ST-008 Appendix IX-C3: e-Compaction Reports

IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.08	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_14_092151a	No. of Measurements:	7331	Machine ID:	Ingios_FCS00210
Date and Time:	8/14/2020 9:21:51 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	Yes	99.6	113.75	0.63	9037	5500	37539.6	56000	11921.57	31.76	-3537	28502.6	46963
k-value	Yes	79.4	100.52	1	150	63.51	170.3	190	30.1	17.68	-86.49	20.3	40
Moisture Content	No												

Mapped Area

square feet	acres
7331	0.17

Pass Count

min.	avg.	max.
1	1.3	4

Elevation (ft)

min.	avg.	max.
1085.31	1093.48	1099.24

Velocity (fps)

min.	avg.	max.
0.08	5.5	6.89

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	7331	0.168	12	9037	150	40

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.08	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_14_092151a	No. of Measurements:	7331	Machine ID:	Ingios_FCS00210
Date and Time:	8/14/2020 9:21:51 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
113.75	CQI > = 95
99.6	80% of Resilient Modulus MVs >= 9037
31.76	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.08	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_14_092151a	No. of Measurements:	7331	Machine ID:	Ingios_FCS00210
Date and Time:	8/14/2020 9:21:51 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
100.52	CQI > = 95
79.4	80% of k-Value MVs >= 150
17.68	COV <= 20
9.18	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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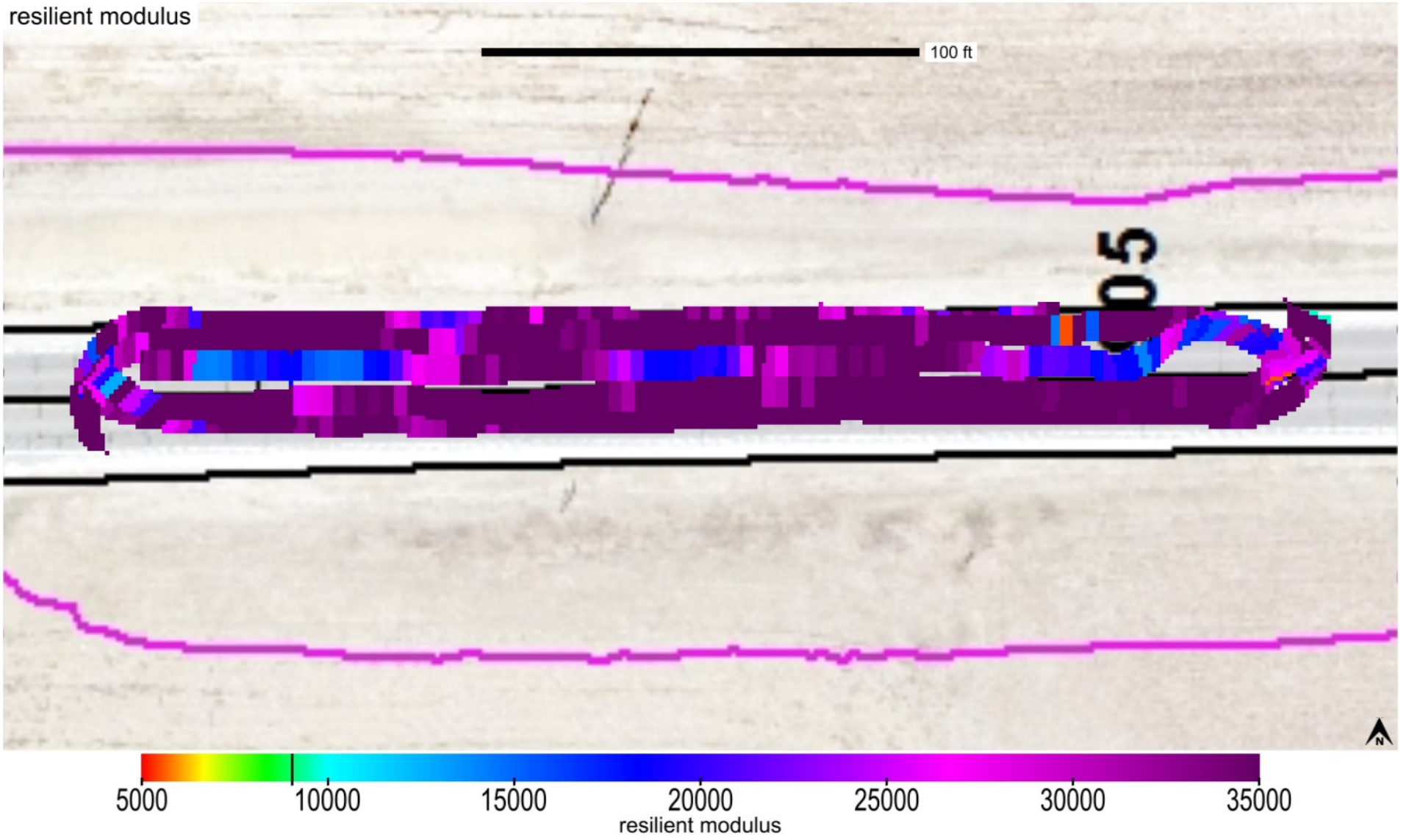
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_092151a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.6	113.75	0.63	9037	5500	37539.6	56000	11921.57	31.76	-3537	28502.6	46963



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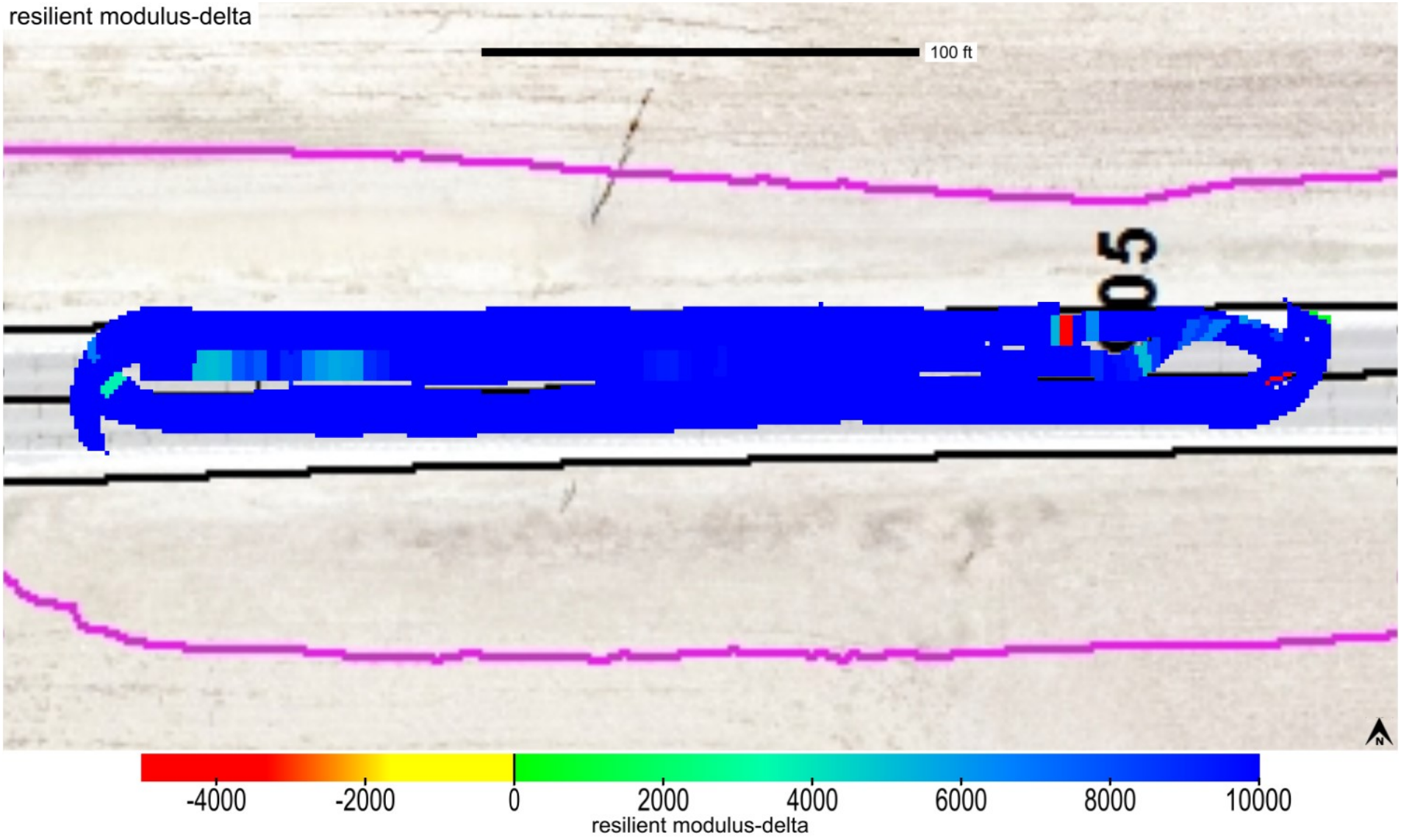
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_092151a

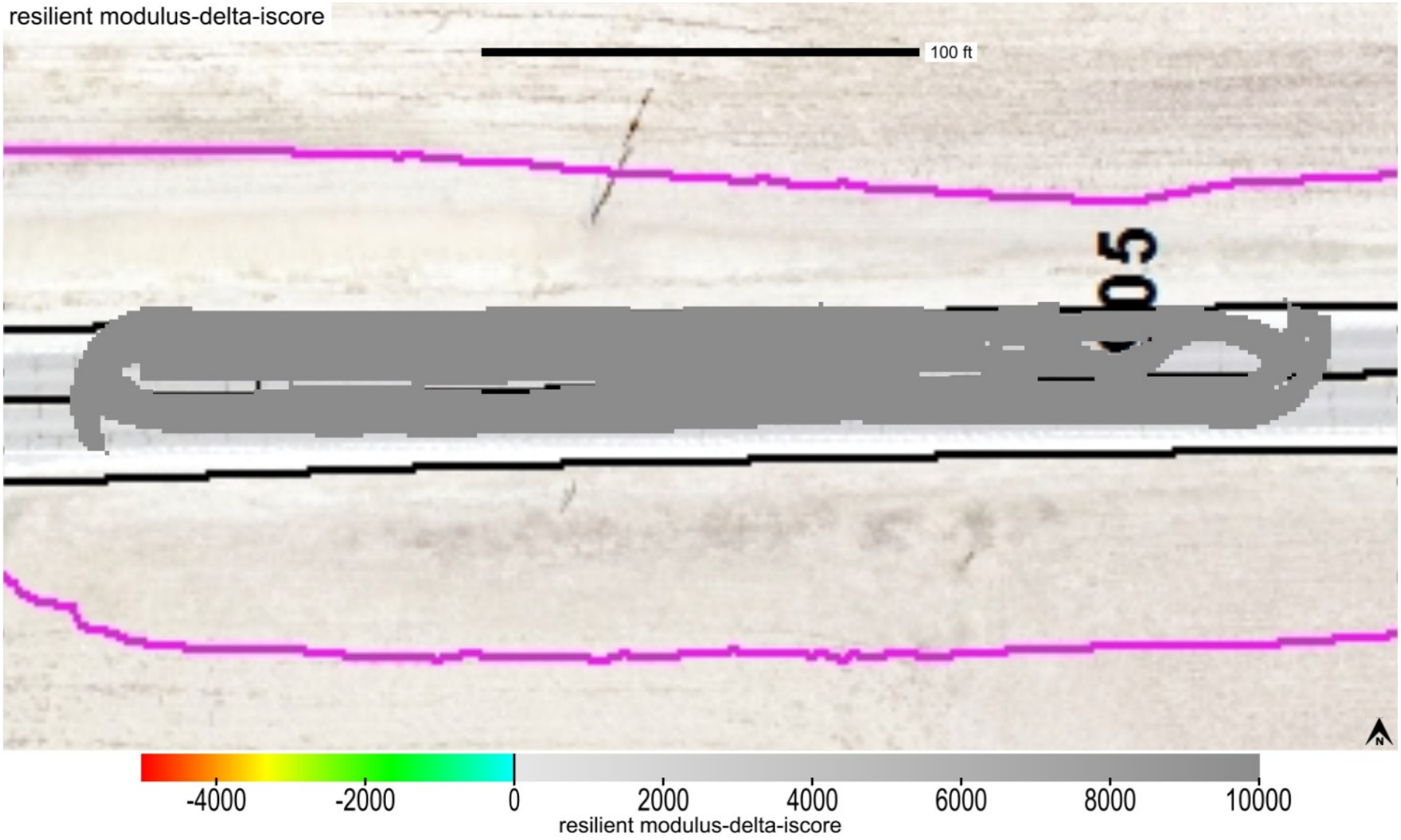
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.6	113.75	0.63	9037	5500	37539.6	56000	11921.57	31.76	-3537	28502.6	46963



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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_092151a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	99.6	9037	-3537	28502.6	46963	12945.49	28290.25	44475.5



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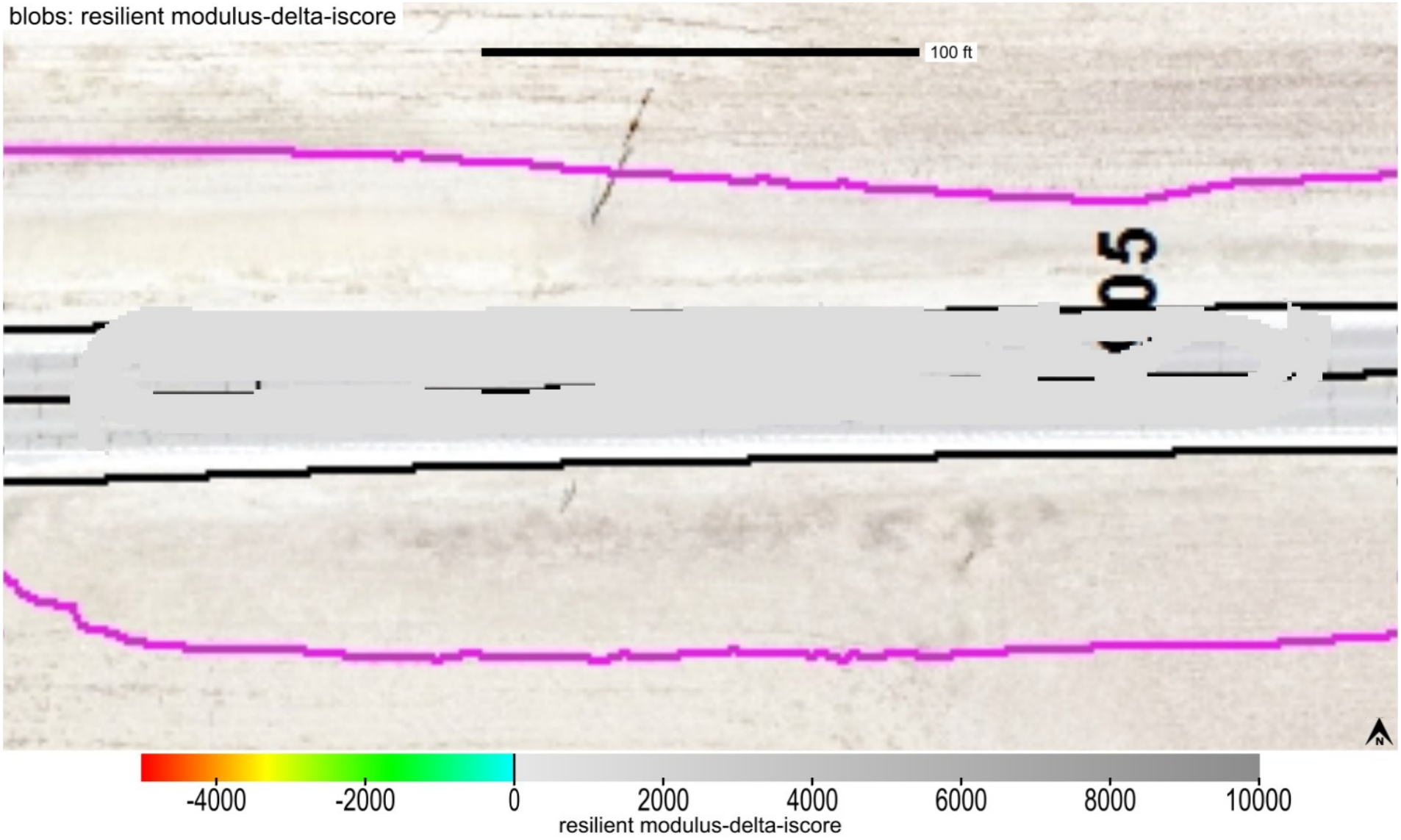
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_092151a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0



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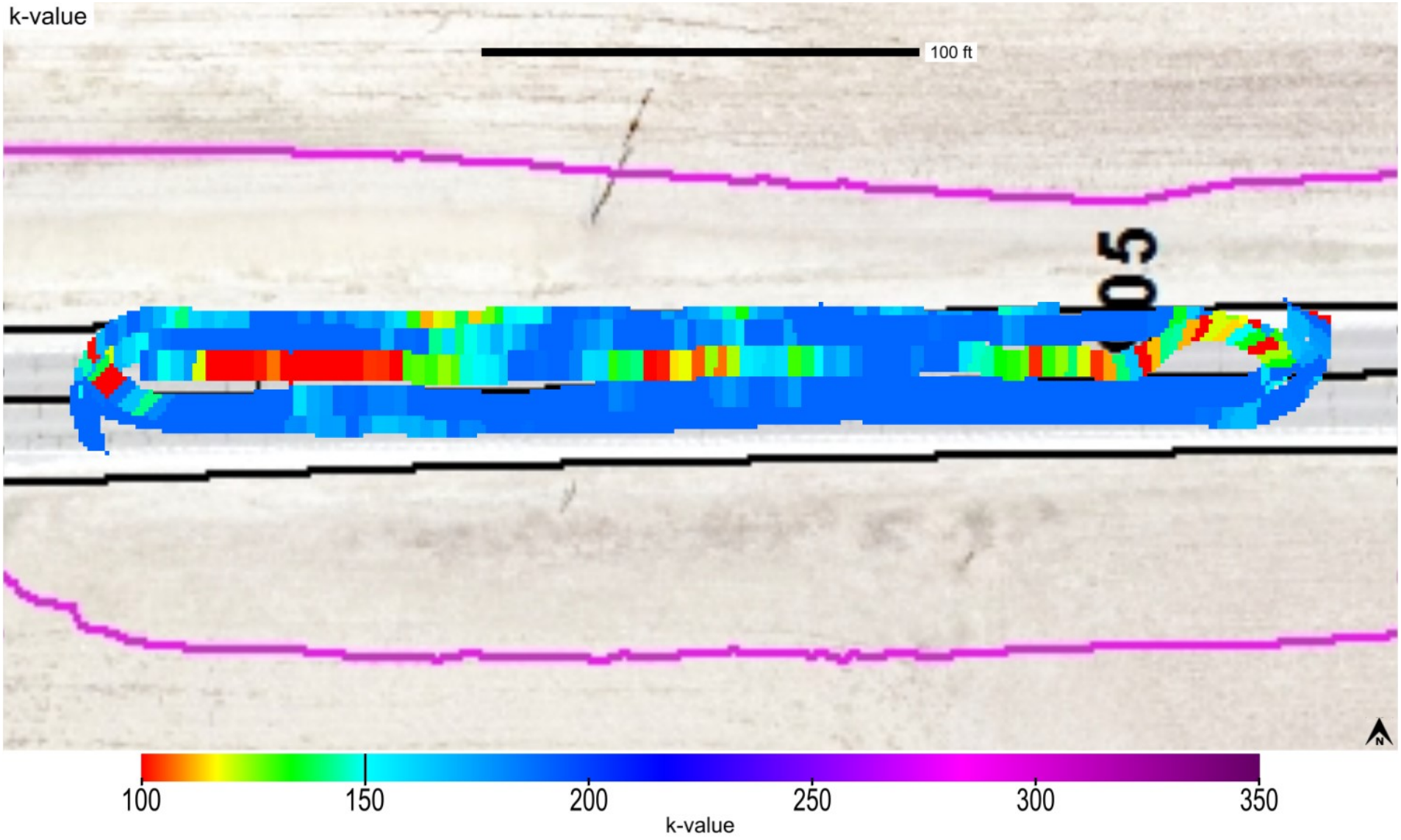
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_092151a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	79.4	100.52	1	150	63.51	170.3	190	30.1	17.68	-86.49	20.3	40



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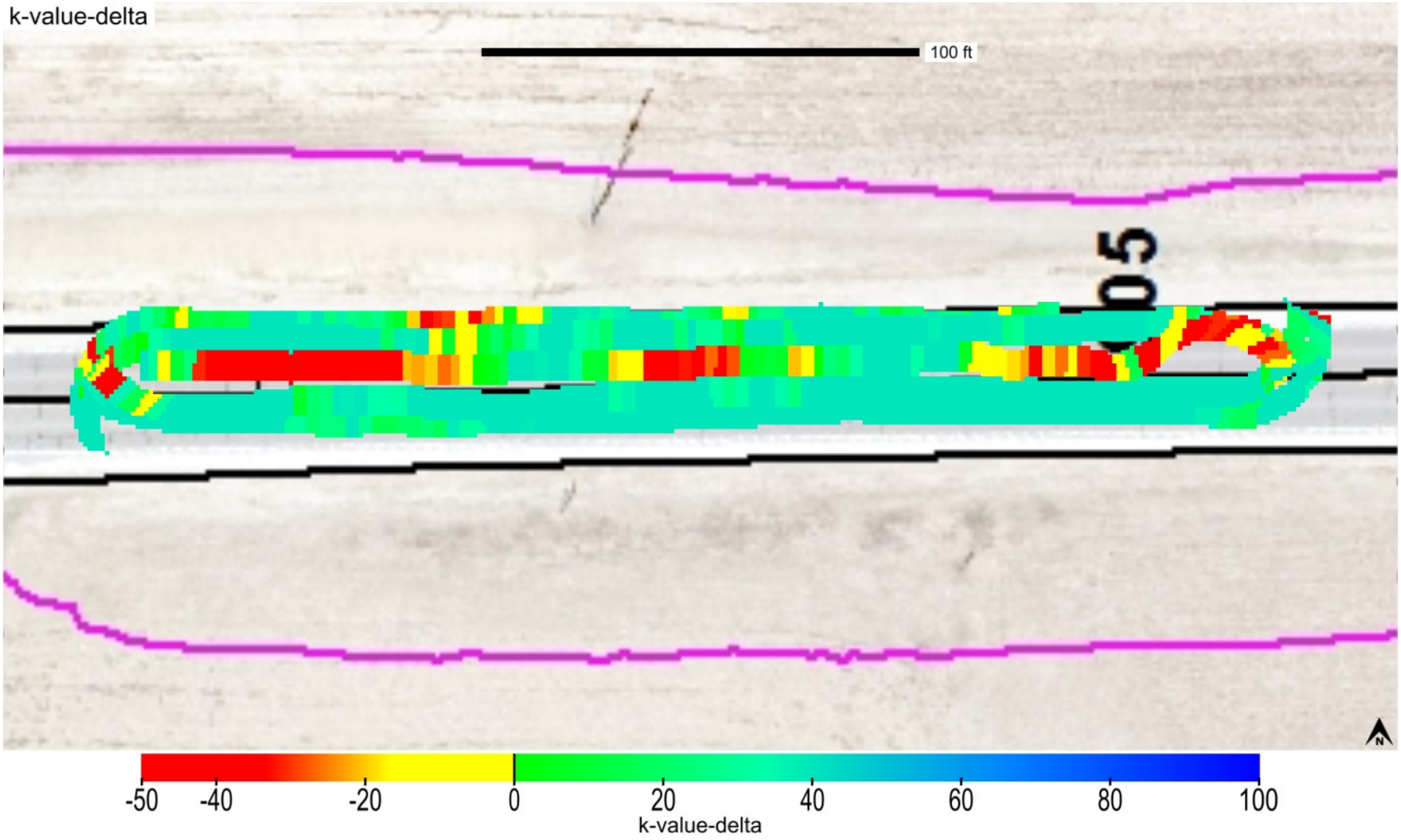
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_092151a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	79.4	100.52	1	150	63.51	170.3	190	30.1	17.68	-86.49	20.3	40



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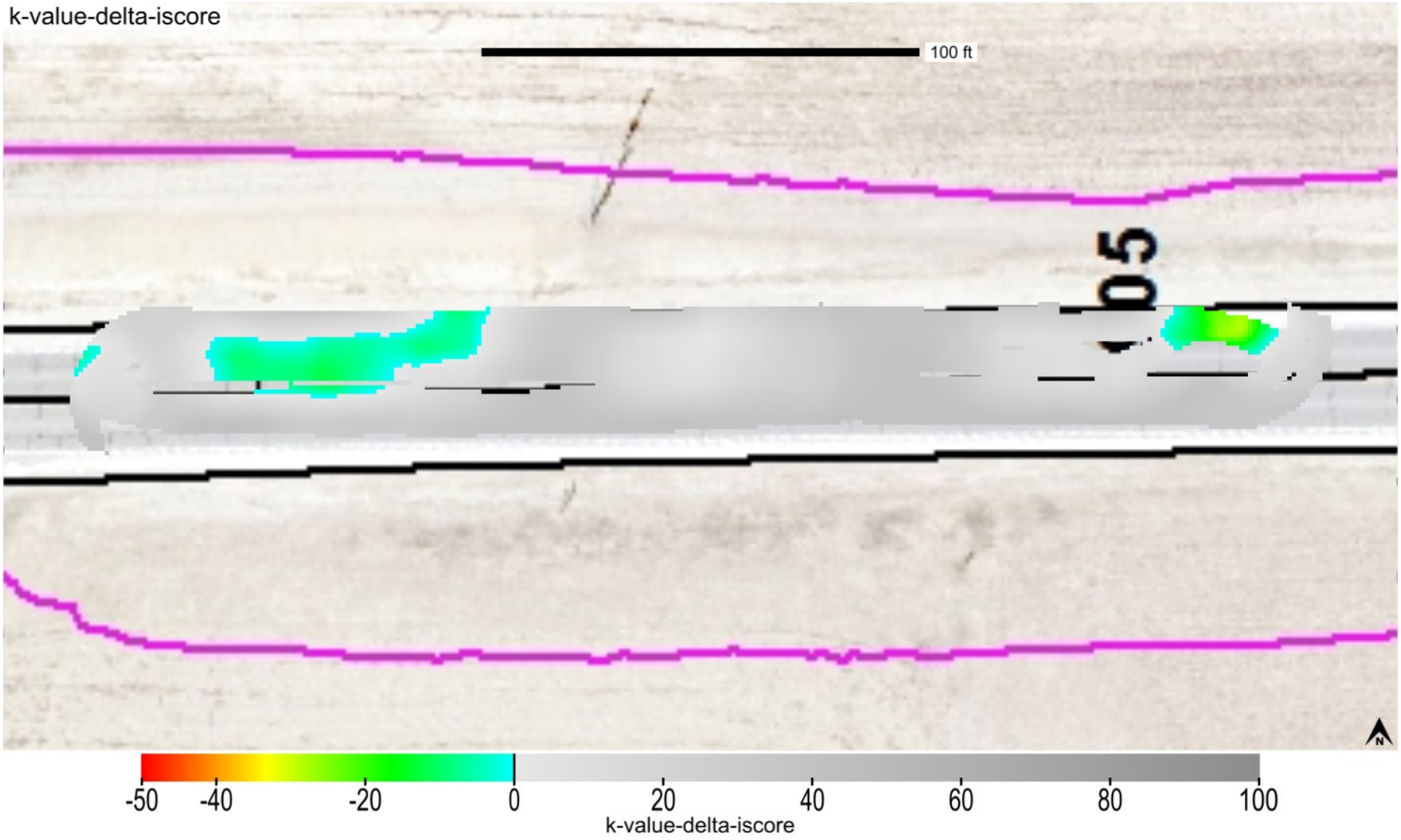
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_092151a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	79.4	150	-86.49	20.3	40	-28.28	19.74	40



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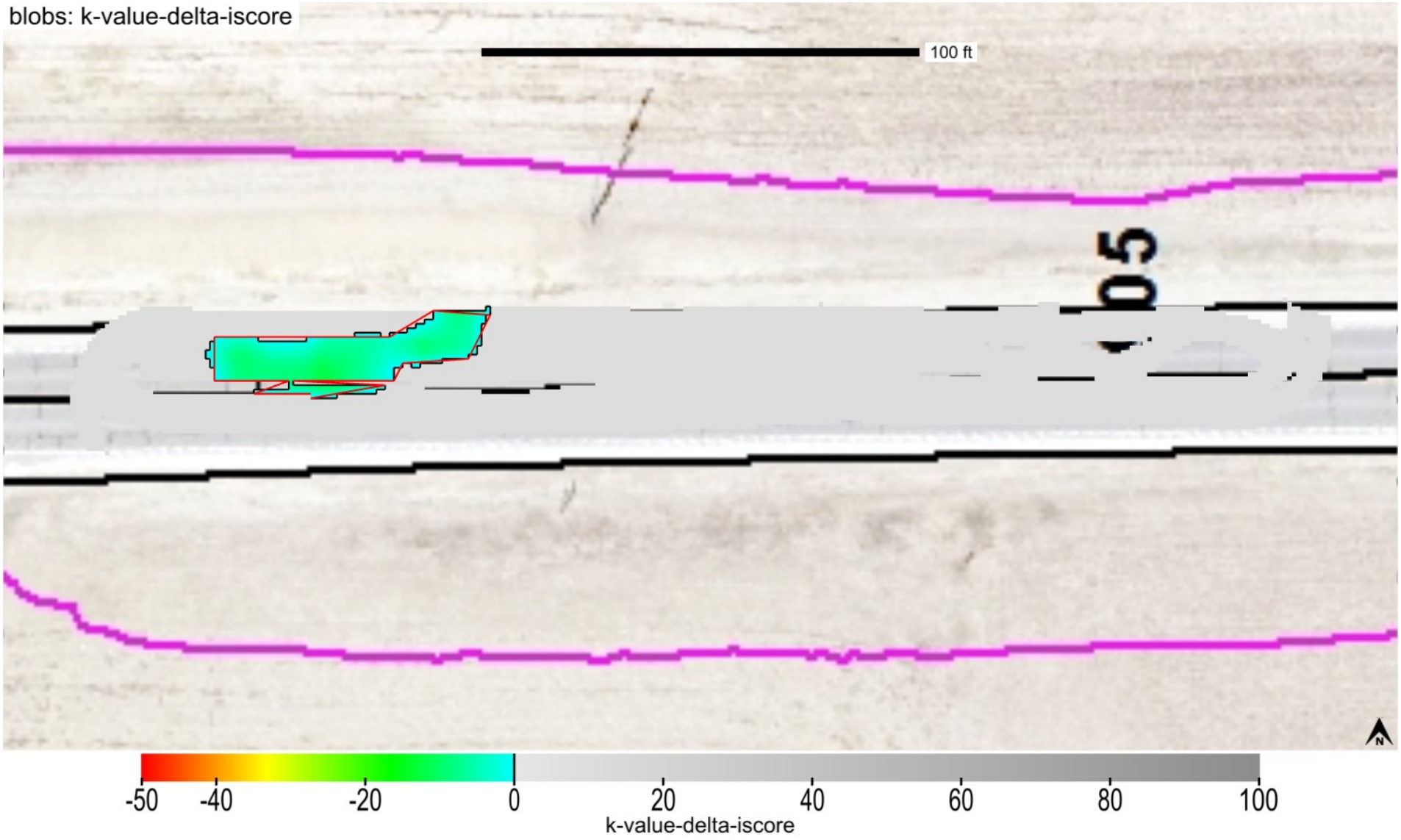
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_092151a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	673	9.18	none	0



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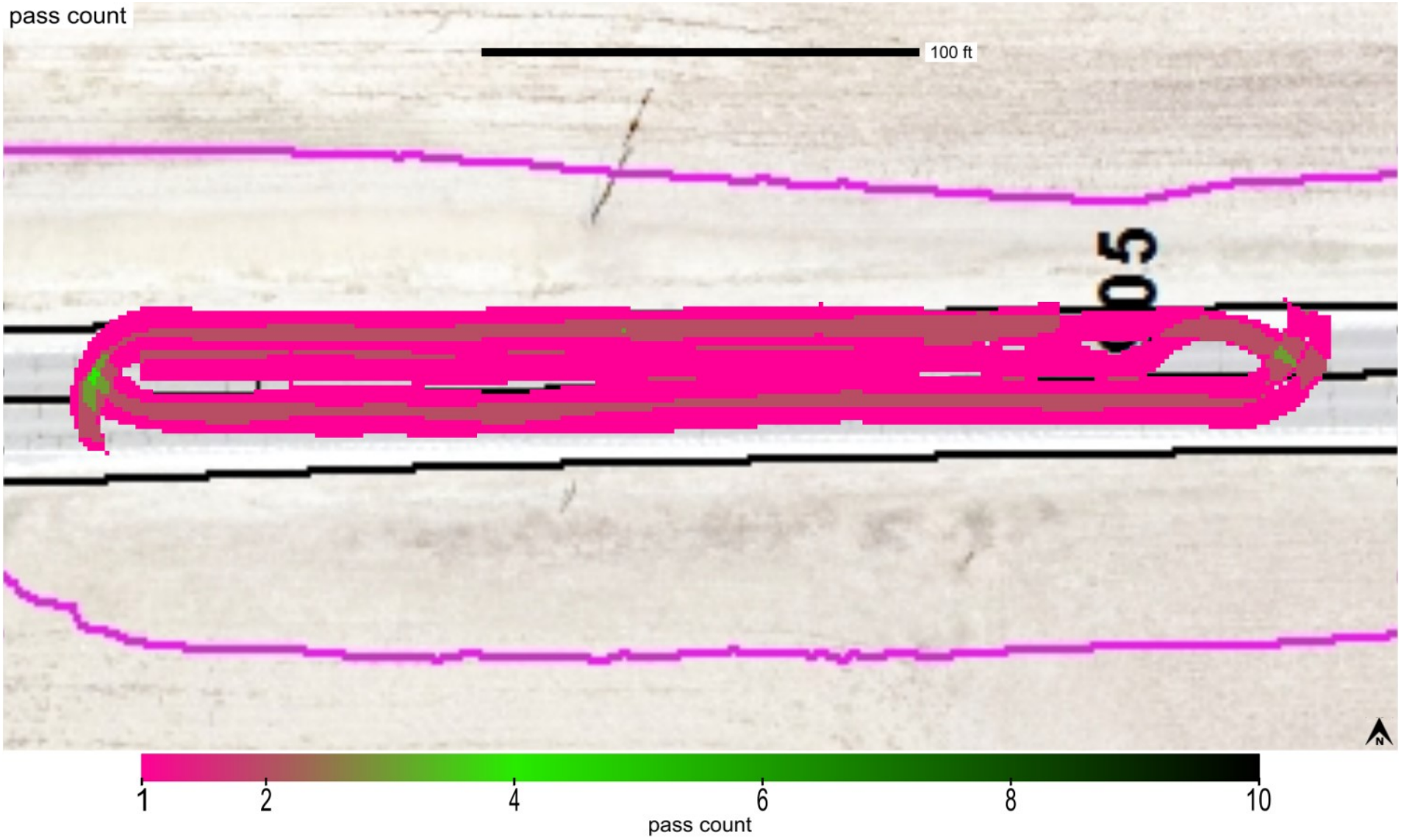
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_092151a

minimum	average	maximum
1	1.3	4



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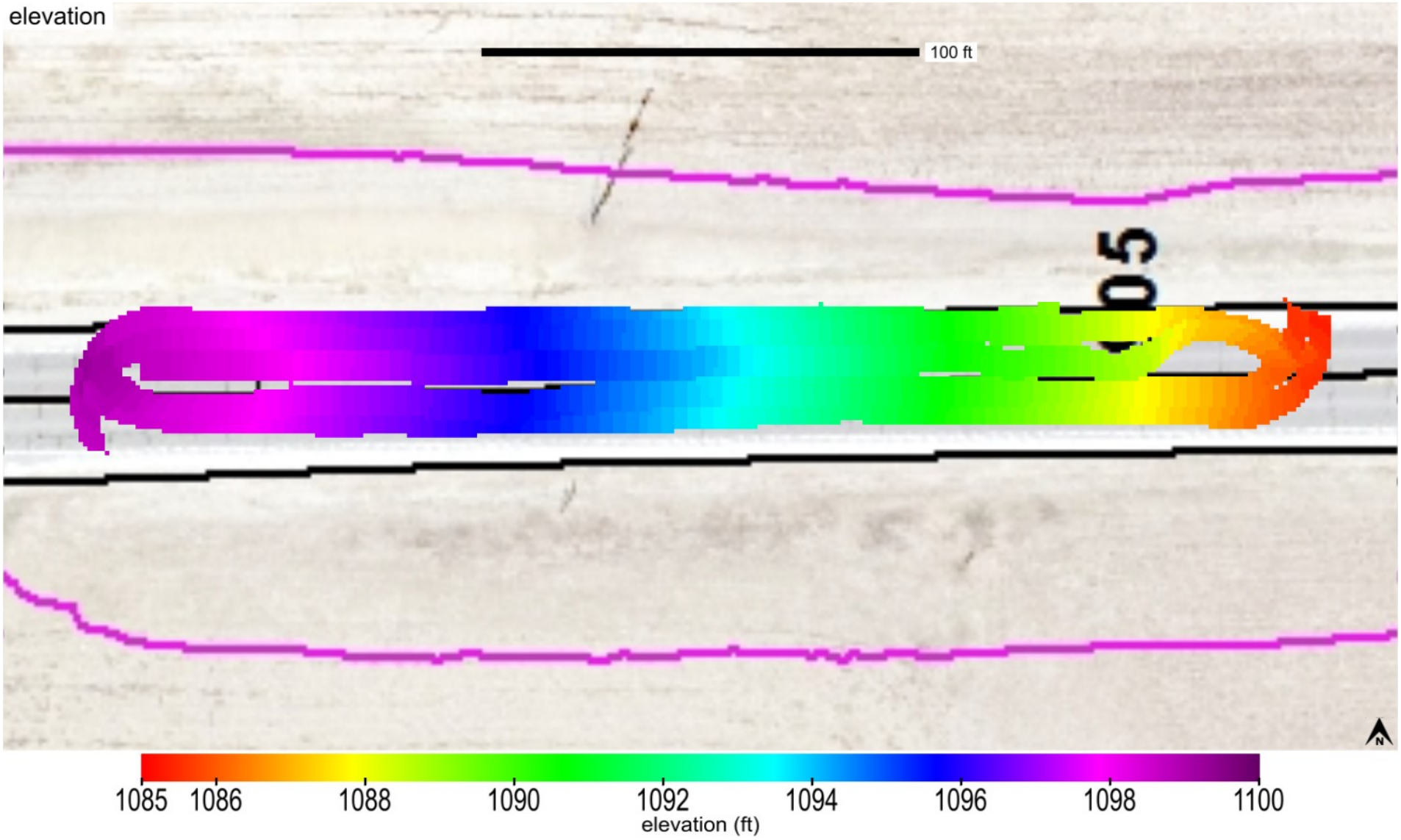
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_092151a

minimum	average	maximum
1085.313	1093.485	1099.24



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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_092151a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	7331	0.168	12	9037	150	40

