

**Appendix C: Tama County, IA (86-US030-240)**

- ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_091716
- ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_114151
- ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_121304
- ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_124411
- ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_131333
- ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_135130

Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_091716

Project:	Tama County US 30	Date and Time:	9/9/2022 9:17:16 AM	Machine ID:	Ingios01
Description:	W of IA 21 to 11th Ave Dr	Mapping Duration (hrs):	0.122	Operator:	Ingios
Location:	Tama County IA	No. of Measurements:	13336	Machine Operator ID:	774
Review Status:	Review Required	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subgrade Treatment 24 Inches	Segment:	US 30 WB

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	0.6	22.0	0.3	150.0	35.0	69.2	165.0	18.8	27.2	-115.0	-80.8	15.0
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.
13336	0.306	0	0	0.0	0.0	0	807.08	808.86	810.58	4.4	5.1	5.6

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade_Treatment Select Cohesive_IADOT	24006	100.0	13336	0.306	100.0	3600.0	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	2	13336	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
732+00	739+50

Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_091716

Project:	Tama County US 30	Date and Time:	9/9/2022 9:17:16 AM	Machine ID:	Ingios01
Description:	W of IA 21 to 11th Ave Dr	Mapping Duration (hrs):	0.122	Operator:	Ingios
Location:	Tama County IA	No. of Measurements:	13336	Machine Operator ID:	774
Review Status:	Review Required	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subgrade Treatment 24 Inches	Segment:	US 30 WB

**QUALITY ANALYSIS SUMMARY - k-Value**

Quality Value	Criteria
<b>22.0</b>	CQI >= 95
<b>0.6</b>	80% of k-Value MVs >= 150
<b>27.2</b>	COV <= 30
100.0	% i-Score Blob Area >= 1000 ft <sup>2</sup>
<b>0.0</b>	Lift Thickness Median Value (in.)
<b>0</b>	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%.

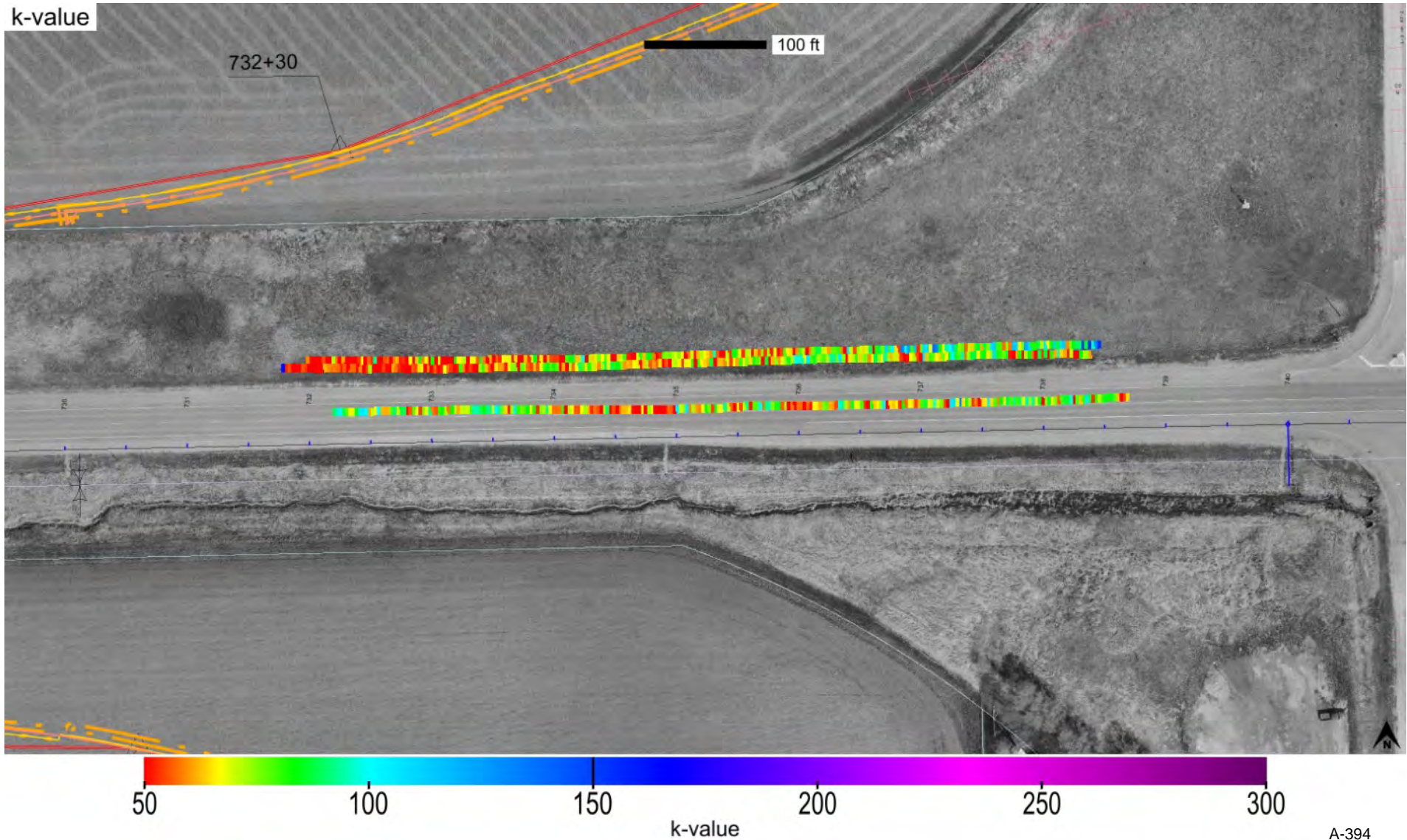
i-Score Blob (%): The percentage of the map area analyzed with contiguous blob areas with MVs < TV. Control Level 1 >= 100 sq. ft.; Control Level 2 >= 200 sq. ft.; Control Level 3 >= 500 sq. ft.; Control Level 4 >= 1,000 sq. ft.; Control Level 5 >= 2,000 sq. ft.

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\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_091716    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

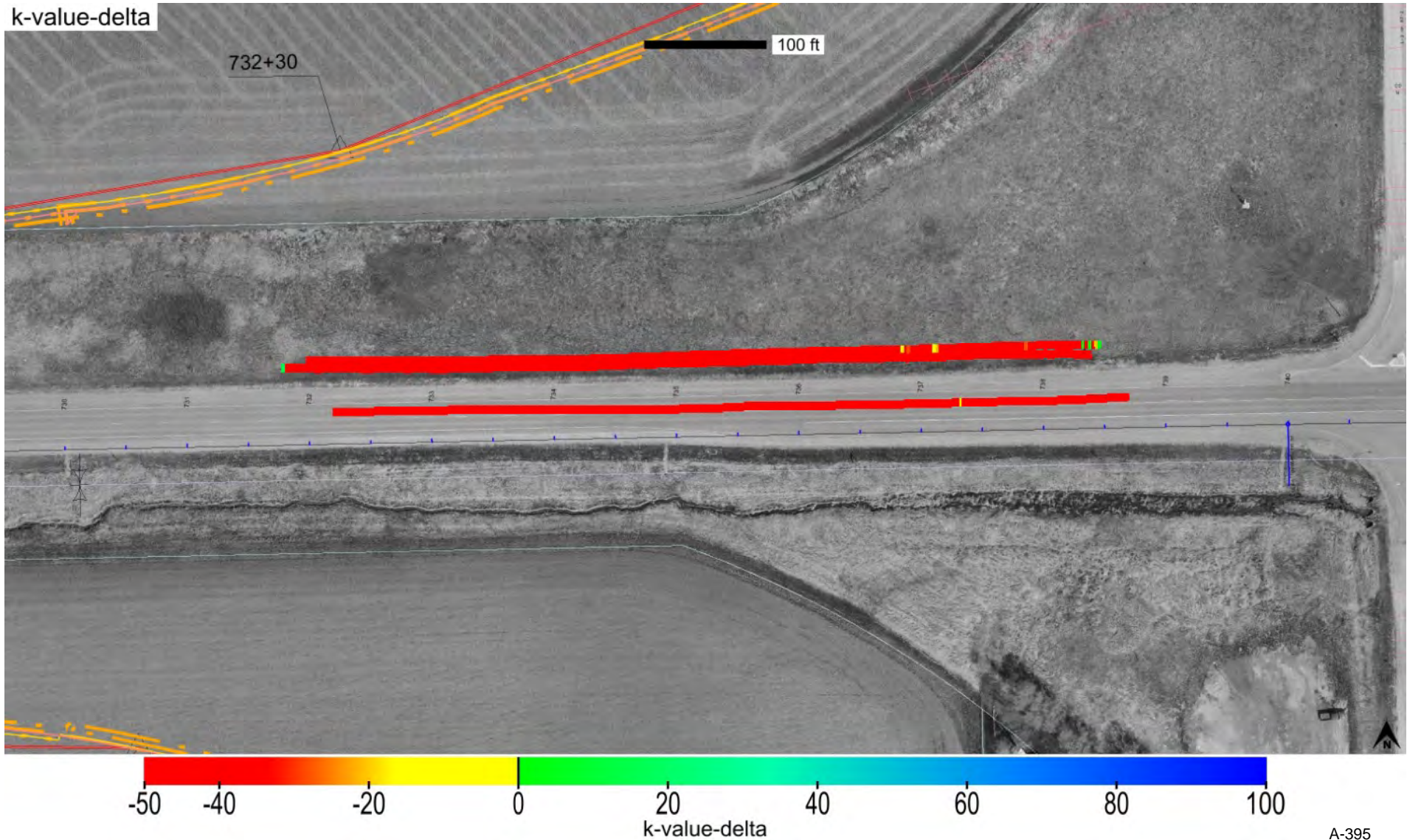
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.6	22.0	0.3	150.0	35.0	69.2	165.0	18.8	27.2	-115.0	-80.8	15.0





Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_091716    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

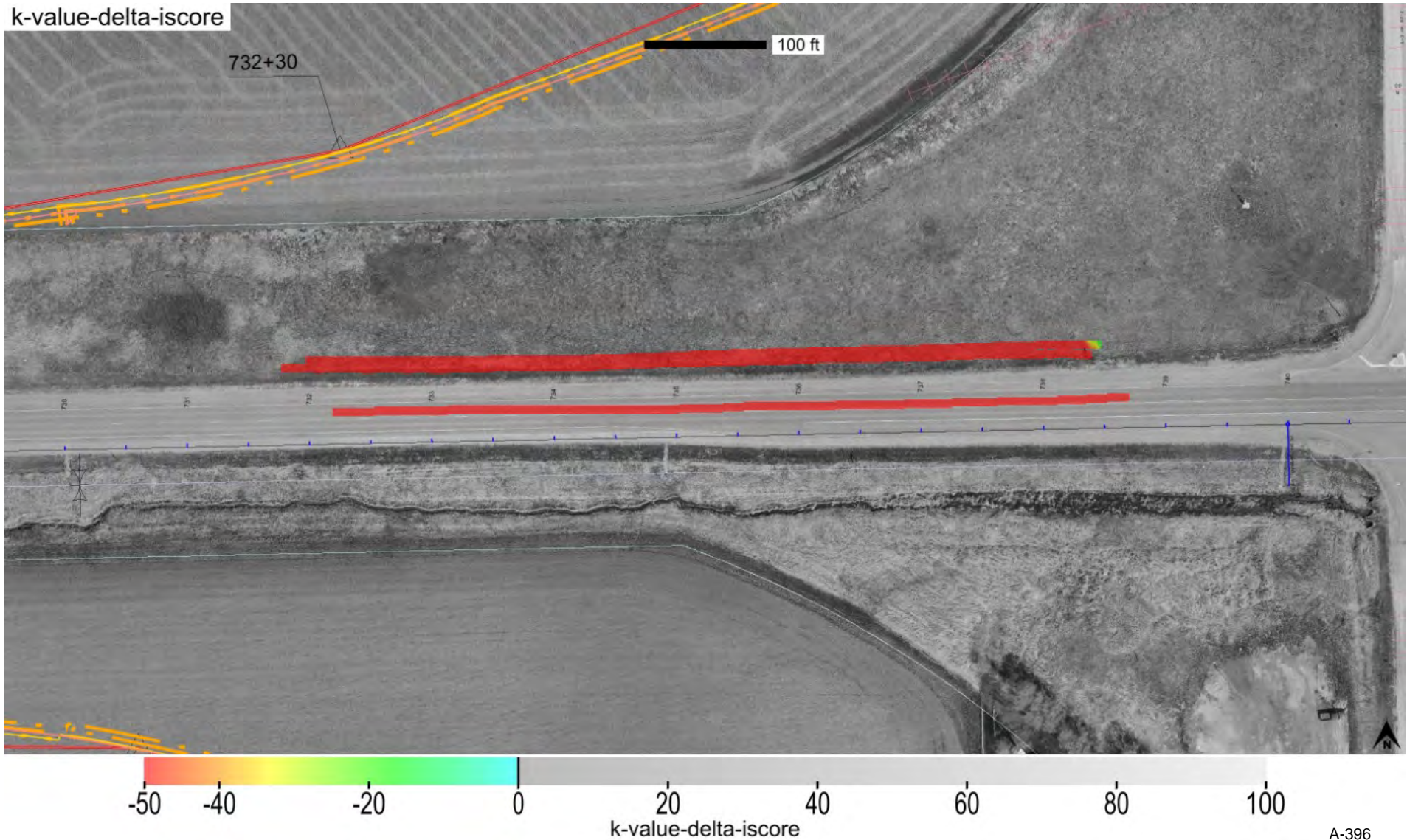
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.6	22.0	0.3	150.0	35.0	69.2	165.0	18.8	27.2	-115.0	-80.8	15.0





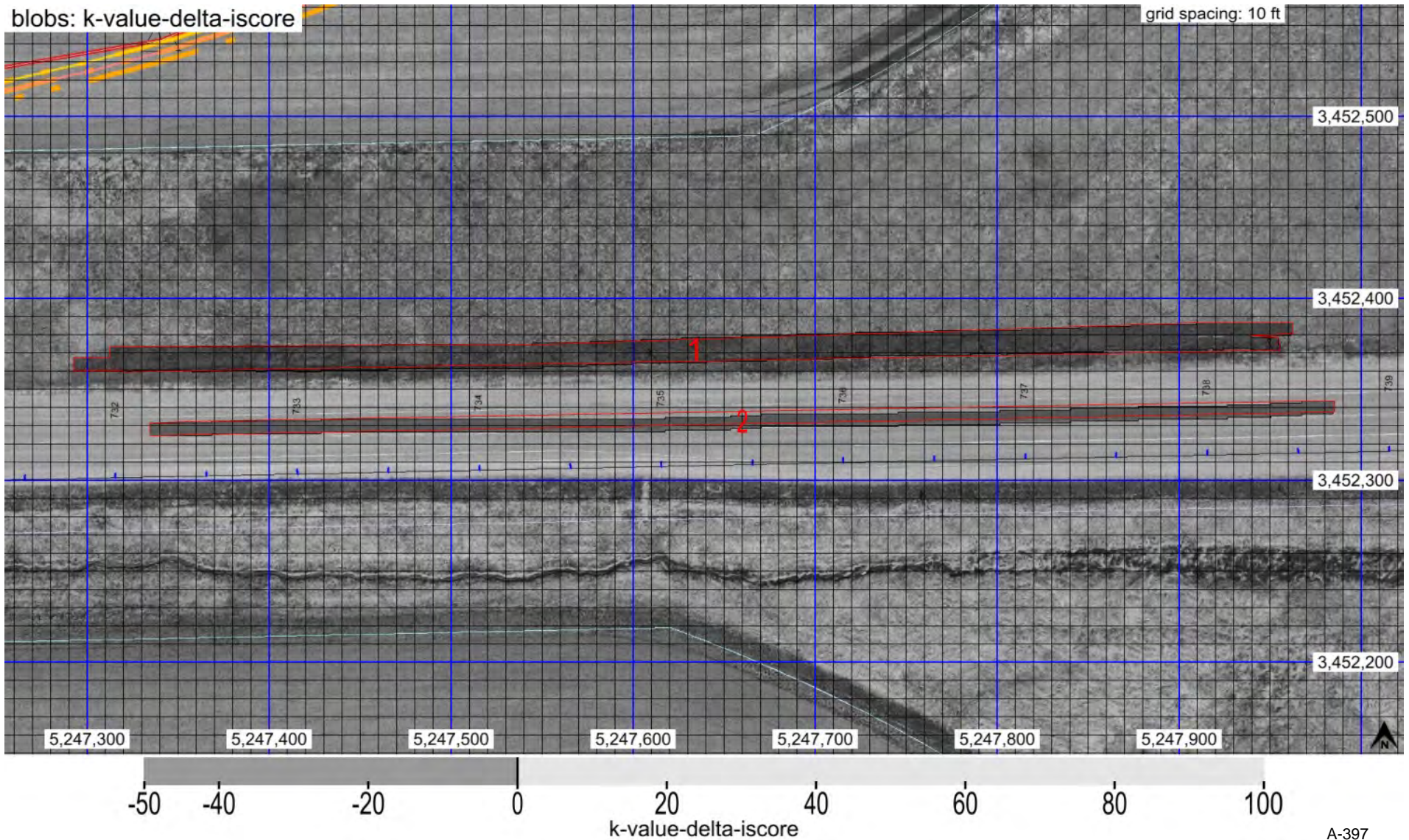
Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_091716    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	0.6	150.0	-115.0	-80.8	15.0	-103.4	-80.9	-15.5





min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv	poly-tol.
1000	2	13336	100.0	none	0.0	4.0



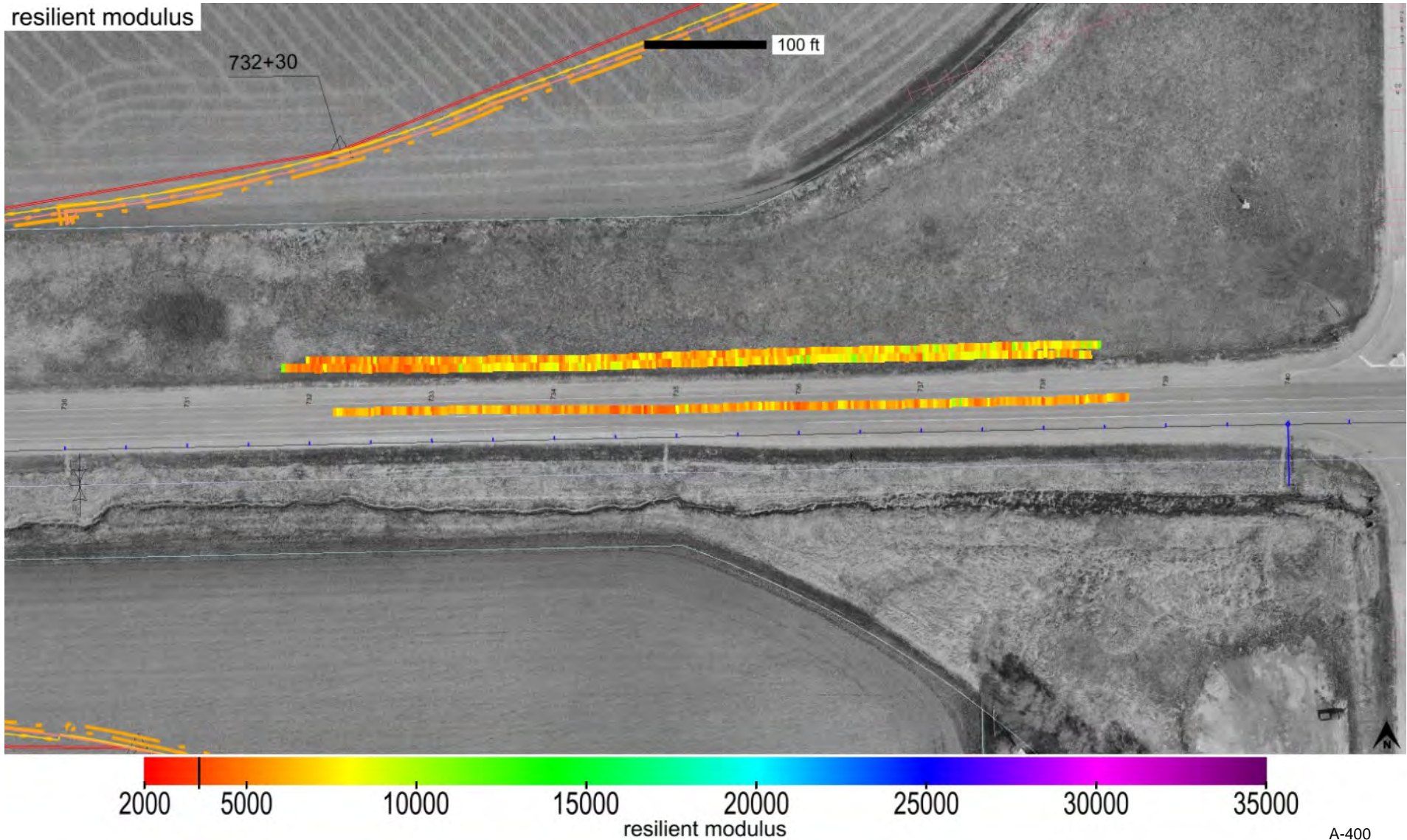






Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_091716    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

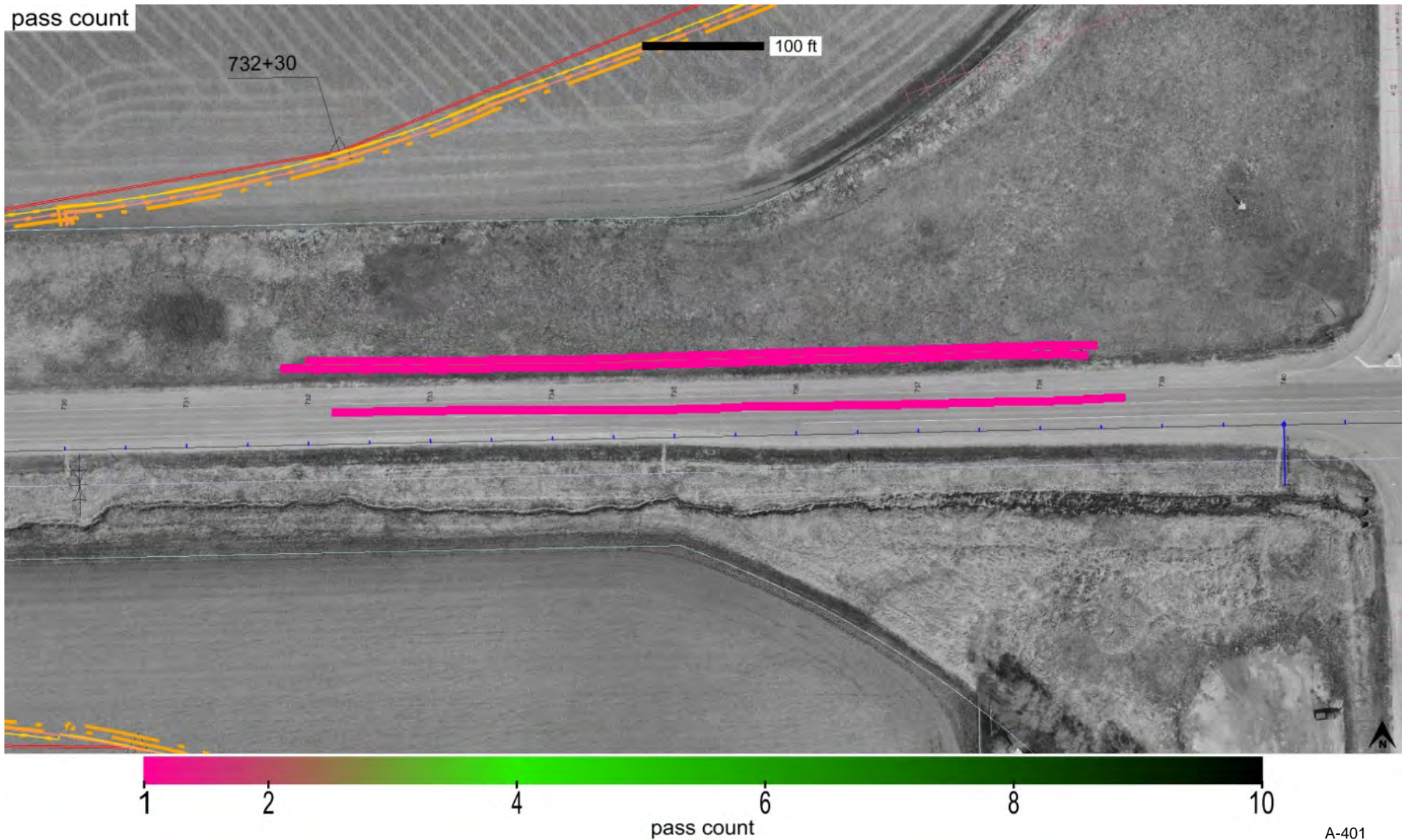
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100.0	124.1	1.1	3600.0	3624.8	6377.1	11000.0	1387.2	21.8	24.8	2777.1	7400.0



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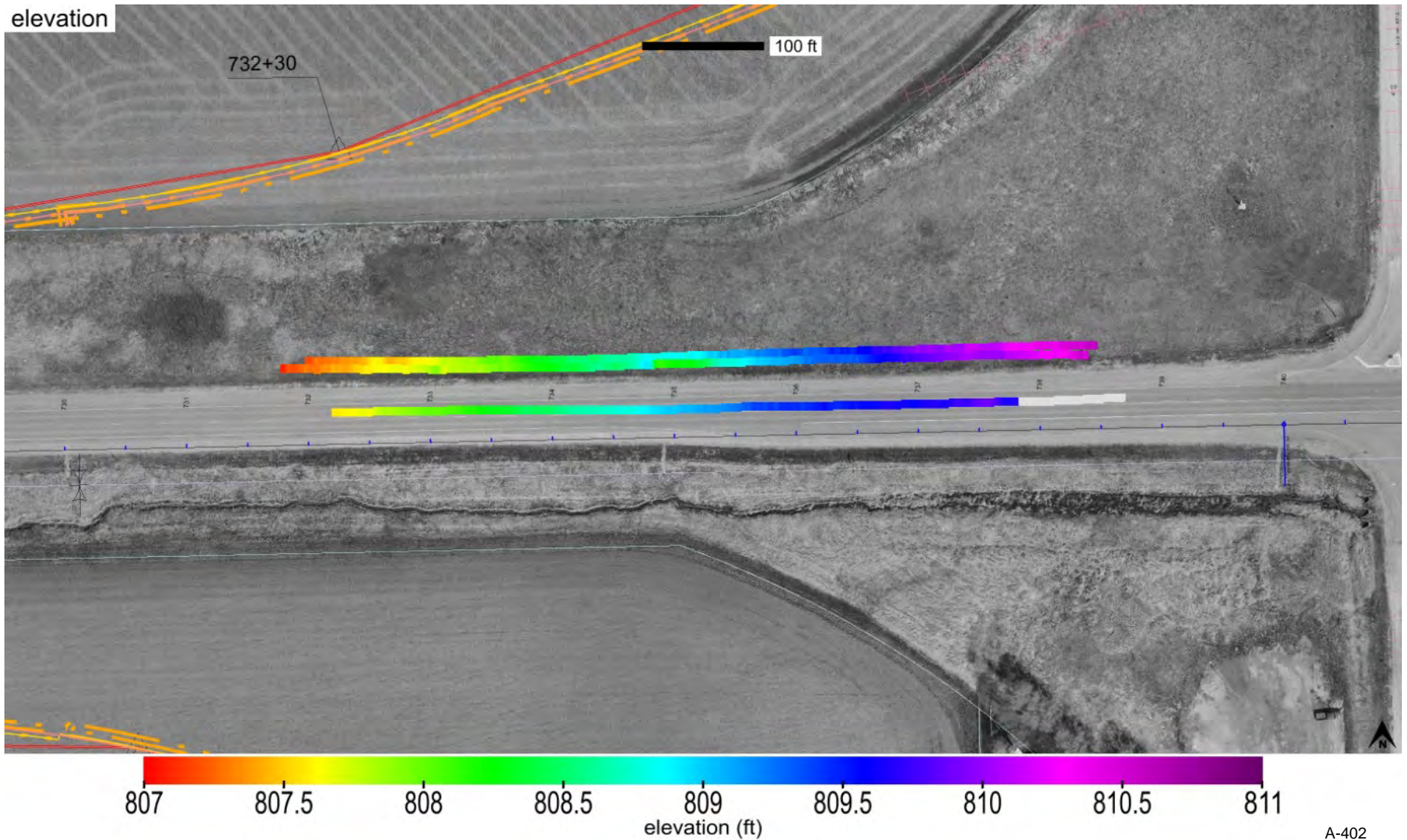


