2	90.4		195			195	
3	92.5		162			162	
4	87.4		143			143	
5			<u> </u>				
6							
Weighted Average for	r Bridge		166			166	
Approach	100.0		133			133	
Approach	100.0		194			194	
Weighted Average for and Approache	_		165			165	
Remarks Spans and Join			o North. Jo	oints #1, 2,	5, 8, 9 - E	spansion;	
#3, 7 - Construction; #4, Concrete Appr		oansion.					
		•	(Con	tinued on ne	xt page)		

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

ridge No. S24 of 82251 rate Measured 6-24-64 rual Structures (separate	Number	of Spans	4 Ler ?es [ngth (includi No 🗶		nes) <u>OWP = 51</u> IWP = 51
ingle Structure Yes x S Bound Roadwa	Co-tomated	Method	of Finishing	Hand		
	Profilometer Roughness Value - R inches pe					
Item	Length	Traffi	Traffic Lane		Passing Lane	
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	44.0			220		220
2	91.0			167		167
3	96.0			128		128
4	87.0			152		152
5						
6						
Weighted Average for	Bridge			158		158
Approach	100.0			151		151
Approach	100.0		CHARLOSAN	139		139
Weighted Average for Bridge and Approaches			Yendood Downley op the Wood of	153		153
S Bound Roadw	ay	** PPINE PARAMETRIAN PRINCIPAL PRINC		-	e General Materials (1992) e de competent de la filipie de la Colombia de accesso que	
		Profile	meter Roug	hness Value	- R inches	s per mile
Item	Length	Traffic Lane		Passing Lane		A
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average
Span 1	44.2				188	188
2	92.0				131	131
3	99.6				111	111
4	85.3				165	165
5						
6						
Weighted Average for Bridge					142	142
Approach	100.0				158	158
Approach	100.0				208	208
Weighted Average for Bridge and Approaches				And the second s	158	158
emarks <u>Bridge built on</u>	curve makin	g wheel paths	s different l	engths.		-45-

PROFILOMETER BRIDGE ROUGHNESS MEASUREMENTS TEST RESULT TABULATION Research Project 61 F-65

Bridge No. (Not State Proj	ect) Location	Bogue S	t. over Red	Cedar Rive	<u>r</u>		
Date Measured 8-18-64						es) <u>274</u>	
Dual Structures (separate		way) Y	es X	No [
Single Structure Yes	gammariani	Method o	of Finishing	Shugart	<u>Longitudina</u>	l Machine	
N Bound Roadwa	CONTRACTOR OF THE PARTY OF THE	District					
. (000000000000000000000000000000000000		Profilometer Roughness Value - R inches per mile					
Item	Length	Traffi	c Lane	Passin	Passing Lane		
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average	
Span 1	58.0	56	50	47	74	57	
2	58.0	99	38	46	59	60	
3	58.0	81	68	42	50	60	
4							
5							
6							
Weighted Average for	Bridge	79	52	45	61	59	
S Approach	50.0	143	144	86	107	120	
N Approach	50.0	103	84	84	148	105	
Weighted Average for Bridge and Approaches		95	74	60	85	78	
S Bound Roadwa	ay						
	Length	Profilometer Roughness Value - R inches per mile					
Item		Traffic Lane		Passing Lane			
		O.W.P.	I.W.P.	O.W.P.	I.W.P.	Average	
Span 1	58.0	40	45	35	56	44	
2	58.0	46	57	49	31	46	
3	58.0	41	36	37	47	40	
4							
5.							
6		ļ					
Weighted Average for Bridge		42	46	40	45	43	
S Approach	50.0	199	127	46	156	132	
N Approach	50.0	187	116	200	269	193	
Weighted Average for and Approaches	-	97	74	70	106	87	
Remarks Spans and joint No joint seal a		rom South to	North. Jo	oint #1, 2, 3	4 - Constr	ruction.	
Bituminous App			······			10	
Special Reques		nt.				-46-	