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.59	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_14_103319a	No. of Measurements:	35457	Machine ID:	Ingios_FCS00210
Date and Time:	8/14/2020 10:33:19 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	Yes	99.4	111.05	0.7	9037	5500	33861.1	56000	12435.52	36.73	-3537	24824.1	46963
k-value	Yes	73.4	92.41	0.78	150	20	163.8	190	36.02	21.99	-130	13.8	40
Moisture Content	No												

Mapped Area

square feet	acres
35457	0.81

Pass Count

min.	avg.	max.
1	2.14	10

Elevation (ft)

min.	avg.	max.
1068.15	1100.04	1112.19

Velocity (fps)

min.	avg.	max.
0.51	5.49	6.32

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	35457	0.814	12	9037	150	40

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.59	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_14_103319a	No. of Measurements:	35457	Machine ID:	Ingios_FCS00210
Date and Time:	8/14/2020 10:33:19 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
111.05	CQI > = 95
99.4	80% of Resilient Modulus MVs >= 9037
36.73	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.59	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_14_103319a	No. of Measurements:	35457	Machine ID:	Ingios_FCS00210
Date and Time:	8/14/2020 10:33:19 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
92.41	CQI > = 95
73.4	80% of k-Value MVs >= 150
21.99	COV <= 20
20.19	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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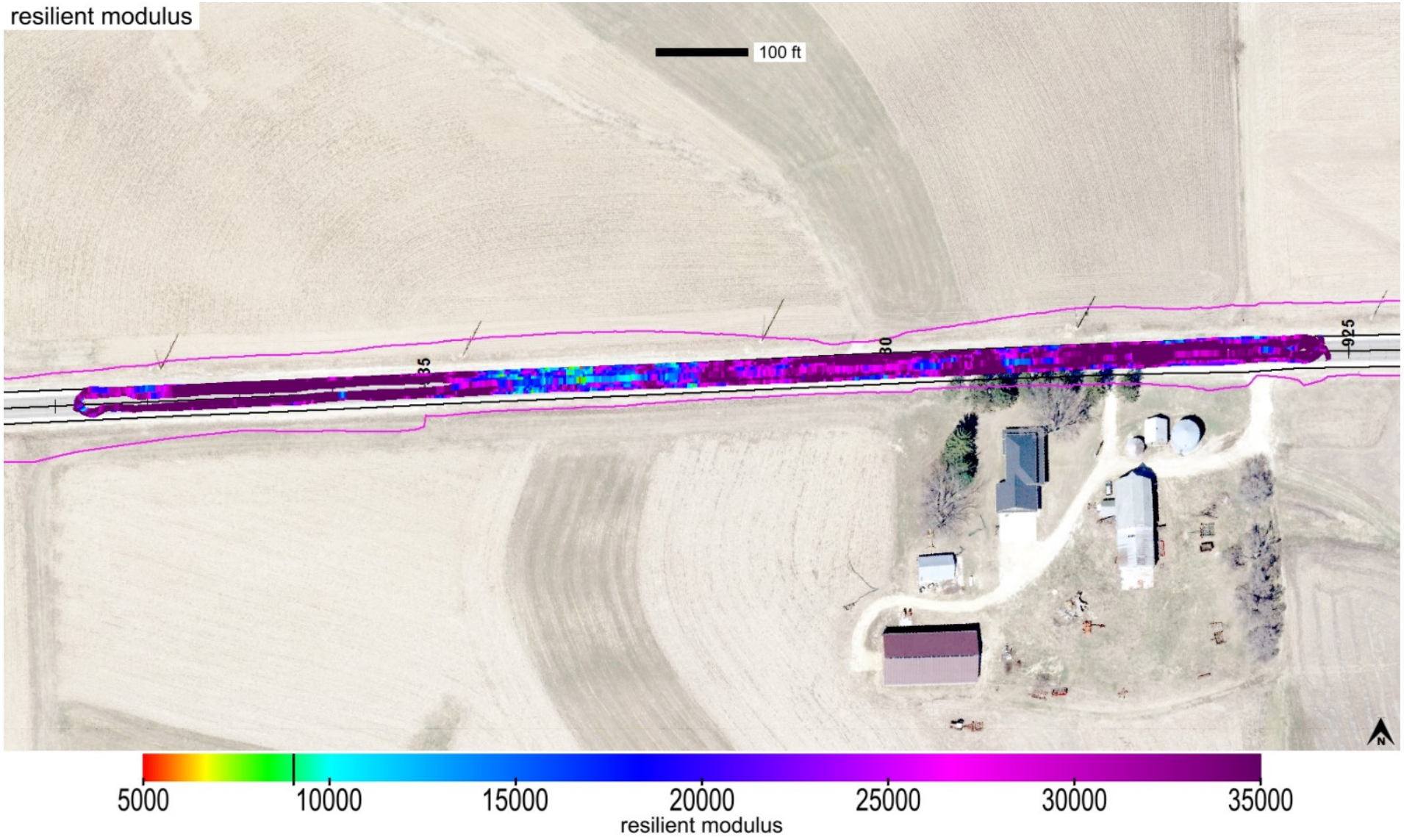
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_103319a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.4	111.05	0.7	9037	5500	33861.1	56000	12435.52	36.73	-3537	24824.1	46963



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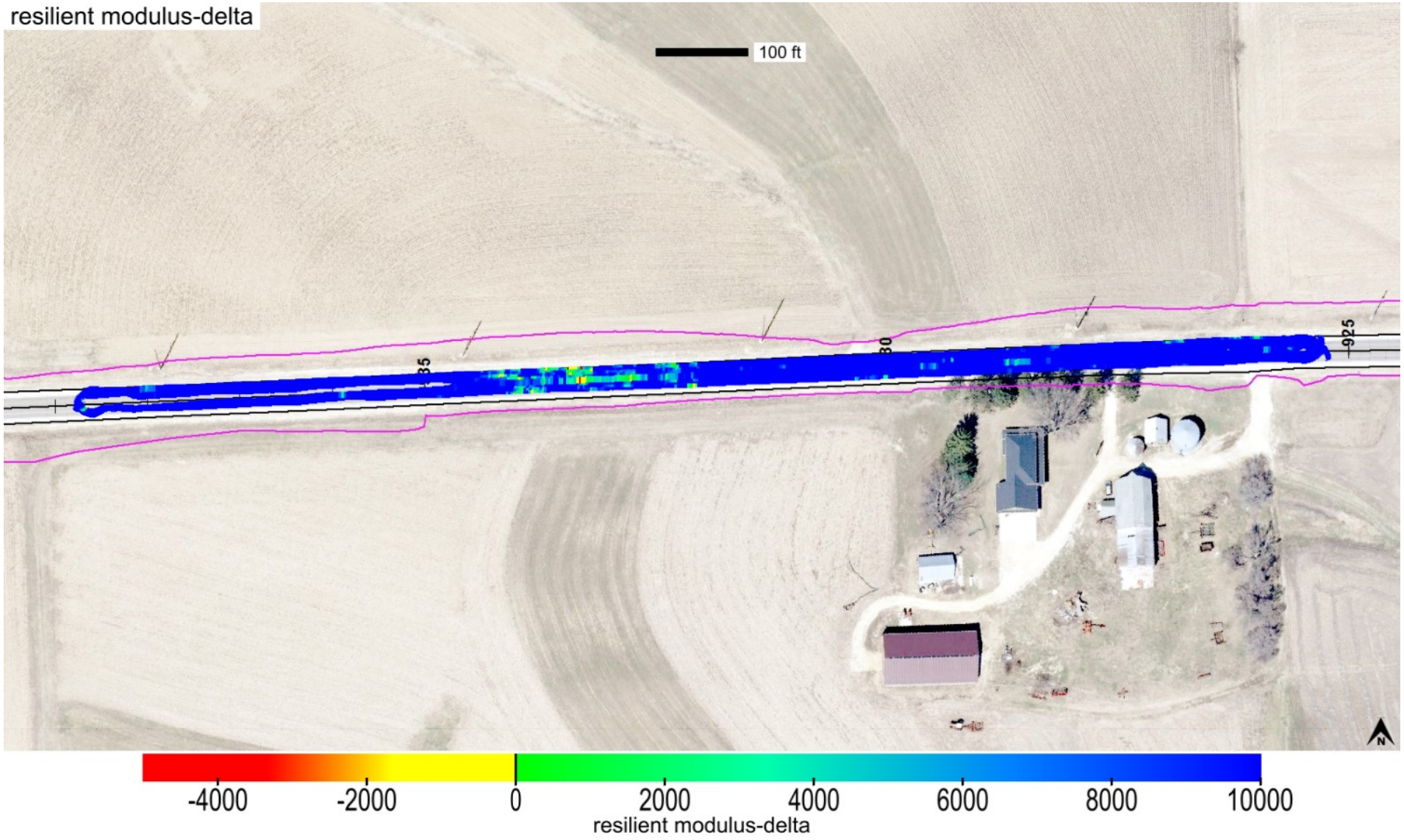
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_103319a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.4	111.05	0.7	9037	5500	33861.1	56000	12435.52	36.73	-3537	24824.1	46963



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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_103319a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	99.4	9037	-3537	24824.1	46963	1627.4	24930.86	46699.66

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_103319a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

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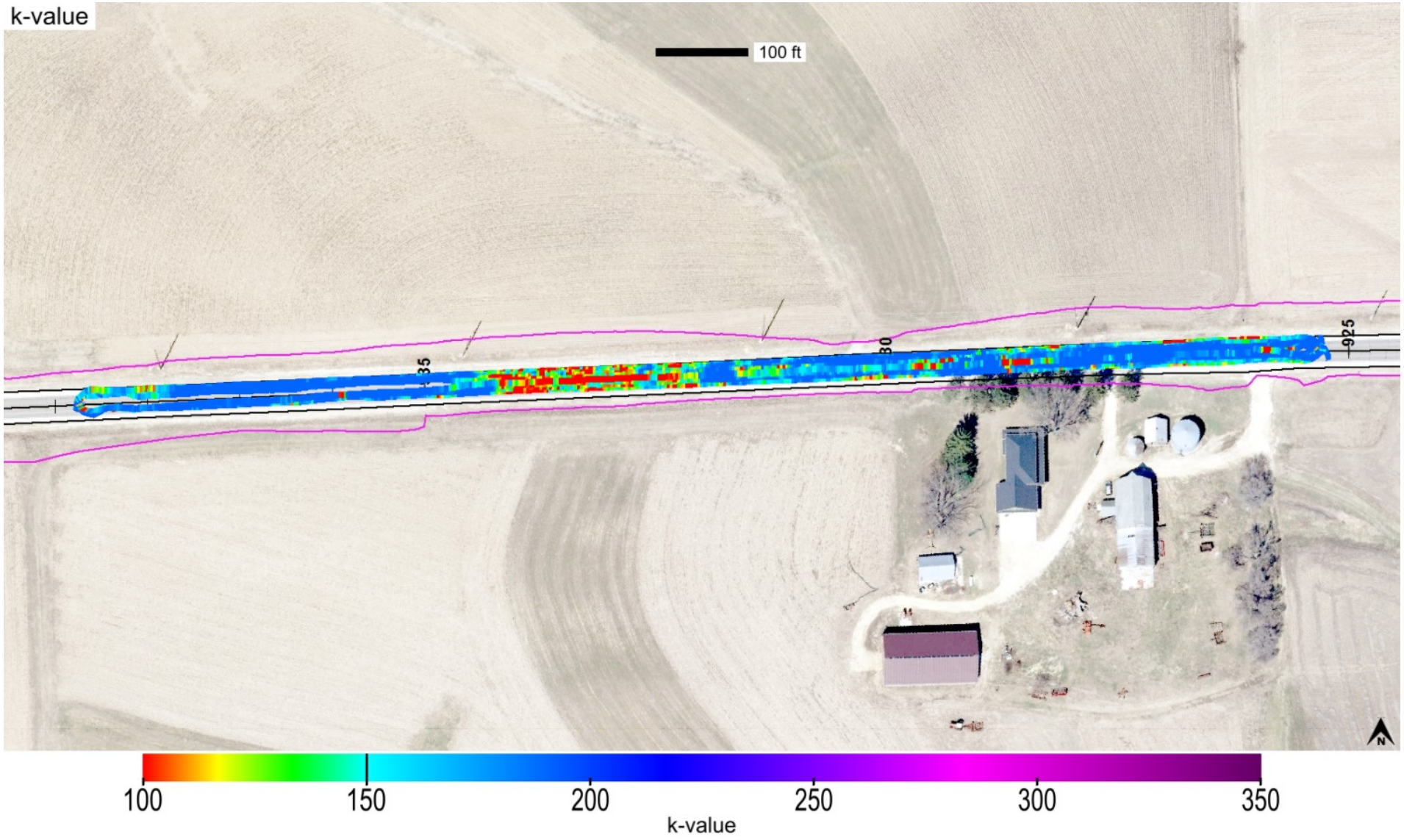
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_103319a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	73.4	92.41	0.78	150	20	163.8	190	36.02	21.99	-130	13.8	40



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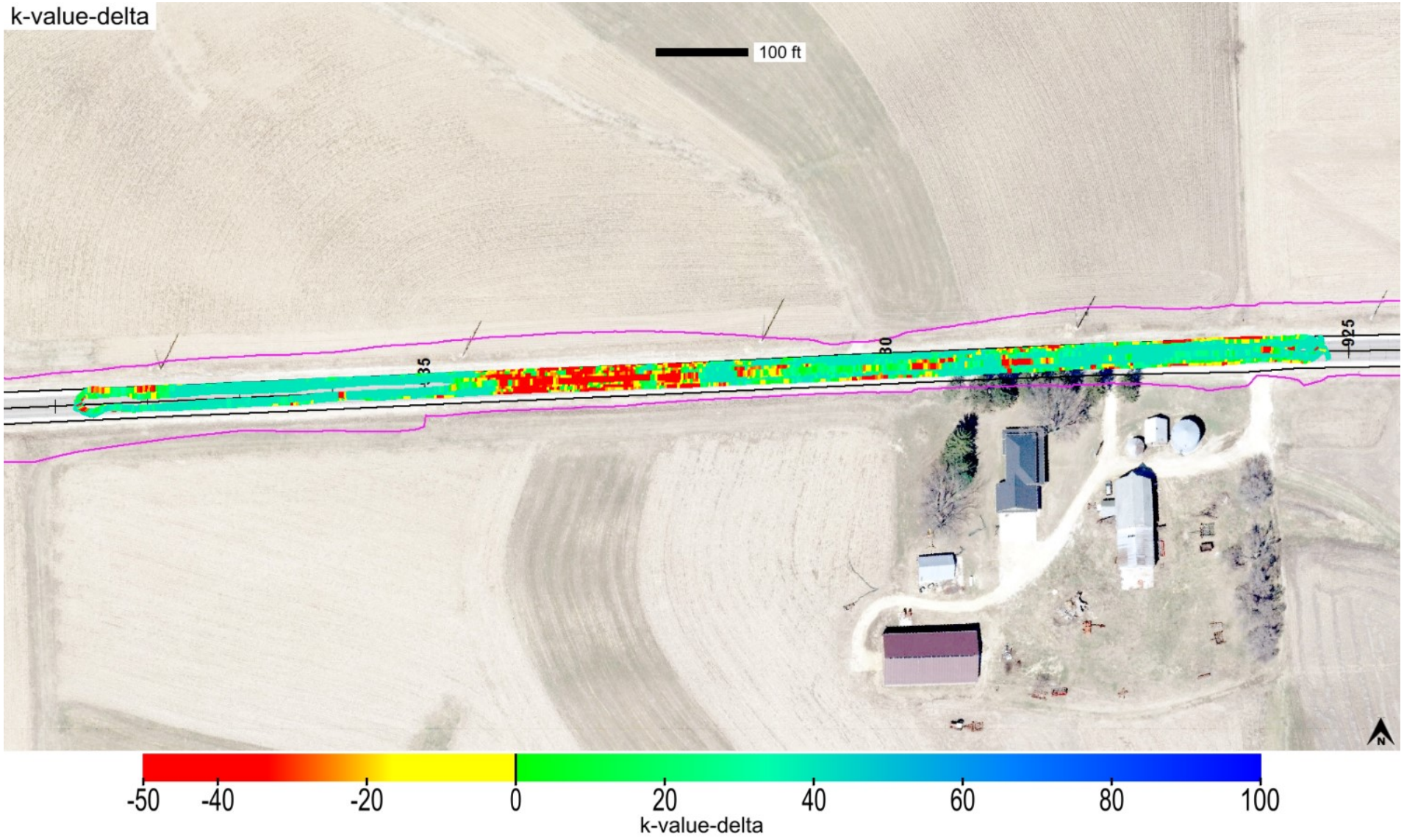
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_103319a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	73.4	92.41	0.78	150	20	163.8	190	36.02	21.99	-130	13.8	40



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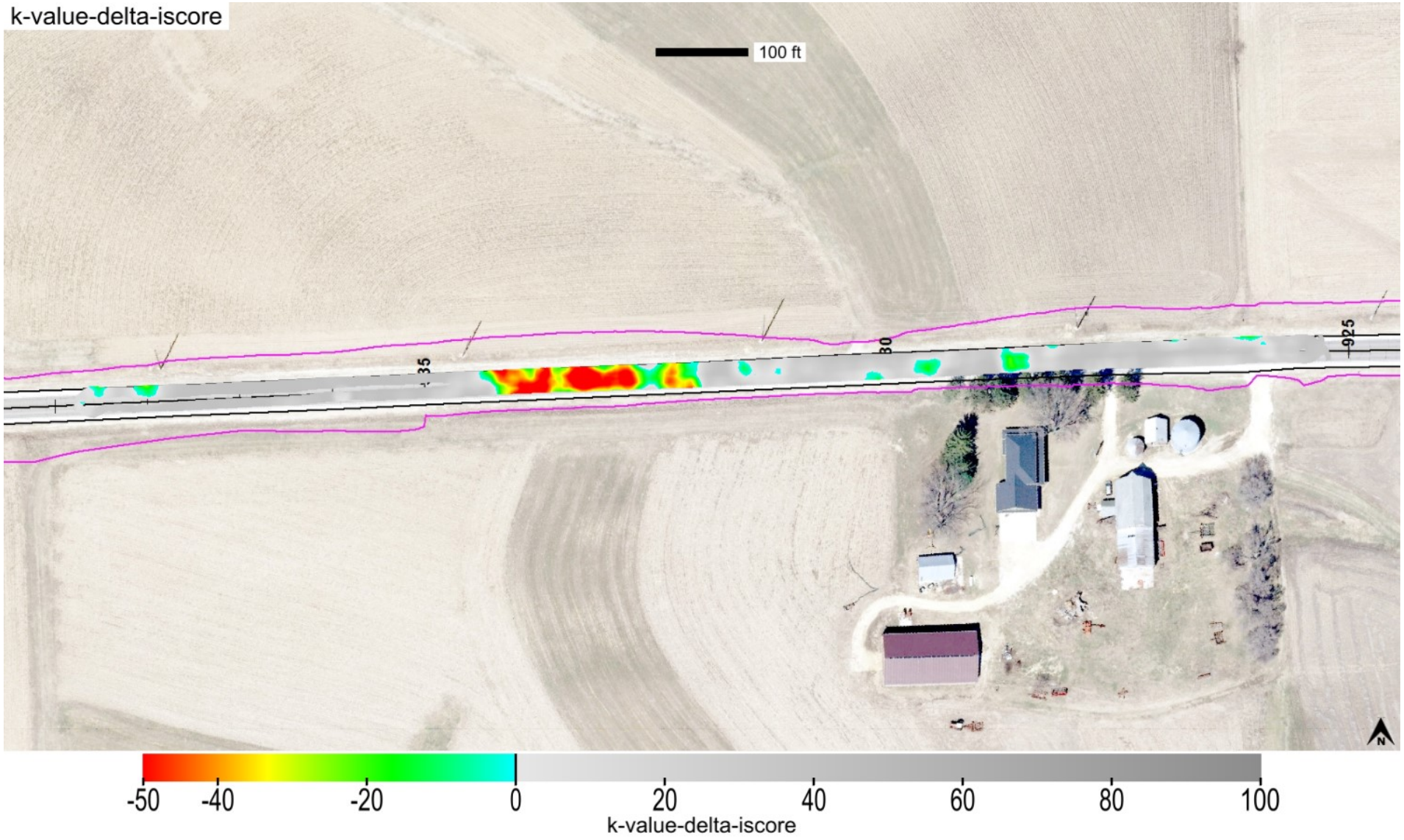
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_103319a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	73.4	150	-130	13.8	40	-79.84	14.13	40



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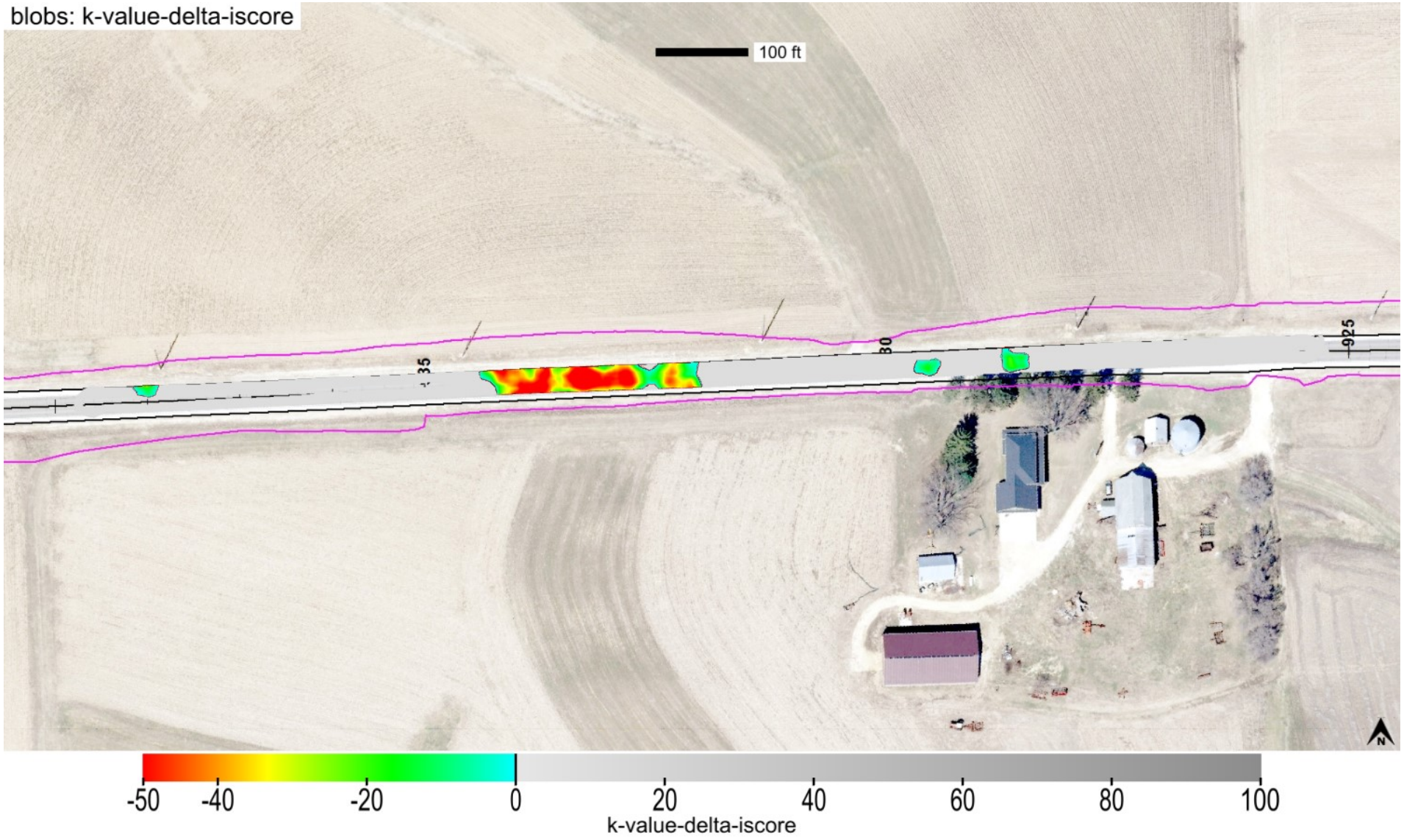
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_103319a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	4	7159	20.19	none	0



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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_103319a

minimum	average	maximum
1	2.14	10

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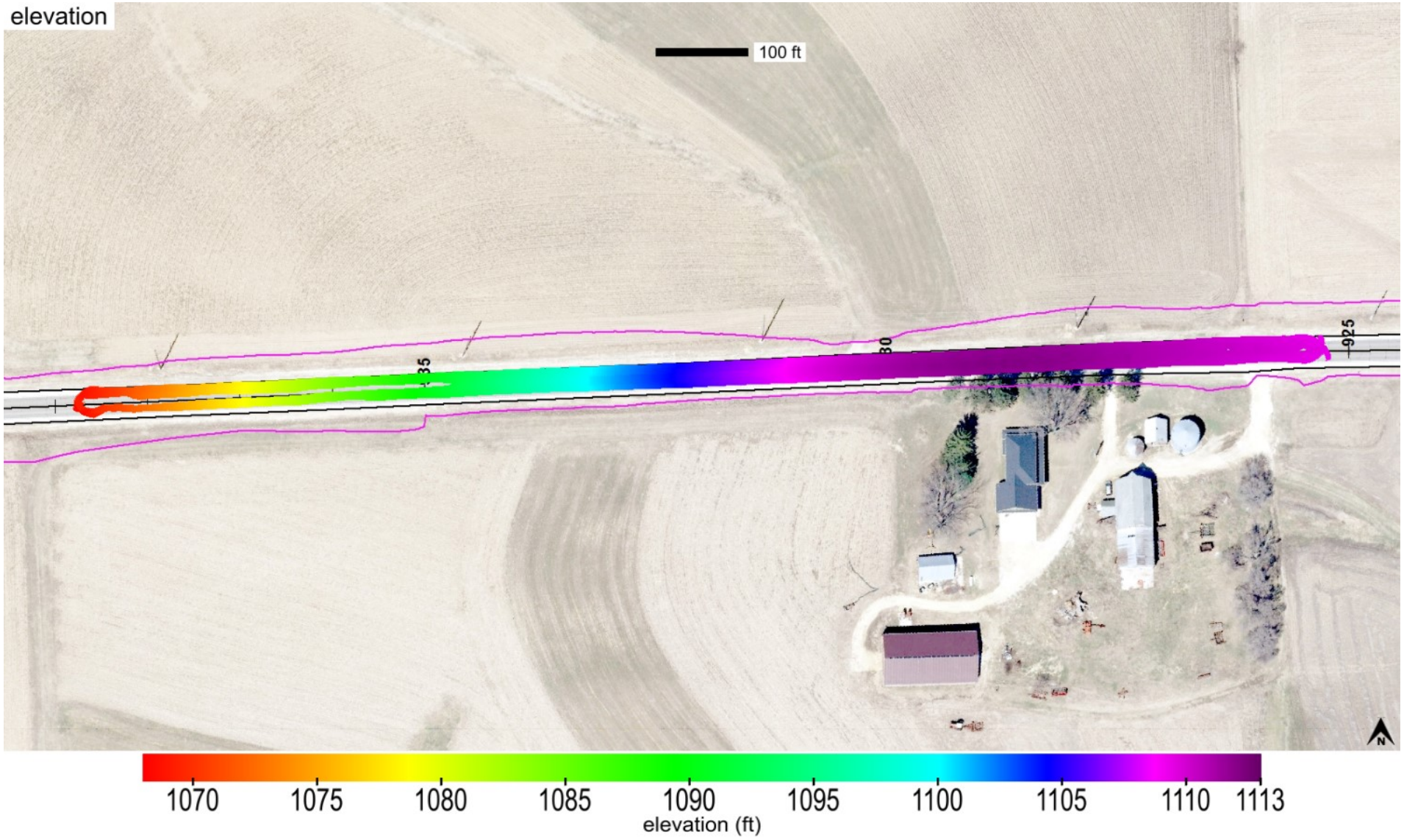
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_103319a

minimum	average	maximum
1068.148	1100.036	1112.193



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

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_103319a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	35457	0.814	12	9037	150	40

Modified Subbase_IADOT (2115)

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

IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.23	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_14_111121a	No. of Measurements:	2133	Machine ID:	Ingios_FCS00210
Date and Time:	8/14/2020 11:11:21 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	Yes	94.5	97.31	0.57	9037	5500	26450.5	56000	14392.49	54.41	-3537	17413.5	46963
k-value	Yes	50.6	68.16	0.6	150	26.88	146.1	190	36.44	24.95	-123.12	-3.9	40
Moisture Content	No												

Mapped Area

square feet	acres
2133	0.05

Pass Count

min.	avg.	max.
1	7.05	10

Elevation (ft)

min.	avg.	max.
1089.39	1096.16	1102.29

Velocity (fps)

min.	avg.	max.
0.14	5.61	6.21

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	2133	0.049	12	9037	150	40

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

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.23	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_14_111121a	No. of Measurements:	2133	Machine ID:	Ingios_FCS00210
Date and Time:	8/14/2020 11:11:21 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
97.31	CQI > = 95
94.5	80% of Resilient Modulus MVs >= 9037
54.41	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.23	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_14_111121a	No. of Measurements:	2133	Machine ID:	Ingios_FCS00210
Date and Time:	8/14/2020 11:11:21 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
68.16	CQI > = 95
50.6	80% of k-Value MVs >= 150
24.95	COV <= 20
57.52	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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

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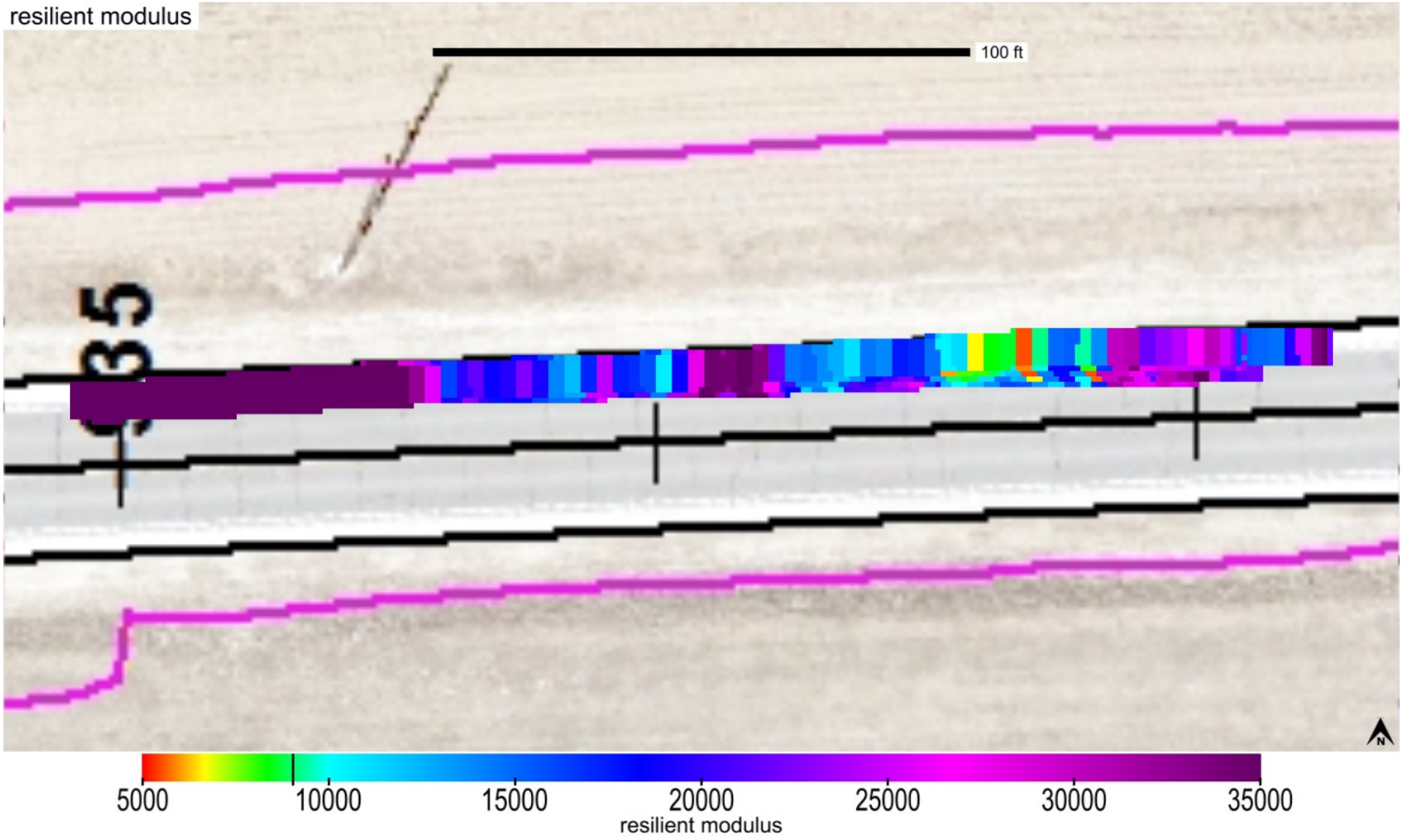
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_111121a

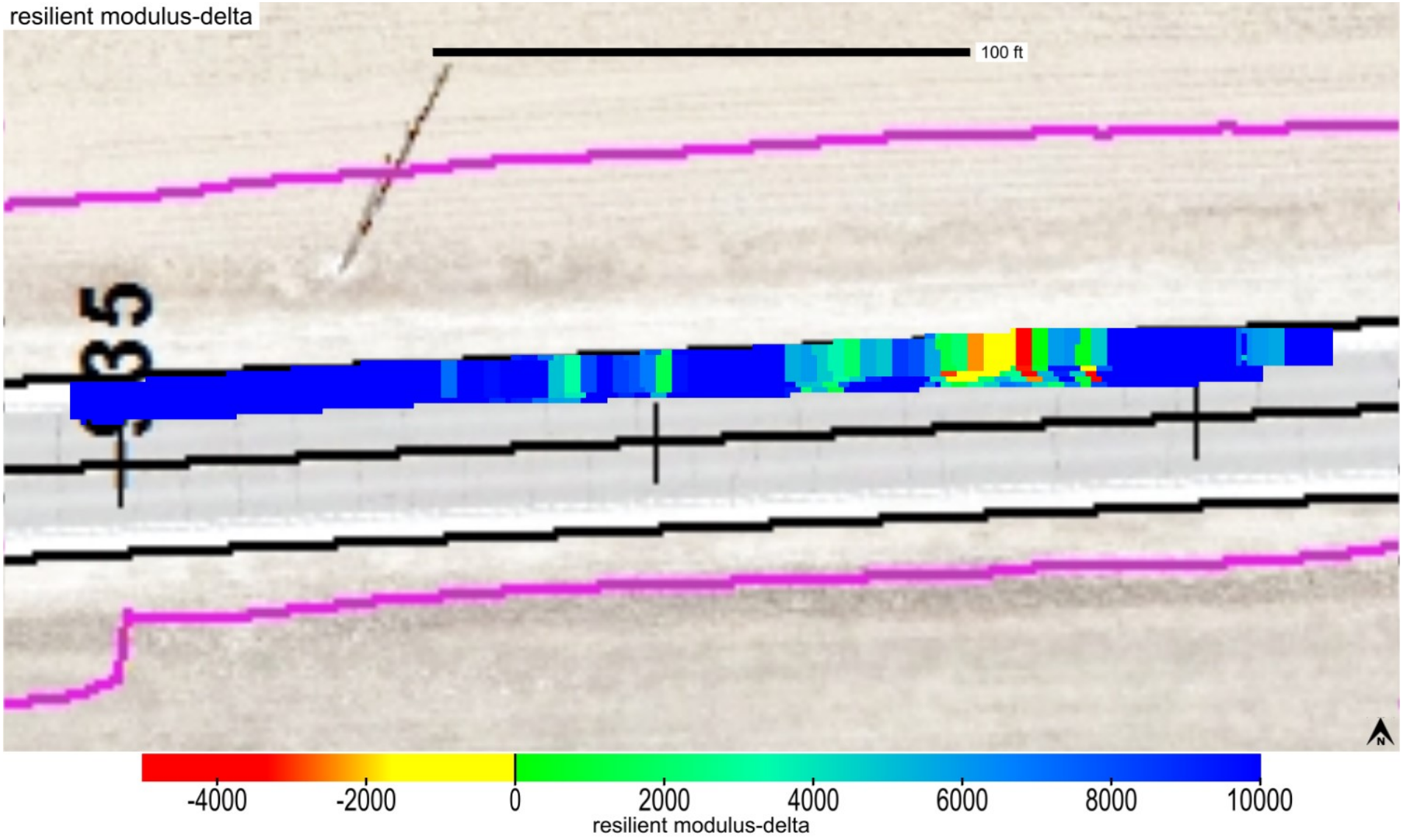
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	94.5	97.31	0.57	9037	5500	26450.5	56000	14392.49	54.41	-3537	17413.5	46963



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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_111121a

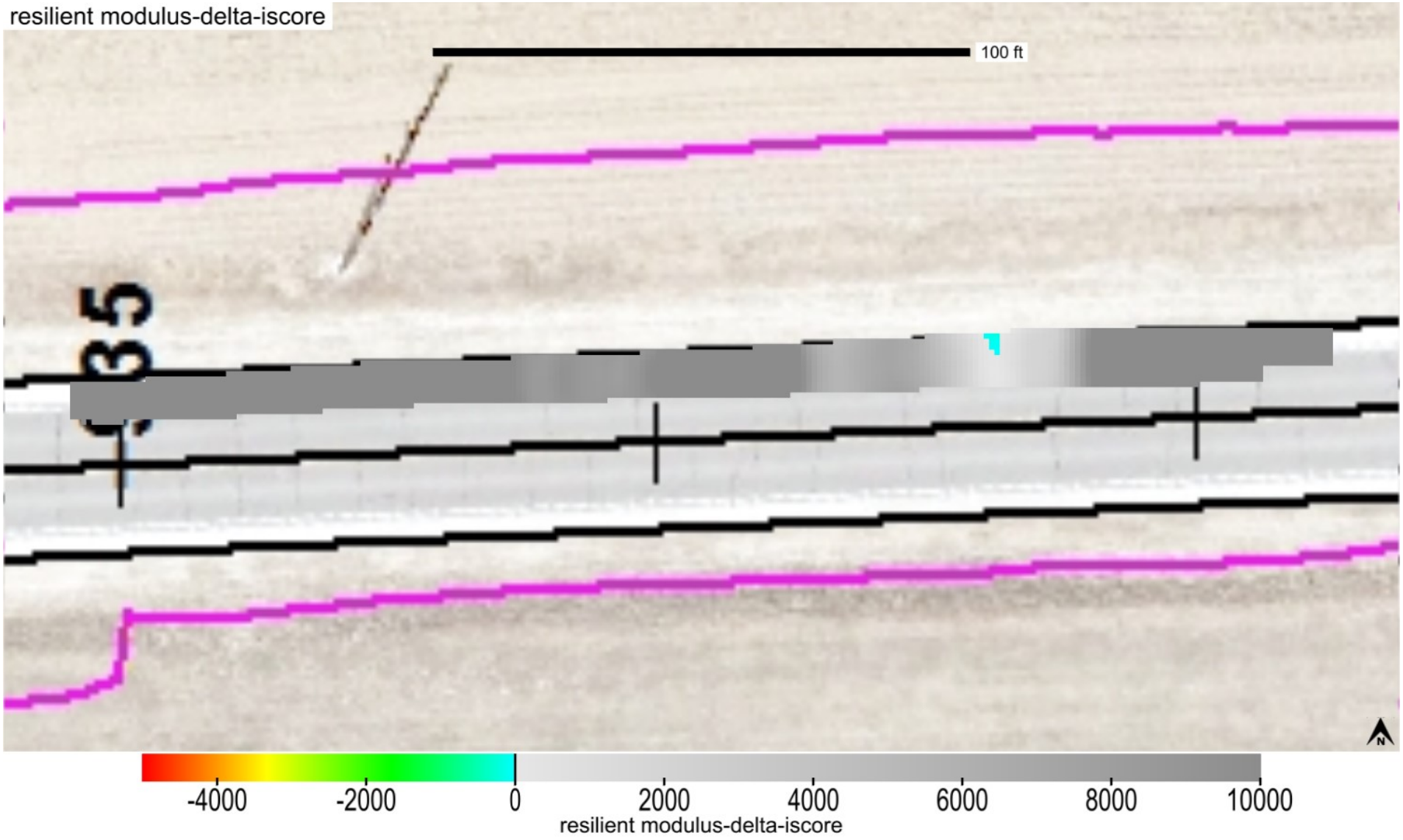
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	94.5	97.31	0.57	9037	5500	26450.5	56000	14392.49	54.41	-3537	17413.5	46963



