ILLINOIS CERTIFICATION AND RESEARCH TRACK

-A FEW NOTES FROM PUTTING R56 INTO PRACTICE

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ILLINOIS DEPARTMENT OF TRANSPORTATION

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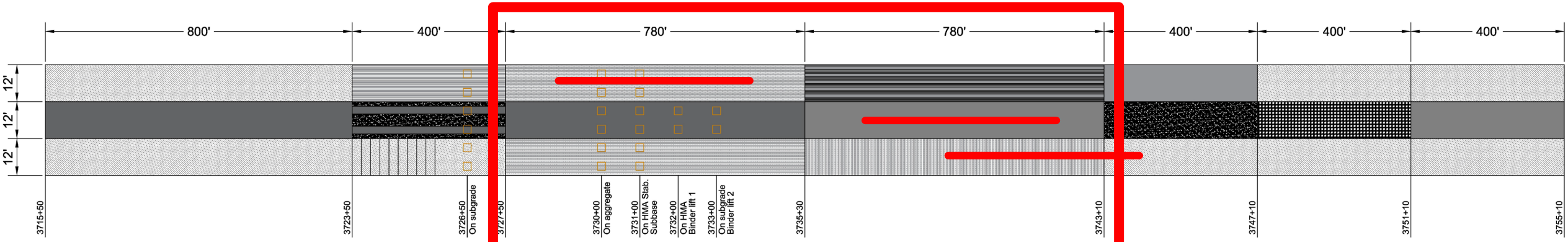
ICART LAYOUT

ILLINOIS CERTIFICATION AND RESEARCH TRACK



8.5" CRCP - Turf Drag Finish	Smooth Finish with Diamond Grooving	Turf Drag Finish w/ Diamond Grooving	Smooth Finish with Diamond Grinding	mooth Finish	Turf Drag Finish	Turf Drag Finish
11.5" 12.5 mm SMA	Artificial Rutting	12.5 mm SMA	9.5 mm Dense Graded HMA	Micro surfacing with 30% Calcined Bauxite & 70% Slag	Single Chip Seal	9.5 mm Dense Graded HMA
8.5" JPCP - Turf Drag Finish	Artificial Faulting	Longitudinal Tining	Transverse Tining	urf Drag Finish	Turf Drag Finish	Turf Drag Finish

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AASHTO R 57

TABLE 1—MEASURING PAVEMENT PROFILE AND REPORTING SMOOTHNESS INDICES FOR QC/QA OF SMOOTHNESS OF NEW CONSTRUCTION

	operational speed at any point during data collection.
3	A lead-in length of roadway of up to 450 ft may be required to stabilize the inertial profiler's filters and achieve the same accuracy in the first 0.1 mile that is achieved through the rest of the job. The presection length is dependent on the filter type, the grade change on entering the test segment, and the accuracy required of the first 0.1 mile of measured pavement. Typically, this presection shall be at least 300 ft in length and located immediately before the section of pavement to be tested. Shorter sections have been used when the physical constraints of the project required it and the other project conditions made it acceptable. Take the inertial profiler measurements on one or more longitudinal lines as specified by the Owner-Agency. If two longitudinal traces are specified, set the sensor path spacing to the values specified by the Owner-Agency. If such is not specified, sensor path spacing shall be between 65 and 71 in. If two longitudinal traces are specified, but the profiling system collects profile data only in one longitudinal path at a time, the longitudinal traces shall be taken in each wheelpath of the lane independently and in the same direction of travel.
4	Preferably collect measurements in the direction of traffic. If this is not practical and data are collected in the other direction, make a

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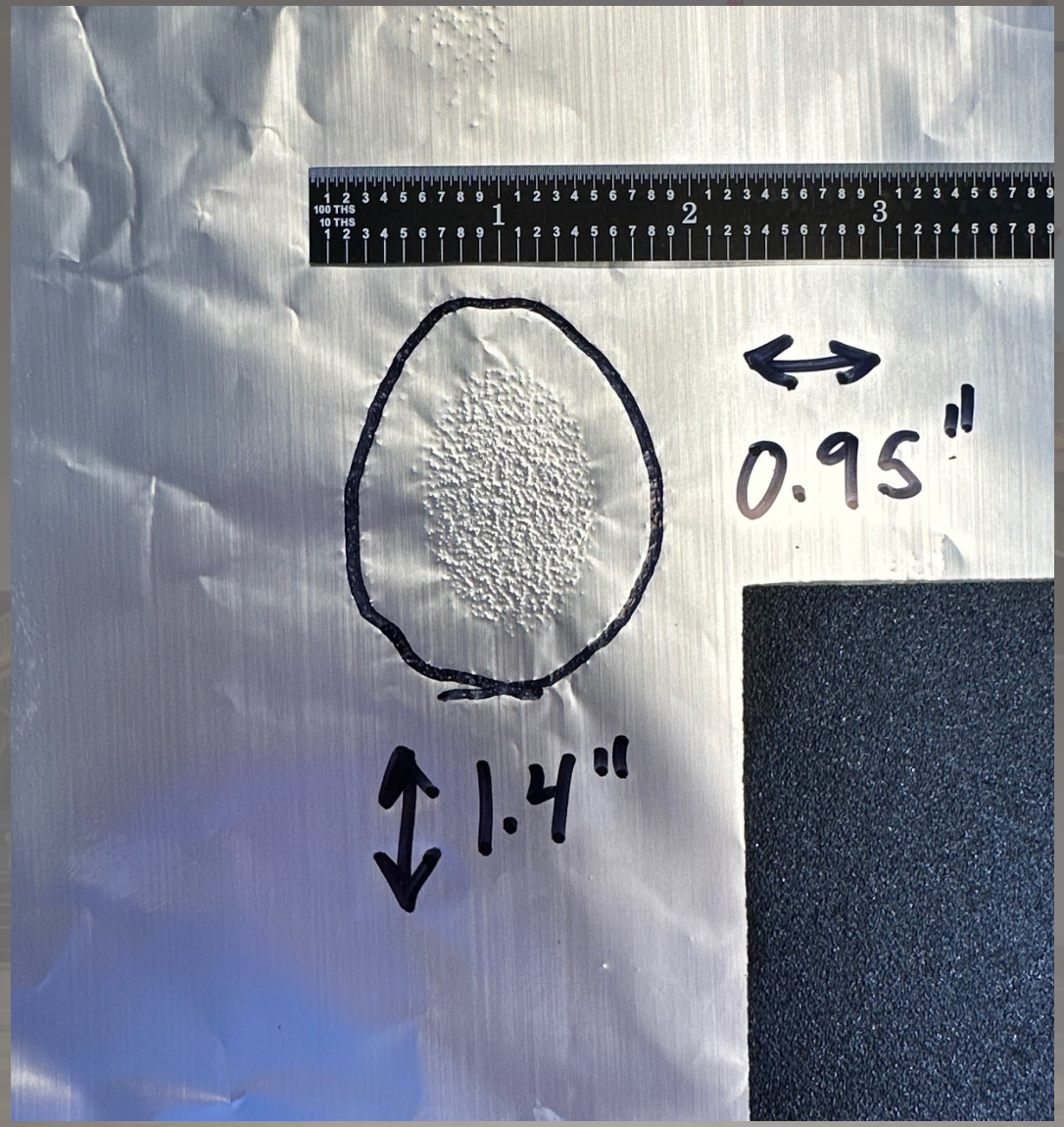
SURPRO TIRE PATCH



