

Appendix B: Linn County, IA (57-I380-200)

- ing_57-i380-200_cs56b-ingios01_2022_08_25_174134
- ing_57-i380-200_cs56b-ingios01_2022_08_26_073228
- ing_57-i380-200_cs56b-ingios01_2022_08_26_080109
- ing_57-i380-200_cs56b-ingios01_2022_08_26_085116
- ing_57-i380-200_cs56b-ingios01_2022_08_26_092036
- ing_57-i380-200_cs56b-ingios01_2022_08_26_100736
- ing_57-i380-200_cs56b-ingios01_2022_08_26_120258
- ing_57-i380-200_cs56b-ingios01_2022_08_26_120728
- ing_57-i380-200_cs56b-ingios01_2022_08_26_133014

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_25_174134

Project:	Linn County I-380	Date and Time:	8/25/2022 5:41:34 PM	Machine ID:	Ingios01
Description:	Tower Terrace Road Interchange	Mapping Duration (hrs):	0.032	Operator:	Ingios
Location:	Linn County IA	No. of Measurements:	4067	Machine Operator ID:	582
Review Status:	Review Required	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subgrade Top	Segment:	Ramp C

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	No												
k-value	Yes	0.0	29.1	-0.9	100.0	35.0	37.7	51.7	4.5	11.9	-65.0	-62.3	-48.3
Moisture Content	No												

Mapped Area		Pass Count			Elevation (ft)			Velocity (fps)		
square feet	acres	min.	avg.	max.	min.	avg.	max.	min.	avg.	max.
4067	0.093	1	1.0	1	811.33	812.78	814.50	4.7	5.1	5.4

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade_Class 10 (Sand)_IADOT	22013	100.0	4067	0.093	100.0	3000.0	100.0	20.5

Blobs

parameter	min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv	poly-tol.
k-value	1000.0	1	4067	100.0	none	0.0	4.0

Lift Thickness

25th percentile (in.)	Median (in.)	75th percentile (in.)	Target Value (in.)
0.0	0.0	0.0	6.0

Station

Start	End
1013+50	1019+00

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_25_174134

Project:	Linn County I-380	Date and Time:	8/25/2022 5:41:34 PM	Machine ID:	Ingios01
Description:	Tower Terrace Road Interchange	Mapping Duration (hrs):	0.032	Operator:	Ingios
Location:	Linn County IA	No. of Measurements:	4067	Machine Operator ID:	582
Review Status:	Review Required	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subgrade Top	Segment:	Ramp C

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
29.1	CQI > = 95
0.0	80% of k-Value MVs >= 100
11.9	COV <= 30
100.0	% i-Score Blob Area >= 1000 ft ²
0.0	Lift Thickness Median Value (in.)

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction. The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value (TV) for the selected material. Level I target % Passing TV = 80%. Level II target % Passing TV = 90%.

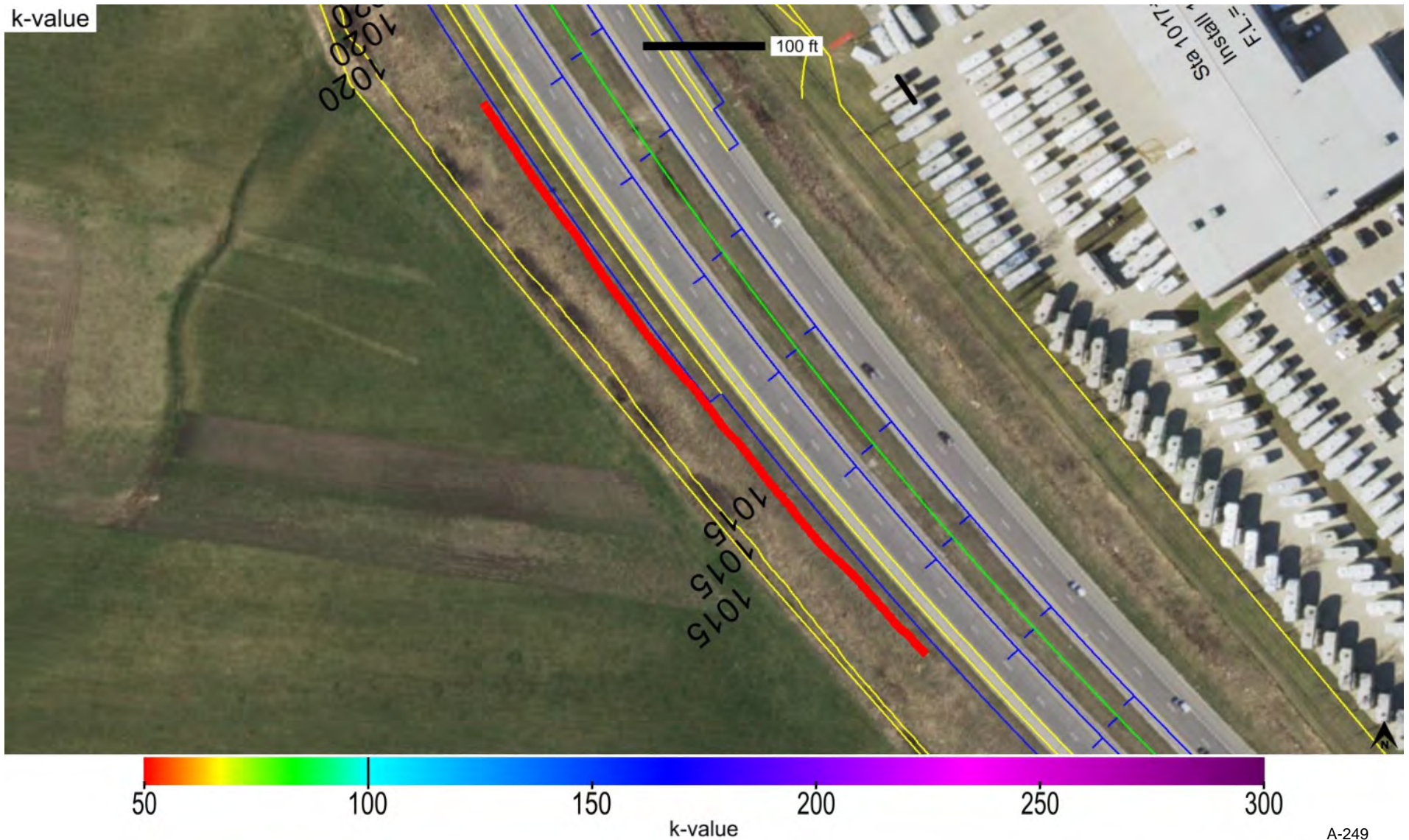
Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the measurement values (MV) reported at each grid point of the mapping area. Description of COV ranges: <= 20% = Low Variability; 20 to 40% = Moderate Variability; > 40% = High Variability. The default target COV is <= 30%.

i-Score Blob (%): The percentage of the map area analyzed with contiguous blob areas with MVs < TV. Control Level 1 >= 100 sq. ft.; Control Level 2 >= 200 sq. ft.; Control Level 3 >= 500 sq. ft.; Control Level 4 >= 1,000 sq. ft.; Control Level 5 >= 2,000 sq. ft.

Lift thickness: Green: 75th percentile value <= TV; Yellow: median value <= TV and 75th percentile > TV; Red: median value (50th percentile) > TV.

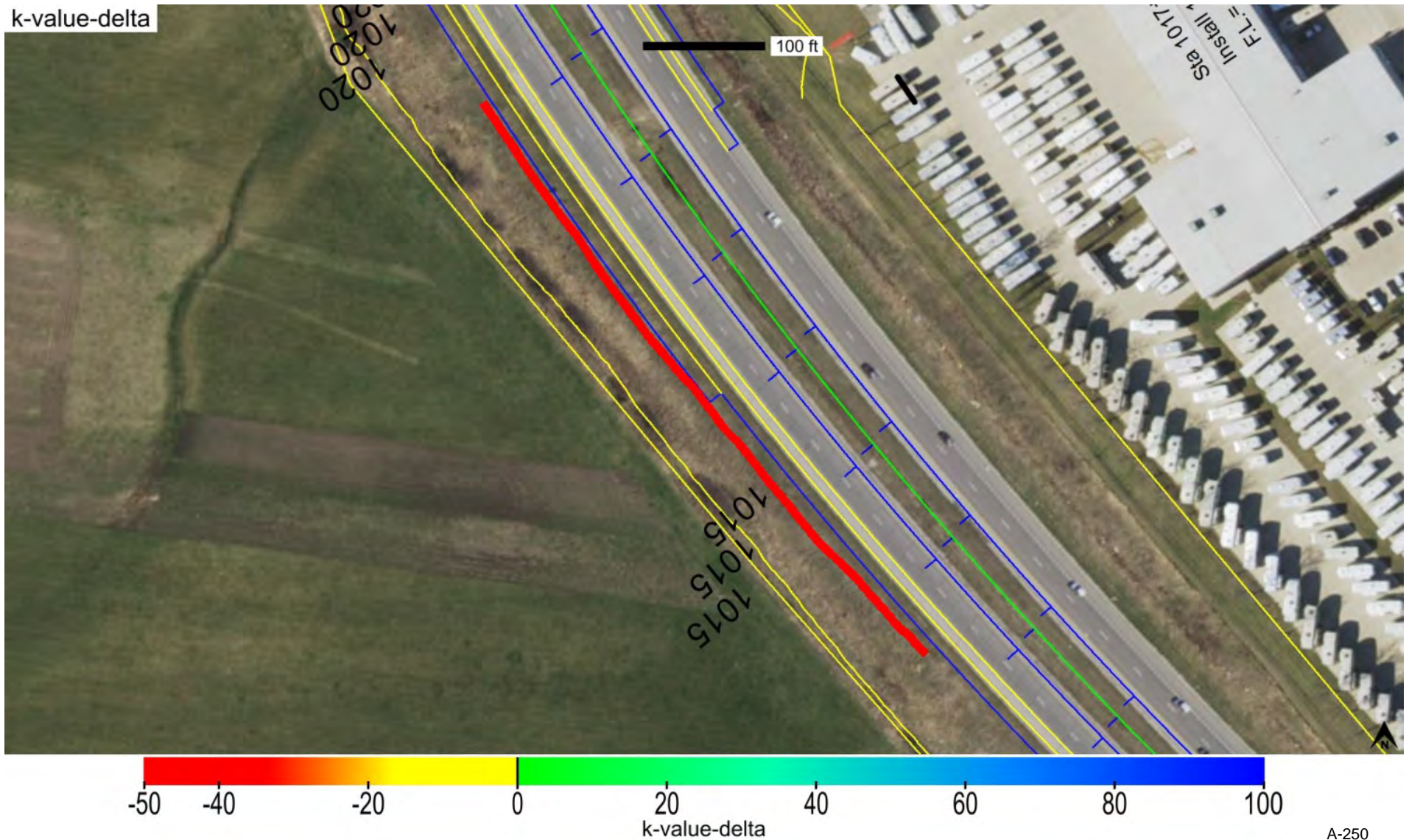
Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_25_174134 Map Type: Verification Map Map Layer: Subgrade Top

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.0	29.1	-0.9	100.0	35.0	37.7	51.7	4.5	11.9	-65.0	-62.3	-48.3



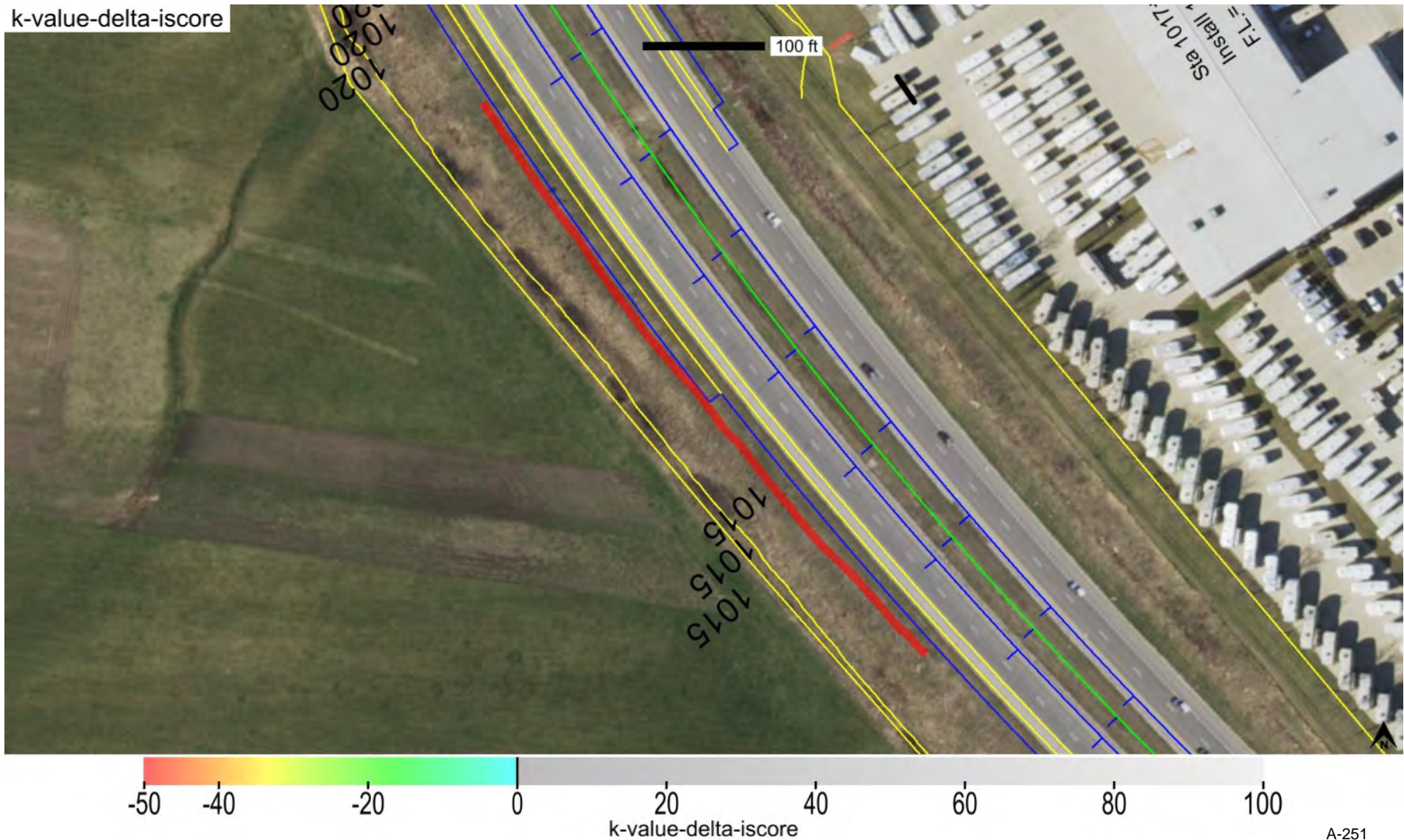
Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_25_174134 Map Type: Verification Map Map Layer: Subgrade Top

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.0	29.1	-0.9	100.0	35.0	37.7	51.7	4.5	11.9	-65.0	-62.3	-48.3



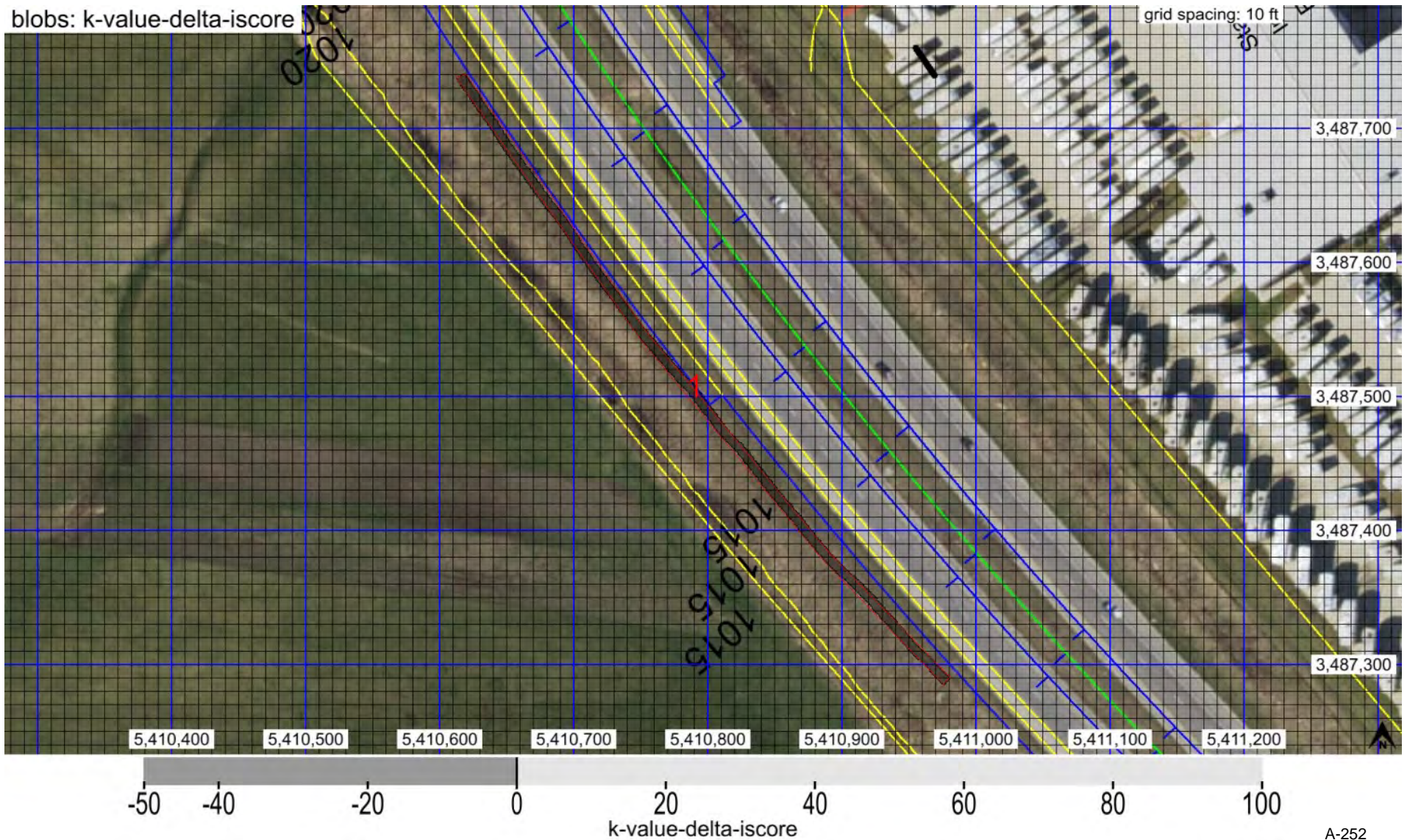
Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_25_174134 Map Type: Verification Map Map Layer: Subgrade Top

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	0.0	100.0	-65.0	-62.3	-48.3	-65.0	-62.3	-55.1



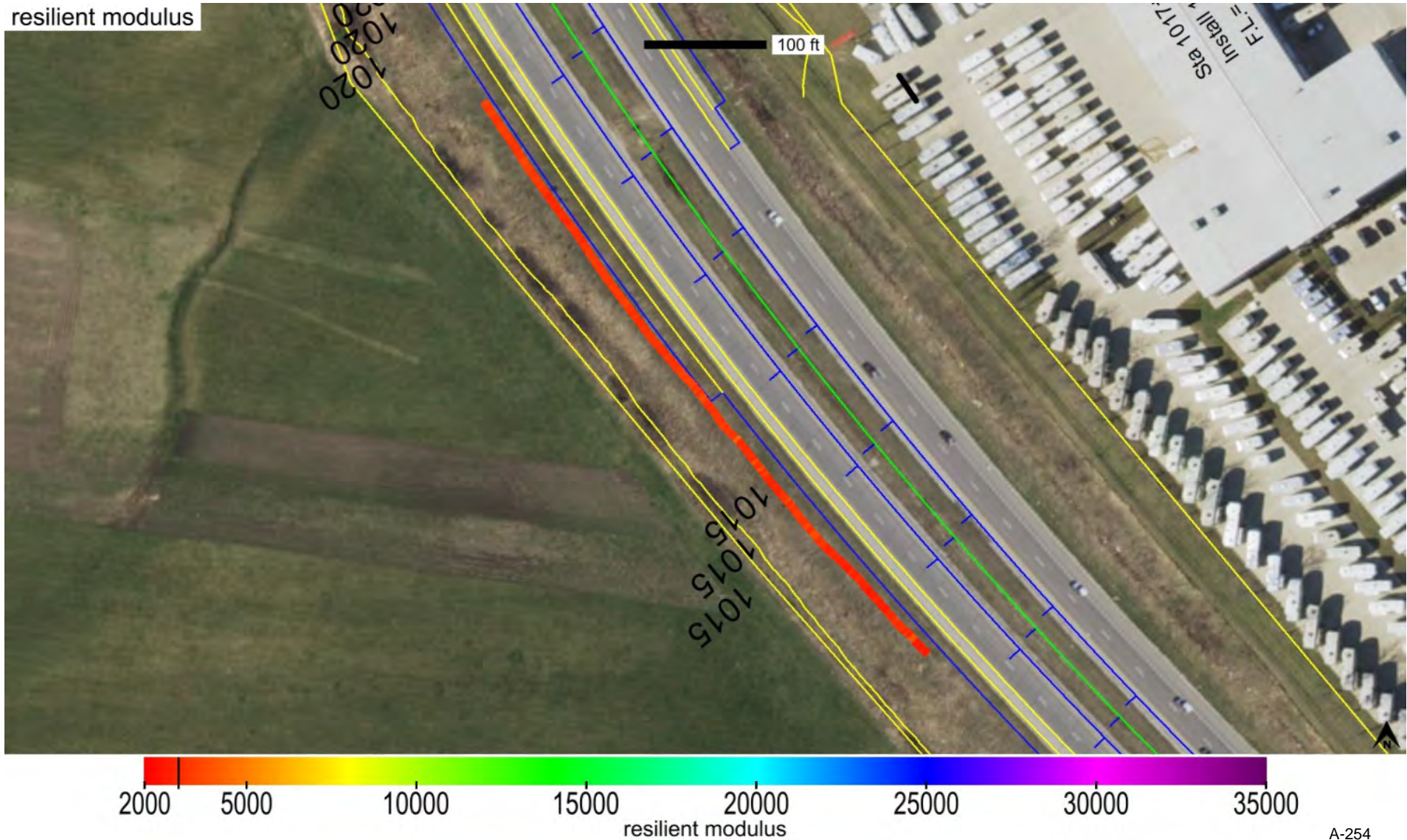
Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_25_174134 Map Type: Verification Map Map Layer: Subgrade Top

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv	poly-tol.
1000	1	4067	100.0	none	0.0	4.0

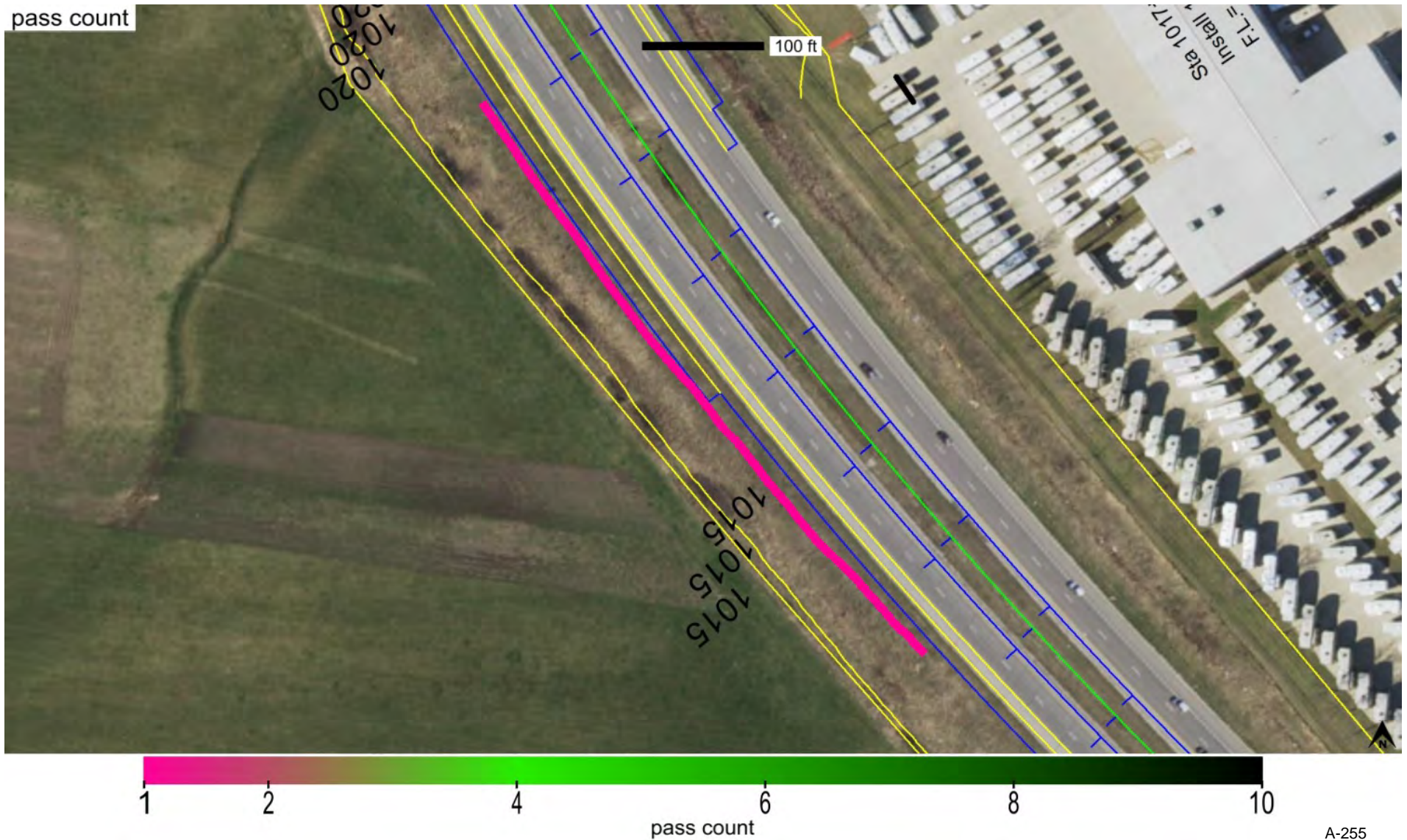


Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_25_174134 Map Type: Verification Map Map Layer: Subgrade Top

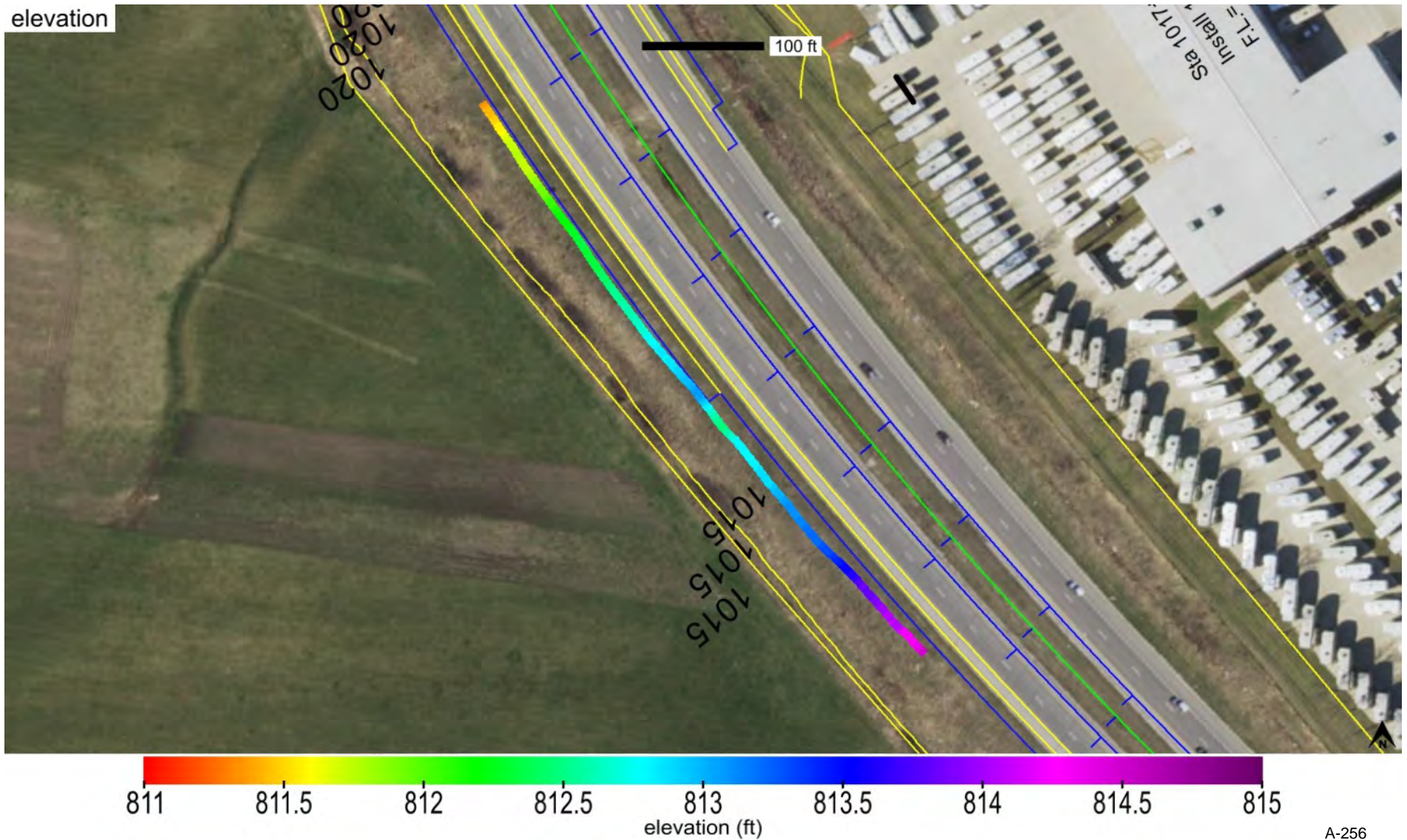
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	80.9	111.6	1.5	3000.0	2574.8	3220.5	4488.5	278.2	8.6	-425.2	220.5	1488.5



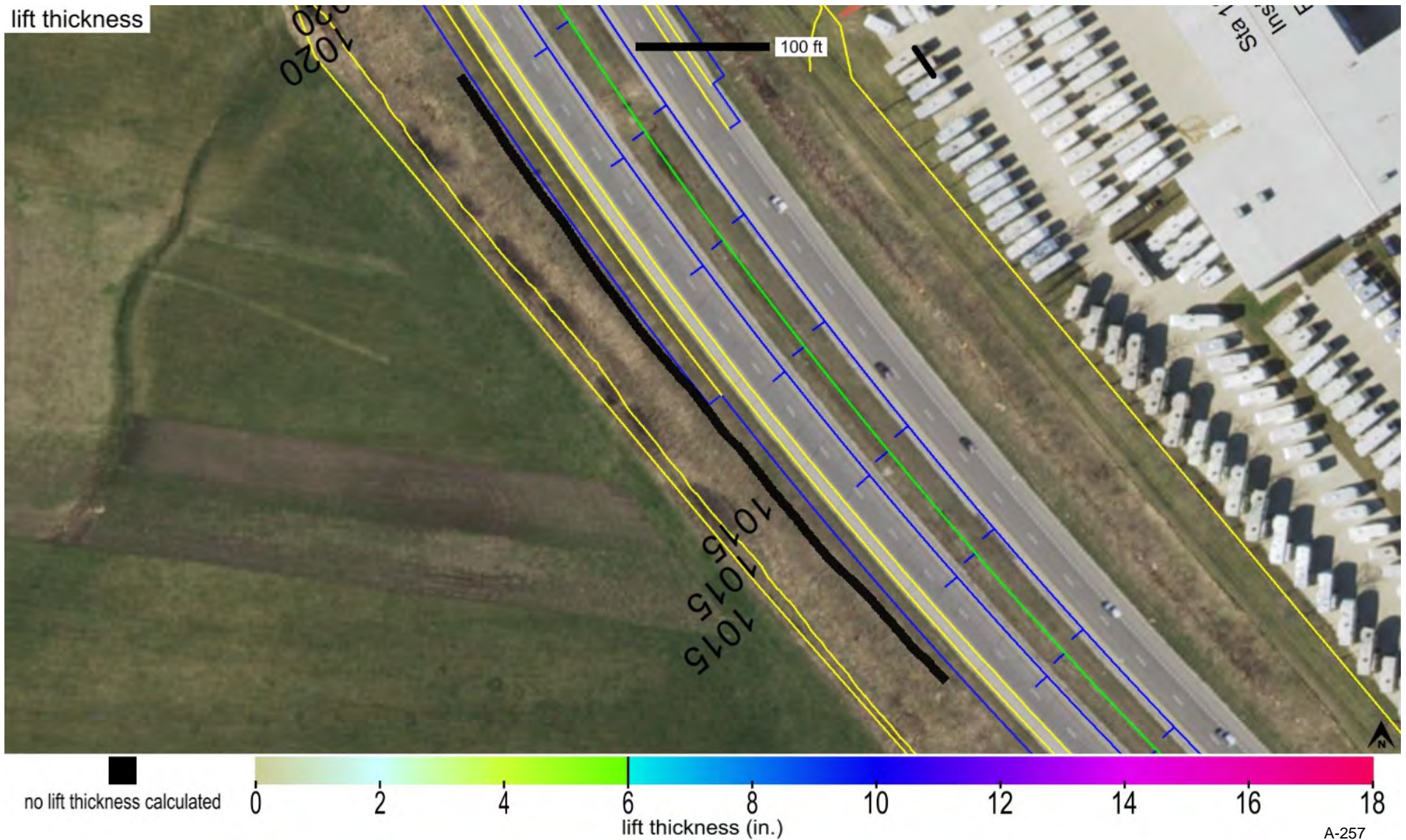
minimum	average	maximum
1	1.0	1



minimum	average	maximum
811.33	812.78	814.50

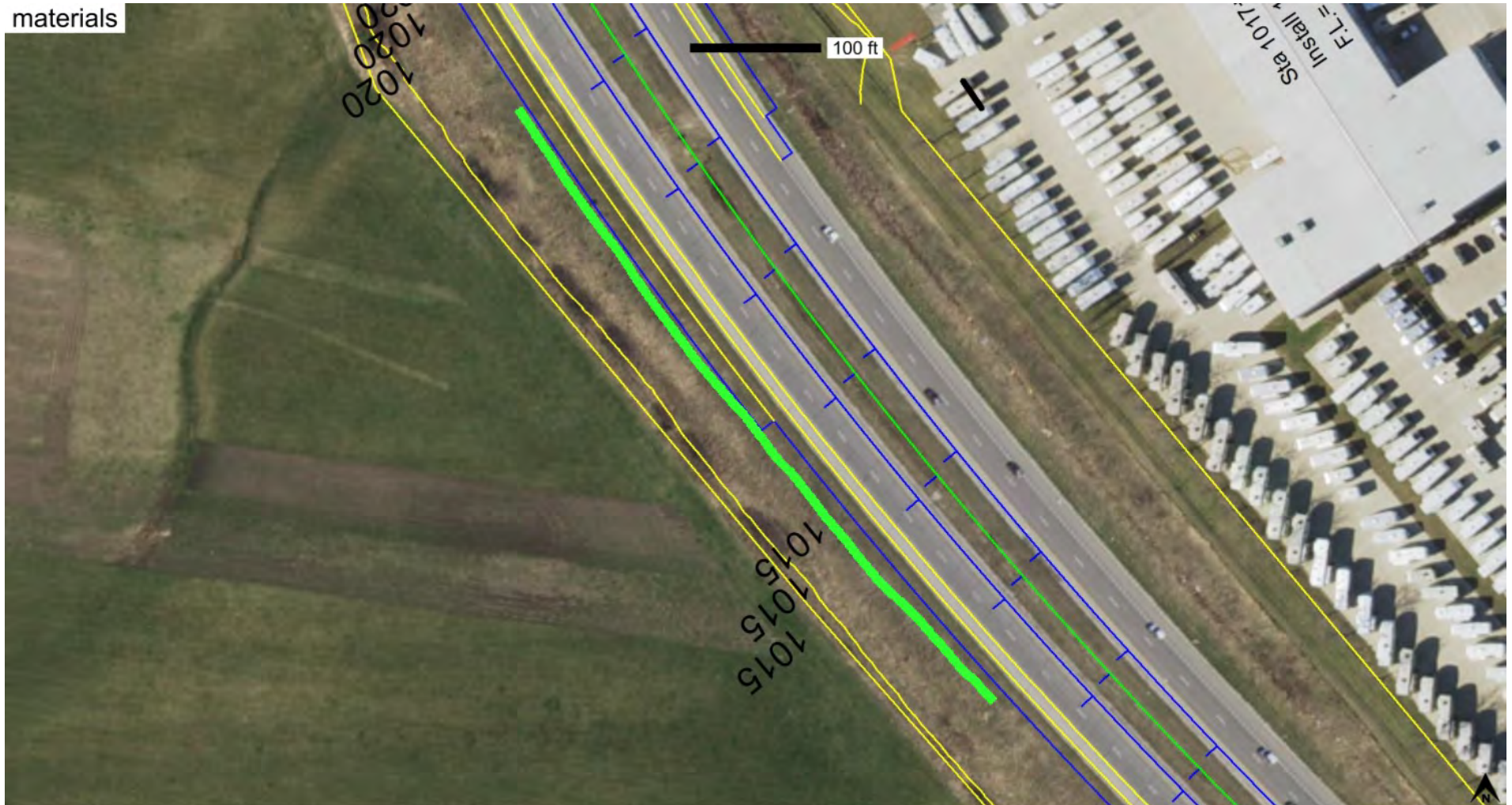


25th percentile (in.)	Median (in.)	75th percentile (in.)	Target Value (in.)
0.0	0.0	0.0	6.0



Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_25_174134 Map Type: Verification Map Map Layer: Subgrade Top

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade_Class 10 (Sand)_IADOT	22013	100.0	4067	0.093	100.0	3000.0	100.0	20.5



Subgrade_Class 10 (Sand)_IADOT

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_073228

Project:	Linn County I-380	Date and Time:	8/26/2022 7:32:28 AM	Machine ID:	Ingios01
Description:	Tower Terrace Road Interchange	Mapping Duration (hrs):	0.427	Operator:	Ingios
Location:	Linn County IA	No. of Measurements:	33005	Machine Operator ID:	582
Review Status:	Review Required	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subgrade Top	Segment:	Ramp C

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	No												
k-value	Yes	4.2	20.5	0.1	100.0	35.0	54.2	165.0	20.2	37.3	-65.0	-45.8	65.0
Moisture Content	No												

Mapped Area		Pass Count					Elevation (ft)			Velocity (fps)		
square feet	acres	10th percentile	Median	cov(%)	% >= TV	Target Value	min.	avg.	max.	min.	avg.	max.
33005	0.758	0	0	0.0	0.0	0	802.27	804.65	809.13	4.5	5.0	5.8

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade_Class 10 (Sand)_IADOT	22013	100.0	33005	0.758	100.0	3000.0	100.0	20.5

Blobs

parameter	min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv	poly-tol.
k-value	1000.0	1	32578	98.7	none	0.0	4.0

Lift Thickness

25th percentile (in.)	Median (in.)	75th percentile (in.)	Target Value (in.)
0.0	0.0	0.0	6.0

Station

Start	End
4027+00	4035+50

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_073228

Project:	Linn County I-380	Date and Time:	8/26/2022 7:32:28 AM	Machine ID:	Ingios01
Description:	Tower Terrace Road Interchange	Mapping Duration (hrs):	0.427	Operator:	Ingios
Location:	Linn County IA	No. of Measurements:	33005	Machine Operator ID:	582
Review Status:	Review Required	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subgrade Top	Segment:	Ramp C

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
20.5	CQI > = 95
4.2	80% of k-Value MVs >= 100
37.3	COV <= 30
98.7	% i-Score Blob Area >= 1000 ft ²
0.0	Lift Thickness Median Value (in.)
0	Pass Count >= 0

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction. The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value (TV) for the selected material. Level I target % Passing TV = 80%. Level II target % Passing TV = 90%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the measurement values (MVs) reported at each grid point of the mapping area. Description of COV ranges: <= 20% = Low Variability; 20 to 40% = Moderate Variability; > 40% = High Variability. The default target COV is <= 30%.