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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_111121a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	94.5	9037	-3537	17413.5	46963	-178.43	17377.18	45050



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

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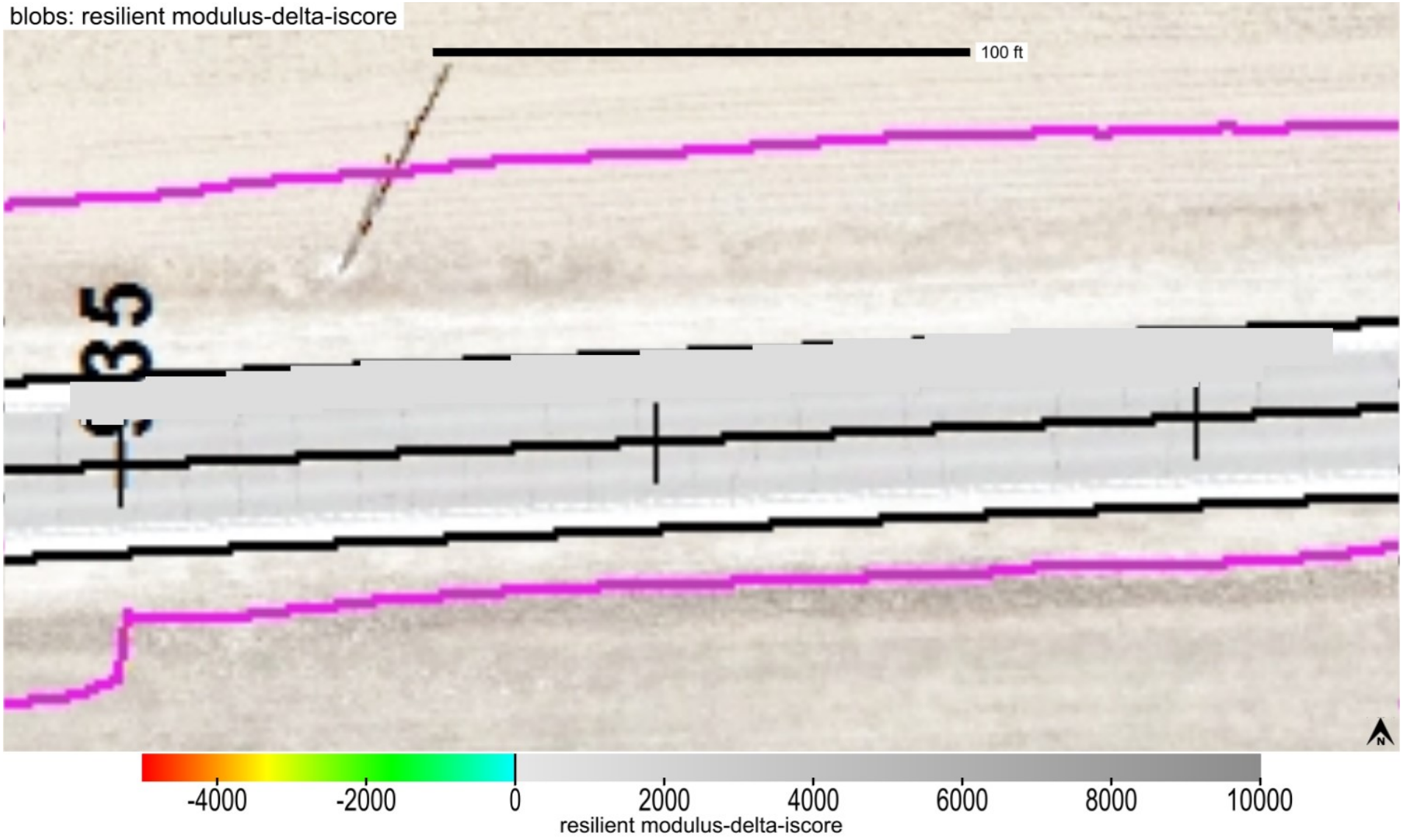
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_111121a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0



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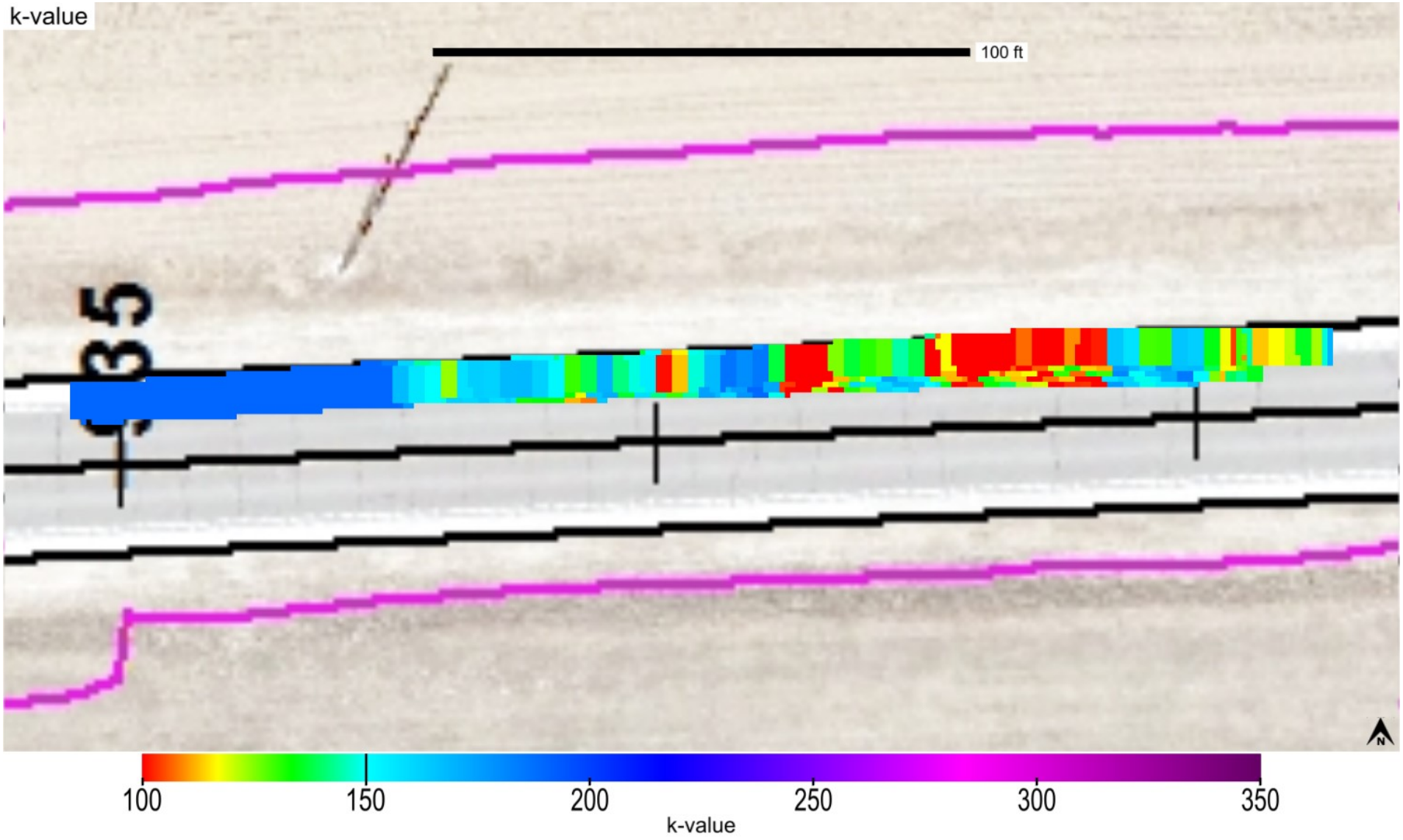
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_111121a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	50.6	68.16	0.6	150	26.88	146.1	190	36.44	24.95	-123.12	-3.9	40



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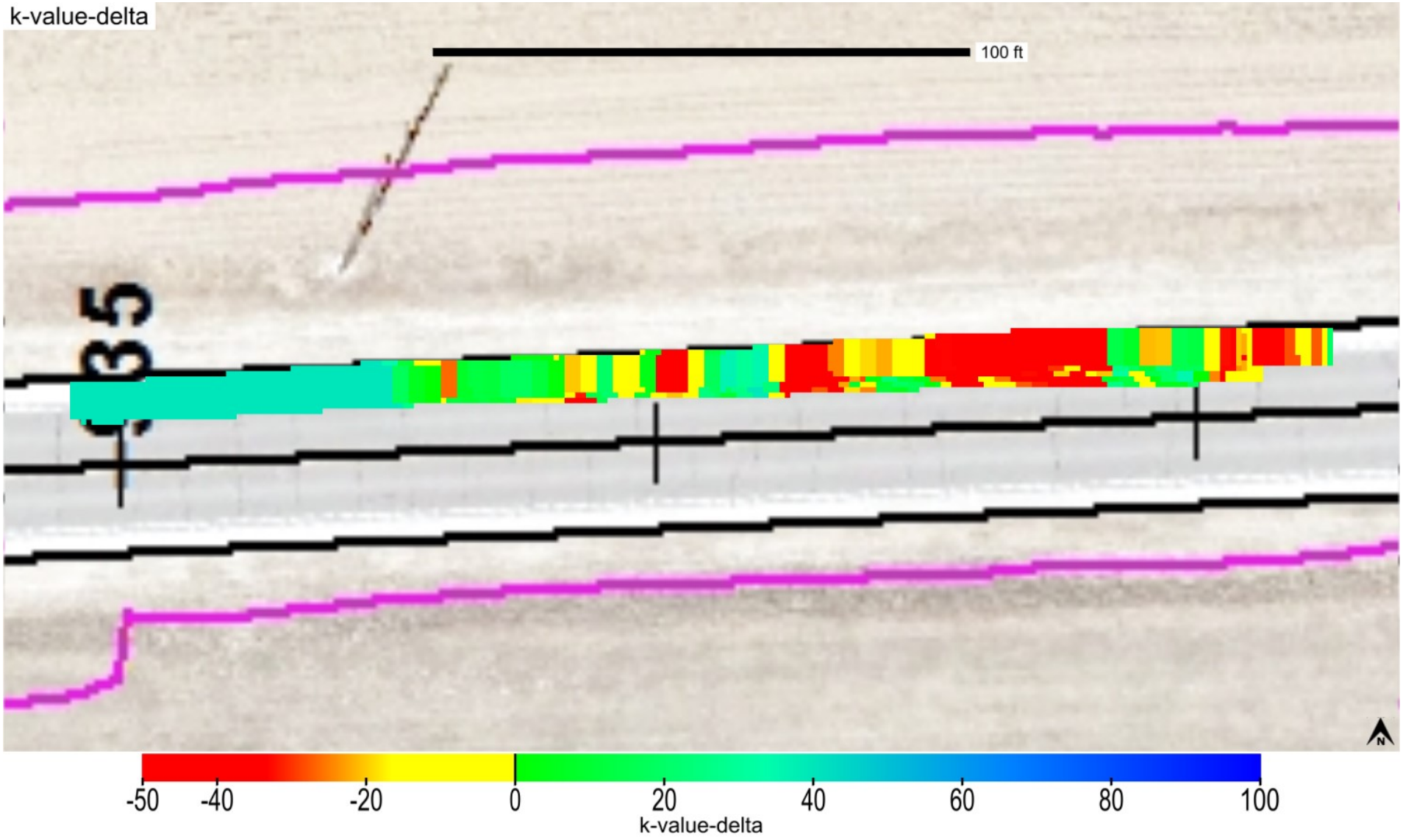
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_111121a

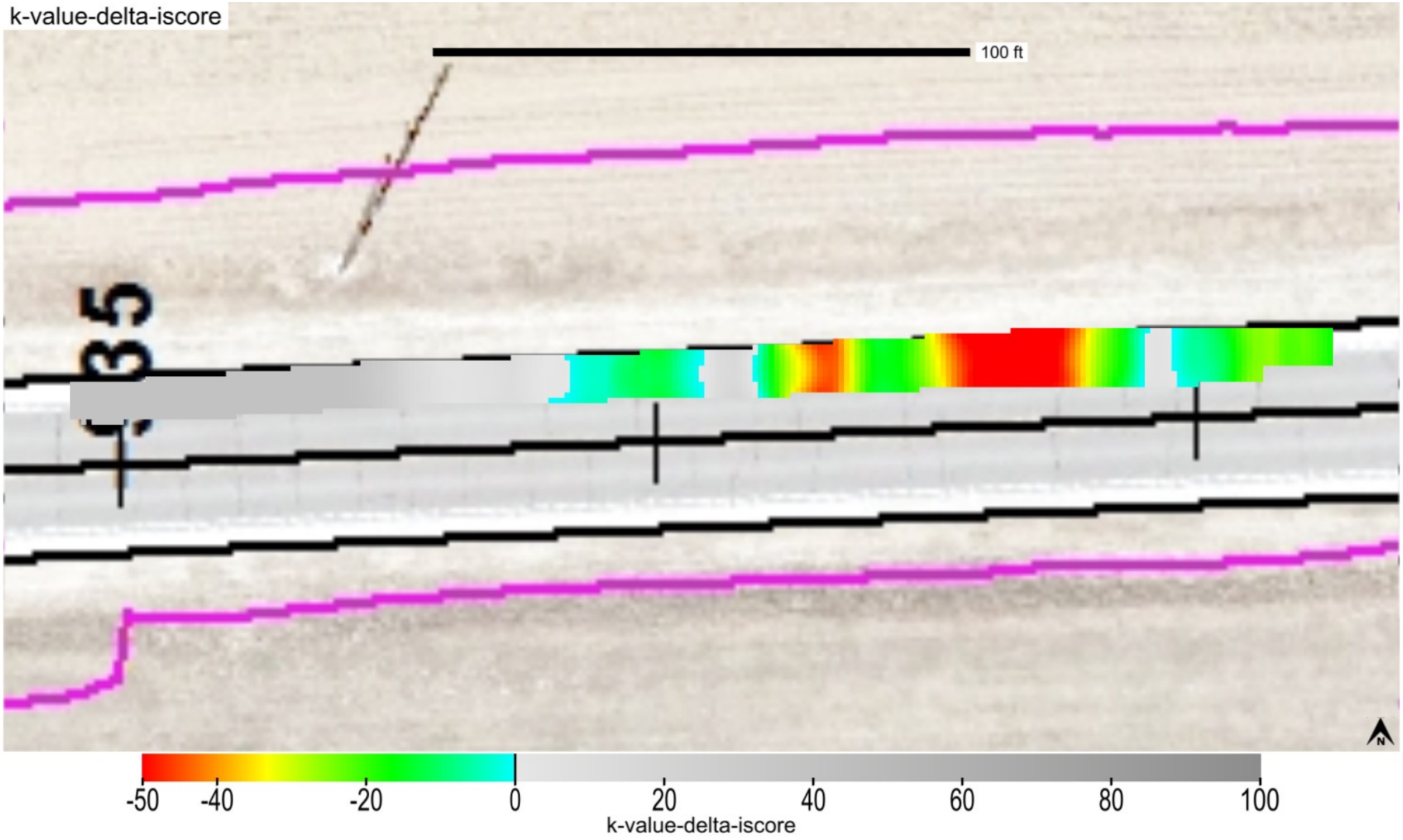
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	50.6	68.16	0.6	150	26.88	146.1	190	36.44	24.95	-123.12	-3.9	40



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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_111121a

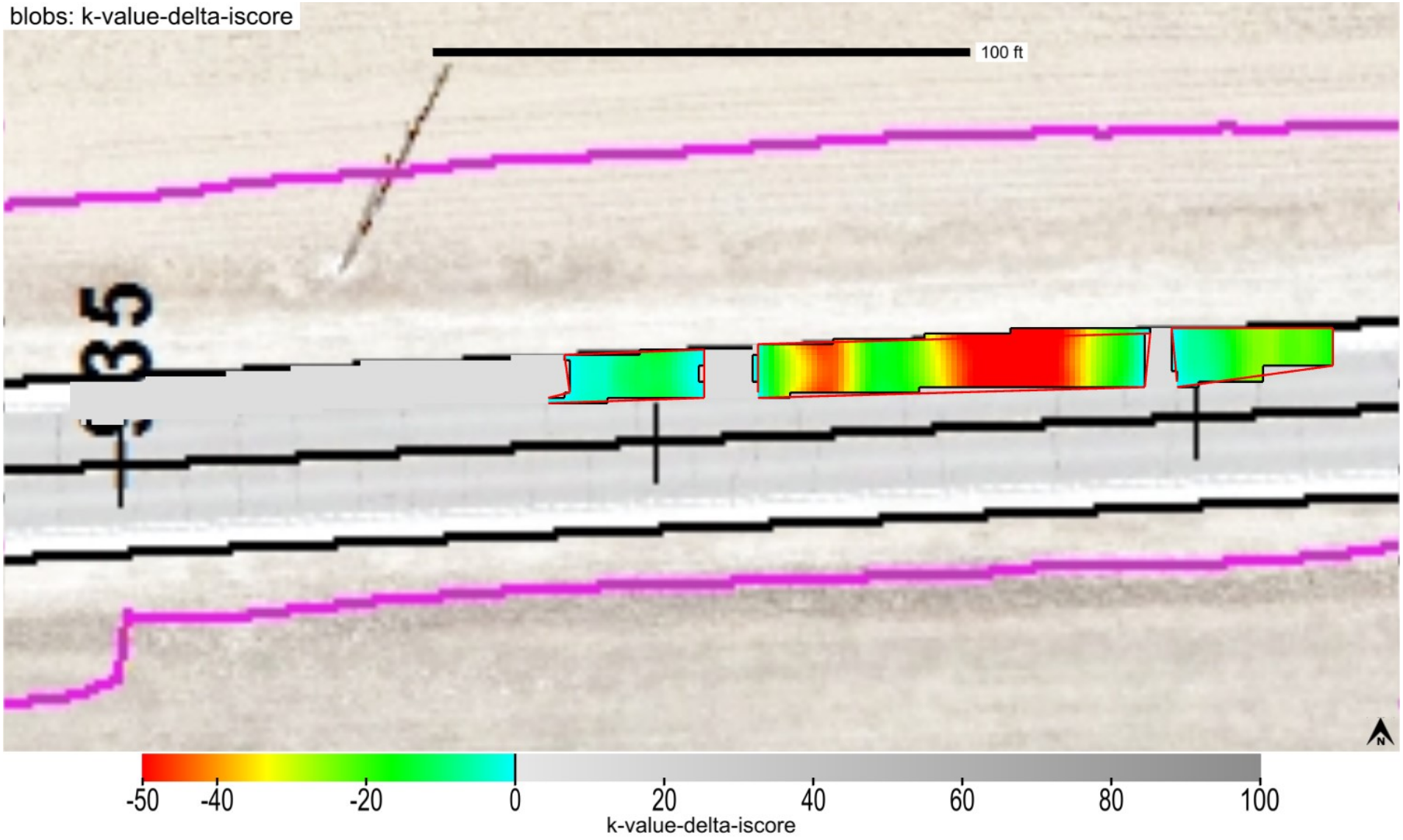
Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	50.6	150	-123.12	-3.9	40	-59.46	-4.06	40



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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_111121a

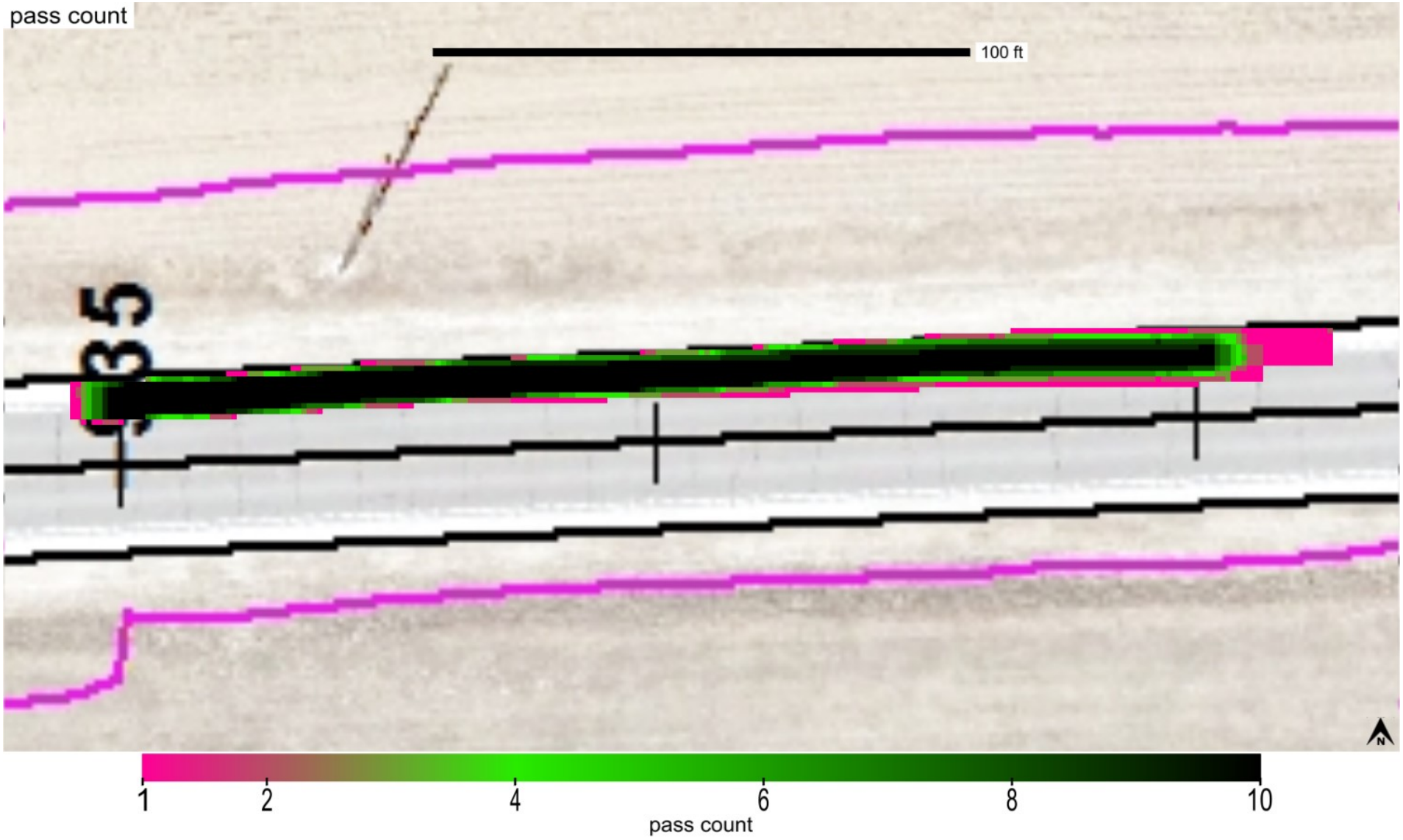
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	3	1227	57.52	none	0



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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_111121a

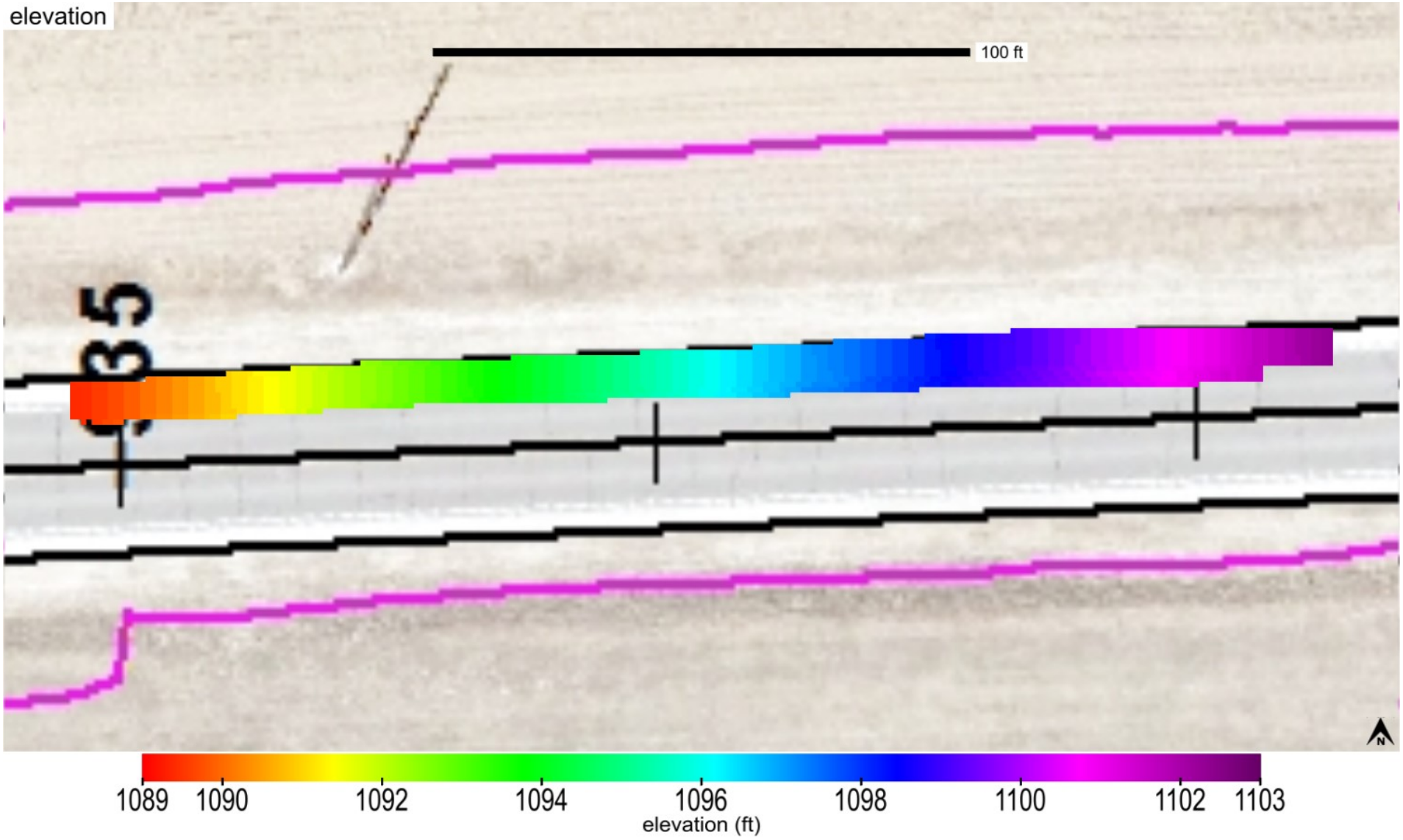
minimum	average	maximum
1	7.05	10



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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_111121a

minimum	average	maximum
1089.394	1096.158	1102.288



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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_111121a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	2133	0.049	12	9037	150	40

Modified Subbase_IADOT (2115)

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

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.23	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_14_115942a	No. of Measurements:	25727	Machine ID:	Ingios_FCS00210
Date and Time:	8/14/2020 11:59:42 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	45.7	56.53	0.38	150	35	140.5	287.98	53.78	38.27	-115	-9.5	137.98
Moisture Content	No												

Mapped Area

square feet	acres
25727	0.59

Pass Count

min.	avg.	max.
1	1.23	3

Elevation (ft)

min.	avg.	max.
1014.52	1016.83	1018.03

Velocity (fps)

min.	avg.	max.
1.33	5.54	6.64

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Soil Cement_Subgrade	31001	100	25727	0.591	12	3000	150	40

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.23	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_14_115942a	No. of Measurements:	25727	Machine ID:	Ingios_FCS00210
Date and Time:	8/14/2020 11:59:42 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
56.53	CQI > = 95
45.7	80% of k-Value MVs >= 150
38.27	COV <= 20
58.05	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_115942a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	45.7	56.53	0.38	150	35	140.5	287.98	53.78	38.27	-115	-9.5	137.98

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_115942a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	45.7	56.53	0.38	150	35	140.5	287.98	53.78	38.27	-115	-9.5	137.98

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

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_115942a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	45.7	150	-115	-9.5	137.98	-115	-10.28	104.57

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_115942a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	10	14934	58.05	none	0

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

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_115942a

minimum	average	maximum
1	1.23	3

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

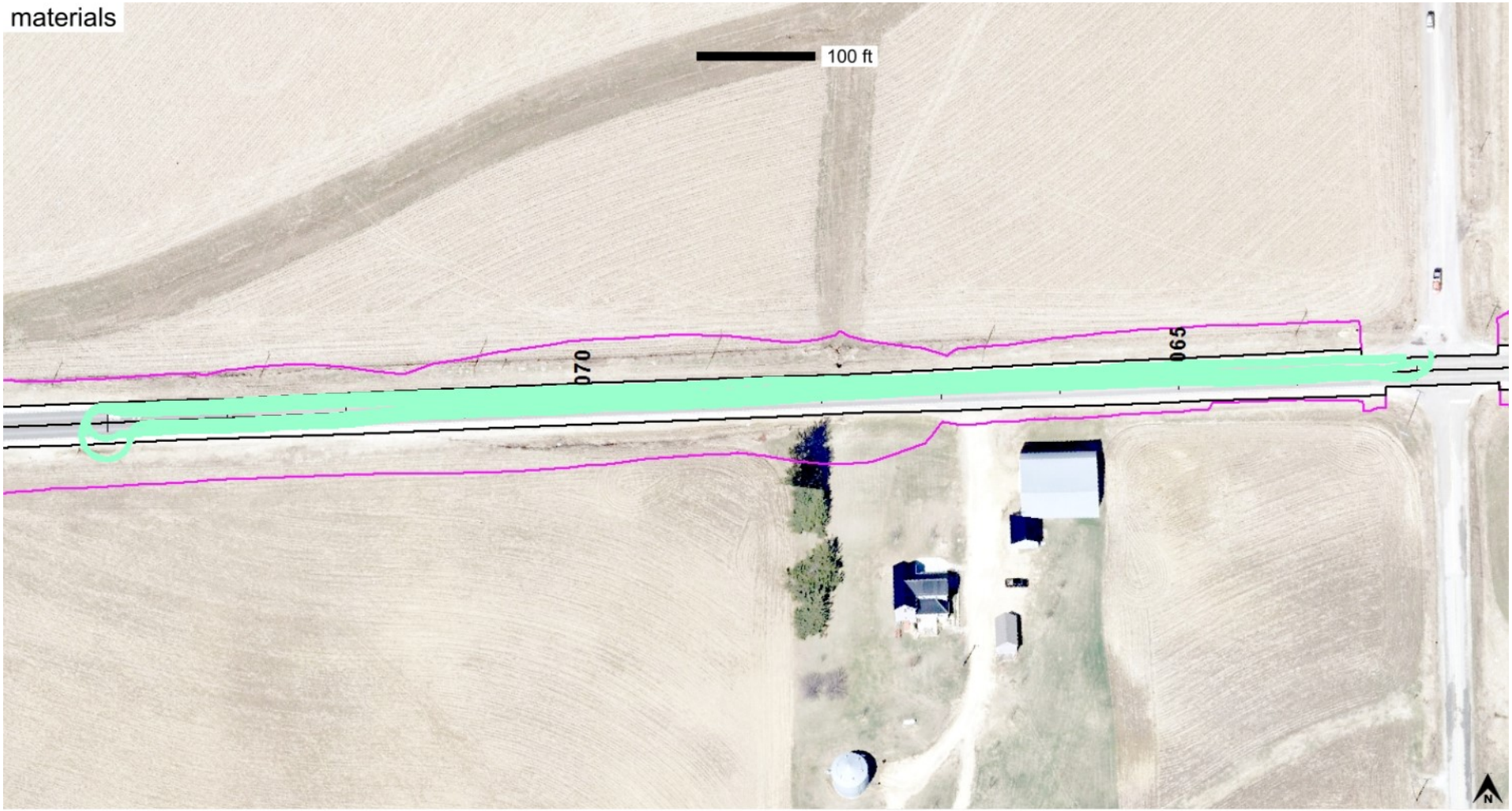
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_115942a

minimum	average	maximum
1014.522	1016.83	1018.03

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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_115942a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Soil Cement_Subgrade	31001	100	25727	0.591	12	3000	150	40



Soil Cement_Subgrade

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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_115942a

IMG_20200811_110902242_TOP.jpg

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

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_115942a

IMG_20200811_110912774_TOP.jpg

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

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_115942a

IMG_20200811_110934360.jpg

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

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_115942a

IMG_20200811_111016214_TOP.jpg

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

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_115942a

IMG_20200811_130602891_TOP.jpg

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

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.06	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_14_121500a	No. of Measurements:	7096	Machine ID:	Ingios_FCS00210
Date and Time:	8/14/2020 12:15:00 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	15.33	-1.16	150	35	39.6	126.06	11.61	29.34	-115	-110.4	-23.94
Moisture Content	No												

Mapped Area

square feet	acres
7096	0.16

Pass Count

min.	avg.	max.
1	1.12	2

Elevation (ft)

min.	avg.	max.
0	0	0

Velocity (fps)

min.	avg.	max.
0.73	5.45	6

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Soil Cement_Subgrade	24006	100	7096	0.163	12	3000	150	40

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

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.06	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_14_121500a	No. of Measurements:	7096	Machine ID:	Ingios_FCS00210
Date and Time:	8/14/2020 12:15:00 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
15.33	CQI > = 95
0	80% of k-Value MVs >= 150
29.34	COV <= 20
100	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

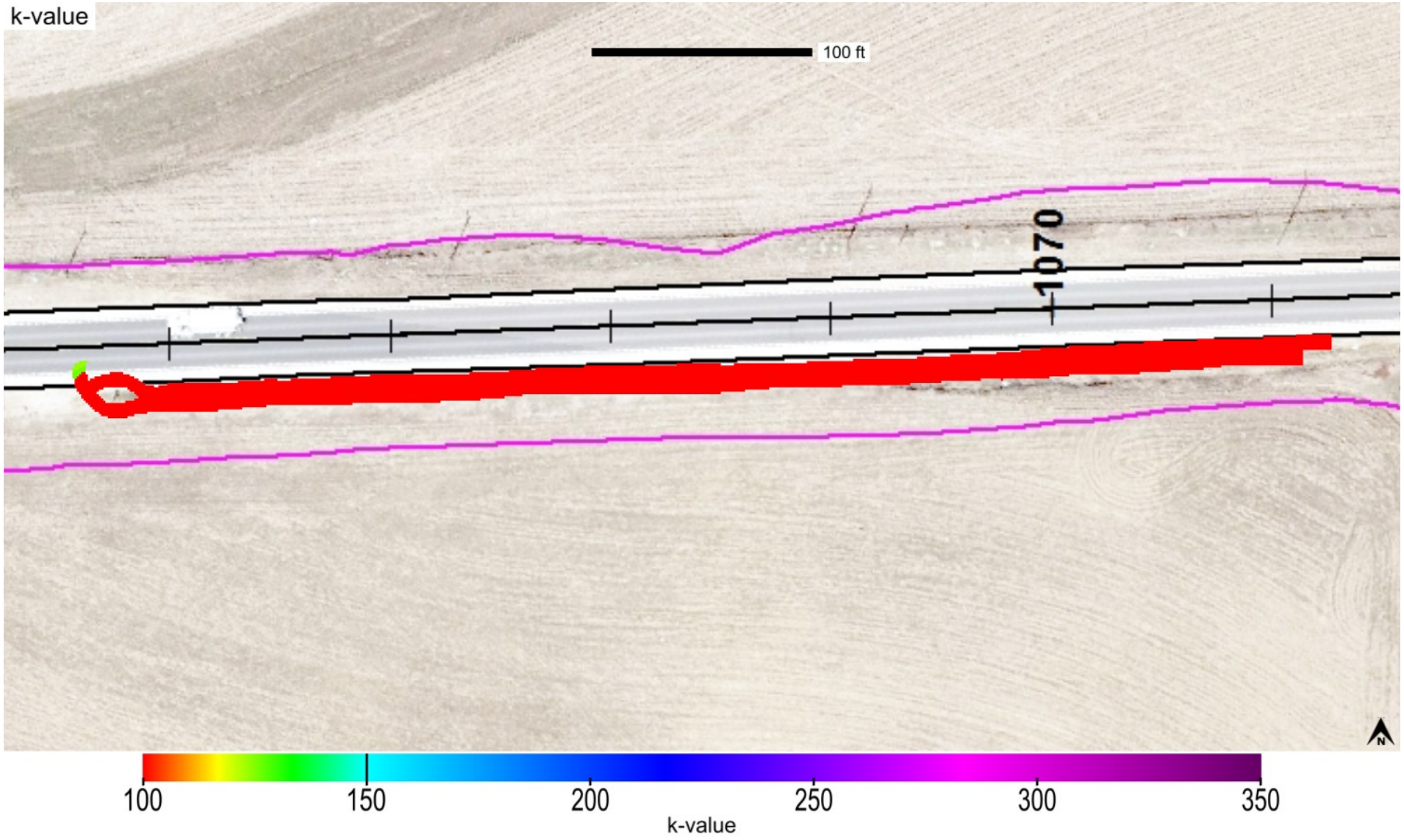
i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_121500a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0	15.33	-1.16	150	35	39.6	126.06	11.61	29.34	-115	-110.4	-23.94