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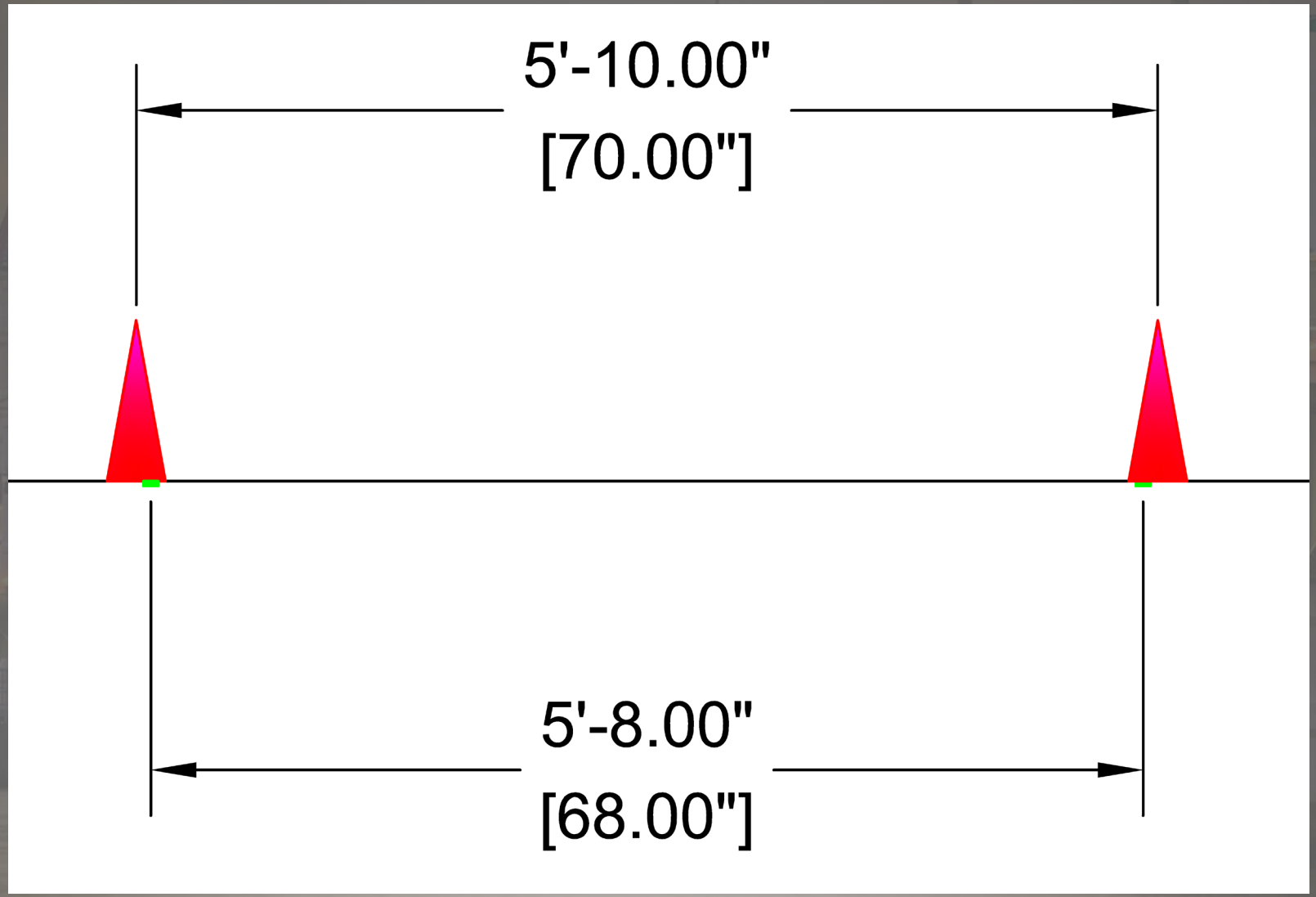