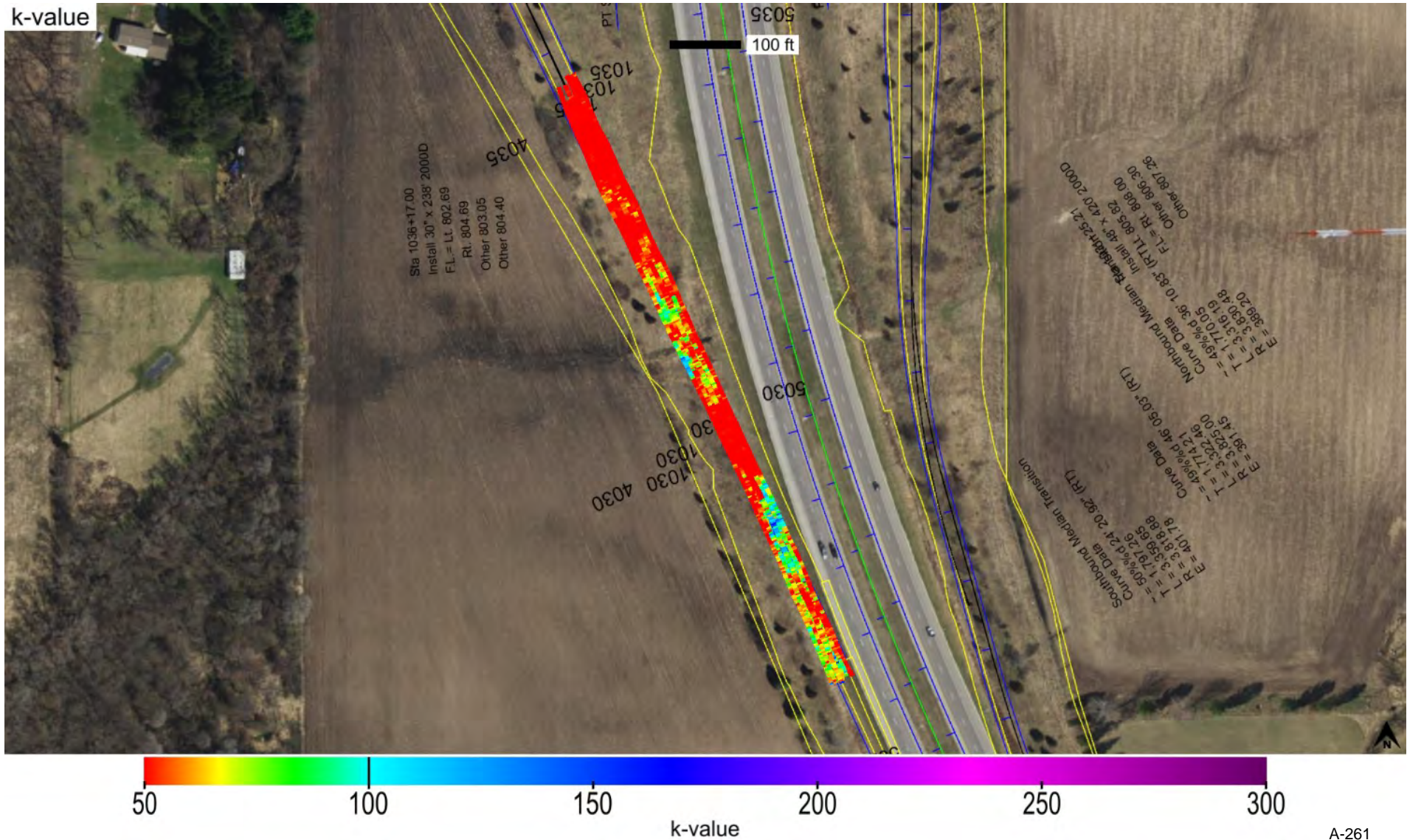
i-Score Blob (%): The percentage of the map area analyzed with contiguous blob areas with MVs < TV. Control Level 1 >= 100 sq. ft.; Control Level 2 >= 200 sq. ft.; Control Level 3 >= 500 sq. ft.; Control Level 4 >= 1,000 sq. ft.; Control Level 5 >= 2,000 sq. ft.

Lift thickness: Green: 75th percentile value <= TV; Yellow: median value <= TV and 75th percentile > TV; Red: median value (50th percentile) > TV.

Pass Count: Green: 10th percentile value >= TV; Yellow: 10th percentile value >= TV and cov% > 50%; Red: 10th percentile value < TV.

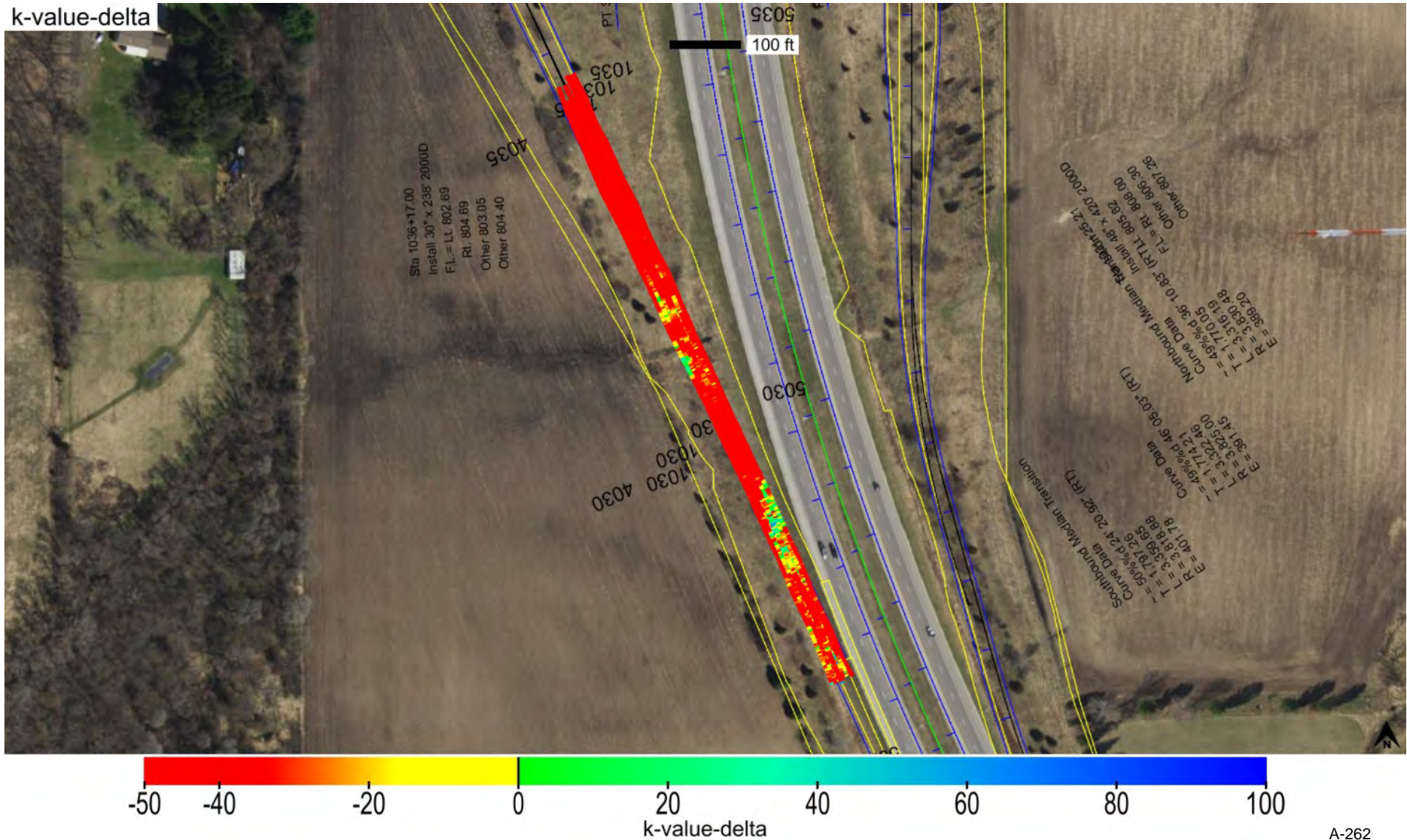
Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_073228 Map Type: Verification Map Map Layer: Subgrade Top

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	4.2	20.5	0.1	100.0	35.0	54.2	165.0	20.2	37.3	-65.0	-45.8	65.0

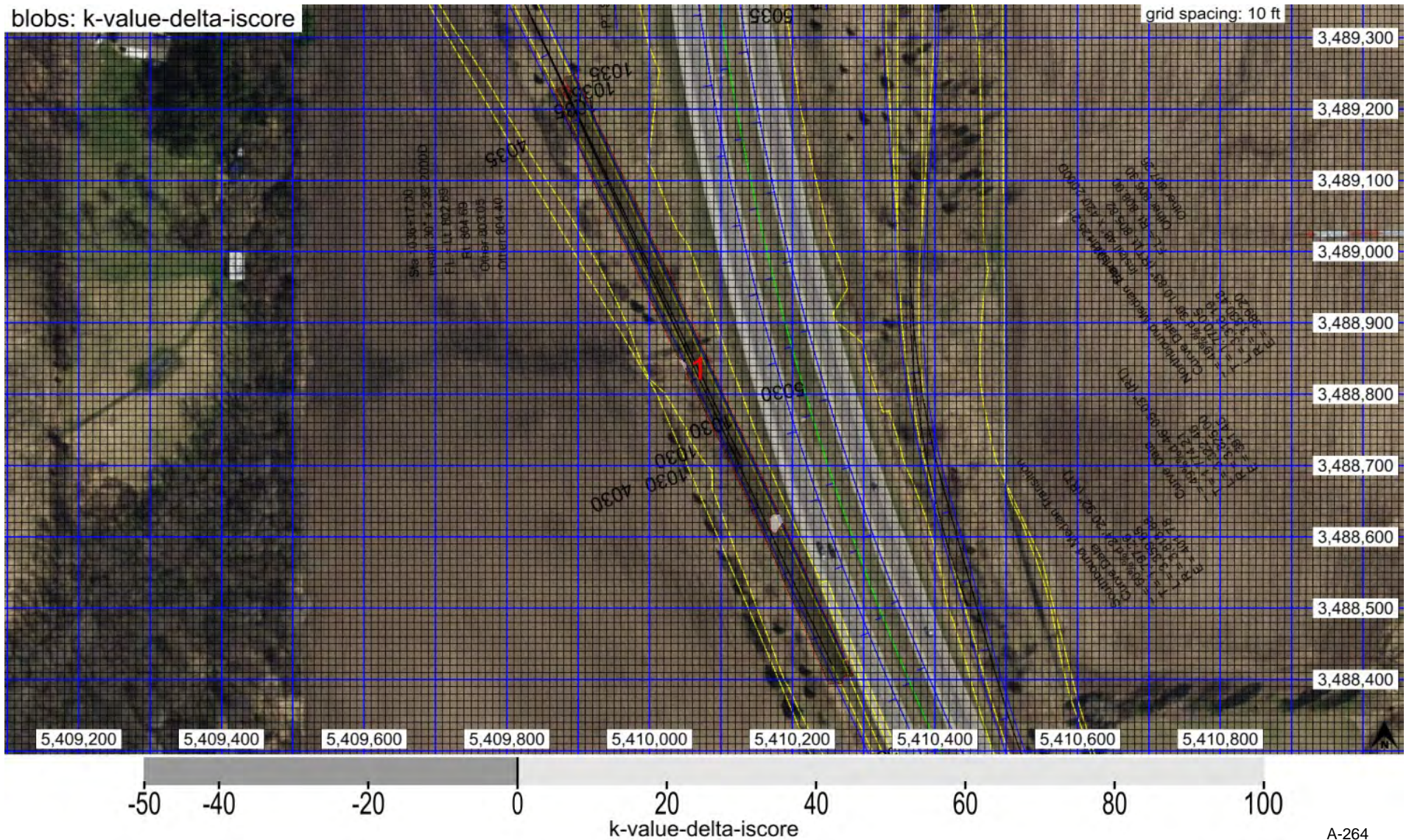


Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_073228 Map Type: Verification Map Map Layer: Subgrade Top

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	4.2	20.5	0.1	100.0	35.0	54.2	165.0	20.2	37.3	-65.0	-45.8	65.0



min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv	poly-tol.
1000	1	32578	98.7	none	0.0	4.0



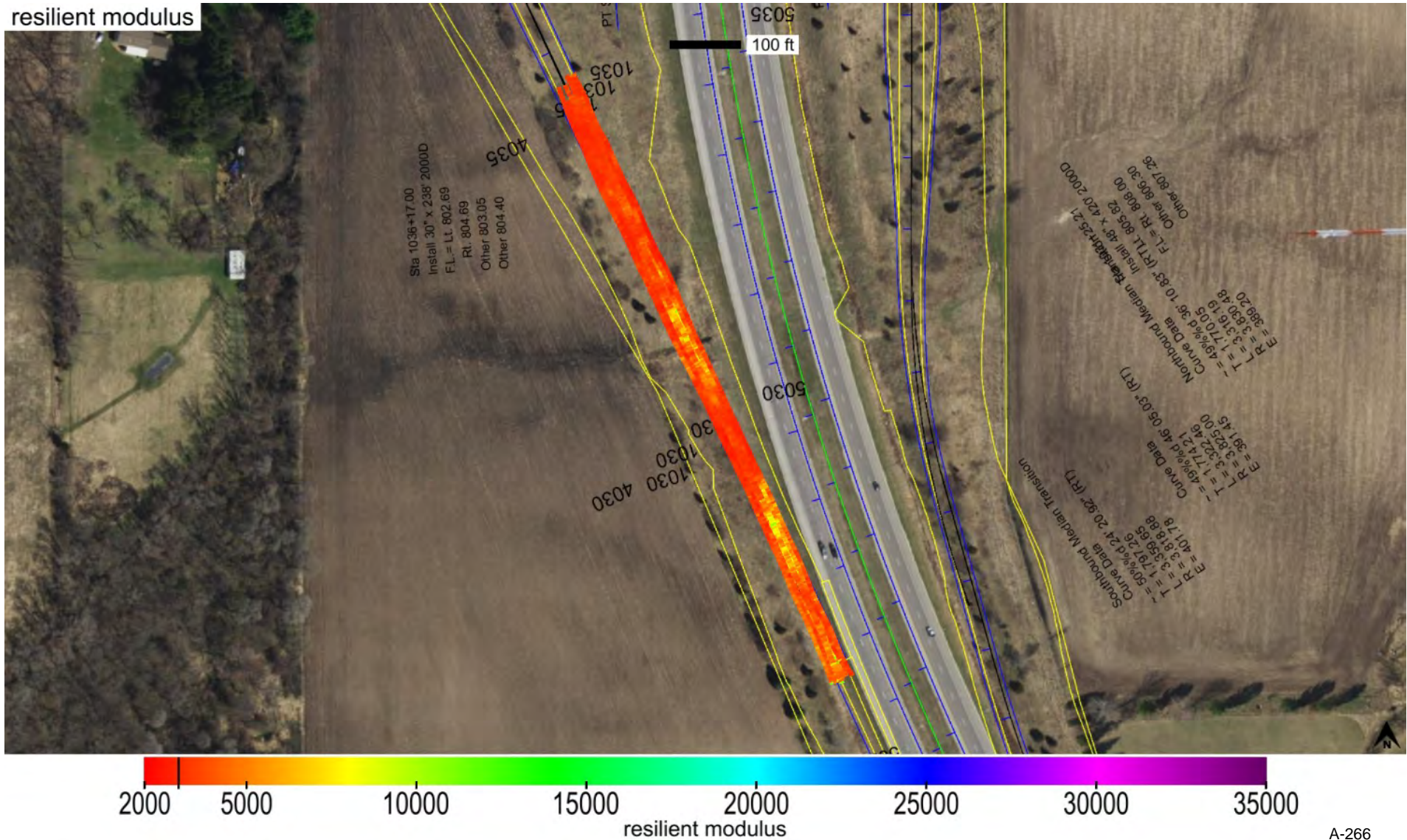
Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_073228 Map Type: Verification Map Map Layer: Subgrade Top

blob: k-value-delta-iscore

Blob #	Area (ft^2)	% of blobs area	# b.p.	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
1	32578	100.0	25	-64.6	-46.2	0.0

Point	Easting (ft)	Northing (ft)
1	5410250	3488392
2	5410270	3488394
3	5410276	3488408
4	5410278	3488404
5	5410286	3488408
6	5410188	3488618
7	5410178	3488606
8	5410170	3488610
9	5410168	3488626
10	5410182	3488634
11	5410032	3488964
12	5409896	3489250
13	5409880	3489244
14	5409892	3489218
15	5409884	3489234
16	5409878	3489232
17	5409886	3489210
18	5409874	3489230
19	5409868	3489228
20	5409928	3489082
21	5410040	3488850
22	5410052	3488844
23	5410052	3488828
24	5410134	3488662
25	5410250	3488394

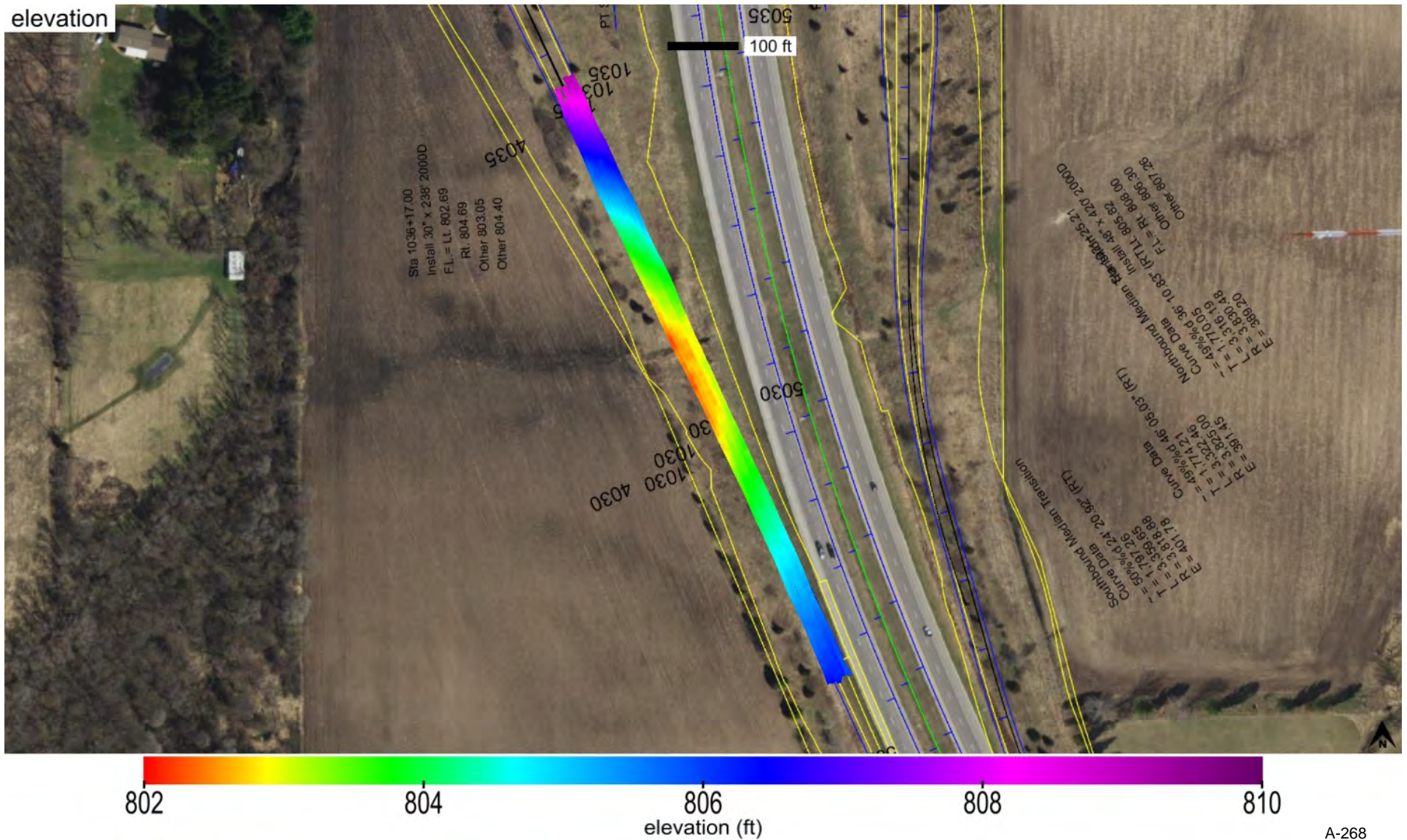
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	85.8	106.6	0.6	3000.0	2380.1	3861.9	11000.0	1099.2	28.5	-619.9	861.9	8000.0



10th percentile	Median	cov(%)	% >= TV	Target Value
0	0	0.0	0.0	0

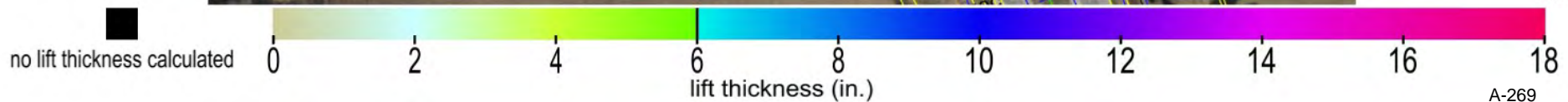


minimum	average	maximum
802.27	804.65	809.13



25th percentile (in.)	Median (in.)	75th percentile (in.)	Target Value (in.)
0.0	0.0	0.0	6.0

lift thickness



Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_073228 Map Type: Verification Map Map Layer: Subgrade Top

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade_Class 10 (Sand)_IADOT	22013	100.0	33005	0.758	100.0	3000.0	100.0	20.5

materials



Subgrade_Class 10 (Sand)_IADOT



Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_080109

Project:	Linn County I-380	Date and Time:	8/26/2022 8:01:09 AM	Machine ID:	Ingios01
Description:	Tower Terrace Road Interchange	Mapping Duration (hrs):	0.529	Operator:	Ingios
Location:	Linn County IA	No. of Measurements:	46071	Machine Operator ID:	582
Review Status:	Review Required	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subgrade Top	Segment:	Ramp C

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	No												
k-value	Yes	0.3	22.4	-0.2	100.0	35.0	43.5	114.3	11.2	25.6	-65.0	-56.5	14.3
Moisture Content	No												

Mapped Area

square feet	acres
46071	1.058

Pass Count

10th percentile	Median	cov(%)	% >= TV	Target Value
0	0	0.0	0.0	0

Elevation (ft)

min.	avg.	max.
805.99	811.18	816.60

Velocity (fps)

min.	avg.	max.
4.5	5.1	5.8

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade_Class 10 (Sand)_IADOT	22013	100.0	46071	1.058	100.0	3000.0	100.0	20.5

Blobs

parameter	min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv	poly-tol.
k-value	1000.0	1	46071	100.0	none	0.0	4.0

Lift Thickness

25th percentile (in.)	Median (in.)	75th percentile (in.)	Target Value (in.)
-1.2	-0.4	0.3	6.0

Station

Start	End
1010+50	1027+00

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_080109

Project:	Linn County I-380	Date and Time:	8/26/2022 8:01:09 AM	Machine ID:	Ingios01
Description:	Tower Terrace Road Interchange	Mapping Duration (hrs):	0.529	Operator:	Ingios
Location:	Linn County IA	No. of Measurements:	46071	Machine Operator ID:	582
Review Status:	Review Required	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subgrade Top	Segment:	Ramp C

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
22.4	CQI > = 95
0.3	80% of k-Value MVs >= 100
25.6	COV <= 30
100.0	% i-Score Blob Area >= 1000 ft ²
-0.4	Lift Thickness Median Value (in.)
0	Pass Count >= 0

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction. The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value (TV) for the selected material. Level I target % Passing TV = 80%. Level II target % Passing TV = 90%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the measurement values (MVs) reported at each grid point of the mapping area. Description of COV ranges: <= 20% = Low Variability; 20 to 40% = Moderate Variability; > 40% = High Variability. The default target COV is <= 30%.

i-Score Blob (%): The percentage of the map area analyzed with contiguous blob areas with MVs < TV. Control Level 1 >= 100 sq. ft.; Control Level 2 >= 200 sq. ft.; Control Level 3 >= 500 sq. ft.; Control Level 4 >= 1,000 sq. ft.; Control Level 5 >= 2,000 sq. ft.

Lift thickness: Green: 75th percentile value <= TV; Yellow: median value <= TV and 75th percentile > TV; Red: median value (50th percentile) > TV.

Pass Count: Green: 10th percentile value >= TV; Yellow: 10th percentile value >= TV and cov% > 50%; Red: 10th percentile value < TV.

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_080109 Map Type: Verification Map Map Layer: Subgrade Top

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.3	22.4	-0.2	100.0	35.0	43.5	114.3	11.2	25.6	-65.0	-56.5	14.3



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_080109 Map Type: Verification Map Map Layer: Subgrade Top

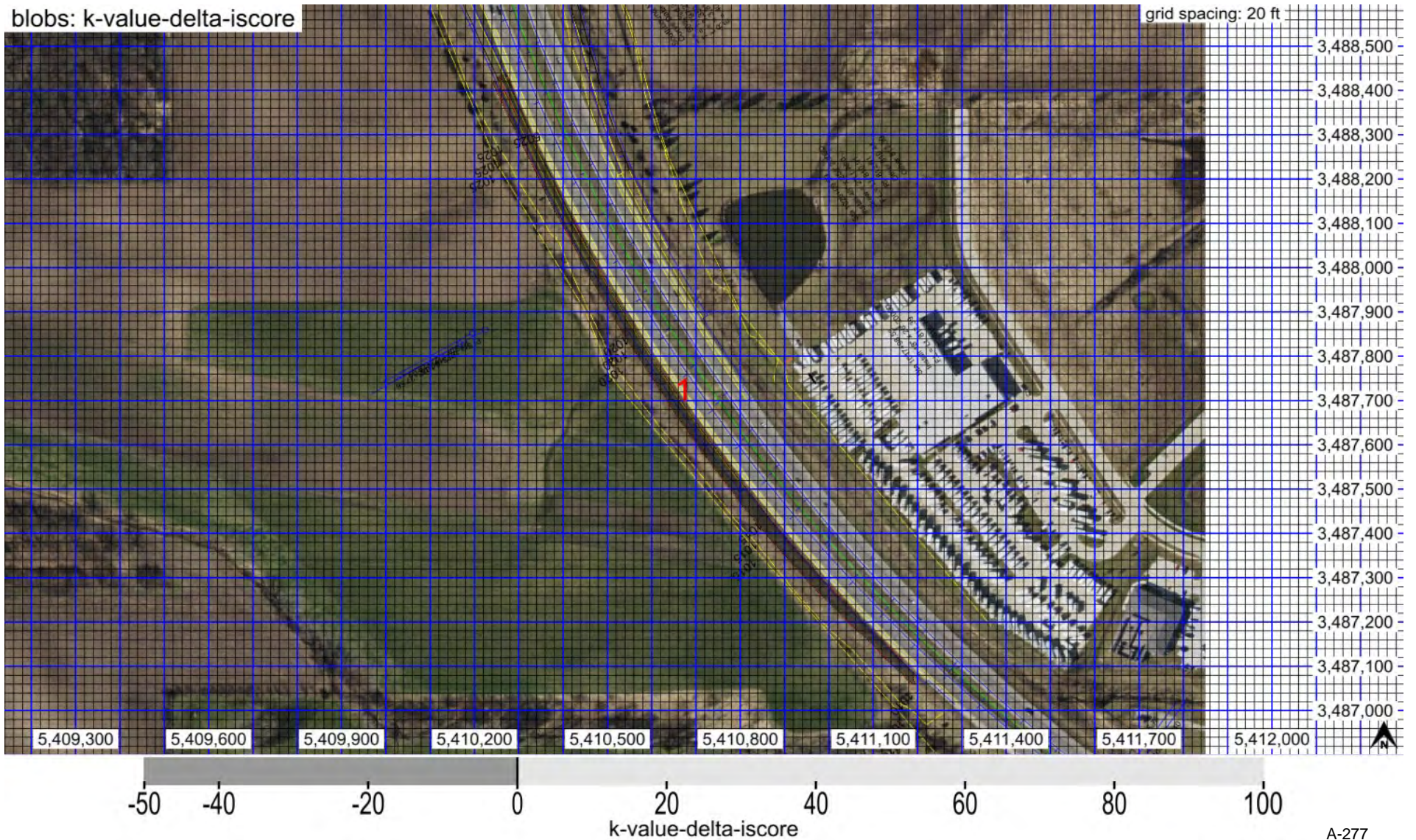
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.3	22.4	-0.2	100.0	35.0	43.5	114.3	11.2	25.6	-65.0	-56.5	14.3



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_080109 Map Type: Verification Map Map Layer: Subgrade Top

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv	poly-tol.
1000	1	46071	100.0	none	0.0	4.0



A-277

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_080109 Map Type: Verification Map Map Layer: Subgrade Top

blob: k-value-delta-iscore

Blob #	Area (ft^2)	% of blobs area	# b.p.	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
1	46071	100.0	26	-65.0	-56.8	-17.1

Point	Easting (ft)	Northing (ft)
1	5411188	3487058
2	5411196	3487062
3	5411190	3487070
4	5411194	3487086
5	5411002	3487280
6	5410898	3487396
7	5410686	3487672
8	5410498	3487966
9	5410342	3488270
10	5410276	3488430
11	5410272	3488438
12	5410258	3488432
13	5410304	3488328
14	5410262	3488410
15	5410258	3488432
16	5410250	3488428
17	5410262	3488392
18	5410246	3488424
19	5410240	3488420
20	5410454	3487988
21	5410544	3487836
22	5410658	3487662
23	5410800	3487466
24	5410874	3487378
25	5410978	3487264
26	5411188	3487060

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_080109 Map Type: Verification Map Map Layer: Subgrade Top

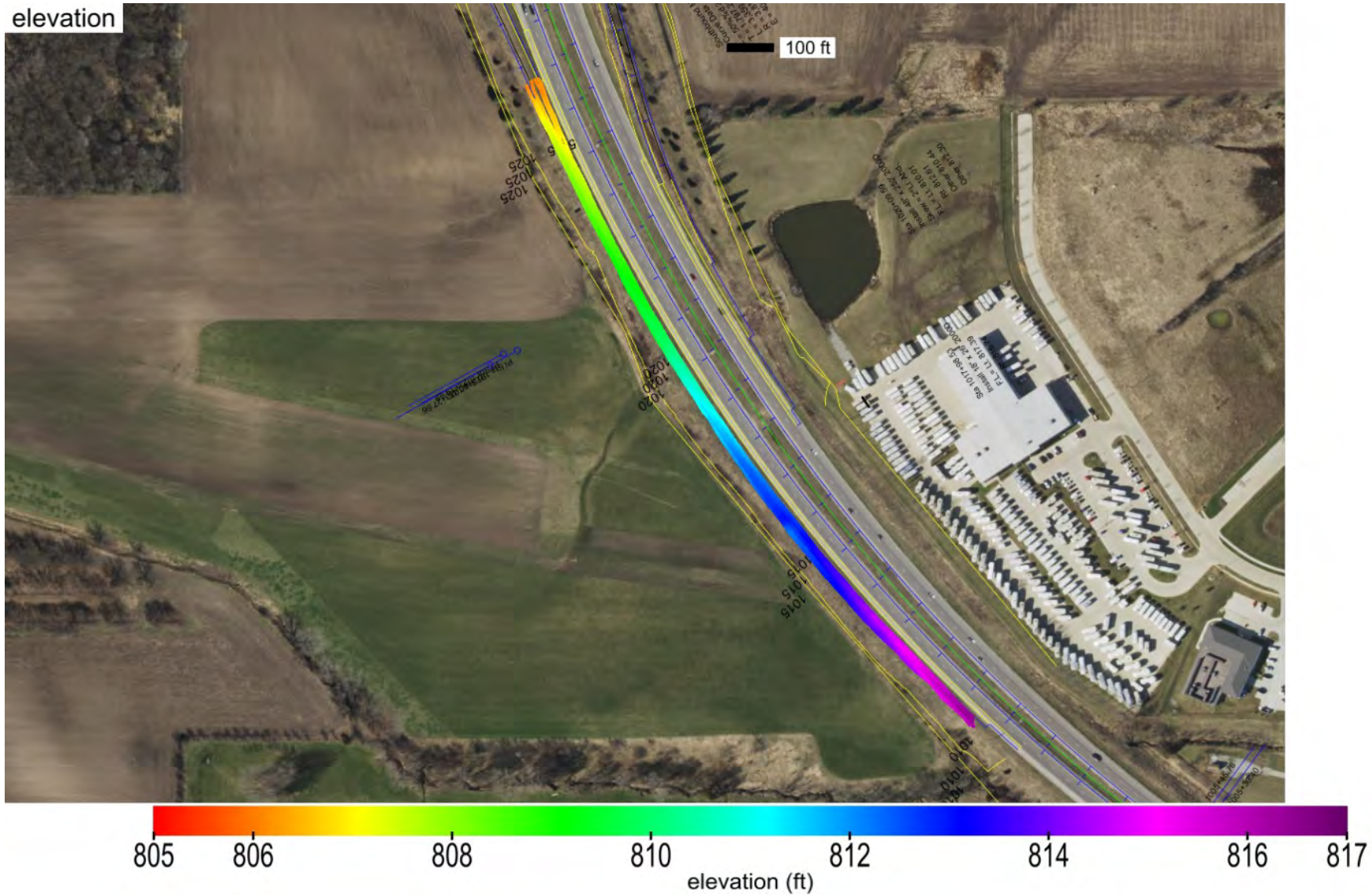
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	69.6	96.6	0.8	3000.0	2289.5	3265.1	10122.6	519.0	15.9	-710.5	265.1	7122.6



10th percentile	Median	cov(%)	% >= TV	Target Value
0	0	0.0	0.0	0

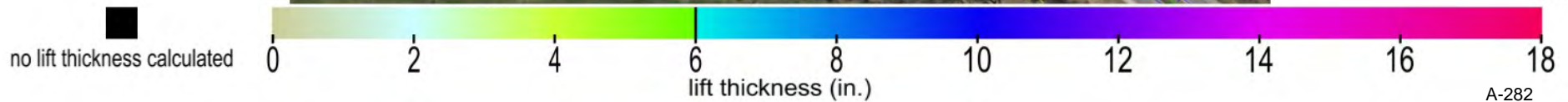


minimum	average	maximum
805.99	811.18	816.60



25th percentile (in.)	Median (in.)	75th percentile (in.)	Target Value (in.)
-1.2	-0.4	0.3	6.0

lift thickness



Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_080109 Map Type: Verification Map Map Layer: Subgrade Top

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade_Class 10 (Sand)_IADOT	22013	100.0	46071	1.058	100.0	3000.0	100.0	20.5

materials



Subgrade_Class 10 (Sand)_IADOT



Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_085116

Project:	Linn County I-380	Date and Time:	8/26/2022 8:51:16 AM	Machine ID:	Ingios01
Description:	Tower Terrace Road Interchange	Mapping Duration (hrs):	0.428	Operator:	Ingios
Location:	Linn County IA	No. of Measurements:	40861	Machine Operator ID:	582
Review Status:	Review Required	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subbase 12 Inches	Segment:	Tower Terrace Road

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	No												
k-value	Yes	33.9	54.3	0.7	150.0	20.0	130.4	189.0	38.0	29.1	-130.0	-19.6	39.0
Moisture Content	No												

Mapped Area		Pass Count			Elevation (ft)			Velocity (fps)		
square feet	acres	min.	avg.	max.	min.	avg.	max.	min.	avg.	max.
40861	0.938	1	1.3	5	810.12	814.82	819.78	4.3	5.2	6.6

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase Recycled Composite_IADOT	41025	100.0	40861	0.938	100.0	10017.0	150.0	20.5

Blobs

parameter	min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv	poly-tol.
k-value	1000.0	3	28960	70.9	none	0.0	4.0

Lift Thickness

25th percentile (in.)	Median (in.)	75th percentile (in.)	Target Value (in.)
0.0	0.0	0.0	6.0

Station

Start	End
7033+00	7040+00

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_085116

Project:	Linn County I-380	Date and Time:	8/26/2022 8:51:16 AM	Machine ID:	Ingios01
Description:	Tower Terrace Road Interchange	Mapping Duration (hrs):	0.428	Operator:	Ingios
Location:	Linn County IA	No. of Measurements:	40861	Machine Operator ID:	582
Review Status:	Review Required	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subbase 12 Inches	Segment:	Tower Terrace Road

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
54.3	CQI > = 95
33.9	80% of k-Value MVs >= 150
29.1	COV <= 30
70.9	% i-Score Blob Area >= 1000 ft ²
0.0	Lift Thickness Median Value (in.)