10th percentile	Median	cov(%)	% >= TV	Target Value
0	0	0.0	0.0	0



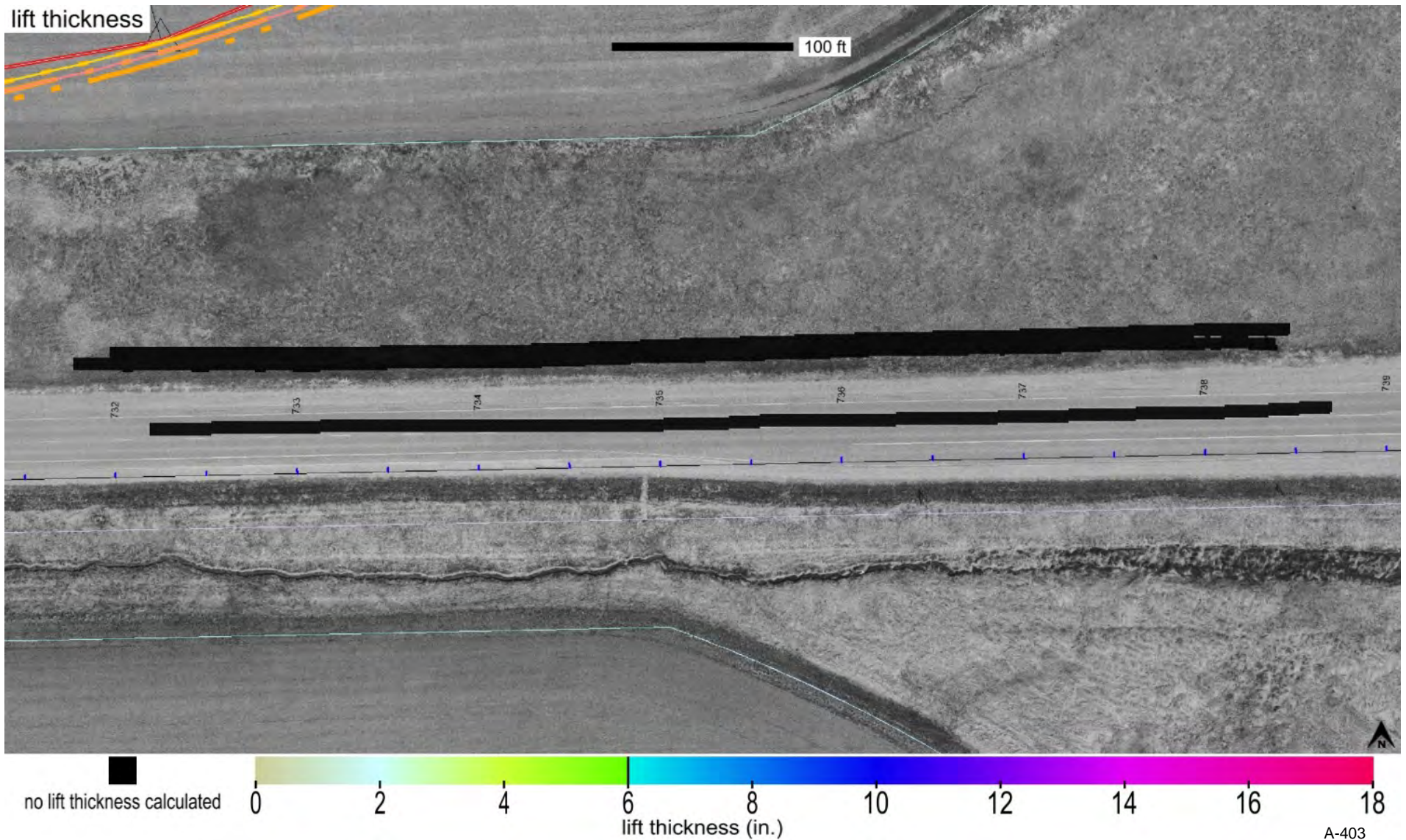


minimum	average	maximum
807.08	808.86	810.58





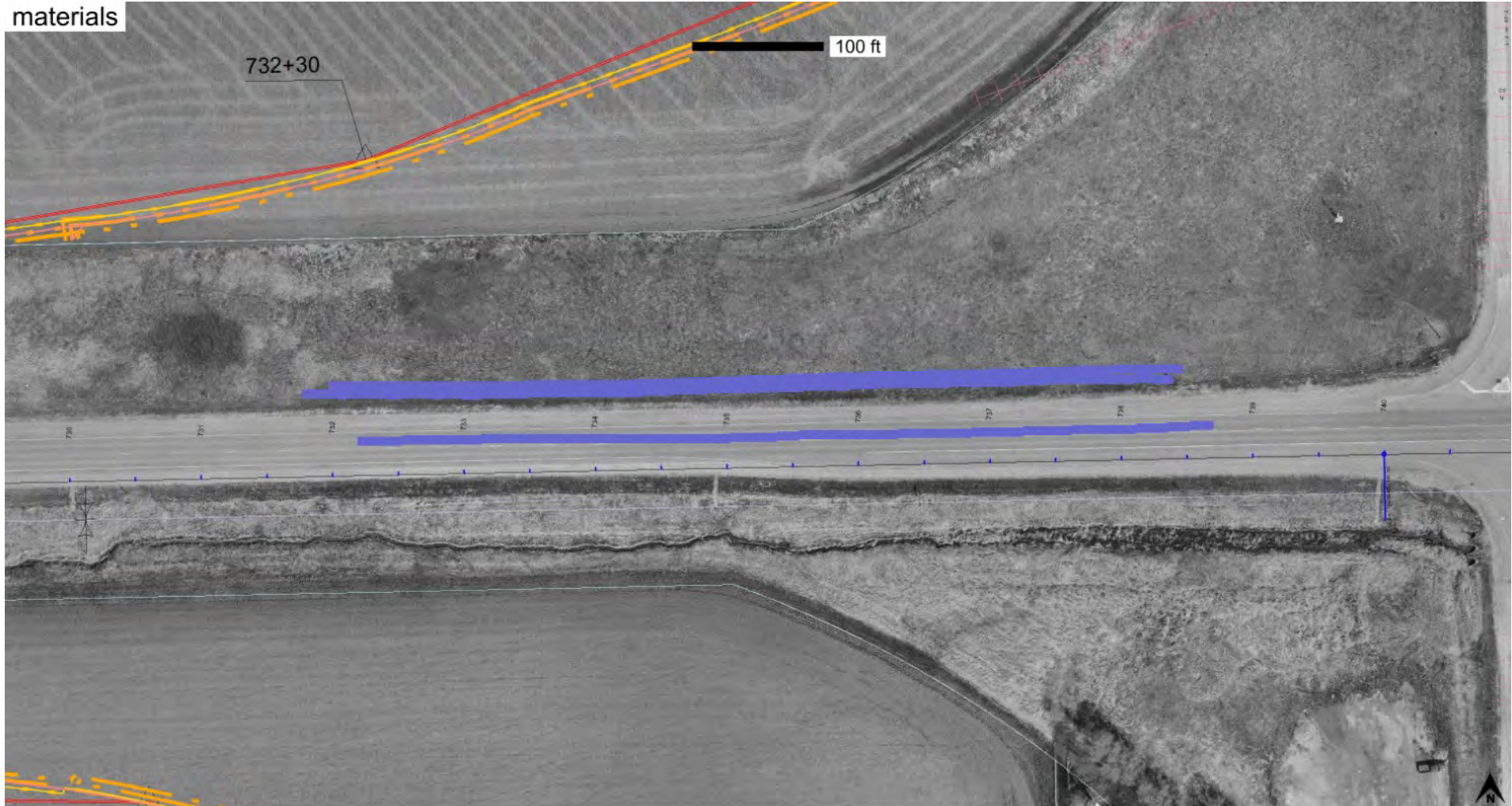
25th percentile (in.)	Median (in.)	75th percentile (in.)	Target Value (in.)
0.0	0.0	0.0	6.0





Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_091716    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade_Treatment Select Cohesive_IADOT	24006	100.0	13336	0.306	100.0	3600.0	150.0	20.5



 Subgrade\_Treatment Select Cohesive\_IADOT



ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_091716\_20221031T212135\_20220909-083050.jpg



A-405

Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_114151

Project:	Tama County US 30	Date and Time:	9/9/2022 11:41:51 AM	Machine ID:	Ingios01
Description:	W of IA 21 to 11th Ave Dr	Mapping Duration (hrs):	0.434	Operator:	Ingios
Location:	Tama County IA	No. of Measurements:	29449	Machine Operator ID:	774
Review Status:	Review Required	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subgrade Treatment 24 Inches	Segment:	US 30 WB

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	0.1	20.8	0.1	150.0	35.0	55.6	165.0	15.9	28.6	-115.0	-94.4	15.0
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.
29449	0.676	0	0	0.0	0.0	0	803.70	805.97	808.02	4.3	5.2	6.3

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade_Treatment Select Cohesive_IADOT	24006	100.0	29449	0.676	100.0	3600.0	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	29449	100.0	none	0.0	4.0

Lift Thickness

25th percentile (in.)	Median (in.)	75th percentile (in.)	Target Value (in.)
-1.1	0.1	0.8	6.0

Station

Start	End
727+00	732+00



Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_114151

Project:	Tama County US 30	Date and Time:	9/9/2022 11:41:51 AM	Machine ID:	Ingios01
Description:	W of IA 21 to 11th Ave Dr	Mapping Duration (hrs):	0.434	Operator:	Ingios
Location:	Tama County IA	No. of Measurements:	29449	Machine Operator ID:	774
Review Status:	Review Required	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subgrade Treatment 24 Inches	Segment:	US 30 WB

**QUALITY ANALYSIS SUMMARY - k-Value**

Quality Value	Criteria
<b>20.8</b>	CQI >= 95
<b>0.1</b>	80% of k-Value MVs >= 150
<b>28.6</b>	COV <= 30
100.0	% i-Score Blob Area >= 1000 ft <sup>2</sup>
<b>0.1</b>	Lift Thickness Median Value (in.)
<b>0</b>	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 (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%.

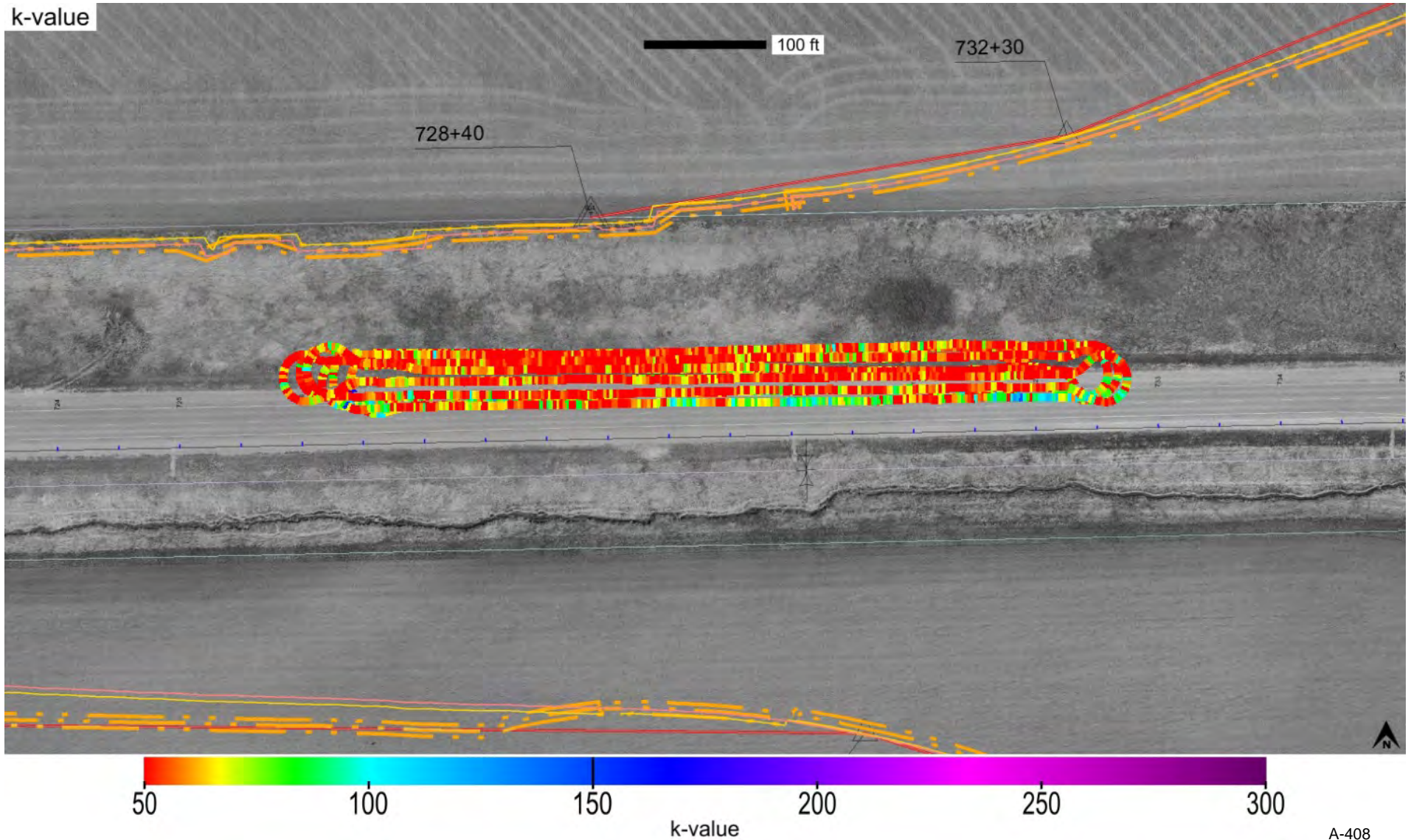
i-Score Blob (%): The percentage of the map area analyzed with contiguous blob areas with MVs < TV. Control Level 1 >= 100 sq. ft.; Control Level 2 >= 200 sq. ft.; Control Level 3 >= 500 sq. ft.; Control Level 4 >= 1,000 sq. ft.; Control Level 5 >= 2,000 sq. ft.

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

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

Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_114151    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

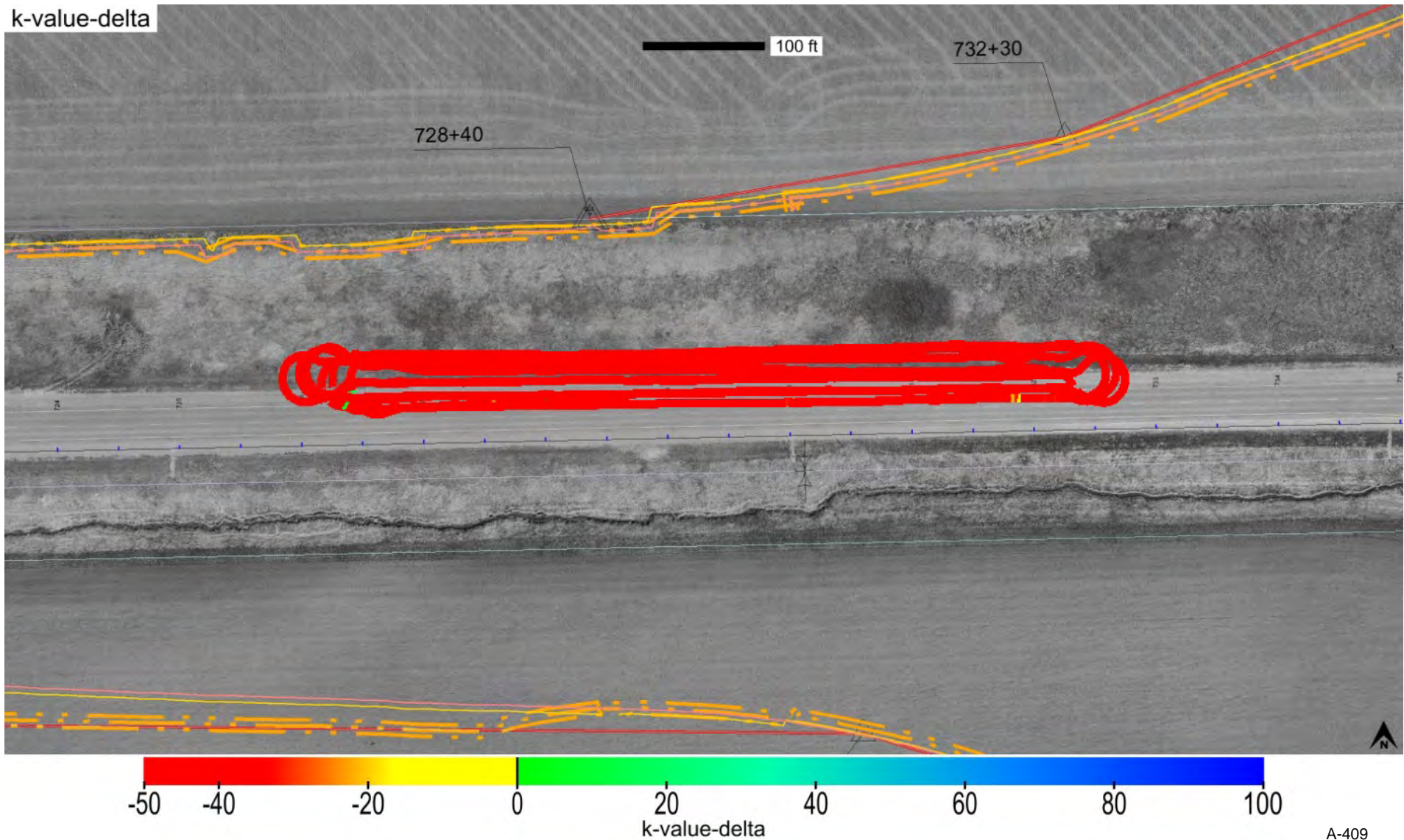
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.1	20.8	0.1	150.0	35.0	55.6	165.0	15.9	28.6	-115.0	-94.4	15.0





Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_114151    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.1	20.8	0.1	150.0	35.0	55.6	165.0	15.9	28.6	-115.0	-94.4	15.0



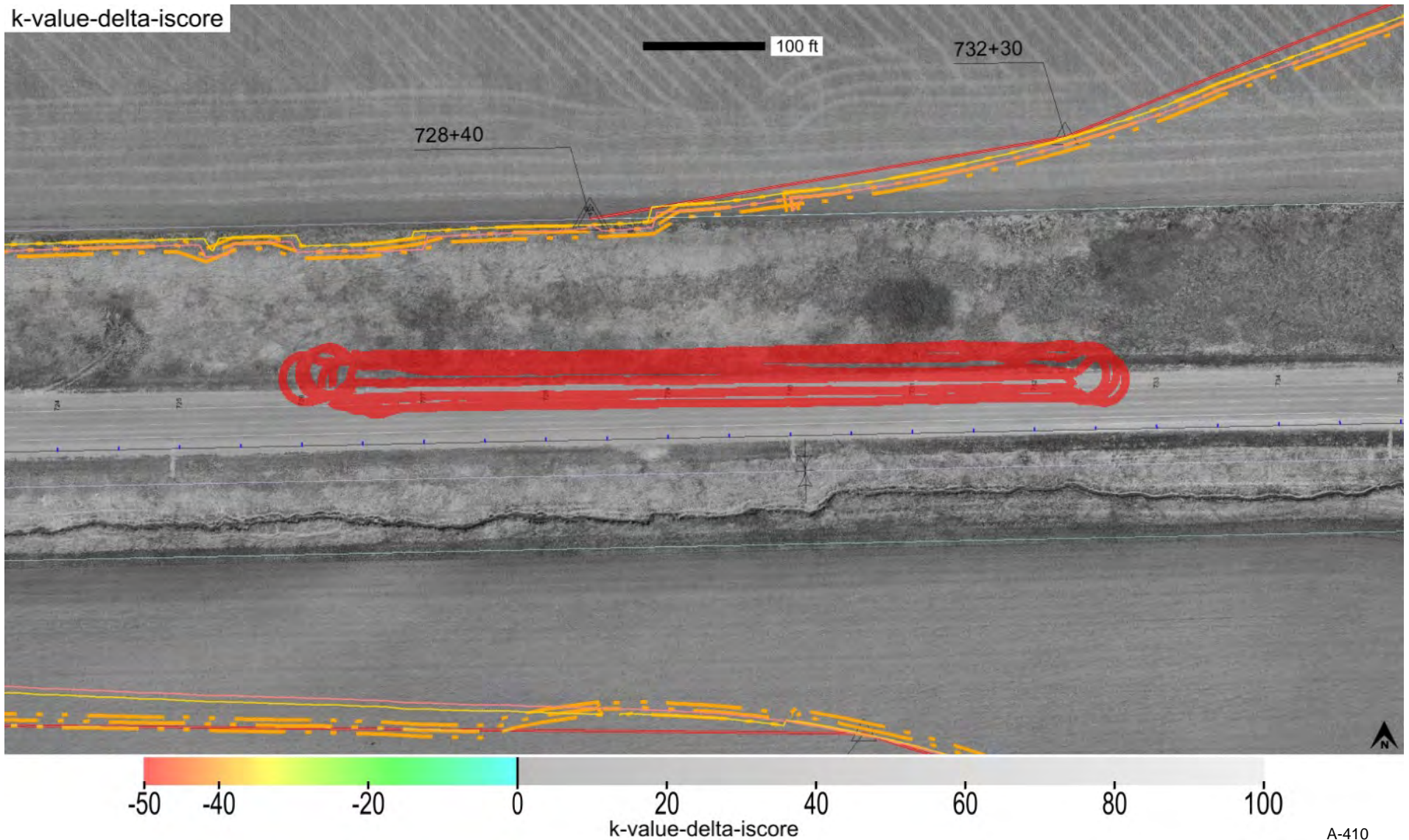
A-409

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Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_114151    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	0.1	150.0	-115.0	-94.4	15.0	-110.5	-94.5	-53.2

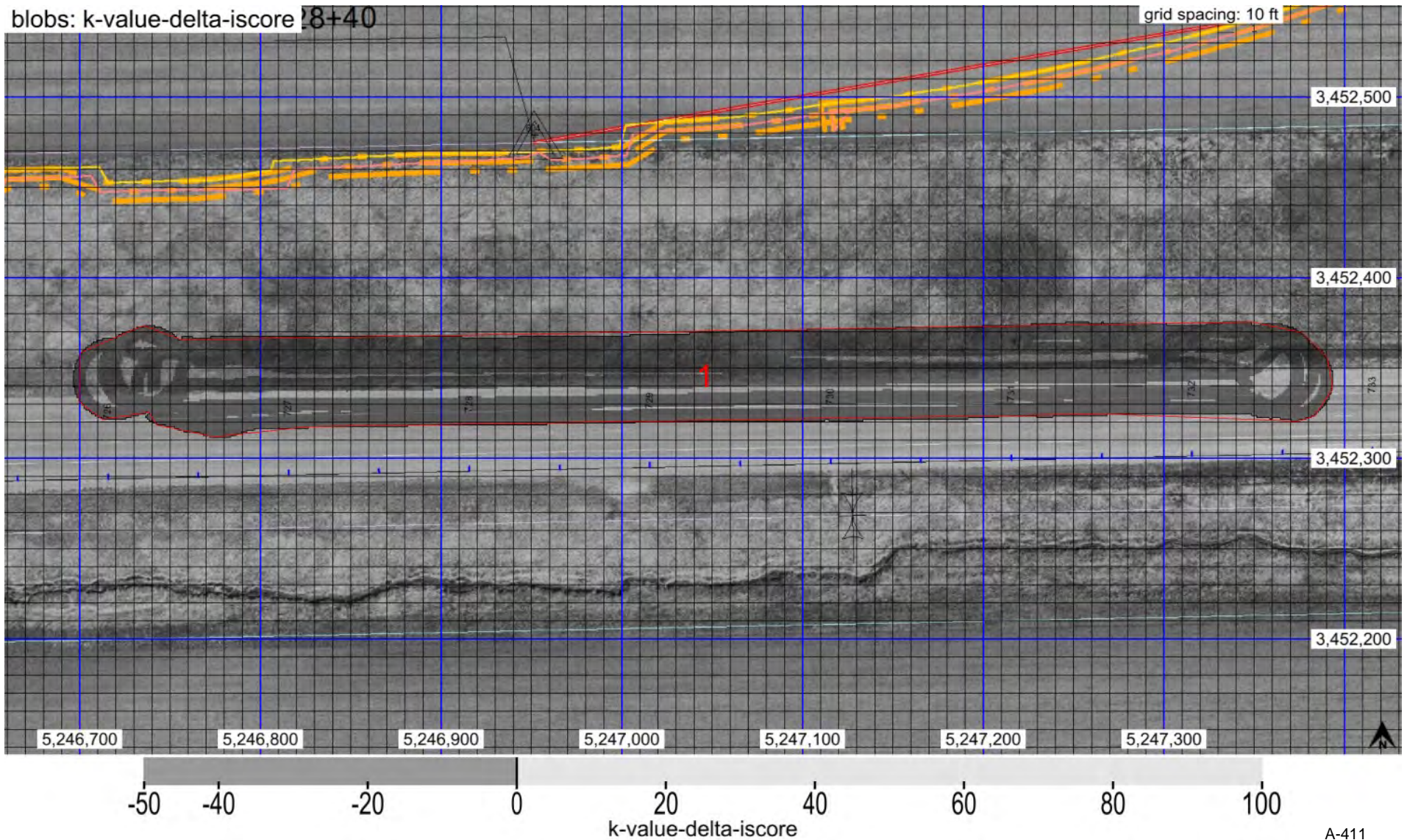


A-410

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min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv	poly-tol.
1000	1	29449	100.0	none	0.0	4.0