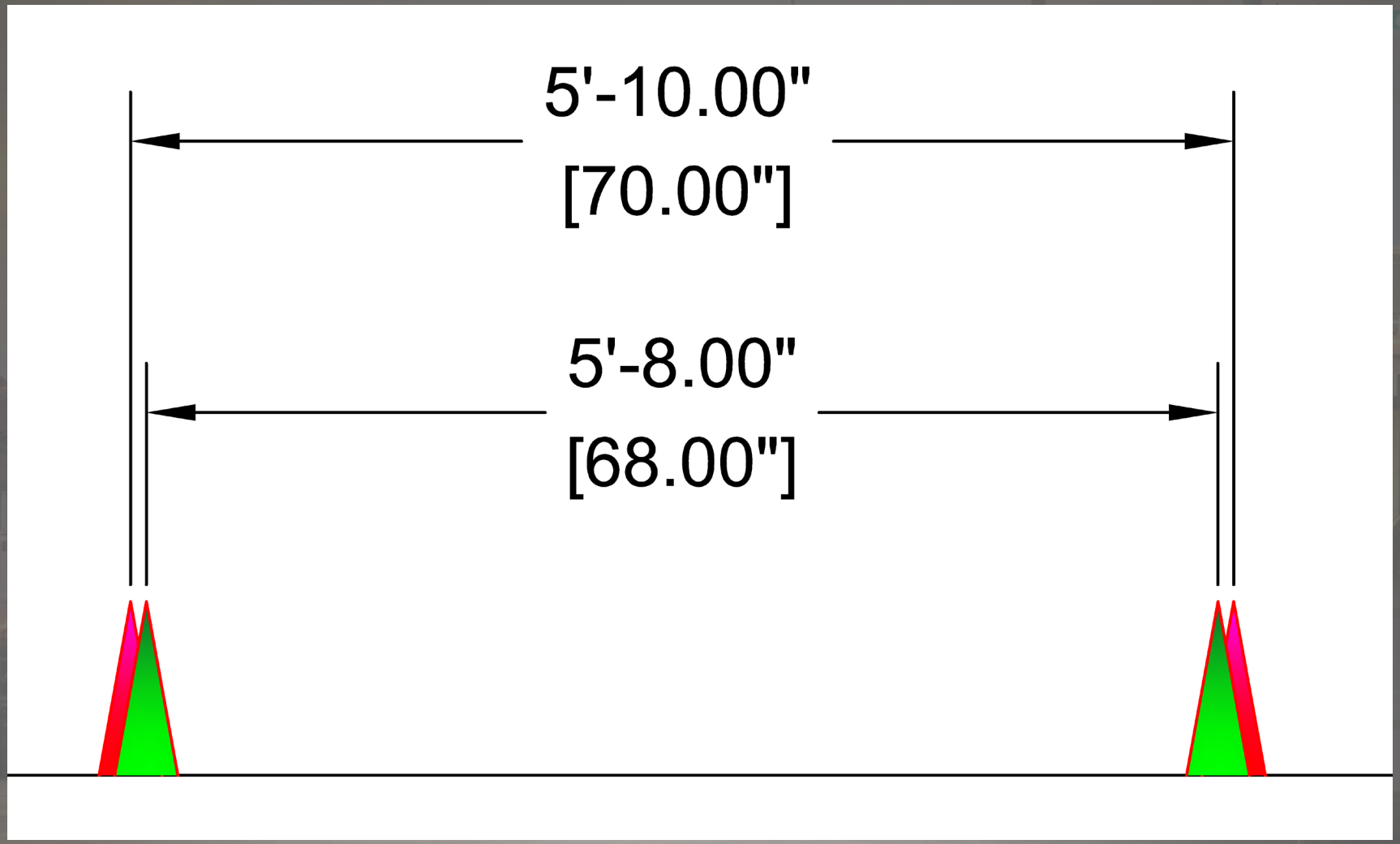
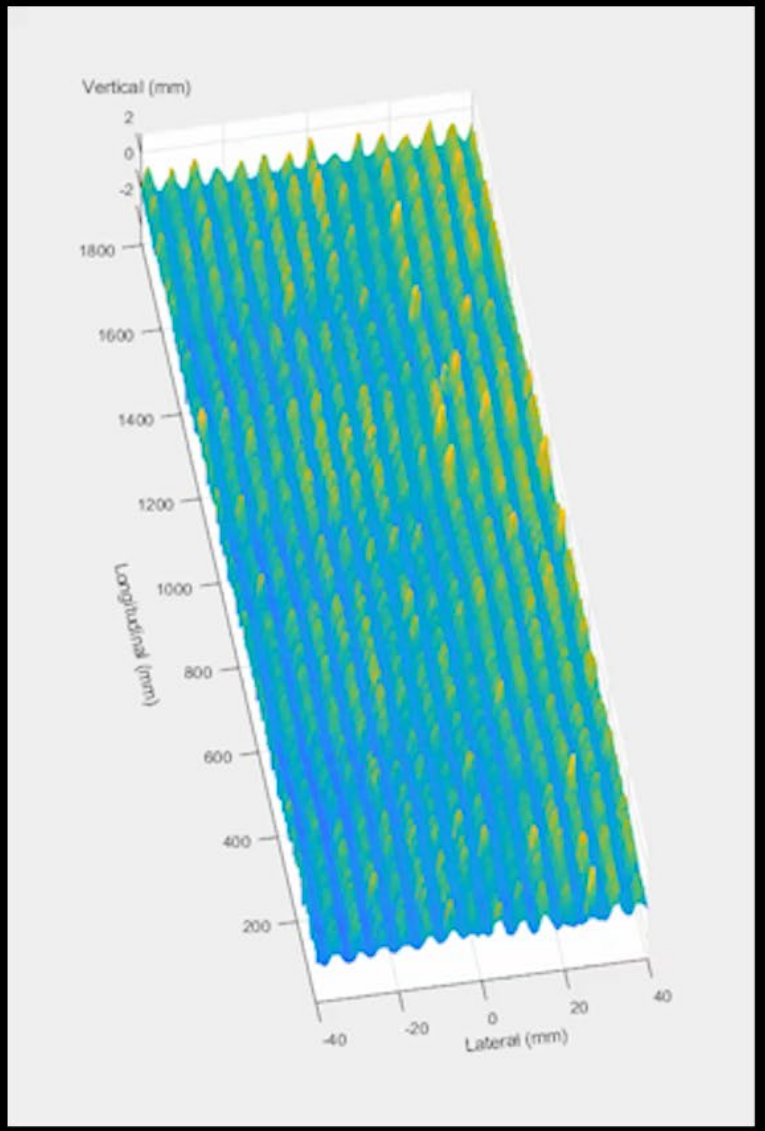
SENSOR SPACING