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction. The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value (TV) for the selected material. Level I target % Passing TV = 80%. Level II target % Passing TV = 90%.

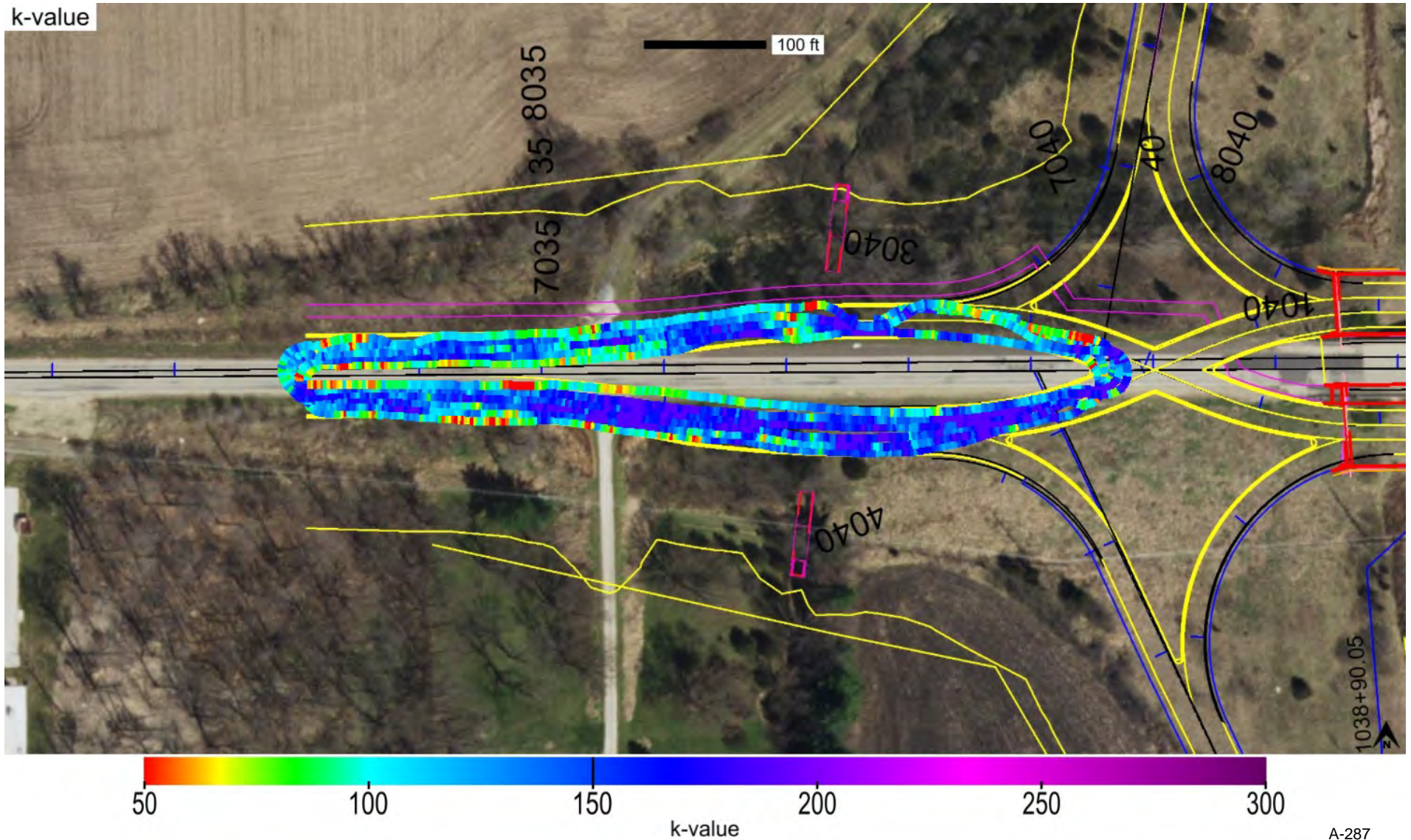
Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the measurement values (MV) reported at each grid point of the mapping area. Description of COV ranges: <= 20% = Low Variability; 20 to 40% = Moderate Variability; > 40% = High Variability. The default target COV is <= 30%.

i-Score Blob (%): The percentage of the map area analyzed with contiguous blob areas with MVs < TV. Control Level 1 >= 100 sq. ft.; Control Level 2 >= 200 sq. ft.; Control Level 3 >= 500 sq. ft.; Control Level 4 >= 1,000 sq. ft.; Control Level 5 >= 2,000 sq. ft.

Lift thickness: Green: 75th percentile value <= TV; Yellow: median value <= TV and 75th percentile > TV; Red: median value (50th percentile) > TV.

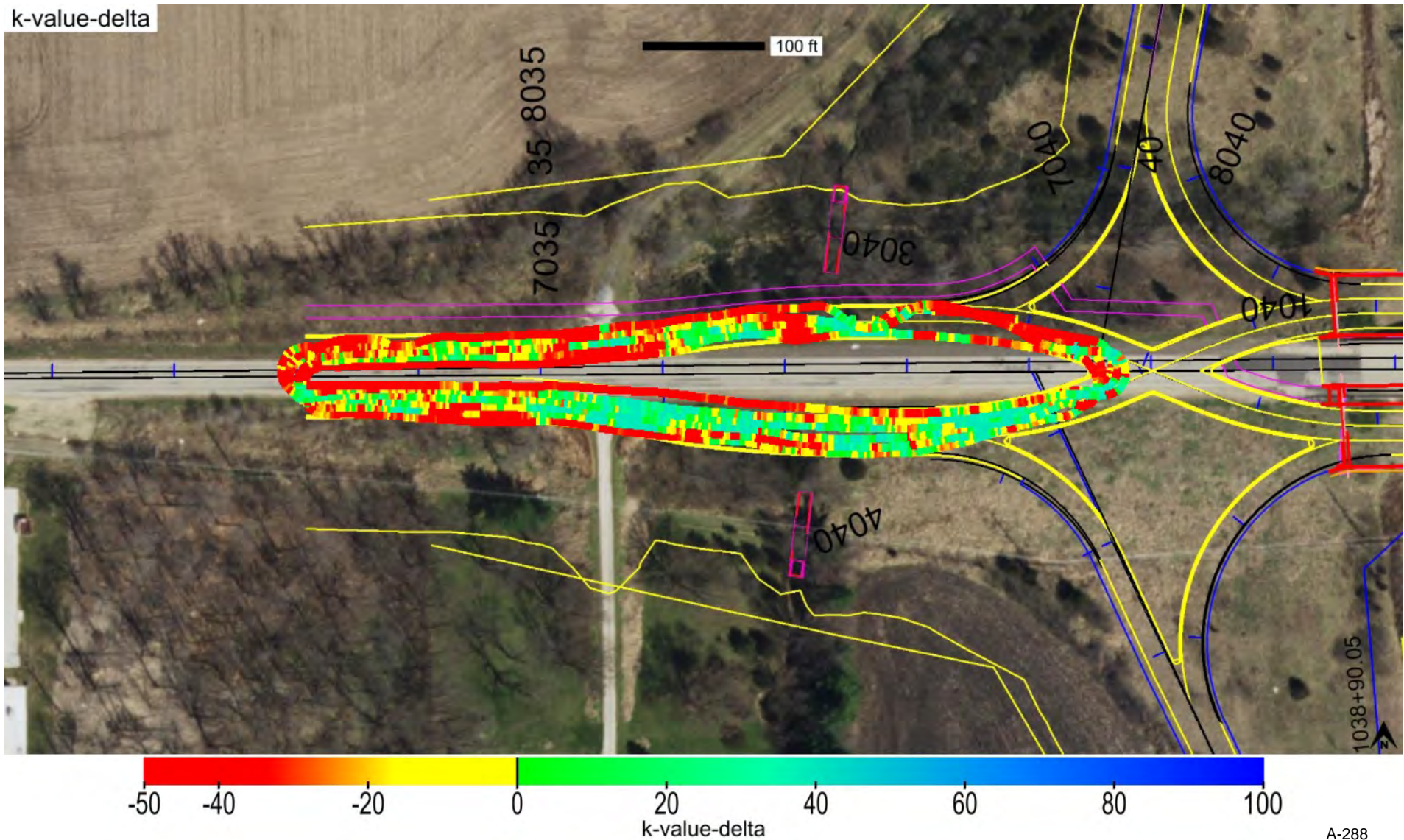
Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_085116 Map Type: Verification Map Map Layer: Subbase 12 Inches

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	33.9	54.3	0.7	150.0	20.0	130.4	189.0	38.0	29.1	-130.0	-19.6	39.0



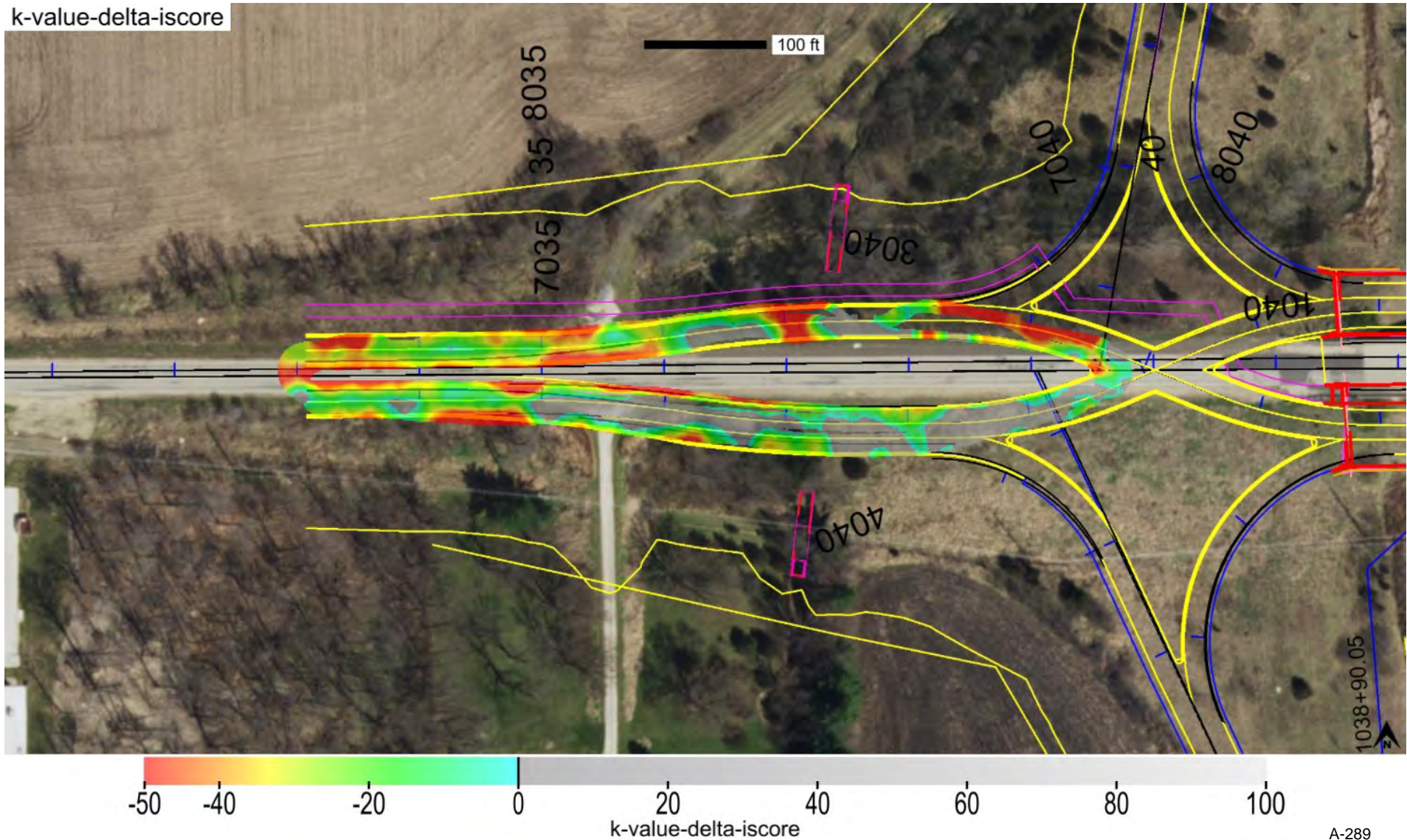
Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_085116 Map Type: Verification Map Map Layer: Subbase 12 Inches

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	33.9	54.3	0.7	150.0	20.0	130.4	189.0	38.0	29.1	-130.0	-19.6	39.0

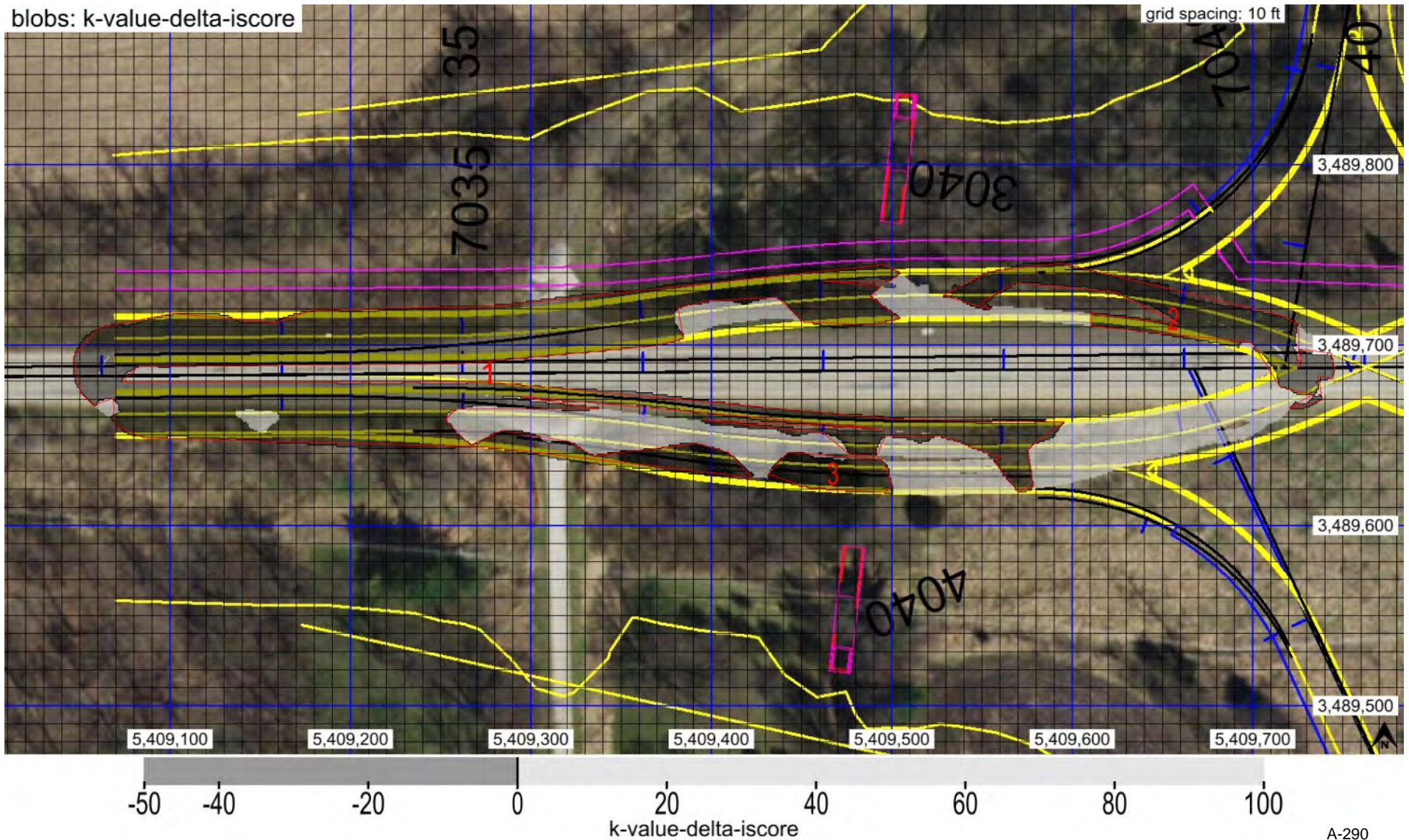


Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_085116 Map Type: Verification Map Map Layer: Subbase 12 Inches

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	33.9	150.0	-130.0	-19.6	39.0	-103.5	-18.3	37.2



min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv	poly-tol.
1000	3	28960	70.9	none	0.0	4.0



Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_085116 Map Type: Verification Map Map Layer: Subbase 12 Inches

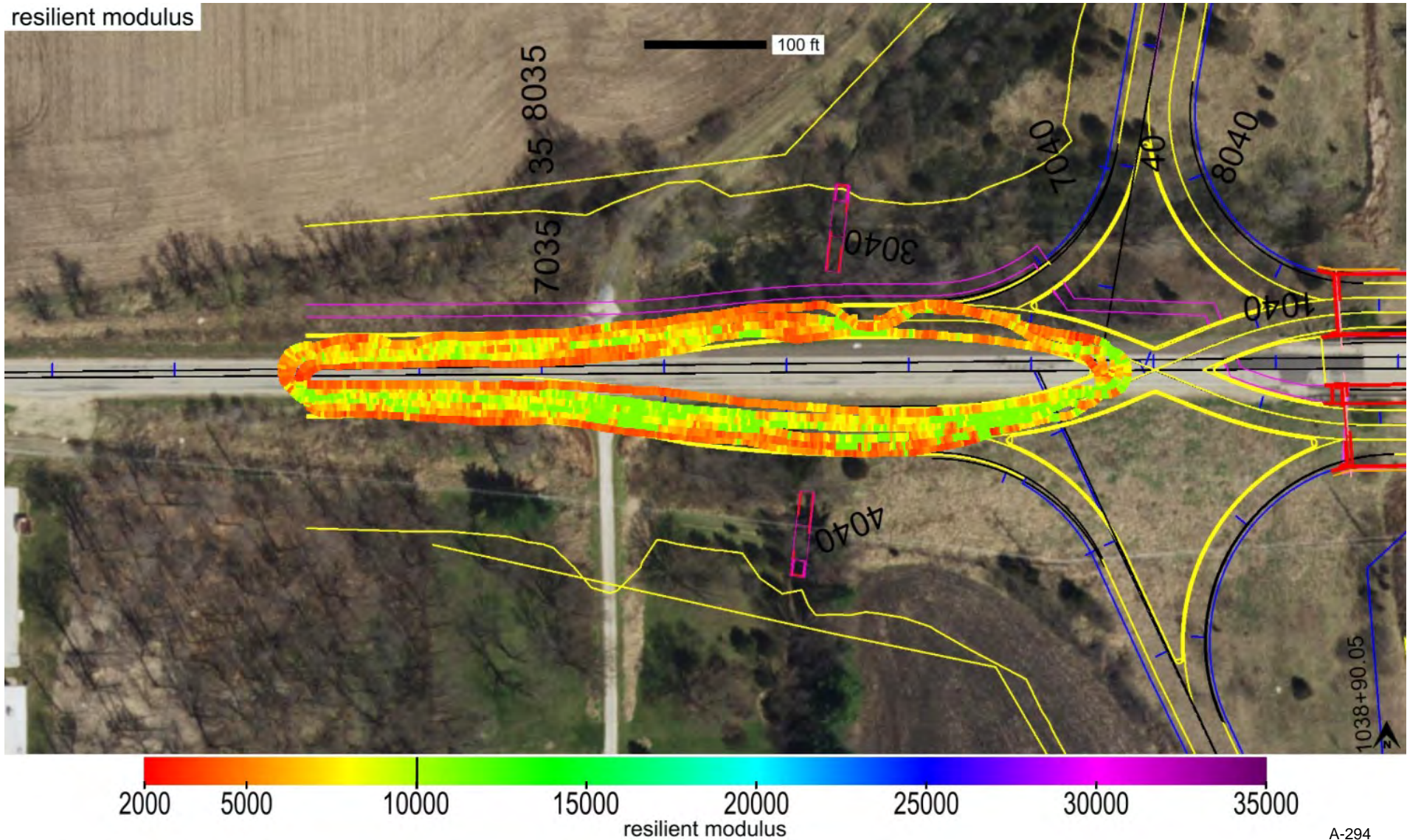
blob: k-value-delta-iscore

Blob #	Area (ft^2)	% of blobs area	# b.p.	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
2	3809	13.2	24	-99.1	-35.1	0.0

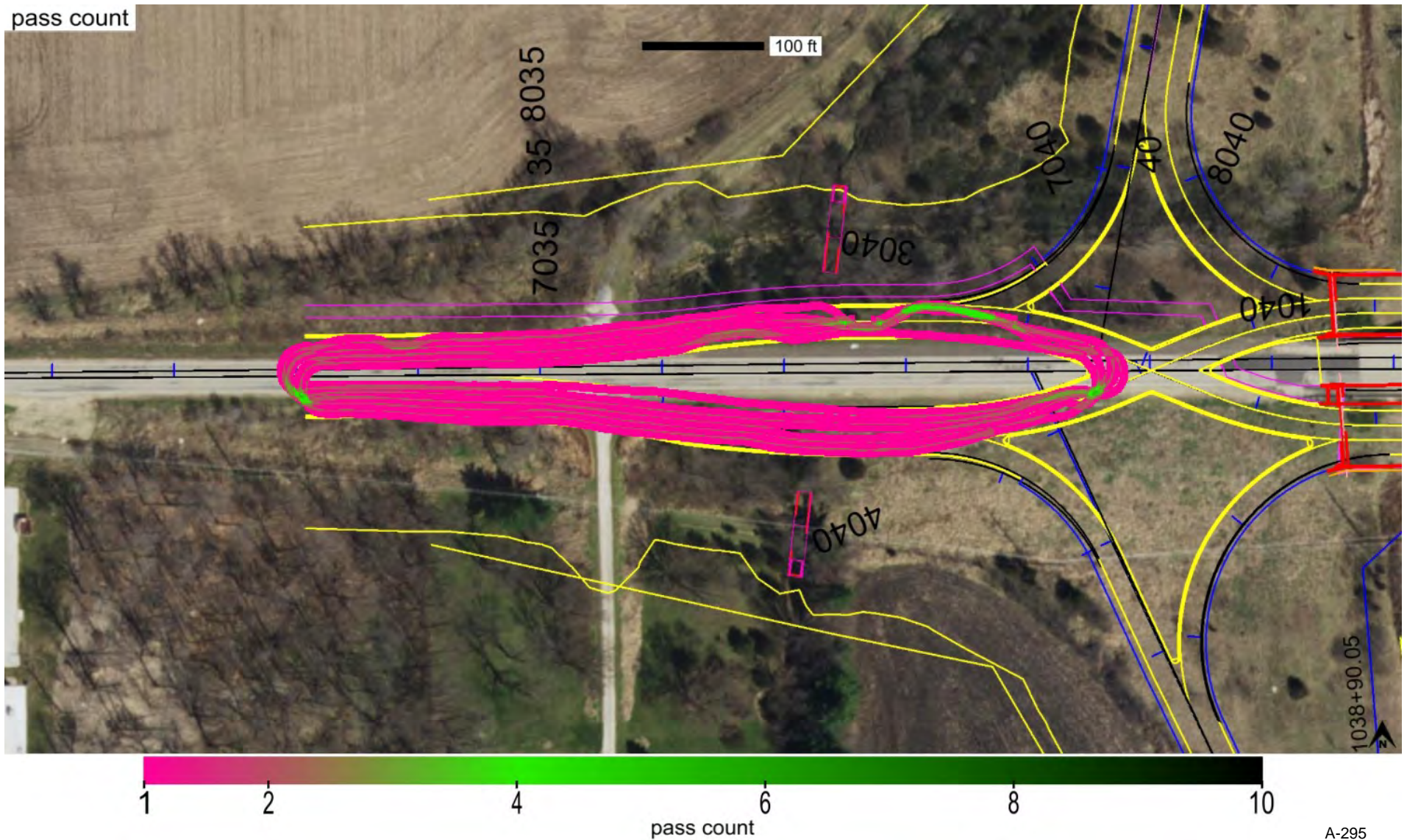
Point	Easting (ft)	Northing (ft)
1	5409720	3489664
2	5409738	3489670
3	5409736	3489682
4	5409744	3489682
5	5409746	3489686
6	5409744	3489696
7	5409728	3489698
8	5409726	3489688
9	5409726	3489712
10	5409716	3489716
11	5409594	3489746
12	5409554	3489740
13	5409528	3489728
14	5409554	3489720
15	5409550	3489724
16	5409568	3489734
17	5409624	3489730
18	5409660	3489712
19	5409610	3489718
20	5409610	3489710
21	5409700	3489702
22	5409716	3489676
23	5409734	3489672
24	5409720	3489666

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_085116 Map Type: Verification Map Map Layer: Subbase 12 Inches

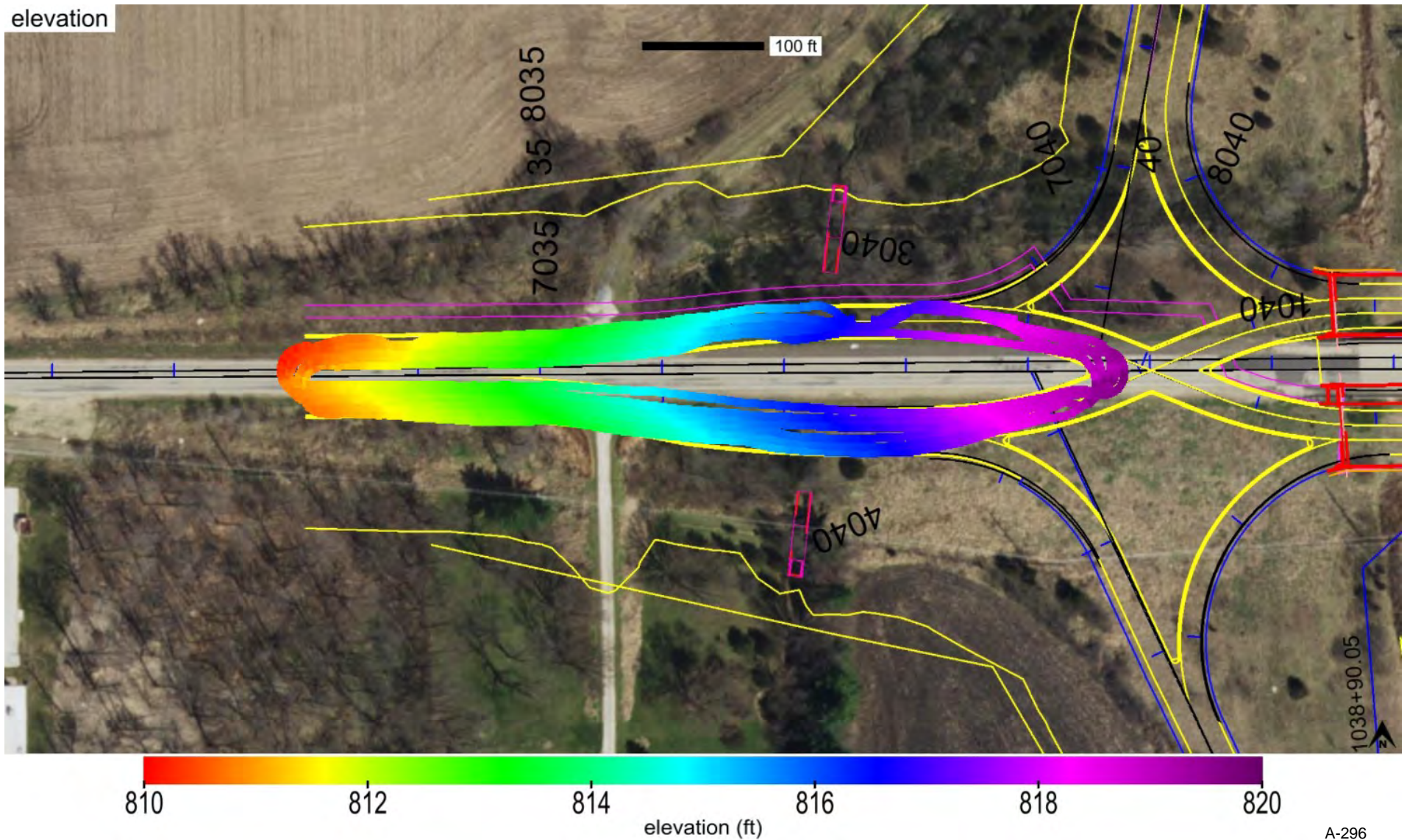
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	16.4	33.9	0.7	10017.0	2725.3	6807.5	11000.0	2382.6	35.0	-7291.7	-3209.5	983.0



minimum	average	maximum
1	1.3	5

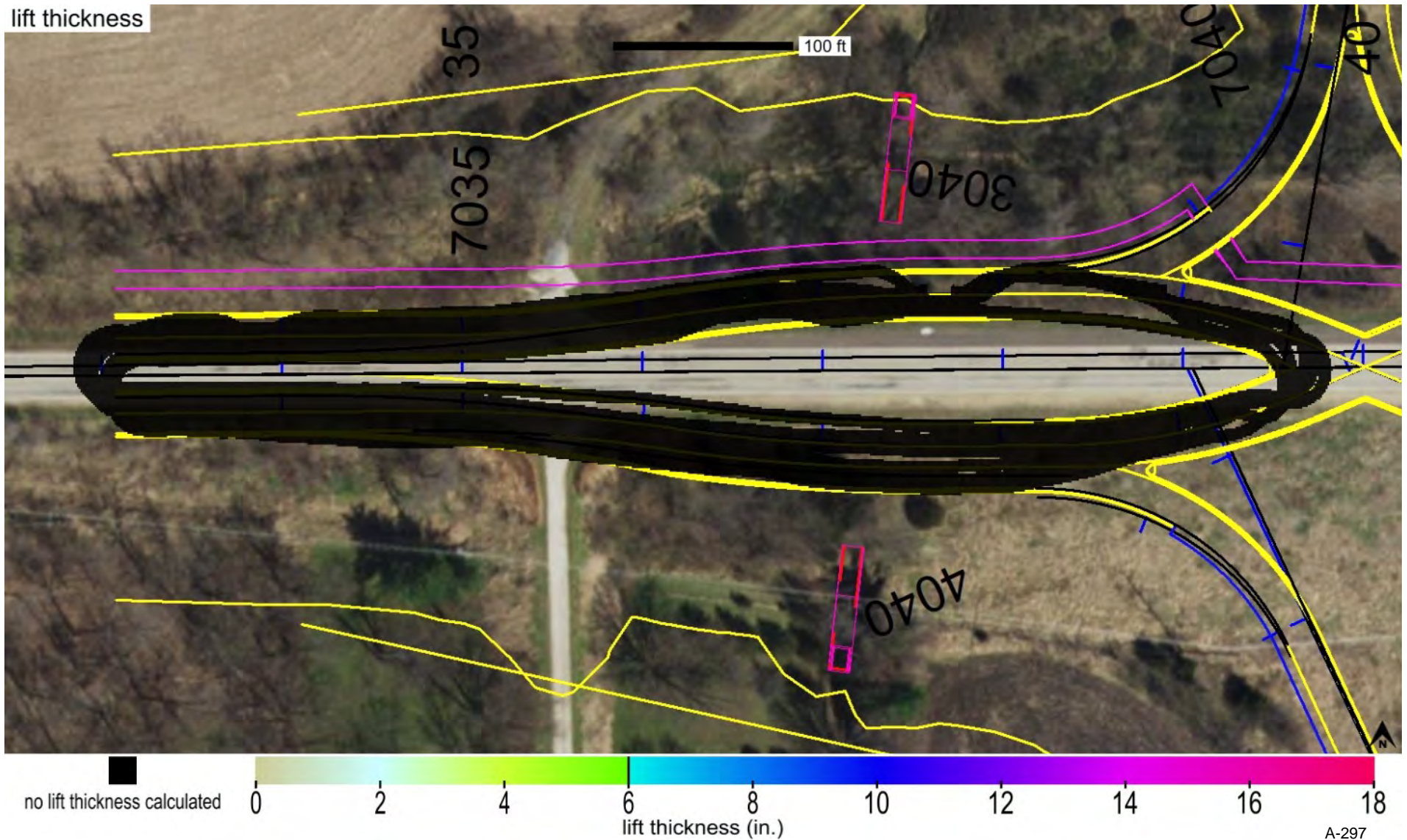


minimum	average	maximum
810.12	814.82	819.78



Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_085116 Map Type: Verification Map Map Layer: Subbase 12 Inches

25th percentile (in.)	Median (in.)	75th percentile (in.)	Target Value (in.)
0.0	0.0	0.0	6.0

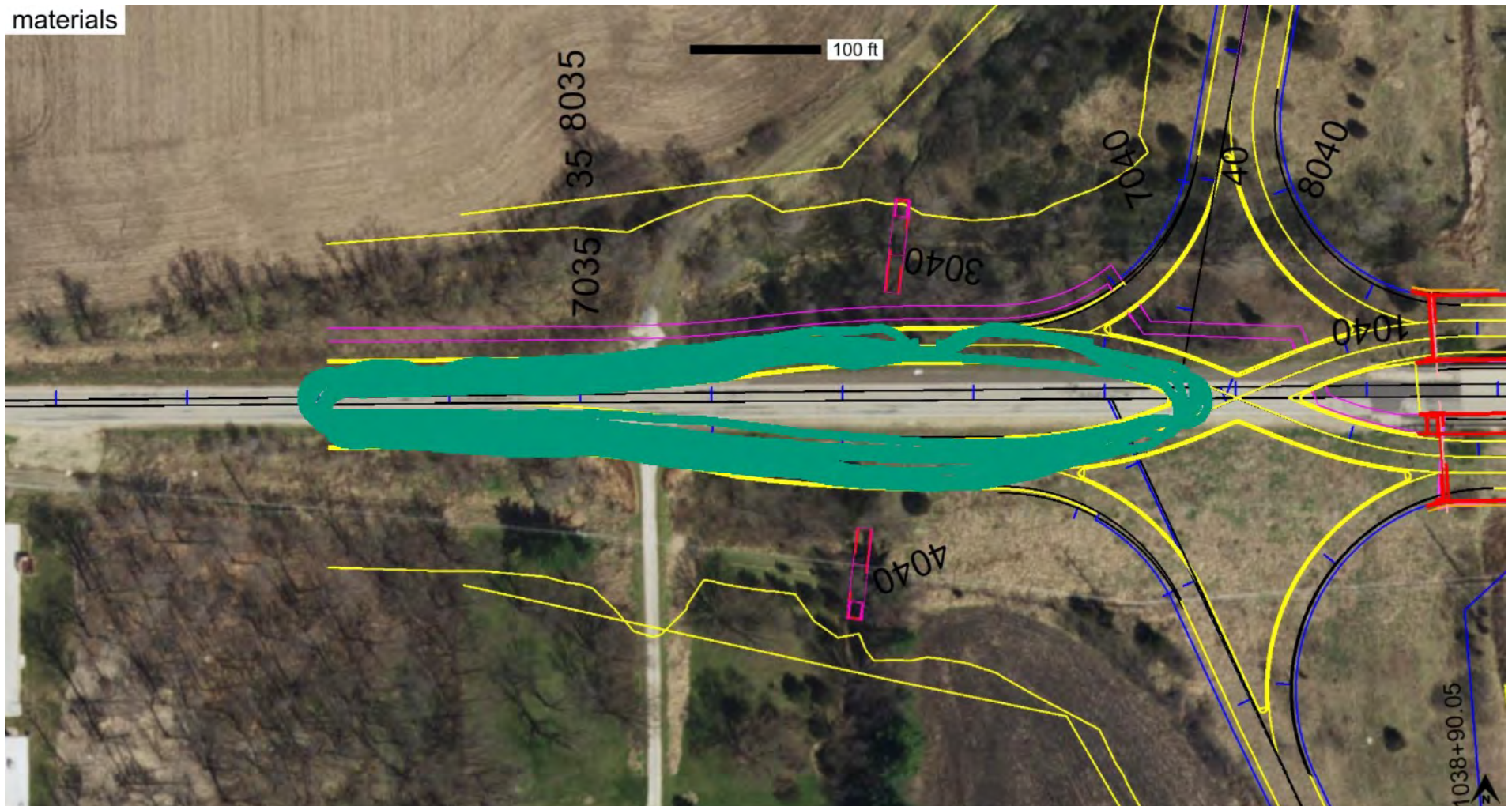


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_085116 Map Type: Verification Map Map Layer: Subbase 12 Inches

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase Recycled Composite_IADOT	41025	100.0	40861	0.938	100.0	10017.0	150.0	20.5

materials



Modified Subbase Recycled Composite_IADOT

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_092036

Project:	Linn County I-380	Date and Time:	8/26/2022 9:20:36 AM	Machine ID:	Ingios01
Description:	Tower Terrace Road Interchange	Mapping Duration (hrs):	0.752	Operator:	Ingios
Location:	Linn County IA	No. of Measurements:	63616	Machine Operator ID:	582
Review Status:	Review Required	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subbase 12 Inches	Segment:	Tower Terrace Road

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	No												
k-value	Yes	18.6	35.0	0.5	150.0	20.0	111.6	189.0	41.4	37.0	-130.0	-38.4	39.0
Moisture Content	No												

Mapped Area		Pass Count			Elevation (ft)			Velocity (fps)		
square feet	acres	min.	avg.	max.	min.	avg.	max.	min.	avg.	max.
63616	1.460	1	1.5	6	795.01	803.60	811.40	4.3	5.2	7.6

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase Recycled Composite_IADOT	41025	100.0	63616	1.460	100.0	10017.0	150.0	20.5

Blobs

parameter	min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv	poly-tol.
k-value	1000.0	1	55871	87.8	none	0.0	4.0

Lift Thickness

25th percentile (in.)	Median (in.)	75th percentile (in.)	Target Value (in.)
-0.9	0.3	1.5	6.0

Station

Start	End
22+00	33+00

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_092036

Project:	Linn County I-380	Date and Time:	8/26/2022 9:20:36 AM	Machine ID:	Ingios01
Description:	Tower Terrace Road Interchange	Mapping Duration (hrs):	0.752	Operator:	Ingios
Location:	Linn County IA	No. of Measurements:	63616	Machine Operator ID:	582
Review Status:	Review Required	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subbase 12 Inches	Segment:	Tower Terrace Road

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
35.0	CQI > = 95
18.6	80% of k-Value MVs >= 150
37.0	COV <= 30
87.8	% i-Score Blob Area >= 1000 ft ²
0.3	Lift Thickness Median Value (in.)