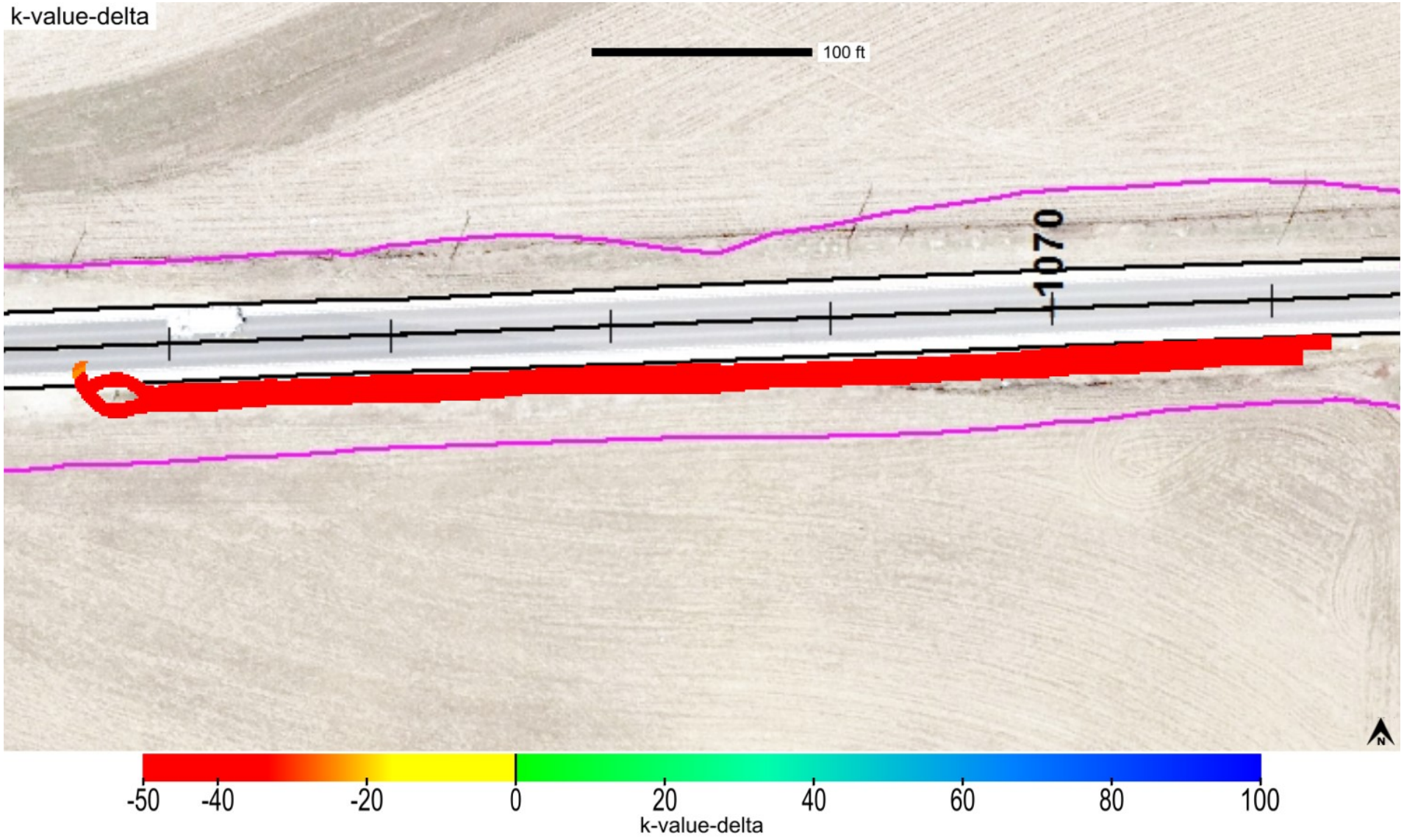


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_121500a

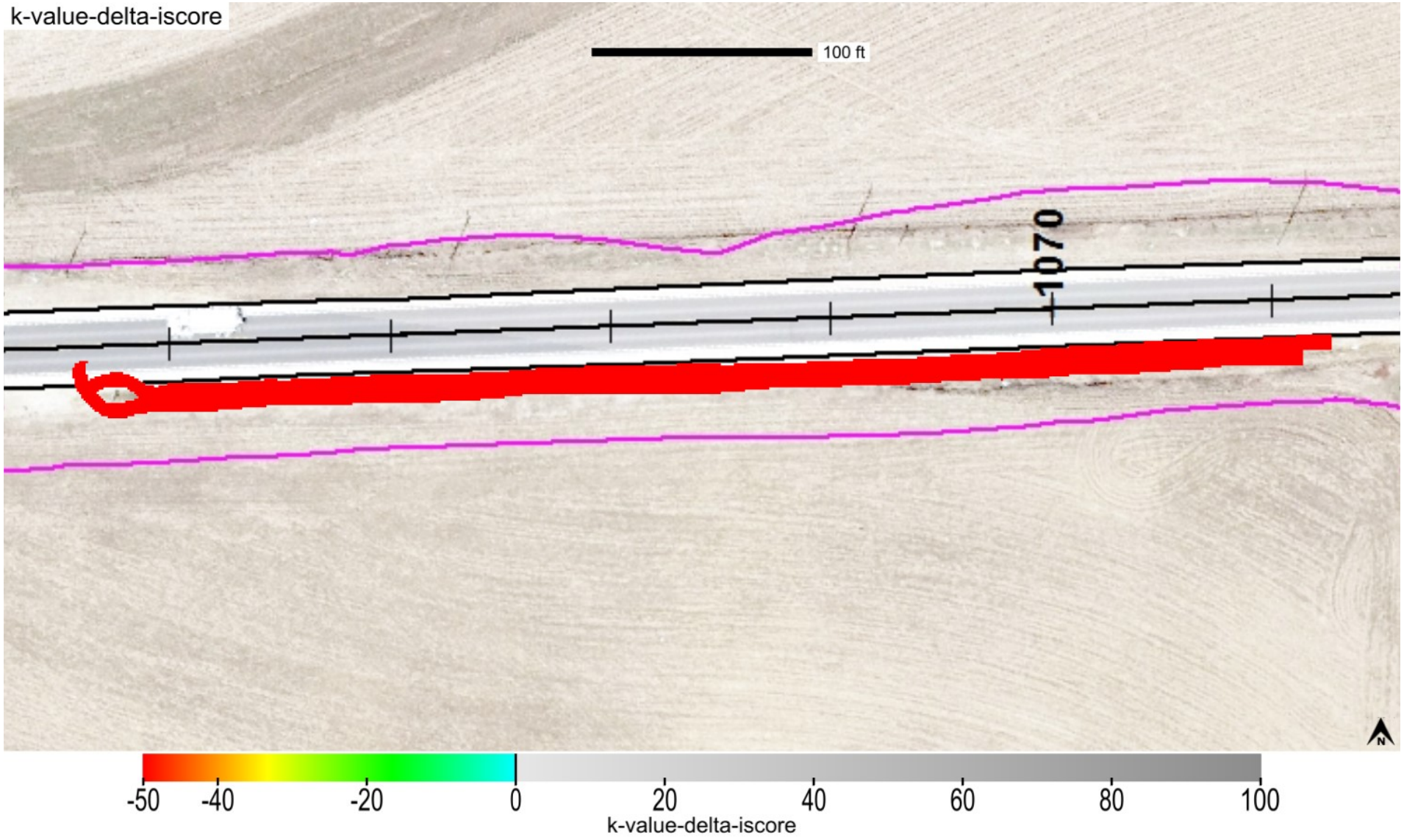
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0	15.33	-1.16	150	35	39.6	126.06	11.61	29.34	-115	-110.4	-23.94



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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_121500a

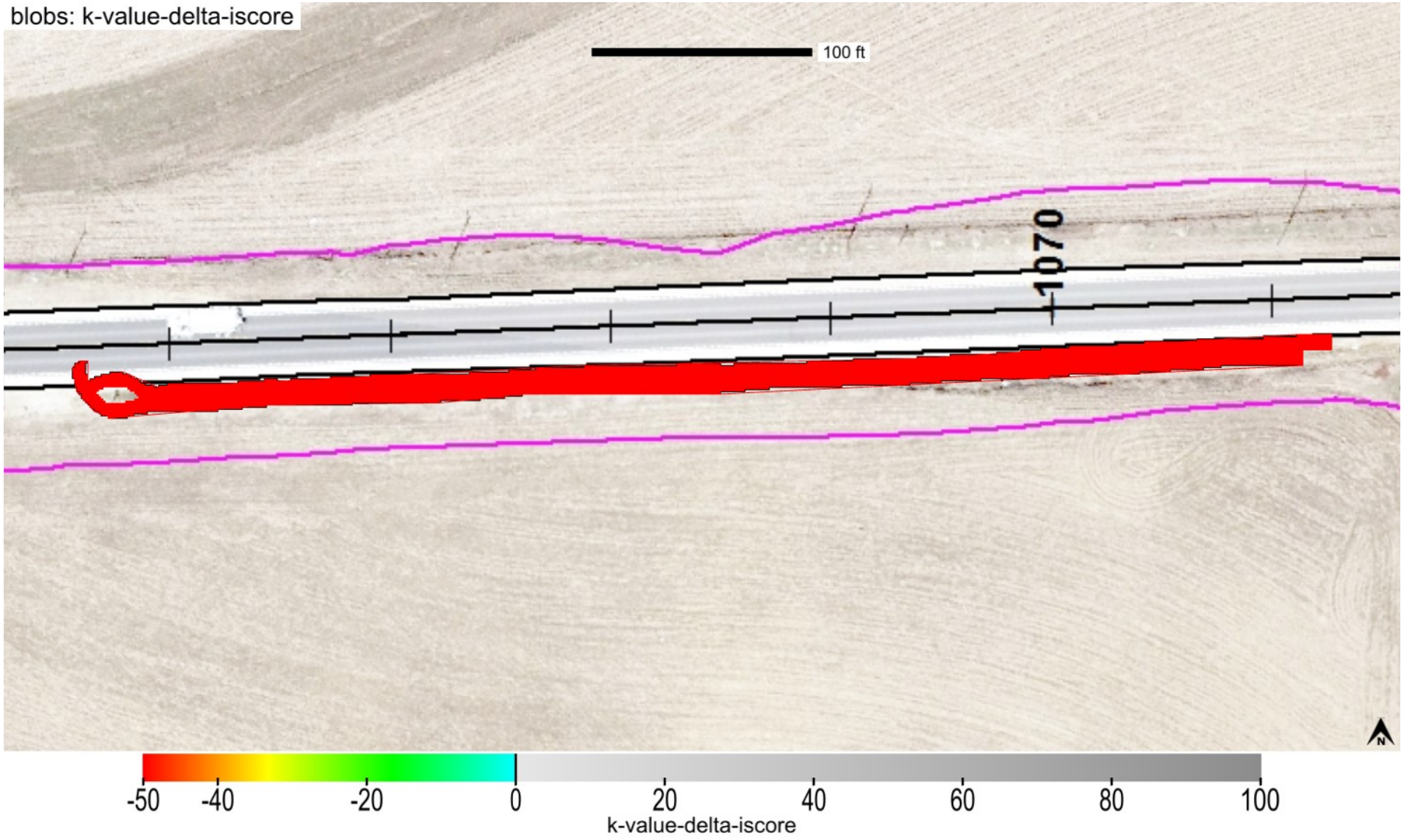
Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	0	150	-115	-110.4	-23.94	-115	-110.57	-54.18



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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_121500a

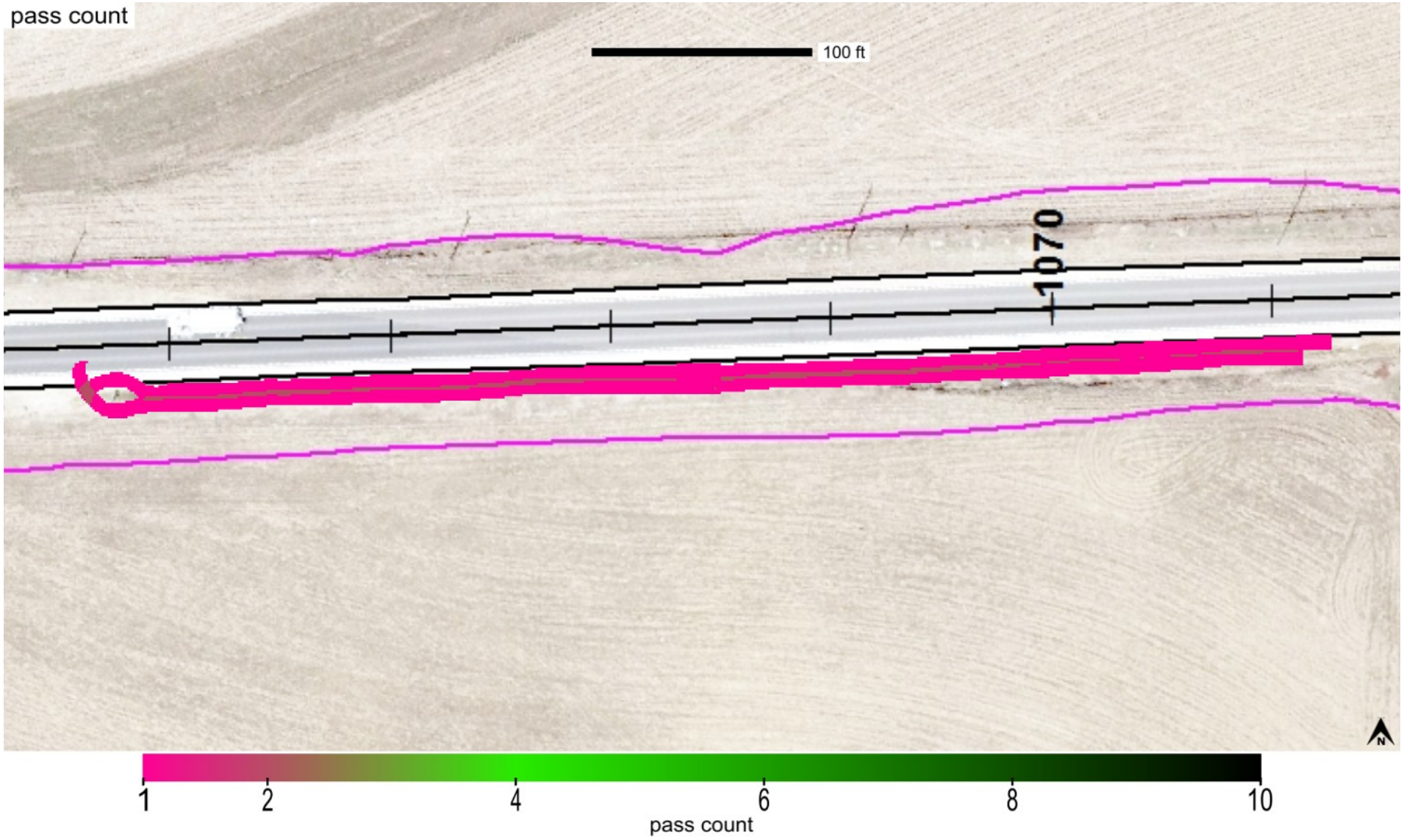
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	7096	100	none	0



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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_121500a

minimum	average	maximum
1	1.12	2



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

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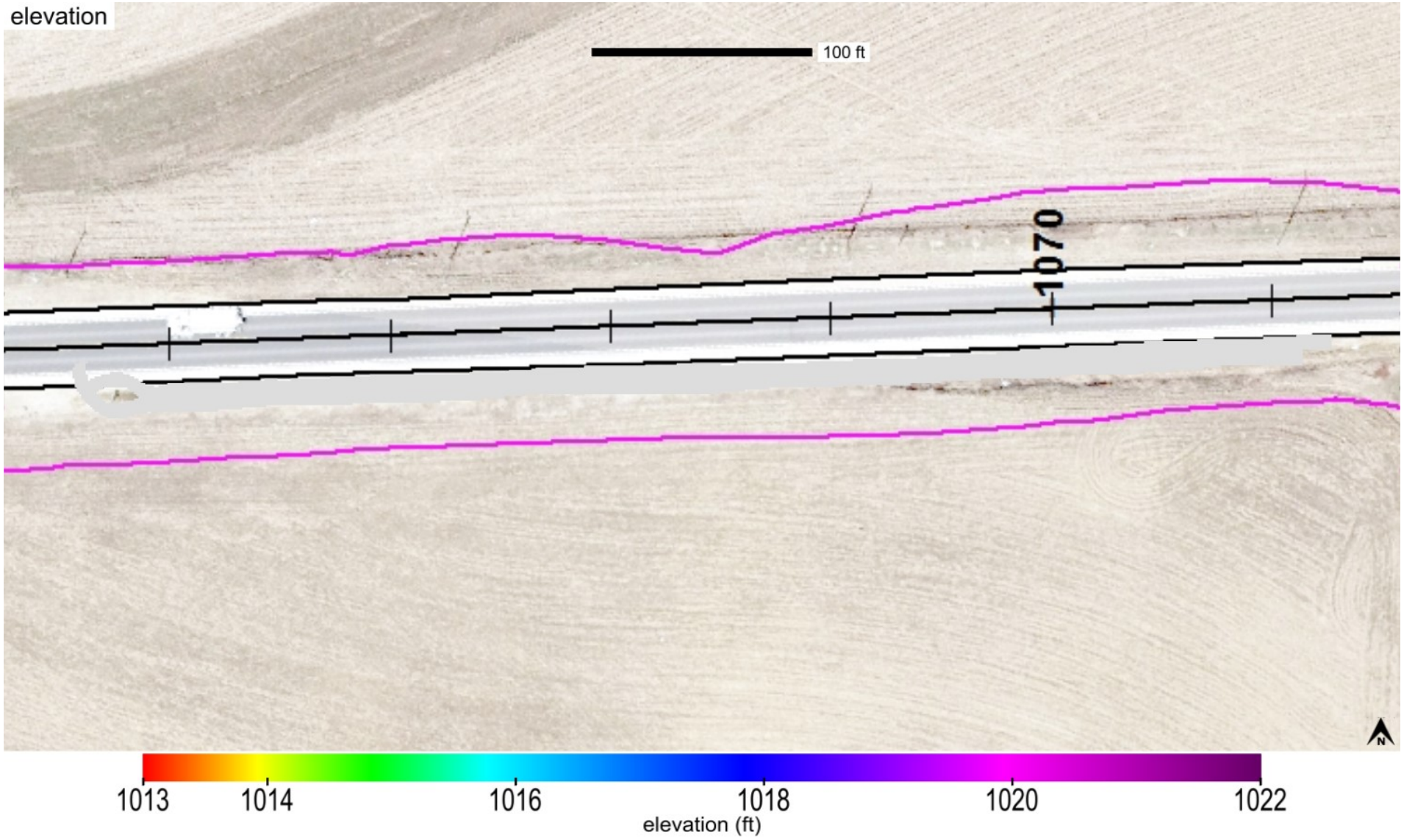
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_121500a

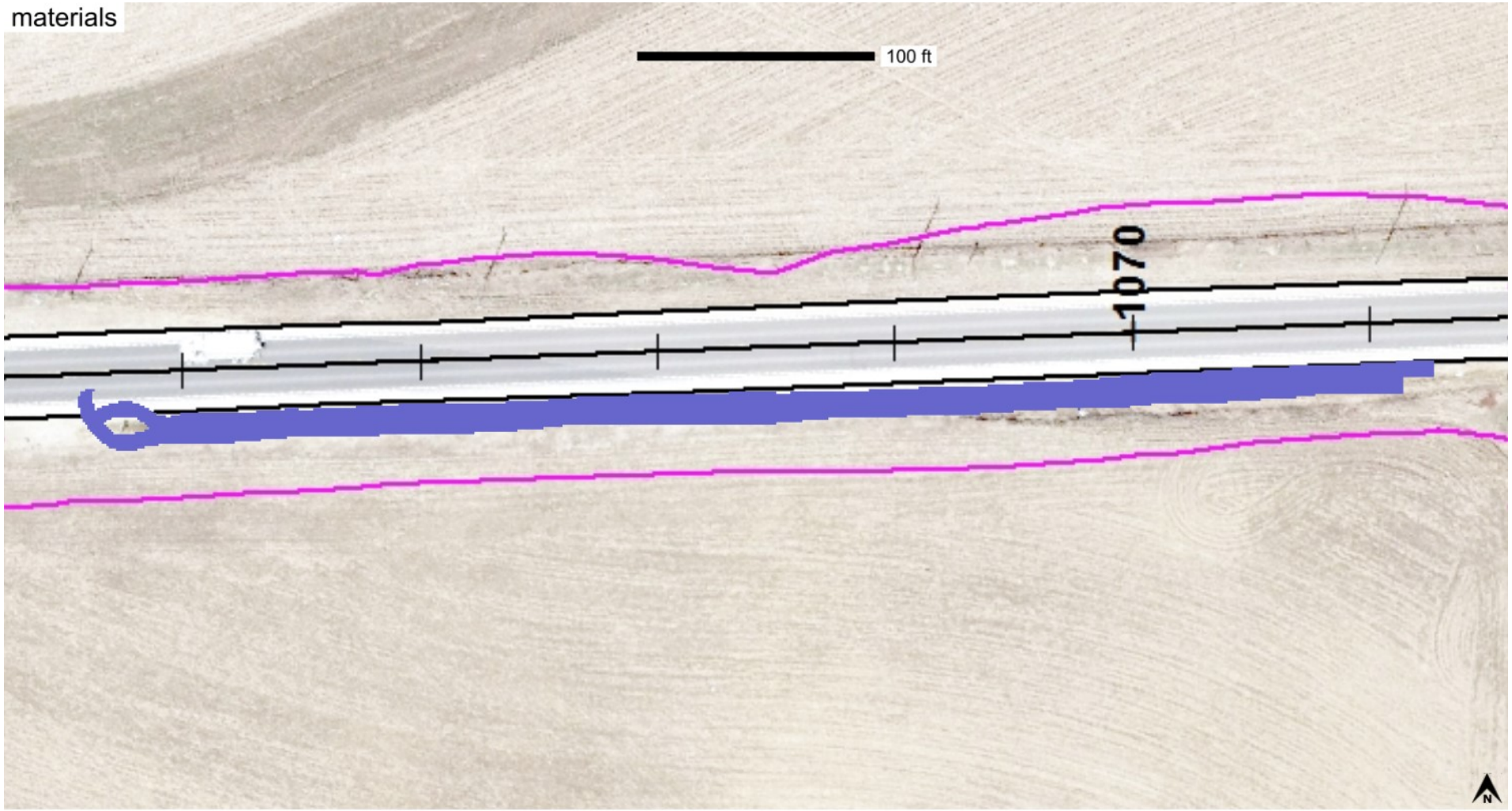
minimum	average	maximum
0	0	0



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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_121500a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Soil Cement_Subgrade	24006	100	7096	0.163	12	3000	150	40



Subgrade_Treatment Select Cohesive_IADOT (2102.02D)

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

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_121500a

IMG_20200811_110608889.jpg

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_121500a

IMG_20200811_110902242_TOP.jpg

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

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_121500a

IMG_20200811_111016214_TOP.jpg

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

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_121500a

IMG_20200811_130602891_TOP.jpg

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.16	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_14_122948a	No. of Measurements:	14706	Machine ID:	Ingios_FCS00210
Date and Time:	8/14/2020 12:29:48 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	65.2	80.43	0.59	150	35	166.8	268.29	49.19	29.49	-115	16.8	118.29
Moisture Content	No												

Mapped Area

square feet	acres
14706	0.34

Pass Count

min.	avg.	max.
1	1.41	4

Elevation (ft)

min.	avg.	max.
993.76	994.83	995.33

Velocity (fps)

min.	avg.	max.
0.24	5.56	6.46

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Soil Cement_Subgrade	31001	100	14706	0.338	12	3000	150	40

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

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.16	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_14_122948a	No. of Measurements:	14706	Machine ID:	Ingios_FCS00210
Date and Time:	8/14/2020 12:29:48 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
80.43	CQI > = 95
65.2	80% of k-Value MVs >= 150
29.49	COV <= 20
22.18	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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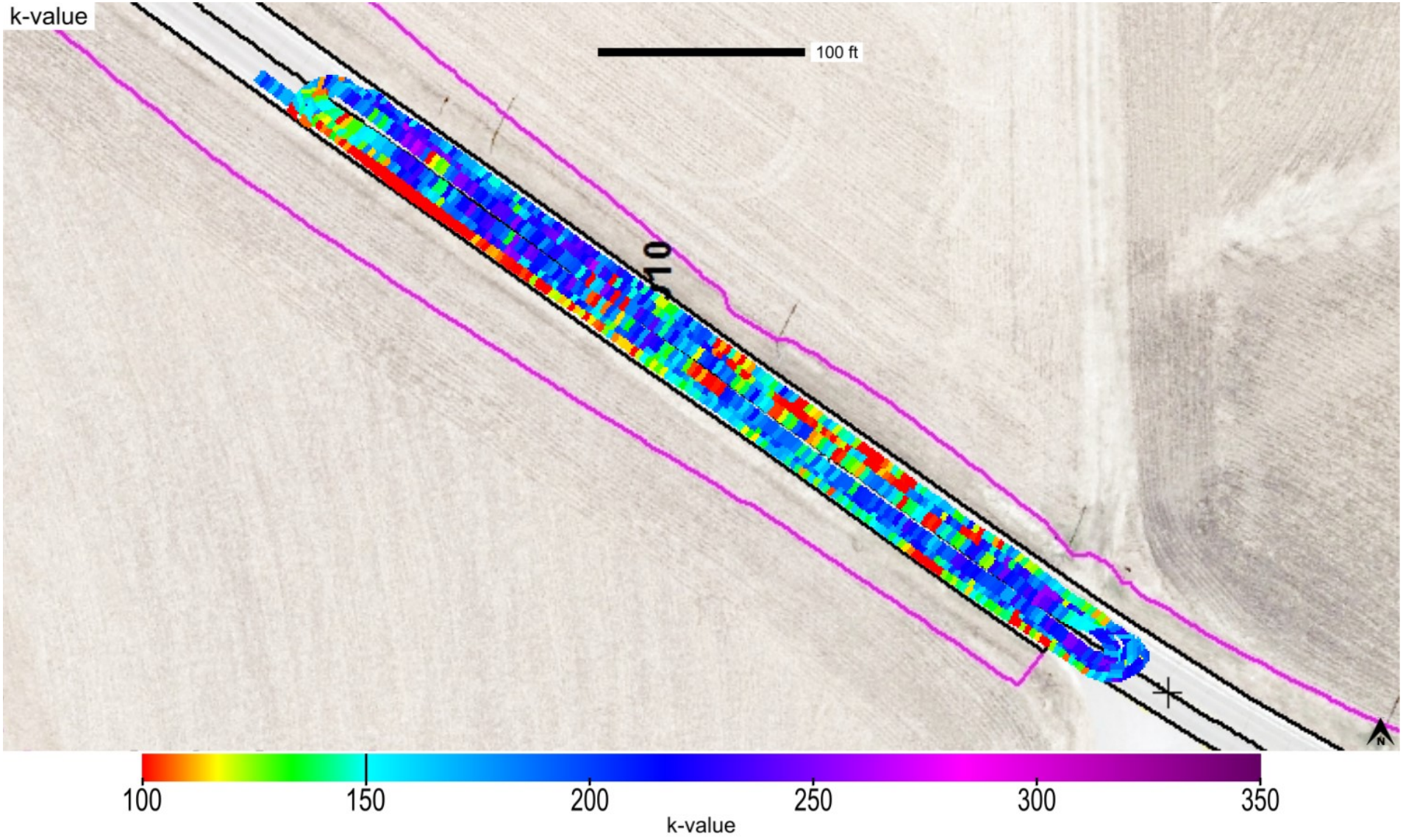
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_122948a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	65.2	80.43	0.59	150	35	166.8	268.29	49.19	29.49	-115	16.8	118.29



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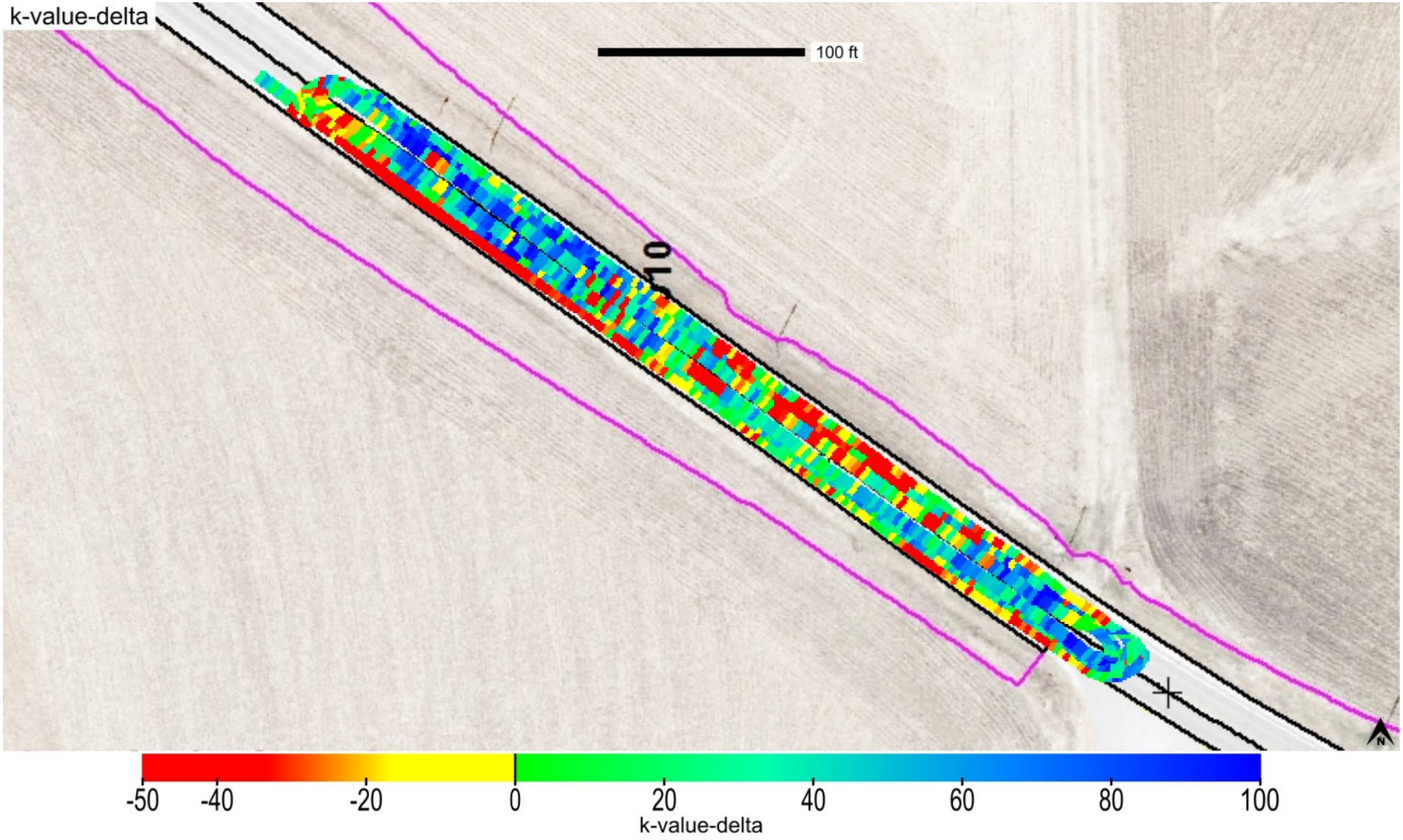
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_122948a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	65.2	80.43	0.59	150	35	166.8	268.29	49.19	29.49	-115	16.8	118.29



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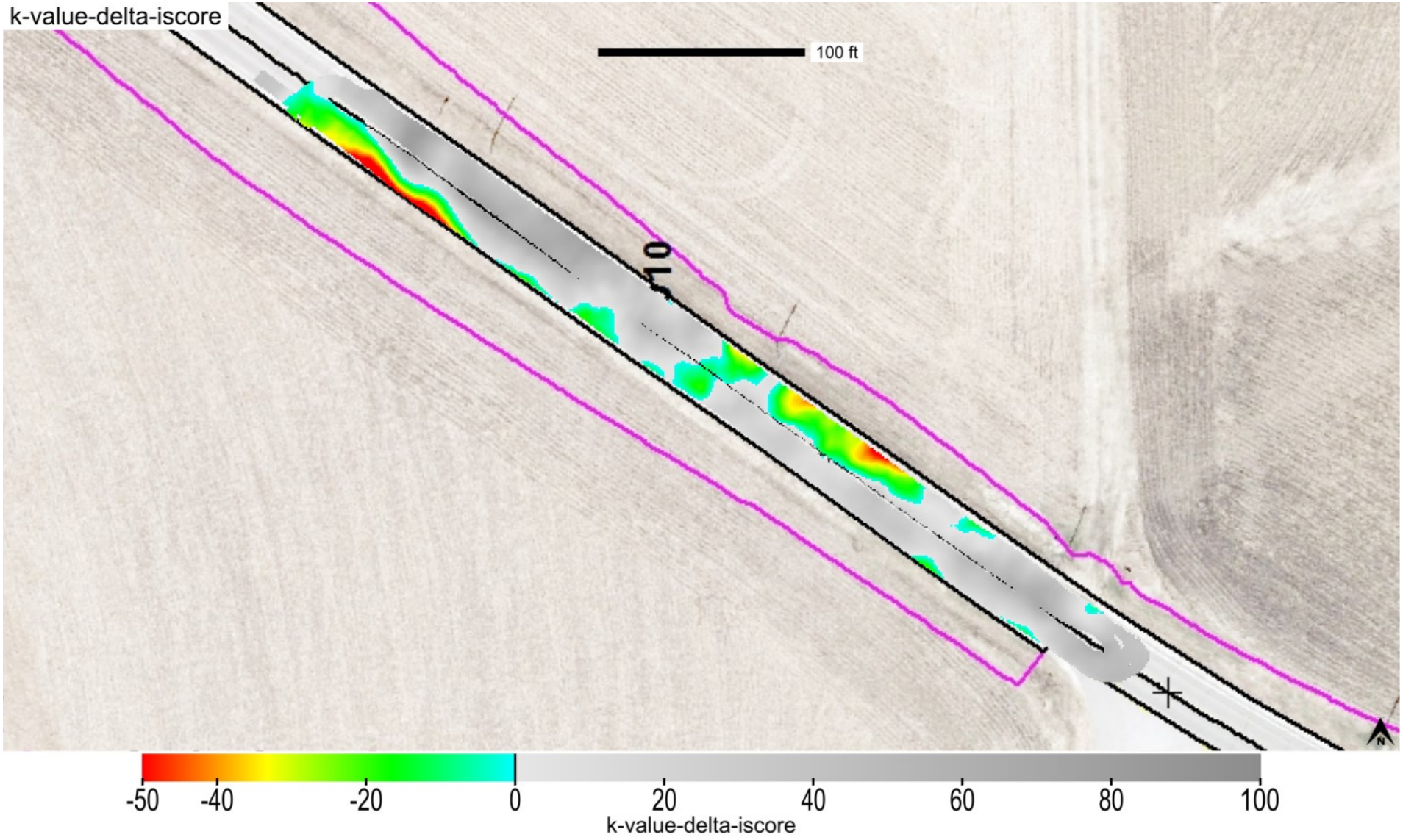
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_122948a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	65.2	150	-115	16.8	118.29	-78.63	18.46	80.49

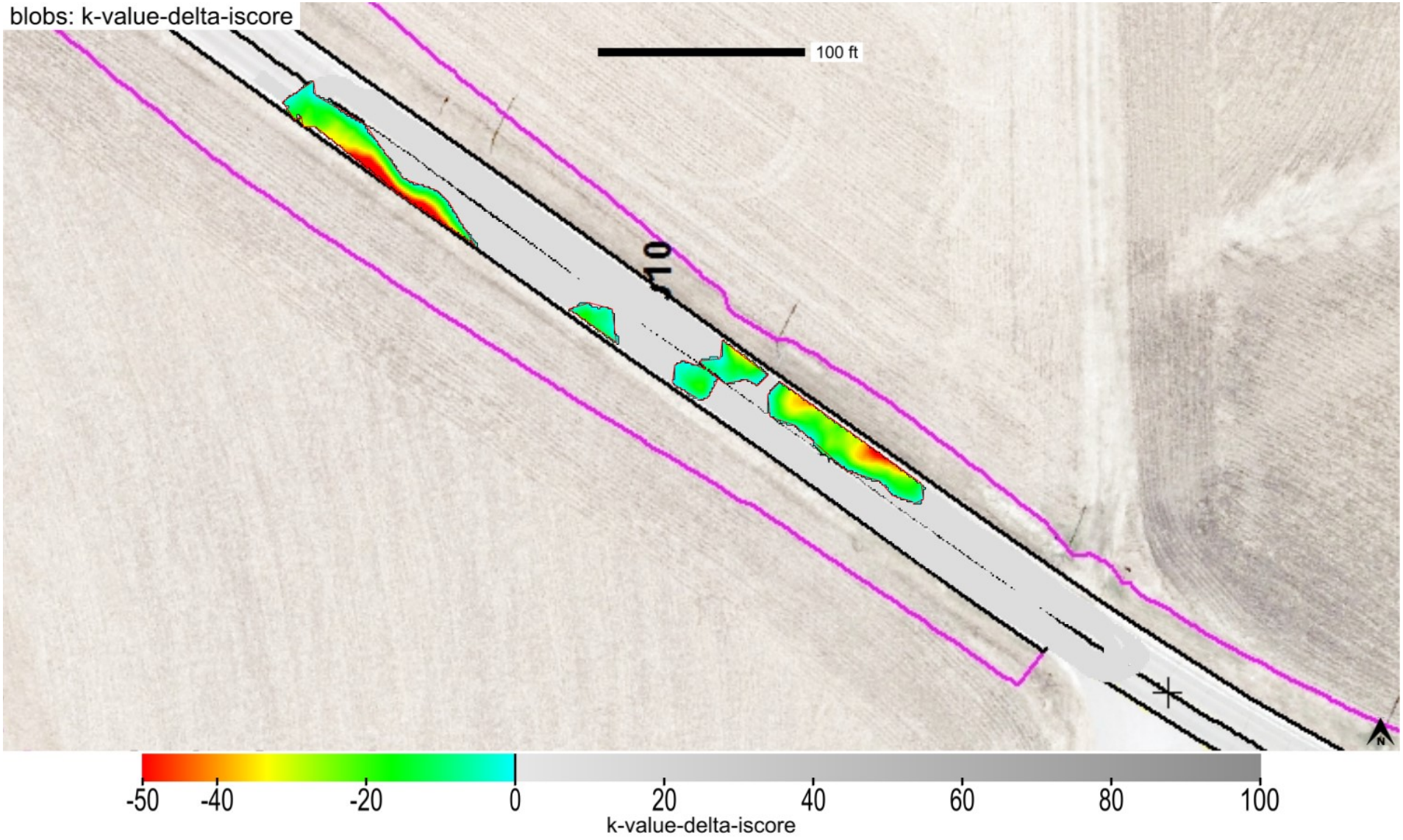


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_122948a

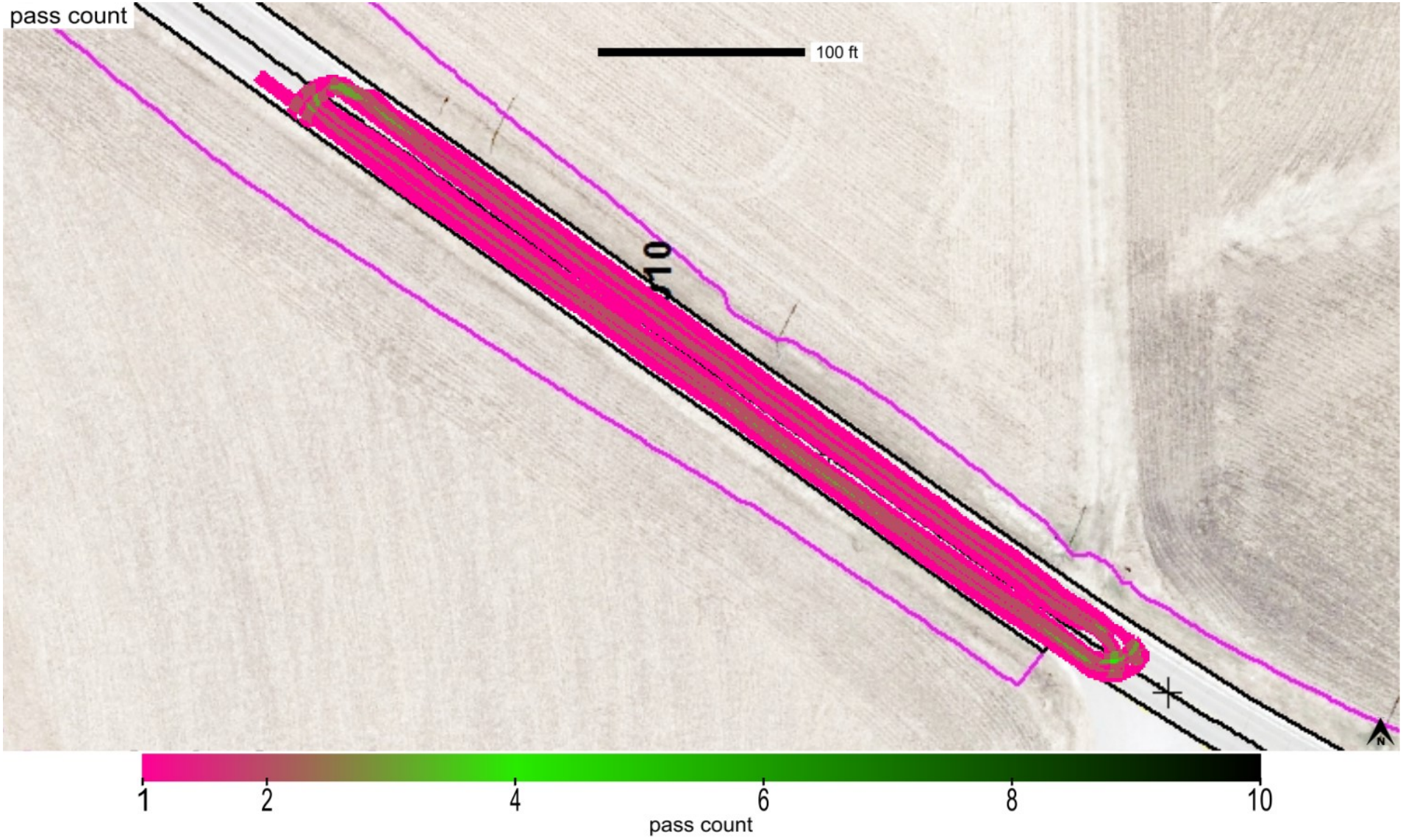
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	4	3262	22.18	none	0