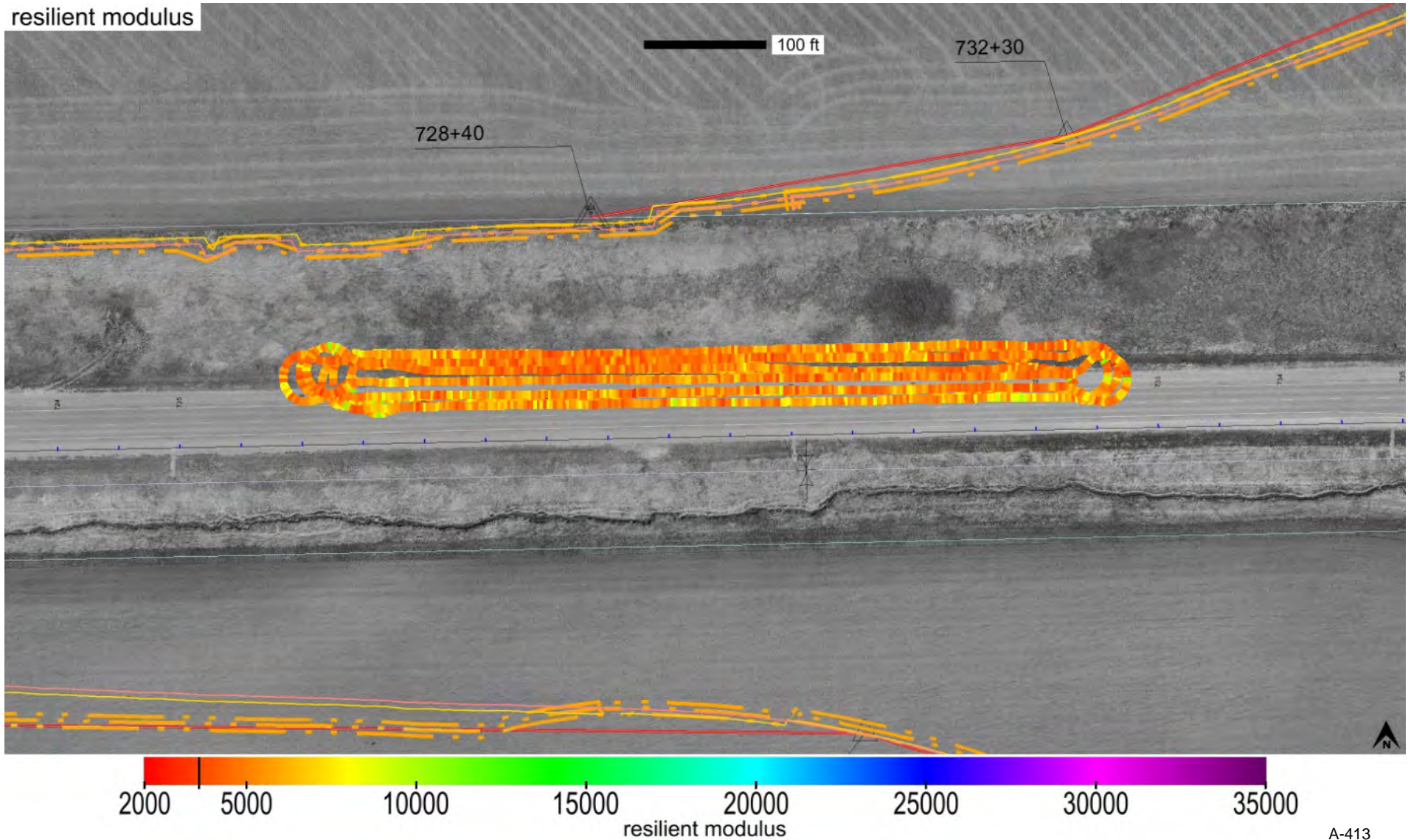






Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_114151    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	98.8	123.2	1.0	3600.0	2903.8	5379.6	11000.0	1142.7	21.2	-696.2	1779.6	7400.0

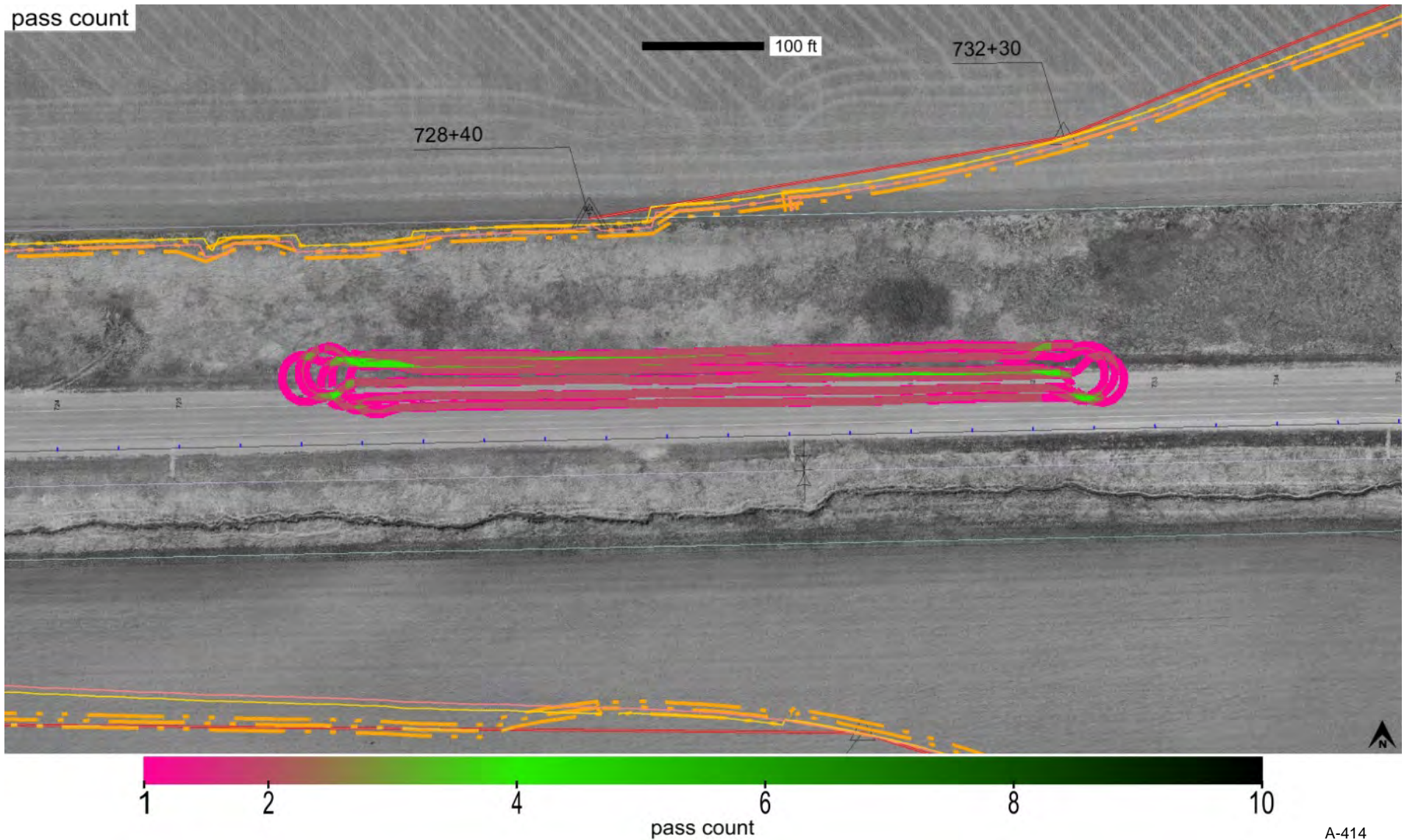


A-413

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

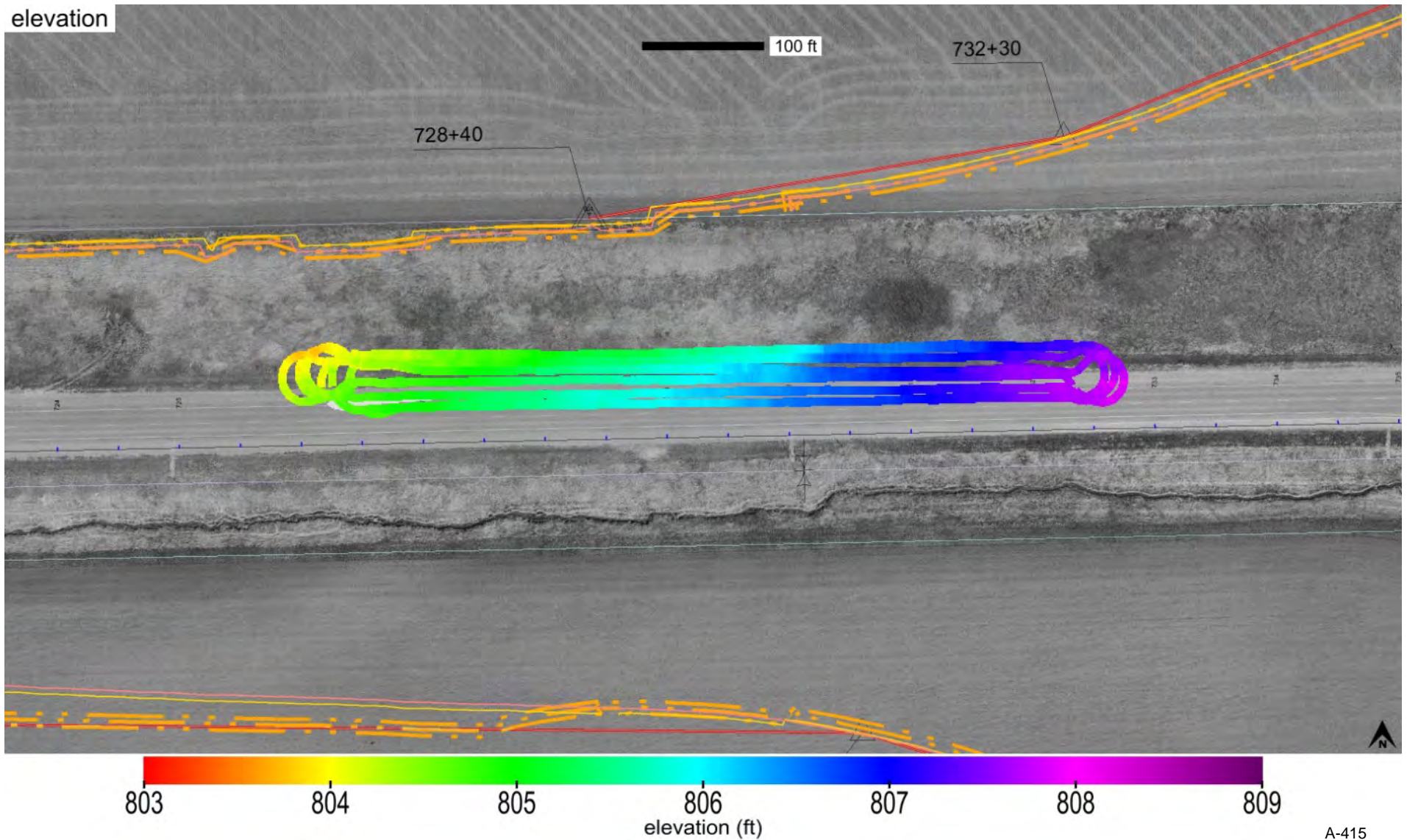


10th percentile	Median	cov(%)	% >= TV	Target Value
0	0	0.0	0.0	0



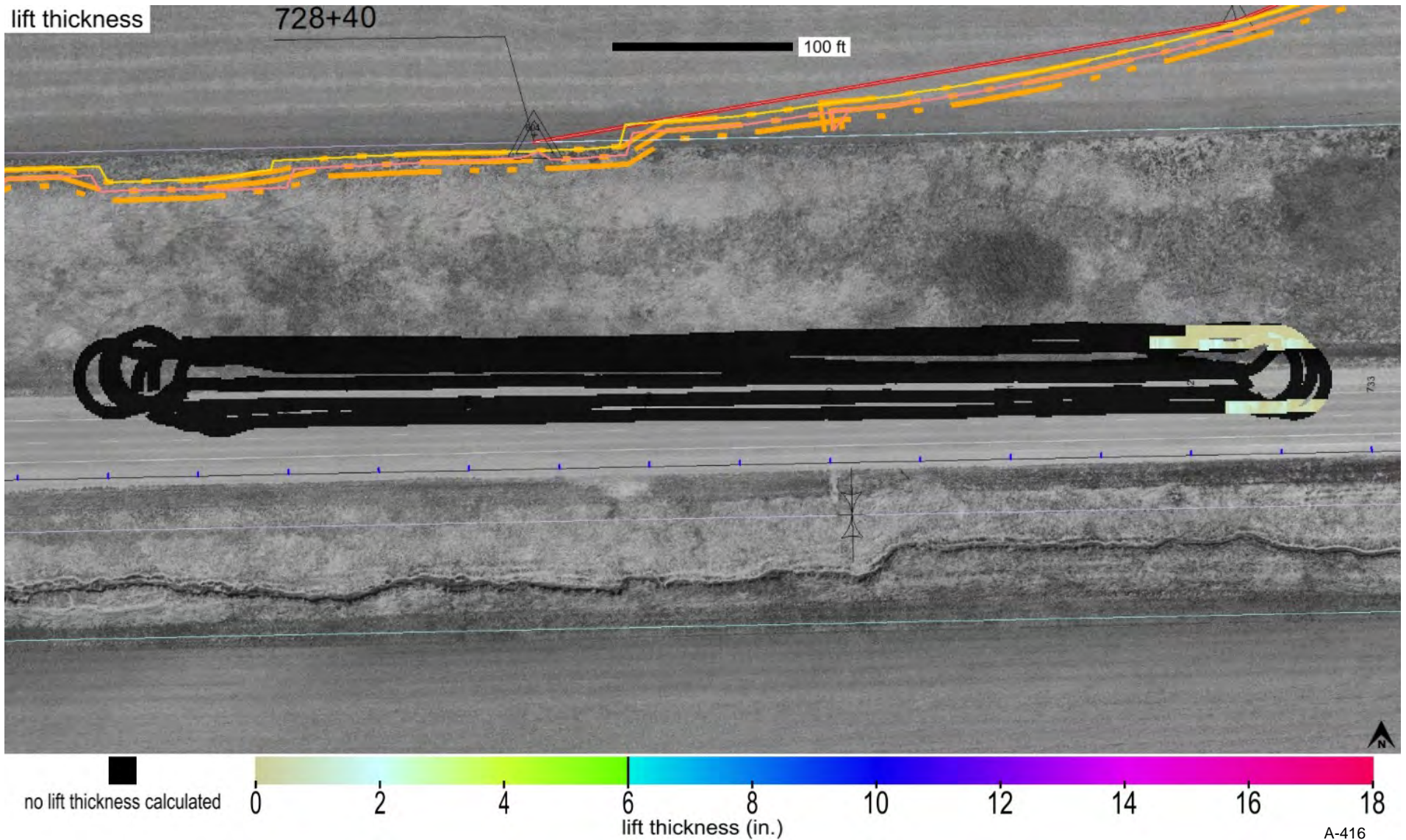


minimum	average	maximum
803.70	805.97	808.02





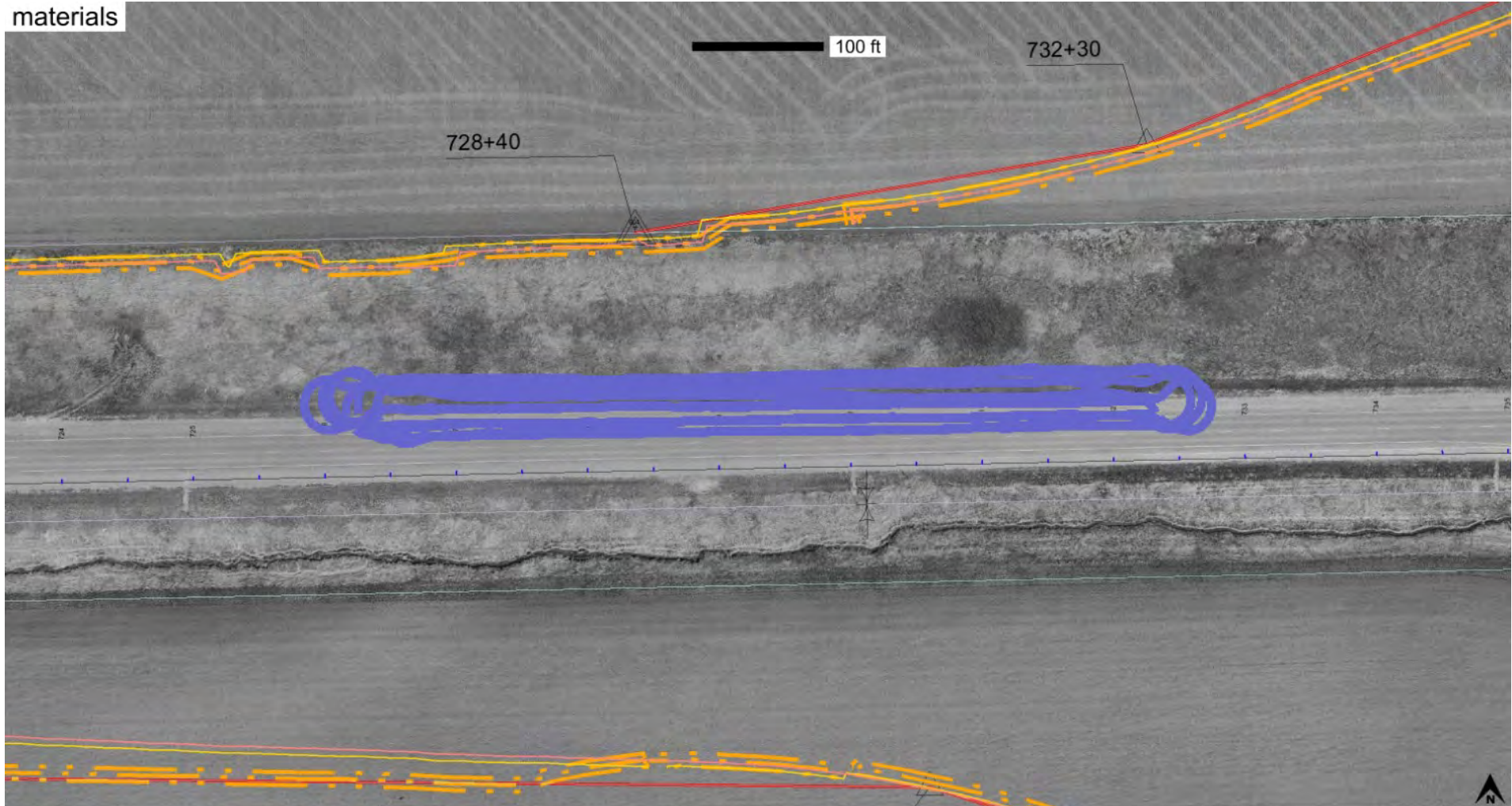
25th percentile (in.)	Median (in.)	75th percentile (in.)	Target Value (in.)
-1.1	0.1	0.8	6.0






Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_114151    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade_Treatment Select Cohesive_IADOT	24006	100.0	29449	0.676	100.0	3600.0	150.0	20.5



 Subgrade\_Treatment Select Cohesive\_IADOT



ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_114151\_20221031T220953\_20220909-141448.jpg



Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_121304

Project:	Tama County US 30	Date and Time:	9/9/2022 12:13:04 PM	Machine ID:	Ingios01
Description:	W of IA 21 to 11th Ave Dr	Mapping Duration (hrs):	0.427	Operator:	Ingios
Location:	Tama County IA	No. of Measurements:	28955	Machine Operator ID:	774
Review Status:	Review Required	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subgrade Treatment 24 Inches	Segment:	US 30 WB

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	17.6	0.2	150.0	35.0	64.7	165.0	22.8	35.3	-115.0	-85.3	15.0
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.
28955	0.665	0	0	0.0	0.0	0	0.00	0.00	0.00	4.5	5.3	6.6

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade_Treatment Select Cohesive_IADOT	24006	100.0	28955	0.665	100.0	3600.0	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	28955	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
722+00	726+00



Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_121304

Project:	Tama County US 30	Date and Time:	9/9/2022 12:13:04 PM	Machine ID:	Ingios01
Description:	W of IA 21 to 11th Ave Dr	Mapping Duration (hrs):	0.427	Operator:	Ingios
Location:	Tama County IA	No. of Measurements:	28955	Machine Operator ID:	774
Review Status:	Review Required	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subgrade Treatment 24 Inches	Segment:	US 30 WB

**QUALITY ANALYSIS SUMMARY - k-Value**

Quality Value	Criteria
17.6	CQI >= 95
0.3	80% of k-Value MVs >= 150
35.3	COV <= 30
100.0	% i-Score Blob Area >= 1000 ft <sup>2</sup>
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%.

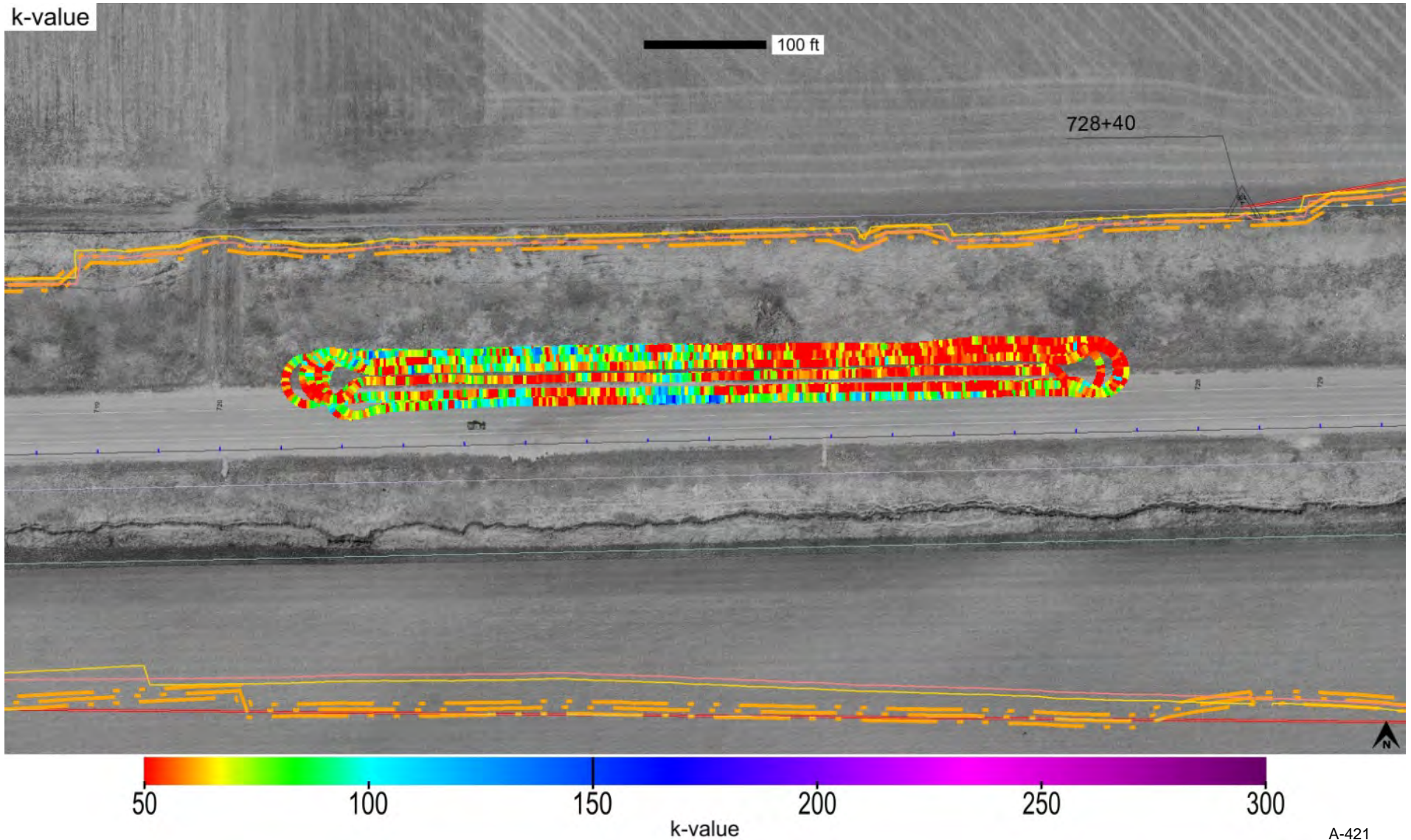
i-Score Blob (%): The percentage of the map area analyzed with contiguous blob areas with MVs < TV. Control Level 1 >= 100 sq. ft.; Control Level 2 >= 200 sq. ft.; Control Level 3 >= 500 sq. ft.; Control Level 4 >= 1,000 sq. ft.; Control Level 5 >= 2,000 sq. ft.