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction. The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value (TV) for the selected material. Level I target % Passing TV = 80%. Level II target % Passing TV = 90%.

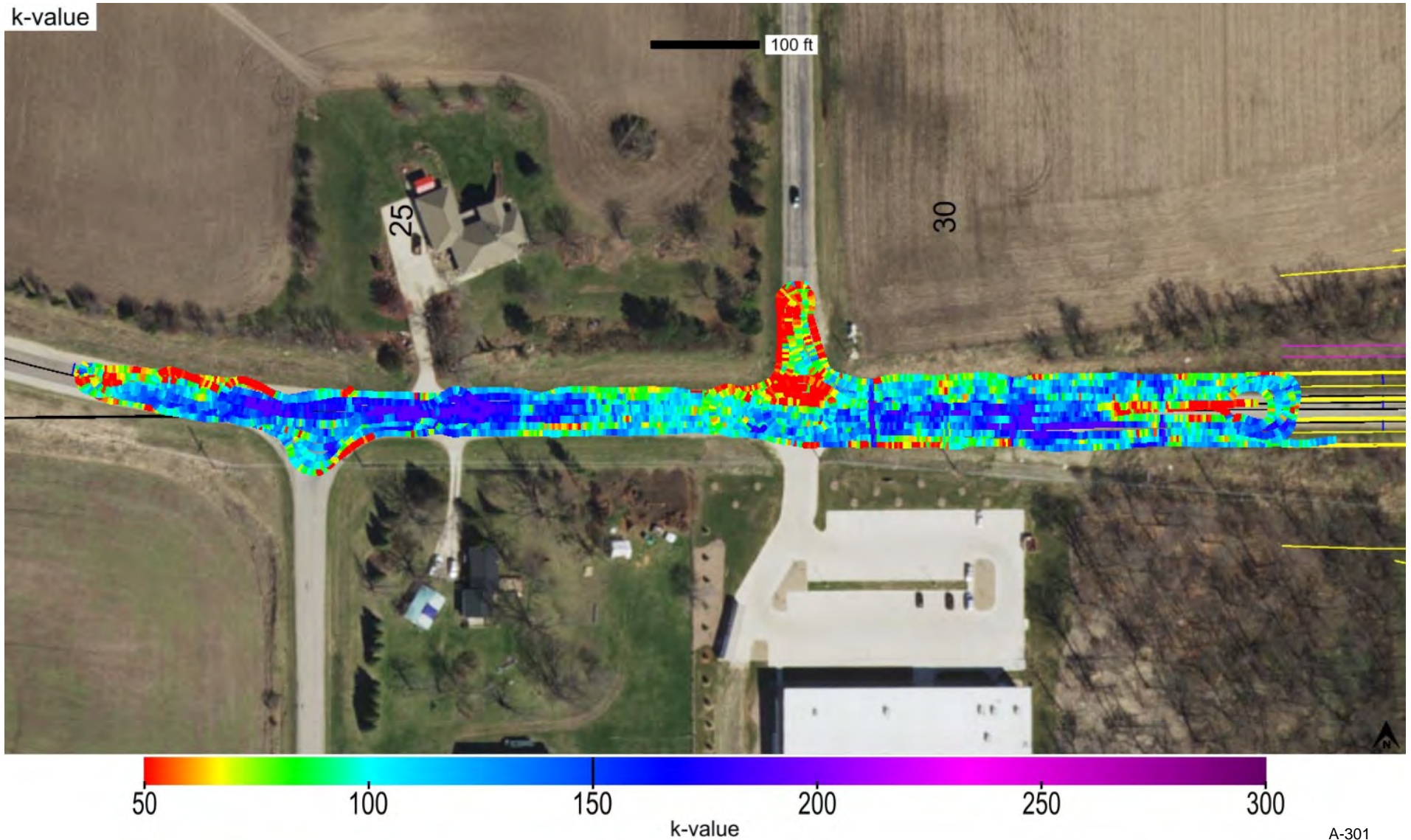
Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the measurement values (MV) reported at each grid point of the mapping area. Description of COV ranges: <= 20% = Low Variability; 20 to 40% = Moderate Variability; > 40% = High Variability. The default target COV is <= 30%.

i-Score Blob (%): The percentage of the map area analyzed with contiguous blob areas with MVs < TV. Control Level 1 >= 100 sq. ft.; Control Level 2 >= 200 sq. ft.; Control Level 3 >= 500 sq. ft.; Control Level 4 >= 1,000 sq. ft.; Control Level 5 >= 2,000 sq. ft.

Lift thickness: Green: 75th percentile value <= TV; Yellow: median value <= TV and 75th percentile > TV; Red: median value (50th percentile) > TV.

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_092036 Map Type: Verification Map Map Layer: Subbase 12 Inches

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	18.6	35.0	0.5	150.0	20.0	111.6	189.0	41.4	37.0	-130.0	-38.4	39.0

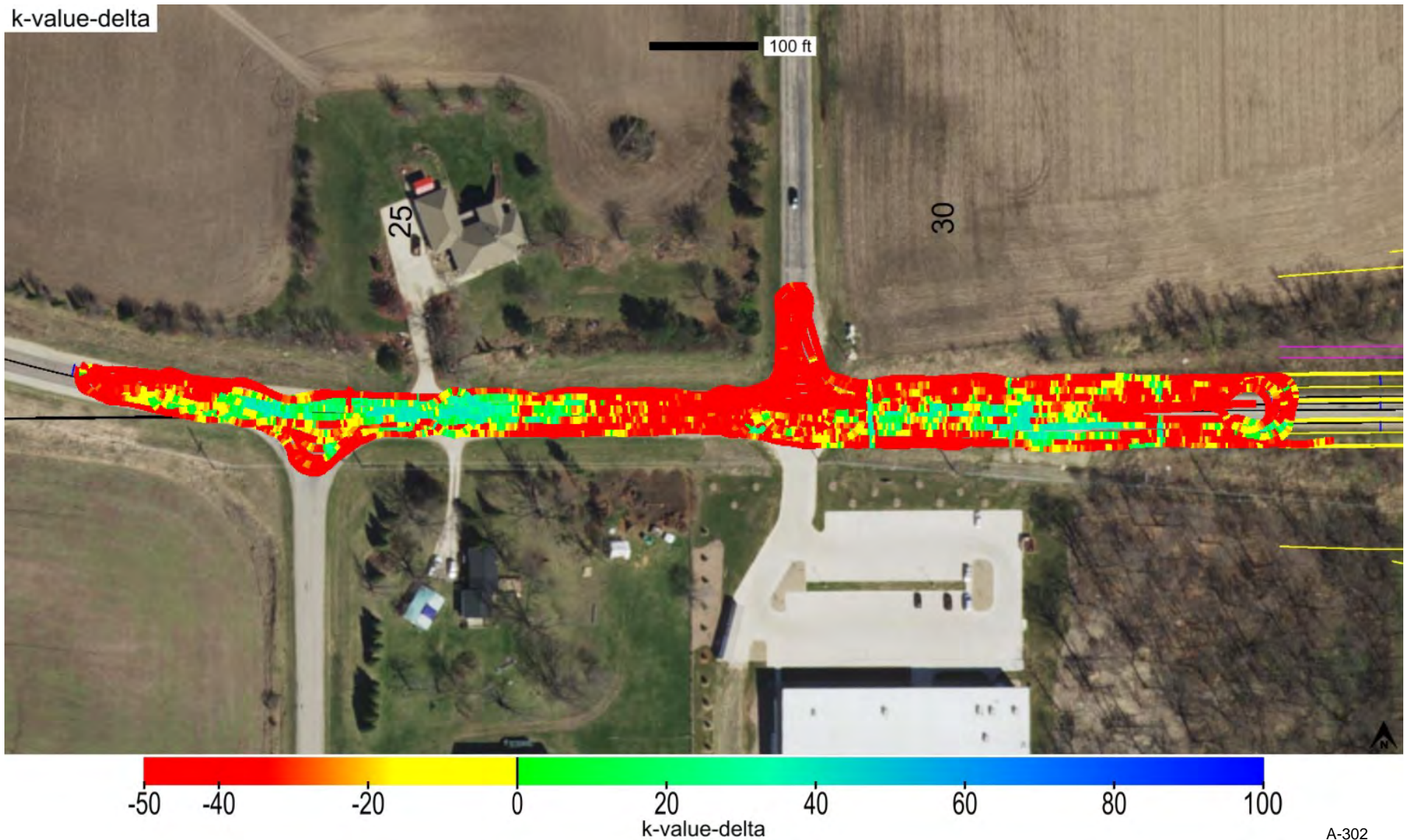


A-301

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_092036 Map Type: Verification Map Map Layer: Subbase 12 Inches

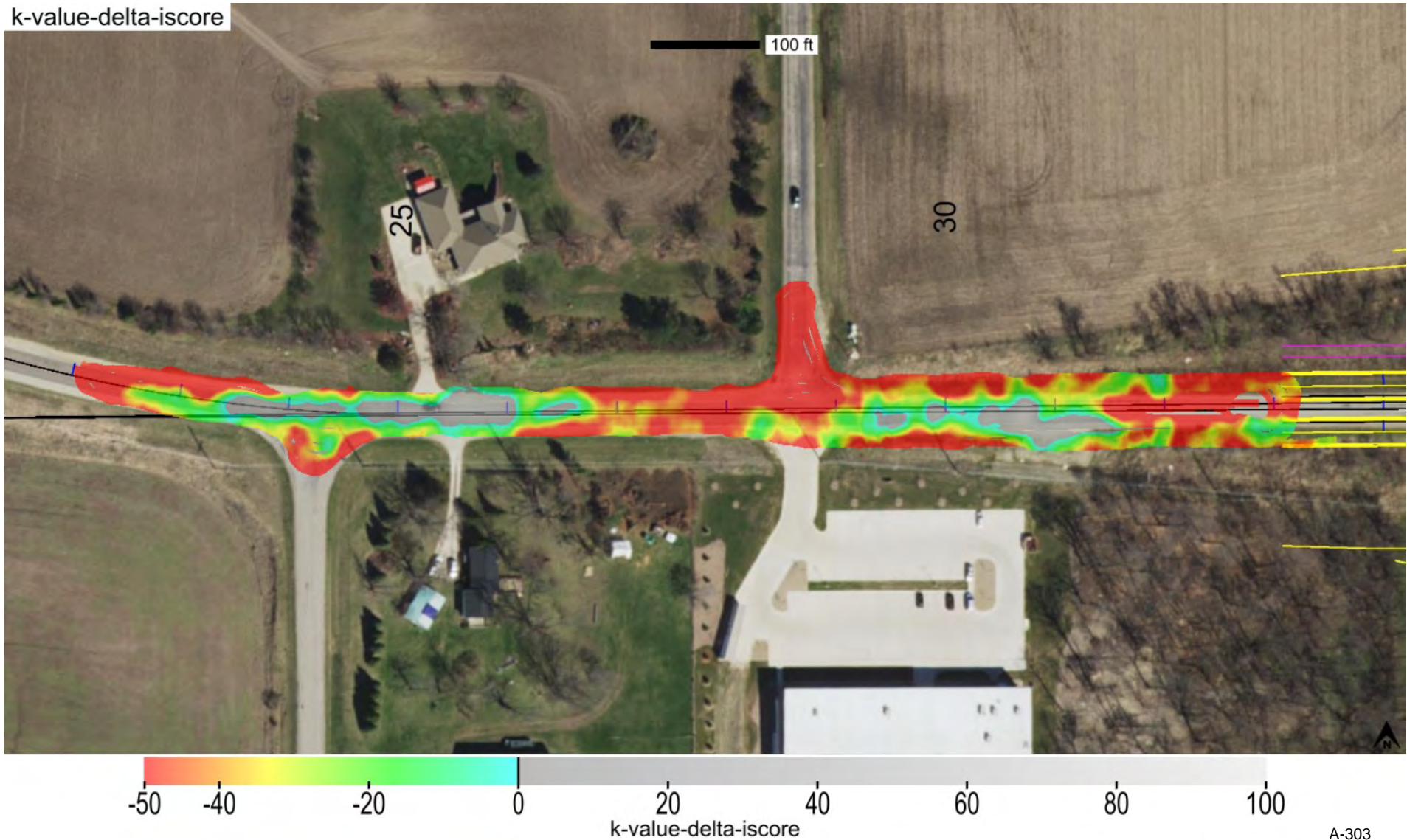
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	18.6	35.0	0.5	150.0	20.0	111.6	189.0	41.4	37.0	-130.0	-38.4	39.0



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_092036 Map Type: Verification Map Map Layer: Subbase 12 Inches

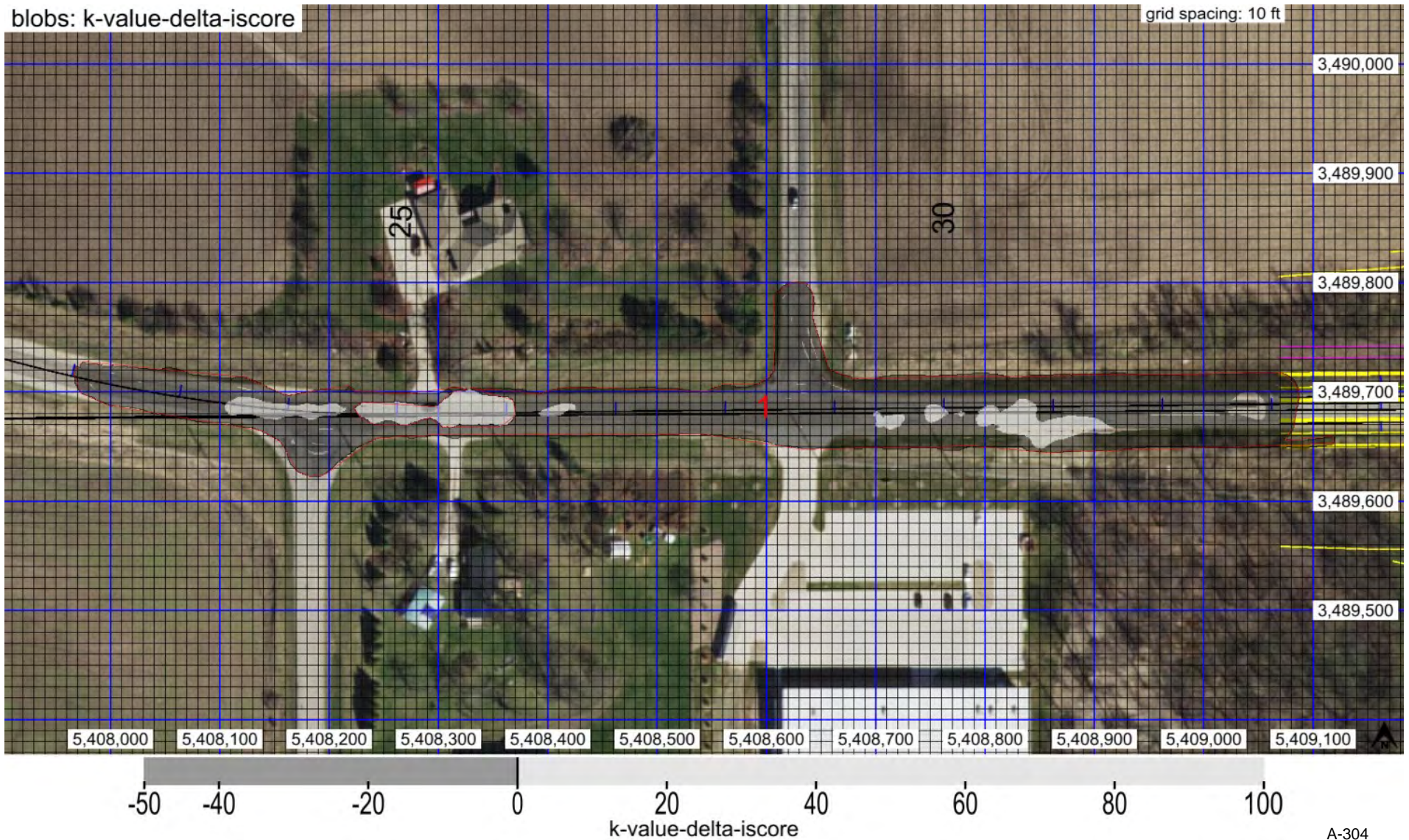
Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	18.6	150.0	-130.0	-38.4	39.0	-125.9	-37.7	35.3



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

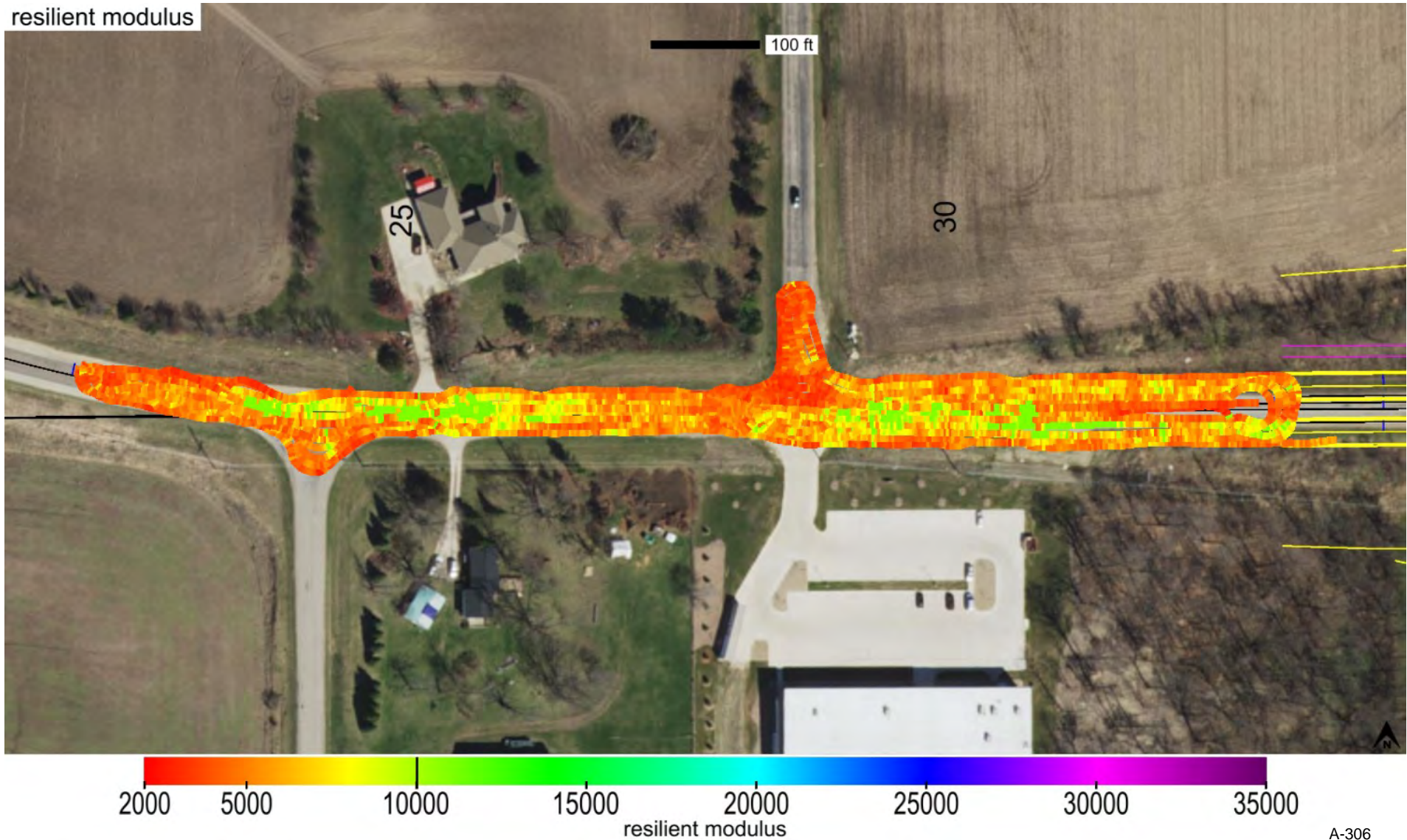
Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_092036 Map Type: Verification Map Map Layer: Subbase 12 Inches

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv	poly-tol.
1000	1	55871	87.8	none	0.0	4.0



Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_092036 Map Type: Verification Map Map Layer: Subbase 12 Inches

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	7.4	25.3	0.6	10017.0	2496.1	5894.5	11000.0	2015.4	34.2	-7520.9	-4122.5	983.0



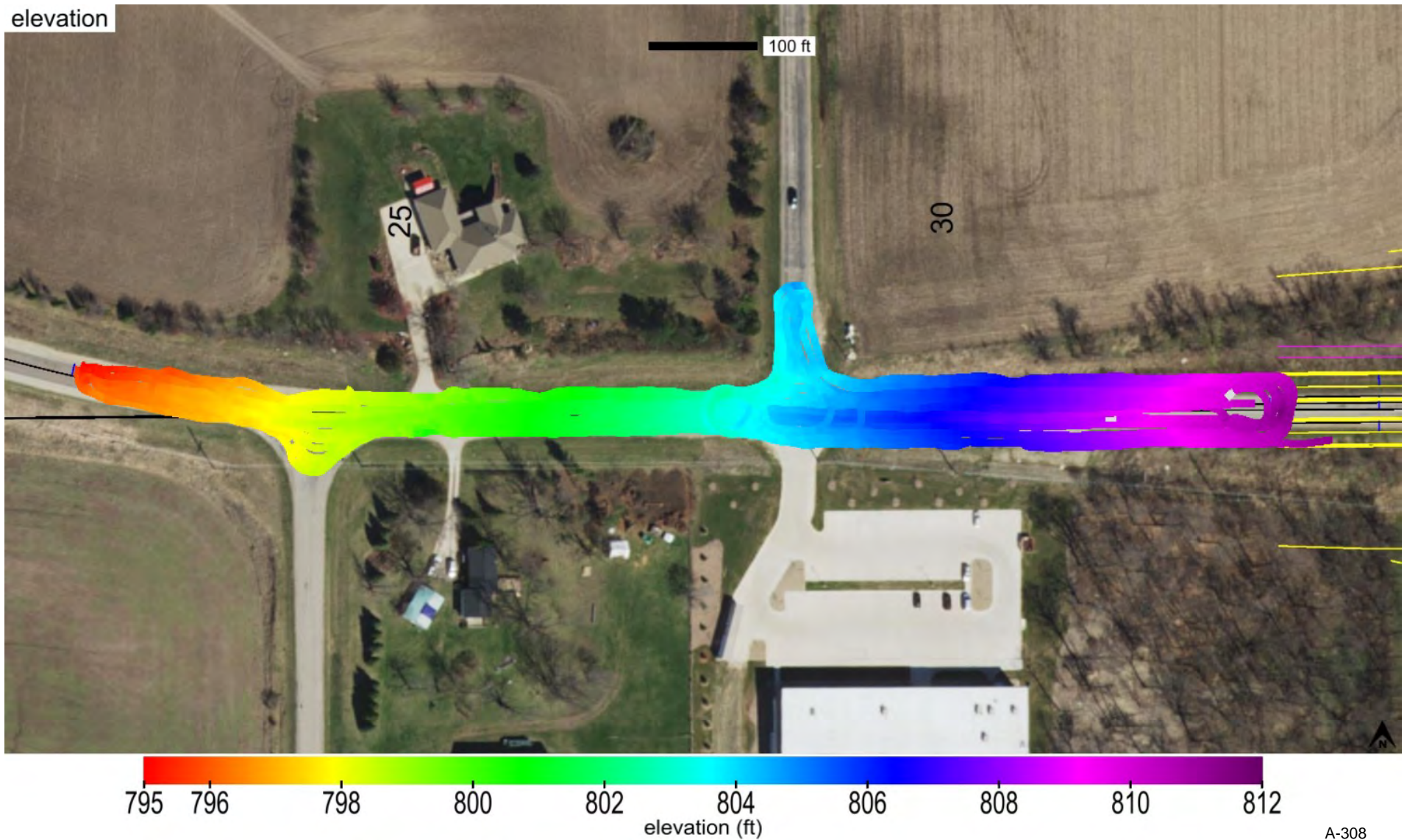
A-306

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

minimum	average	maximum
1	1.5	6

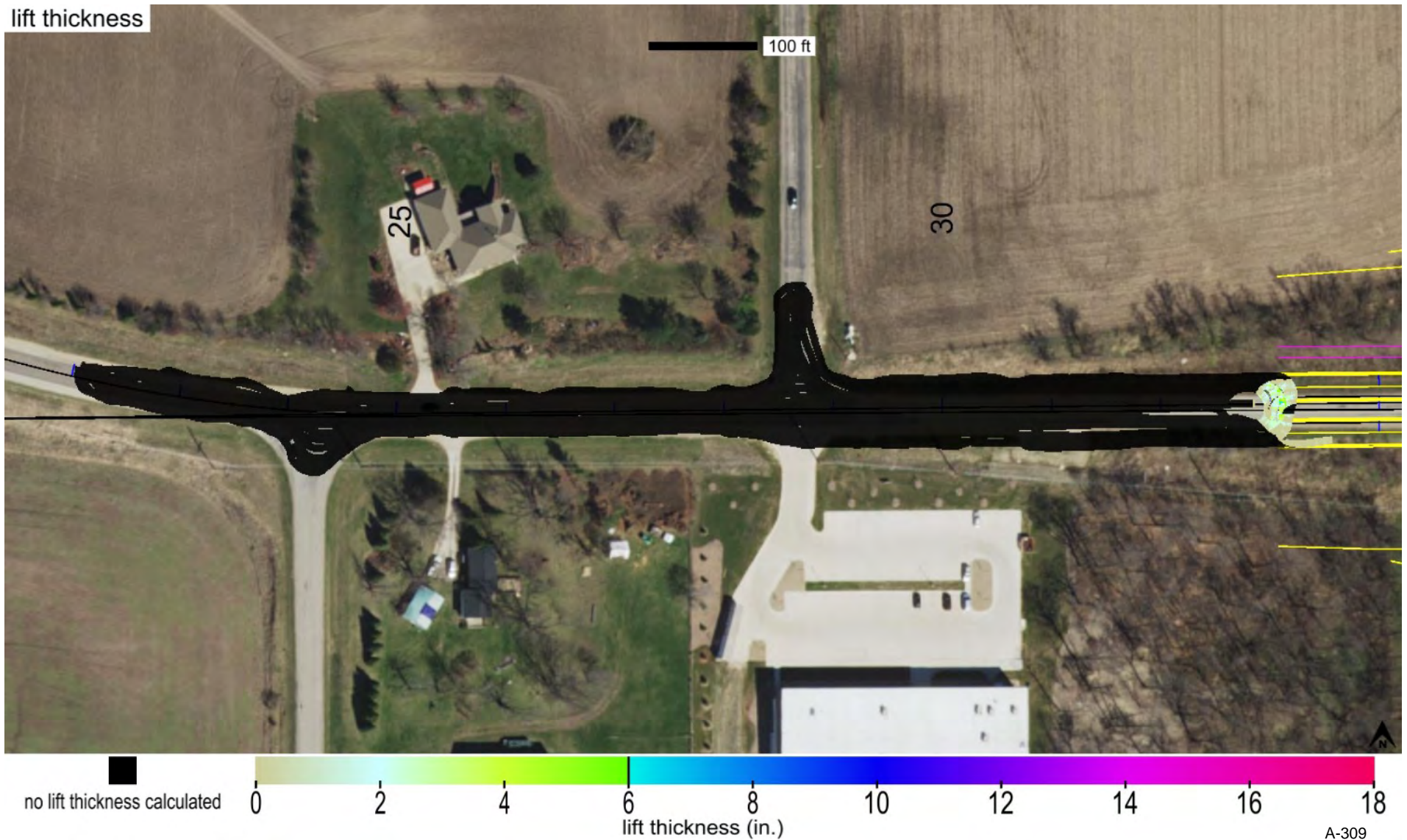


minimum	average	maximum
795.01	803.60	811.40



Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_092036 Map Type: Verification Map Map Layer: Subbase 12 Inches

25th percentile (in.)	Median (in.)	75th percentile (in.)	Target Value (in.)
-0.9	0.3	1.5	6.0



This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_092036 Map Type: Verification Map Map Layer: Subbase 12 Inches

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase Recycled Composite_IADOT	41025	100.0	63616	1.460	100.0	10017.0	150.0	20.5

materials



 Modified Subbase Recycled Composite_IADOT

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_100736

Project:	Linn County I-380	Date and Time:	8/26/2022 10:07:36 AM	Machine ID:	Ingios01
Description:	Tower Terrace Road Interchange	Mapping Duration (hrs):	1.186	Operator:	Ingios
Location:	Linn County IA	No. of Measurements:	63400	Machine Operator ID:	582
Review Status:	Review Required	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subbase 12 Inches	Segment:	Tower Terrace Road

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	No												
k-value	Yes	29.5	48.8	0.6	150.0	20.0	124.7	189.0	39.2	31.4	-130.0	-25.3	39.0
Moisture Content	No												

Mapped Area		Pass Count					Elevation (ft)			Velocity (fps)		
square feet	acres	10th percentile	Median	cov(%)	% >= TV	Target Value	min.	avg.	max.	min.	avg.	max.
63400	1.455	0	0	0.0	0.0	0	806.04	813.45	819.76	4.7	5.2	7.0

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase Recycled Composite_IADOT	41025	100.0	63400	1.455	100.0	10017.0	150.0	20.5

Blobs

parameter	min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv	poly-tol.
k-value	1000.0	3	50197	79.2	none	0.0	4.0

Lift Thickness

25th percentile (in.)	Median (in.)	75th percentile (in.)	Target Value (in.)
-1.1	-0.3	0.6	6.0

Station

Start	End
7031+00	7040+00

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_100736

Project:	Linn County I-380	Date and Time:	8/26/2022 10:07:36 AM	Machine ID:	Ingios01
Description:	Tower Terrace Road Interchange	Mapping Duration (hrs):	1.186	Operator:	Ingios
Location:	Linn County IA	No. of Measurements:	63400	Machine Operator ID:	582
Review Status:	Review Required	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subbase 12 Inches	Segment:	Tower Terrace Road

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
48.8	CQI > = 95
29.5	80% of k-Value MVs >= 150
31.4	COV <= 30
79.2	% i-Score Blob Area >= 1000 ft ²
-0.3	Lift Thickness Median Value (in.)
0	Pass Count >= 0

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction. The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value (TV) for the selected material. Level I target % Passing TV = 80%. Level II target % Passing TV = 90%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the measurement values (MVs) reported at each grid point of the mapping area. Description of COV ranges: <= 20% = Low Variability; 20 to 40% = Moderate Variability; > 40% = High Variability. The default target COV is <= 30%.

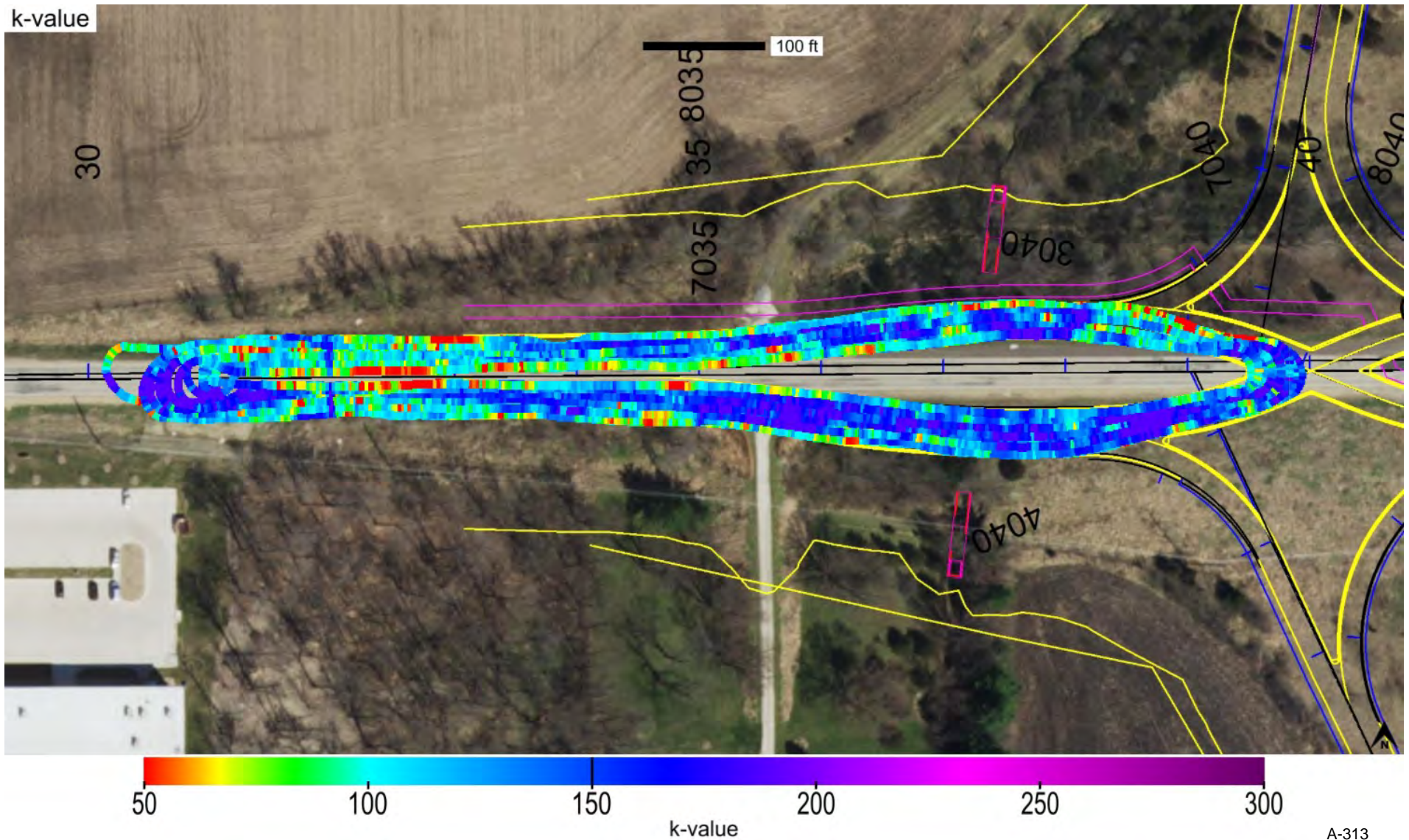
i-Score Blob (%): The percentage of the map area analyzed with contiguous blob areas with MVs < TV. Control Level 1 >= 100 sq. ft.; Control Level 2 >= 200 sq. ft.; Control Level 3 >= 500 sq. ft.; Control Level 4 >= 1,000 sq. ft.; Control Level 5 >= 2,000 sq. ft.

Lift thickness: Green: 75th percentile value <= TV; Yellow: median value <= TV and 75th percentile > TV; Red: median value (50th percentile) > TV.

Pass Count: Green: 10th percentile value >= TV; Yellow: 10th percentile value >= TV and cov% > 50%; Red: 10th percentile value < TV.