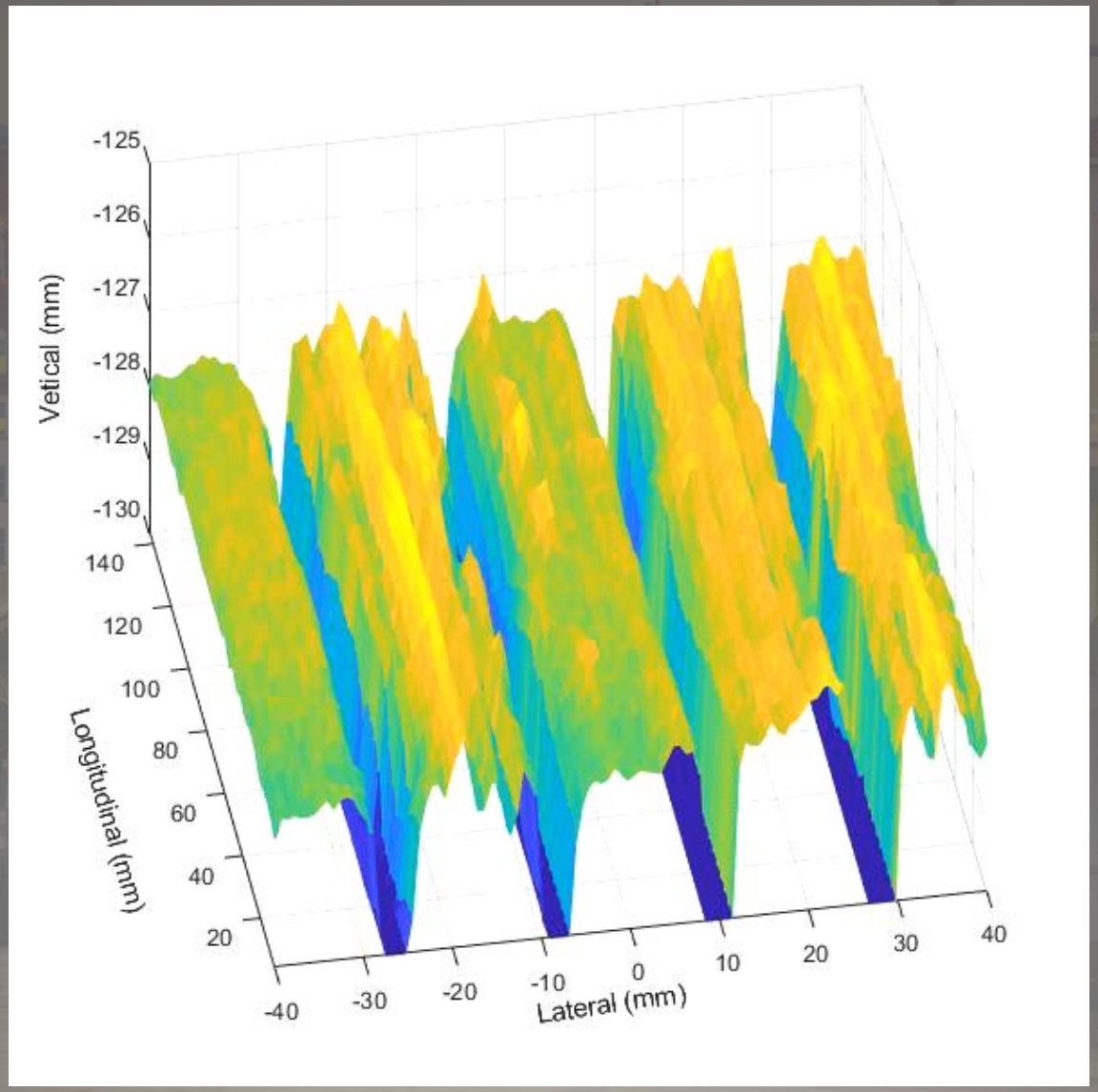


SENSOR SPACING – NEEDED




Vertical (mm)
2
0
-2
1800
1600
1400
1200
1000
800
600
400
200
Longitudinal (mm)
-40
-20
0
20
40
Lateral (mm)

