

Improving the Quality of Element Level Bridge Inspections

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Reporting Part of Research Projects

Indiana, Michigan





Web-Only Document 259:

Guidelines to Improve the Quality of Element-Level Bridge Inspection Data

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> Contractor's Final Report for NO-80P Project 12-104 Butenillard October 2018

The National Assolution of SCENCES - ENGINEERING - MEDICINE (2019/03) Teleprotection Header Sched Manual for Bridge 2





Second Edition, 2019



IMPROVING THE Reliability of Element-Level Inspections

Final Report September 2018

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Goal – NCHRP Improving the quality of element-level data

Objective

Developing guidelines for NHS bridges

Improving consistency



Establishing accuracy requirement





Presentation Objective

Reporting quality of element-level data















Data Collection

Only for TGA





Inspection Form for all participants

Element /Defect #	Element/Defect Name	Tot. Qty.	T.I. at	Condition State Rating			
			Unit	CS1	CS2	CS3	CS4
12	Reinforced Concrete Deck	6090	sq ft				
Comment:							
			-				
510	Wearing Surfaces	5670	sg ft				
Comment:							

No previous inspection report



Tasks at S-BRITE Center





TASKS at S-BRITE Center

1 Tallying individual length/area VS Percentage of the total quantity





2 Area vs Length for Steel Protective Coating



TASKS at S-BRITE Center

Tallying individual Area



80 **OTGA** 70 Ο 60 **×TGB** 0 × × 50 **▲**Actual Damage (%) 8 40 **8**36% 0 30 \cap × Ŏ 20 ×18% 0 8 12% 10 6% 0 Side #1 Side #2 Side #3 Side #4 Web Side No.

Percentage of the Total Area





TASKS at S-BRITE Center



Percentage of Total Length



Web Side No.

Web Side NO.



Inspection Results















Condition State



RC Deck (Sq ft)











Wearing Surface (Sq ft)



PSC Girder (ft)





Condition State







Missouri Inspection Result









RC Deck (Sq ft)



Steel Girder (ft)



Condition State



Inspection Data Quality



INDOT Inspection Results

Element No. and Name	CS	l1 Result (%)		l2 Res	ult (%)
		Mean	COV	Mean	COV
	CS2	4.7	79	9.6	81
12 – RC Deck	CS3	4	94	0.7	118
	CS2+CS3	7.7	<mark>55</mark>	10	76
	CS2	9.2	126	9.2	68
510 – Wearing Surface	CS3	8.4	125	3.8	99
	CS2+CS3	17	95	11	61
407 Onen Steel	CS2	21	120	60	60
107 – Open Steel	CS3	14	98	14	115
Girder/Beam	CS2+CS3	32	94	53	74
	CS2	53	85	47	88
515 – Steel Protective	CS3	7	<mark>142</mark>	4.7	85
Coating	CS4	3	55	2.2	81
	CS3+CS4	7.5	129	5.2	82



MDOT Inspection Results

Element No. and Name	CS	M1/M3 Result (%)		M2/M4 Result (%)	
		Mean	COV	Mean	COV
	CS2	3.2	42	8.1	63
12 – RC Deck	CS3	0.9	120	2.6	112
	CS2+CS3	3.6	54	9.3	60
205 – RC Column	CS2	7.5	40	5.8	45
/£1\	CS3	7	58	3.4	0
(π)	CS2+CS3	10	33	5.7	51
205 – RC Column	CS2	44	76	42	74
	CS3	38	<mark>19</mark>	25	0
	CS2+CS3	49	35	40	74
	CS2	1.2	99	1.2	80
109 – PSC Girder	CS3	2	86	1.8	80
	CS2+3	2.6	106	2.5	72



MoDOT Inspection Results

Element No. and Name	CS	A5/K0 Re	sult (%)	G0 Res	sult (%)
		Mean	COV	Mean	COV
12 – RC Deck	CS2	5	60	13.6	95
	CS3	0.13	0	7.6	75
	CS2+CS3	5	60	20.7	70
510 – Wearing Surface	CS2	50	58	33	128
	CS3	31	106	1.2	179
	CS2+CS3	66	<mark>57</mark>	33.3	126
	CS2	7.2	102	25.5	70
107 – Open Steel	CS3	0.9	<mark>184</mark>	4.4	134
Girder/Beam	CS2+CS3	7.5	103	27.8	63
E4E Steel Drotesting	CS2	5.1	131	24	131
515 - Steel Protective	CS3	1.1	175	3.2	122
Coating	CS2+CS3	5.4	127	26	126







COV

mostly > 50% sometime >100%



Recommendations







Thank you!