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\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_121304    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.3	17.6	0.2	150.0	35.0	64.7	165.0	22.8	35.3	-115.0	-85.3	15.0



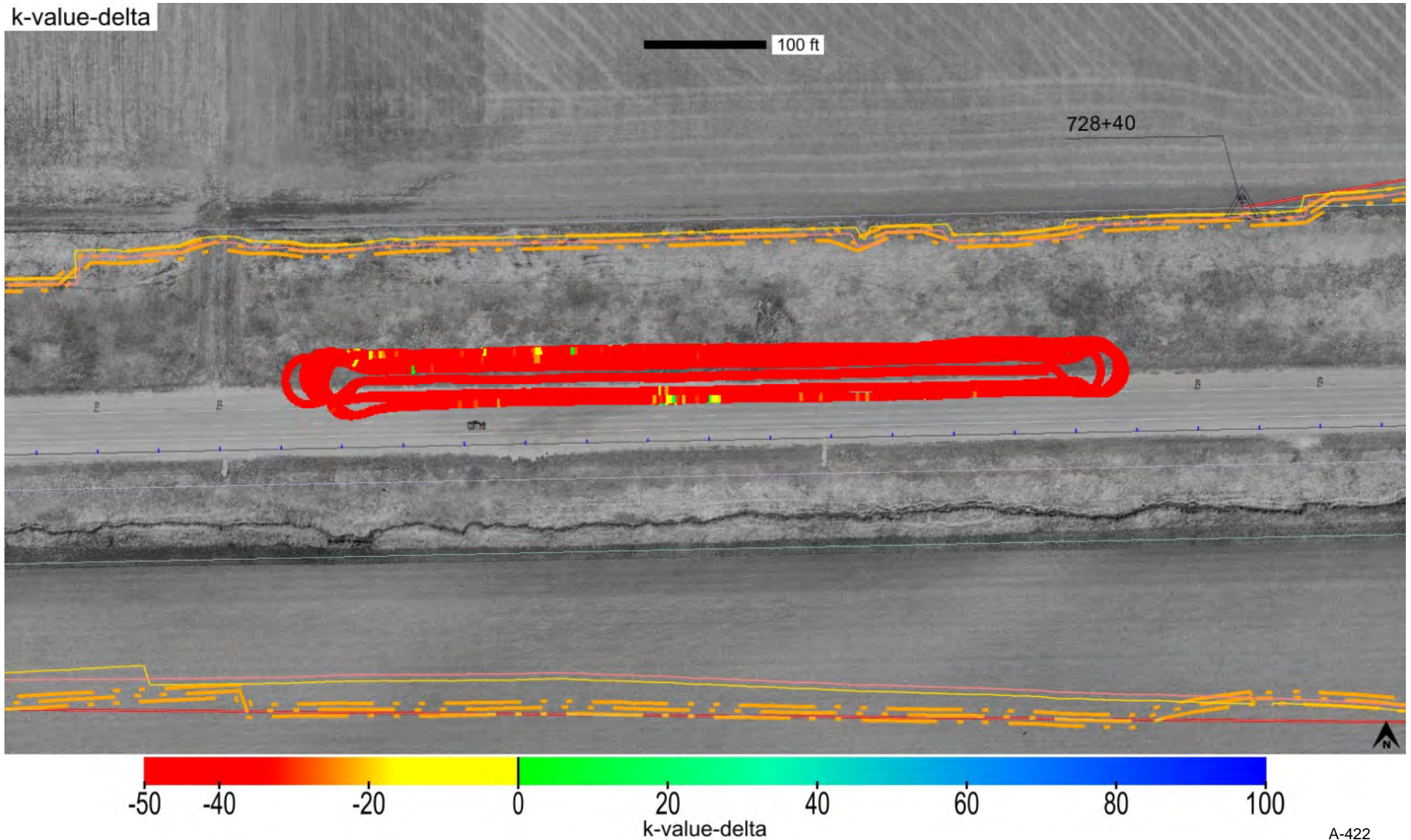
A-421

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Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_121304    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.3	17.6	0.2	150.0	35.0	64.7	165.0	22.8	35.3	-115.0	-85.3	15.0



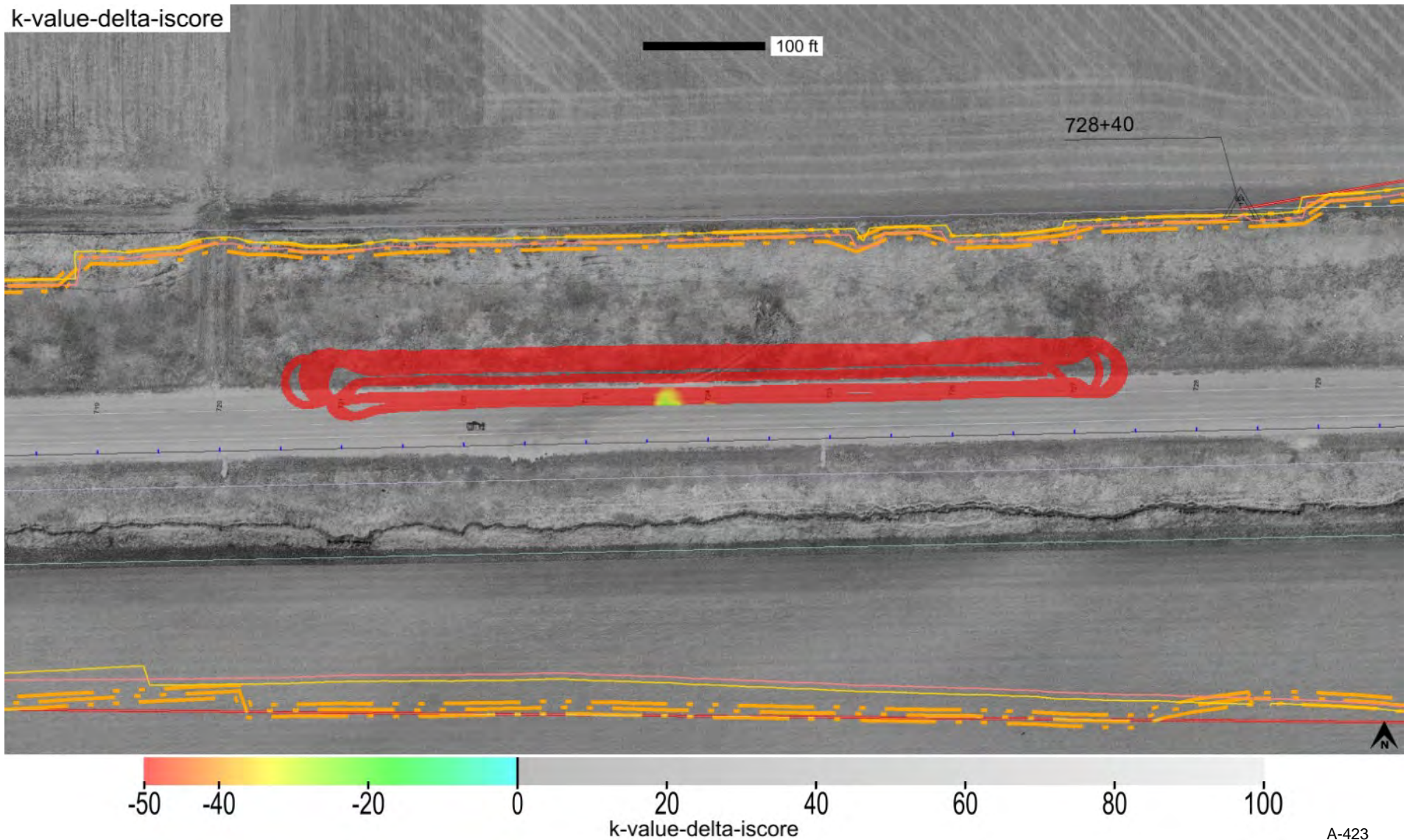
A-422

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\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_121304    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	0.3	150.0	-115.0	-85.3	15.0	-109.0	-85.3	-24.7



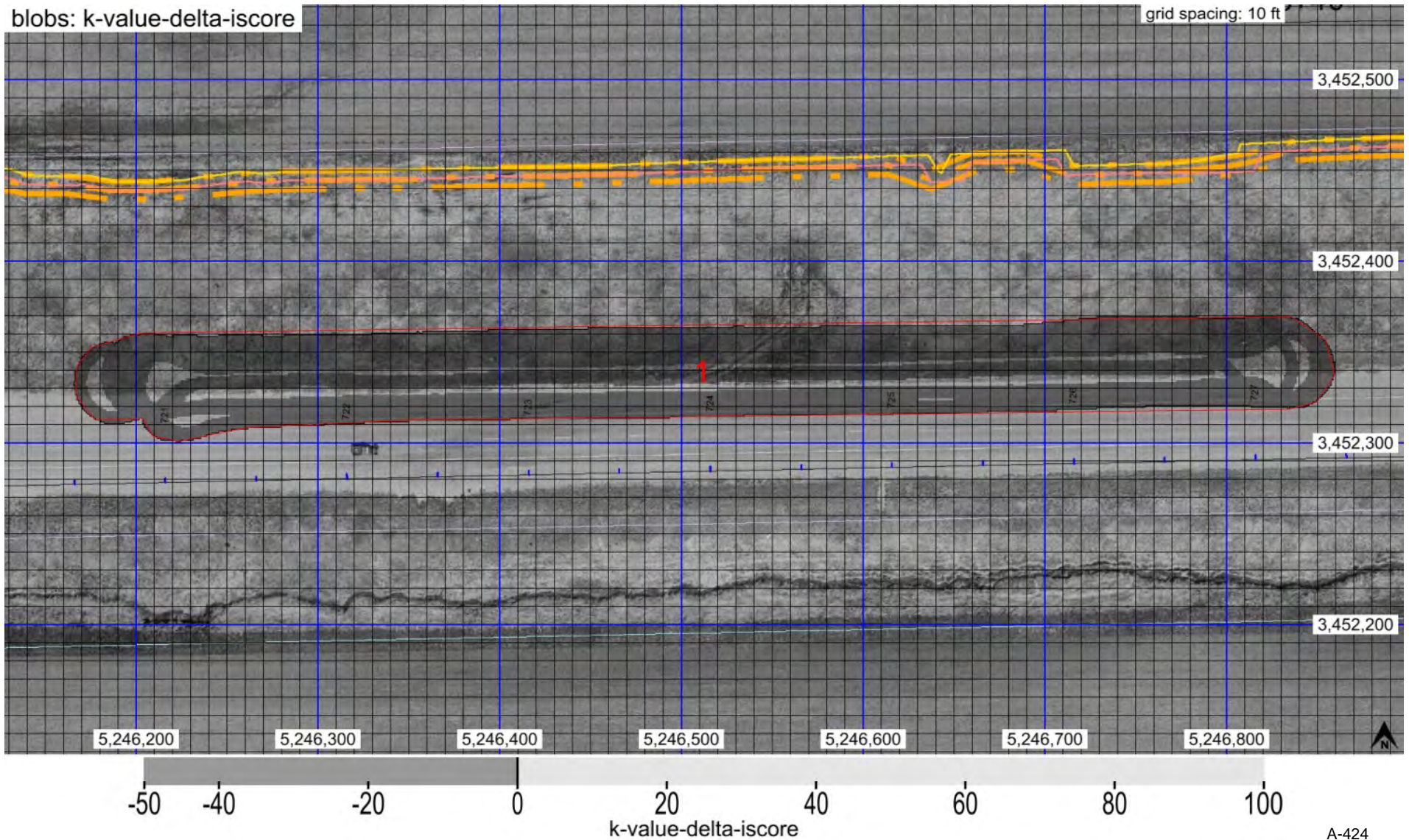
A-423

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\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_121304    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv	poly-tol.
1000	1	28955	100.0	none	0.0	4.0



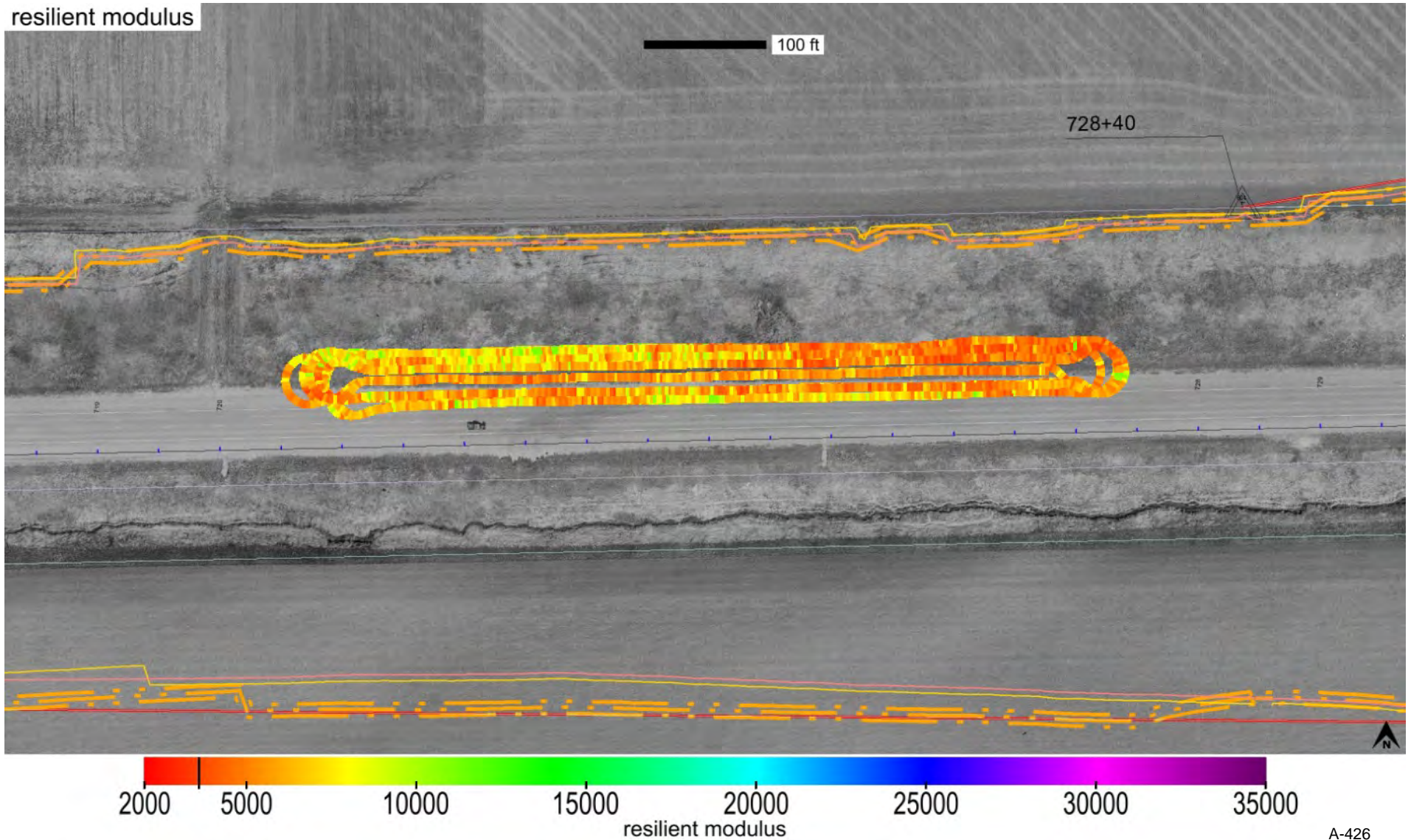
This report is only for use of the client named and it cannot be relied upon by any other person or entity.





Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_121304    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	98.4	120.5	0.9	3600.0	2950.5	6048.9	11000.0	1564.7	25.9	-649.5	2448.9	7400.0

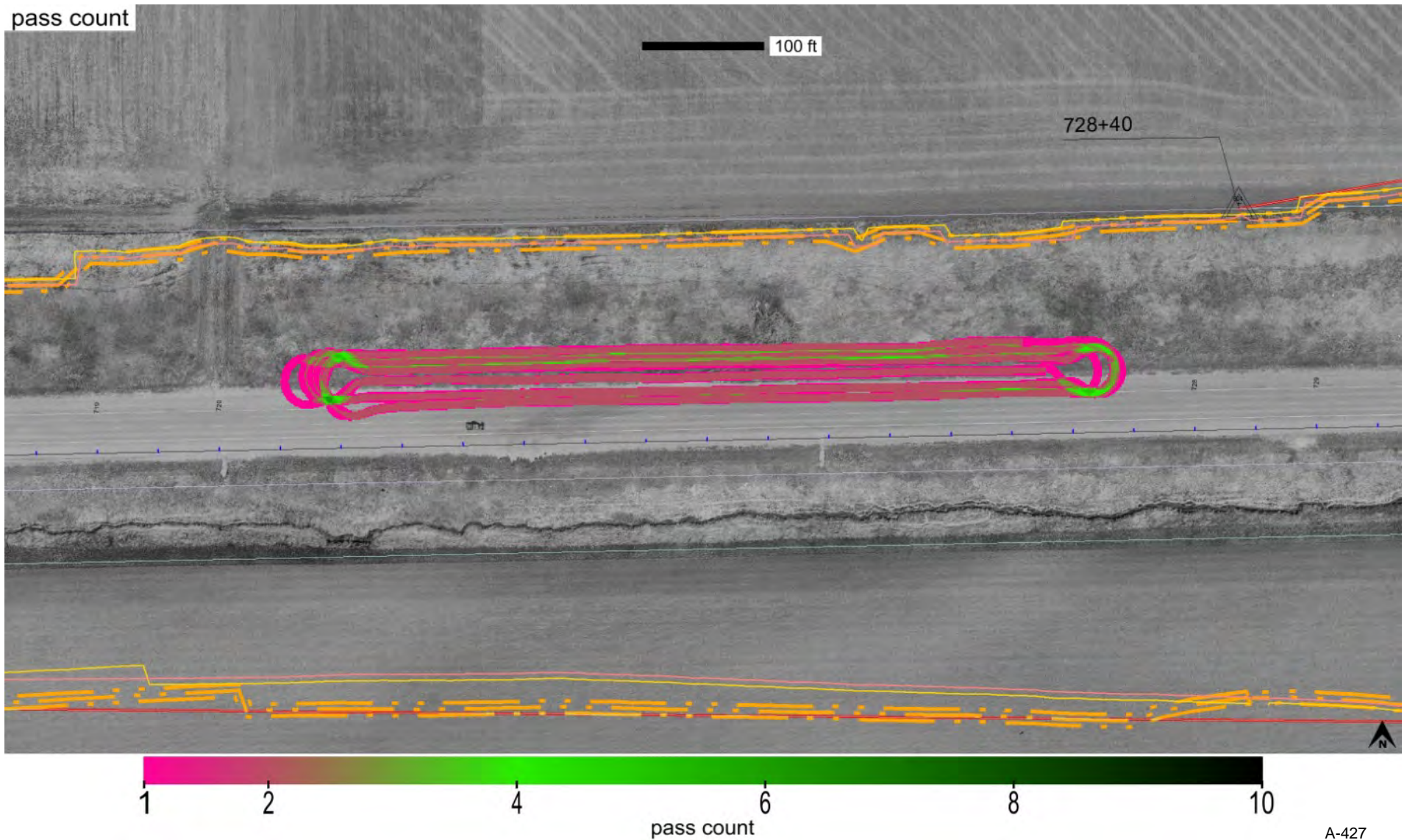


A-426

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

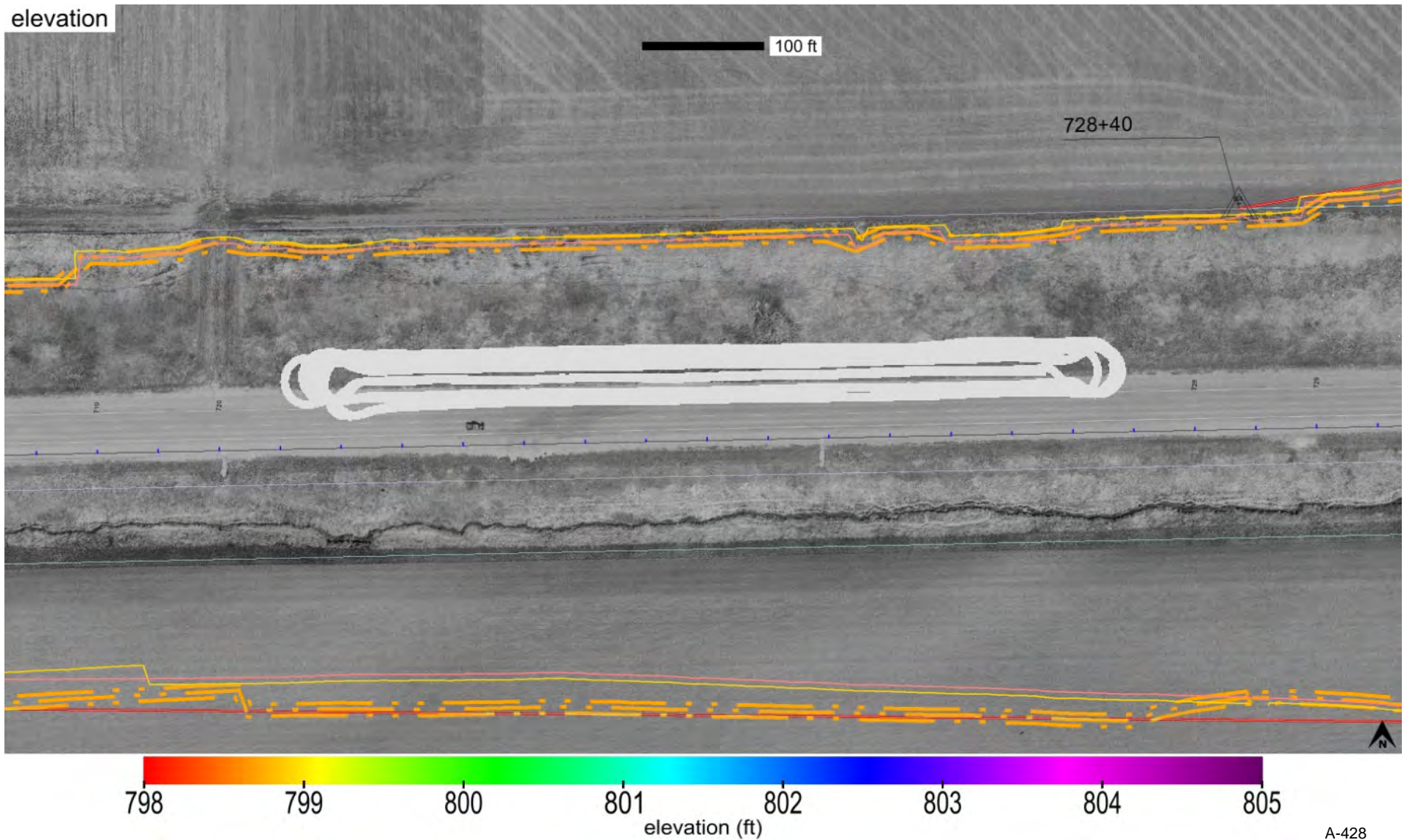


10th percentile	Median	cov(%)	% >= TV	Target Value
0	0	0.0	0.0	0





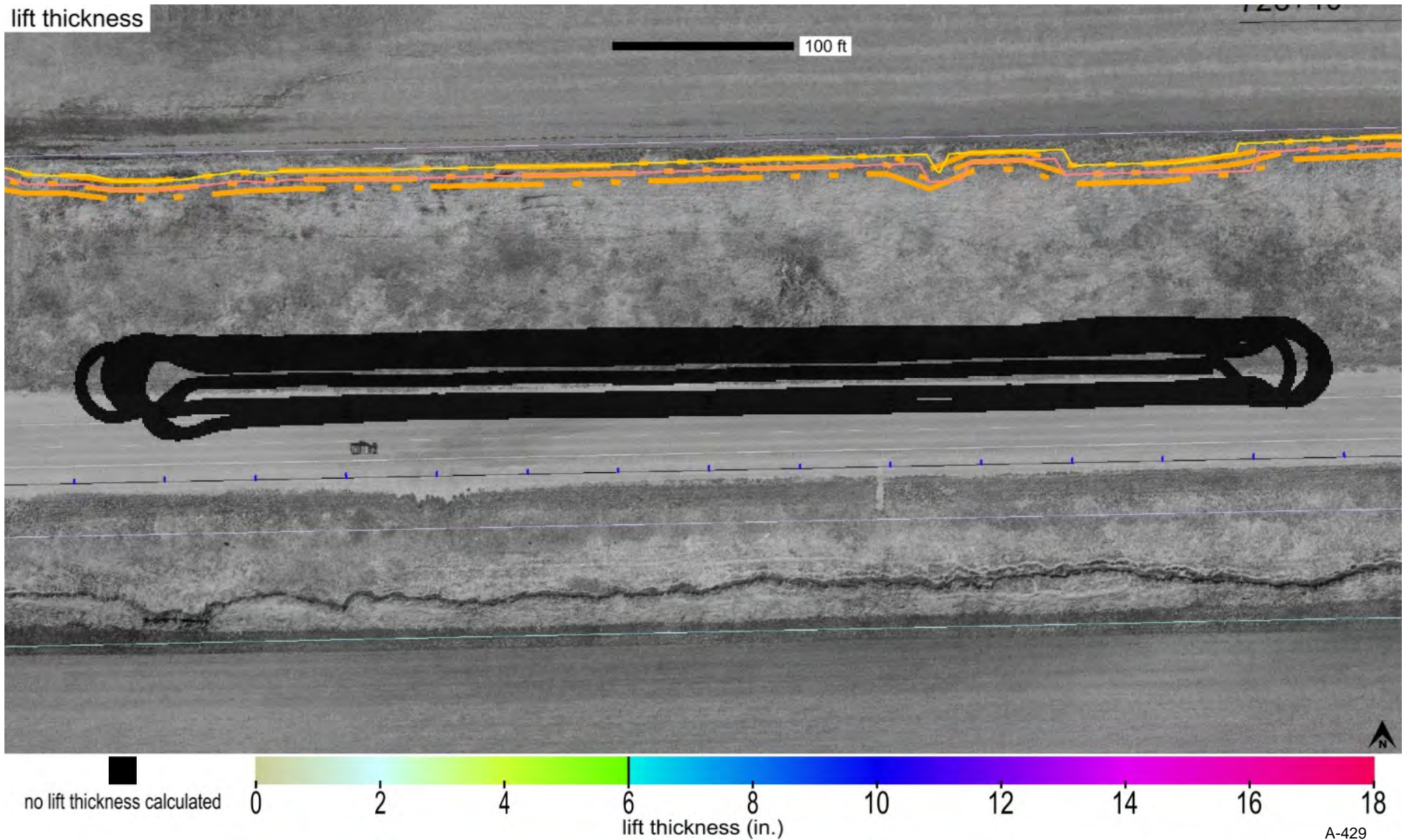
minimum	average	maximum
0.00	0.00	0.00





Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_121304    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

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

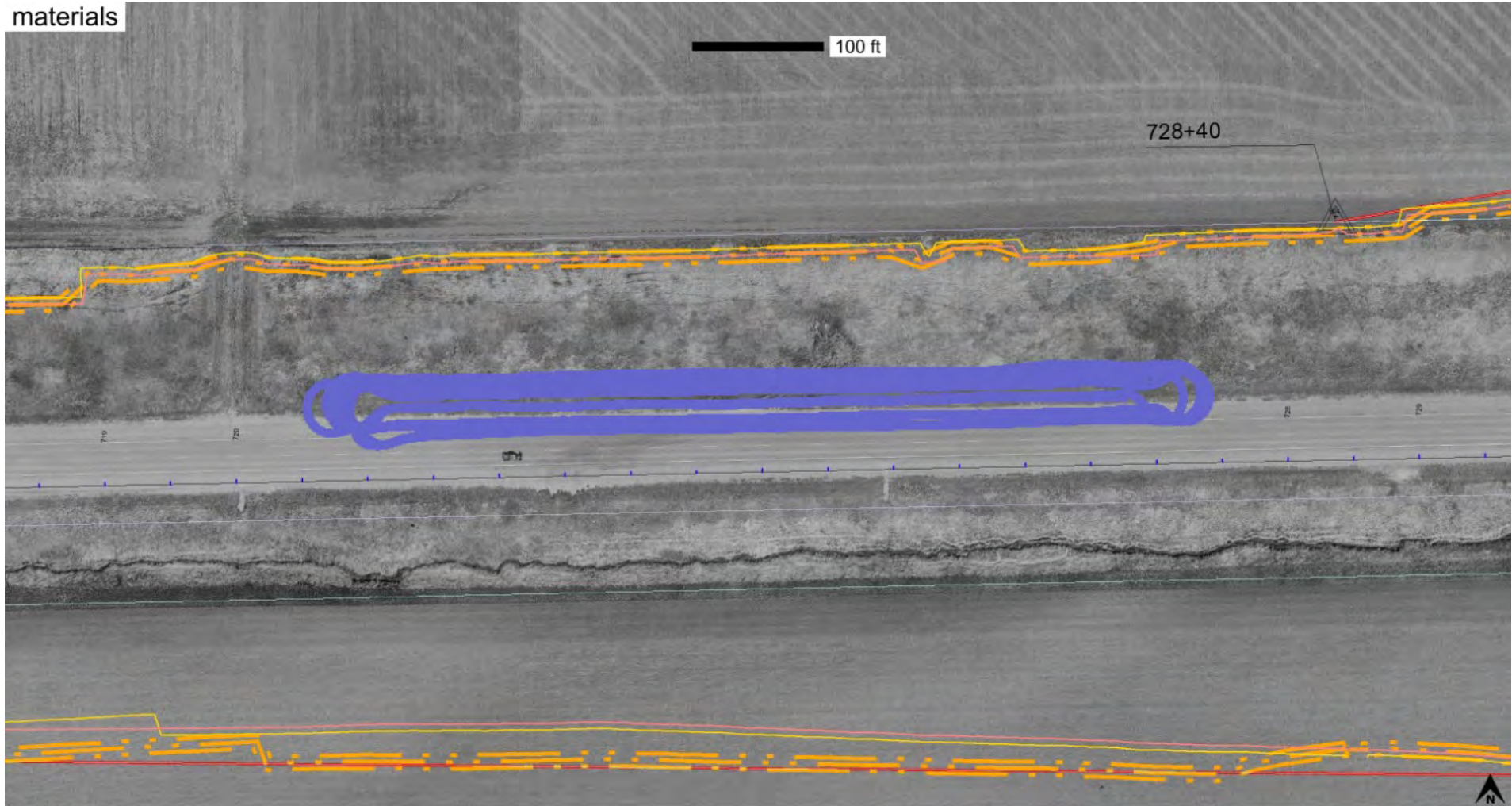


This report is only for use of the client named and it cannot be relied upon by any other person or entity.



Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_121304    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade_Treatment Select Cohesive_IADOT	24006	100.0	28955	0.665	100.0	3600.0	150.0	20.5



 Subgrade\_Treatment Select Cohesive\_IADOT

ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_121304\_20221031T220714\_20220909-120957.jpg





Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_124411

Project:	Tama County US 30	Date and Time:	9/9/2022 12:44:11 PM	Machine ID:	Ingios01
Description:	W of IA 21 to 11th Ave Dr	Mapping Duration (hrs):	0.433	Operator:	Ingios
Location:	Tama County IA	No. of Measurements:	28456	Machine Operator ID:	774
Review Status:	Review Required	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subgrade Treatment 24 Inches	Segment:	US 30 WB

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	20.4	0.3	150.0	35.0	64.5	165.0	18.9	29.3	-115.0	-85.5	15.0
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.
28456	0.653	0	0	0.0	0.0	0	0.00	0.00	0.00	4.7	5.3	6.7

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade_Treatment Select Cohesive_IADOT	24006	100.0	28456	0.653	100.0	3600.0	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	28456	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
717+00	720+00

Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_124411

Project:	Tama County US 30	Date and Time:	9/9/2022 12:44:11 PM	Machine ID:	Ingios01
Description:	W of IA 21 to 11th Ave Dr	Mapping Duration (hrs):	0.433	Operator:	Ingios
Location:	Tama County IA	No. of Measurements:	28456	Machine Operator ID:	774
Review Status:	Review Required	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subgrade Treatment 24 Inches	Segment:	US 30 WB

**QUALITY ANALYSIS SUMMARY - k-Value**

Quality Value	Criteria
<b>20.4</b>	CQI > = 95
<b>0.0</b>	80% of k-Value MVs >= 150
<b>29.3</b>	COV <= 30
100.0	% i-Score Blob Area >= 1000 ft <sup>2</sup>
<b>0.0</b>	Lift Thickness Median Value (in.)
<b>0</b>	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.

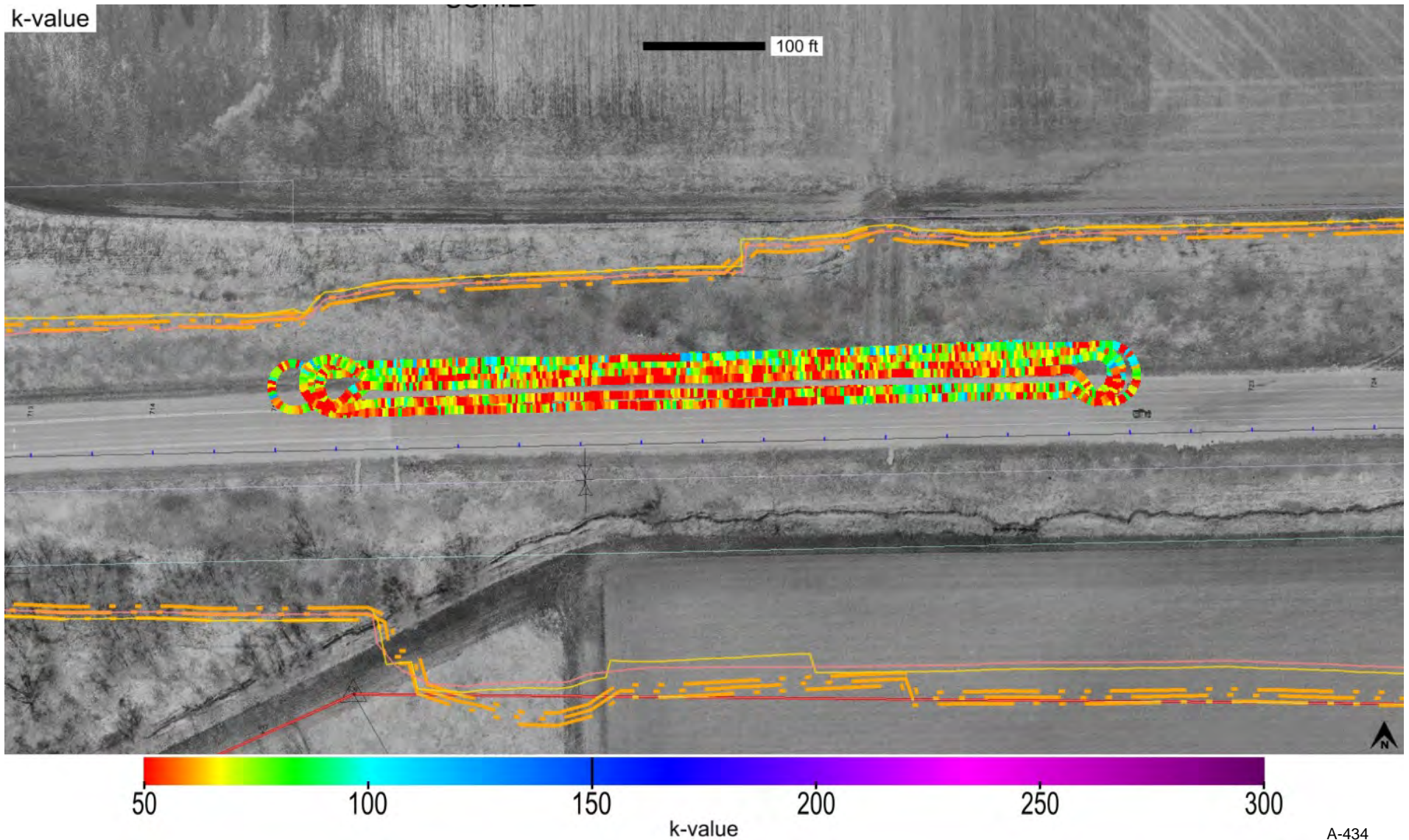
Lift thickness: Green: 75th percentile value <= TV; Yellow: median value <= TV and 75th percentile > TV; Red: median value (50th percentile) > TV.

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



Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_124411    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 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	20.4	0.3	150.0	35.0	64.5	165.0	18.9	29.3	-115.0	-85.5	15.0



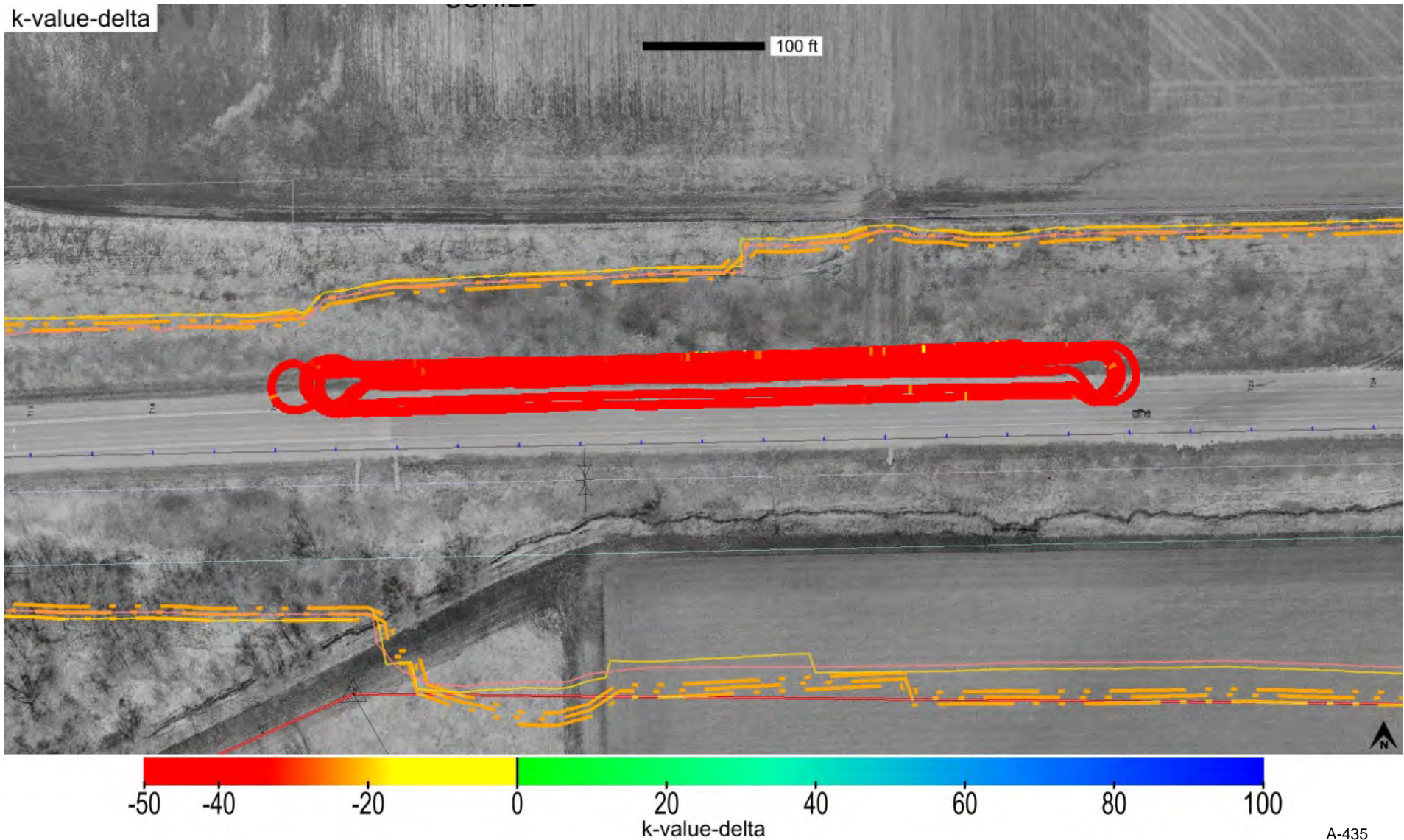
A-434

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Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_124411    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 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	20.4	0.3	150.0	35.0	64.5	165.0	18.9	29.3	-115.0	-85.5	15.0



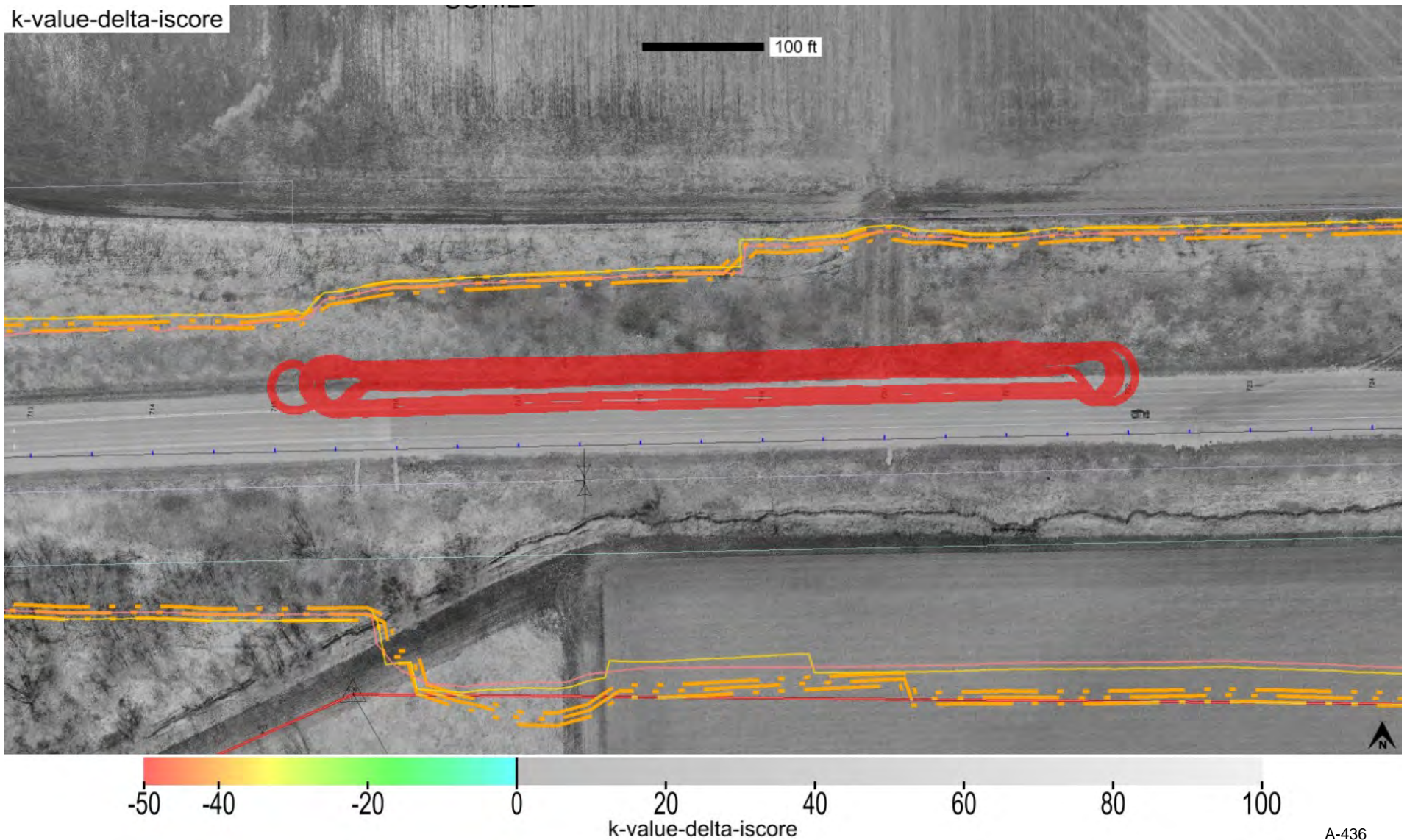
A-435

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\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_124411    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 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	-115.0	-85.5	15.0	-107.0	-85.6	-51.5

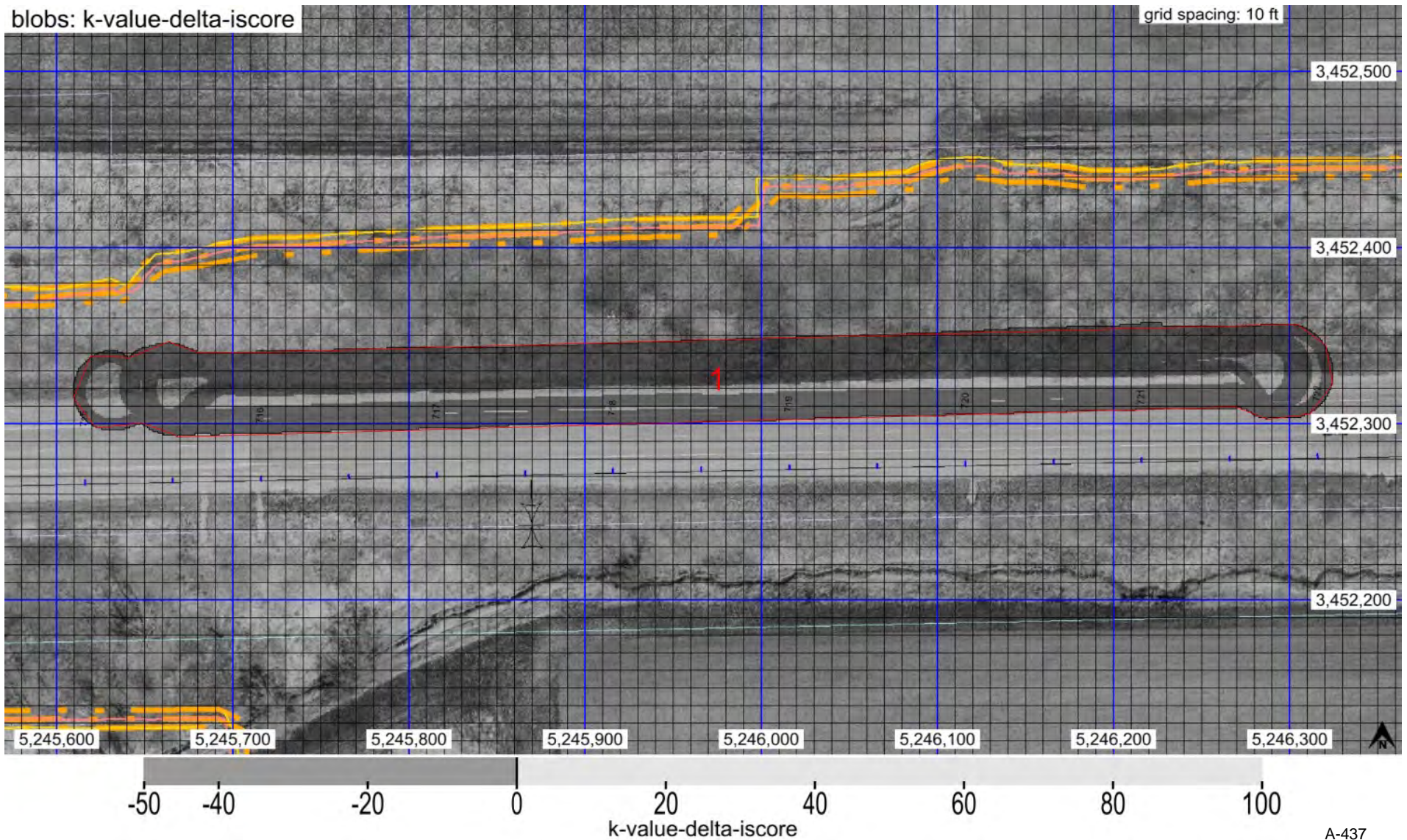


A-436

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



min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv	poly-tol.
1000	1	28456	100.0	none	0.0	4.0

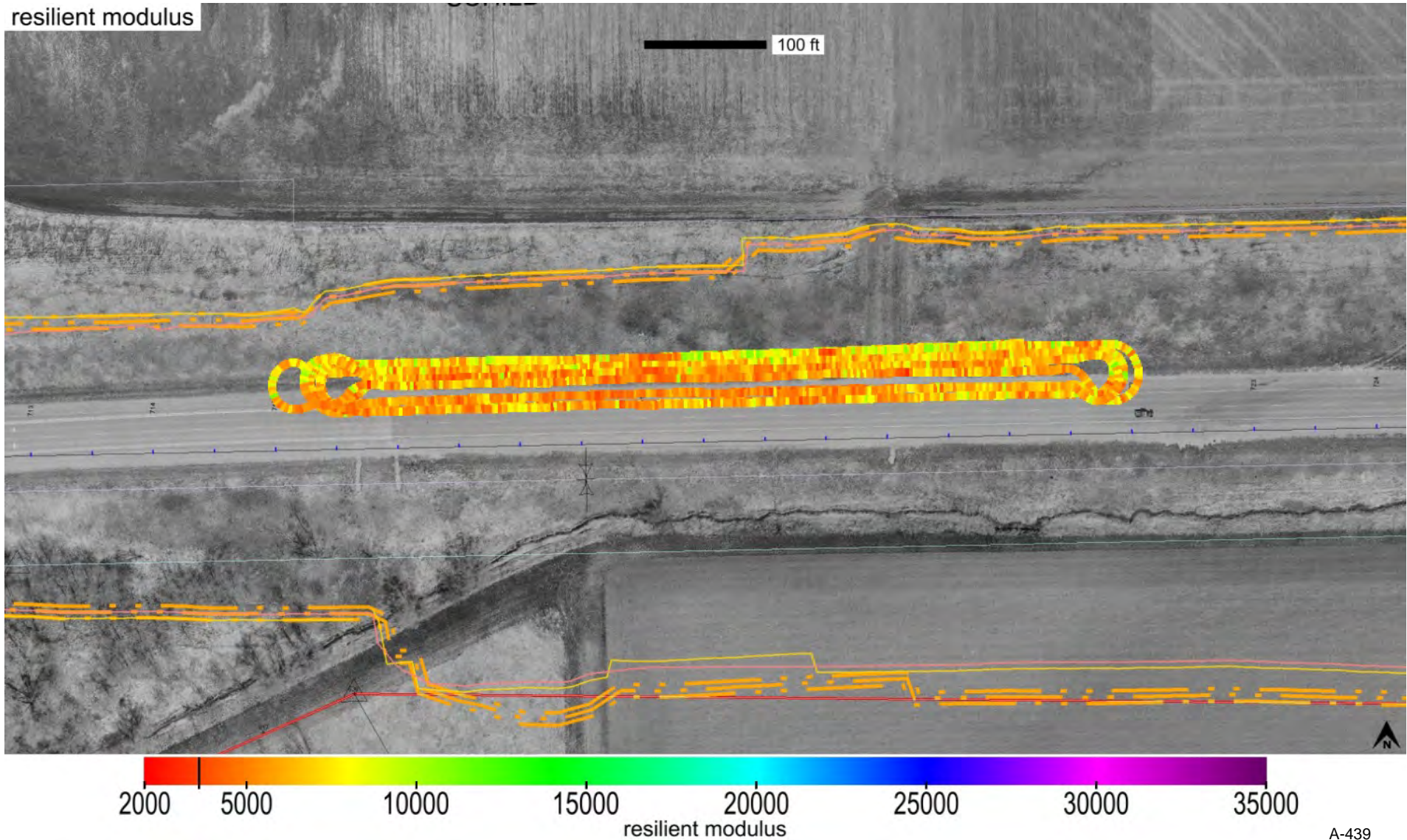






Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_124411    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.5	122.6	1.0	3600.0	3040.9	6264.9	11000.0	1496.2	23.9	-559.1	2664.9	7400.0