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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_122948a

minimum	average	maximum
1	1.41	4



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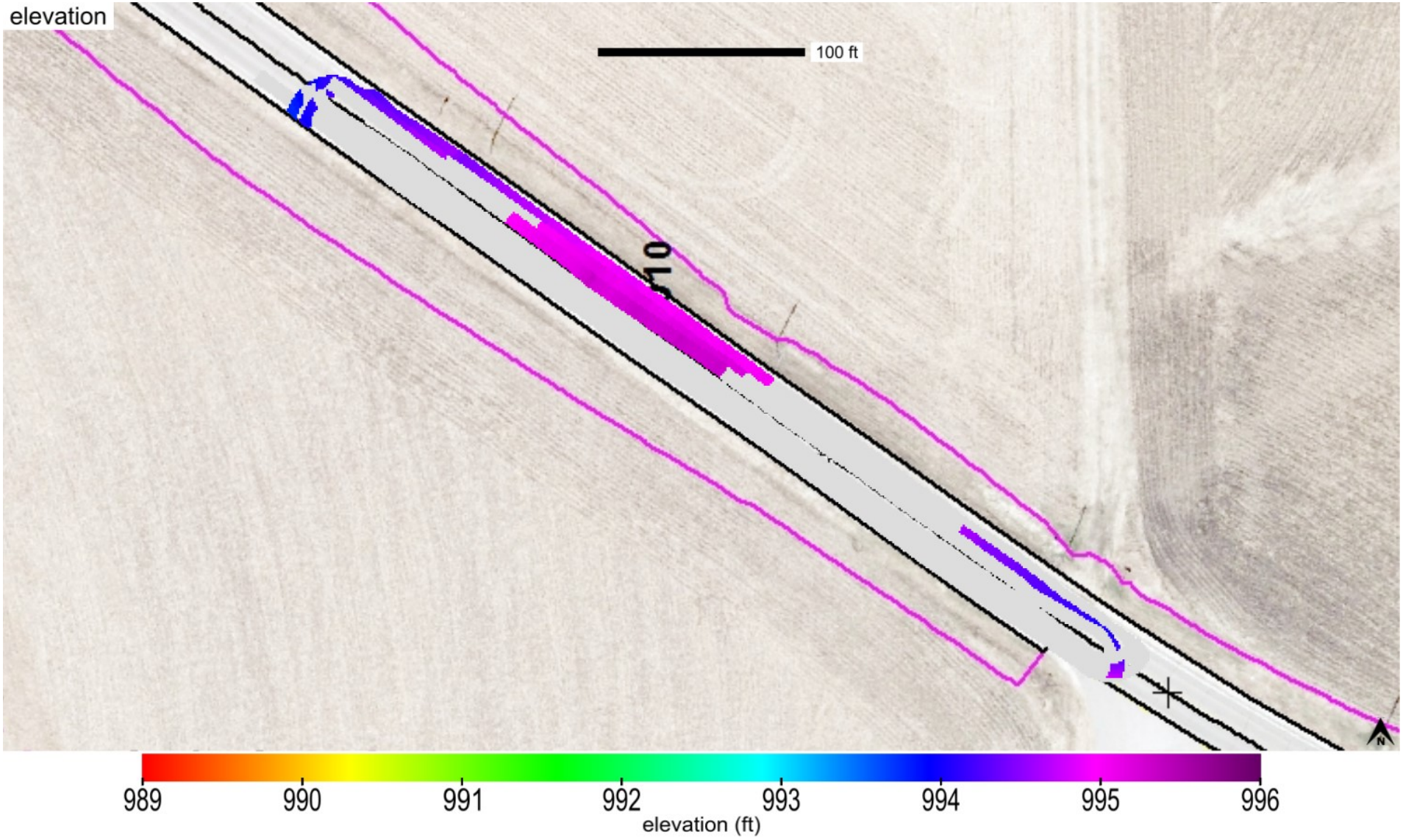
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_122948a

minimum	average	maximum
993.761	994.829	995.333



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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_122948a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Soil Cement_Subgrade	31001	100	14706	0.338	12	3000	150	40

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

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_122948a

IMG_20200806_113012797.jpg

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_122948a

IMG_20200806_113437095.jpg

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_14_122948a

IMG_20200811_143849947.jpg

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

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.03	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_17_105613a	No. of Measurements:	3450	Machine ID:	Ingios_FCS00210
Date and Time:	8/17/2020 10:56:13 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	47.7	62.41	0.48	150	35	143.9	237.28	44.09	30.65	-115	-6.1	87.28
Moisture Content	No												

Mapped Area

square feet	acres
3450	0.08

Pass Count

min.	avg.	max.
1	1	1

Elevation (ft)

min.	avg.	max.
1016.76	1019.49	1020.98

Velocity (fps)

min.	avg.	max.
4.87	5.54	6

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Soil Cement_Subgrade	31001	100	3450	0.079	12	3000	150	40

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

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.03	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_17_105613a	No. of Measurements:	3450	Machine ID:	Ingios_FCS00210
Date and Time:	8/17/2020 10:56:13 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
62.41	CQI > = 95
47.7	80% of k-Value MVs >= 150
30.65	COV <= 20
36.2	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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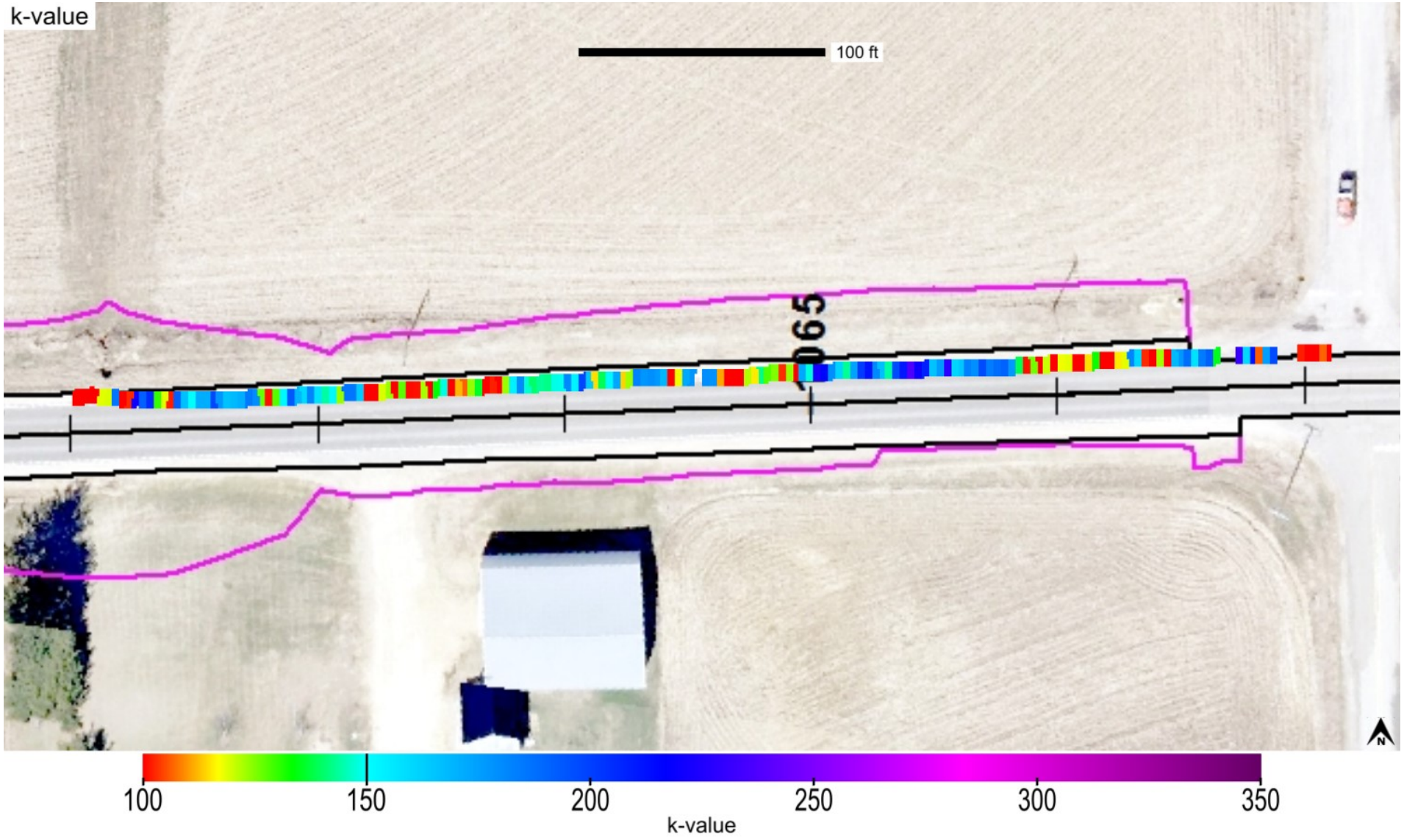
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_105613a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	47.7	62.41	0.48	150	35	143.9	237.28	44.09	30.65	-115	-6.1	87.28



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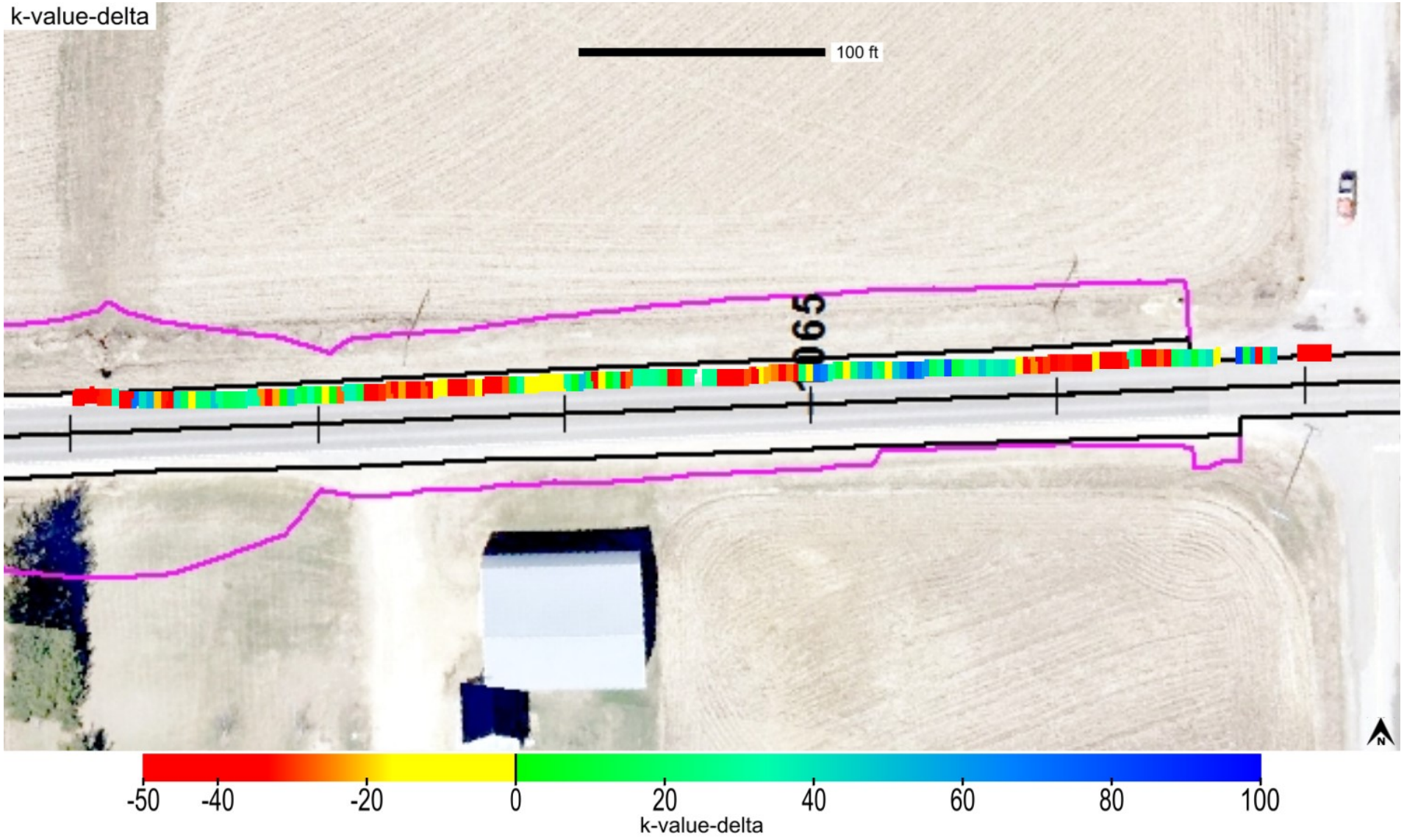
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_105613a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	47.7	62.41	0.48	150	35	143.9	237.28	44.09	30.65	-115	-6.1	87.28



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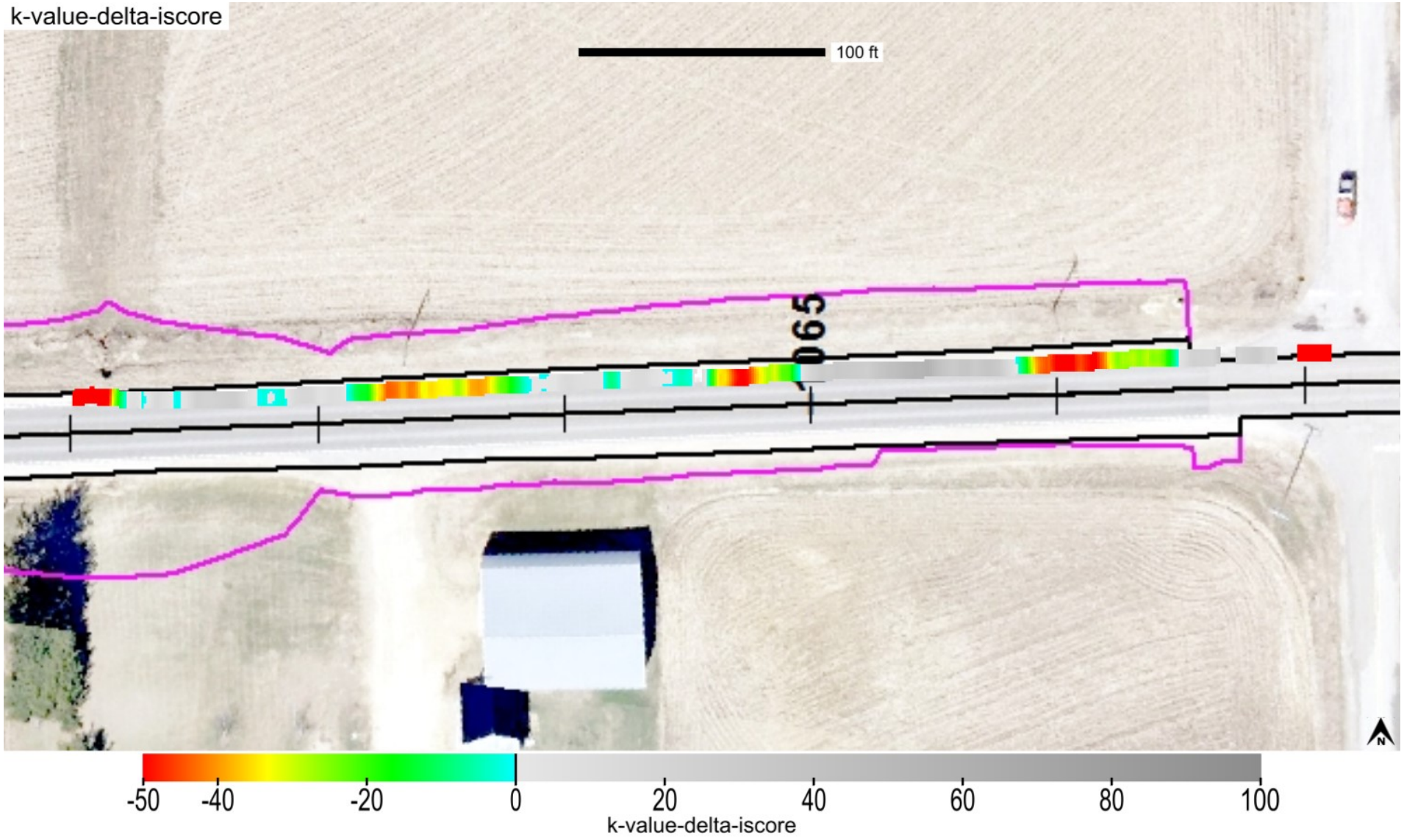
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_105613a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	47.7	150	-115	-6.1	87.28	-109.48	-6.33	56.23



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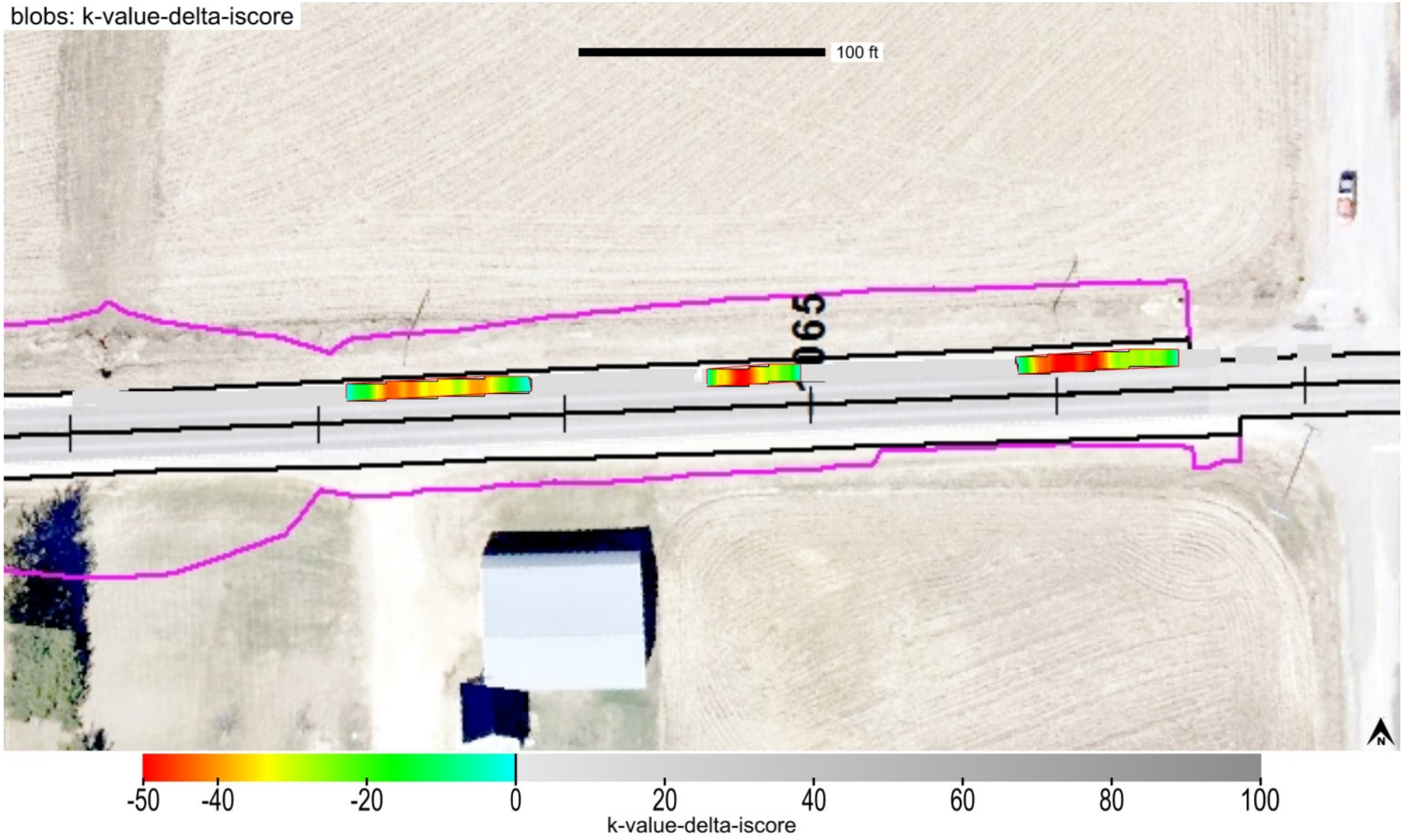
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_105613a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	3	1249	36.2	none	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: iadot_31-us52_cs56-fcs00210_2020_08_17_105613a

minimum	average	maximum
1	1	1

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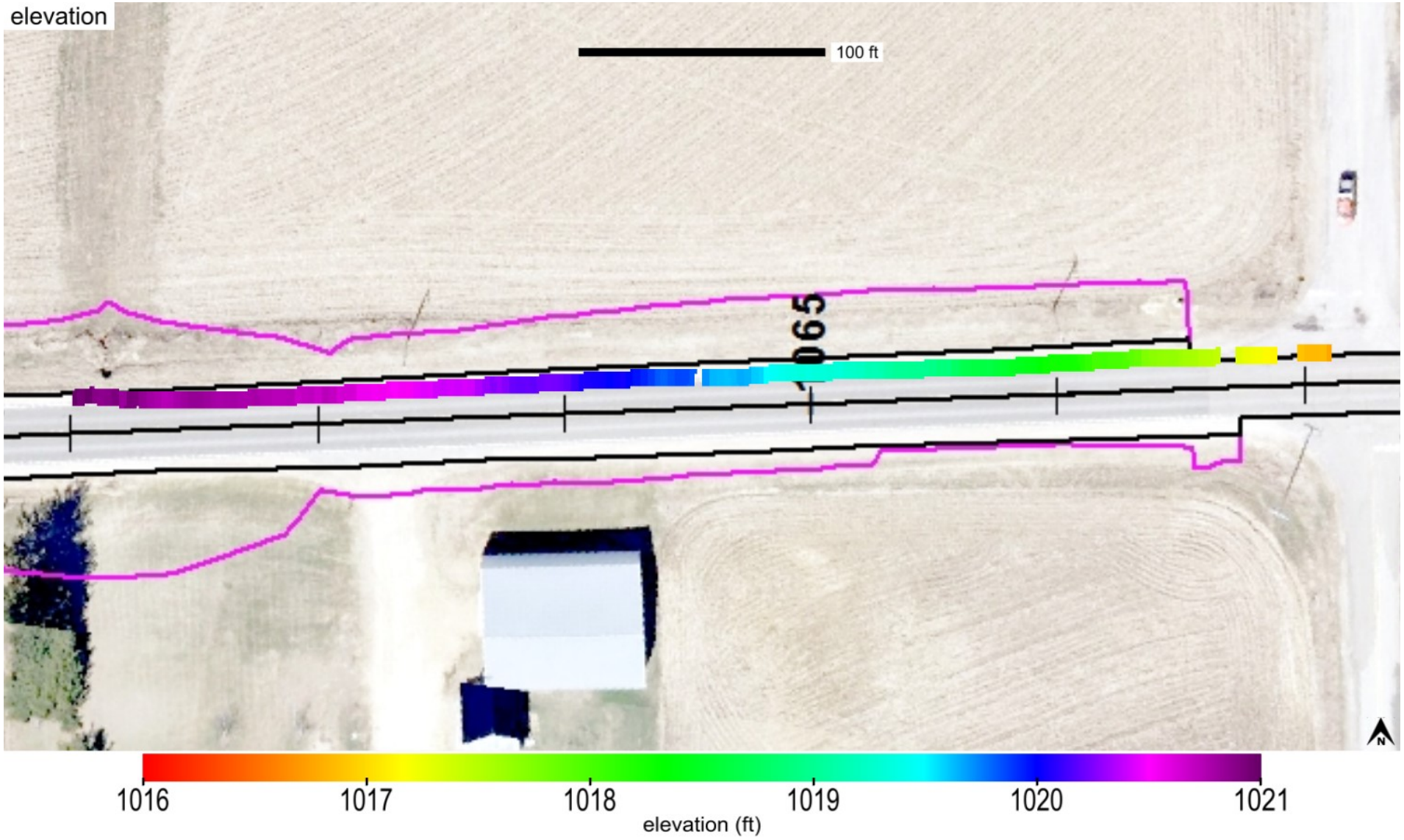
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_105613a

minimum	average	maximum
1016.76	1019.492	1020.979



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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_105613a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Soil Cement_Subgrade	31001	100	3450	0.079	12	3000	150	40

Soil Cement_Subgrade

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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_105613a

IMG_20200811_110934360.jpg

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

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_105613a

IMG_20200811_111016214_TOP.jpg

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ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_105613a

IMG_20200811_130602891_TOP.jpg

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.42	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_17_114325a	No. of Measurements:	40333	Machine ID:	Ingios_FCS00210
Date and Time:	8/17/2020 11:43:25 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	44.7	51.3	0.29	150	35	136.3	370	63.78	46.79	-115	-13.7	220
Moisture Content	No												

Mapped Area

square feet	acres
40333	0.93

Pass Count

min.	avg.	max.
1	1.3	4

Elevation (ft)

min.	avg.	max.
1016.33	1021.45	1024.95

Velocity (fps)

min.	avg.	max.
0.55	5.34	6.54

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Soil Cement_Subgrade	24006	100	40333	0.926	12	3000	150	40

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.42	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_17_114325a	No. of Measurements:	40333	Machine ID:	Ingios_FCS00210
Date and Time:	8/17/2020 11:43:25 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
51.3	CQI > = 95
44.7	80% of k-Value MVs >= 150
46.79	COV <= 20
63.72	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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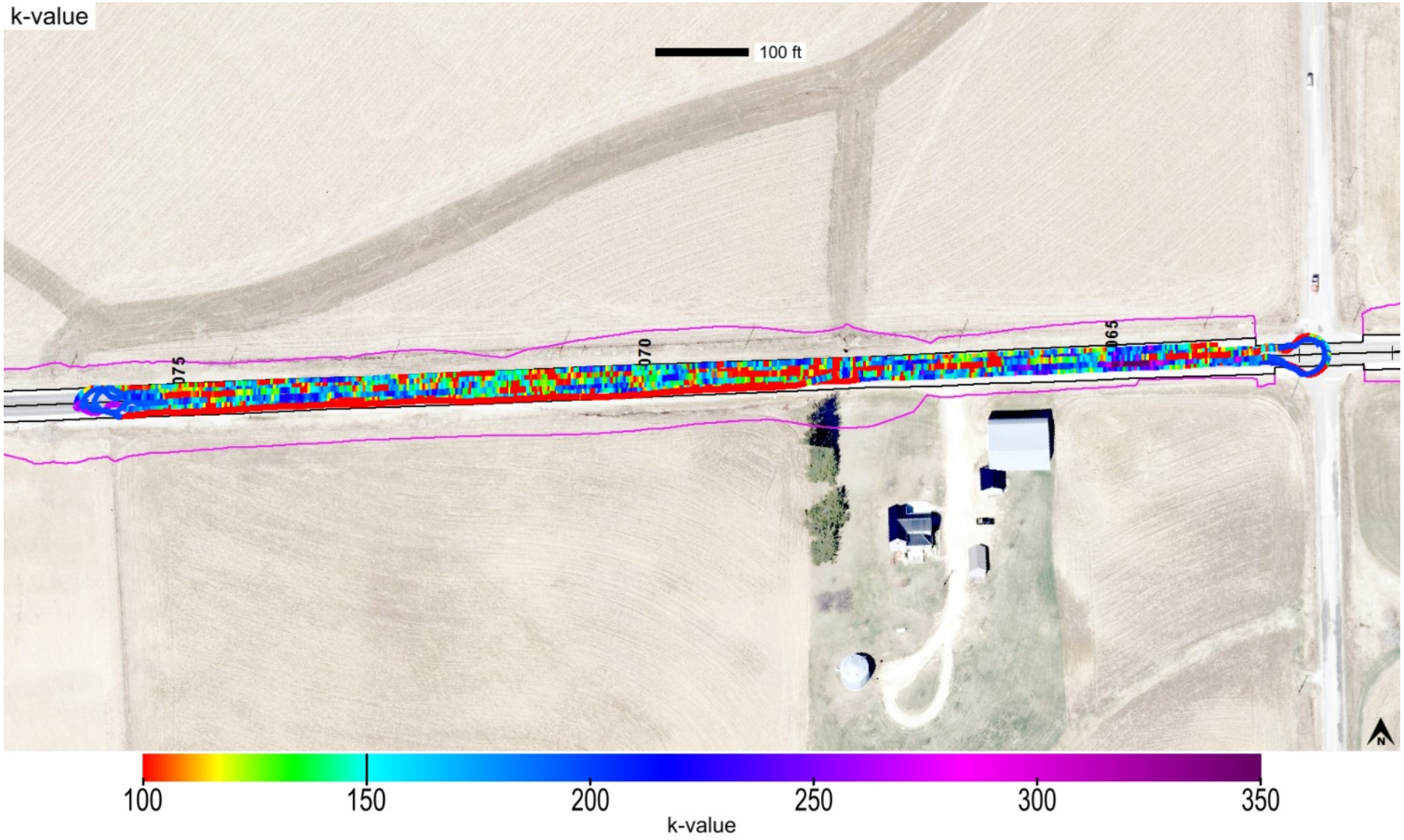
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_114325a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	44.7	51.3	0.29	150	35	136.3	370	63.78	46.79	-115	-13.7	220

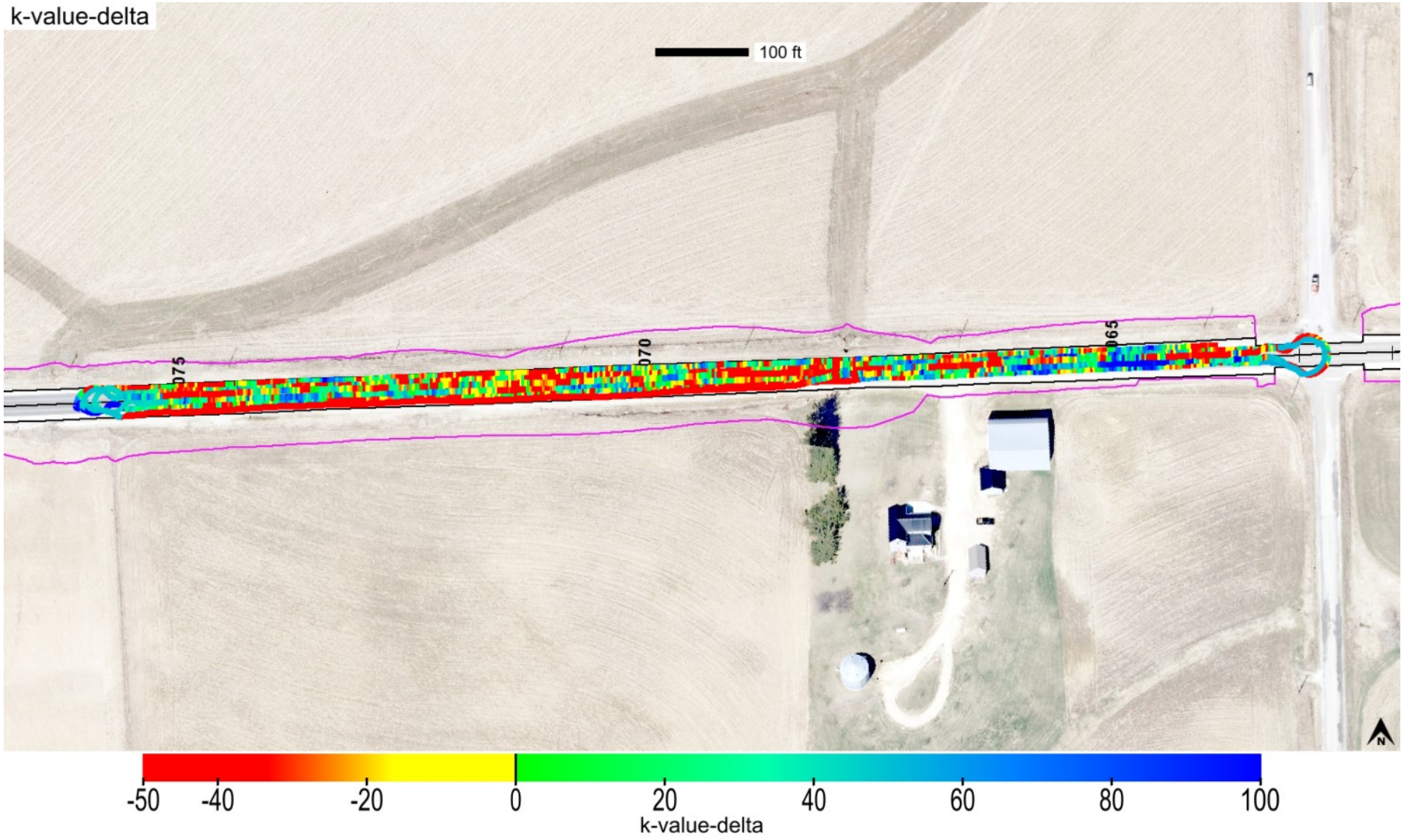


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_114325a

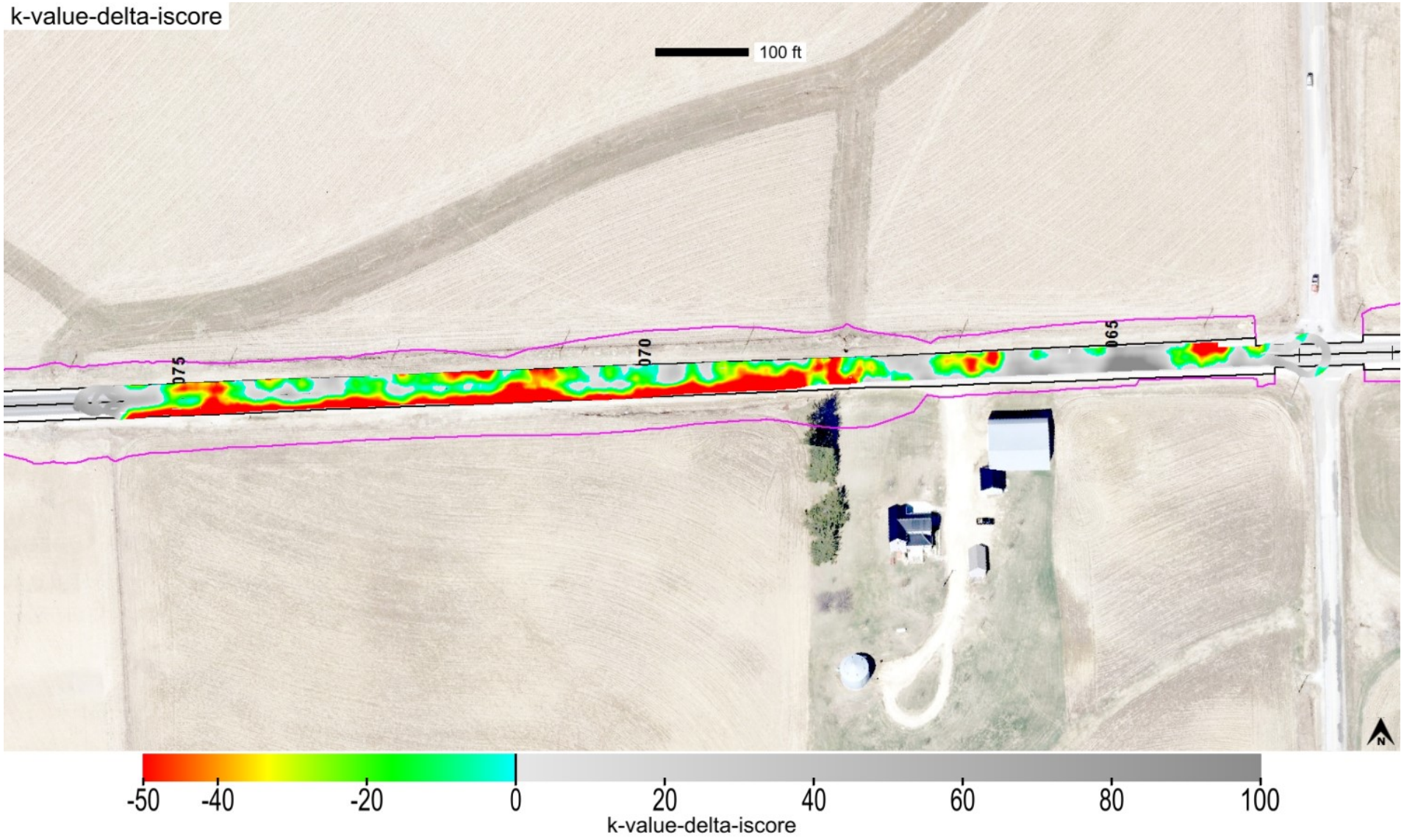
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	44.7	51.3	0.29	150	35	136.3	370	63.78	46.79	-115	-13.7	220



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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_114325a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	44.7	150	-115	-13.7	220	-112.43	-12.46	153.38