MORE NERDY VIDEOS



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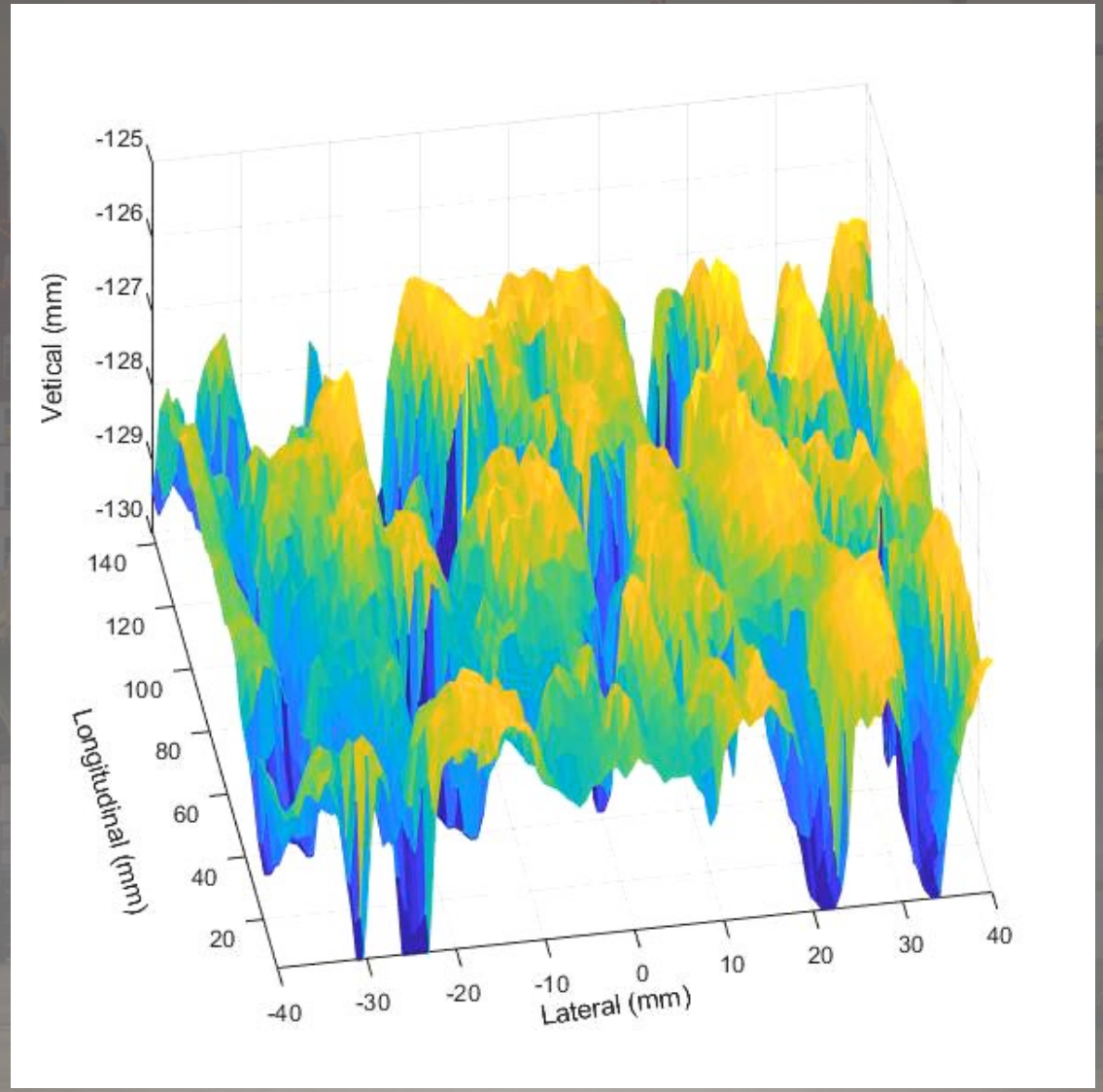
MORE NERDY VIDEOS



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AASHTO R56 CROSS-CORRELATION

8.3.1.10.3. Cross-correlate the two profiles several times by shifting one profile over every possible offset up to 3 ft in either direction. When comparing a profile from a candidate device to the reference device, shift the candidate profile.

8.3.1.10.4. The cross-correlation of the two profiles is the maximum (best) value found over the 6-ft range.

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DMI CERTIFICATION WITH EE

Profiler Certification: Summary Results

Statistics

Statistic	Repeatability - Left	Repeatability - Right	Accuracy - Left	Accuracy - Right
Comparison Count	45	45	10	10
% Passing	100.00	100.00	100.00	100.00
Mean	98.91	99.01	96.70	97.47
Minimum	97.71	98.16	96.11	96.73
Maximum	99.73	99.65	97.34	98.01
Standard Deviation	0.5	0.4	0.4	0.4
Grade	Passed	Passed	Passed	Passed

Accuracy

Run	Left	Right
1	96.41	97.45
2	96.70	97.84
3	96.89	98.01
4	96.88	97.70
5	96.90	97.65
6	96.88	97.37
7	97.34	97.42
8	96.58	97.06
9	96.32	96.73
10	96.11	97.42

Repeatability - Left Correlations (%)

Run	2	3	4	5	6	7	8	9	10
1	99.19	98.74	99.03	98.91	99.28	98.77	97.71	97.94	98.29
2		99.18	99.62	99.57	99.43	99.11	98.39	98.52	98.73
3			99.34	99.35	99.23	99.41	99.27	98.90	98.44
4				99.73	99.49	99.25	98.80	98.68	98.42
5					99.32	99.27	98.99	99.09	98.85
6						99.30	98.58	98.34	98.26
7							98.99	98.61	98.31
8								99.22	98.30
9									98.97

Repeatability - Left Offsets (ft)

Run	2	3	4	5	6	7	8	9	10
1	0.1	0.1	0.2	0.1	0.0	0.0	0.1	0.0	0.1
2		0.0	0.1	0.0	-0.1	-0.1	0.0	-0.1	0.0
3			0.1	0.0	-0.1	-0.2	0.0	-0.1	0.0
4				-0.1	-0.2	-0.2	-0.1	-0.2	-0.1
5					-0.1	-0.1	0.0	-0.1	0.0
6						0.0	0.1	0.0	0.1
7							0.1	0.1	0.2
8								-0.1	0.0
9									0.1