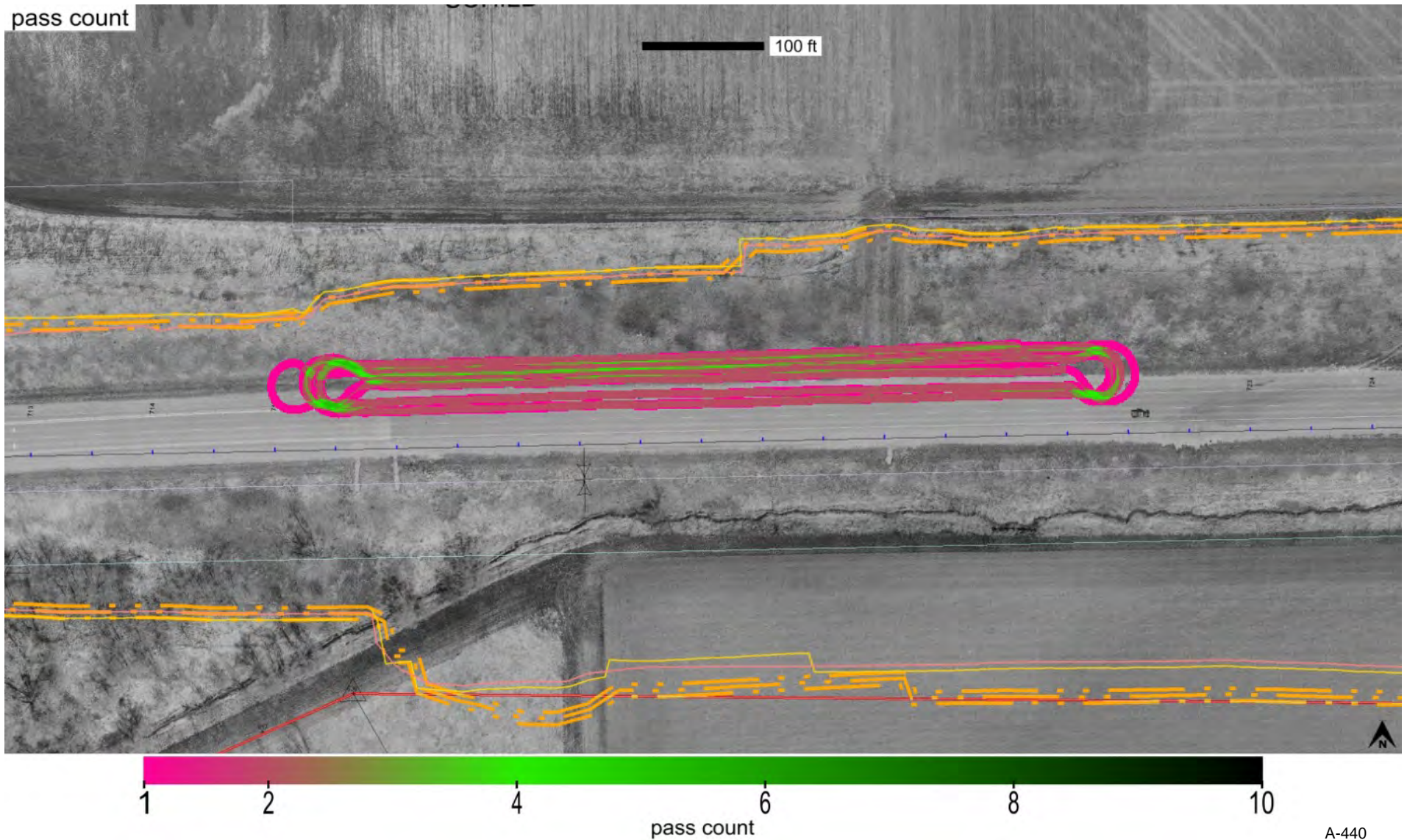


A-439

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

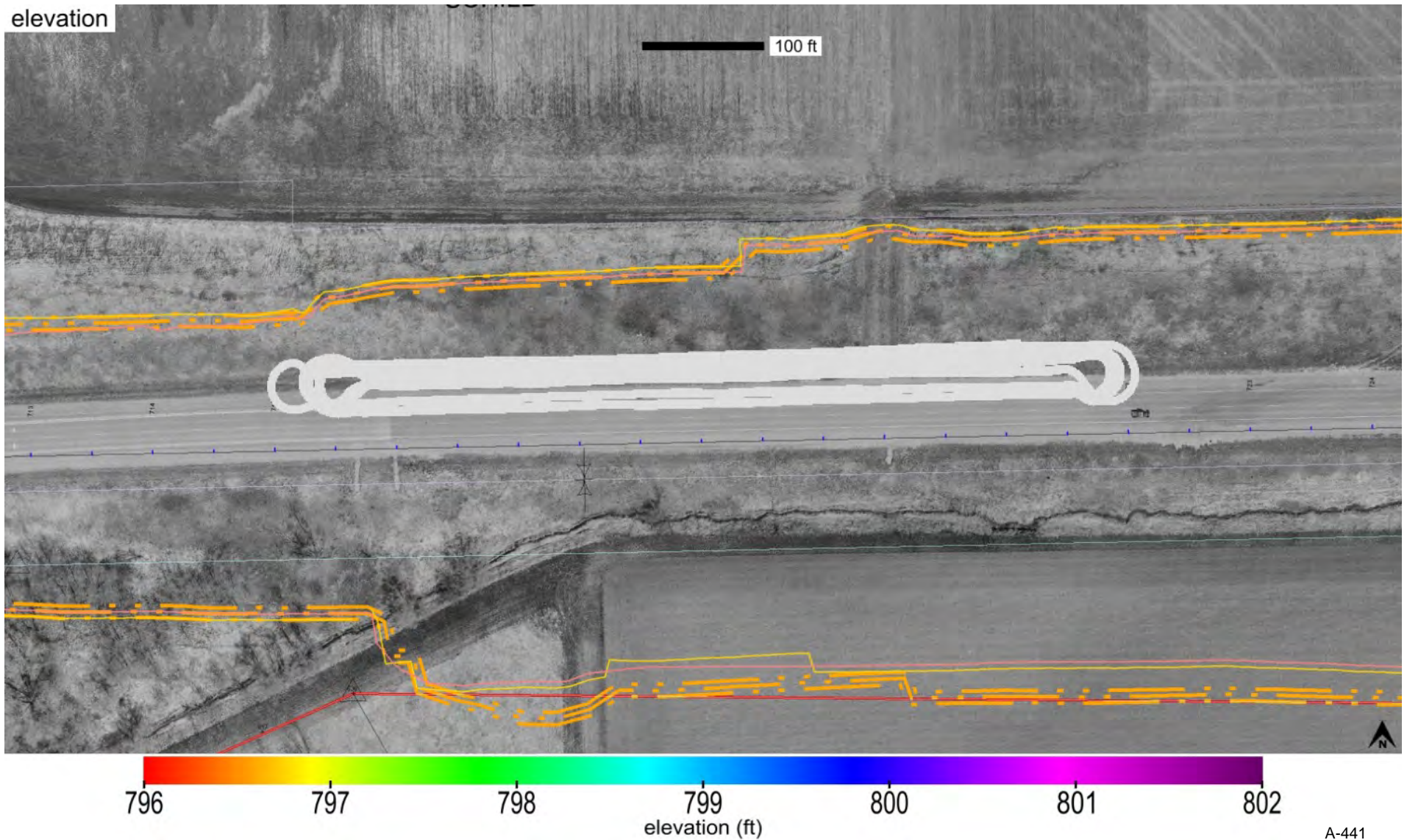


10th percentile	Median	cov(%)	% >= TV	Target Value
0	0	0.0	0.0	0



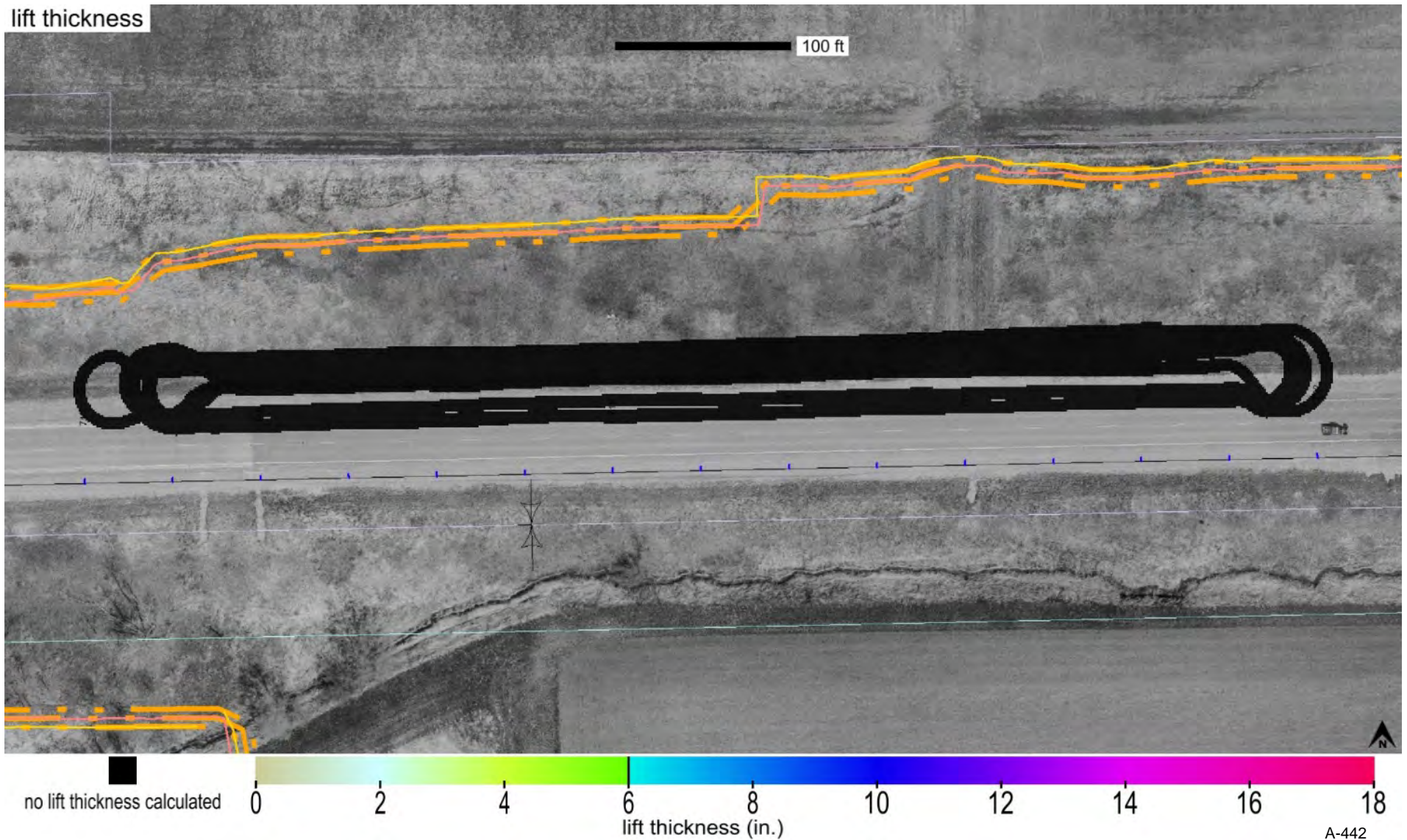


minimum	average	maximum
0.00	0.00	0.00





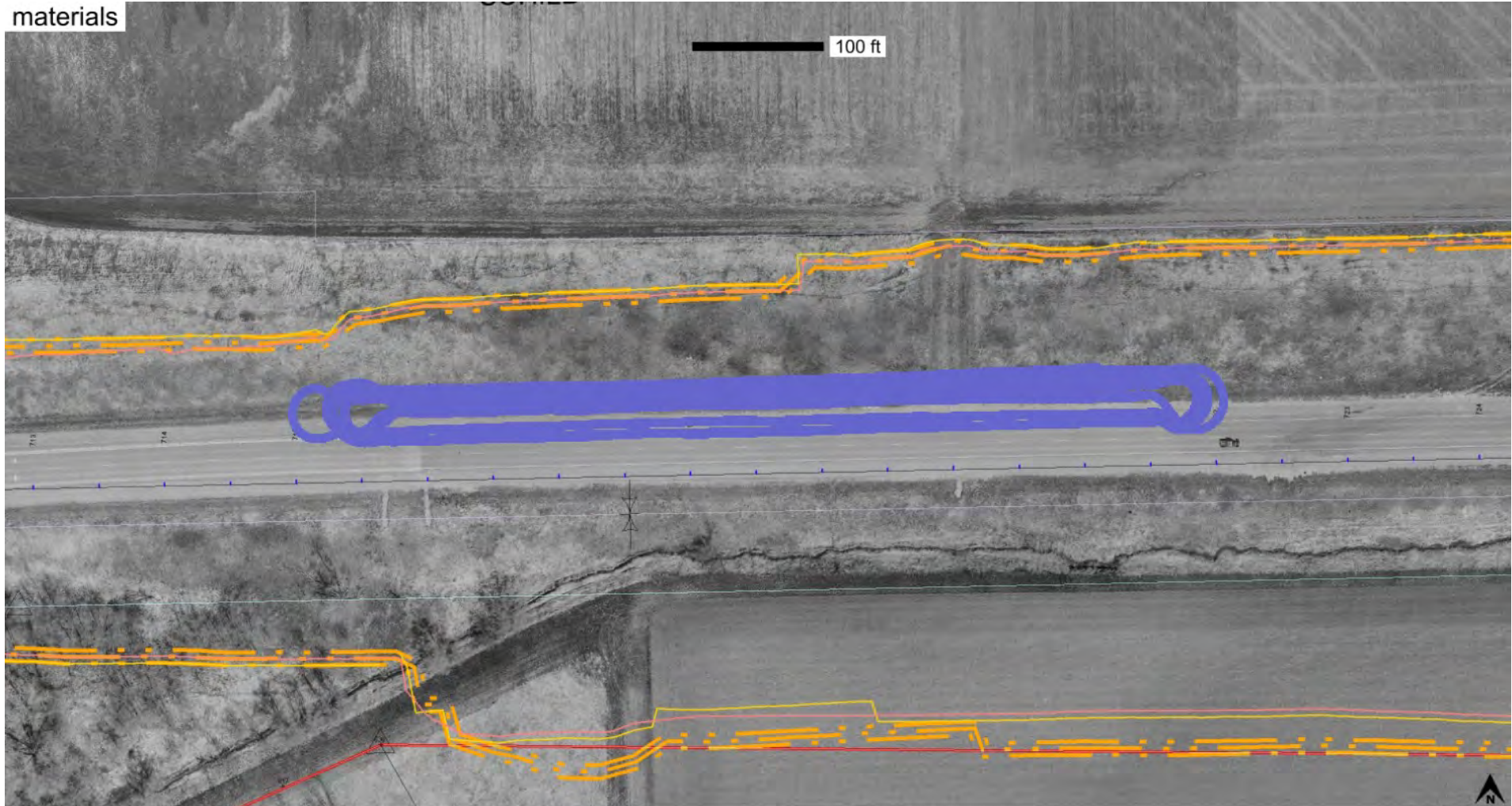
25th percentile (in.)	Median (in.)	75th percentile (in.)	Target Value (in.)
0.0	0.0	0.0	6.0





Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_124411    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade_Treatment Select Cohesive_IADOT	24006	100.0	28456	0.653	100.0	3600.0	150.0	20.5



Subgrade\_Treatment Select Cohesive\_IADOT



ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_124411\_20221031T215901\_20220909-134438.jpg



Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_131333

Project:	Tama County US 30	Date and Time:	9/9/2022 1:13:33 PM	Machine ID:	Ingios01
Description:	W of IA 21 to 11th Ave Dr	Mapping Duration (hrs):	0.495	Operator:	Ingios
Location:	Tama County IA	No. of Measurements:	27752	Machine Operator ID:	774
Review Status:	Review Required	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subgrade Treatment 24 Inches	Segment:	US 30 WB

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	19.7	0.2	150.0	35.0	58.5	158.7	17.9	30.6	-115.0	-91.5	8.7
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.
27752	0.637	0	0	0.0	0.0	0	0.00	0.00	0.00	4.3	5.3	7.6

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade_Treatment Select Cohesive_IADOT	24006	100.0	27752	0.637	100.0	3600.0	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	27738	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
711+00	715+00



Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_131333

Project:	Tama County US 30	Date and Time:	9/9/2022 1:13:33 PM	Machine ID:	Ingios01
Description:	W of IA 21 to 11th Ave Dr	Mapping Duration (hrs):	0.495	Operator:	Ingios
Location:	Tama County IA	No. of Measurements:	27752	Machine Operator ID:	774
Review Status:	Review Required	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subgrade Treatment 24 Inches	Segment:	US 30 WB

**QUALITY ANALYSIS SUMMARY - k-Value**

Quality Value	Criteria
<b>19.7</b>	CQI >= 95
<b>0.0</b>	80% of k-Value MVs >= 150
<b>30.6</b>	COV <= 30
100.0	% i-Score Blob Area >= 1000 ft <sup>2</sup>
<b>0.0</b>	Lift Thickness Median Value (in.)
<b>0</b>	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 (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%.

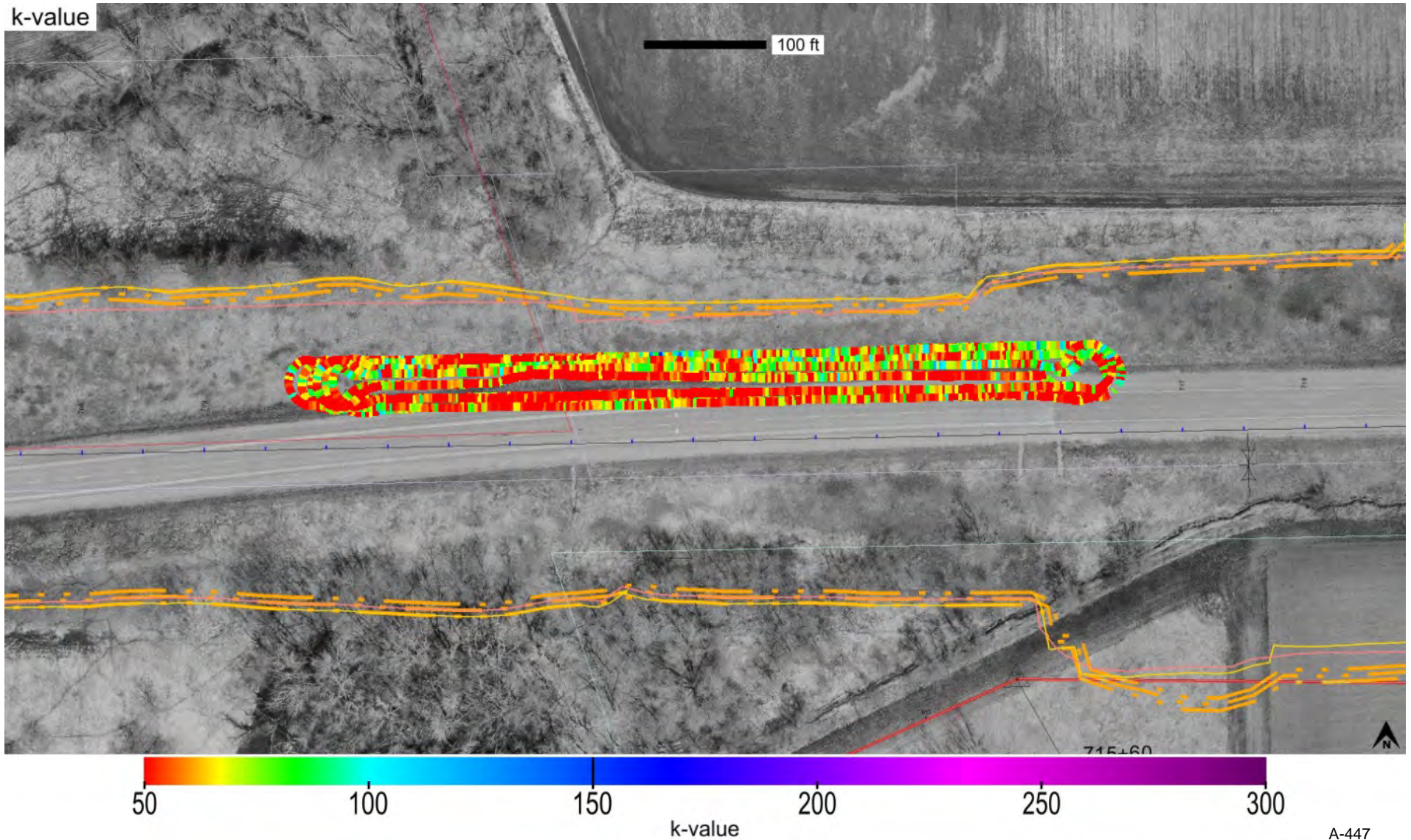
i-Score Blob (%): The percentage of the map area analyzed with contiguous blob areas with MVs < TV. Control Level 1 >= 100 sq. ft.; Control Level 2 >= 200 sq. ft.; Control Level 3 >= 500 sq. ft.; Control Level 4 >= 1,000 sq. ft.; Control Level 5 >= 2,000 sq. ft.

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

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

Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_131333    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

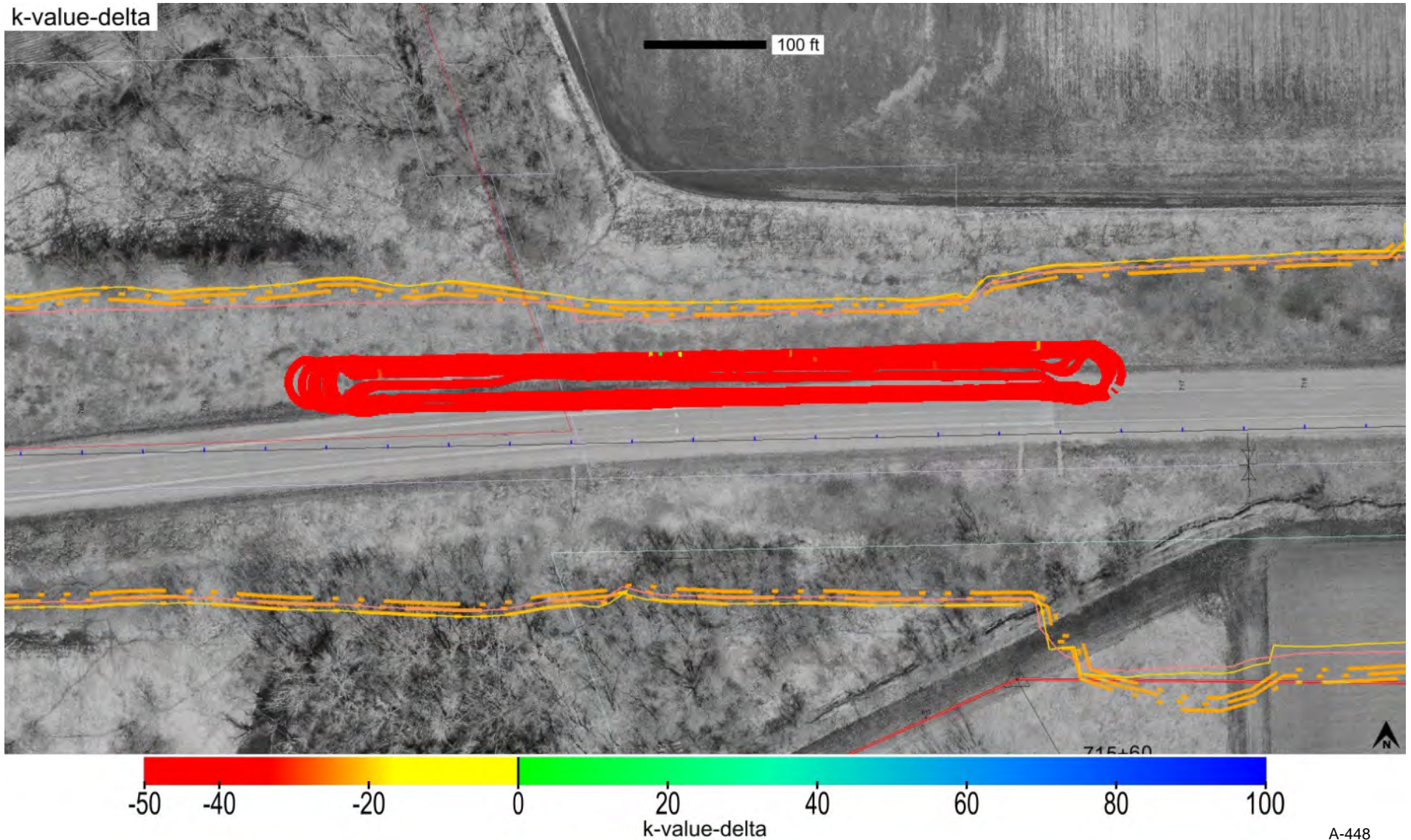
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.0	19.7	0.2	150.0	35.0	58.5	158.7	17.9	30.6	-115.0	-91.5	8.7





Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_131333    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

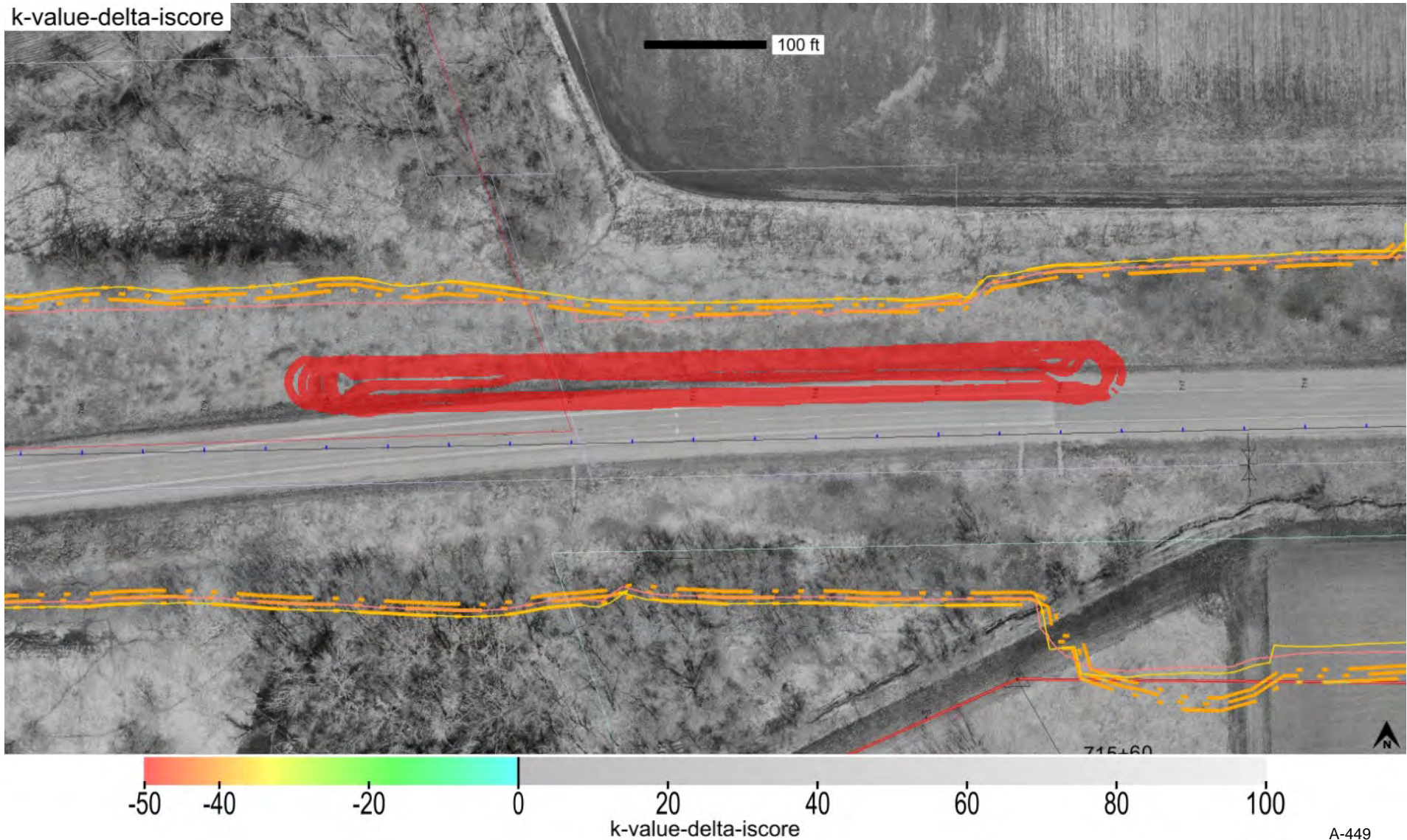
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.0	19.7	0.2	150.0	35.0	58.5	158.7	17.9	30.6	-115.0	-91.5	8.7





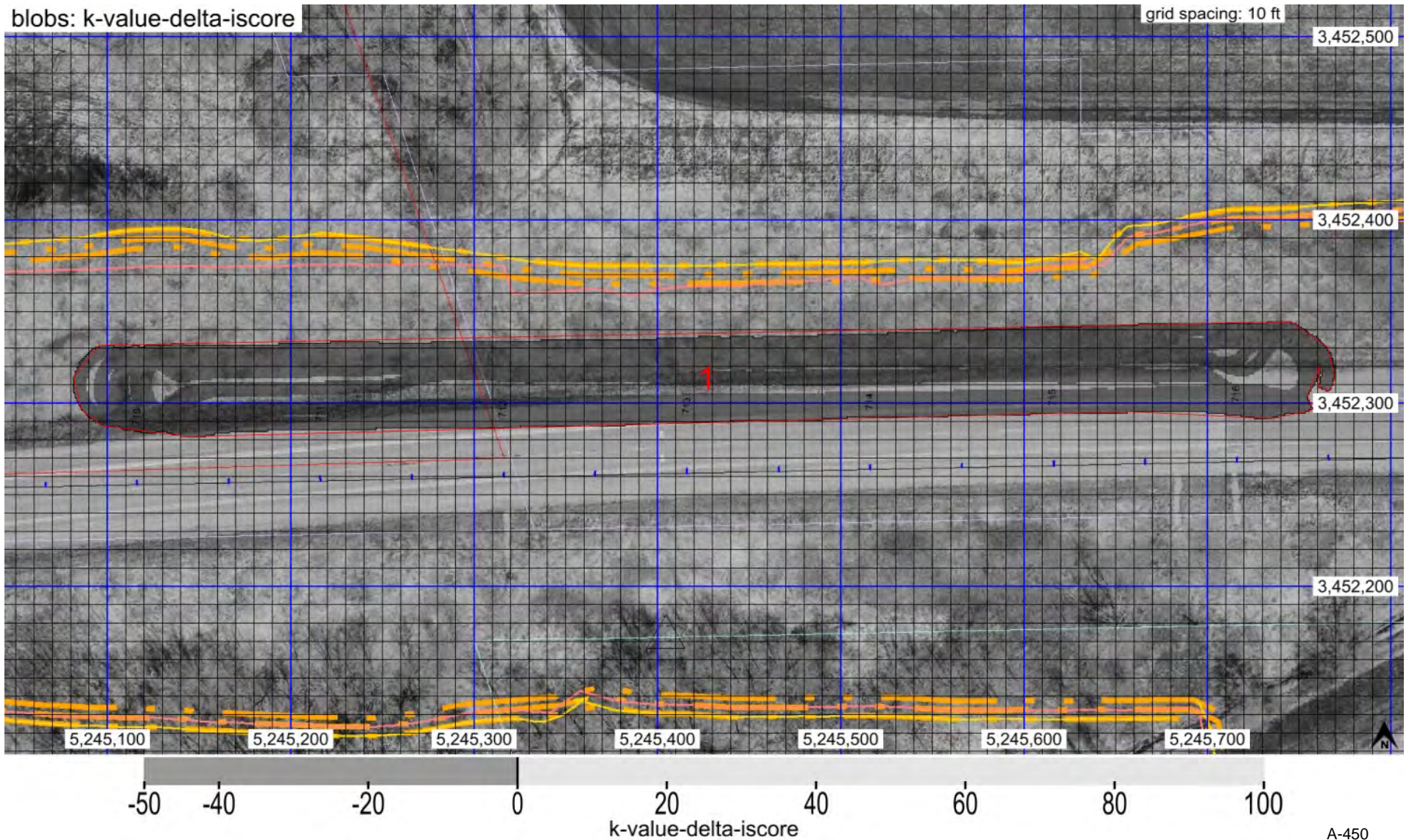
Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_131333    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

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	-115.0	-91.5	8.7	-111.5	-91.4	-64.1





min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv	poly-tol.
1000	1	27738	100.0	none	0.0	4.0