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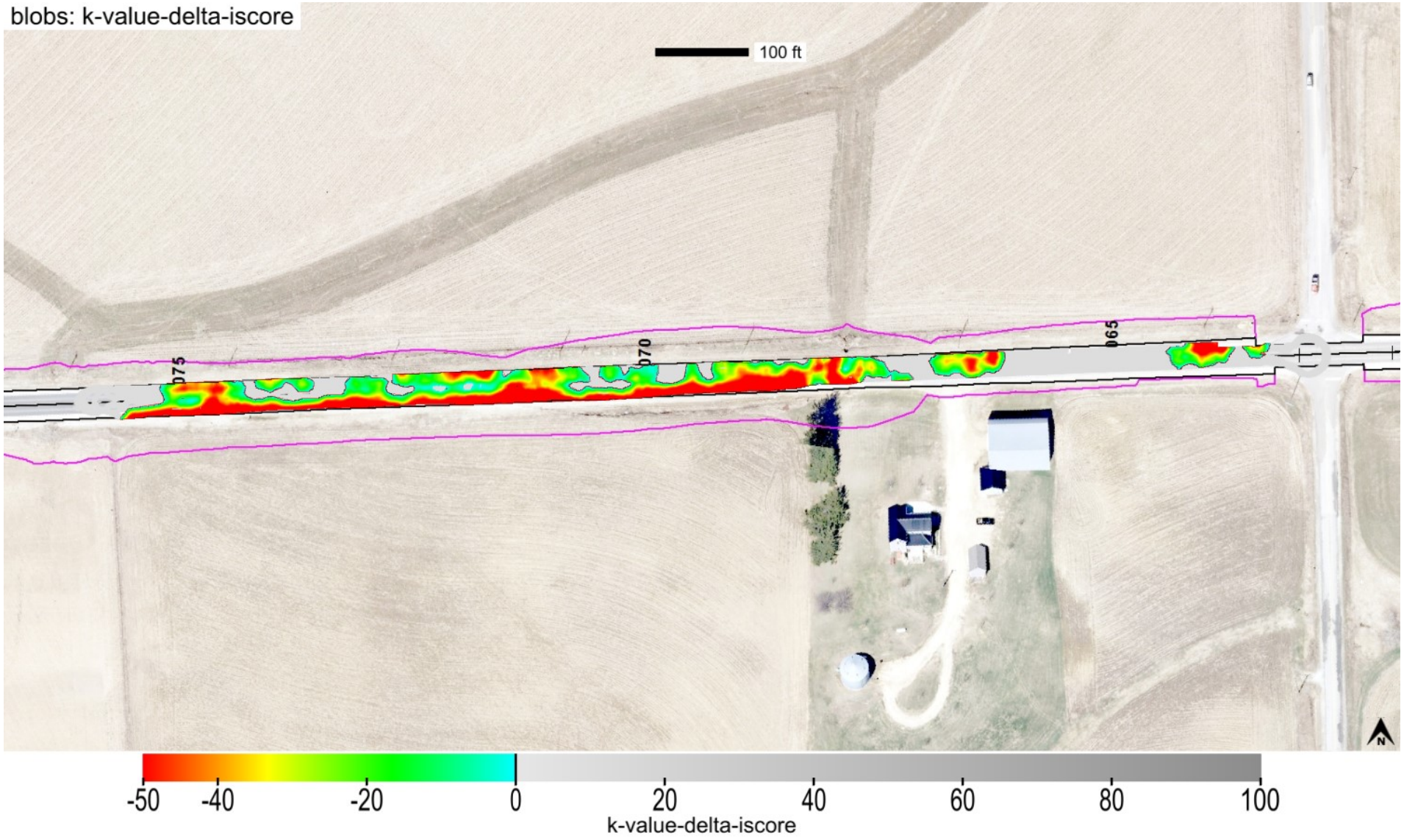
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_114325a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	5	25699	63.72	none	0



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ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_114325a

minimum	average	maximum
1	1.3	4

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

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_114325a

minimum	average	maximum
1016.33	1021.449	1024.952

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_114325a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Soil Cement_Subgrade	24006	100	40333	0.926	12	3000	150	40

Subgrade_Treatment Select Cohesive_IADOT (2102.02D)

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_114325a

IMG_20200811_110934360.jpg

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_114325a

IMG_20200811_111016214_TOP.jpg

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_114325a

IMG_20200811_130602891_TOP.jpg

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.18	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_17_135350a	No. of Measurements:	15457	Machine ID:	Ingios_FCS00210
Date and Time:	8/17/2020 1:53:50 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	73.7	89.67	0.56	150	35	183.1	311.88	51.41	28.07	-115	33.1	161.88
Moisture Content	No												

Mapped Area

square feet	acres
15457	0.35

Pass Count

min.	avg.	max.
1	1.56	6

Elevation (ft)

min.	avg.	max.
1046.13	1054.56	1062.29

Velocity (fps)

min.	avg.	max.
0.36	5.58	6.28

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Soil Cement_Subgrade	31001	100	15457	0.355	12	3000	150	40

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

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.18	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_17_135350a	No. of Measurements:	15457	Machine ID:	Ingios_FCS00210
Date and Time:	8/17/2020 1:53:50 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
89.67	CQI > = 95
73.7	80% of k-Value MVs >= 150
28.07	COV <= 20
12.03	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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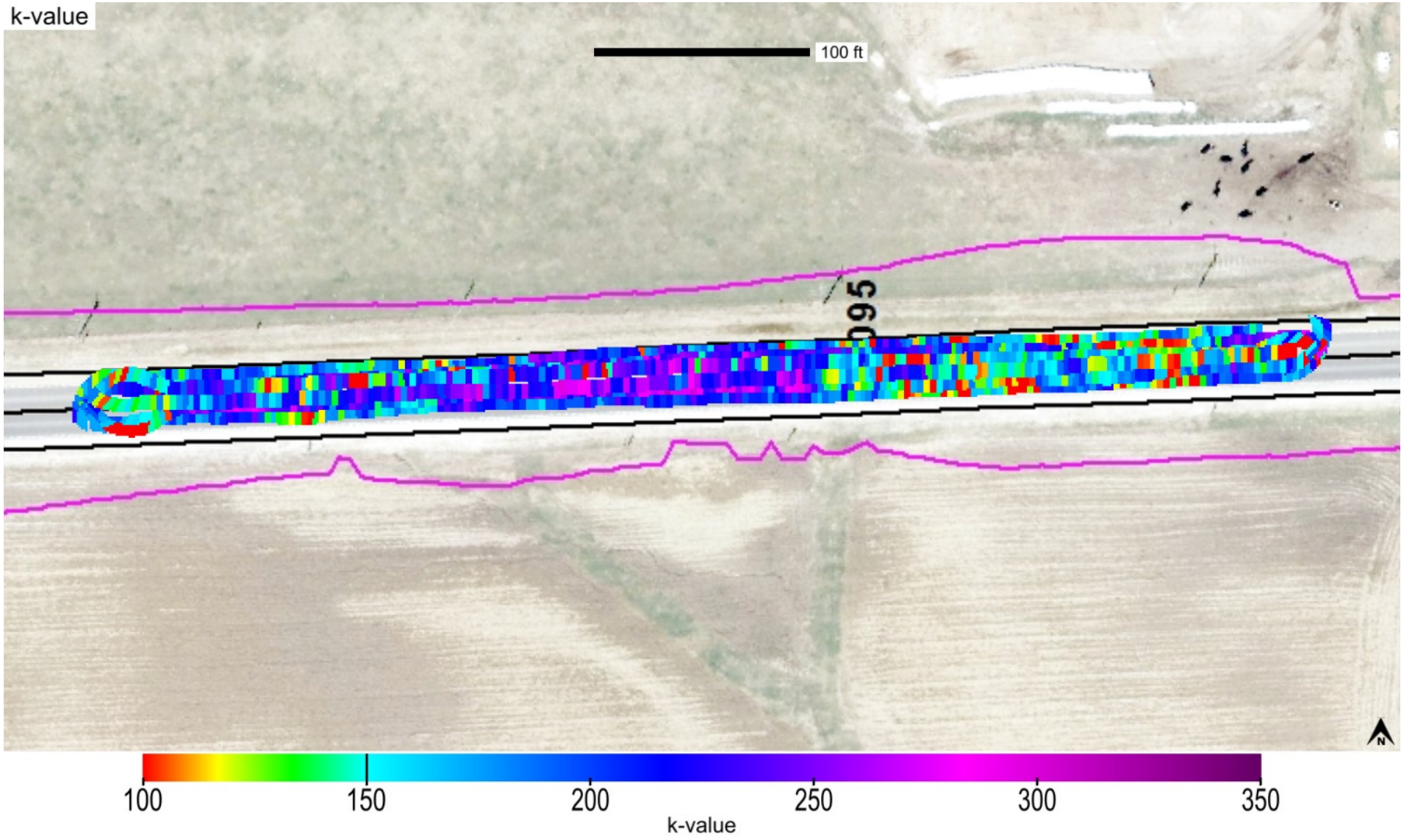
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_135350a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	73.7	89.67	0.56	150	35	183.1	311.88	51.41	28.07	-115	33.1	161.88



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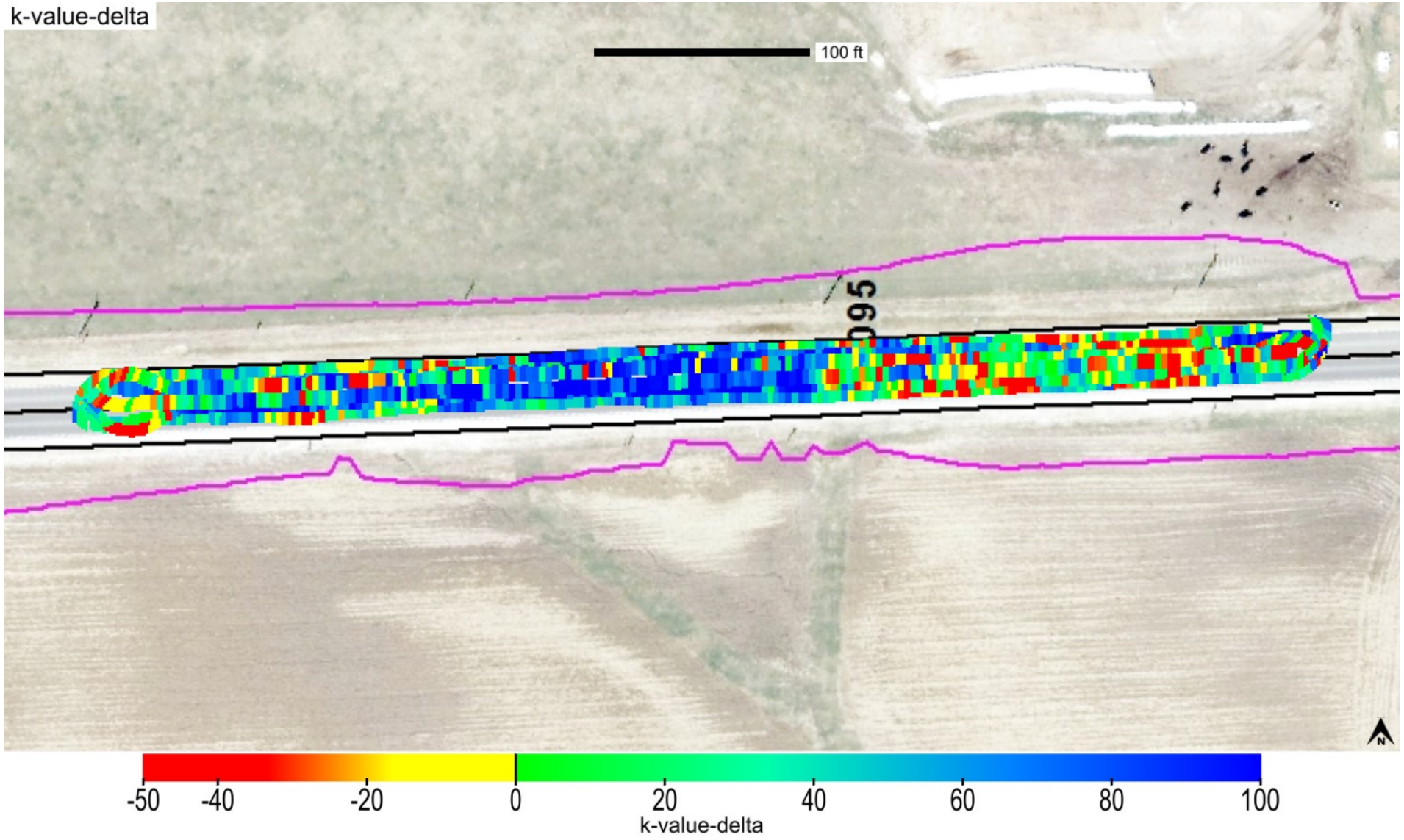
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_135350a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	73.7	89.67	0.56	150	35	183.1	311.88	51.41	28.07	-115	33.1	161.88



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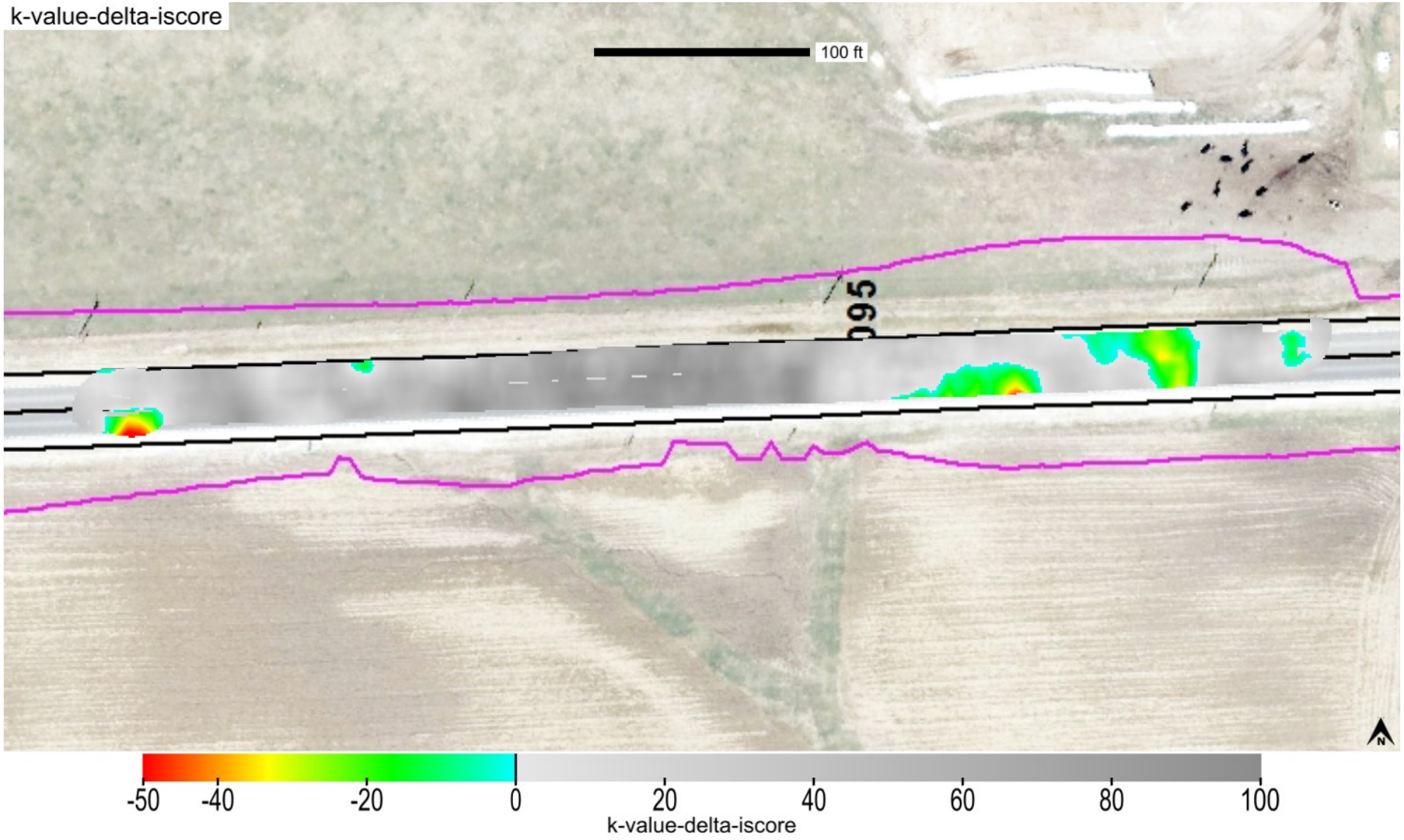
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_135350a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	73.7	150	-115	33.1	161.88	-61.04	33.85	96.22



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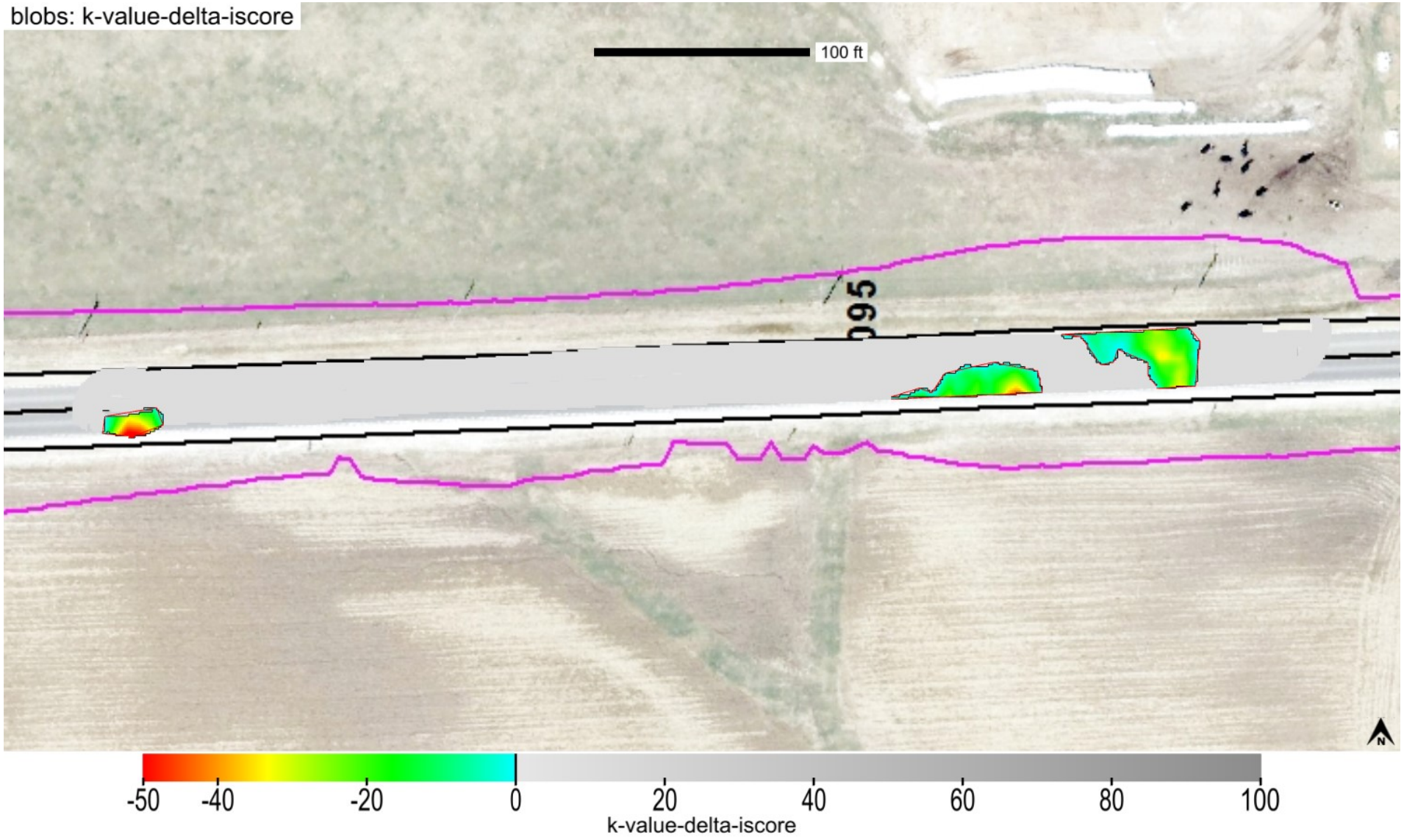
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_135350a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	3	1860	12.03	none	0



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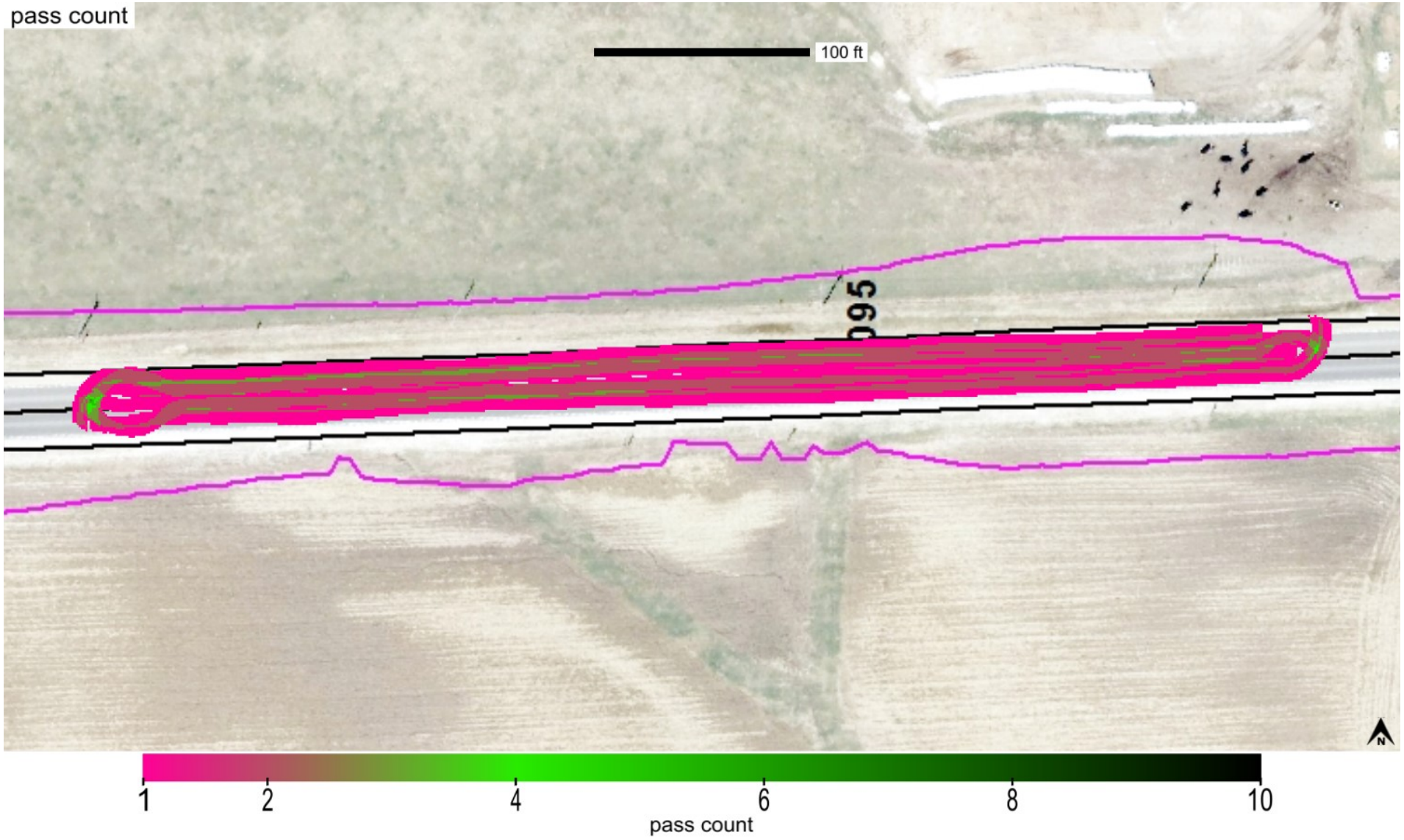
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_135350a

minimum	average	maximum
1	1.56	6



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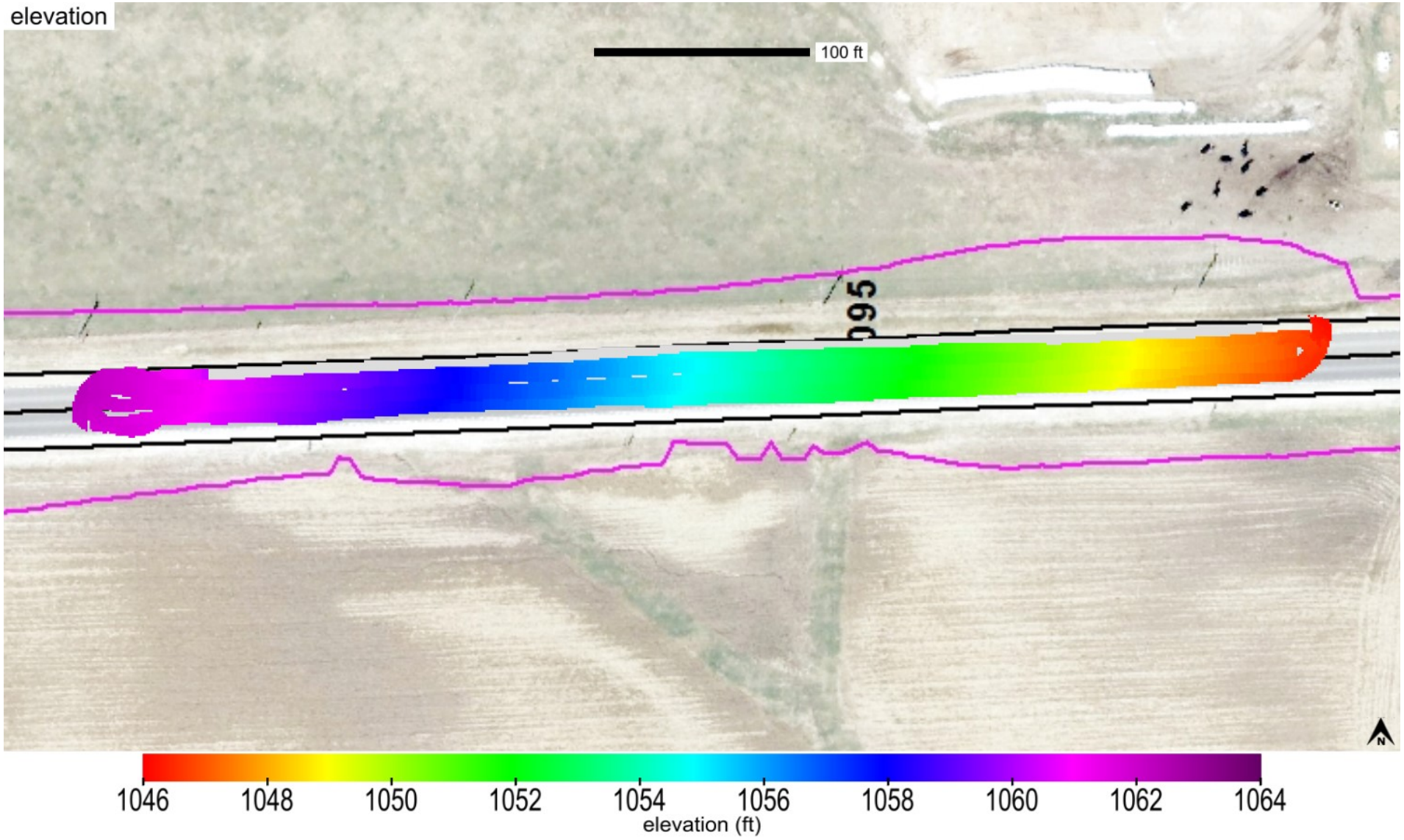
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_135350a

minimum	average	maximum
1046.133	1054.564	1062.288



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ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_135350a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Soil Cement_Subgrade	31001	100	15457	0.355	12	3000	150	40

Soil Cement_Subgrade

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_135350a

IMG_20200810_180336559_TOP.jpg

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_135350a

IMG_20200811_103027690.jpg

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_135350a

IMG_20200811_103036661.jpg

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

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_135350a

IMG_20200811_110158007.jpg

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_135350a

IMG_20200811_110202420.jpg

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

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.29	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_17_145118a	No. of Measurements:	33629	Machine ID:	Ingios_FCS00210
Date and Time:	8/17/2020 2:51:18 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	71.3	86.24	0.58	150	35	177.8	306.36	53.41	30.03	-115	27.8	156.36
Moisture Content	No												

Mapped Area

square feet	acres
33629	0.77

Pass Count

min.	avg.	max.
1	1.17	4

Elevation (ft)

min.	avg.	max.
971.45	974.54	982.16

Velocity (fps)

min.	avg.	max.
0.4	5.59	6.23

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Soil Cement_Subgrade	31001	100	33629	0.772	12	3000	150	40

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

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.29	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_17_145118a	No. of Measurements:	33629	Machine ID:	Ingios_FCS00210
Date and Time:	8/17/2020 2:51:18 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
86.24	CQI > = 95
71.3	80% of k-Value MVs >= 150
30.03	COV <= 20
14.89	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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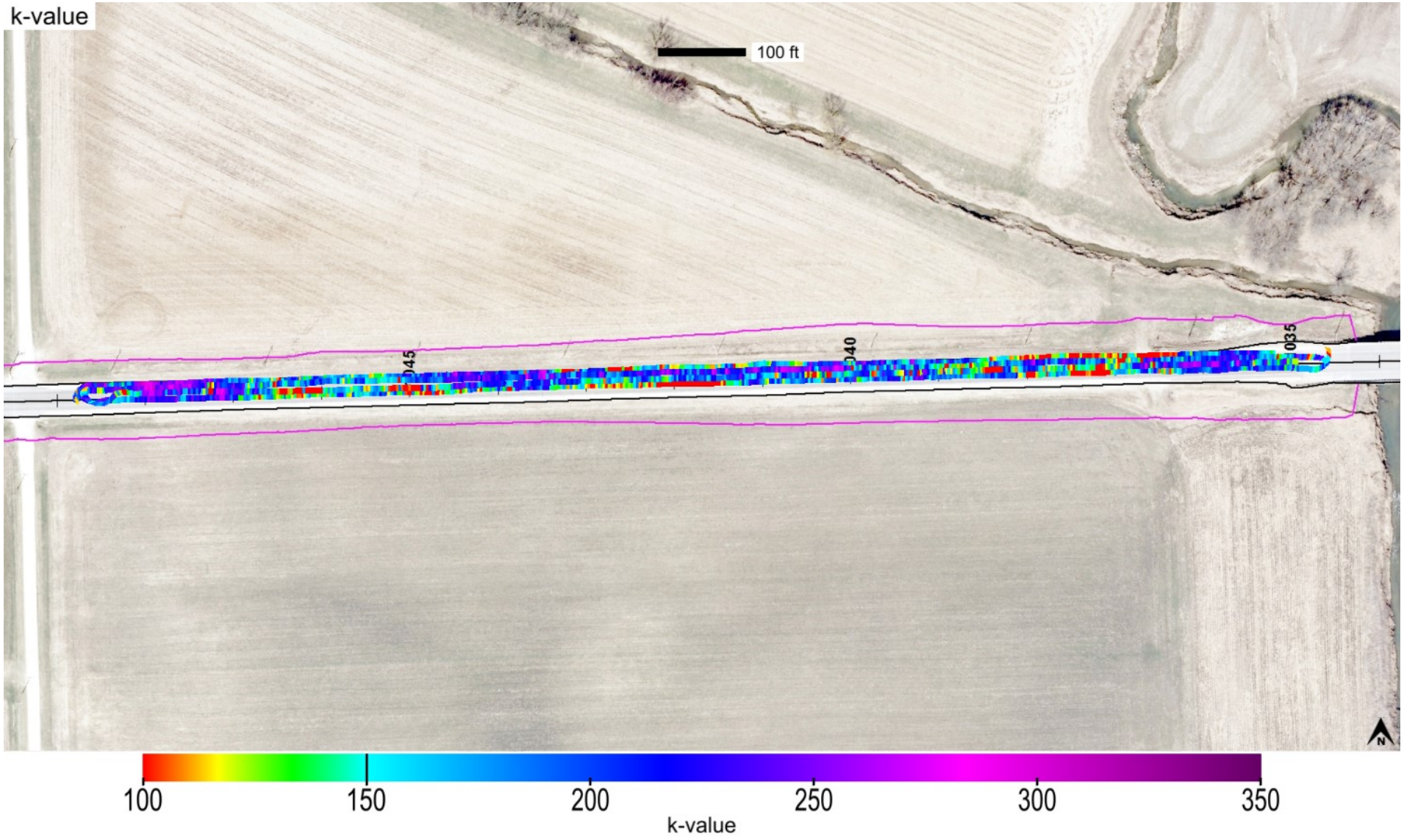
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_145118a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	71.3	86.24	0.58	150	35	177.8	306.36	53.41	30.03	-115	27.8	156.36



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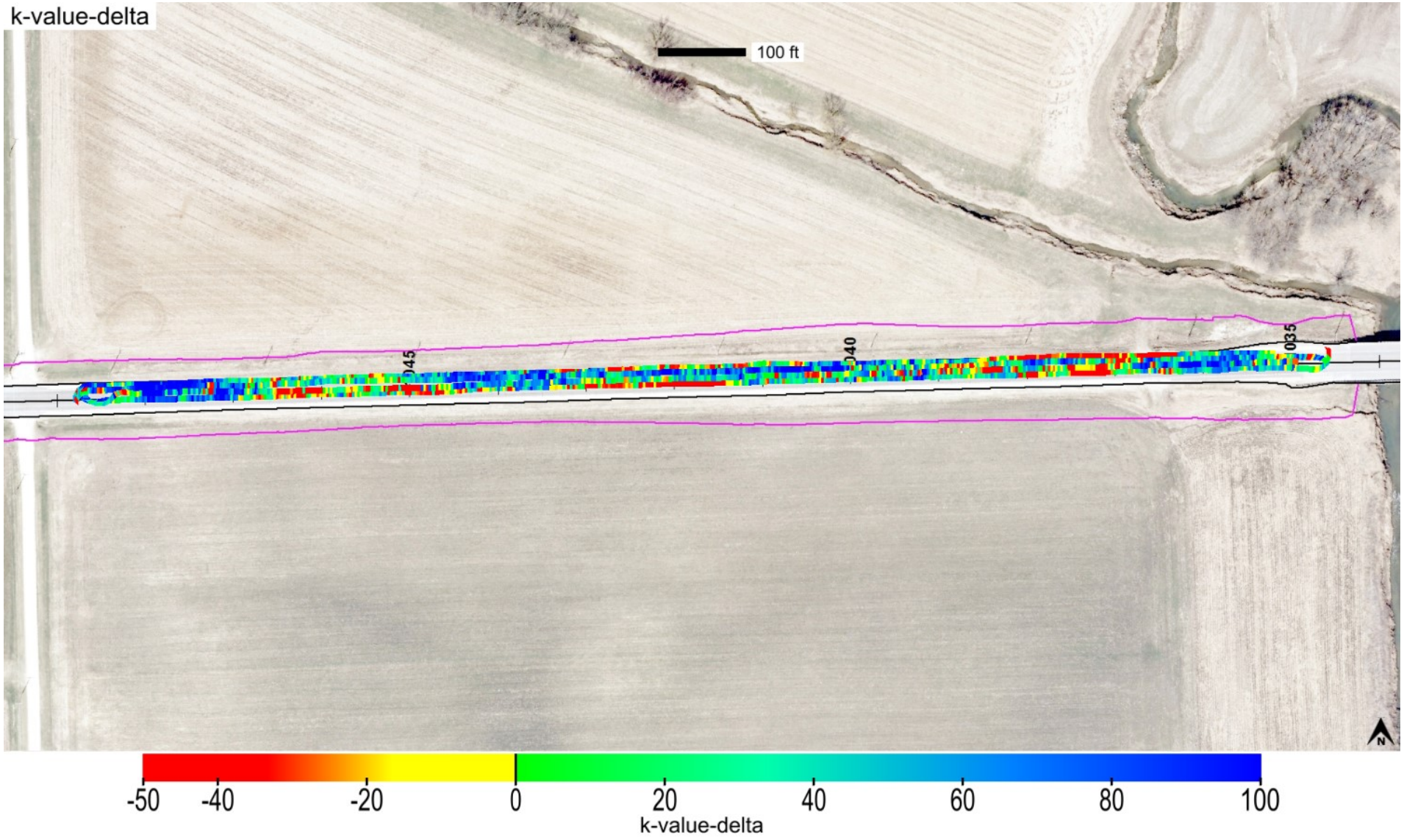
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_145118a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	71.3	86.24	0.58	150	35	177.8	306.36	53.41	30.03	-115	27.8	156.36



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ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_145118a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	71.3	150	-115	27.8	156.36	-97.72	29.05	134.47

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

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_145118a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	7	5007	14.89	none	0

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

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_145118a

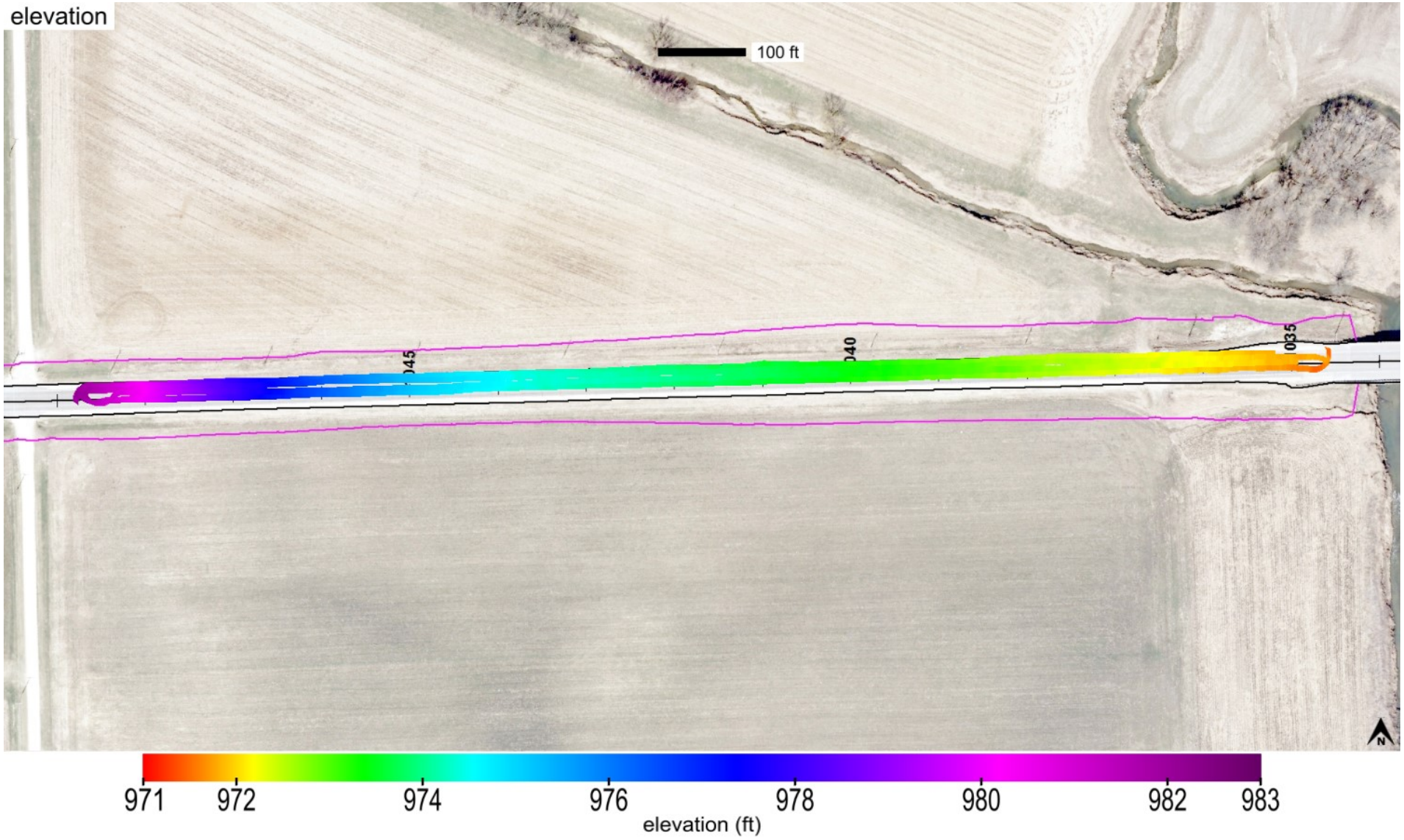
minimum	average	maximum
1	1.17	4

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

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_145118a

minimum	average	maximum
971.448	974.545	982.16



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

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_145118a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Soil Cement_Subgrade	31001	100	33629	0.772	12	3000	150	40