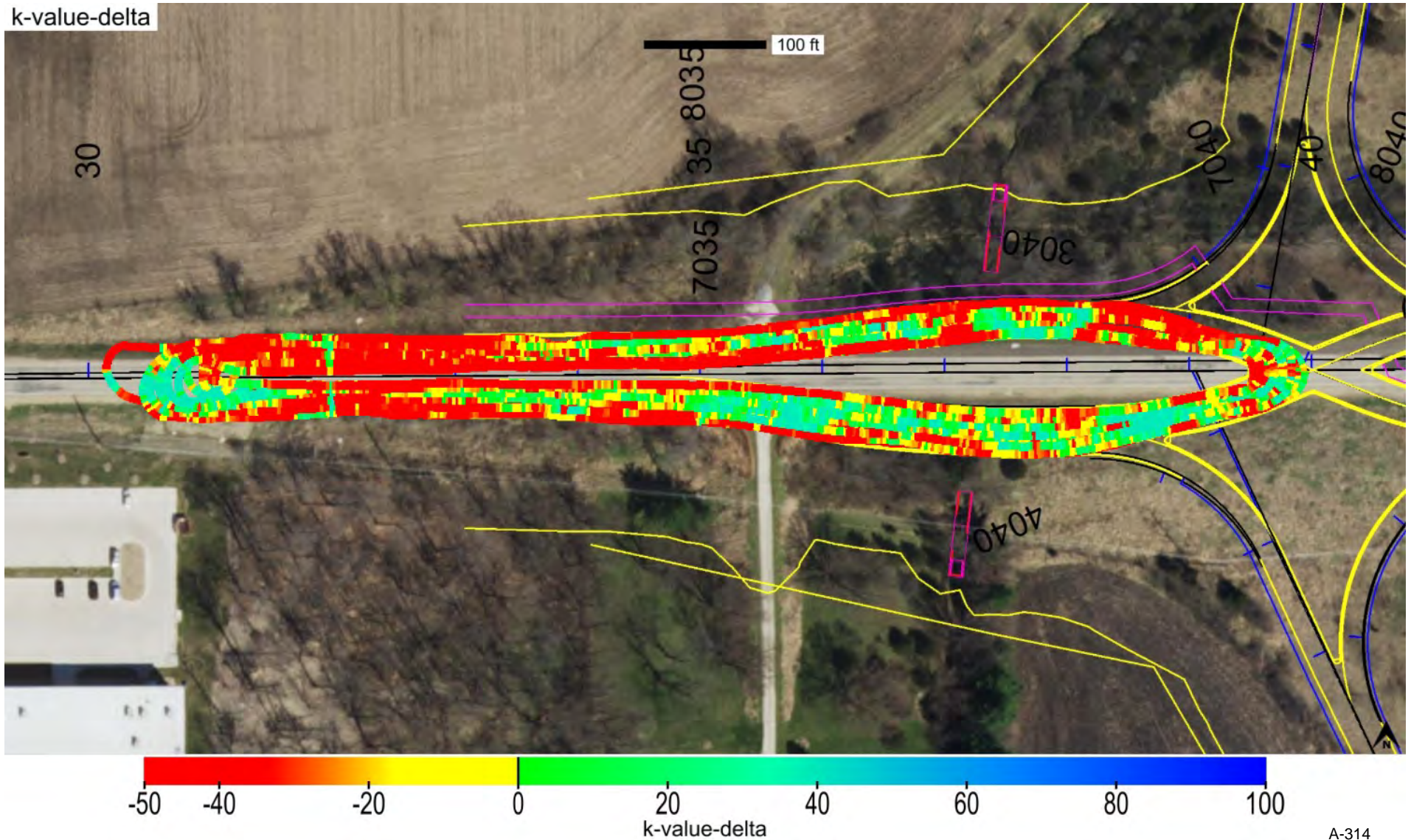
Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_100736 Map Type: Verification Map Map Layer: Subbase 12 Inches

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	29.5	48.8	0.6	150.0	20.0	124.7	189.0	39.2	31.4	-130.0	-25.3	39.0



Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_100736 Map Type: Verification Map Map Layer: Subbase 12 Inches

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	29.5	48.8	0.6	150.0	20.0	124.7	189.0	39.2	31.4	-130.0	-25.3	39.0

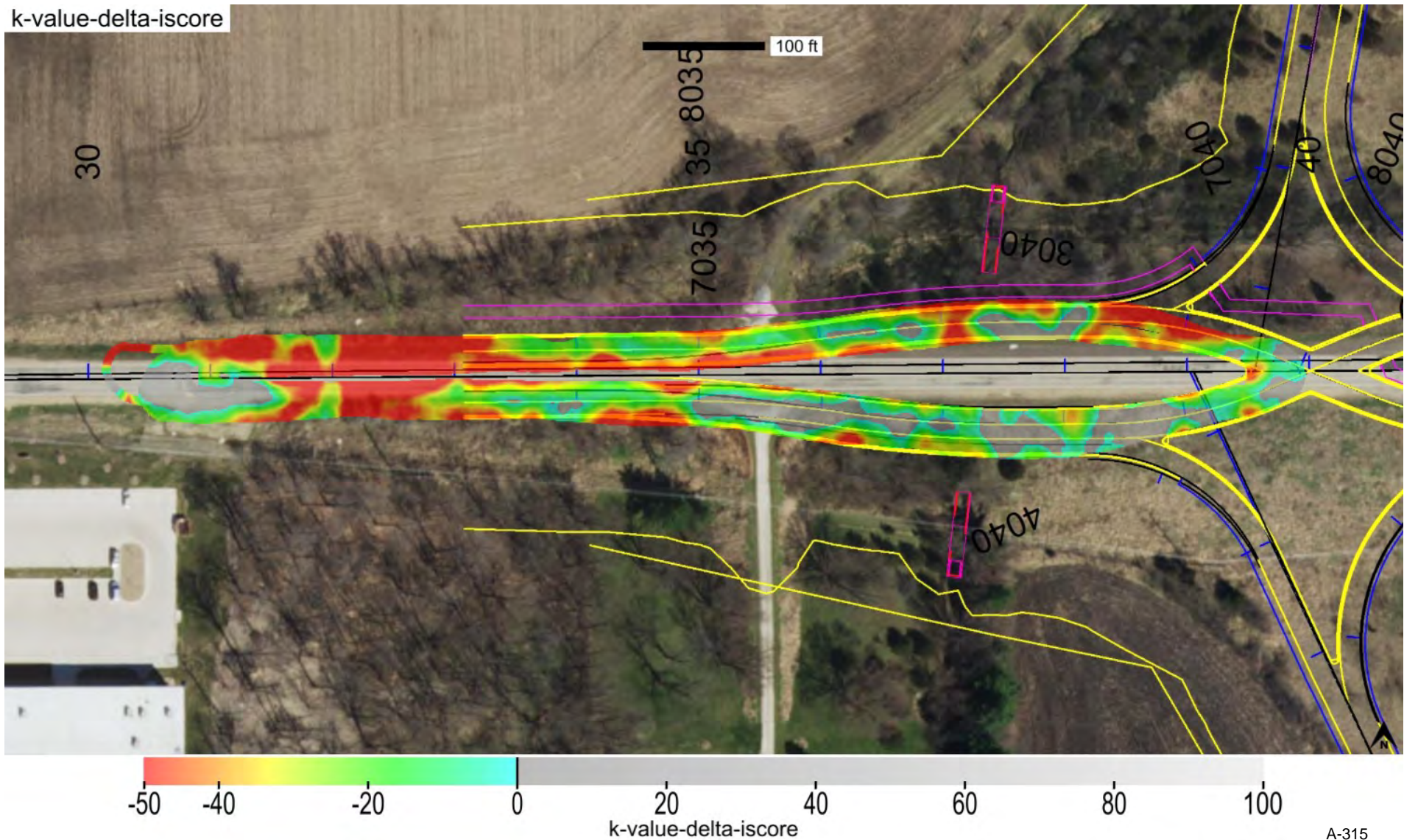


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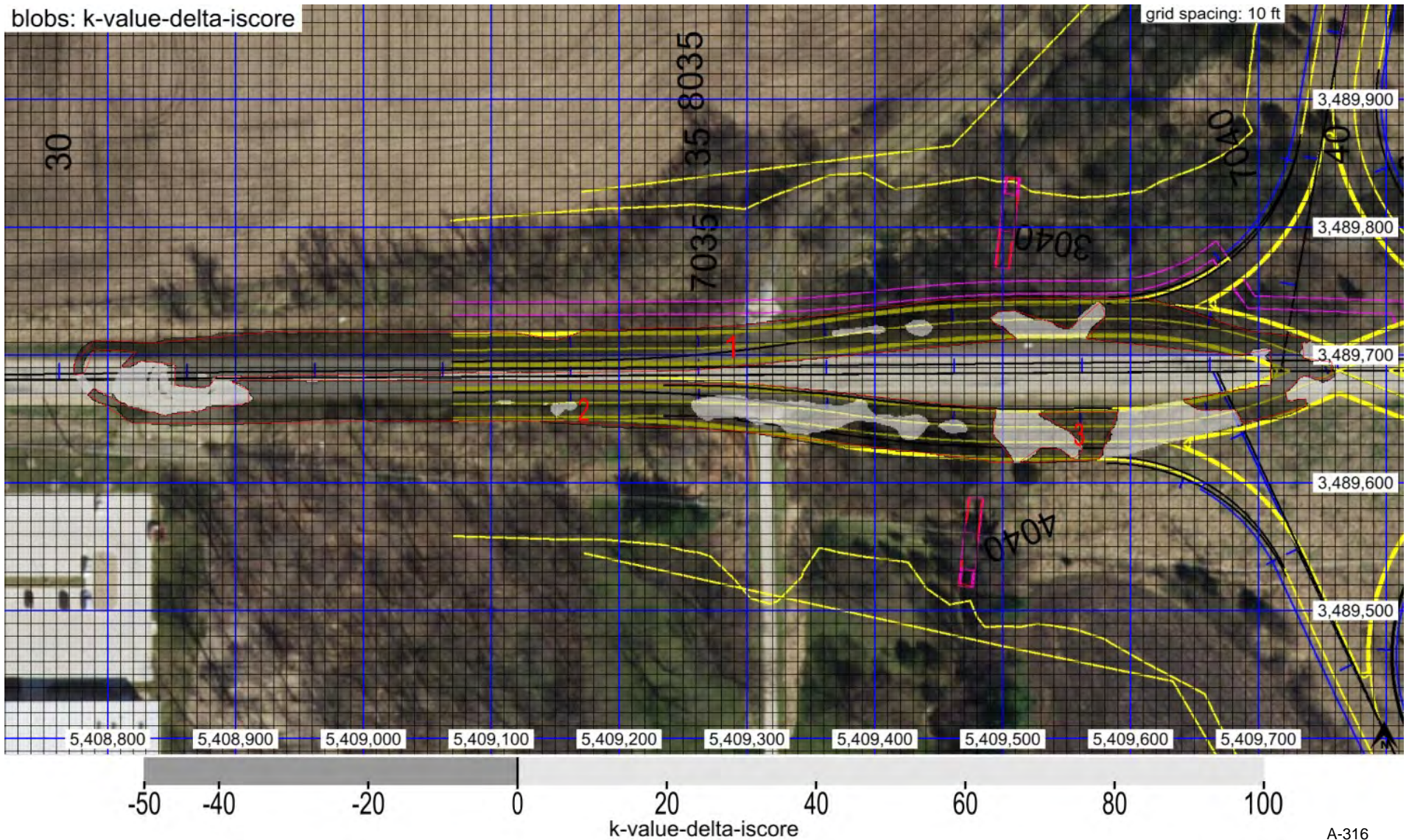
Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_100736 Map Type: Verification Map Map Layer: Subbase 12 Inches

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	29.5	150.0	-130.0	-25.3	39.0	-109.7	-24.3	38.1



Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_100736 Map Type: Verification Map Map Layer: Subbase 12 Inches

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv	poly-tol.
1000	3	50197	79.2	none	0.0	4.0



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blob: k-value-delta-iscore

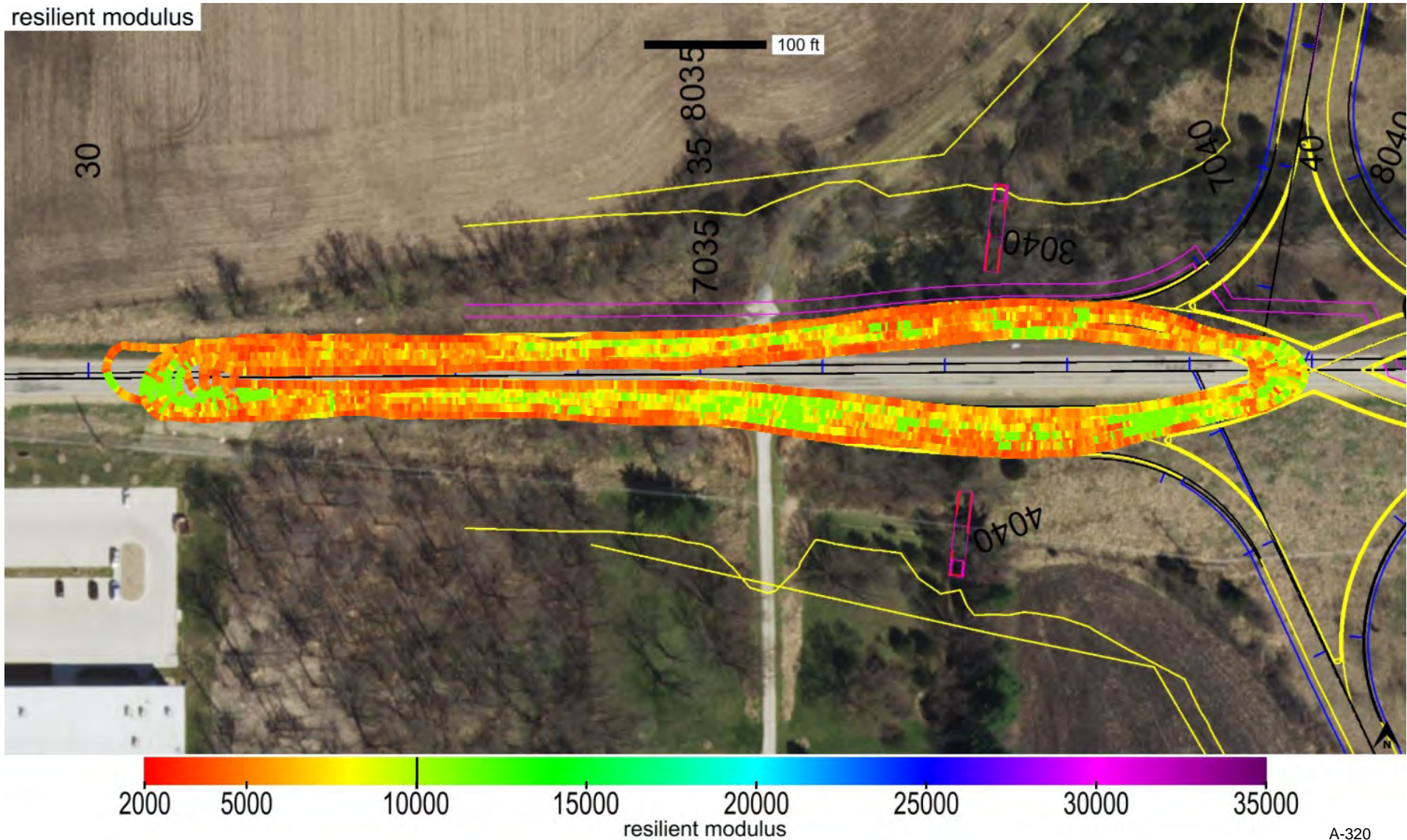
Blob #	Area (ft^2)	% of blobs area	# b.p.	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
1	29655	59.1	50	-109.7	-37.5	0.0

Point	Easting (ft)	Northing (ft)
1	5409688	3489646
2	5409738	3489660
3	5409738	3489666
4	5409722	3489664
5	5409722	3489672
6	5409734	3489684
7	5409756	3489680
8	5409758	3489694
9	5409736	3489698
10	5409734	3489710
11	5409740	3489710
12	5409736	3489714
13	5409694	3489718
14	5409612	3489744
15	5409456	3489744
16	5409292	3489722
17	5409174	3489720
18	5409154	3489712
19	5409120	3489718
20	5408932	3489718
21	5408838	3489710
22	5408790	3489712
23	5408774	3489692
24	5408774	3489684
25	5408782	3489686
26	5408790	3489704

Point	Easting (ft)	Northing (ft)
27	5408822	3489702
28	5408812	3489690
29	5408826	3489696
30	5408852	3489692
31	5408852	3489676
32	5408866	3489674
33	5408880	3489676
34	5408886	3489684
35	5409256	3489688
36	5409510	3489712
37	5409490	3489728
38	5409496	3489734
39	5409510	3489734
40	5409552	3489720
41	5409576	3489742
42	5409580	3489730
43	5409566	3489712
44	5409684	3489700
45	5409710	3489704
46	5409710	3489676
47	5409642	3489666
48	5409656	3489656
49	5409682	3489658
50	5409688	3489648

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_100736 Map Type: Verification Map Map Layer: Subbase 12 Inches

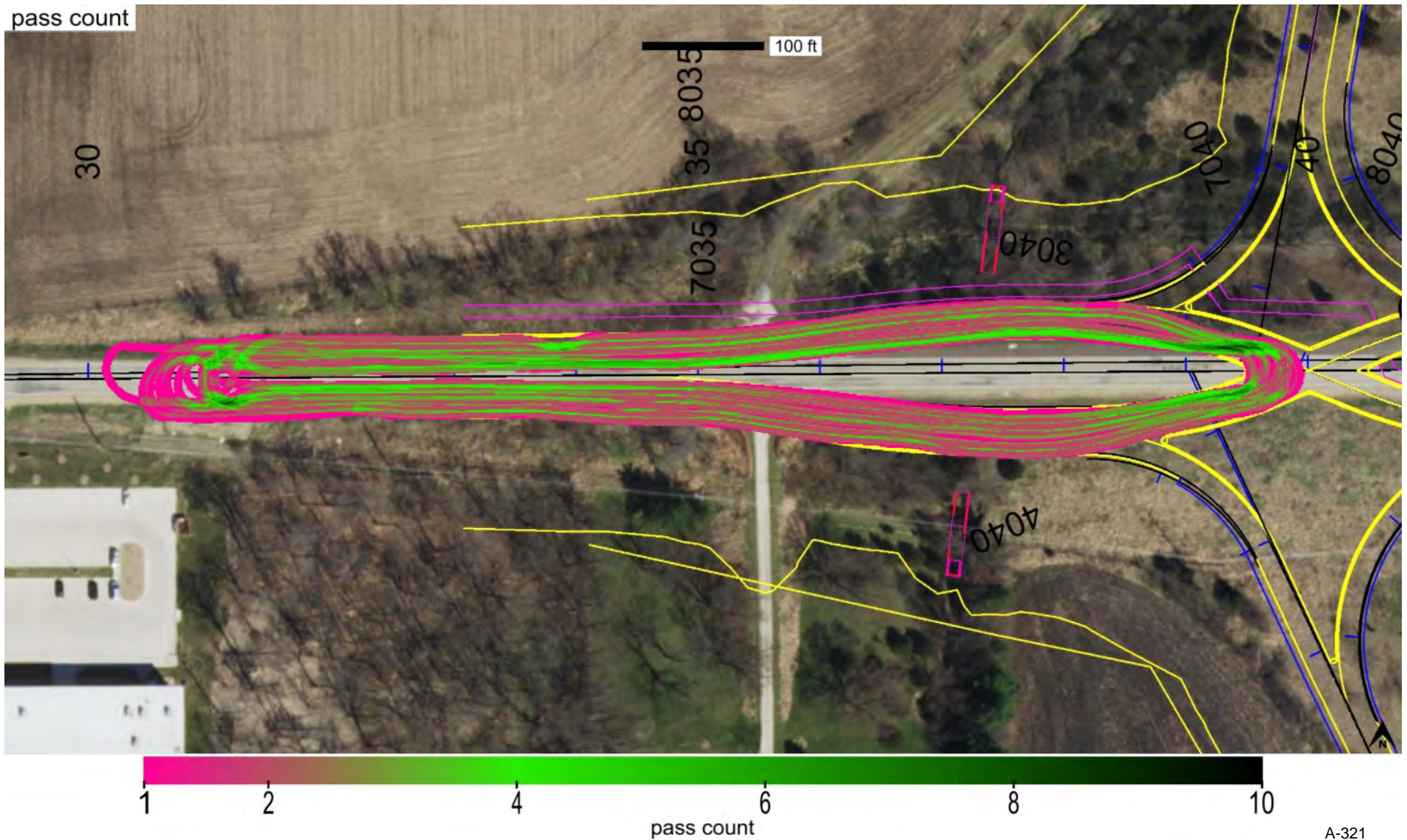
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	12.0	29.0	0.6	10017.0	2757.8	6260.6	11000.0	2242.3	35.8	-7259.2	-3756.4	983.0



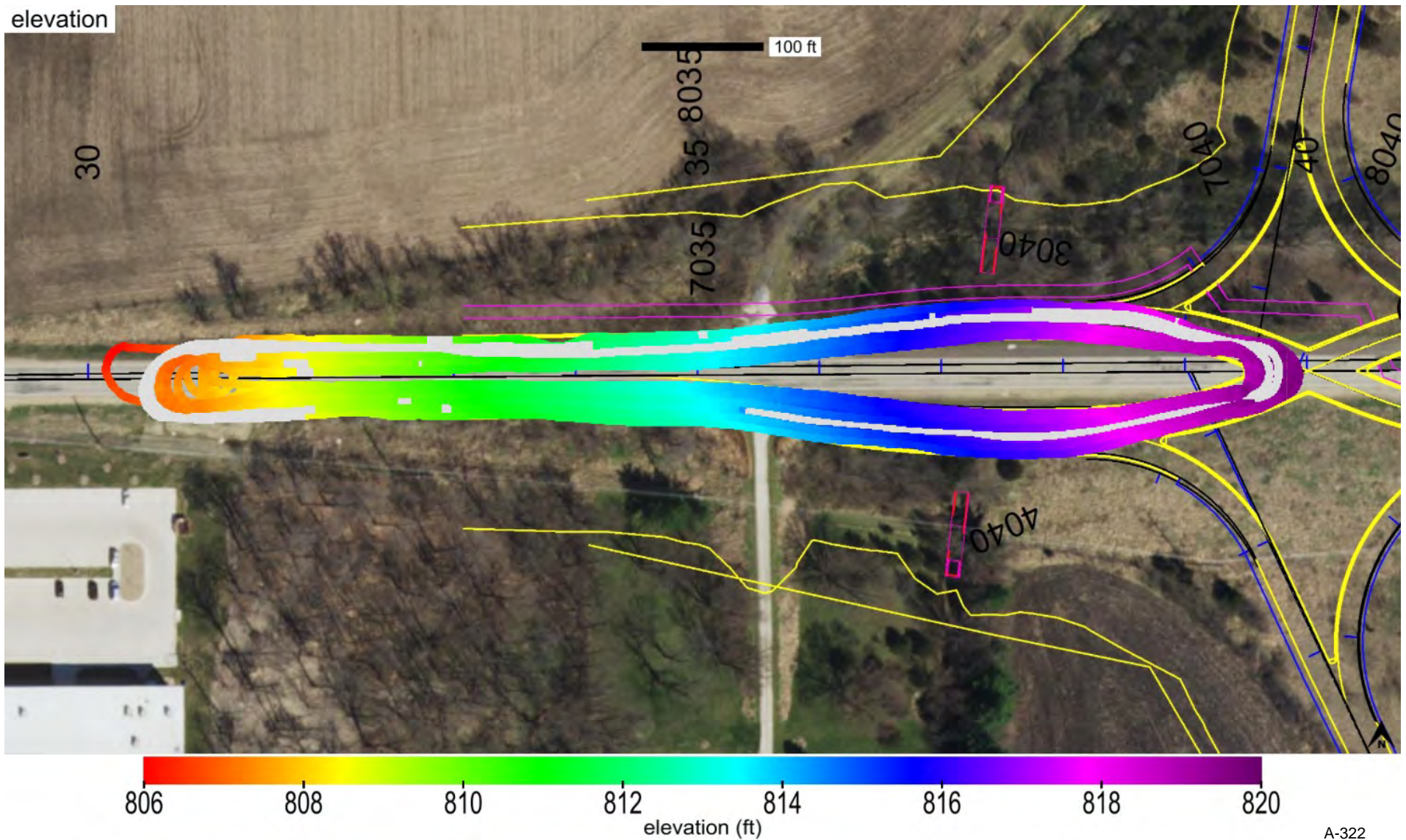
A-320

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10th percentile	Median	cov(%)	% >= TV	Target Value
0	0	0.0	0.0	0

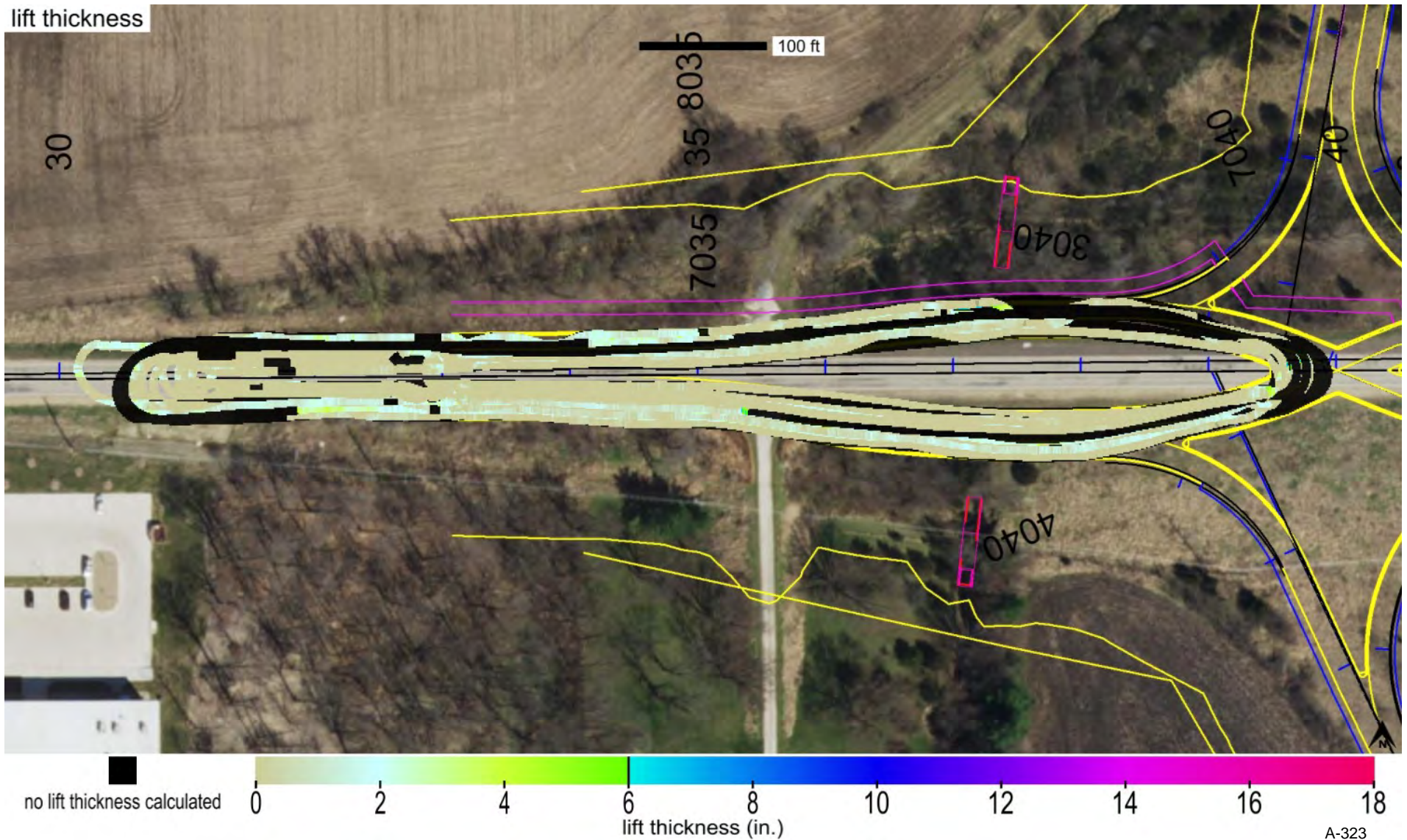


minimum	average	maximum
806.04	813.45	819.77



Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_100736 Map Type: Verification Map Map Layer: Subbase 12 Inches

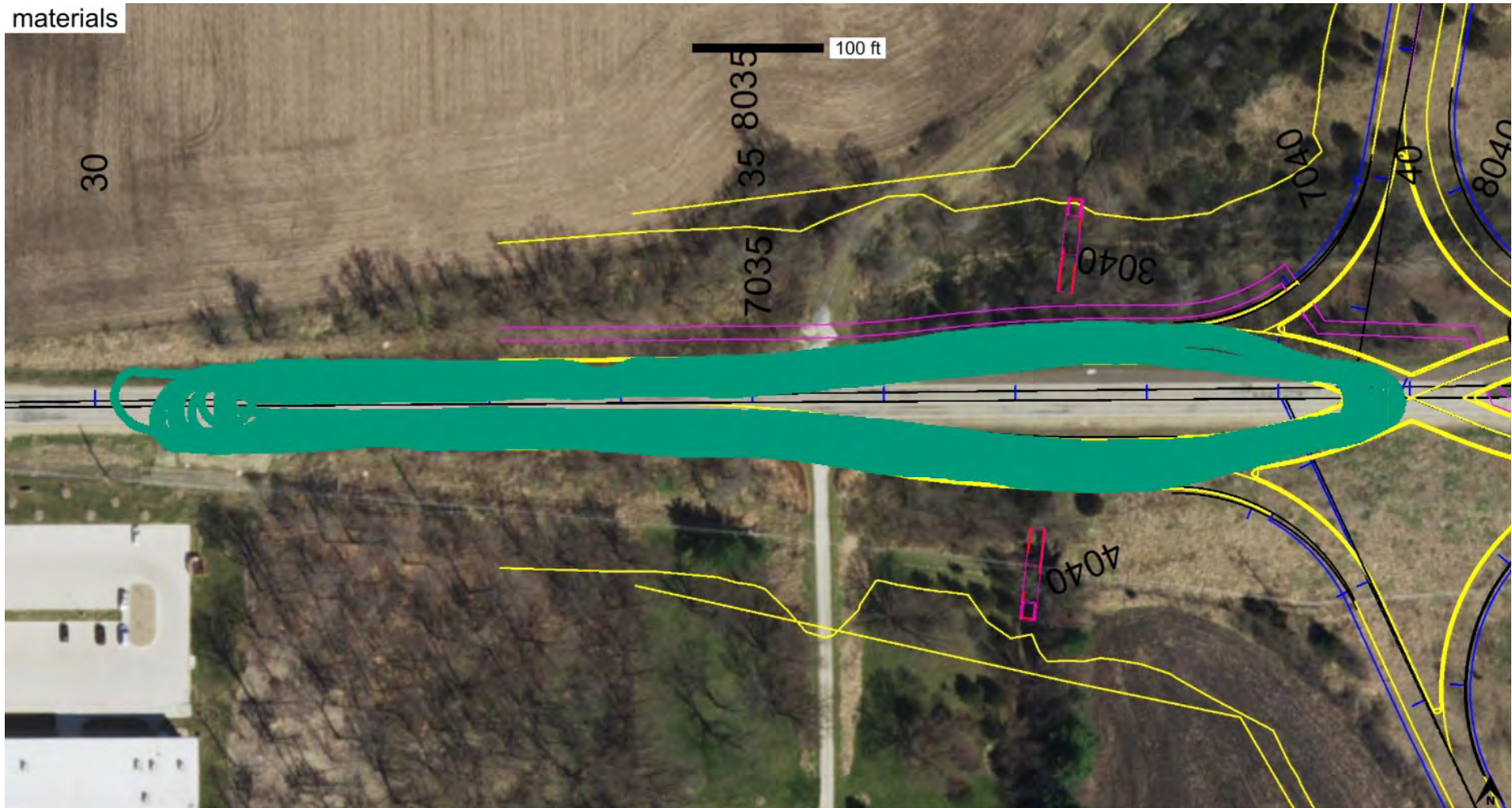
25th percentile (in.)	Median (in.)	75th percentile (in.)	Target Value (in.)
-1.1	-0.3	0.6	6.0



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Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_100736 Map Type: Verification Map Map Layer: Subbase 12 Inches

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase Recycled Composite_IADOT	41025	100.0	63400	1.455	100.0	10017.0	150.0	20.5



Modified Subbase Recycled Composite_IADOT

ing_57-i380-200_cs56b-ingios01_2022_08_26_100736_20221101T112955_IMG-4228.JPG



Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_100736 Map Type: Verification Map Map Layer: Subbase 12 Inches

ing_57-i380-200_cs56b-ingios01_2022_08_26_100736_20221101T114042_ing-57-i380-200-cs56b-ingios01-2022-08-26-100736.JPG



Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_120258

Project:	Linn County I-380	Date and Time:	8/26/2022 12:02:58 PM	Machine ID:	Ingios01
Description:	Tower Terrace Road Interchange	Mapping Duration (hrs):	0.034	Operator:	Ingios
Location:	Linn County IA	No. of Measurements:	1539	Machine Operator ID:	582
Review Status:	Review Required	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subgrade Top	Segment:	Ramp C

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	No												
k-value	Yes	6.9	20.1	0.1	100.0	35.0	59.0	146.9	25.7	43.5	-65.0	-41.0	46.9
Moisture Content	No												

Mapped Area Pass Count Elevation (ft) Velocity (fps)

square feet	acres	min.	avg.	max.	min.	avg.	max.	min.	avg.	max.
1539	0.035	1	1.2	2	0.00	0.00	0.00	4.8	8.9	10.3

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade_Class 10 (Sand)_IADOT	22013	100.0	1539	0.035	100.0	3000.0	100.0	20.5

Blobs

parameter	min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv	poly-tol.
k-value	1000.0	1	1124	73.0	none	0.0	4.0

Lift Thickness

25th percentile (in.)	Median (in.)	75th percentile (in.)	Target Value (in.)
0.0	0.0	0.0	6.0

Station

Start	End
4032+00	4034+00

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_120258

Project:	Linn County I-380	Date and Time:	8/26/2022 12:02:58 PM	Machine ID:	Ingios01
Description:	Tower Terrace Road Interchange	Mapping Duration (hrs):	0.034	Operator:	Ingios
Location:	Linn County IA	No. of Measurements:	1539	Machine Operator ID:	582
Review Status:	Review Required	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subgrade Top	Segment:	Ramp C

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
20.1	CQI > = 95
6.9	80% of k-Value MVs >= 100
43.5	COV <= 30
73.0	% i-Score Blob Area >= 1000 ft ²
0.0	Lift Thickness Median Value (in.)

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction. The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value (TV) for the selected material. Level I target % Passing TV = 80%. Level II target % Passing TV = 90%.

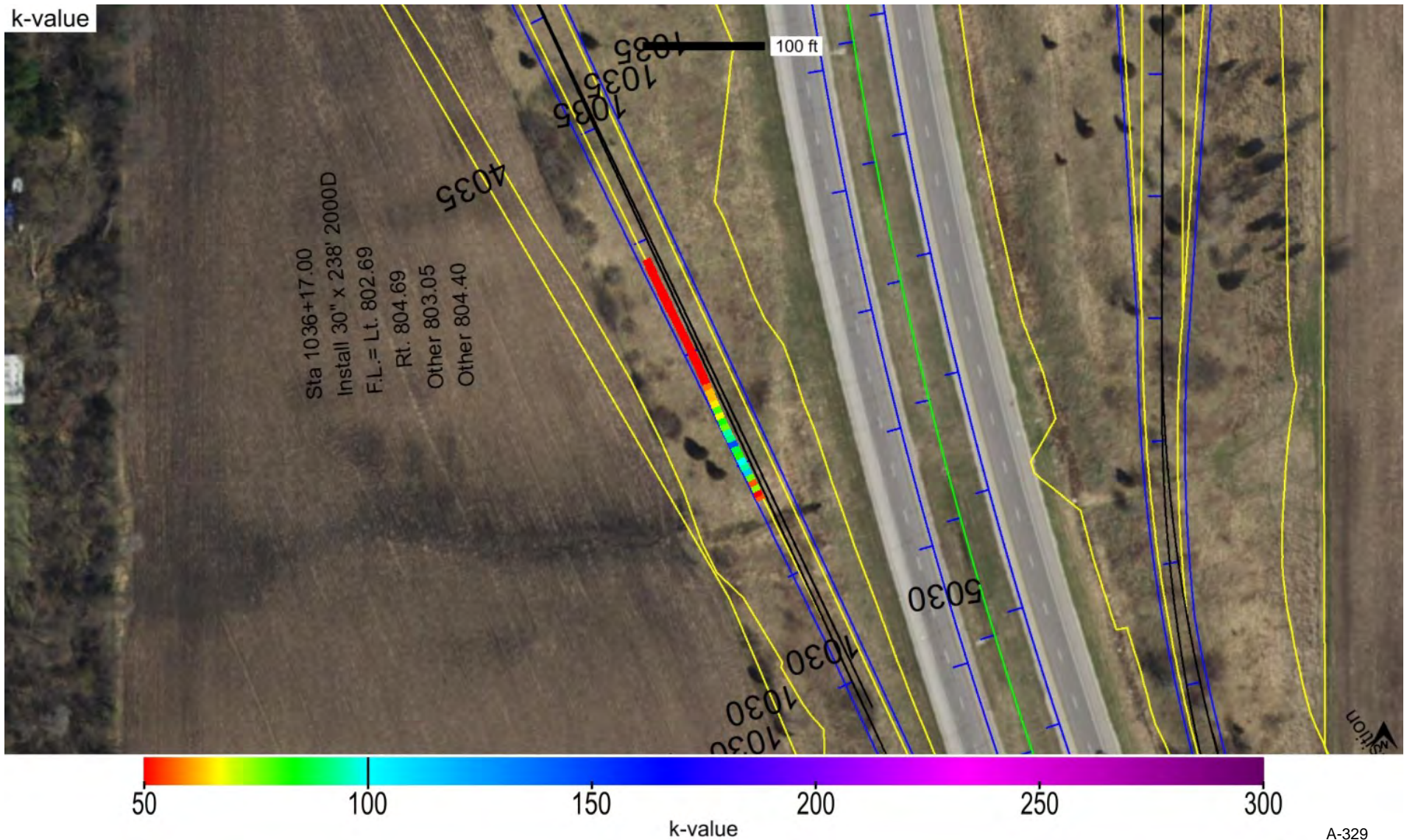
Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the measurement values (MV) reported at each grid point of the mapping area. Description of COV ranges: <= 20% = Low Variability; 20 to 40% = Moderate Variability; > 40% = High Variability. The default target COV is <= 30%.

i-Score Blob (%): The percentage of the map area analyzed with contiguous blob areas with MVs < TV. Control Level 1 >= 100 sq. ft.; Control Level 2 >= 200 sq. ft.; Control Level 3 >= 500 sq. ft.; Control Level 4 >= 1,000 sq. ft.; Control Level 5 >= 2,000 sq. ft.