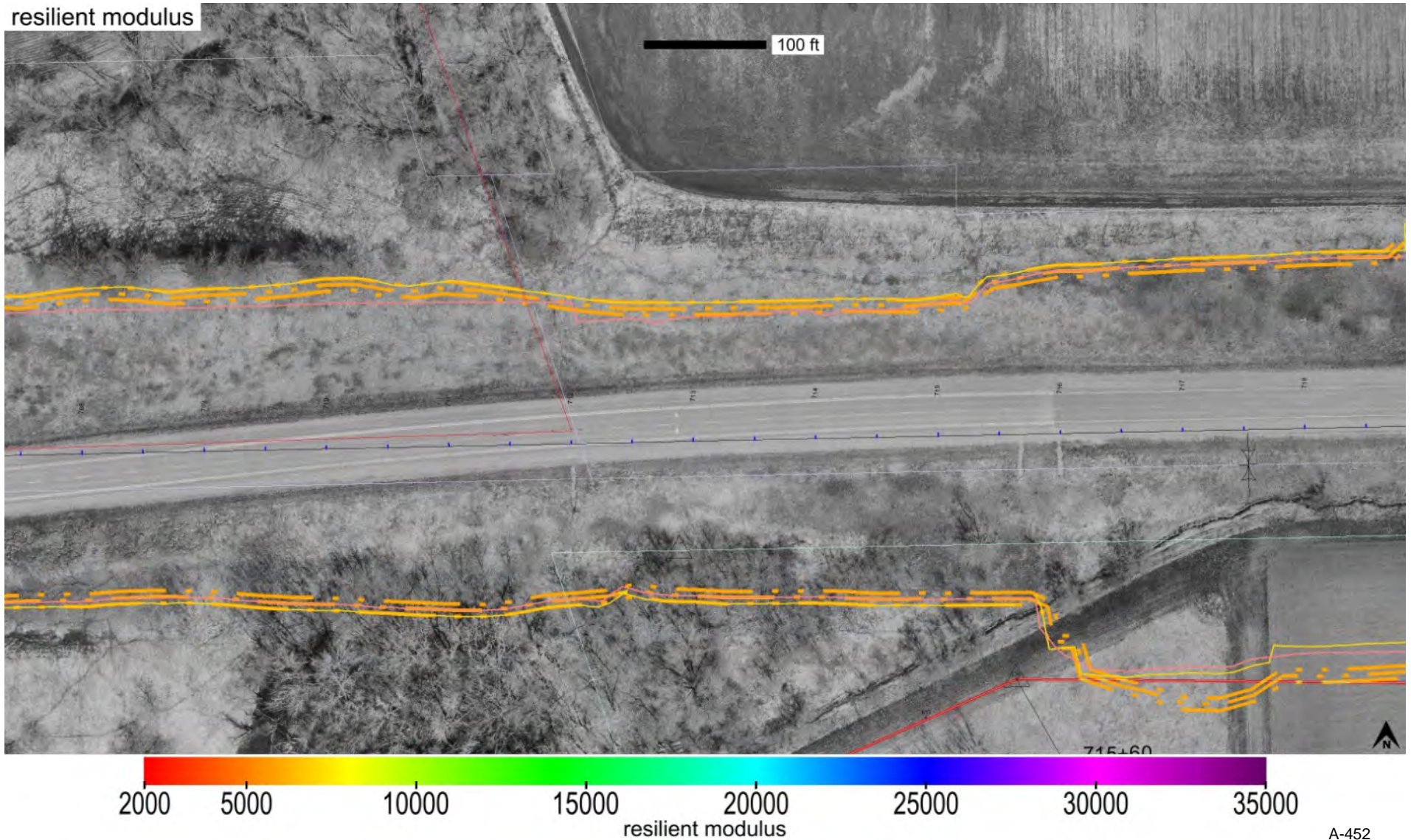






Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_131333    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

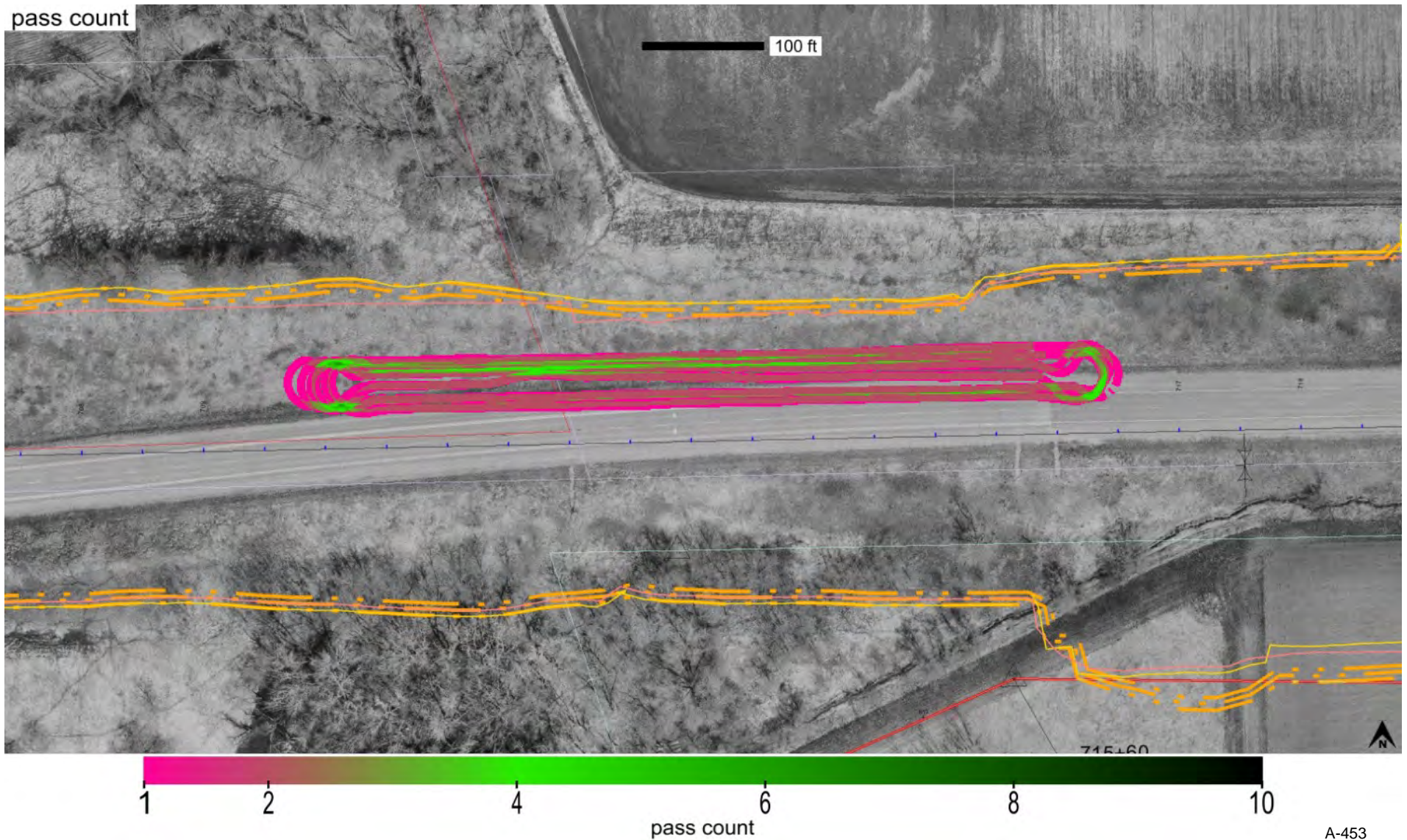
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	0.0	35.0	NaN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



A-452

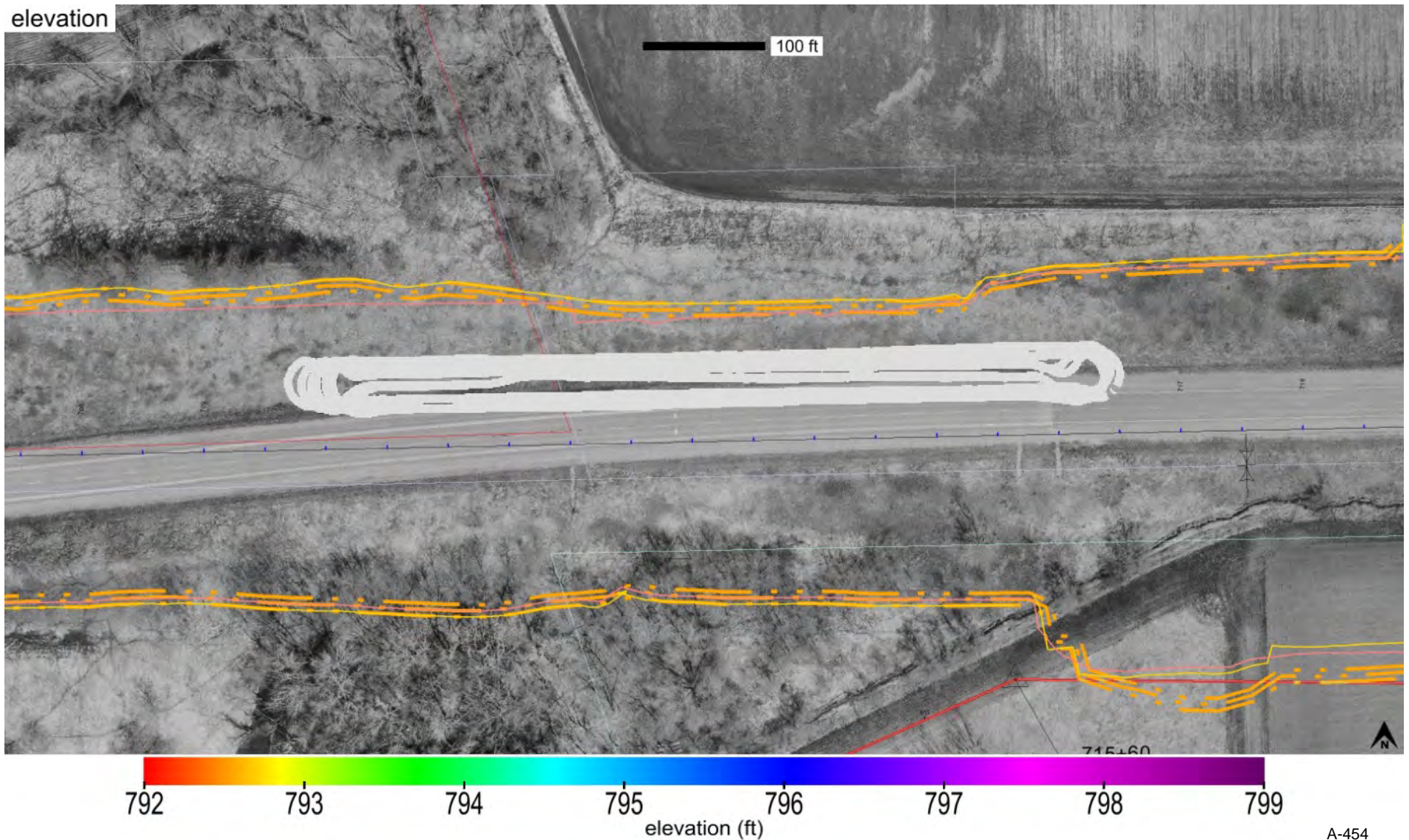


10th percentile	Median	cov(%)	% >= TV	Target Value
0	0	0.0	0.0	0



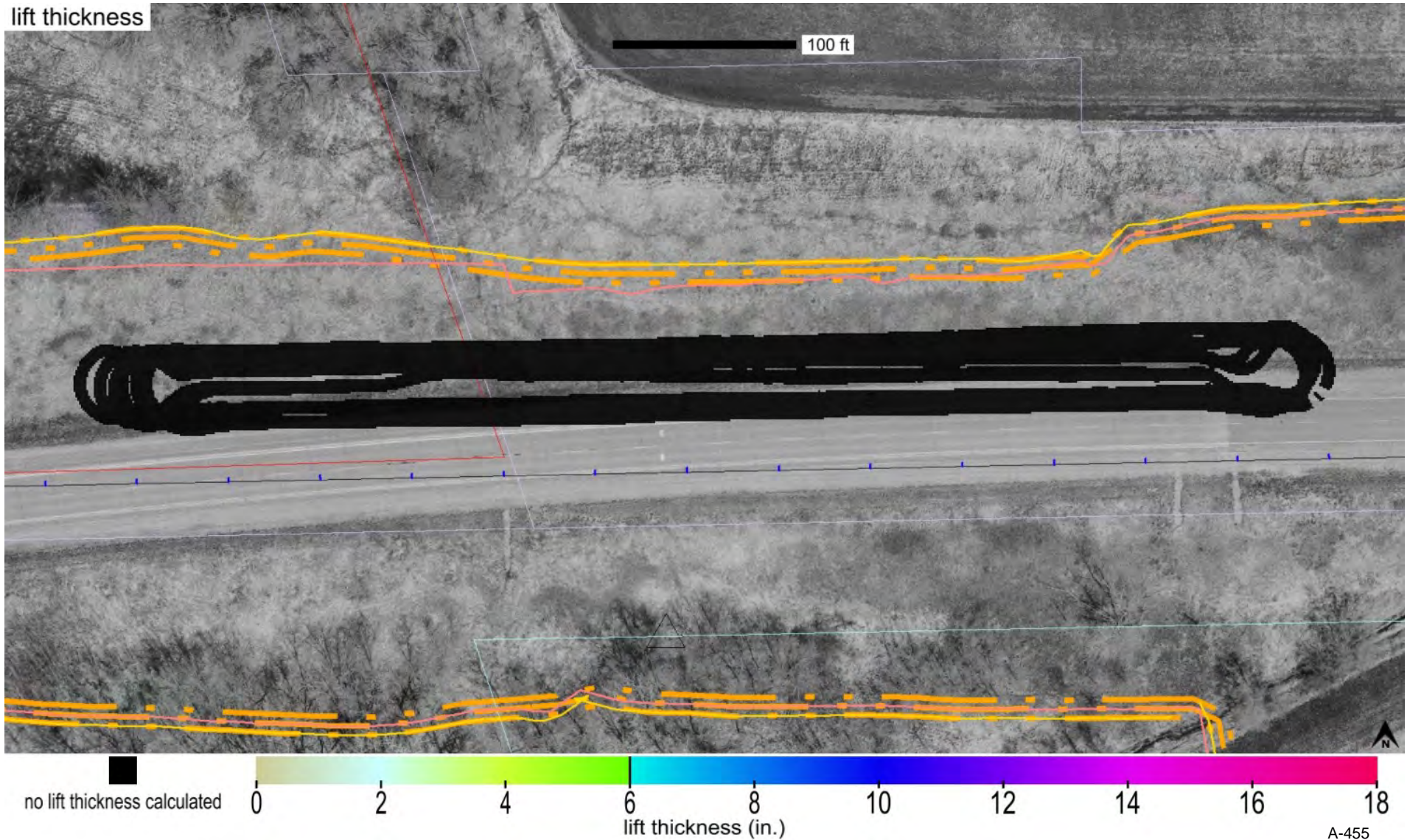


minimum	average	maximum
0.00	0.00	0.00





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

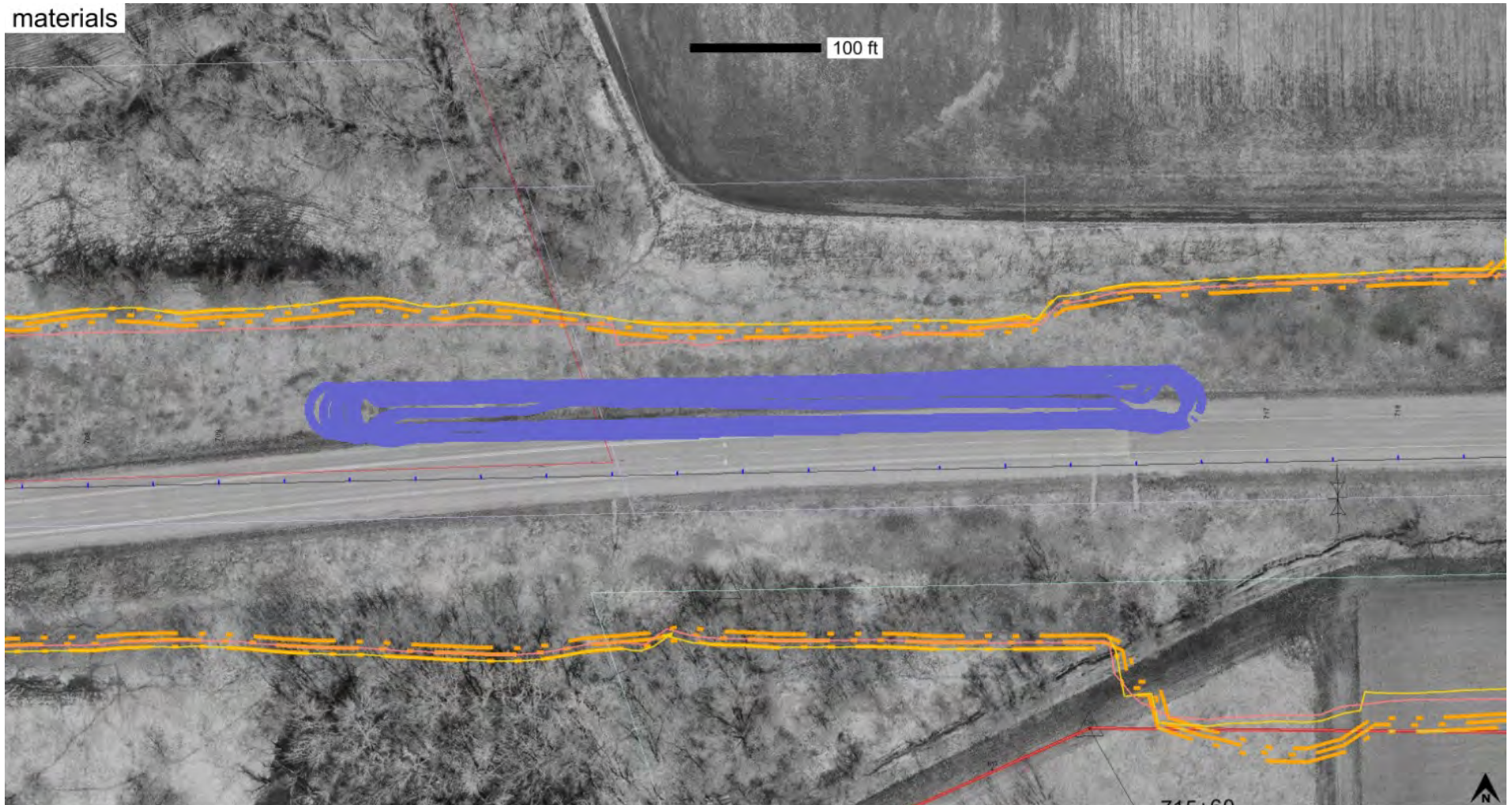





Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_131333    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade_Treatment Select Cohesive_IADOT	24006	100.0	27752	0.637	100.0	3600.0	150.0	20.5

materials



 Subgrade\_Treatment Select Cohesive\_IADOT



ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_131333\_20221031T215602\_20220909-131157.jpg





Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_135130

Project:	Tama County US 30	Date and Time:	9/9/2022 1:51:30 PM	Machine ID:	Ingios01
Description:	W of IA 21 to 11th Ave Dr	Mapping Duration (hrs):	0.313	Operator:	Ingios
Location:	Tama County IA	No. of Measurements:	20269	Machine Operator ID:	774
Review Status:	Review Required	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subgrade Treatment 24 Inches	Segment:	US 30 WB

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	20.0	0.1	150.0	35.0	57.1	130.7	17.2	30.0	-115.0	-92.9	-19.3
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.
20269	0.465	0	0	0.0	0.0	0	795.86	796.65	798.07	4.4	5.3	7.2

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade_Treatment Select Cohesive_IADOT	24006	100.0	20269	0.465	100.0	3600.0	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	20269	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
707+00	709+50

Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_135130

Project:	Tama County US 30	Date and Time:	9/9/2022 1:51:30 PM	Machine ID:	Ingios01
Description:	W of IA 21 to 11th Ave Dr	Mapping Duration (hrs):	0.313	Operator:	Ingios
Location:	Tama County IA	No. of Measurements:	20269	Machine Operator ID:	774
Review Status:	Review Required	Map Type:	Verification Map	State Plane:	1401 IOWA NORTH
		Map Layer:	Subgrade Treatment 24 Inches	Segment:	US 30 WB

**QUALITY ANALYSIS SUMMARY - k-Value**

Quality Value	Criteria
<b>20.0</b>	CQI >= 95
<b>0.0</b>	80% of k-Value MVs >= 150
<b>30.0</b>	COV <= 30
100.0	% i-Score Blob Area >= 1000 ft <sup>2</sup>
<b>0.0</b>	Lift Thickness Median Value (in.)
<b>0</b>	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.

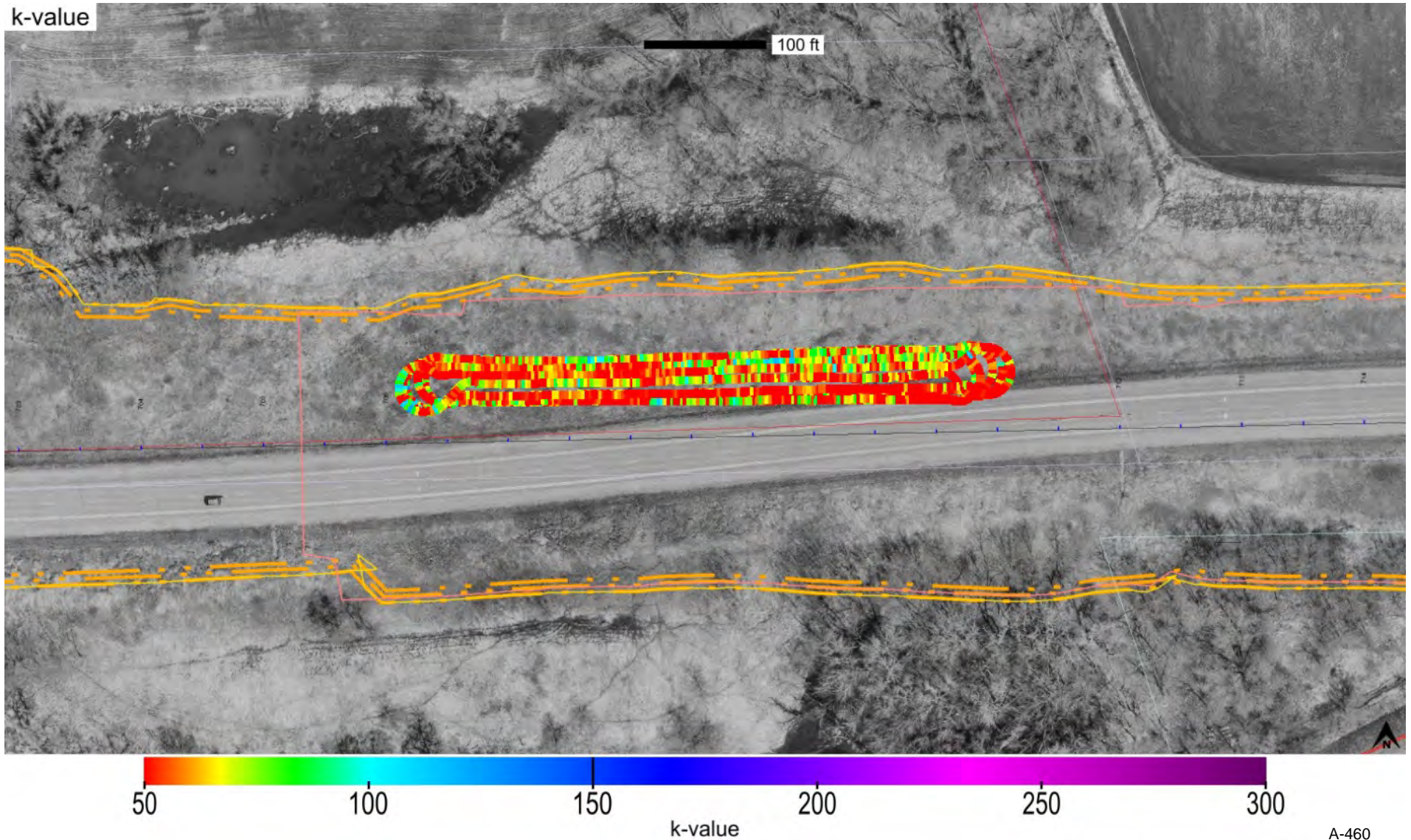
Lift thickness: Green: 75th percentile value <= TV; Yellow: median value <= TV and 75th percentile > TV; Red: median value (50th percentile) > TV.