Repeatability - Right Correlations (%)

Run	2	3	4	5	6	7	8	9	10
1	99.27	98.70	99.29	99.29	99.31	99.04	98.47	98.16	98.82
2		99.31	99.57	99.48	99.23	99.05	98.57	98.36	98.87
3			99.21	99.15	98.71	98.74	98.77	98.58	98.83
4				99.65	99.35	99.26	98.91	98.56	98.93
5					99.18	99.20	99.13	99.03	99.38
6						99.60	99.05	98.53	98.53
7							99.24	98.77	98.69
8								99.58	99.01
9									99.28

Repeatability - Right Offsets (ft)

Run	2	3	4	5	6	7	8	9	10
1	0.1	0.1	0.2	0.1	0.0	0.0	0.1	0.0	0.1
2		0.0	0.0	0.0	-0.1	-0.2	0.0	-0.1	0.0
3			0.0	0.0	-0.1	-0.2	0.0	-0.1	0.0
4				-0.1	-0.2	-0.2	-0.1	-0.2	-0.1
5					-0.1	-0.1	0.0	-0.1	0.0
6						0.0	0.1	0.0	0.1
7							0.1	0.1	0.1
8								-0.1	0.0
9									0.1

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DMI CERTIFICATION WITH GPS

Profiler Certification: Summary Results

Statistics

Statistic	Repeatability - Left	Repeatability - Right	Accuracy - Left	Accuracy - Right
Comparison Count	45	45	10	10
% Passing	66.67	68.89	80.00	90.00
Mean	93.32	93.60	92.32	93.32
Minimum	83.51	84.62	88.79	87.78
Maximum	99.33	98.61	95.42	97.26
Standard Deviation	4.3	3.7	2.3	3.2
Grade	Passed	Passed	Passed	Passed

Accuracy

Run	Left	Right
1	95.42	97.15
2	**89.04**	91.31
3	91.85	94.52
4	94.27	96.32
5	93.85	94.49
6	94.58	97.26
7	90.84	90.56
8	**88.79**	**87.78**
9	92.90	93.04
10	91.64	90.81

Repeatability - Left Correlations (%)

Run	2	3	4	5	6	7	8	9	10
1	92.10	95.33	97.93	96.48	98.39	92.67	92.09	95.45	93.73
2		97.85	95.16	**89.23**	**91.09**	**84.70**	**83.51**	**86.47**	**85.96**
3			98.09	**91.77**	93.90	**87.01**	**86.05**	**89.16**	**88.25**
4				94.84	96.01	**89.17**	**88.45**	**91.69**	**90.46**
5					97.84	93.84	93.03	96.11	95.10
6						94.45	93.84	96.86	95.54
7							98.09	98.47	99.33
8								97.10	98.16
9									98.71

Repeatability - Left Offsets (ft)

Run	2	3	4	5	6	7	8	9	10
1	0.2	-0.6	0.2	0.1	-7.2	-6.4	-6.7	-7.0	-6.1
2		-0.6	0.0	-0.1	-7.3	-6.6	-6.9	-7.1	-6.3
3			0.7	0.6	-6.6	-5.9	-6.2	-6.4	-5.7
4				-0.1	-7.3	-6.6	-6.9	-7.0	-6.3
5					-7.2	-6.5	-6.8	-7.0	-6.2
6						0.7	0.4	0.3	1.0
7							-0.3	-0.6	0.3
8								-0.2	0.6
9									0.8

Repeatability - Right Correlations (%)

Run	2	3	4	5	6	7	8	9	10
1	92.34	96.32	98.16	96.38	98.42	92.92	**90.58**	95.18	93.10
2		96.39	94.12	**89.40**	92.04	**86.85**	**84.62**	**87.96**	**86.86**
3			98.21	92.90	95.64	**89.81**	**88.03**	**91.20**	**89.88**
4				95.16	96.86	**90.96**	**89.02**	93.03	**91.19**
5					97.29	94.93	92.25	96.57	95.04
6						94.11	**91.40**	96.07	94.29
7							97.57	98.37	98.61
8								96.31	97.42
9									98.46

Repeatability - Right Offsets (ft)

Run	2	3	4	5	6	7	8	9	10
1	0.2	-0.5	0.2	0.1	-7.1	-6.4	-6.7	-6.9	-6.1
2		-0.6	0.0	-0.2	-7.3	-6.6	-6.9	-7.1	-6.3
3			0.7	0.6	-6.6	-5.9	-6.2	-6.4	-5.7
4				-0.1	-7.3	-6.6	-6.9	-7.0	-6.3
5					-7.2	-6.4	-6.7	-7.0	-6.1
6						0.8	0.5	0.3	1.0
7							-0.3	-0.6	0.3
8								-0.2	0.6
9									0.8

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PAVEMENT TYPE VS SURFACE TEXTURE

- CRCP and JPCP can be Textured in Similar manners
- CRCP is more temperature Stable
- Curling can play a big role in certification scores
- Current Reference Methods take Too Long to collect to Account for changes due to Curling and Warping