Soil Cement_Subgrade

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

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_145118a

IMG_20200811_130754861.jpg

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

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_145118a

IMG_20200811_130825725.jpg

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

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.22	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_17_151439a	No. of Measurements:	22194	Machine ID:	Ingios_FCS00210
Date and Time:	8/17/2020 3:14:39 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	60.2	69.04	0.4	150	35	161.3	308.77	68.12	42.24	-115	11.3	158.77
Moisture Content	No												

Mapped Area

square feet	acres
22194	0.51

Pass Count

min.	avg.	max.
1	1.37	4

Elevation (ft)

min.	avg.	max.
971.35	973.9	978.79

Velocity (fps)

min.	avg.	max.
0.36	5.54	7.02

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Soil Cement_Subgrade	31001	100	22194	0.51	12	3000	150	40

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

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.22	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_17_151439a	No. of Measurements:	22194	Machine ID:	Ingios_FCS00210
Date and Time:	8/17/2020 3:14:39 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
69.04	CQI > = 95
60.2	80% of k-Value MVs >= 150
42.24	COV <= 20
29.78	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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

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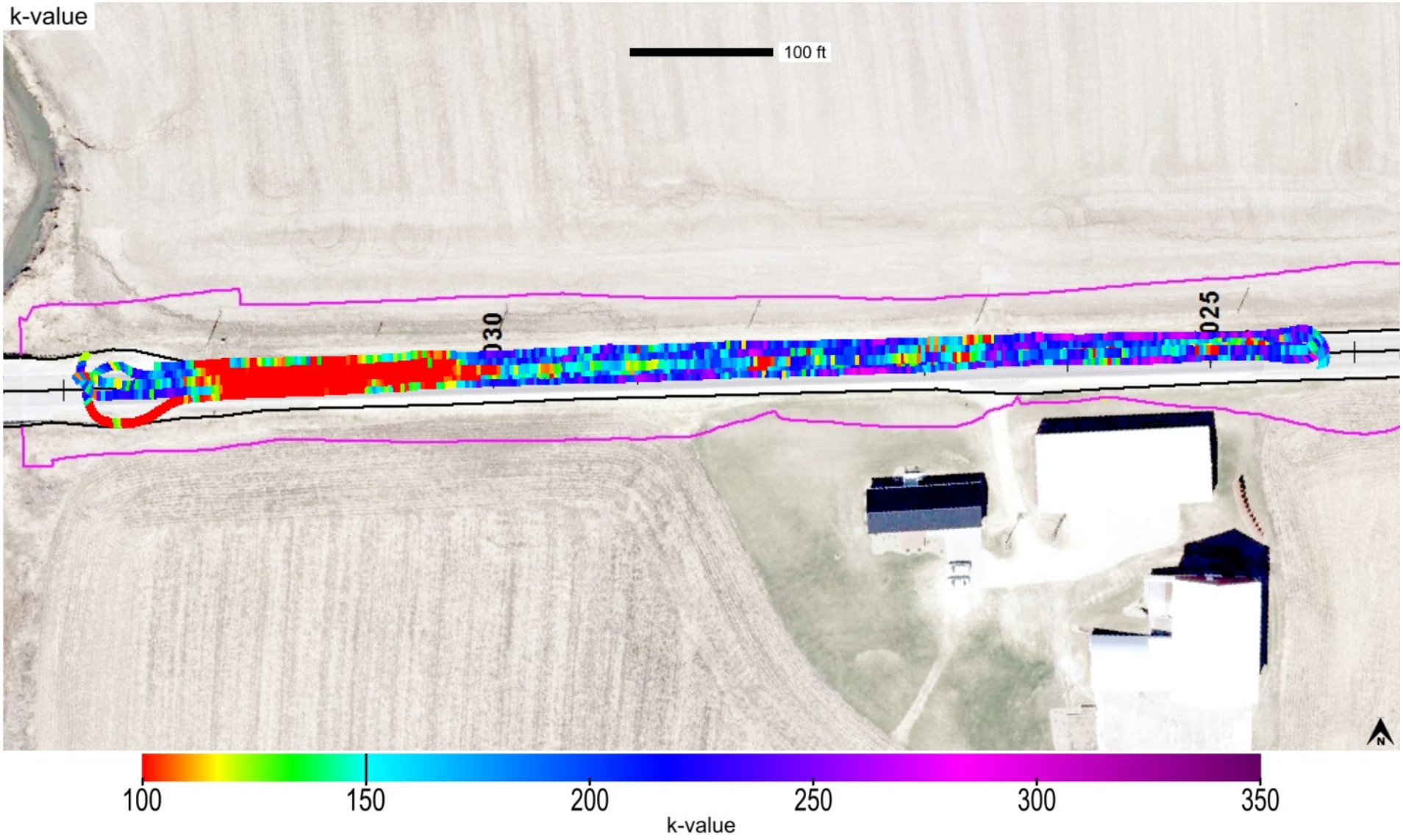
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_151439a

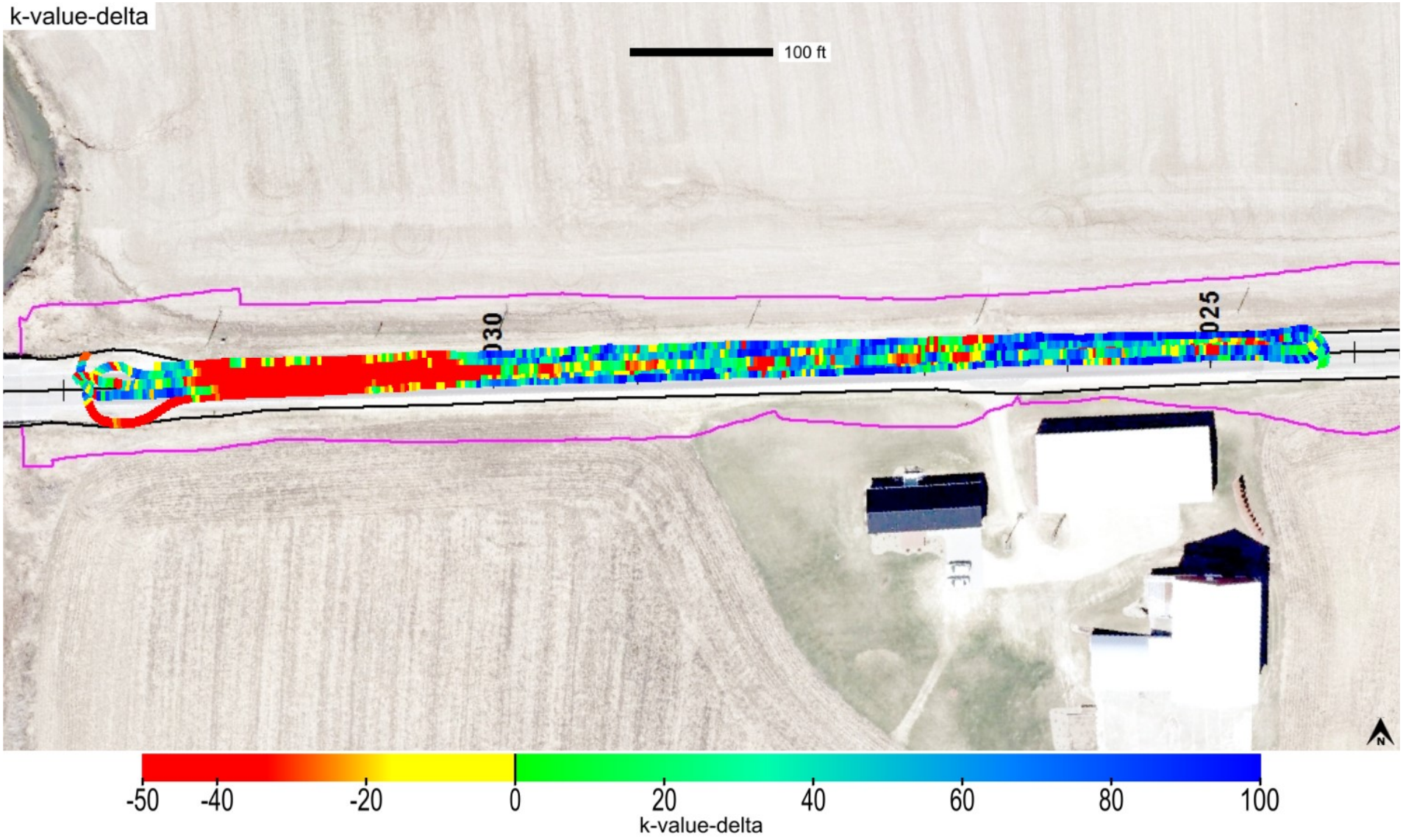
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	60.2	69.04	0.4	150	35	161.3	308.77	68.12	42.24	-115	11.3	158.77



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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_151439a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	60.2	69.04	0.4	150	35	161.3	308.77	68.12	42.24	-115	11.3	158.77



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

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_151439a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	60.2	150	-115	11.3	158.77	-115	9.29	103.63

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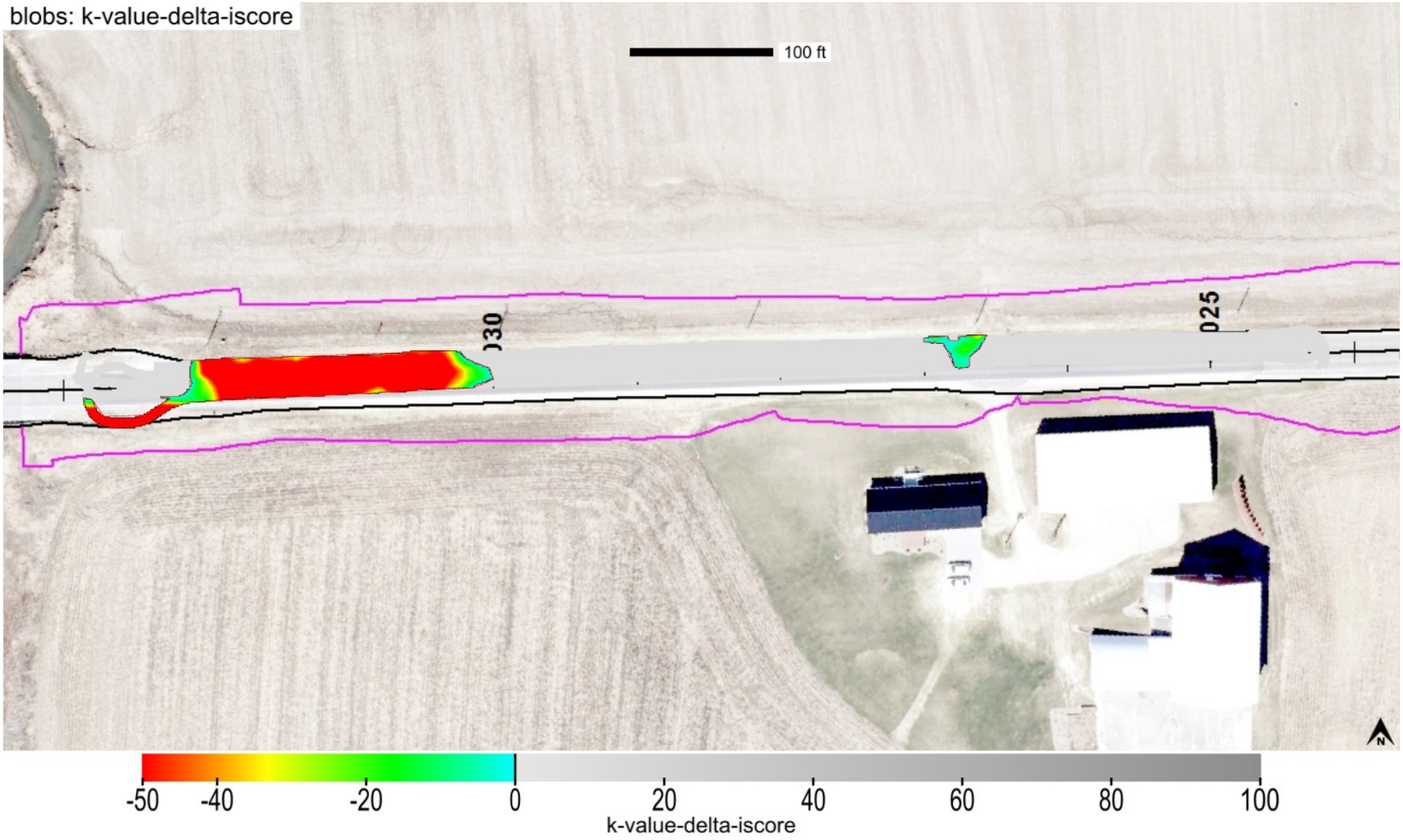
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_151439a

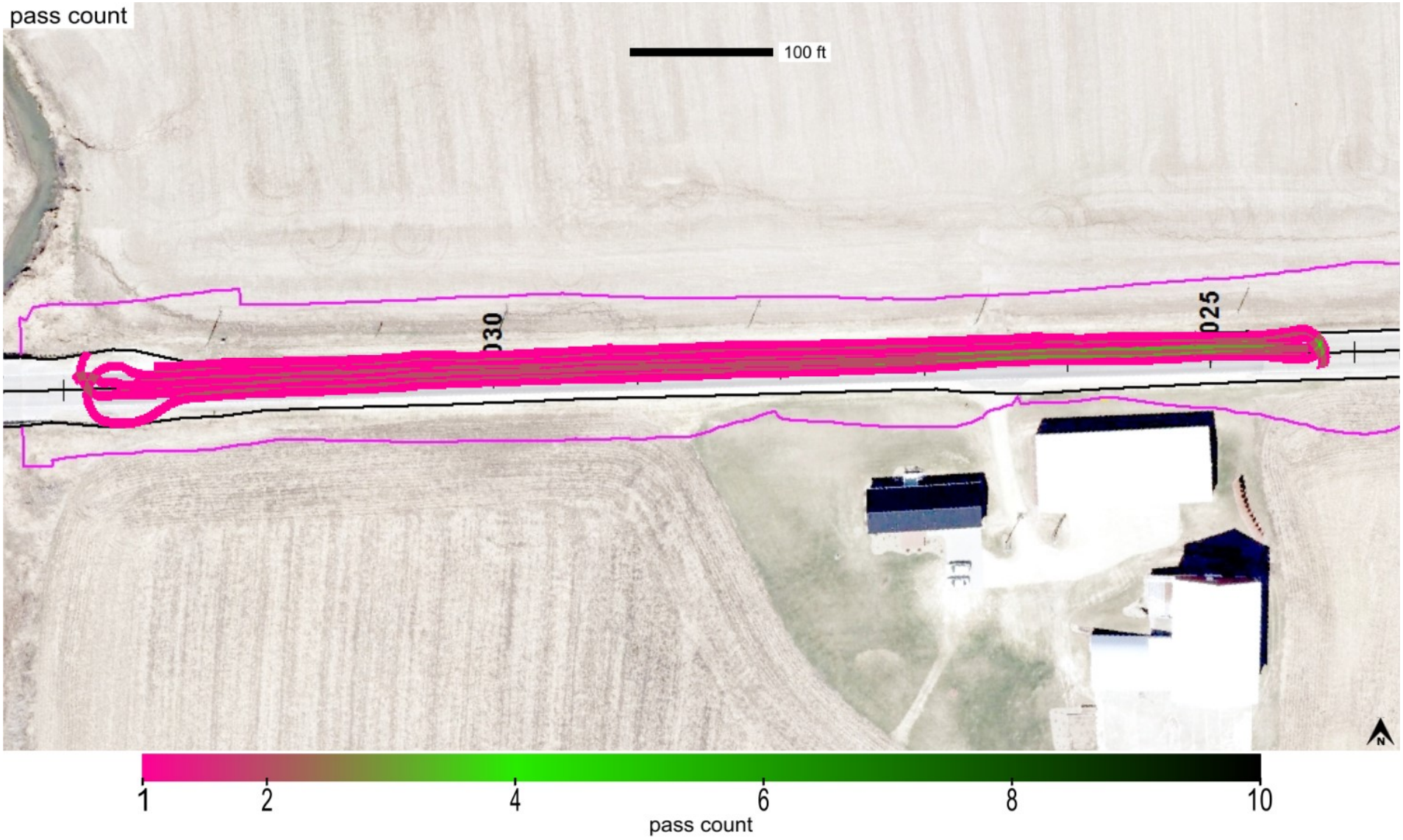
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	2	6609	29.78	none	0



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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_151439a

minimum	average	maximum
1	1.37	4



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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_151439a

minimum	average	maximum
971.353	973.898	978.787

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_151439a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Soil Cement_Subgrade	31001	100	22194	0.51	12	3000	150	40

Soil Cement_Subgrade

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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_151439a

IMG_20200811_143902984.jpg

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

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_151439a

IMG_20200812_095357841.jpg

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.24	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_17_153252a	No. of Measurements:	22332	Machine ID:	Ingios_FCS00210
Date and Time:	8/17/2020 3:32:52 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	54.9	61.1	0.32	150	35	147.4	370	70.18	47.6	-115	-2.6	220
Moisture Content	No												

Mapped Area

square feet	acres
22332	0.51

Pass Count

min.	avg.	max.
1	1.39	5

Elevation (ft)

min.	avg.	max.
979.24	988.14	997.42

Velocity (fps)

min.	avg.	max.
0.89	5.52	6.1

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Soil Cement_Subgrade	31001	100	22332	0.513	12	3000	150	40

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.24	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_17_153252a	No. of Measurements:	22332	Machine ID:	Ingios_FCS00210
Date and Time:	8/17/2020 3:32:52 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
61.1	CQI > = 95
54.9	80% of k-Value MVs >= 150
47.6	COV <= 20
39.72	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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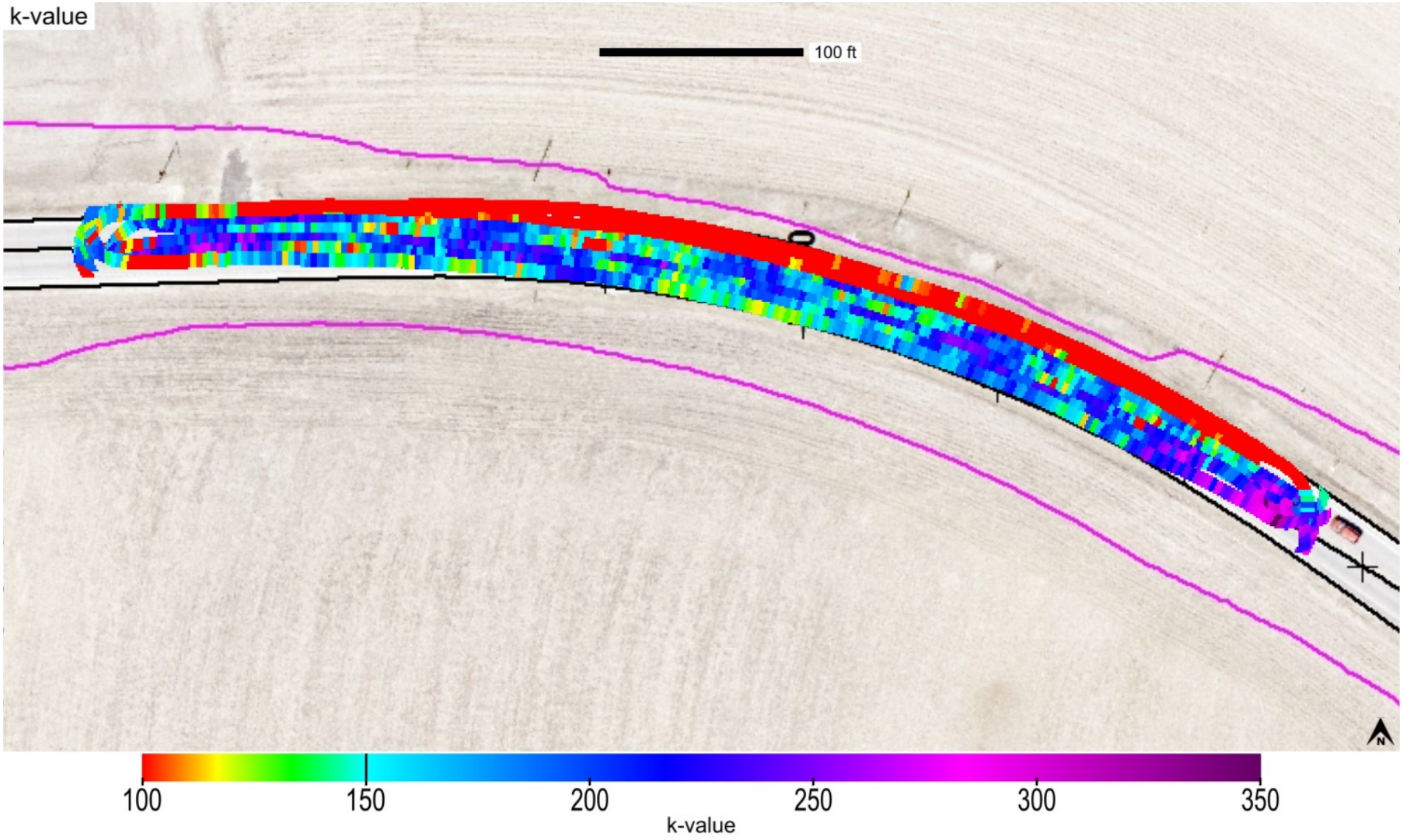
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_153252a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	54.9	61.1	0.32	150	35	147.4	370	70.18	47.6	-115	-2.6	220



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

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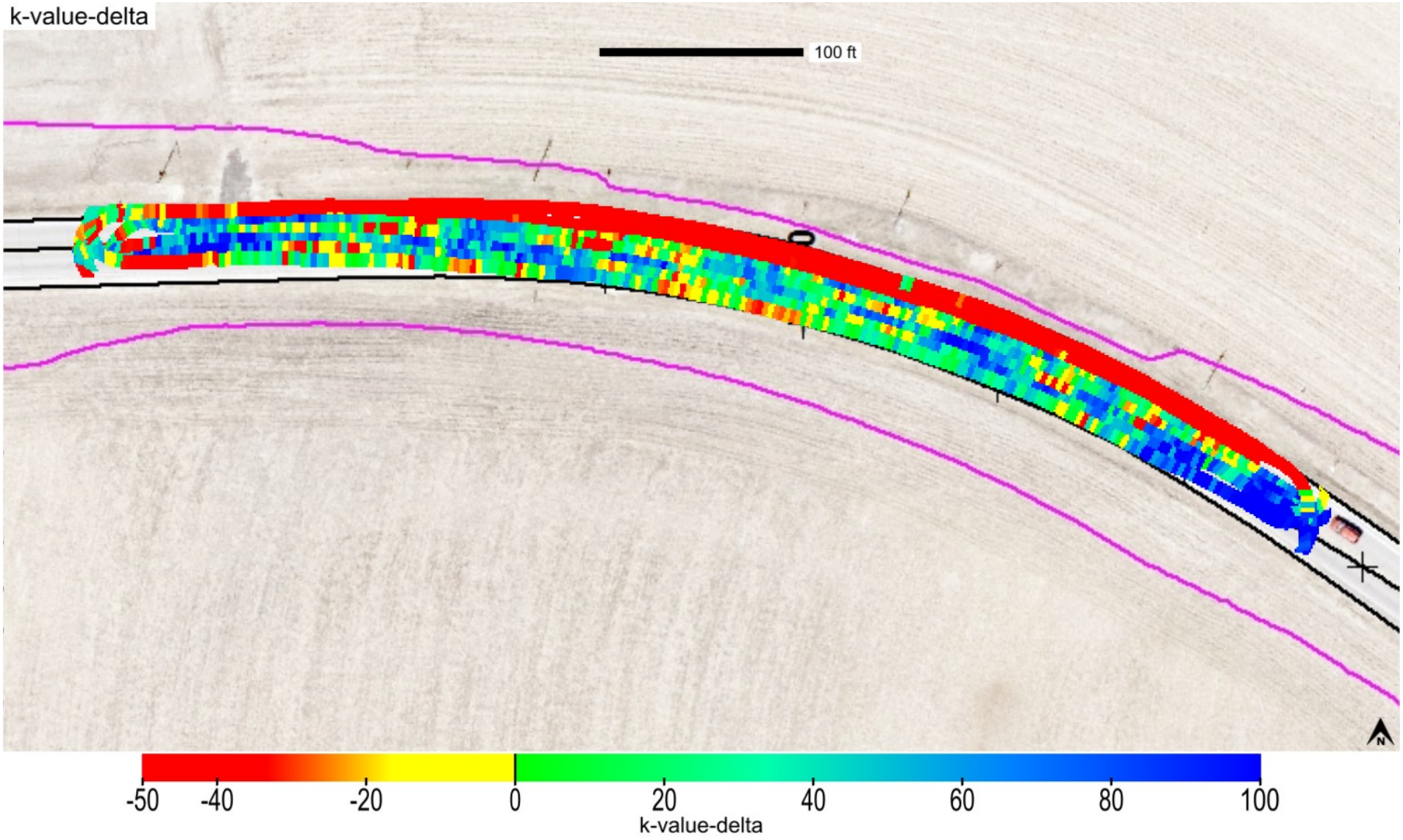
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_153252a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	54.9	61.1	0.32	150	35	147.4	370	70.18	47.6	-115	-2.6	220



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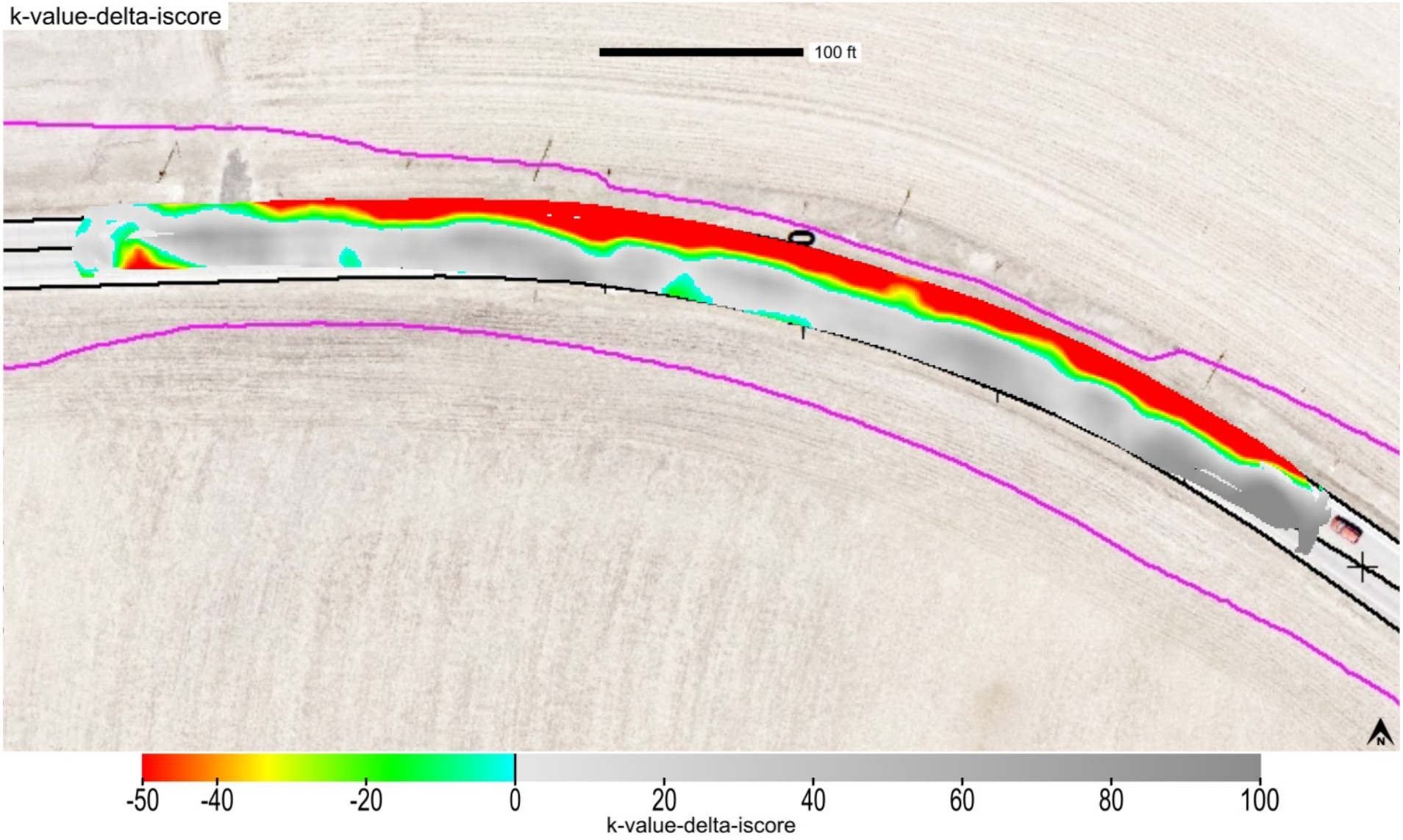
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_153252a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	54.9	150	-115	-2.6	220	-115	-1	155



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

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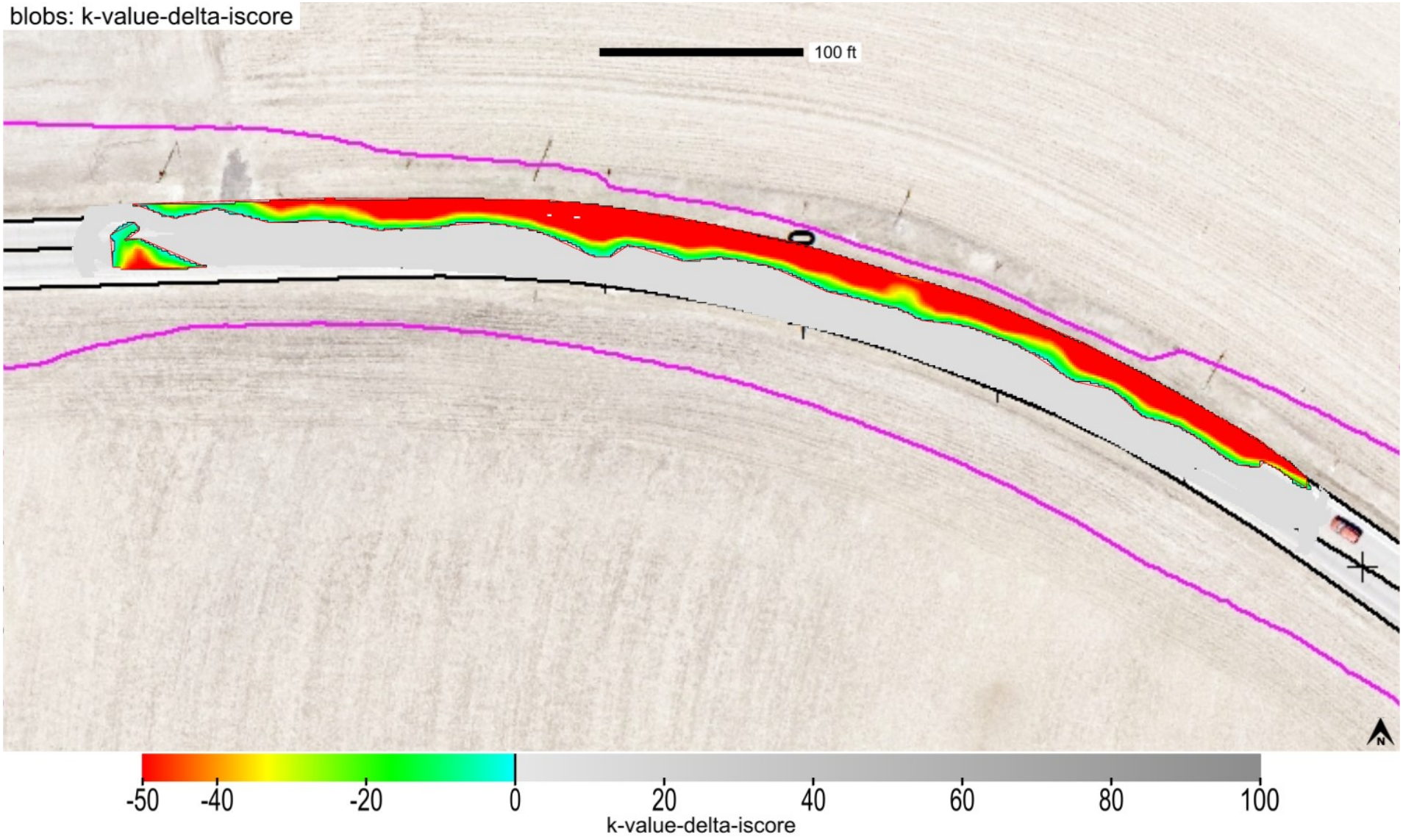
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_153252a

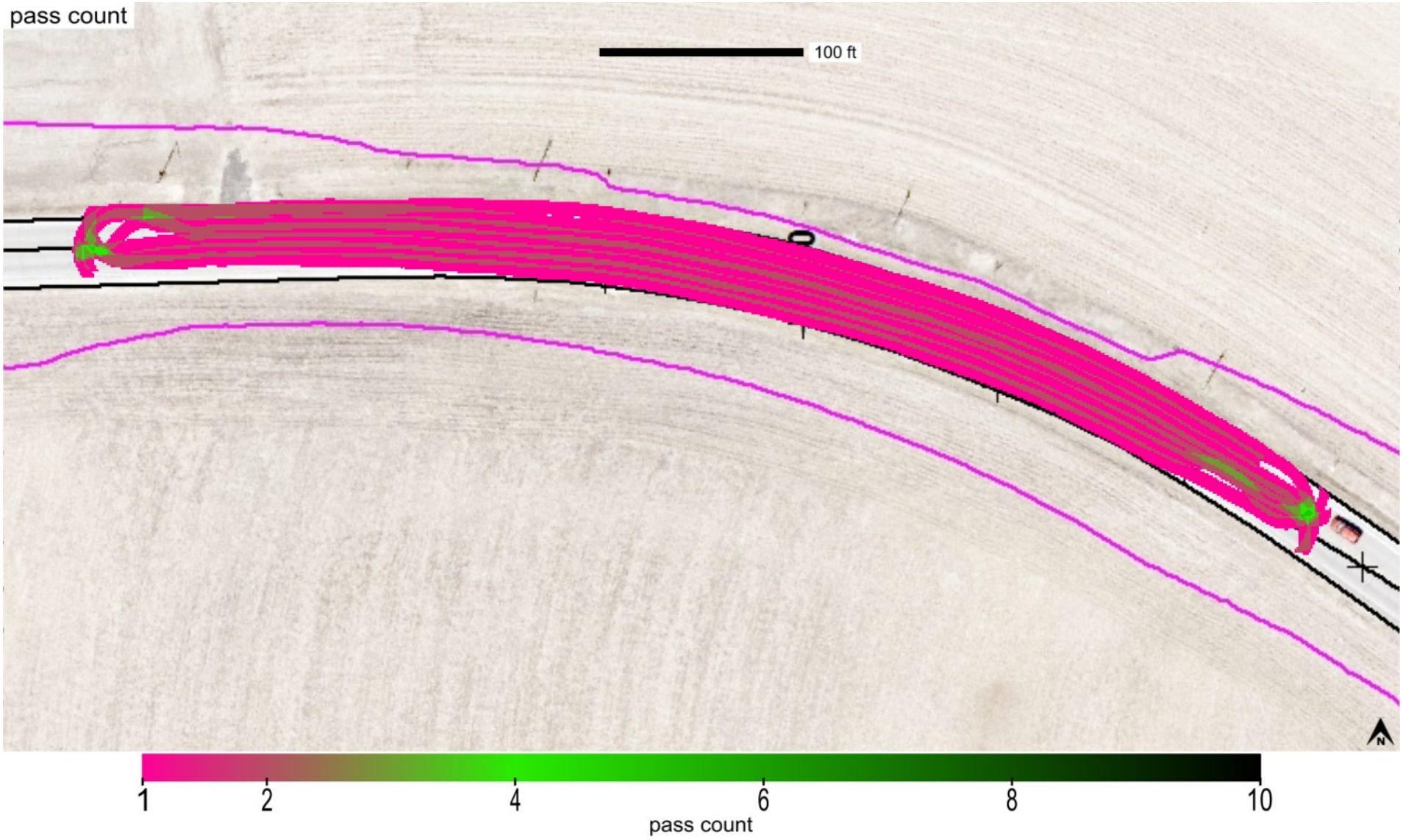
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	2	8871	39.72	none	0



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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_153252a