Lift thickness: Green: 75th percentile value <= TV; Yellow: median value <= TV and 75th percentile > TV; Red: median value (50th percentile) > TV.

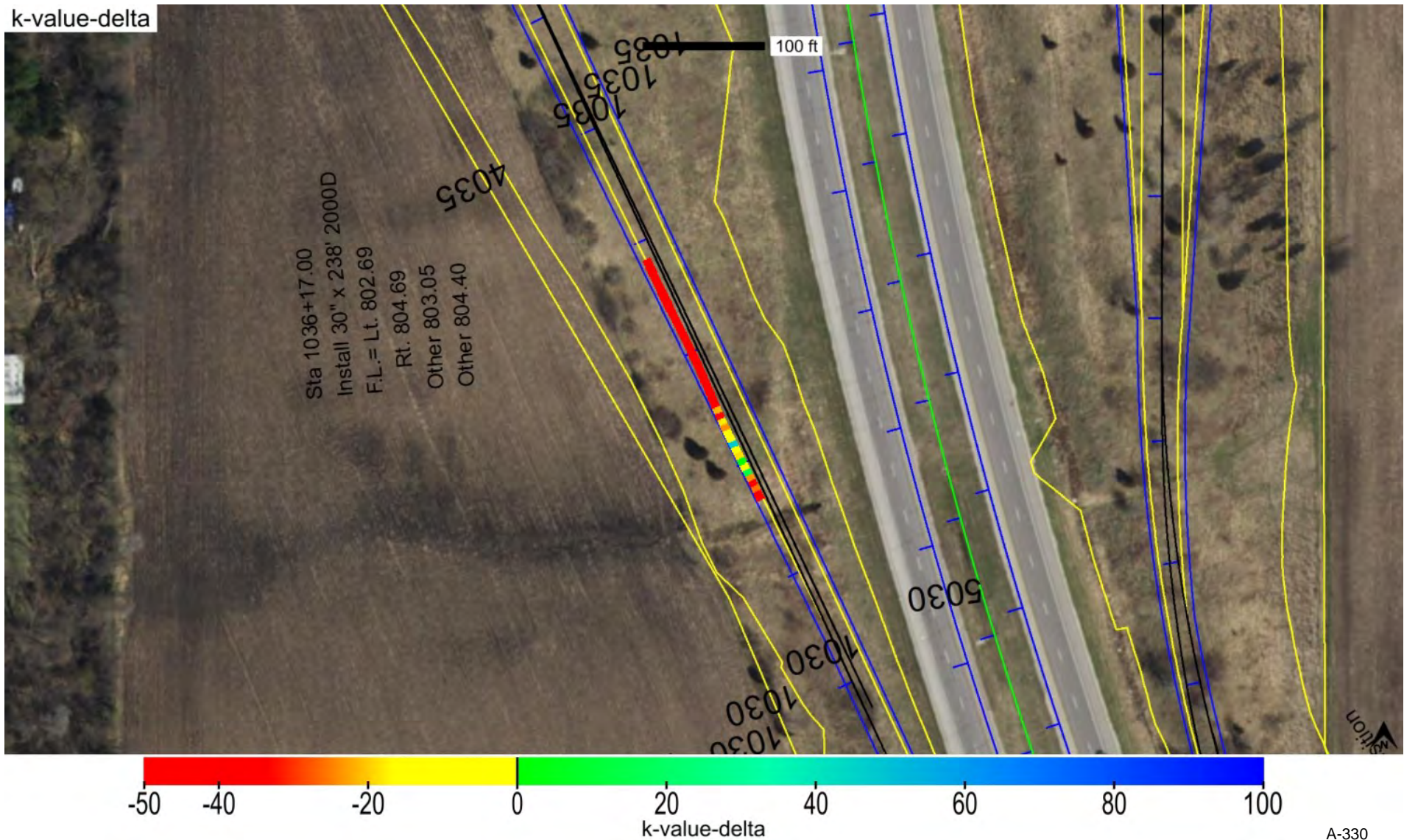
Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_120258 Map Type: Verification Map Map Layer: Subgrade Top

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	6.9	20.1	0.1	100.0	35.0	59.0	146.9	25.7	43.5	-65.0	-41.0	46.9



Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_120258 Map Type: Verification Map Map Layer: Subgrade Top

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	6.9	20.1	0.1	100.0	35.0	59.0	146.9	25.7	43.5	-65.0	-41.0	46.9



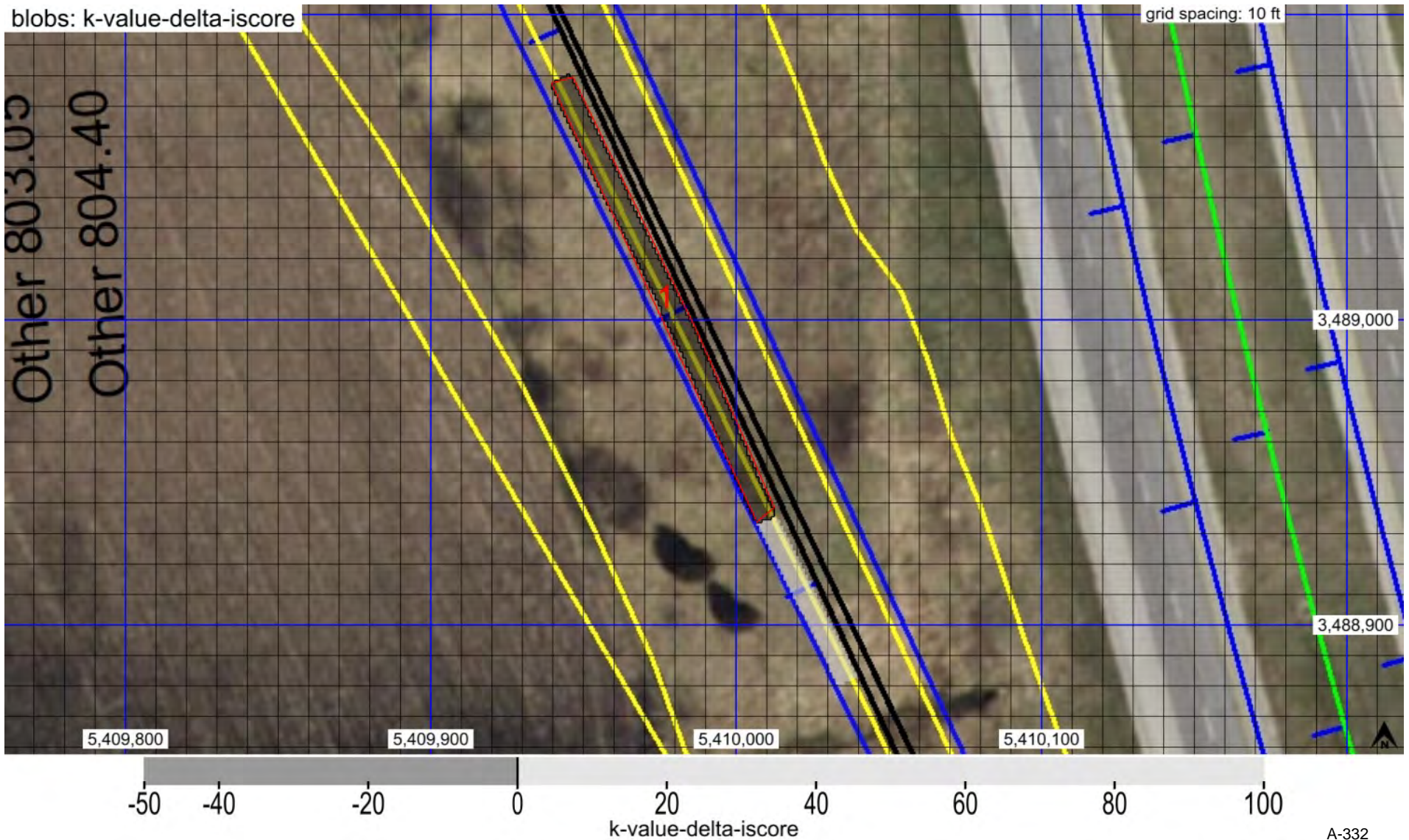
Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_120258 Map Type: Verification Map Map Layer: Subgrade Top

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	6.9	100.0	-65.0	-41.0	46.9	-64.8	-41.0	6.6



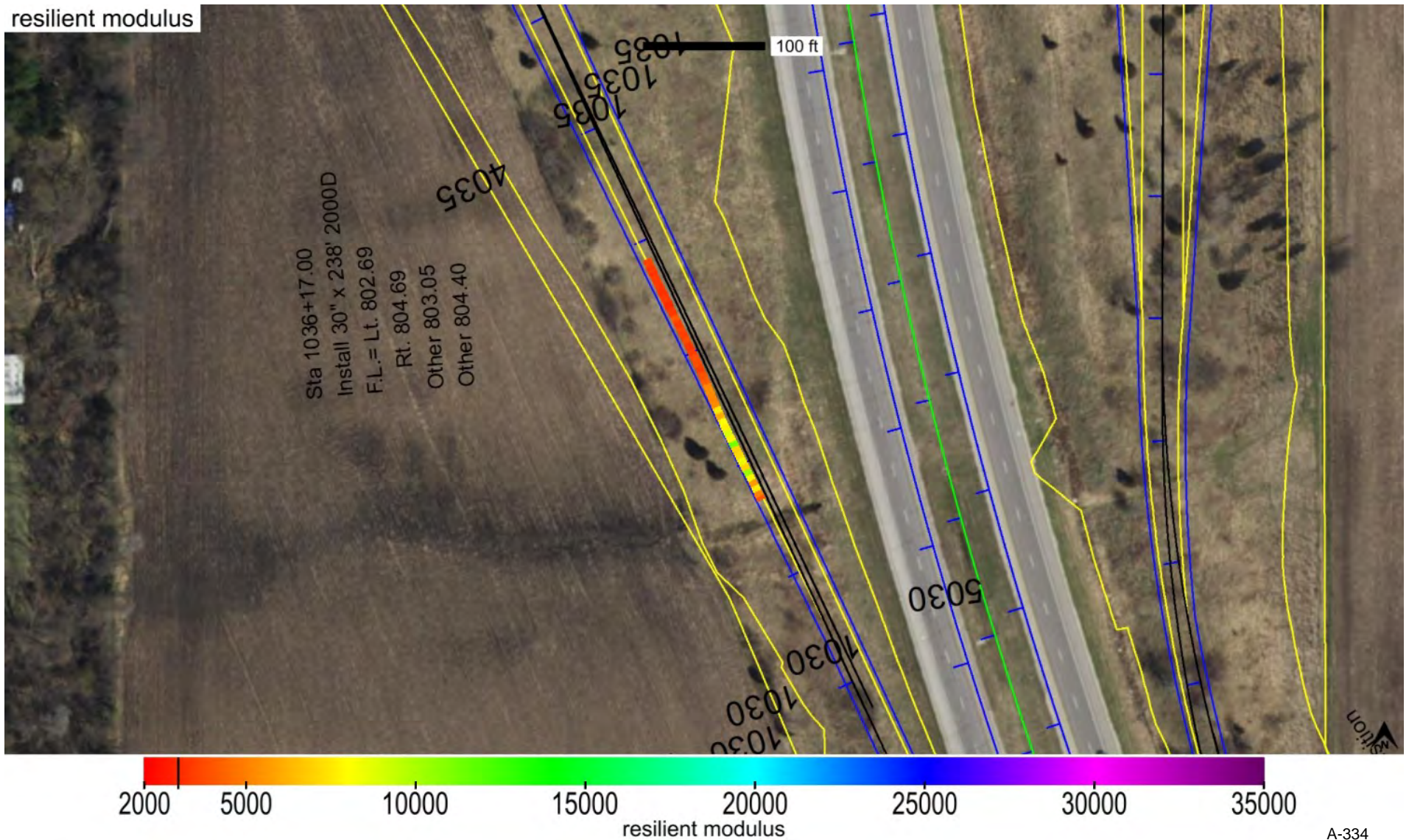
Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_120258 Map Type: Verification Map Map Layer: Subgrade Top

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv	poly-tol.
1000	1	1124	73.0	none	0.0	4.0

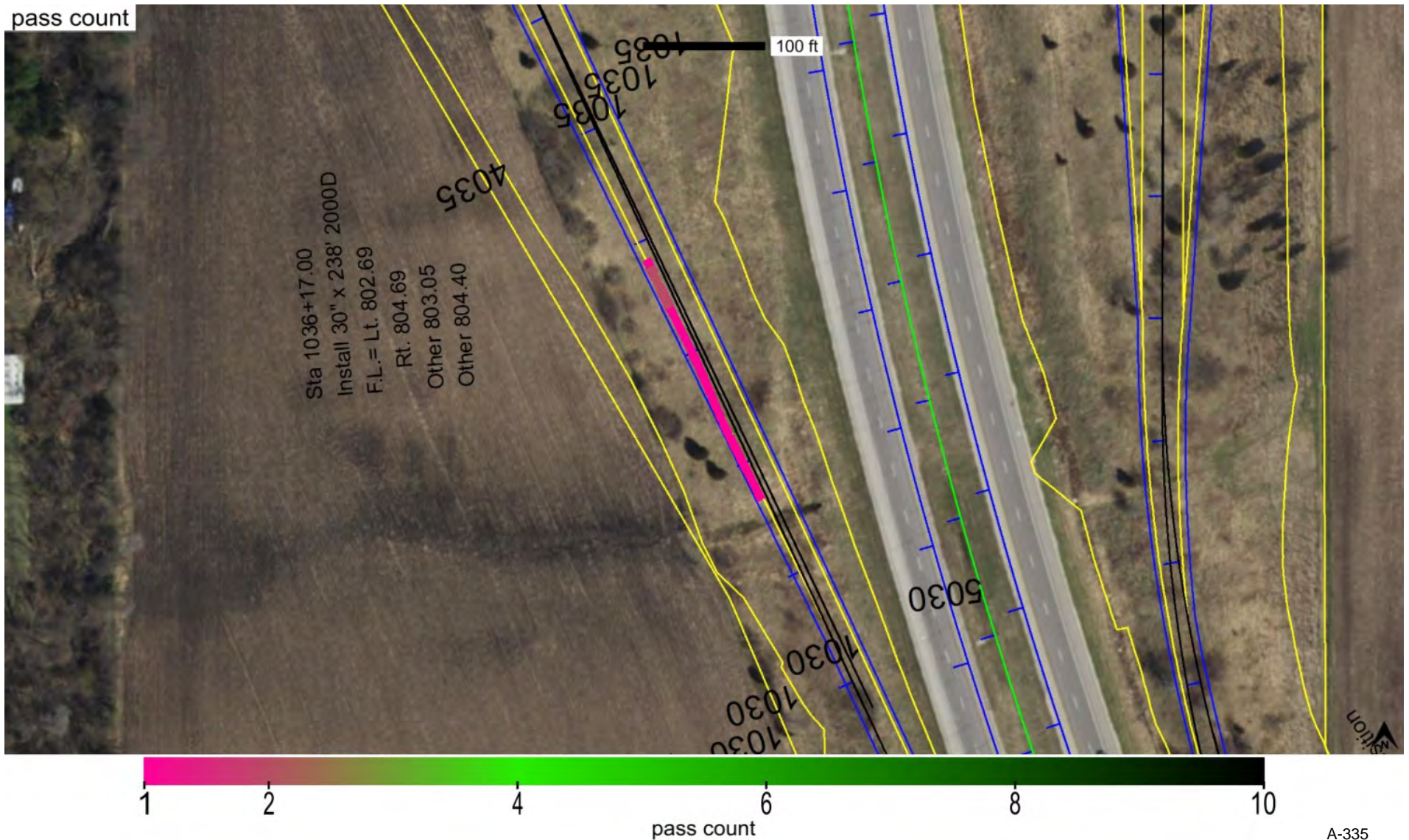


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Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	98.8	113.3	0.5	3000.0	2938.1	5225.0	11000.0	2139.0	40.9	-61.9	2225.0	8000.0



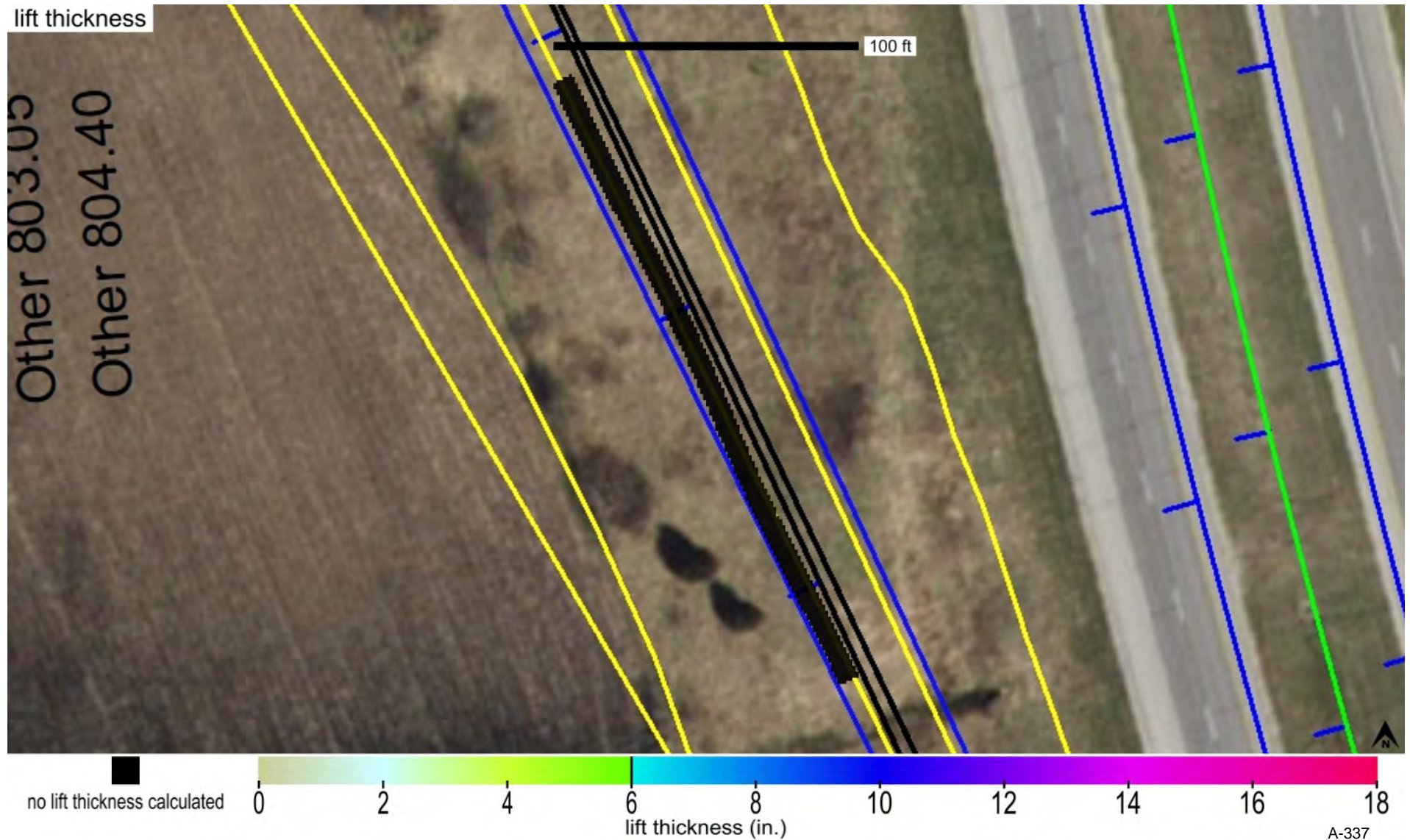
minimum	average	maximum
1	1.2	2



minimum	average	maximum
0.00	0.00	0.00

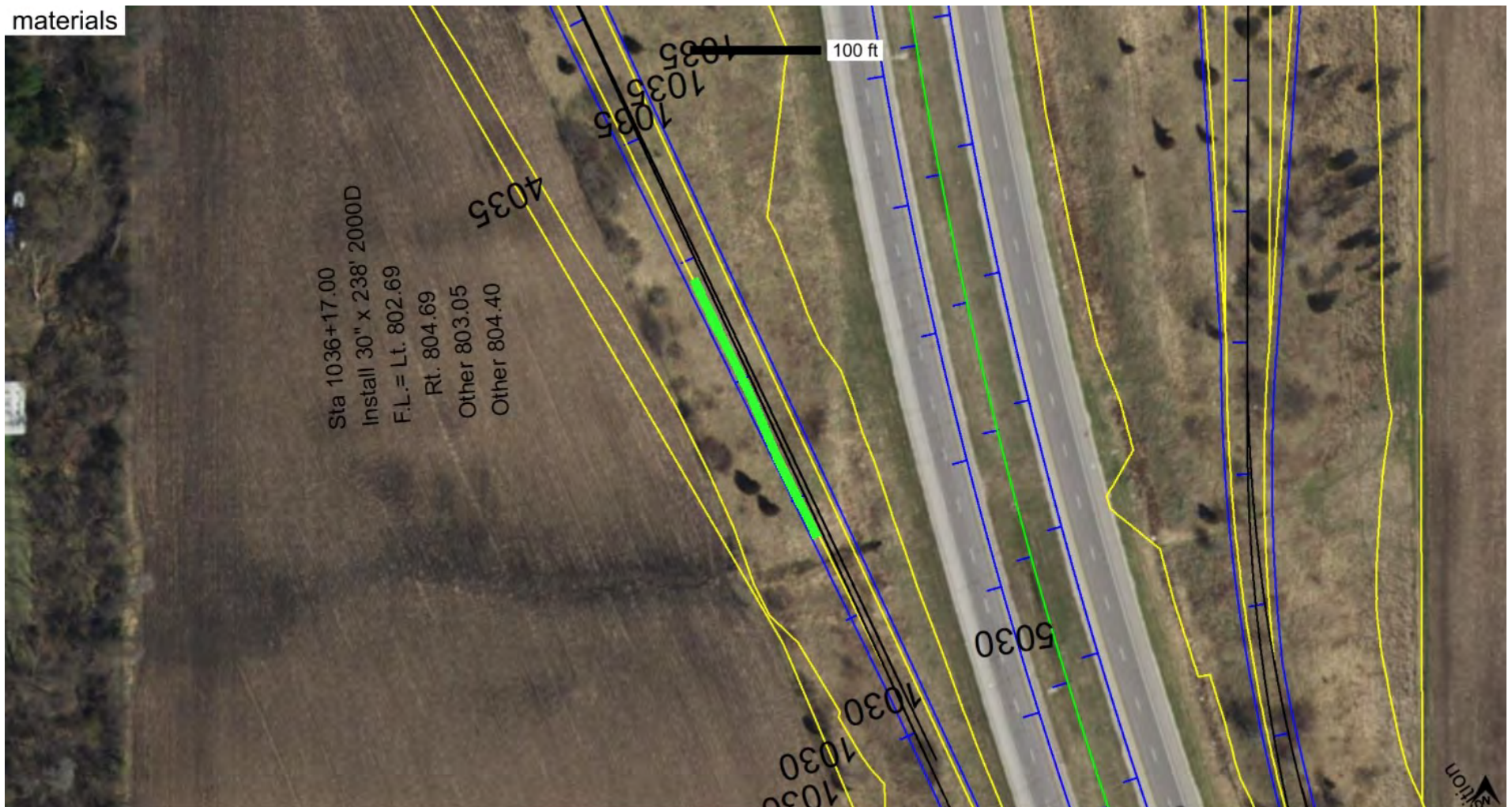


25th percentile (in.)	Median (in.)	75th percentile (in.)	Target Value (in.)
0.0	0.0	0.0	6.0



name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade_Class 10 (Sand)_IADOT	22013	100.0	1539	0.035	100.0	3000.0	100.0	20.5

materials



Subgrade_Class 10 (Sand)_IADOT

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_120728

Project:	Linn County I-380	Date and Time:	8/26/2022 12:07:28 PM	Machine ID:	Ingios01
Description:	Tower Terrace Road Interchange	Mapping Duration (hrs):	0.228	Operator:	Ingios
Location:	Linn County IA	No. of Measurements:	1785	Machine Operator ID:	582
Review Status:	unspecified	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subgrade Top	Segment:	Ramp C

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	No												
k-value	Yes	8.8	23.6	0.1	100.0	35.0	58.1	119.7	23.5	40.4	-65.0	-41.9	19.7
Moisture Content	No												

Mapped Area		Pass Count					Elevation (ft)			Velocity (fps)		
square feet	acres	10th percentile	Median	cov(%)	% >= TV	Target Value	min.	avg.	max.	min.	avg.	max.
1785	0.041	0	0	0.0	0.0	0	802.45	803.62	805.09	4.4	5.1	5.4

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade_Class 10 (Sand)_IADOT	22013	100.0	1785	0.041	100.0	3000.0	100.0	20.5

Blobs

parameter	min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv	poly-tol.
k-value	1000.0	1	1764	98.8	none	0.0	4.0

Lift Thickness

25th percentile (in.)	Median (in.)	75th percentile (in.)	Target Value (in.)
-0.4	0.9	1.9	6.0

Station

Start	End
4032+00	4034+00

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_120728

Project:	Linn County I-380	Date and Time:	8/26/2022 12:07:28 PM	Machine ID:	Ingios01
Description:	Tower Terrace Road Interchange	Mapping Duration (hrs):	0.228	Operator:	Ingios
Location:	Linn County IA	No. of Measurements:	1785	Machine Operator ID:	582
Review Status:	unspecified	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subgrade Top	Segment:	Ramp C

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
23.6	CQI > = 95
8.8	80% of k-Value MVs >= 100
40.4	COV <= 30
98.8	% i-Score Blob Area >= 1000 ft ²
0.9	Lift Thickness Median Value (in.)
0	Pass Count >= 0

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction. The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value (TV) for the selected material. Level I target % Passing TV = 80%. Level II target % Passing TV = 90%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the measurement values (MVs) reported at each grid point of the mapping area. Description of COV ranges: <= 20% = Low Variability; 20 to 40% = Moderate Variability; > 40% = High Variability. The default target COV is <= 30%.

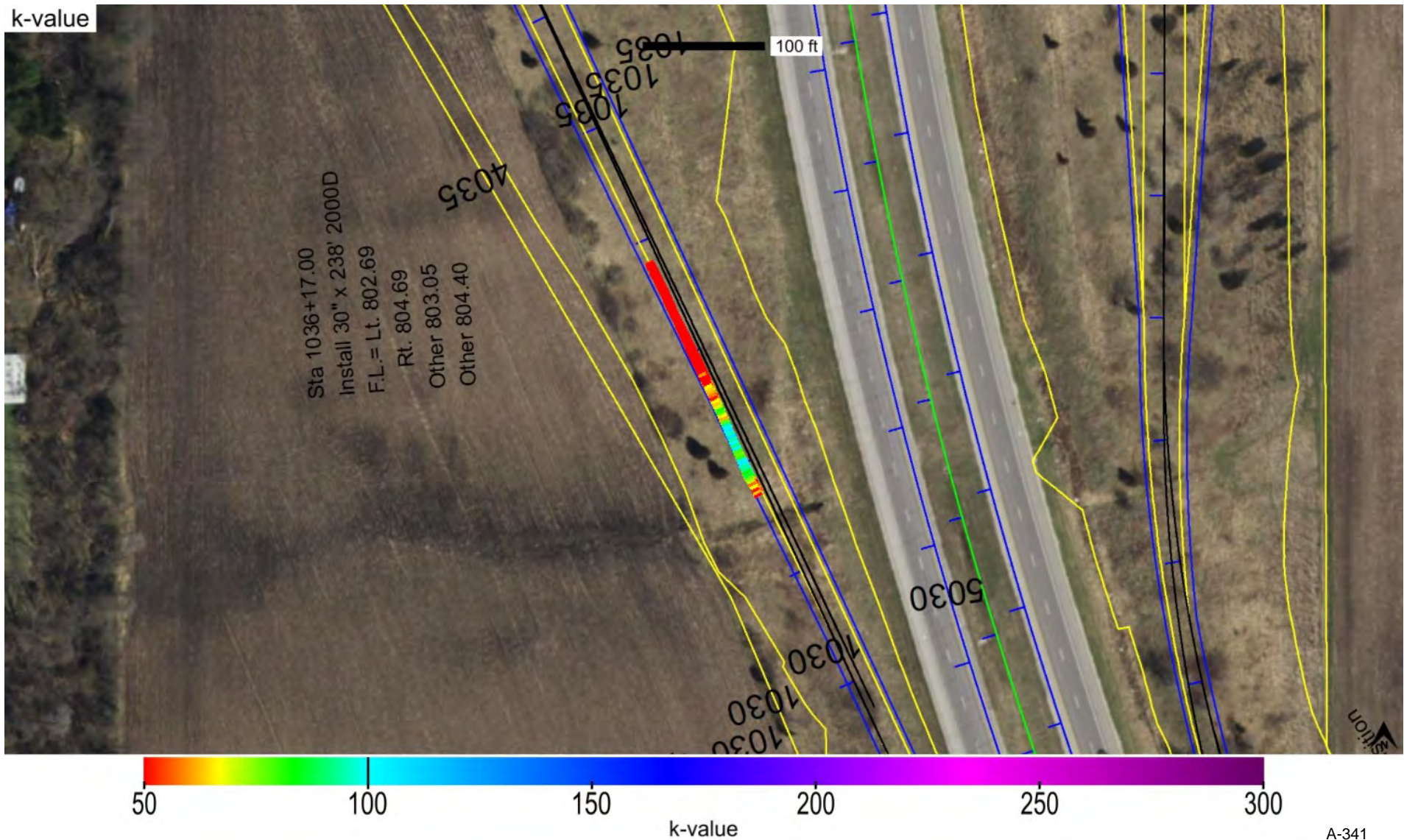
i-Score Blob (%): The percentage of the map area analyzed with contiguous blob areas with MVs < TV. Control Level 1 >= 100 sq. ft.; Control Level 2 >= 200 sq. ft.; Control Level 3 >= 500 sq. ft.; Control Level 4 >= 1,000 sq. ft.; Control Level 5 >= 2,000 sq. ft.

Lift thickness: Green: 75th percentile value <= TV; Yellow: median value <= TV and 75th percentile > TV; Red: median value (50th percentile) > TV.

Pass Count: Green: 10th percentile value >= TV; Yellow: 10th percentile value >= TV and cov% > 50%; Red: 10th percentile value < TV.

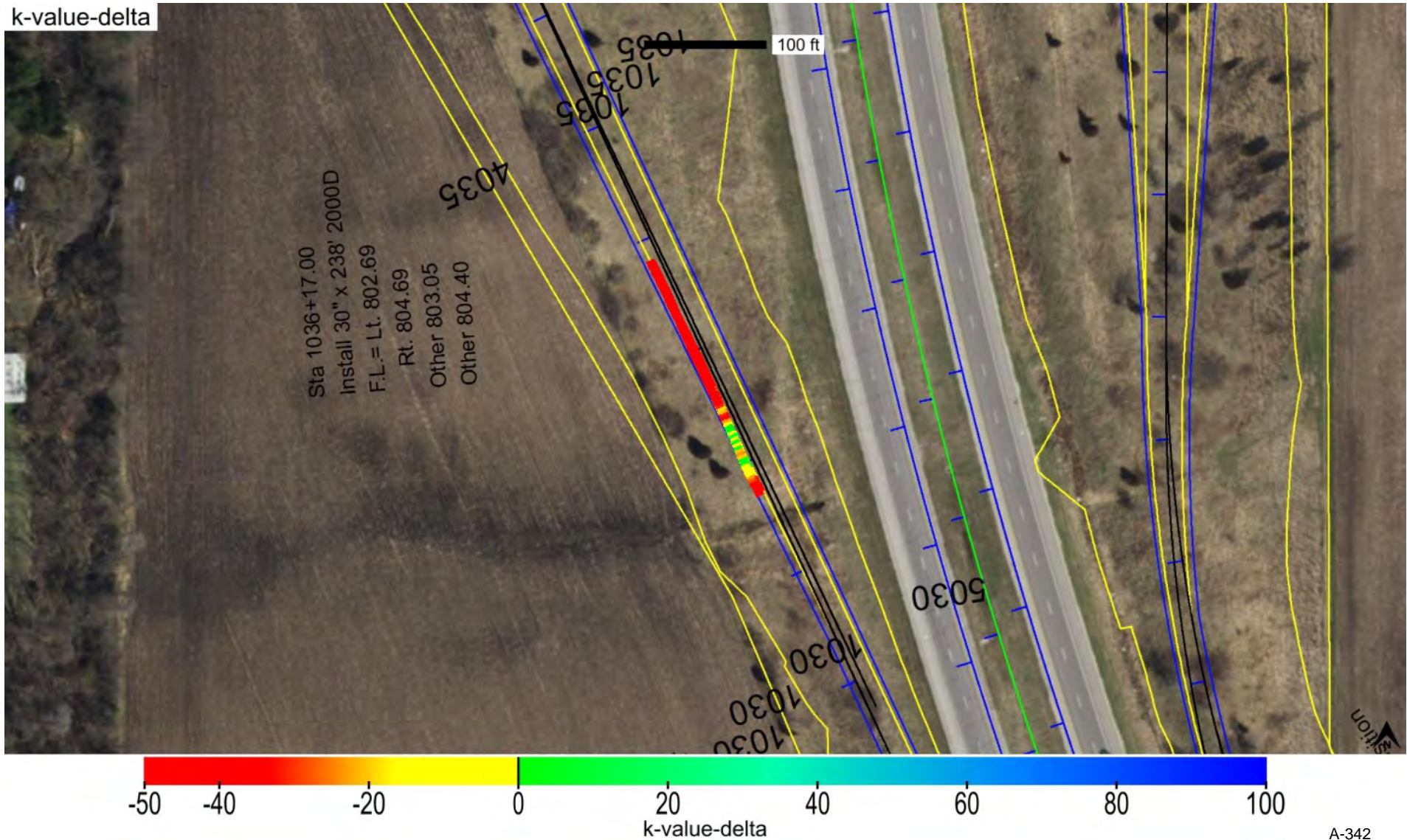
Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_120728 Map Type: Verification Map Map Layer: Subgrade Top

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	8.8	23.6	0.1	100.0	35.0	58.1	119.7	23.5	40.4	-65.0	-41.9	19.7



Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_120728 Map Type: Verification Map Map Layer: Subgrade Top

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	8.8	23.6	0.1	100.0	35.0	58.1	119.7	23.5	40.4	-65.0	-41.9	19.7

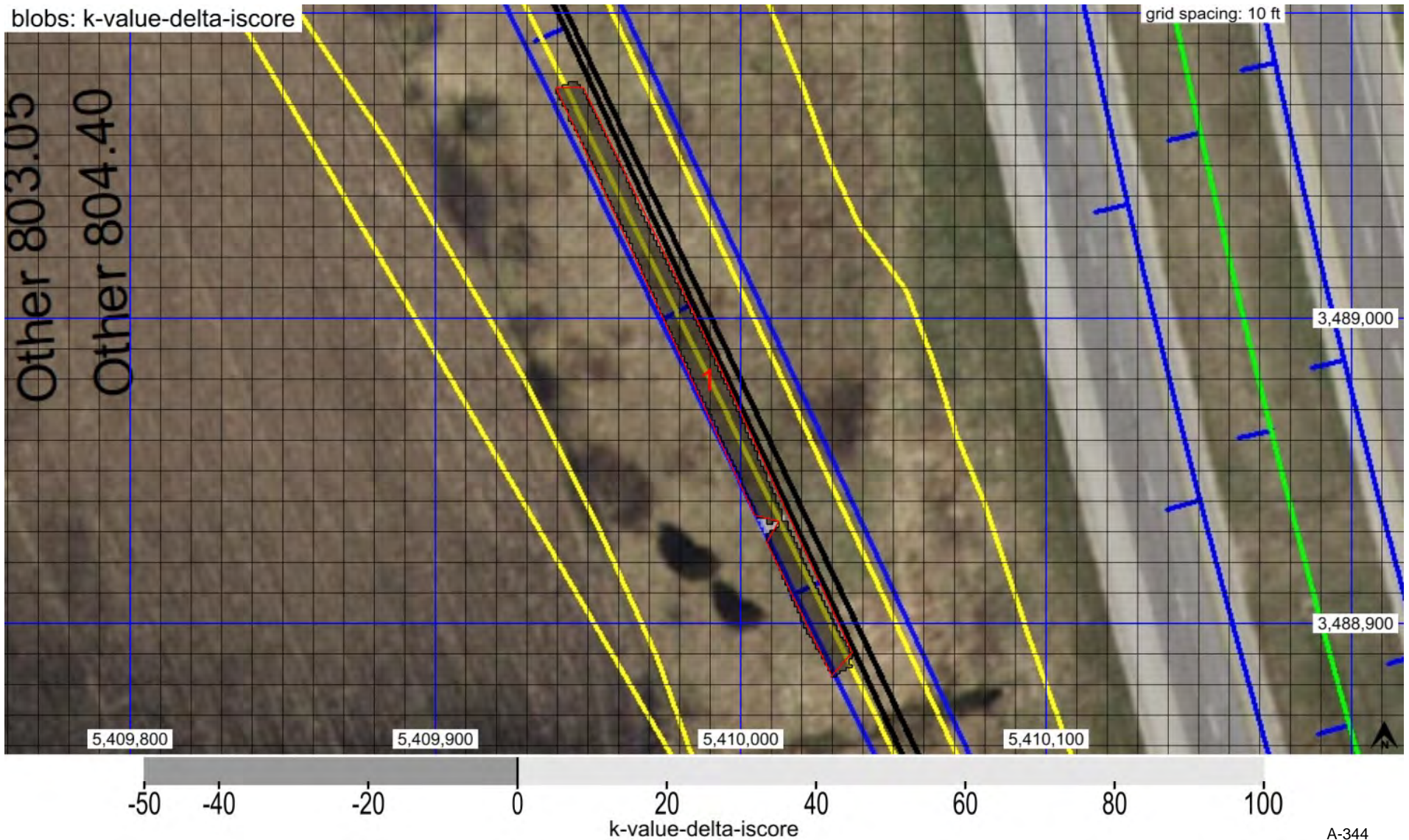


Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_120728 Map Type: Verification Map Map Layer: Subgrade Top