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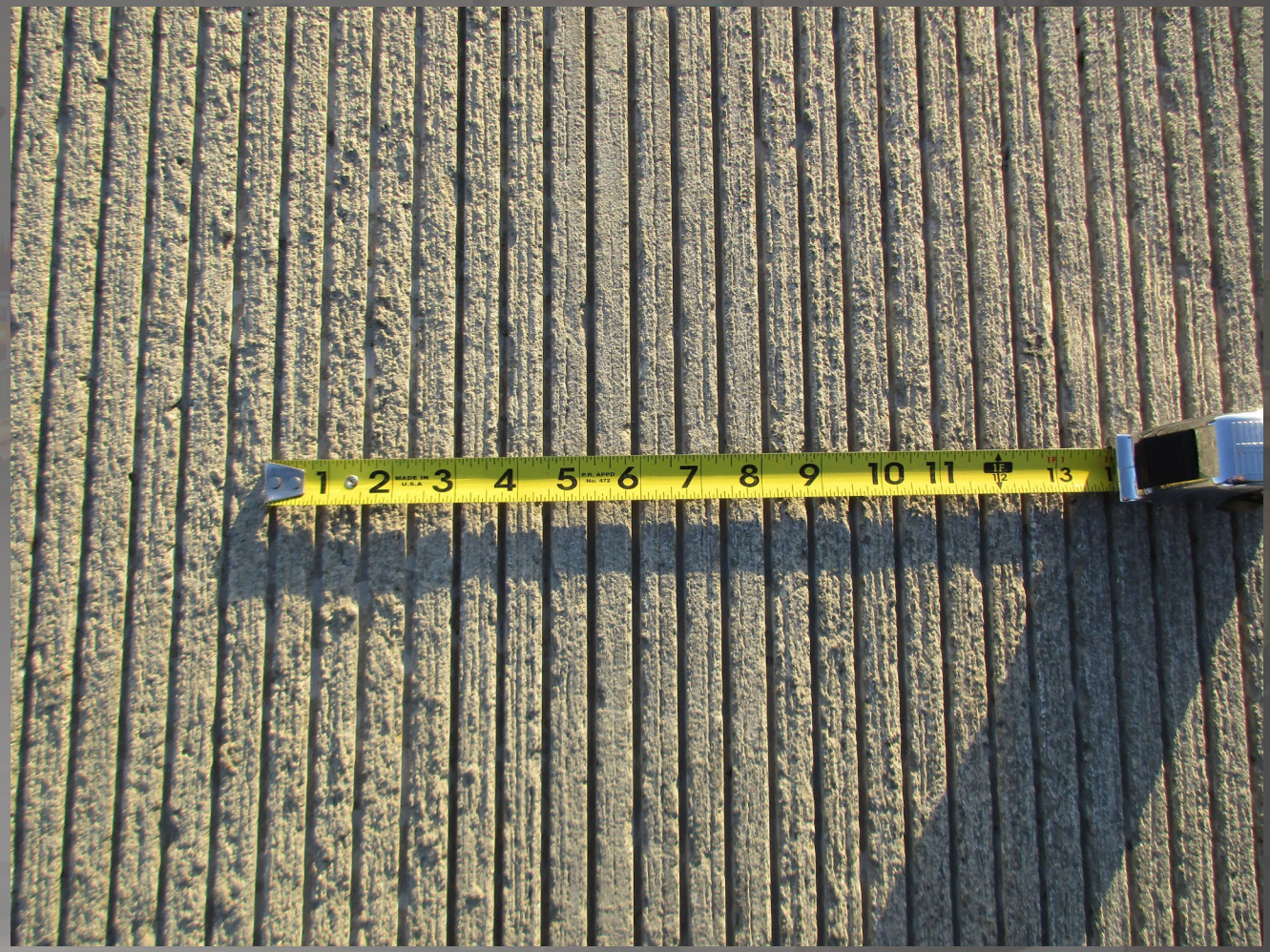
LONGITUDINAL TEXTURE VS 45°

2024 ICART CERTIFICATION REQUIRES

5 PASSES @ 35MPH



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LONGITUDINAL TEXTURE VS 45°

Profiler Certification: Summary Results

Statistics

Statistic	Repeatability - Left	Repeatability - Right	Accuracy - Left	Accuracy - Right
Comparison Count	10	10	5	5
% Passing	0.00	0.00	20.00	0.00
Mean	84.60	80.56	87.87	79.11
Minimum	79.05	71.69	85.52	72.65
Maximum	90.97	85.05	90.15	82.64
Standard Deviation	3.7	4.2	1.7	3.8
Grade	Failed	Failed	Failed	Failed

Accuracy

Run	Left	Right
6	**88.58**	**79.41**
7	90.15	**79.55**
8	**87.95**	**81.28**
9	**87.17**	**72.65**
10	**85.52**	**82.64**

Repeatability - Left Correlations (%)

Run	7	8	9	10
6	**85.33**	**81.67**	**79.05**	**80.97**
7		**89.34**	**86.06**	**83.29**
8			**90.97**	**84.73**
9				**84.54**

Repeatability - Left Offsets (ft)

Run	7	8	9	10
6	0.1	0.1	0.1	0.1
7		-0.1	0.0	0.0
8			0.1	0.1
9				0.0

Repeatability - Right Correlations (%)

Run	7	8	9	10
6	**79.52**	**80.21**	**71.69**	**75.68**
7		**83.73**	**83.57**	**84.32**
8			**85.05**	**80.38**
9				**81.49**

Repeatability - Right Offsets (ft)

Run	7	8	9	10
6	0.0	-0.1	0.0	-0.1
7		-0.1	0.0	-0.1
8			0.1	0.0
9				0.0

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WHY?

Year	# of Contracts	Positive Pay Adjustments	Negative Pay Adjustments	Total
2021	58	$1,663,925.86	$-64,192.90	$1,599,732.96
2022	92	$2,123,884.96	$-30,178.00	$2,093,706.96
2023	TBD	TBD	TBD	TBD

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WHAT'S NEXT?

ProVAL 4.0 Profiler Certification Module

- Decimation
- Interval Adjustment
- Padding
- Upsampling

Equipment Type Testing/Rodeos

- INDOT @ ICART – June 11-13
- IDOT – Later this Fall?