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



Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_135130    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

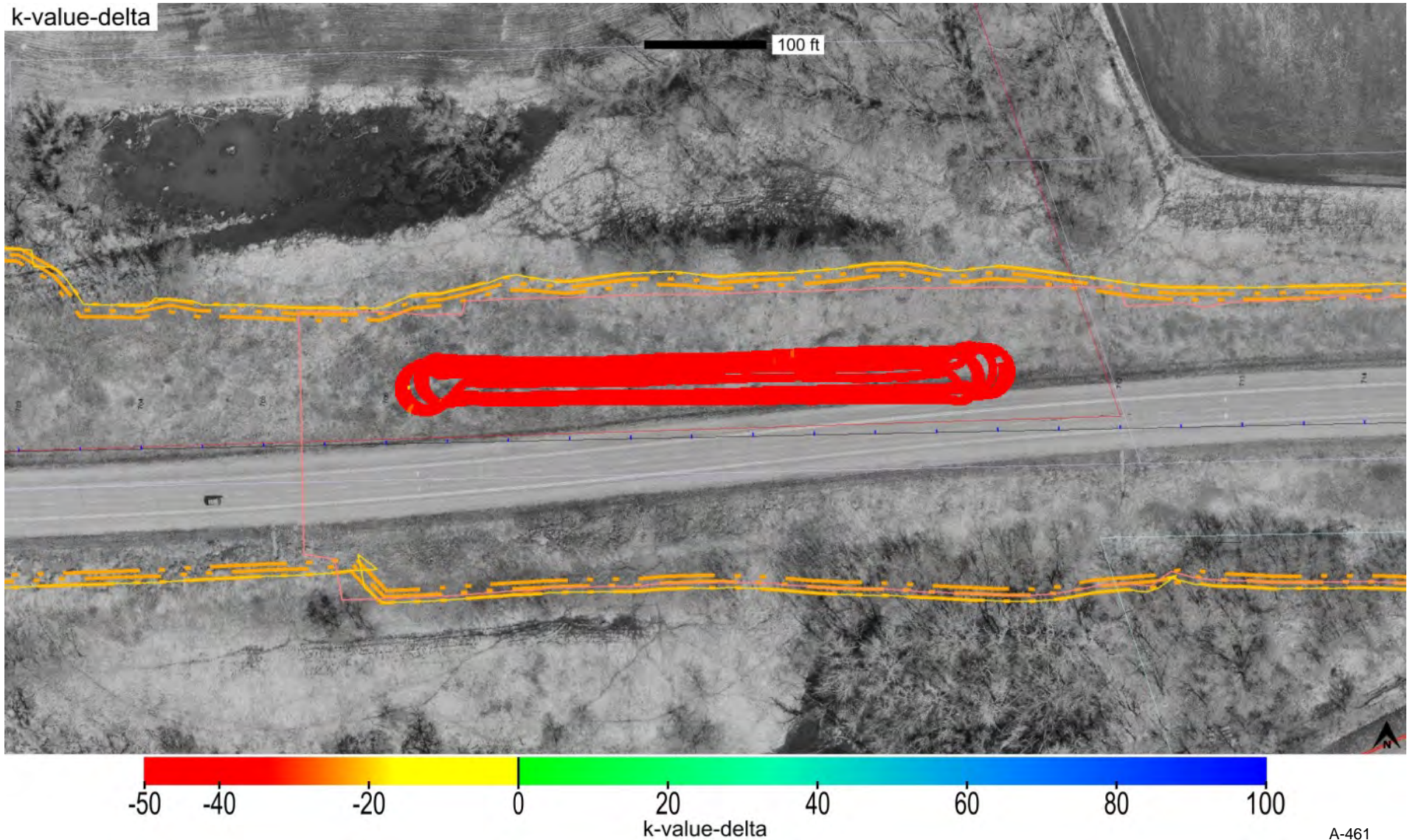
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.0	20.0	0.1	150.0	35.0	57.1	130.7	17.2	30.0	-115.0	-92.9	-19.3





Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_135130    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 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	20.0	0.1	150.0	35.0	57.1	130.7	17.2	30.0	-115.0	-92.9	-19.3



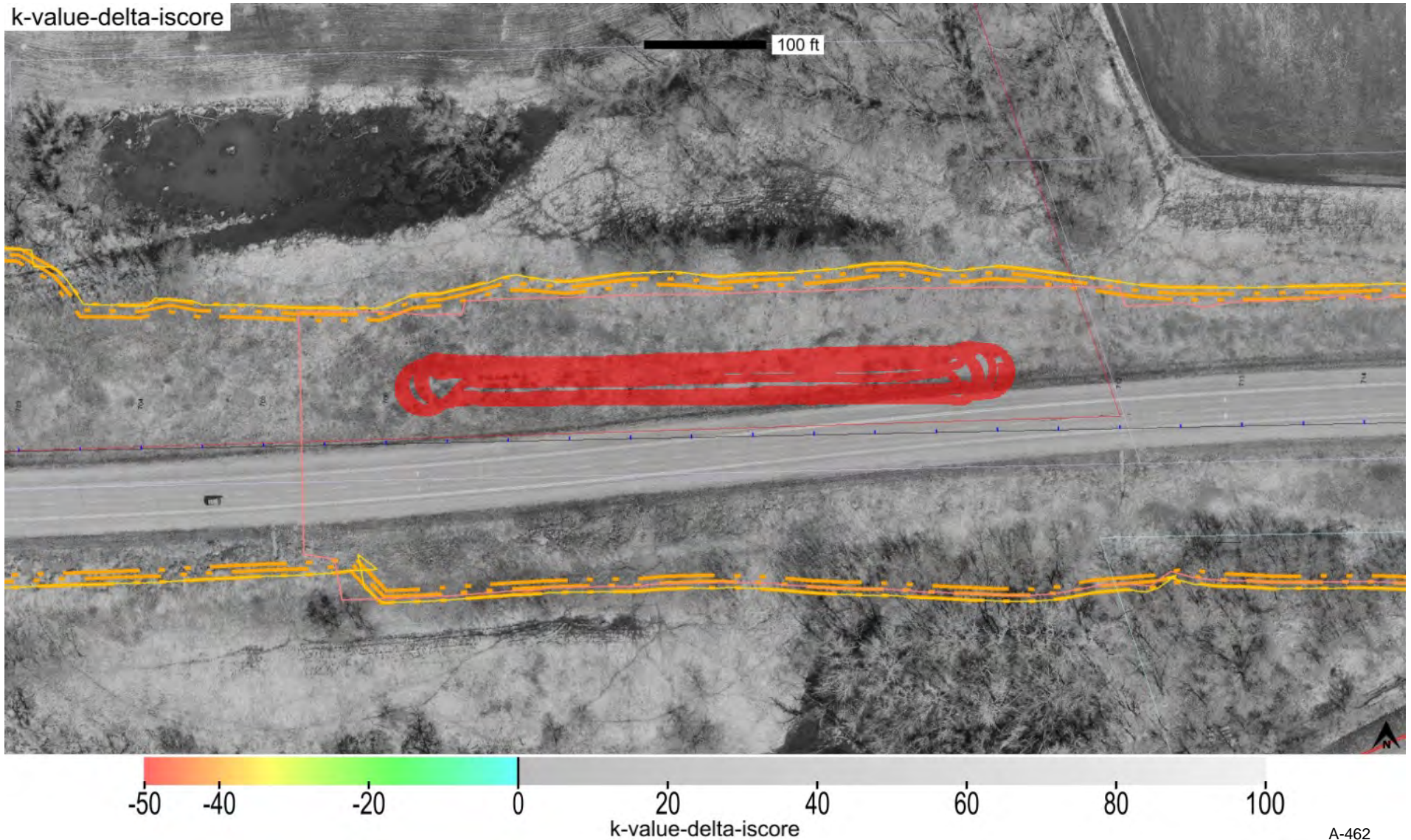
A-461

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\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_135130    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

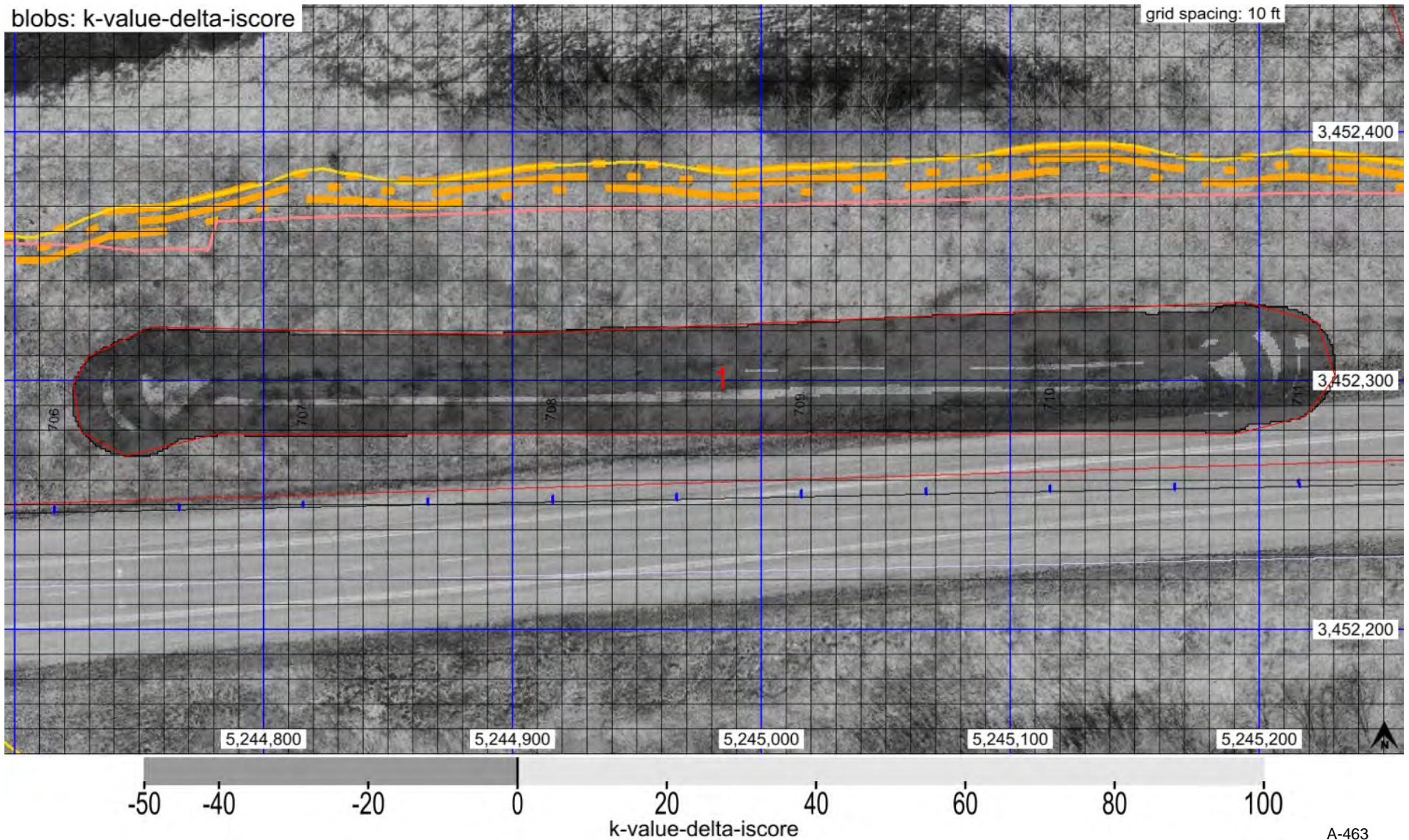
Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	0.0	150.0	-115.0	-92.9	-19.3	-113.5	-92.9	-63.0





Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_135130    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv	poly-tol.
1000	1	20269	100.0	none	0.0	4.0

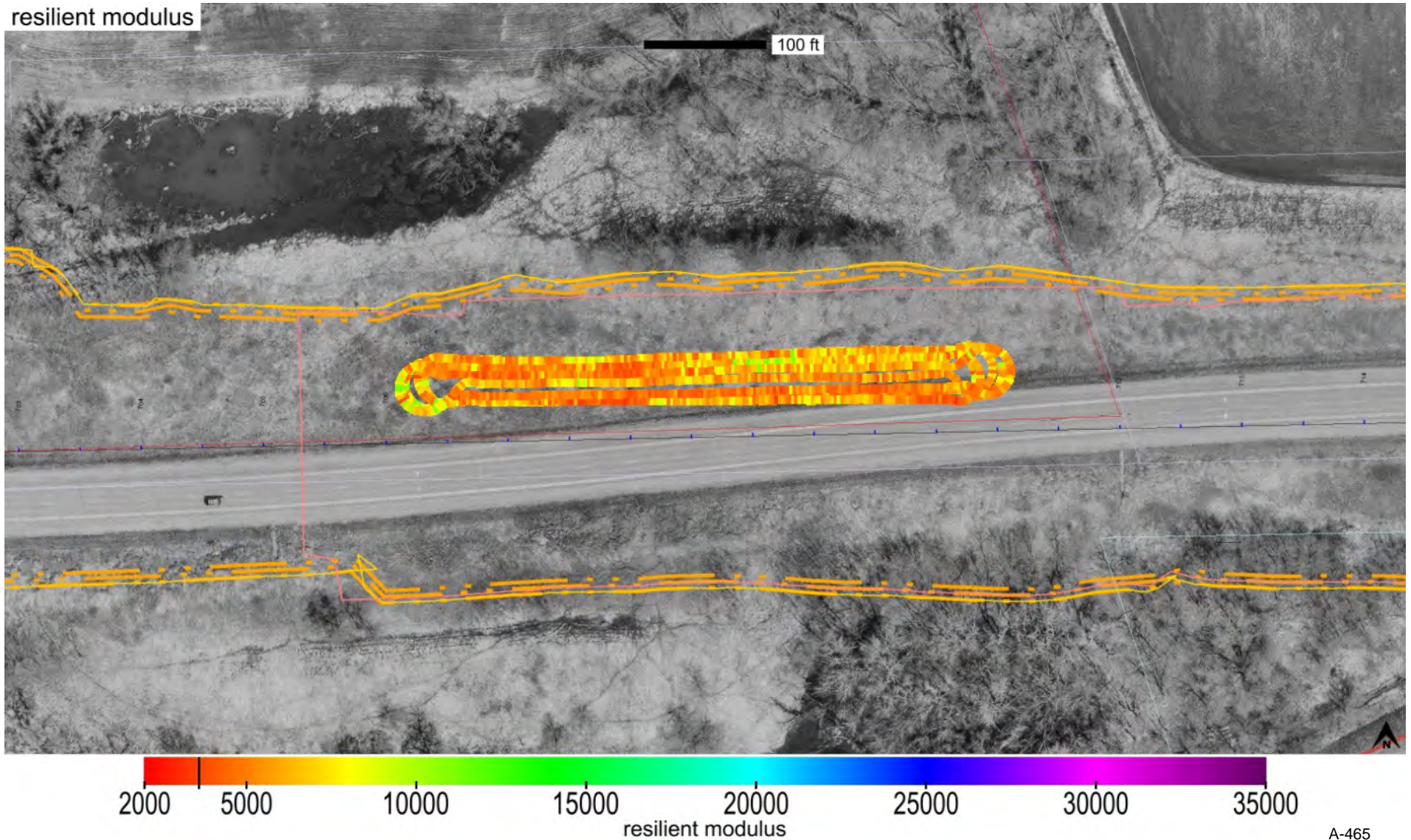






Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_135130    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.1	121.9	0.9	3600.0	3115.2	5825.7	11000.0	1428.3	24.5	-484.8	2225.7	7400.0

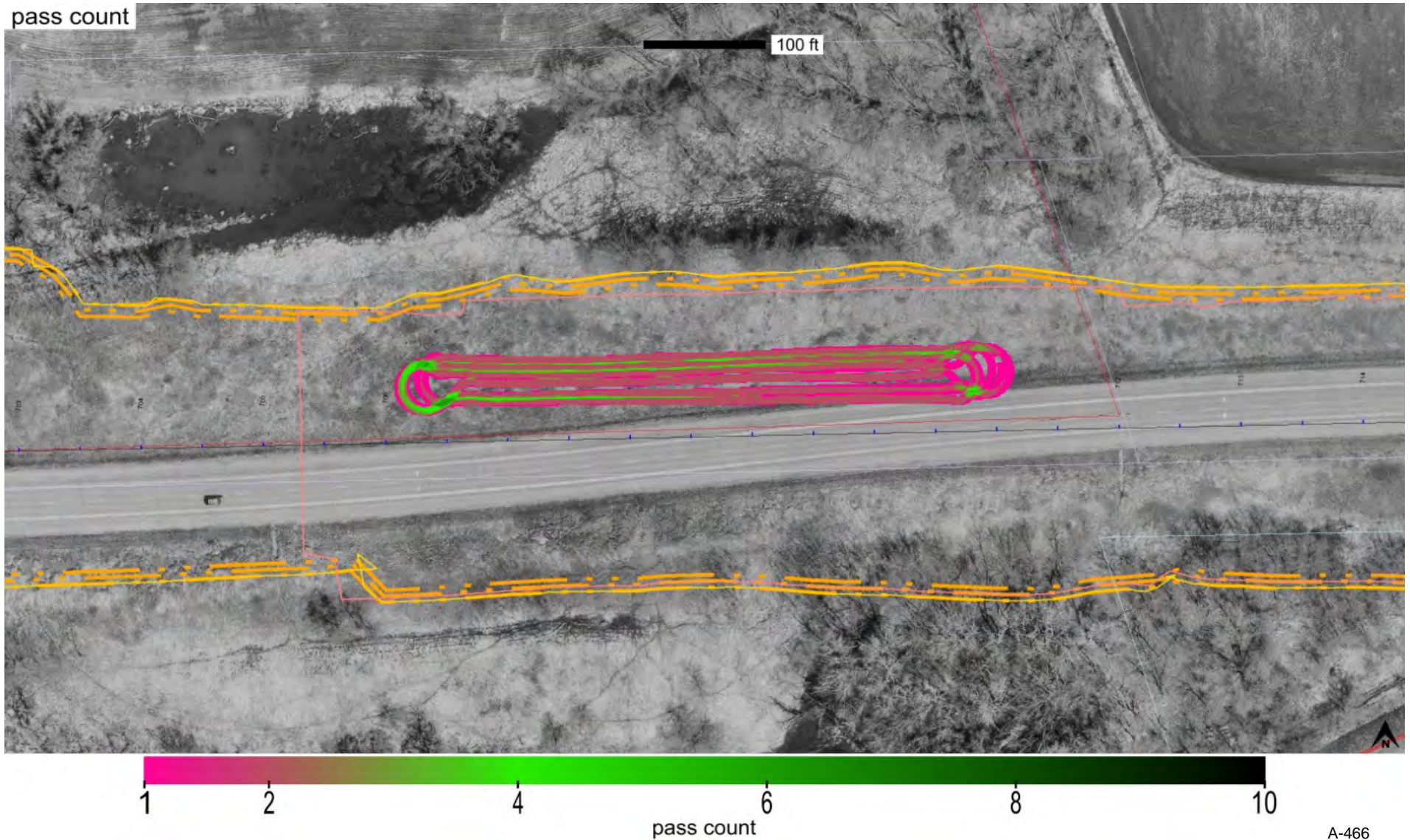


A-465

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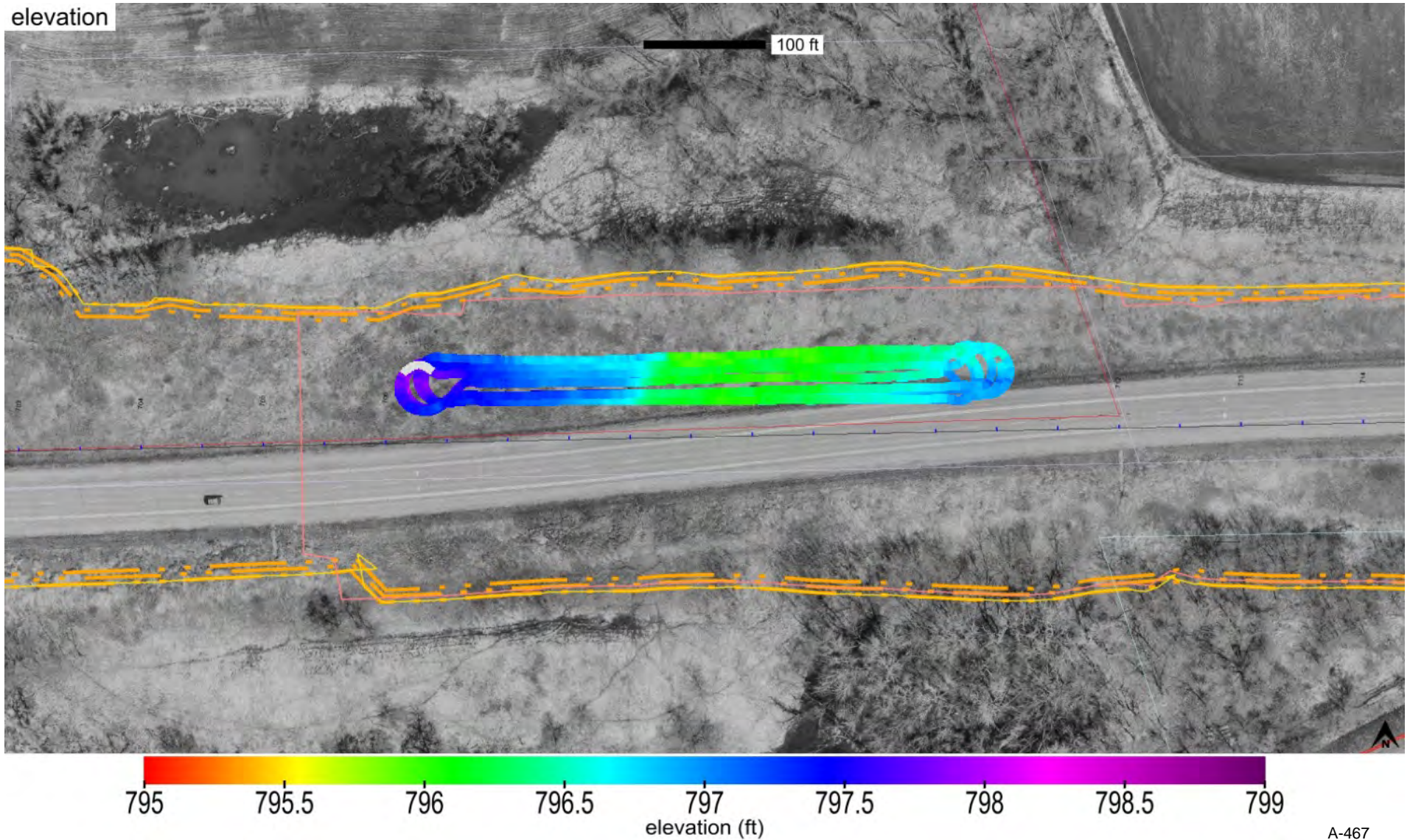


10th percentile	Median	cov(%)	% >= TV	Target Value
0	0	0.0	0.0	0





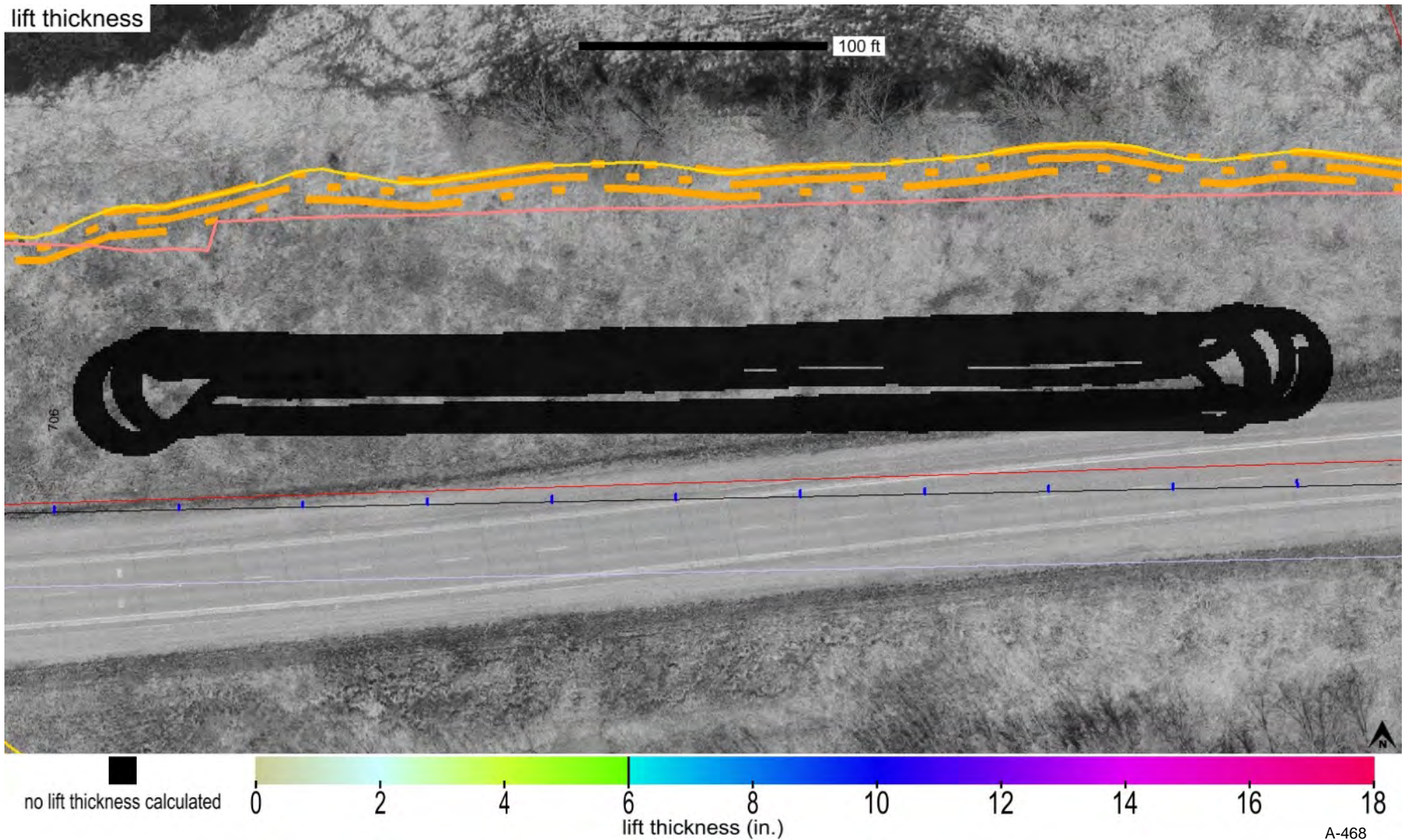
minimum	average	maximum
795.86	796.65	798.07





Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_135130    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

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



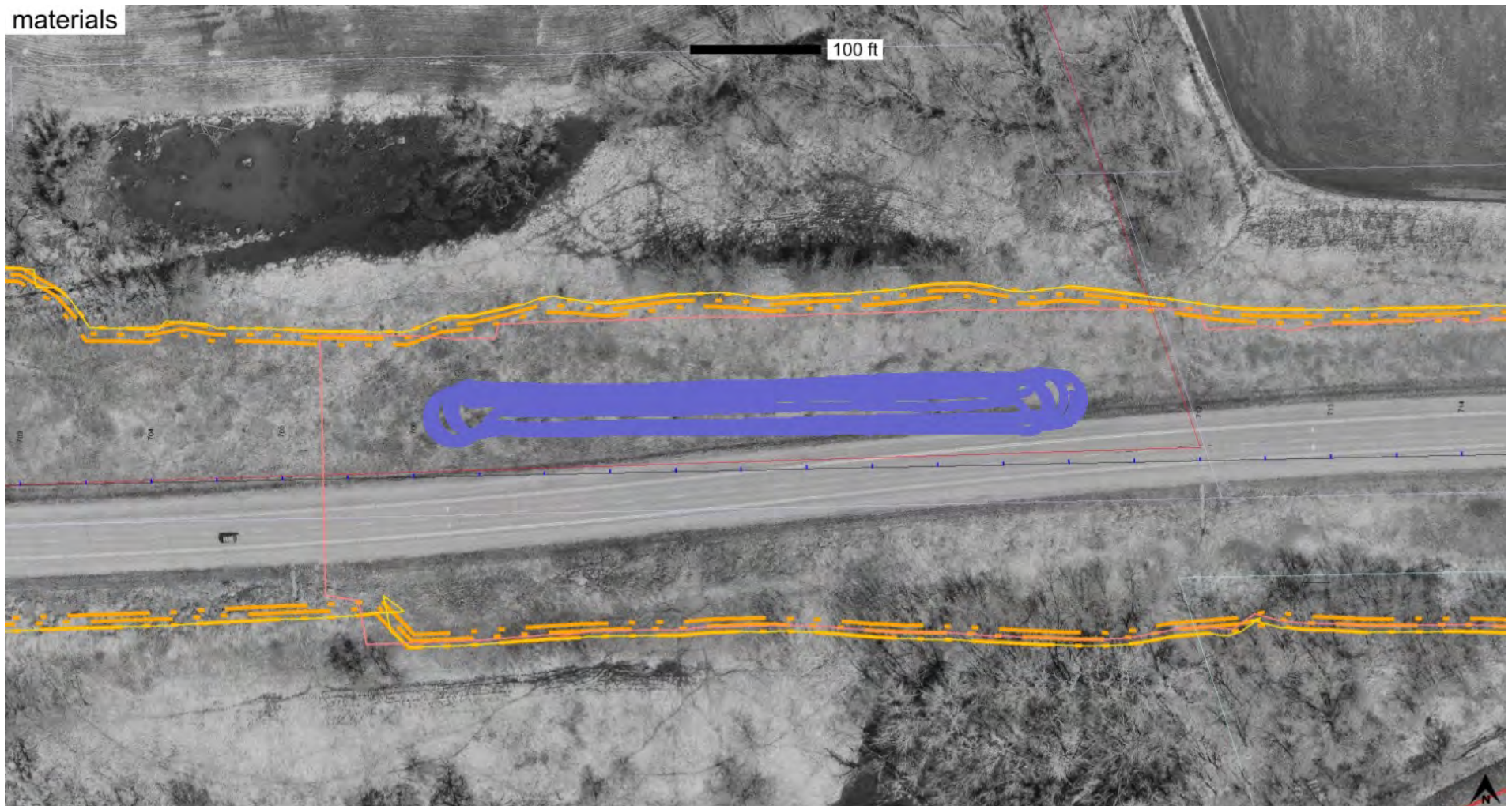
This report is only for use of the client named and it cannot be relied upon by any other person or entity.




Map ID: ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_135130    Map Type: Verification Map    Map Layer: Subgrade Treatment 24 Inches

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade_Treatment Select Cohesive_IADOT	24006	100.0	20269	0.465	100.0	3600.0	150.0	20.5

materials



 Subgrade\_Treatment Select Cohesive\_IADOT



ing\_86-us030-240\_cs56b-ingios01\_2022\_09\_09\_135130\_20221031T211633\_20220909-075947.jpg



A-470