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	8.8	100.0	-65.0	-41.9	19.7	-65.0	-41.9	0.3

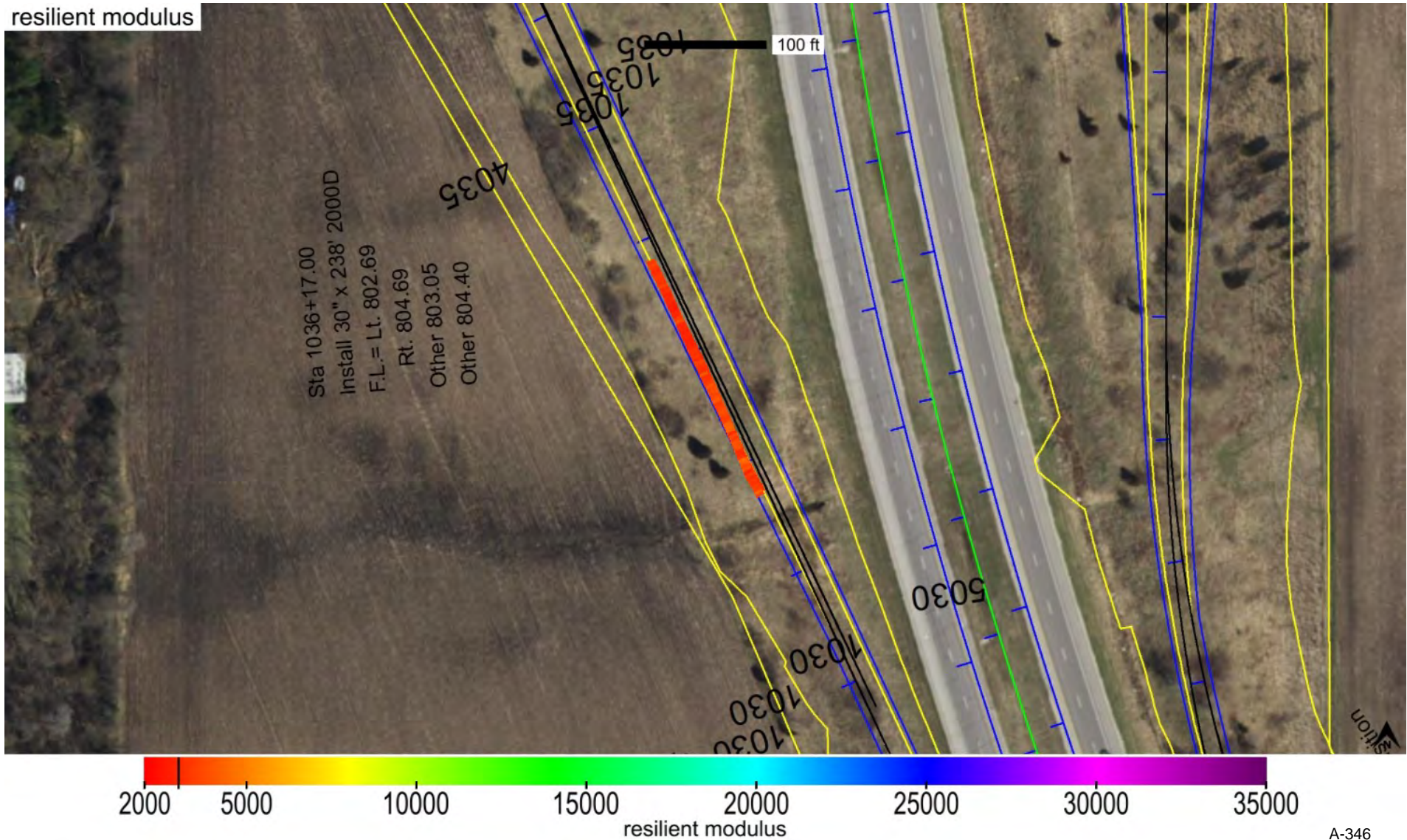


min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv	poly-tol.
1000	1	1764	98.8	none	0.0	4.0



Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_120728 Map Type: Verification Map Map Layer: Subgrade Top

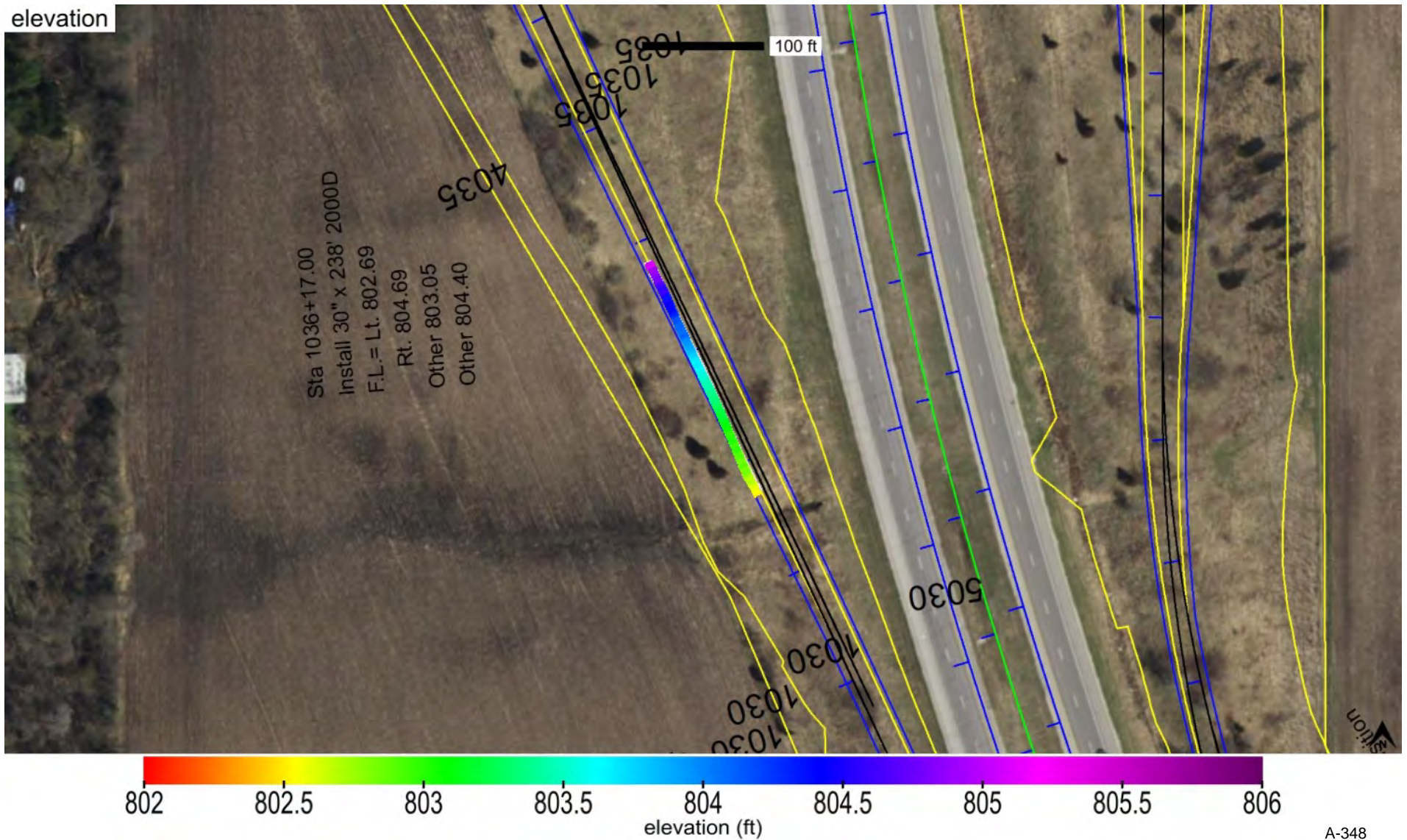
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	74.3	102.6	1.0	3000.0	2607.7	3383.8	4663.8	450.0	13.3	-392.3	383.8	1663.8



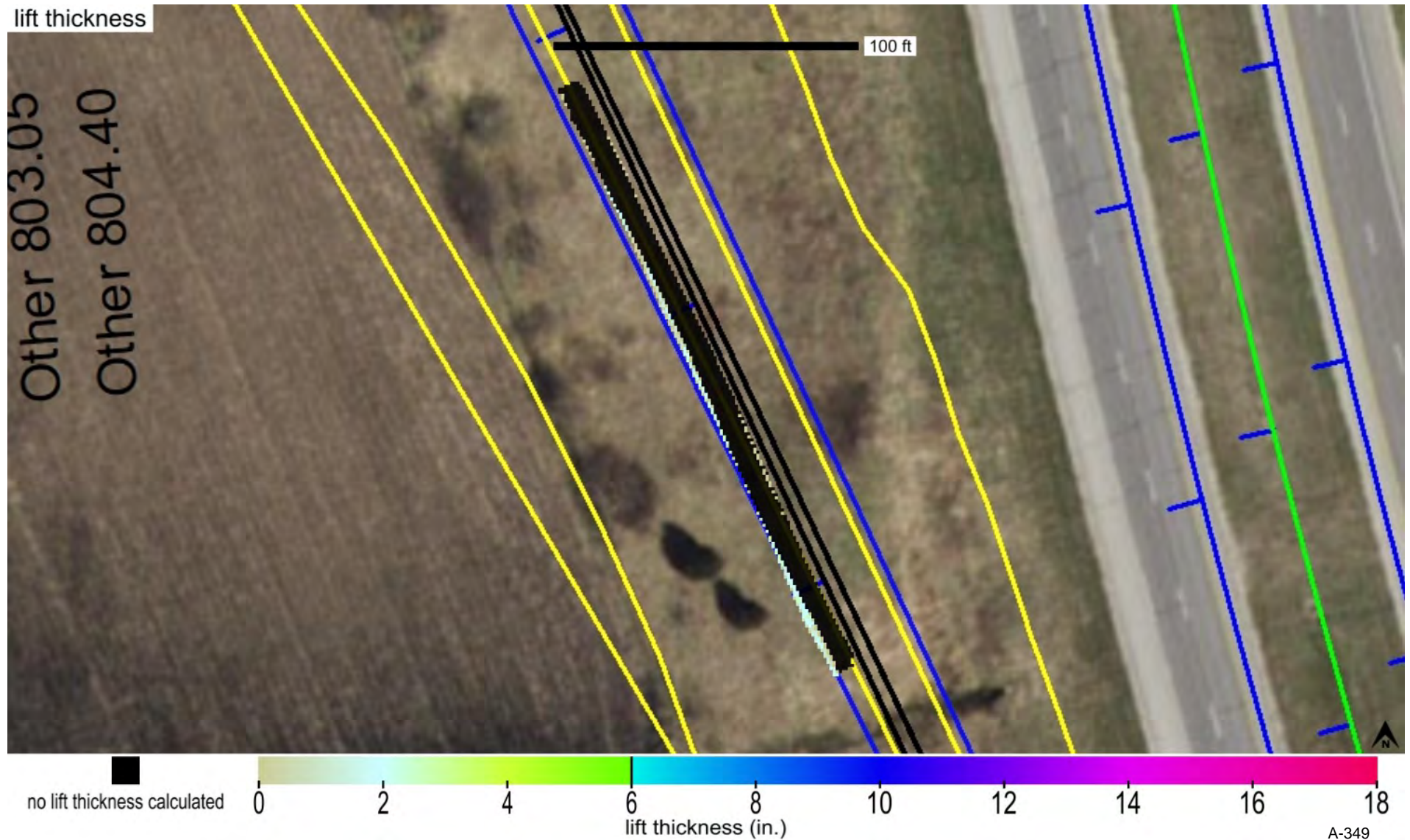
10th percentile	Median	cov(%)	% >= TV	Target Value
0	0	0.0	0.0	0



minimum	average	maximum
802.45	803.63	805.09

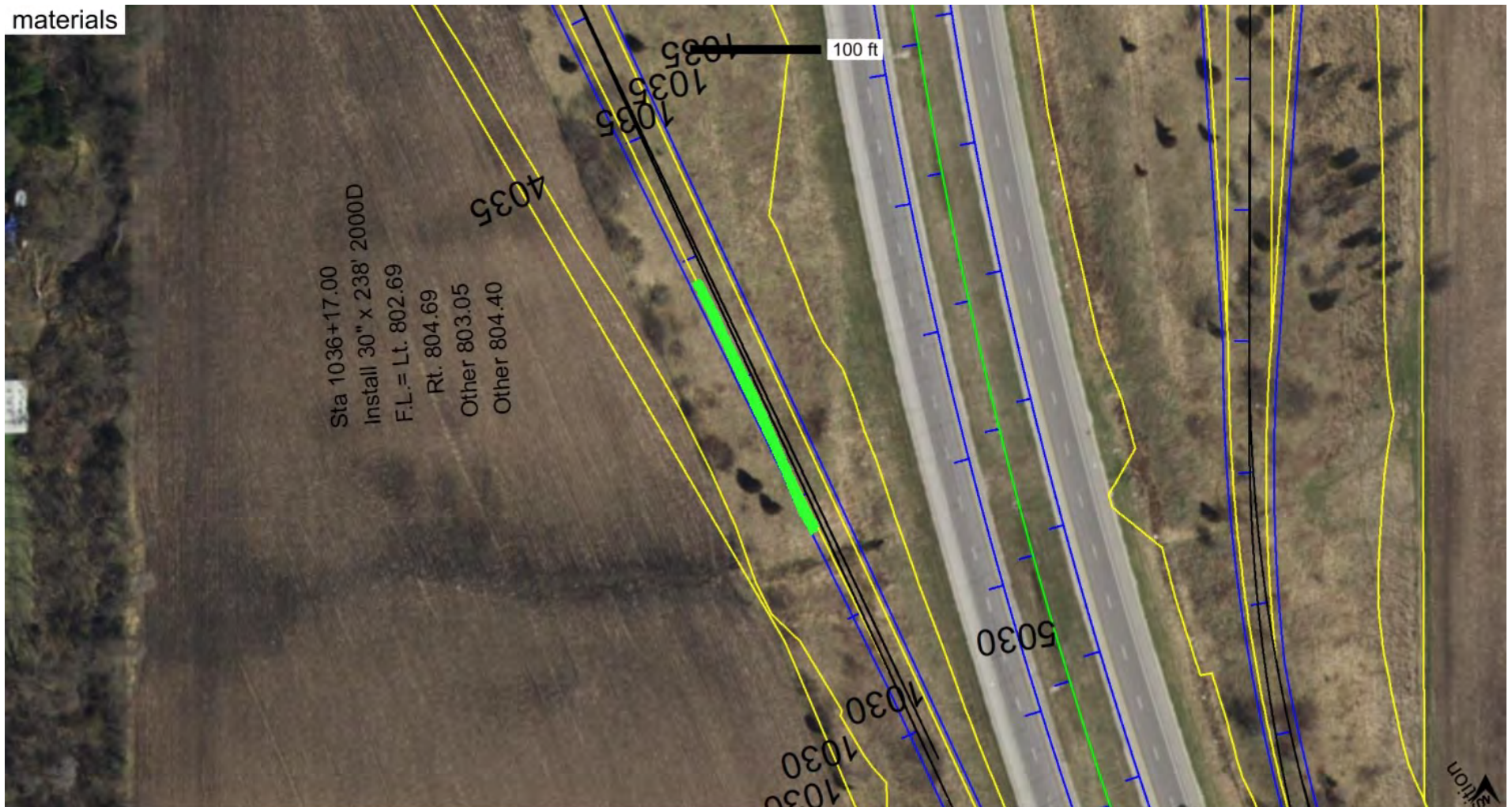


25th percentile (in.)	Median (in.)	75th percentile (in.)	Target Value (in.)
-0.4	0.9	1.9	6.0



name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade_Class 10 (Sand)_IADOT	22013	100.0	1785	0.041	100.0	3000.0	100.0	20.5

materials



Subgrade_Class 10 (Sand)_IADOT

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_120728 Map Type: Verification Map Map Layer: Subgrade Top

Reviews

11/1/2022 11:05:22 AM

unspecified

Kera Gieselman, Ingios

Sixteen vibratory compaction passes were performed using the RT equipped roller, in alternating forward and reverse directions. DCP tests were performed afterpass 1 at test points 1 to 5, and after pass 16 at test points 6 to 10.

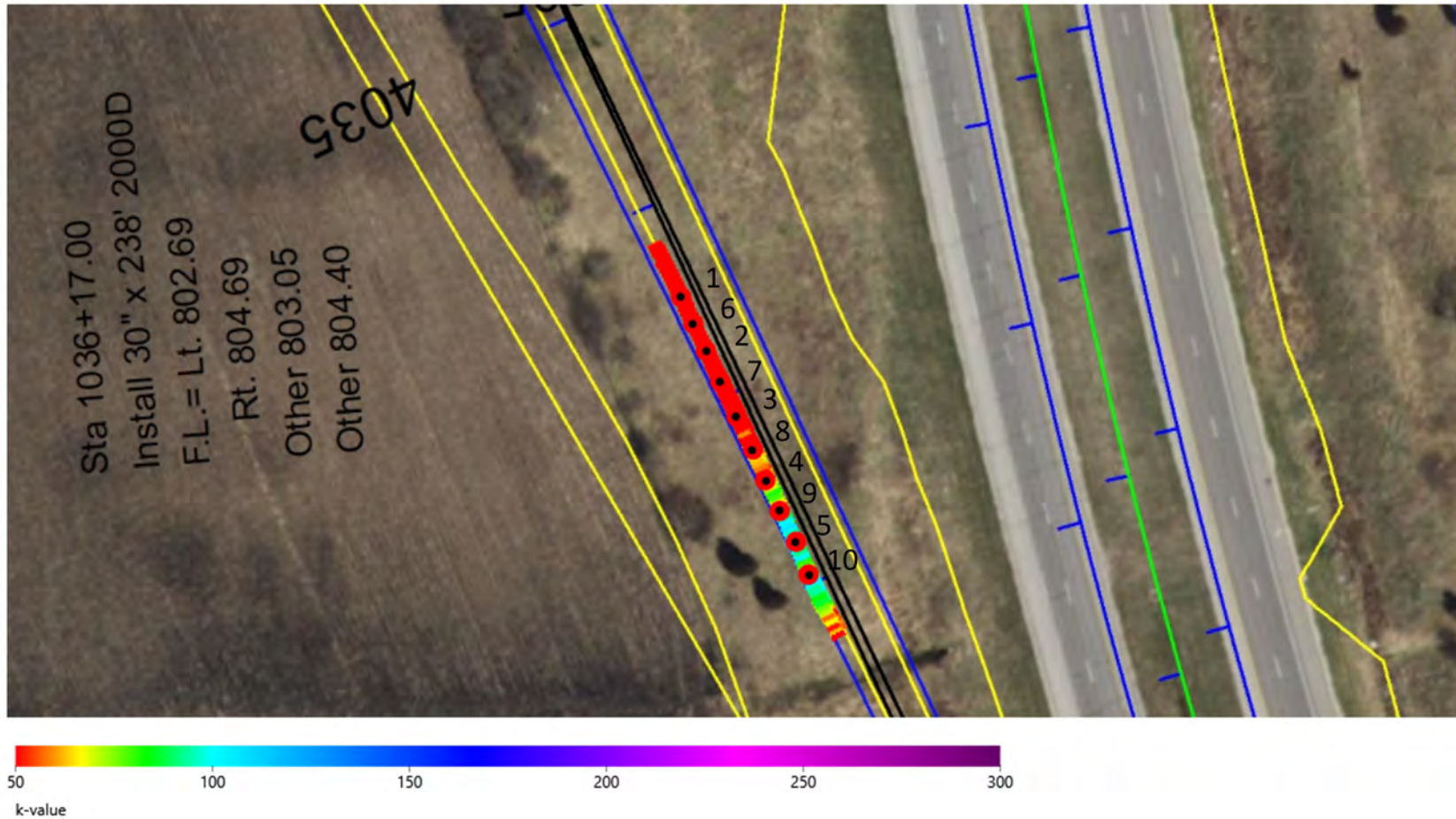
11/1/2022 11:04:52 AM

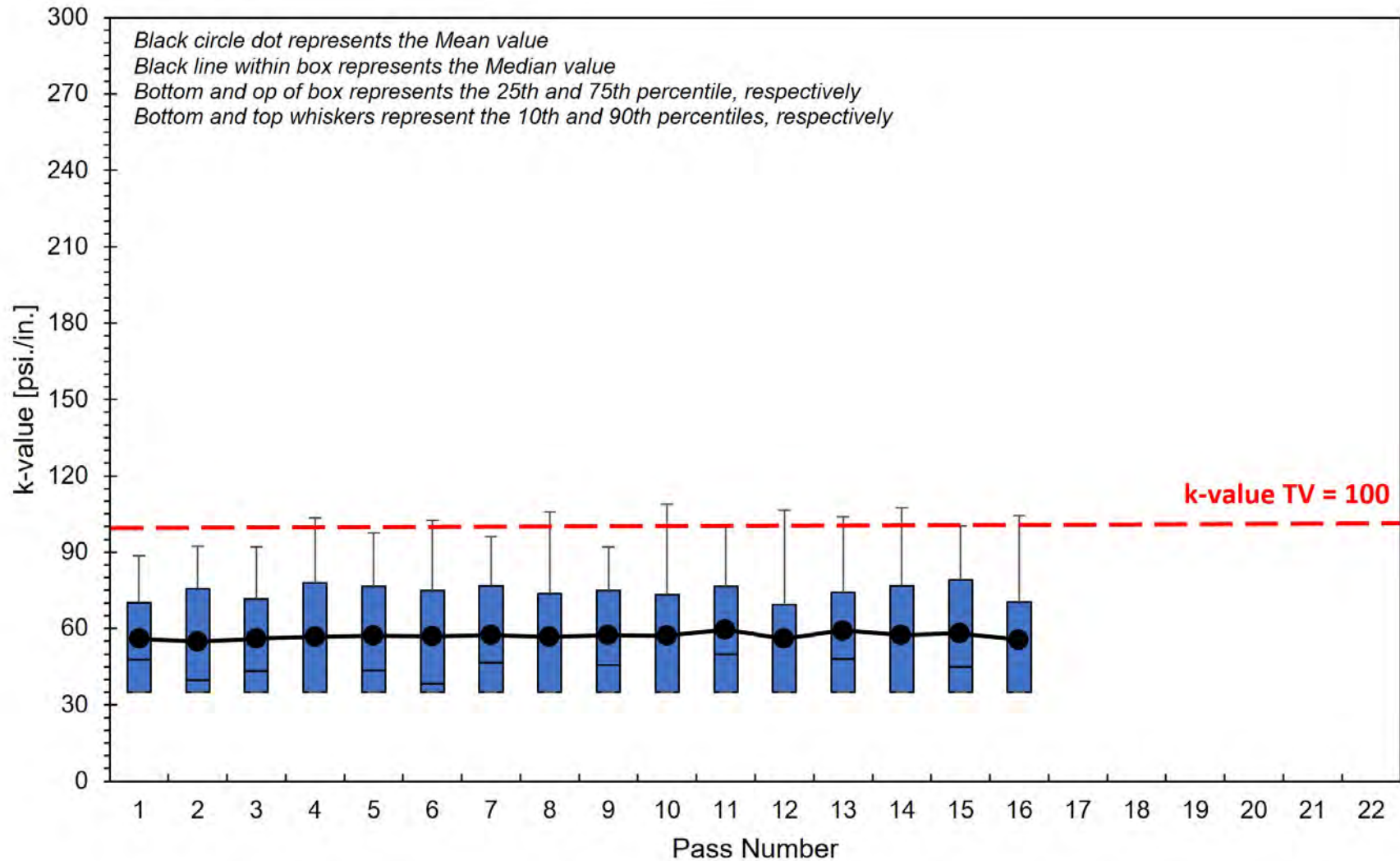
unspecified

Kera Gieselman, Ingios

Sixteen vibratory compaction passes were performed using the RT equipped roller, in alternating forward and reverse directions. DCP tests were performed afterpass 1 at test points 1 to 5, and after pass 16 at test points 6 to 10.

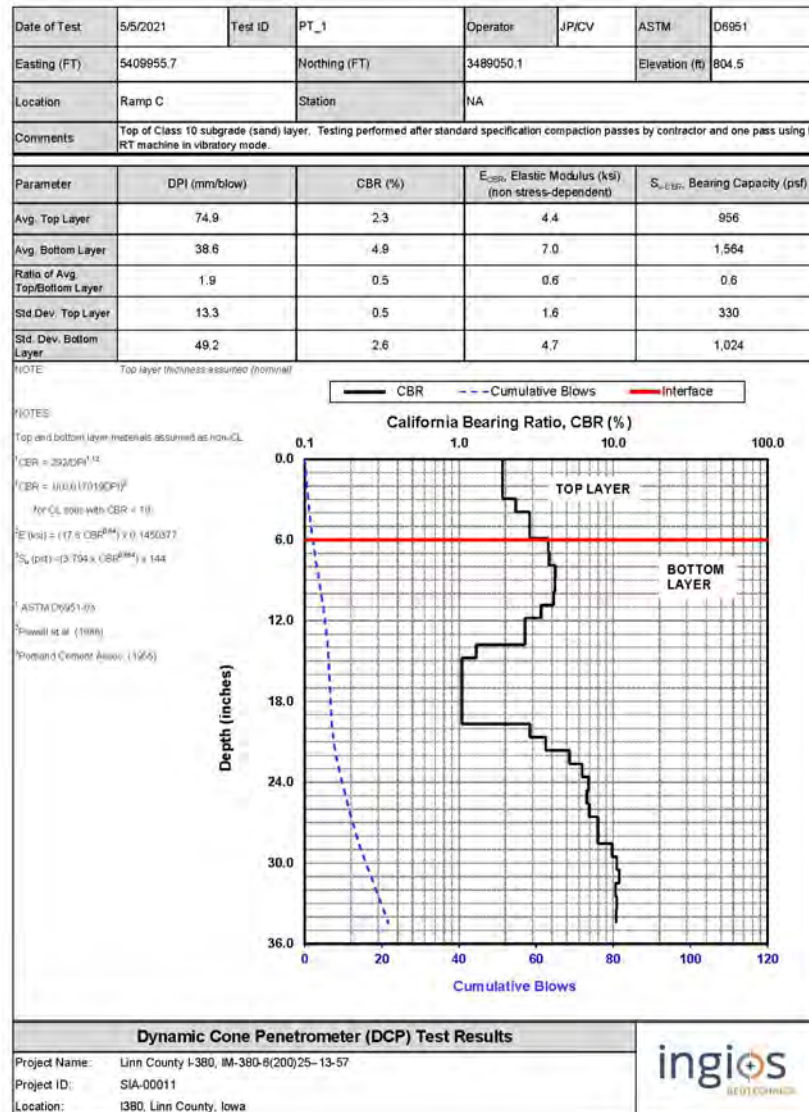






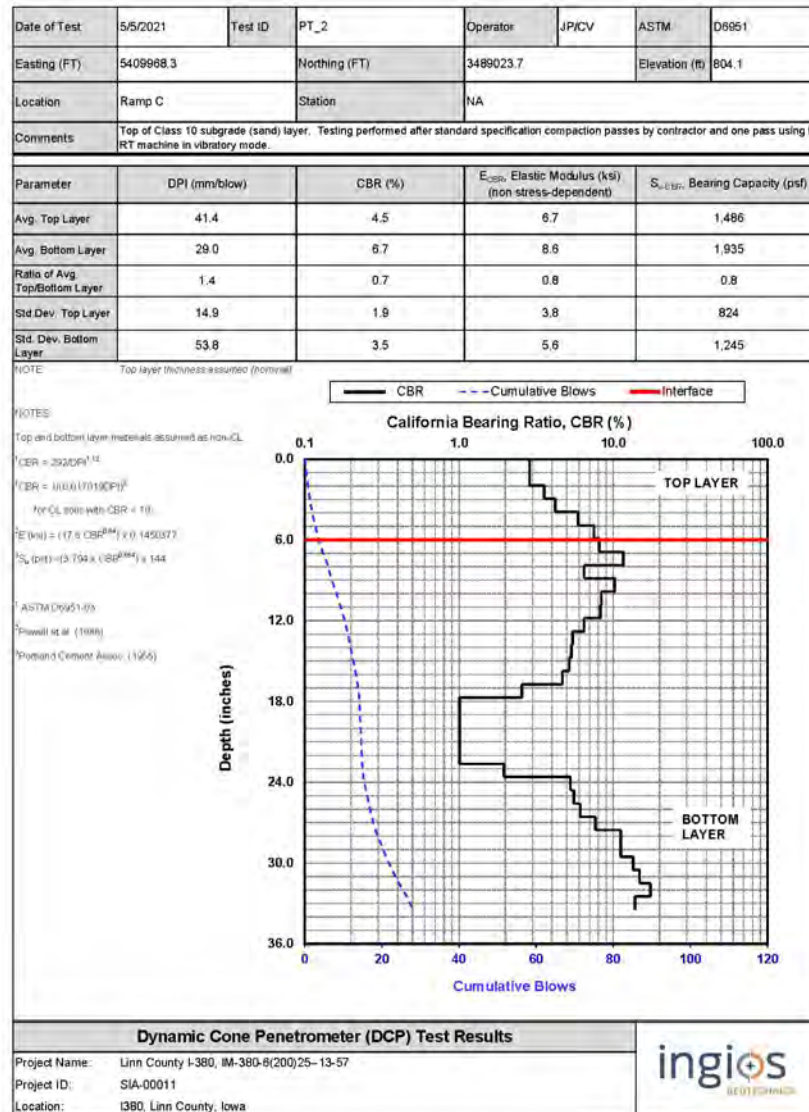
Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_120728 Map Type: Verification Map Map Layer: Subgrade Top

ing_57-i380-200_cs56b-ingios01_2022_08_26_120728_20221101T112347_DCP-I380-Linn-20220826-PT1.jpg



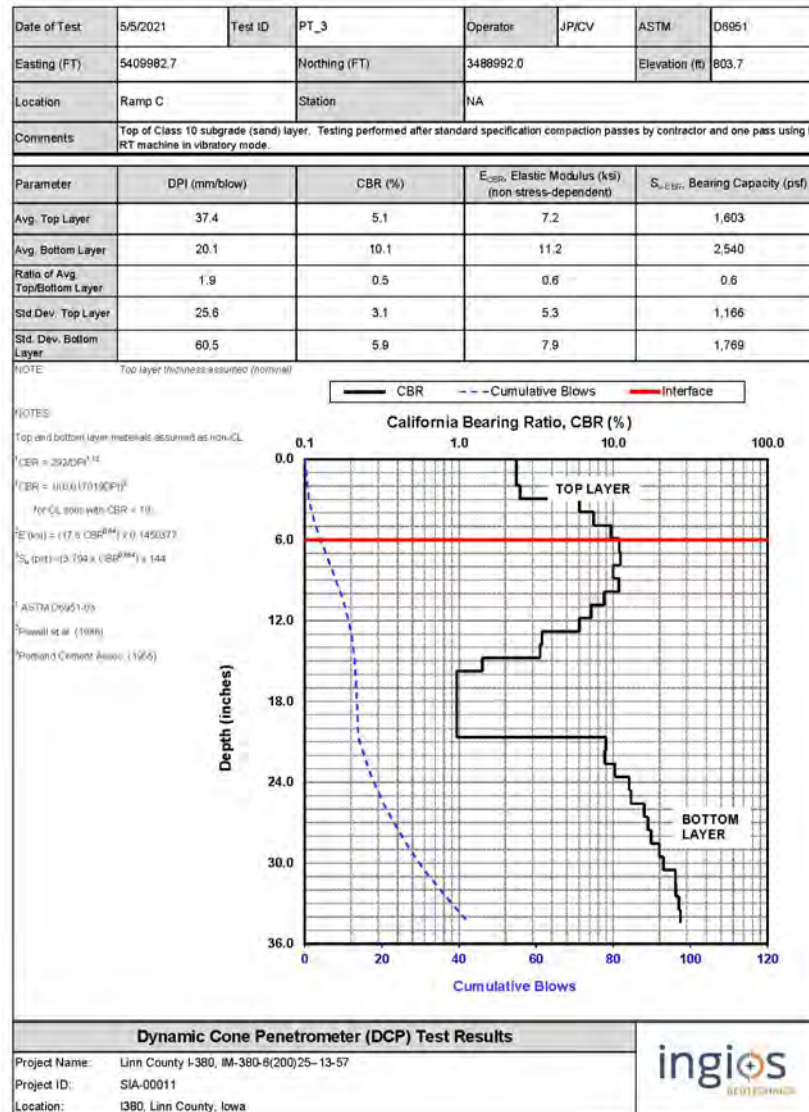
Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_120728 Map Type: Verification Map Map Layer: Subgrade Top

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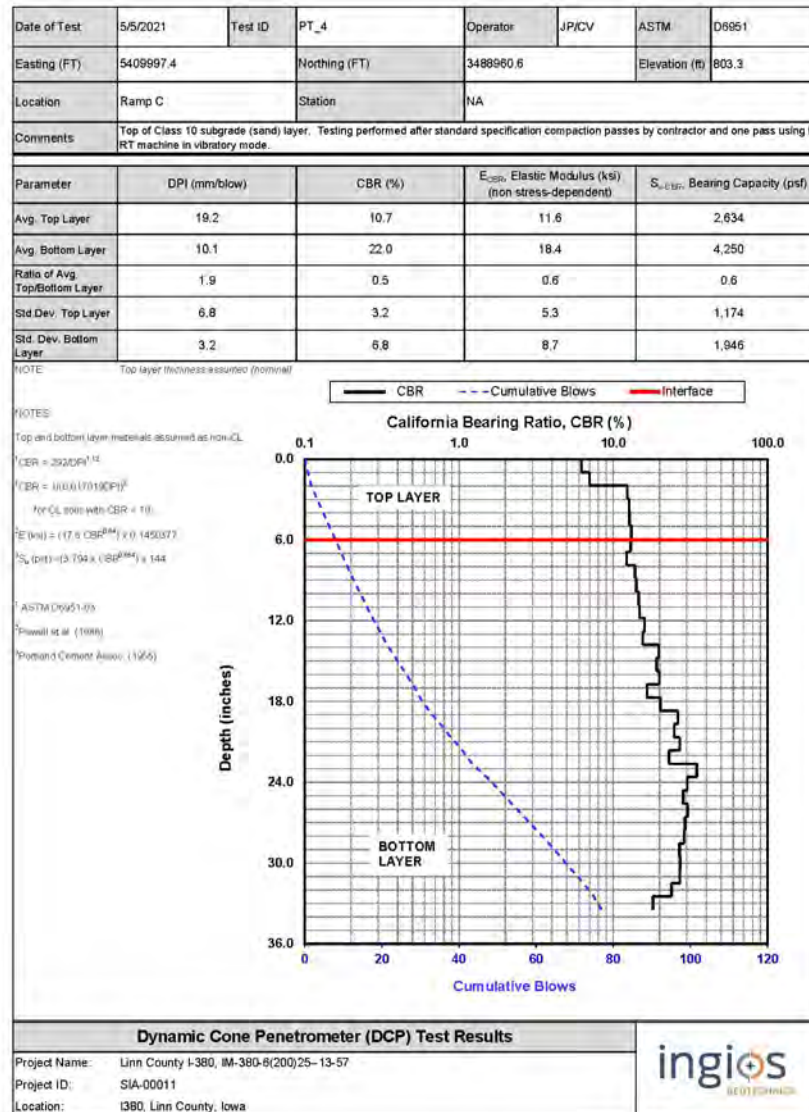
Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_120728 Map Type: Verification Map Map Layer: Subgrade Top

ing_57-i380-200_cs56b-ingios01_2022_08_26_120728_20221101T112414_DCP-I380-Linn-20220826-PT3.jpg