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WHAT'S NEXT FOR ICART?

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WHAT'S NEXT FOR ICART?

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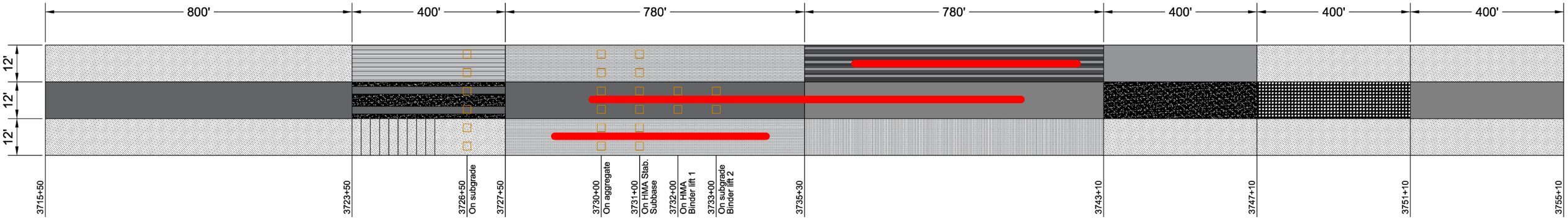

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11.5" 12.5 mm SMA	Artificial Rutting	12.5 mm SMA	9.5 mm Dense Graded HMA	Micro surfacing with 30% Calcined Bauxite & 70% Slag	Single Chip Seal	9.5 mm Dense Graded HMA
8.5" JPCP - Turf Drag Finish	Artificial Faulting	Longitudinal Tining	Transverse Tining	Turf Drag Finish	Turf Drag Finish	Turf Drag Finish

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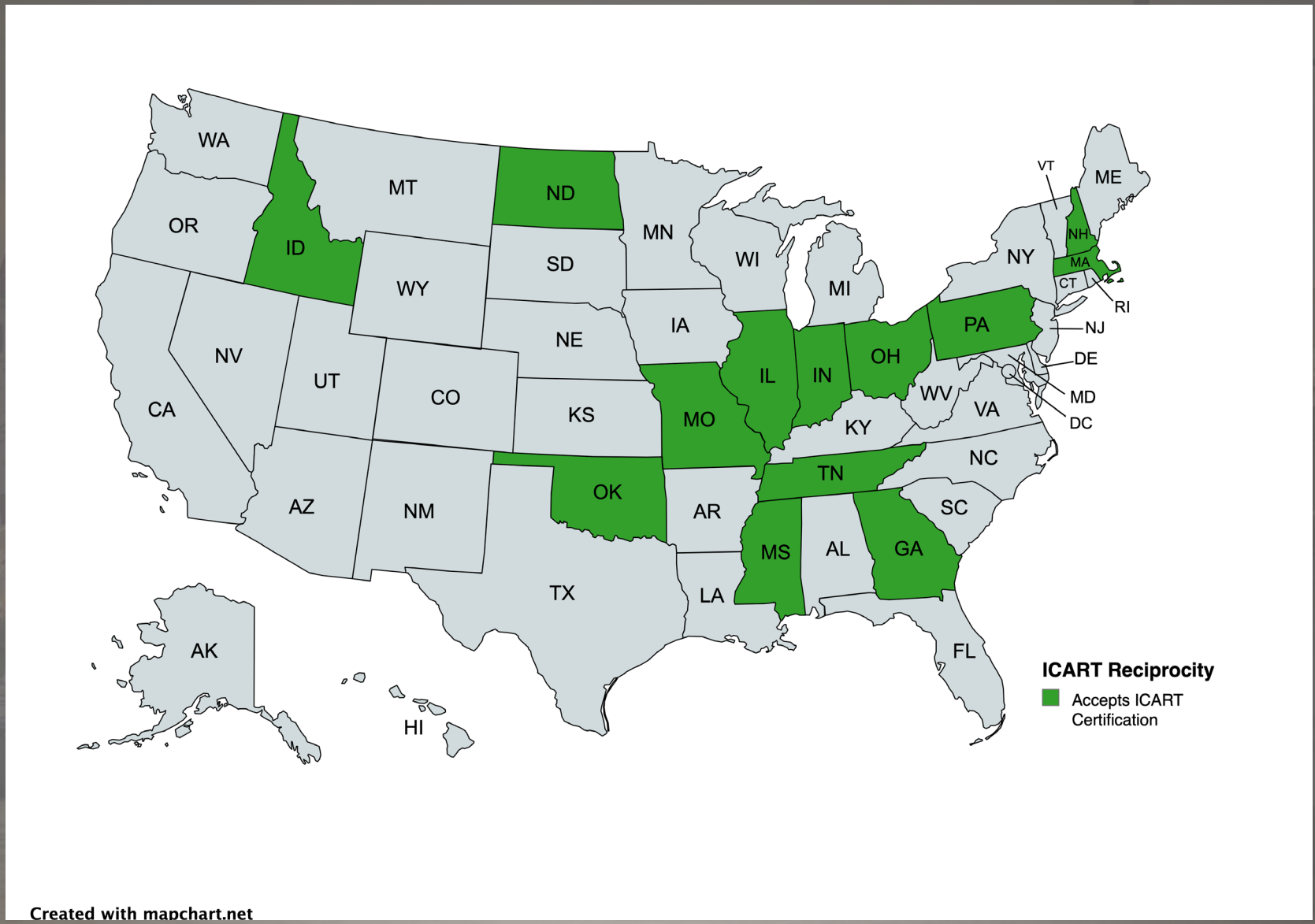
WHAT'S NEXT FOR ICART?



THANK YOU - QUESTIONS

Illinois Department of Transportation

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