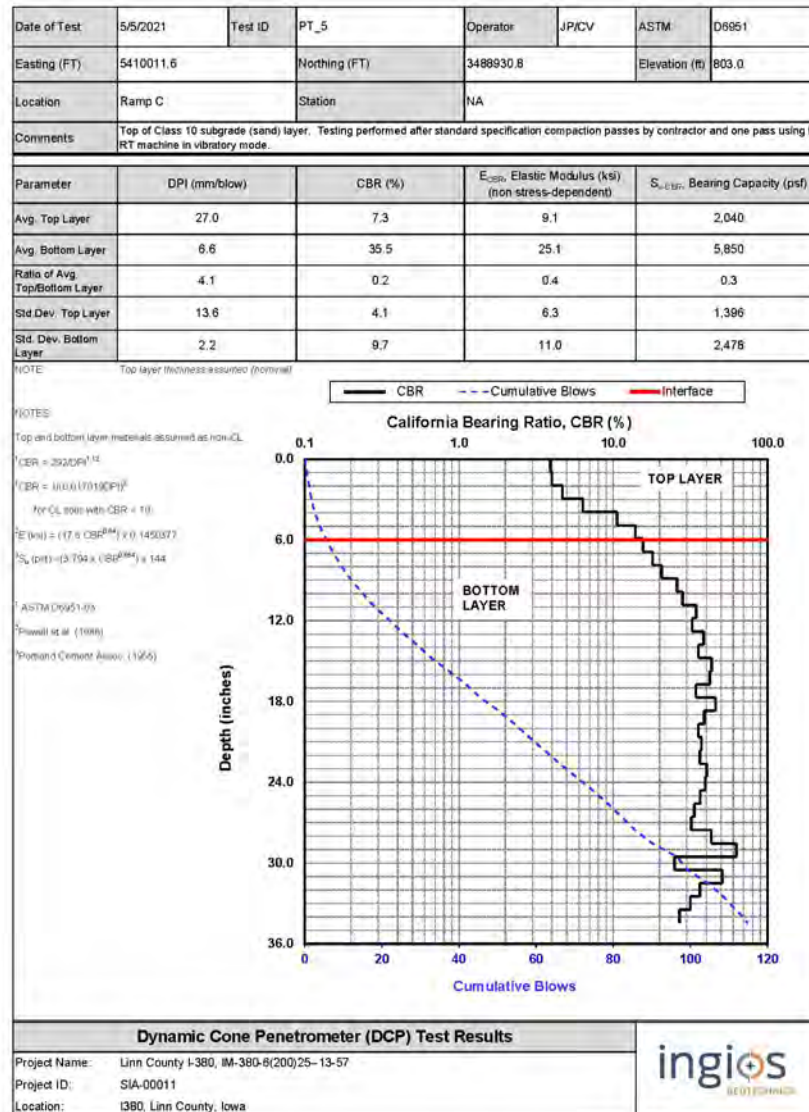
Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_120728 Map Type: Verification Map Map Layer: Subgrade Top

ing_57-i380-200_cs56b-ingios01_2022_08_26_120728_20221101T112424_DCP-I380-Linn-20220826-PT4.jpg



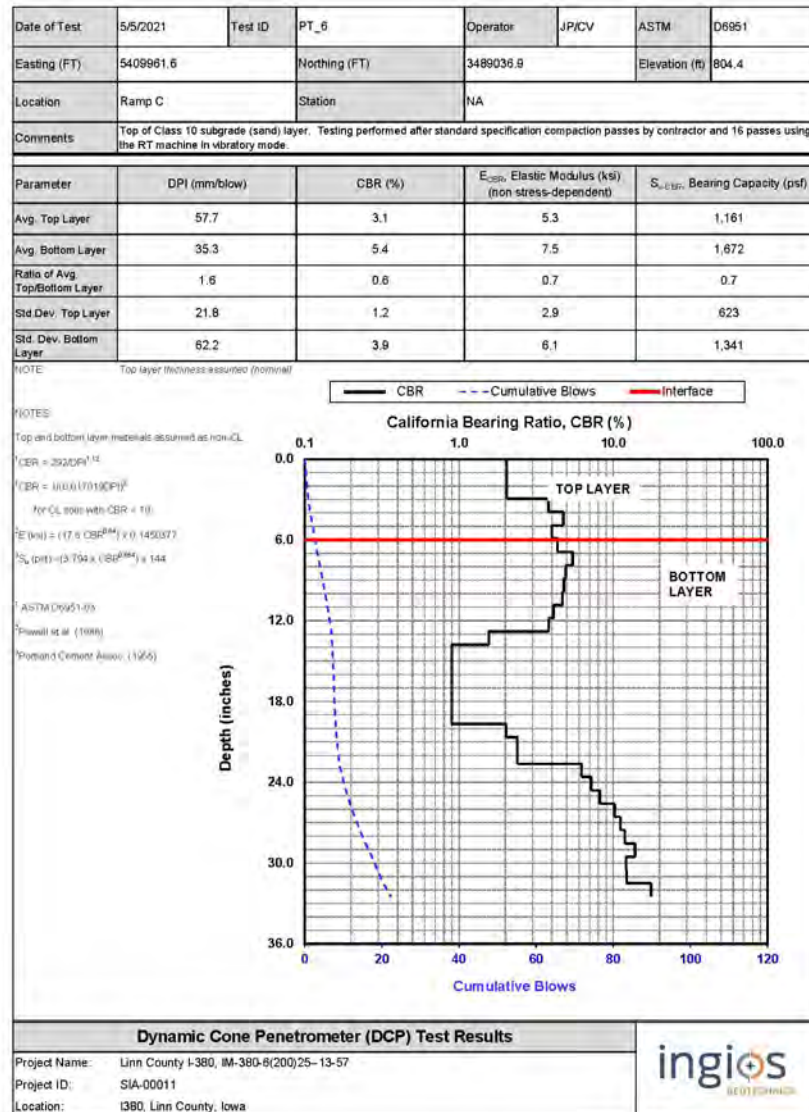
Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_120728 Map Type: Verification Map Map Layer: Subgrade Top

ing_57-i380-200_cs56b-ingios01_2022_08_26_120728_20221101T112436_DCP-I380-Linn-20220826-PT5.jpg



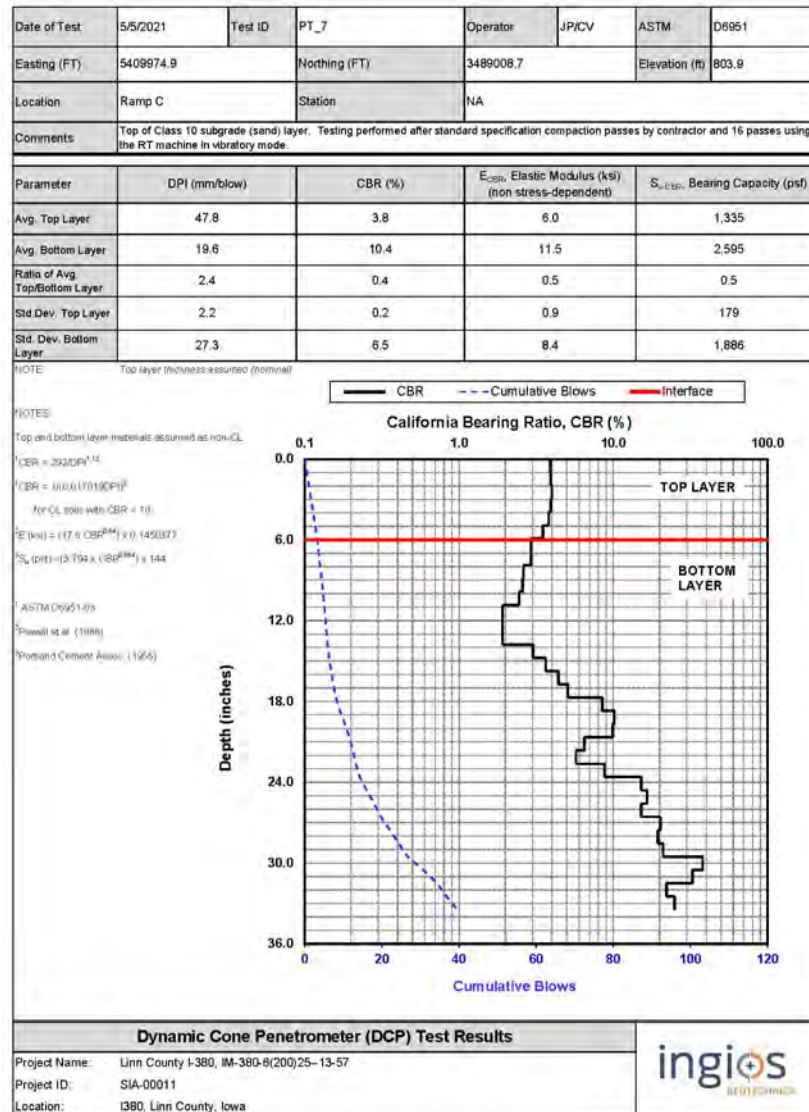
Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_120728 Map Type: Verification Map Map Layer: Subgrade Top

ing_57-i380-200_cs56b-ingios01_2022_08_26_120728_20221101T112448_DCP-I380-Linn-20220826-PT6.jpg



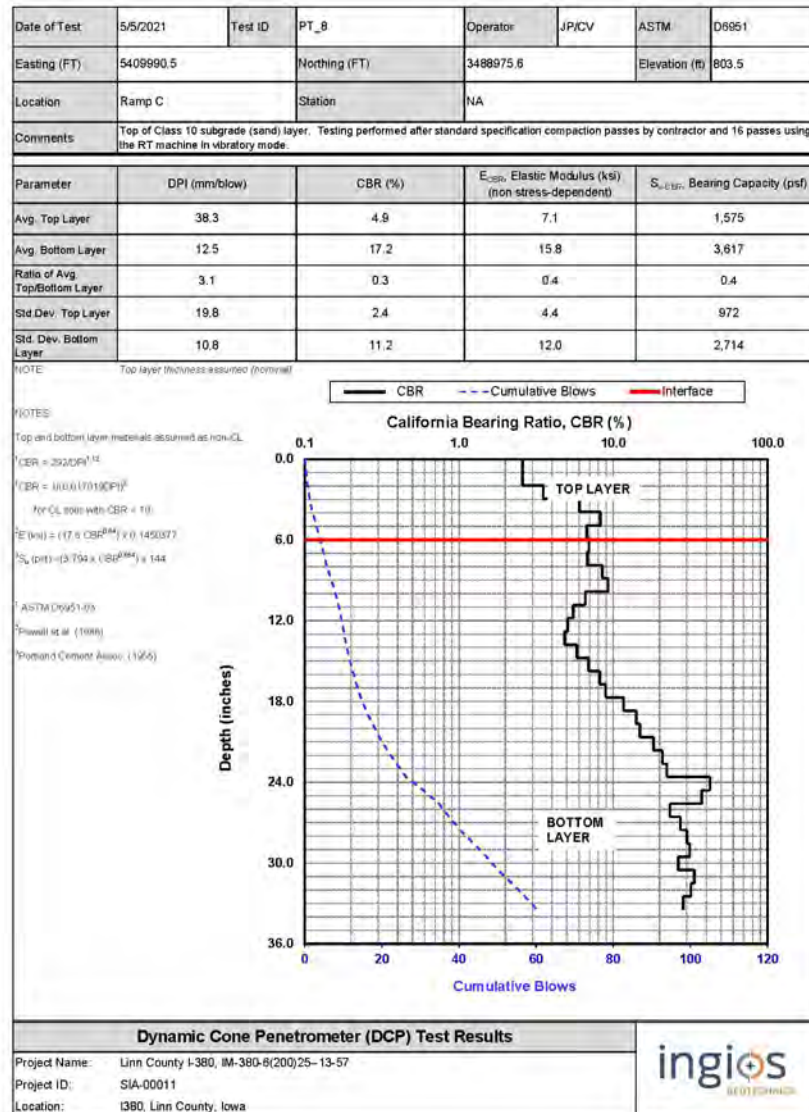
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ing_57-i380-200_cs56b-ingios01_2022_08_26_120728_20221101T112500_DCP-I380-Linn-20220826-PT7.jpg



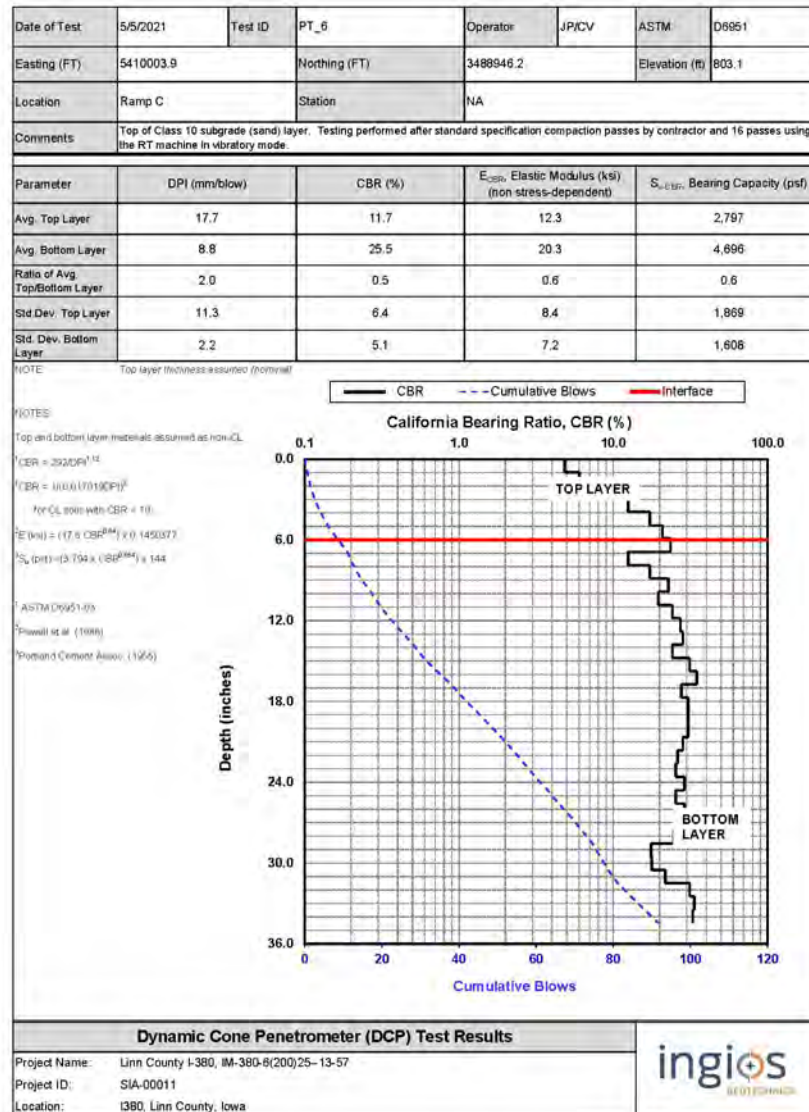
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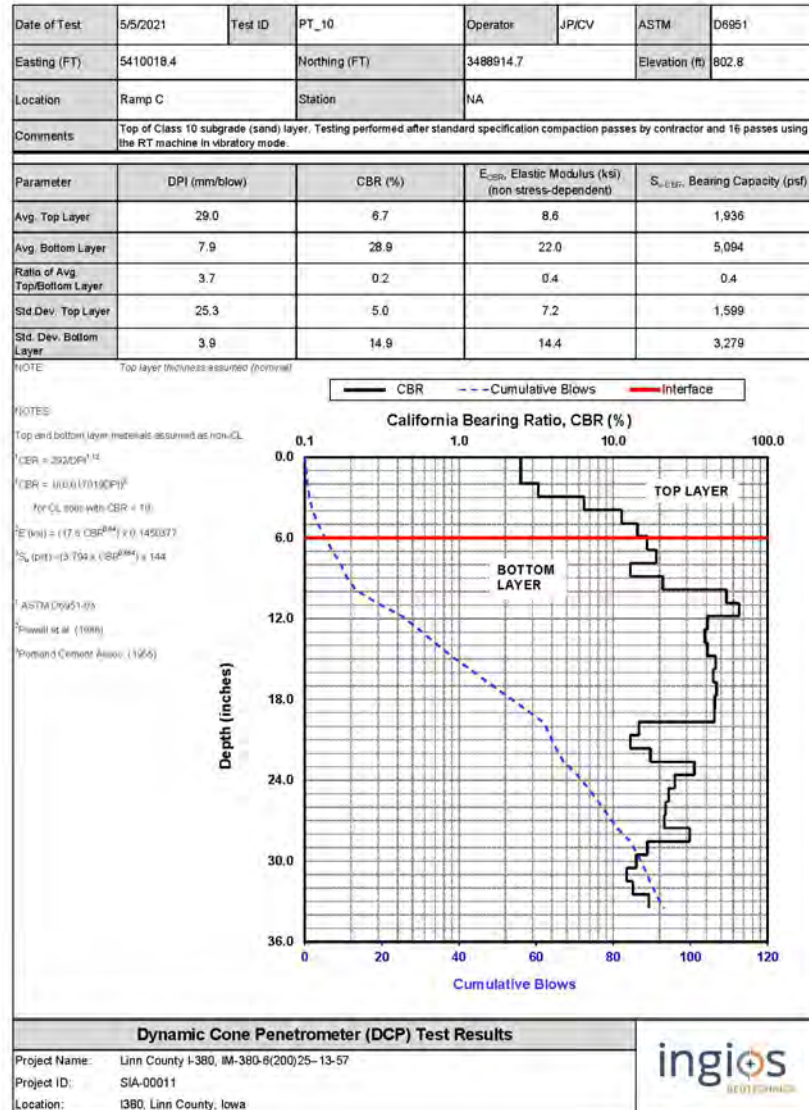
Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_120728 Map Type: Verification Map Map Layer: Subgrade Top

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Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_120728 Map Type: Verification Map Map Layer: Subgrade Top

ing_57-i380-200_cs56b-ingios01_2022_08_26_120728_20221101T112534_DCP-I380-Linn-20220826-PT10.jpg



Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_133014

Project:	Linn County I-380	Date and Time:	8/26/2022 1:30:14 PM	Machine ID:	Ingios01
Description:	Tower Terrace Road Interchange	Mapping Duration (hrs):	0.168	Operator:	Ingios
Location:	Linn County IA	No. of Measurements:	1448	Machine Operator ID:	582
Review Status:	unspecified	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subbase 12 Inches	Segment:	Tower Terrace Road

Map Summary

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
XMV	No												
Resilient Modulus	No												
k-value	Yes	0.0	17.8	0.4	150.0	20.0	87.9	147.2	30.2	34.4	-130.0	-62.1	-2.8
Moisture Content	No												

Mapped Area		Pass Count			Elevation (ft)			Velocity (fps)		
square feet	acres	min.	avg.	max.	min.	avg.	max.	min.	avg.	max.
1448	0.033	1	6.6	8	804.68	806.01	807.41	4.6	4.9	5.2

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase Recycled Composite_IADOT	41025	100.0	1448	0.033	100.0	10017.0	150.0	20.5

Blobs

parameter	min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv	poly-tol.
k-value	1000.0	1	1448	100.0	none	0.0	4.0

Lift Thickness

25th percentile (in.)	Median (in.)	75th percentile (in.)	Target Value (in.)
-2.4	0.4	1.4	6.0

Station

Start	End
29+00	31+00

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_133014

Project:	Linn County I-380	Date and Time:	8/26/2022 1:30:14 PM	Machine ID:	Ingios01
Description:	Tower Terrace Road Interchange	Mapping Duration (hrs):	0.168	Operator:	Ingios
Location:	Linn County IA	No. of Measurements:	1448	Machine Operator ID:	582
Review Status:	unspecified	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subbase 12 Inches	Segment:	Tower Terrace Road

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
17.8	CQI > = 95
0.0	80% of k-Value MVs >= 150
34.4	COV <= 30
100.0	% i-Score Blob Area >= 1000 ft ²
0.4	Lift Thickness Median Value (in.)

Compaction Quality Index(CQI): Relative compaction quality index based on the percentage of the geospatial area that meets the minimum target values and accounts for the uniformity of compaction. The default minimum target CQI is 95% using a uniformity weight factor of 50%.

Percent Passing Target Values: Number of geospatial grid points from the output that meet or exceed the target value (TV) for the selected material. Level I target % Passing TV = 80%. Level II target % Passing TV = 90%.

Coefficient of Variation (COV): Calculated from the ratio of the standard deviation to the mean based on the measurement values (MV) reported at each grid point of the mapping area. Description of COV ranges: <= 20% = Low Variability; 20 to 40% = Moderate Variability; > 40% = High Variability. The default target COV is <= 30%.

i-Score Blob (%): The percentage of the map area analyzed with contiguous blob areas with MVs < TV. Control Level 1 >= 100 sq. ft.; Control Level 2 >= 200 sq. ft.; Control Level 3 >= 500 sq. ft.; Control Level 4 >= 1,000 sq. ft.; Control Level 5 >= 2,000 sq. ft.

Lift thickness: Green: 75th percentile value <= TV; Yellow: median value <= TV and 75th percentile > TV; Red: median value (50th percentile) > TV.

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_133014 Map Type: Verification Map Map Layer: Subbase 12 Inches

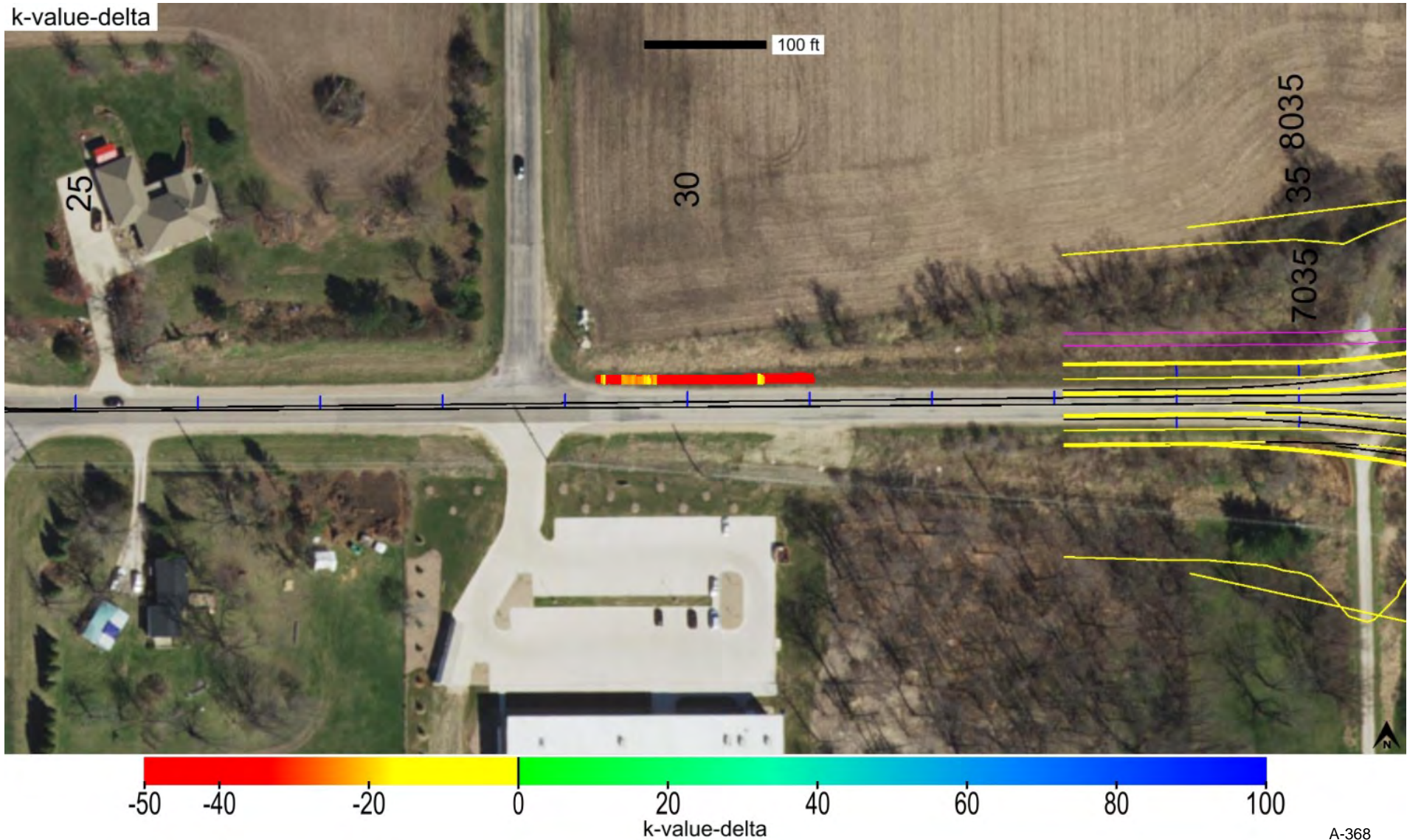
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.0	17.8	0.4	150.0	20.0	87.9	147.2	30.2	34.4	-130.0	-62.1	-2.8



A-367

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_133014 Map Type: Verification Map Map Layer: Subbase 12 Inches

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.0	17.8	0.4	150.0	20.0	87.9	147.2	30.2	34.4	-130.0	-62.1	-2.8



A-368

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_133014 Map Type: Verification Map Map Layer: Subbase 12 Inches

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	0.0	150.0	-130.0	-62.1	-2.8	-97.5	-62.0	-22.1

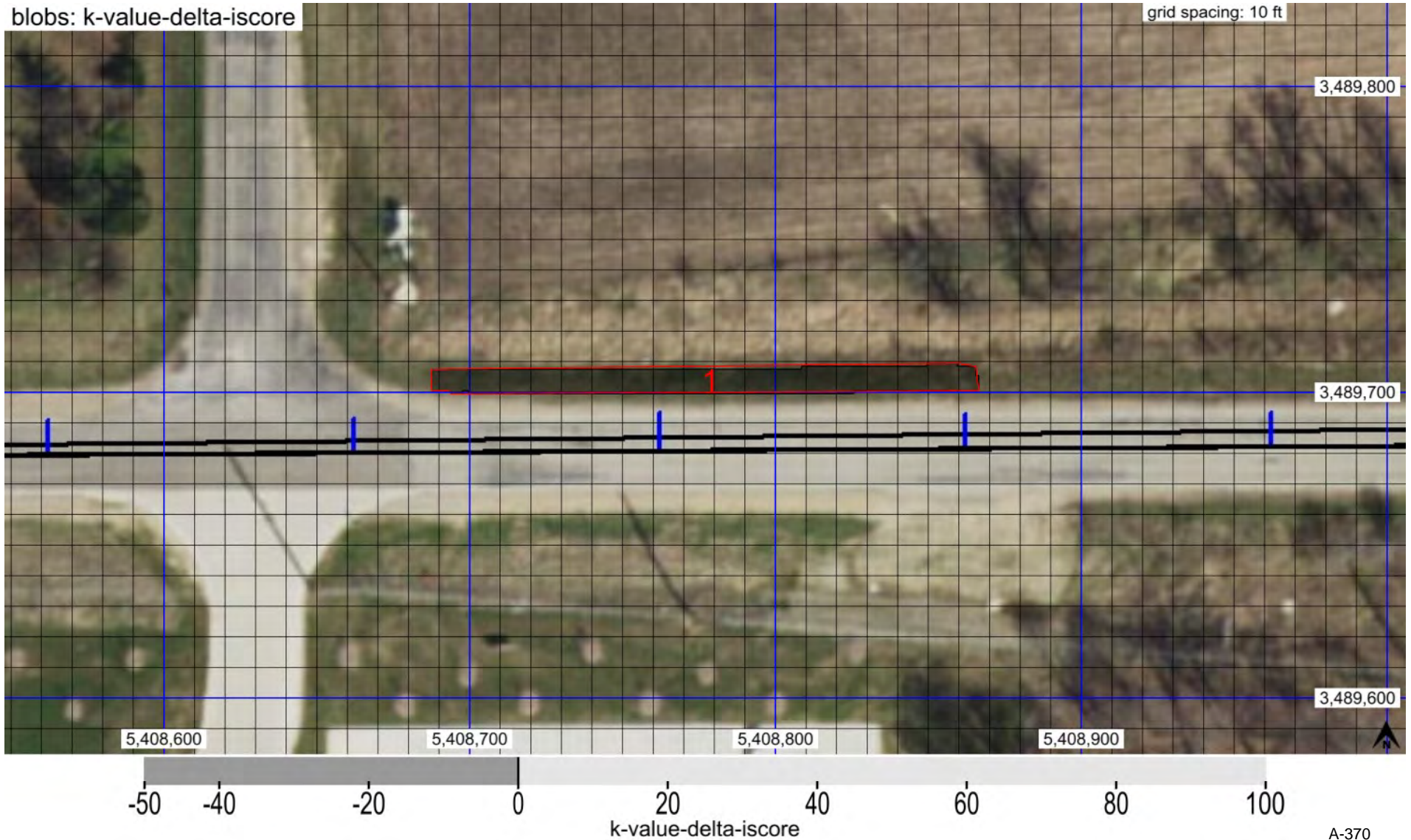


A-369

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_133014 Map Type: Verification Map Map Layer: Subbase 12 Inches

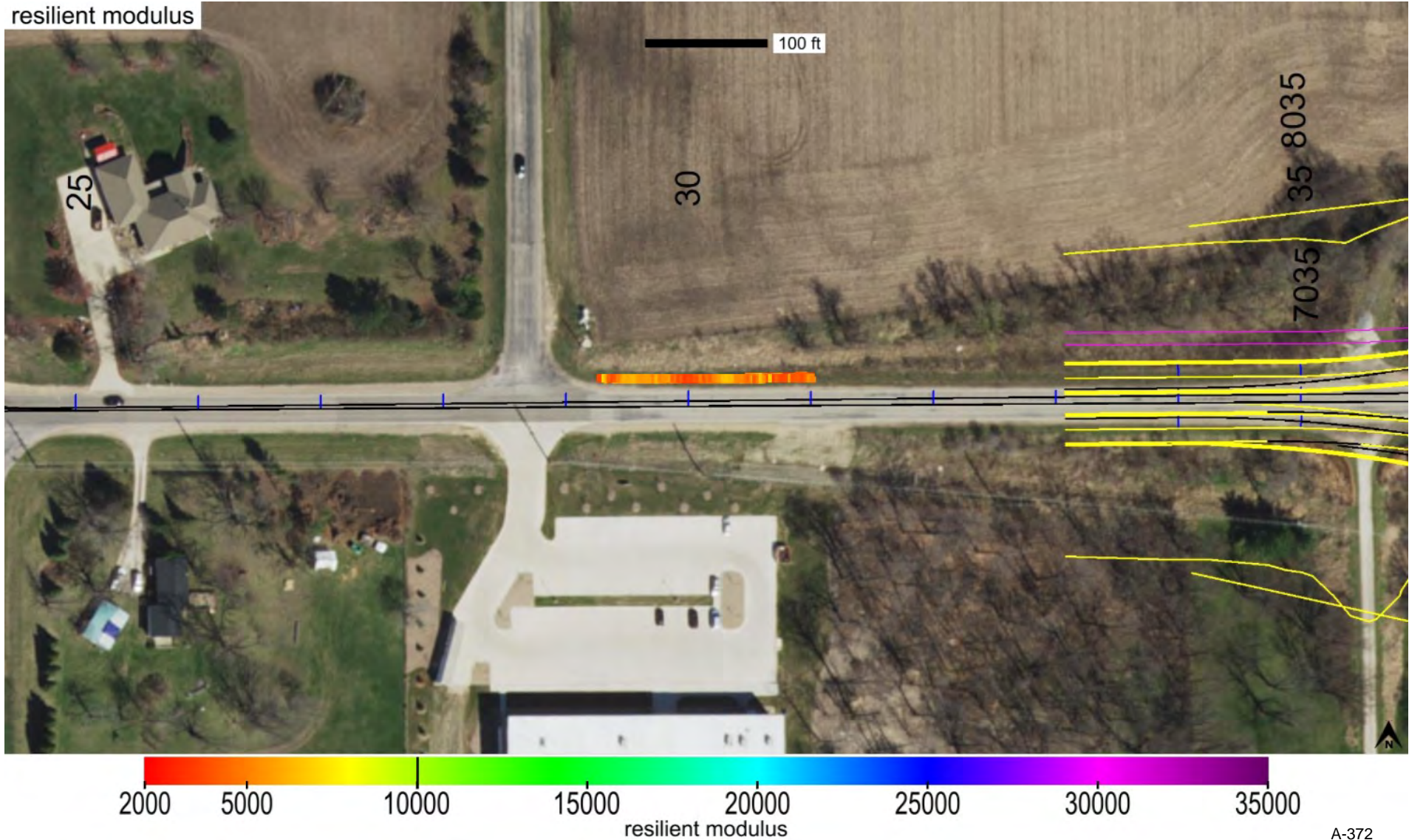
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv	poly-tol.
1000	1	1448	100.0	none	0.0	4.0



A-370

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_133014 Map Type: Verification Map Map Layer: Subbase 12 Inches

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	0.0	25.6	1.1	10017.0	3275.4	4972.9	7024.2	932.0	18.7	-6741.6	-5044.1	-2992.8



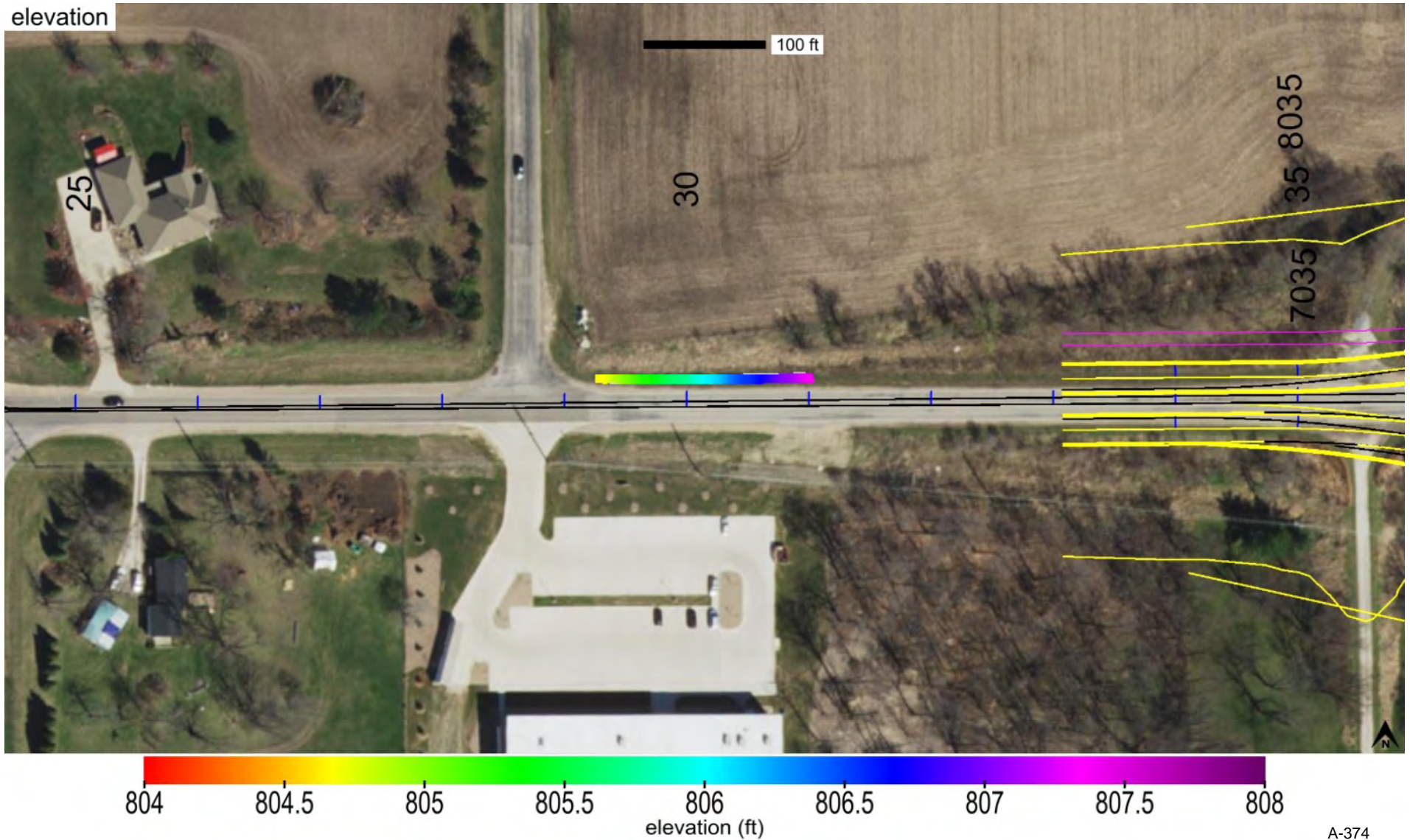
A-372

This report is only for use of the client named and it cannot be relied upon by any other person or entity.

minimum	average	maximum
1	6.6	8



minimum	average	maximum
804.68	806.01	807.41



25th percentile (in.)	Median (in.)	75th percentile (in.)	Target Value (in.)
-2.4	0.4	1.4	6.0



Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_133014 Map Type: Verification Map Map Layer: Subbase 12 Inches

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase Recycled Composite_IADOT	41025	100.0	1448	0.033	100.0	10017.0	150.0	20.5

materials



Modified Subbase Recycled Composite_IADOT

Map ID: ing_57-i380-200_cs56b-ingios01_2022_08_26_133014 Map Type: Verification Map Map Layer: Subbase 12 Inches

Reviews

10/17/2022 9:36:05 AM

unspecified

Pavana Vennapusa, Ph.D., P.E. (IA)

Sixteen vibratory compaction passes were performed using the RT equipped roller, in alternating forward and reverse directions. DCP tests were performed after pass 1 at test points 11 to 15, and after pass 16 at test points 16 to 20.

10/14/2022 9:51:17 AM ing-57-i380-200-cs56b-ingios01-2022-08-26-133014.JPG