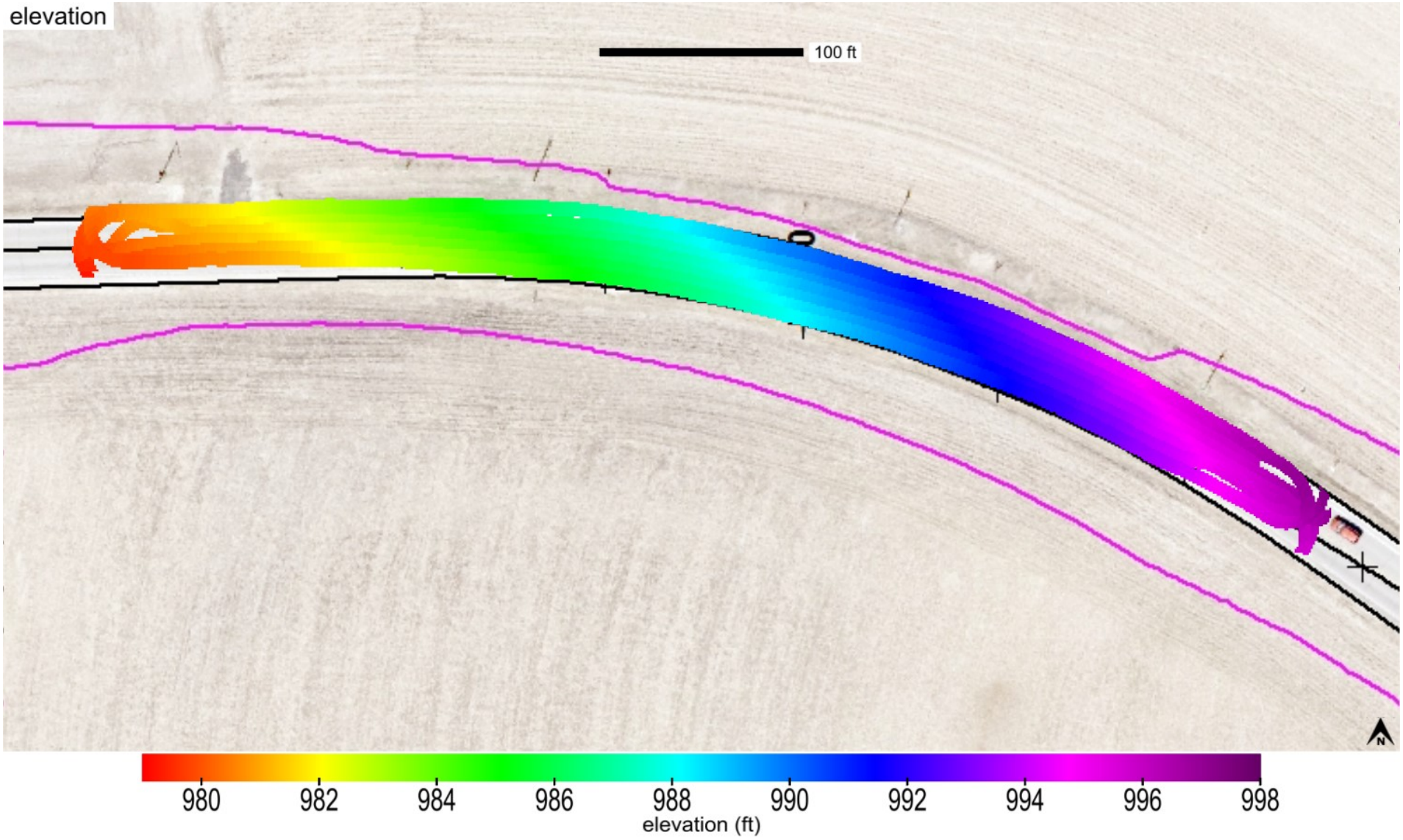
minimum	average	maximum
1	1.39	5



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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_153252a

minimum	average	maximum
979.24	988.138	997.422



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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_153252a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Soil Cement_Subgrade	31001	100	22332	0.513	12	3000	150	40

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

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_153252a

IMG_20200811_143849947.jpg

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

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_153252a

IMG_20200811_143902984.jpg

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

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.16	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_17_171204a	No. of Measurements:	14719	Machine ID:	Ingios_FCS00210
Date and Time:	8/17/2020 5:12:04 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	74.3	91.55	0.68	150	35	178.2	286.18	45.29	25.42	-115	28.2	136.18
Moisture Content	No												

Mapped Area

square feet	acres
14719	0.34

Pass Count

min.	avg.	max.
1	1.39	4

Elevation (ft)

min.	avg.	max.
992.08	993.49	993.96

Velocity (fps)

min.	avg.	max.
0.55	5.55	6.22

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Soil Cement_Subgrade	31001	100	14719	0.338	12	3000	150	40

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

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.16	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_17_171204a	No. of Measurements:	14719	Machine ID:	Ingios_FCS00210
Date and Time:	8/17/2020 5:12:04 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
91.55	CQI > = 95
74.3	80% of k-Value MVs >= 150
25.42	COV <= 20
7.48	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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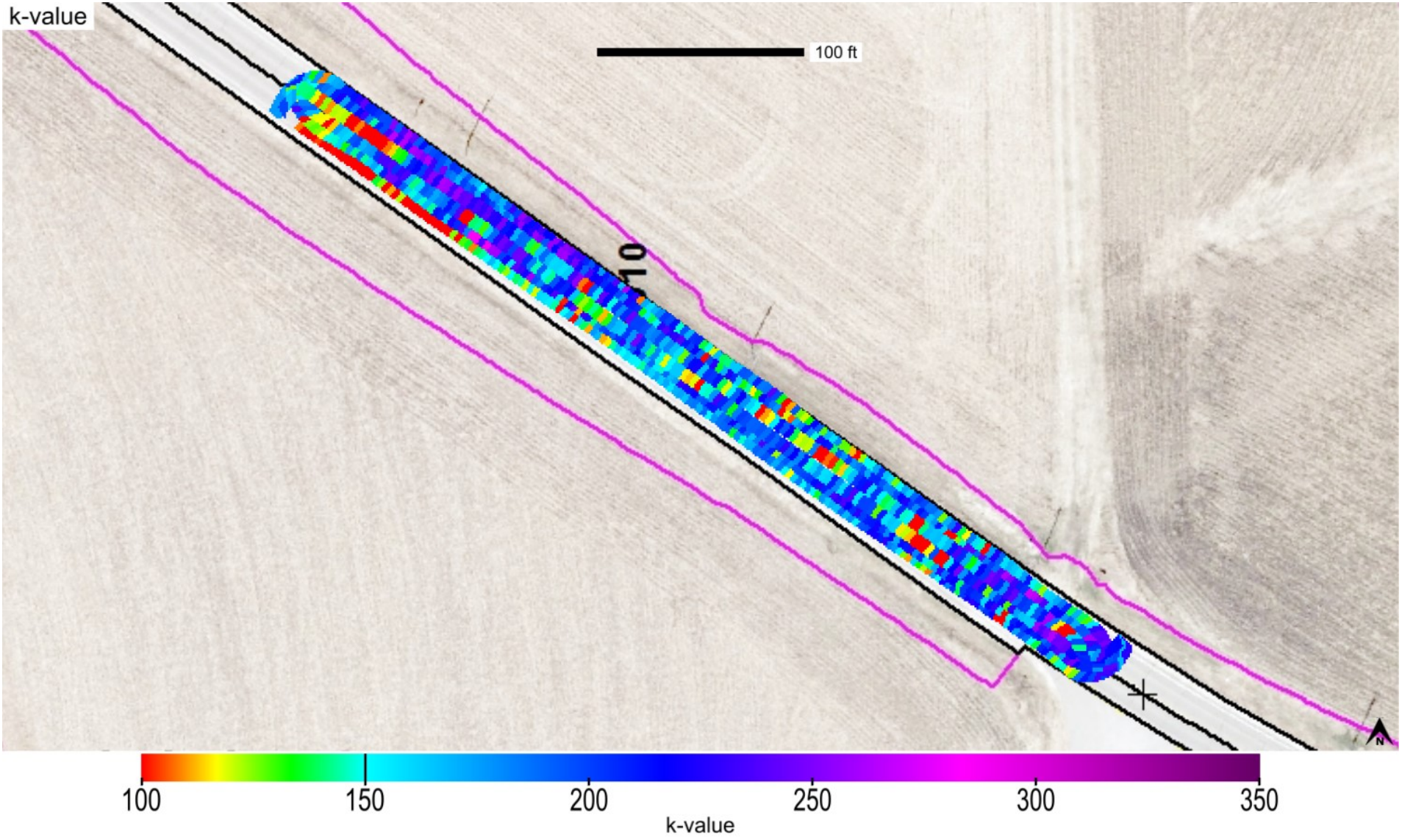
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_171204a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	74.3	91.55	0.68	150	35	178.2	286.18	45.29	25.42	-115	28.2	136.18



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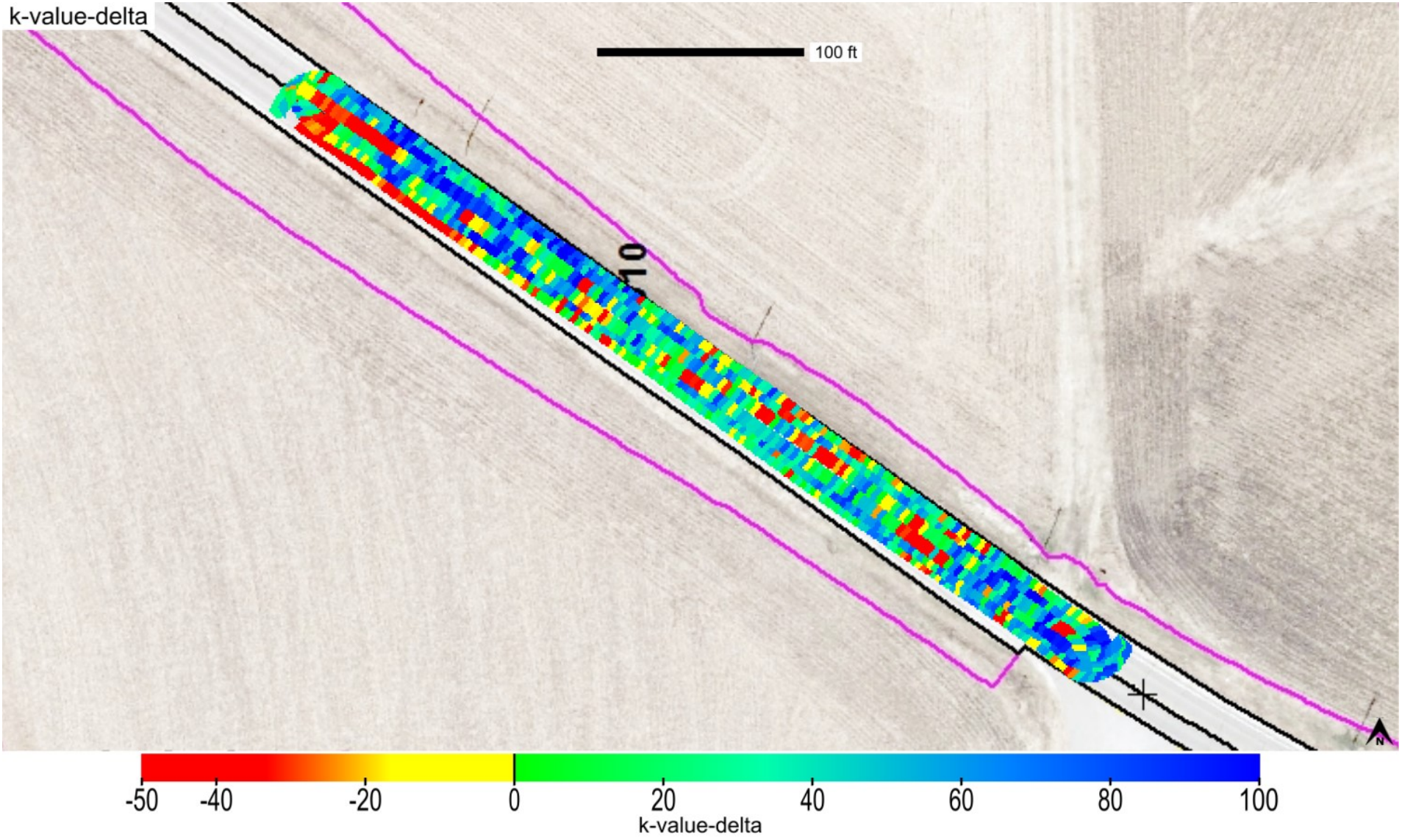
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_171204a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	74.3	91.55	0.68	150	35	178.2	286.18	45.29	25.42	-115	28.2	136.18

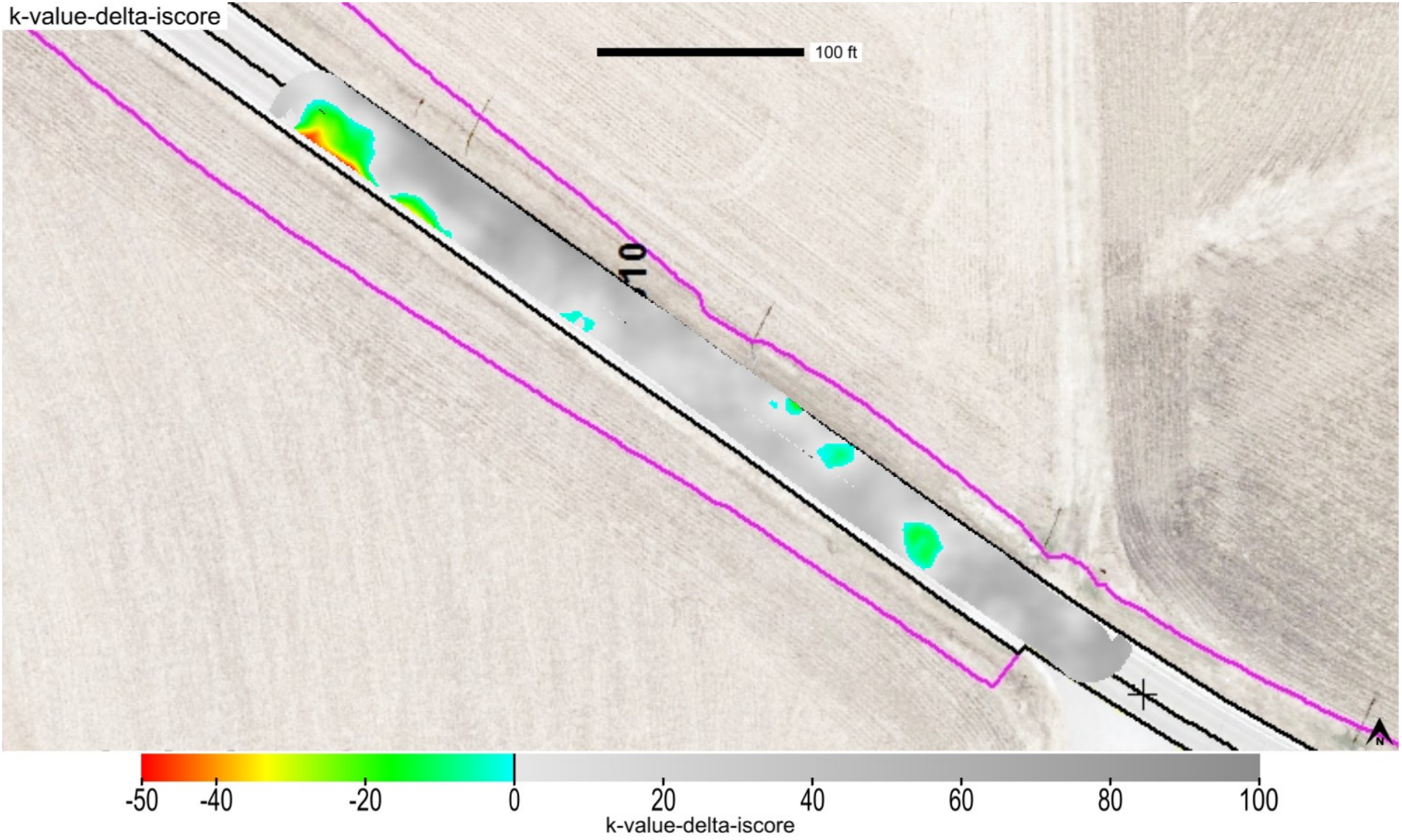


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_171204a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	74.3	150	-115	28.2	136.18	-46.55	28.99	81.99



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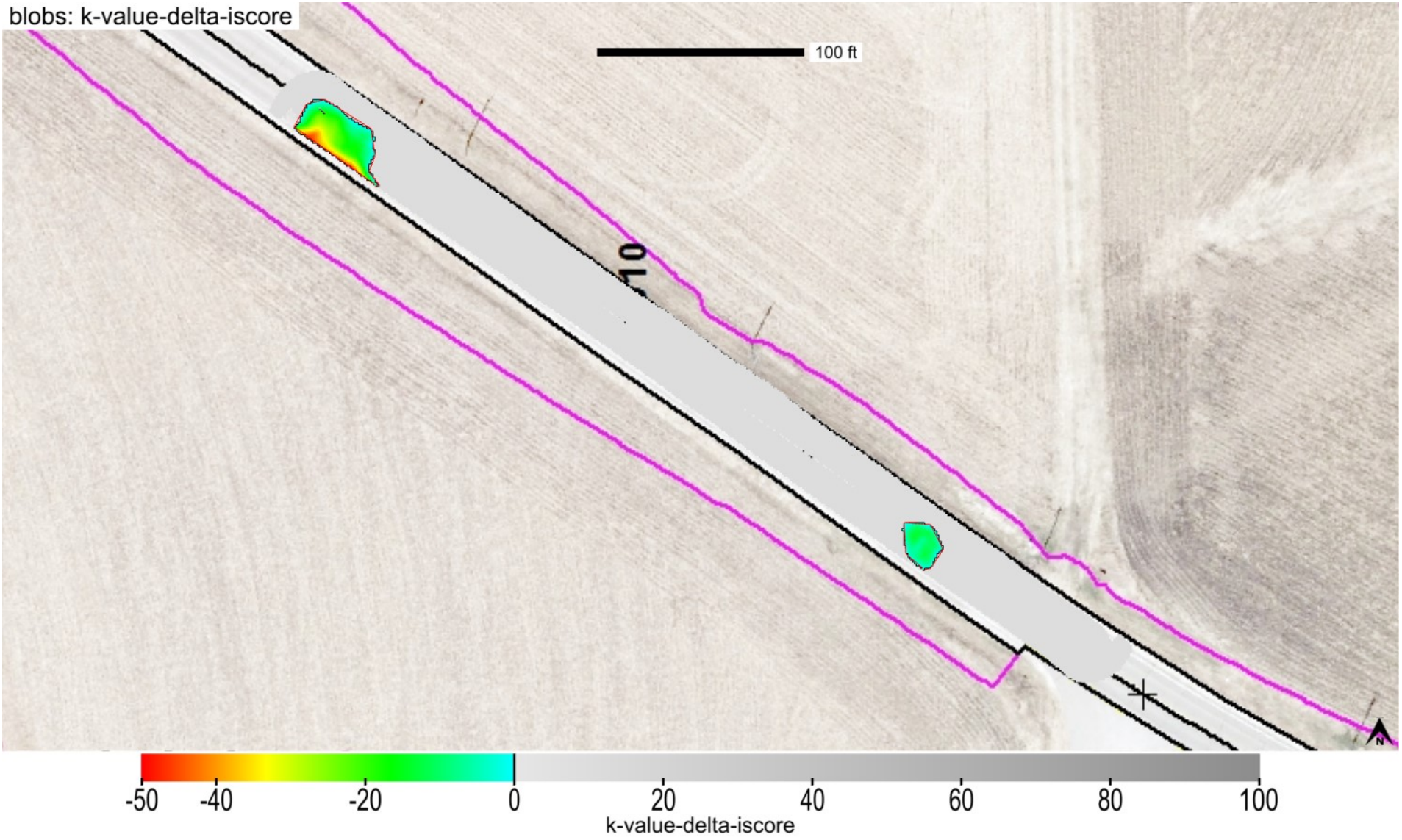
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_171204a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	2	1101	7.48	none	0



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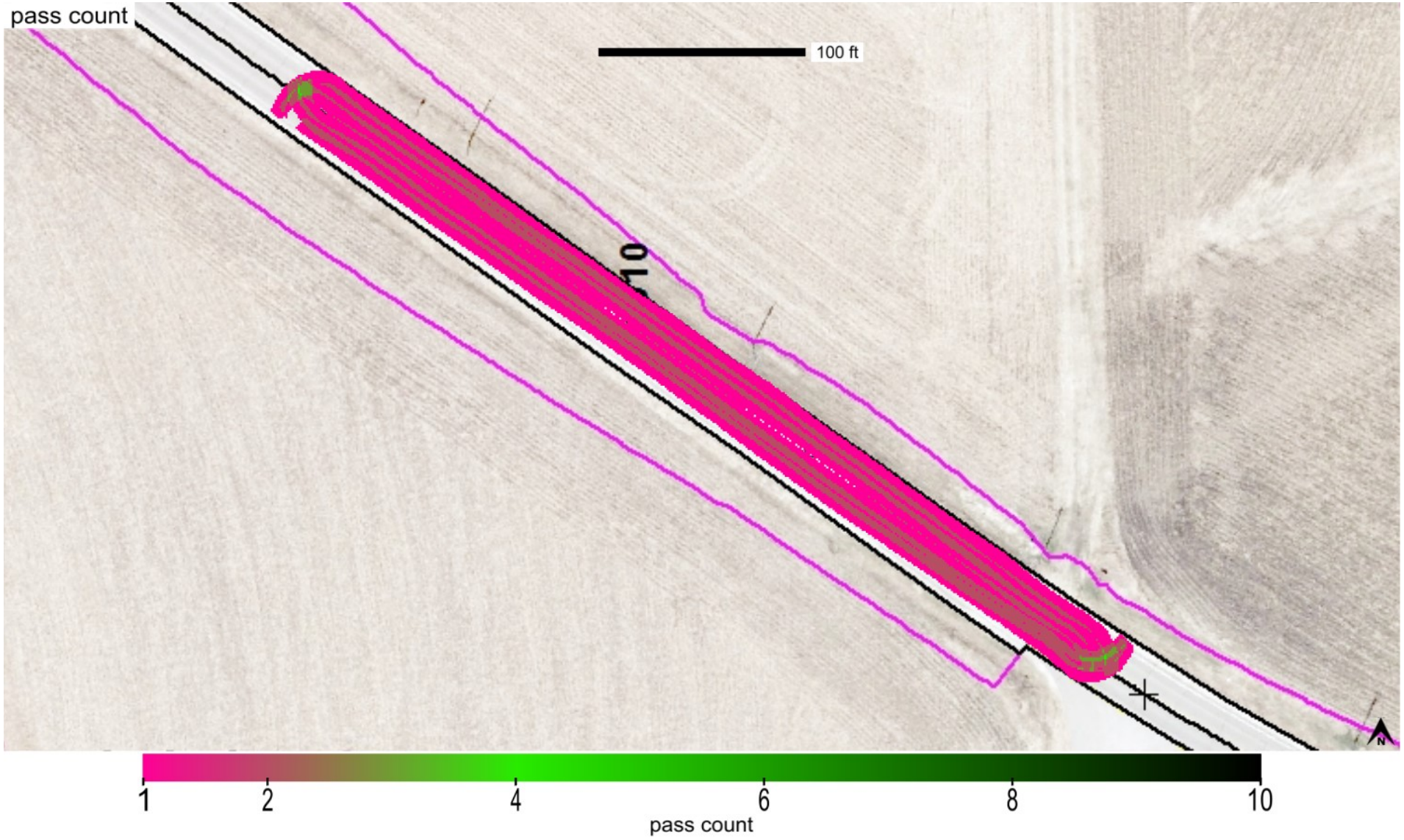
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_171204a

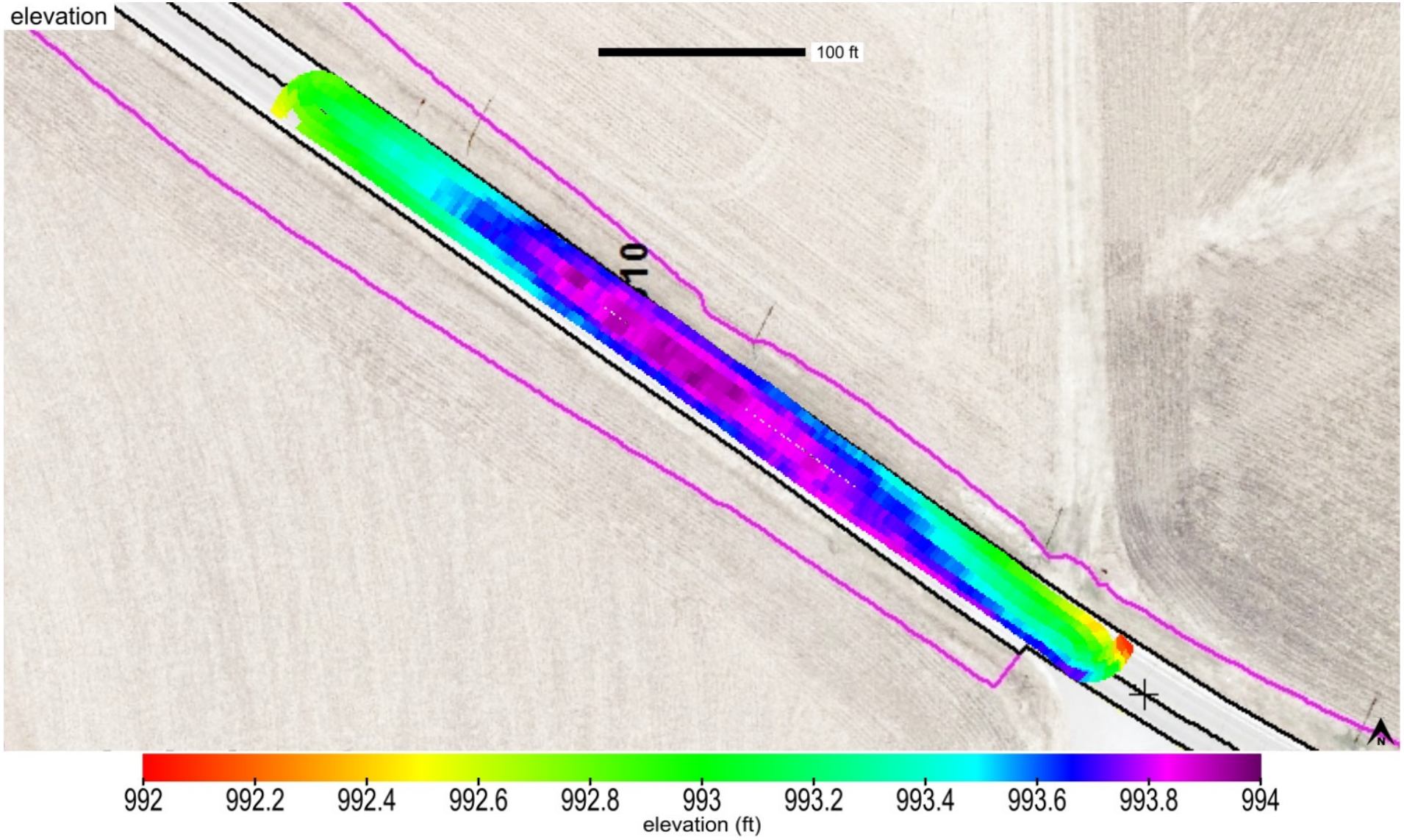
minimum	average	maximum
1	1.39	4



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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_171204a

minimum	average	maximum
992.081	993.494	993.958



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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_171204a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Soil Cement_Subgrade	31001	100	14719	0.338	12	3000	150	40

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_171204a

IMG_20200806_113012797.jpg

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_171204a

IMG_20200806_113437095.jpg

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

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_17_171204a

IMG_20200811_143849947.jpg

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.64	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_18_075113a	No. of Measurements:	54045	Machine ID:	Ingios_FCS00210
Date and Time:	8/18/2020 7:51:13 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	Yes	99.6	113.24	0.54	9037	5500	39232.4	56000	12844.38	32.74	-3537	30195.4	46963
k-value	Yes	81.3	103.97	1.21	150	38.25	171.6	190	25.14	14.66	-111.75	21.6	40
Moisture Content	No												

Mapped Area

square feet	acres
54045	1.24

Pass Count

min.	avg.	max.
1	1.61	6

Elevation (ft)

min.	avg.	max.
1023.7	1064.78	1108.06

Velocity (fps)

min.	avg.	max.
1.21	5.57	6.07

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	54045	1.241	12	9037	150	40

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.64	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_18_075113a	No. of Measurements:	54045	Machine ID:	Ingios_FCS00210
Date and Time:	8/18/2020 7:51:13 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
113.24	CQI > = 95
99.6	80% of Resilient Modulus MVs >= 9037
32.74	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.64	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_18_075113a	No. of Measurements:	54045	Machine ID:	Ingios_FCS00210
Date and Time:	8/18/2020 7:51:13 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
103.97	CQI > = 95
81.3	80% of k-Value MVs >= 150
14.66	COV <= 20
11.72	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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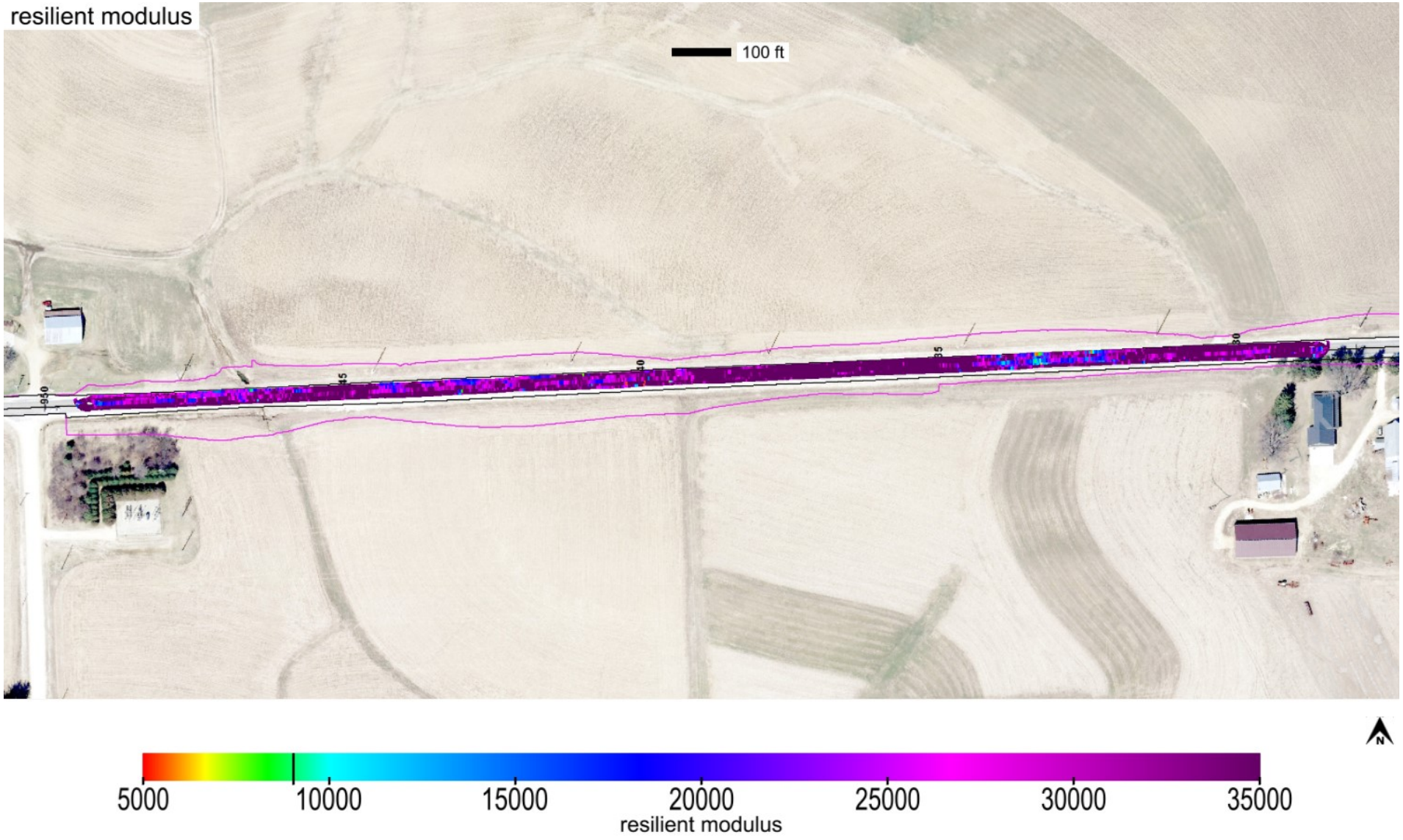
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_075113a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.6	113.24	0.54	9037	5500	39232.4	56000	12844.38	32.74	-3537	30195.4	46963



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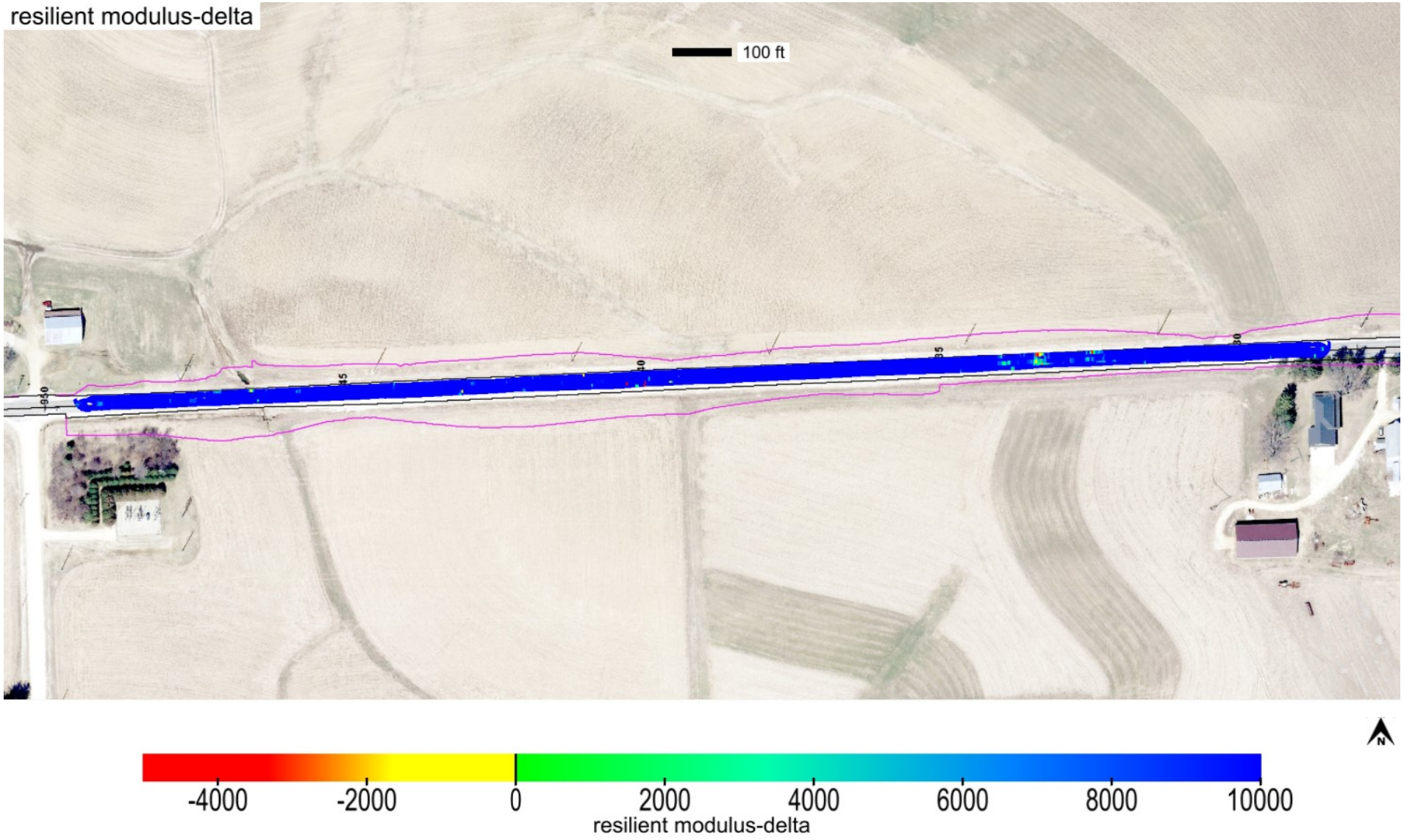
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_075113a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.6	113.24	0.54	9037	5500	39232.4	56000	12844.38	32.74	-3537	30195.4	46963



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ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_075113a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	99.6	9037	-3537	30195.4	46963	3654.31	29983.84	46963

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ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_075113a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

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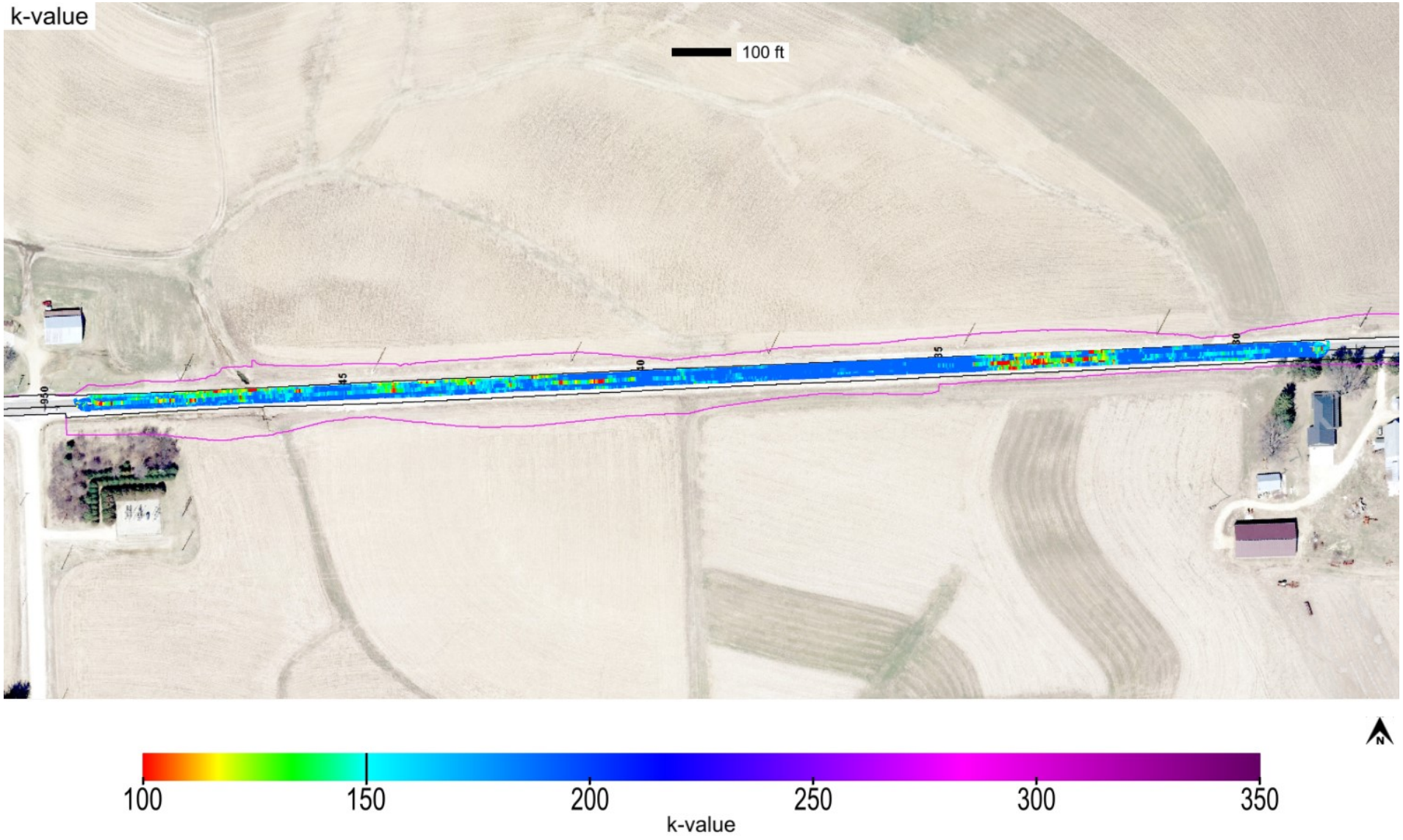
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_075113a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	81.3	103.97	1.21	150	38.25	171.6	190	25.14	14.66	-111.75	21.6	40



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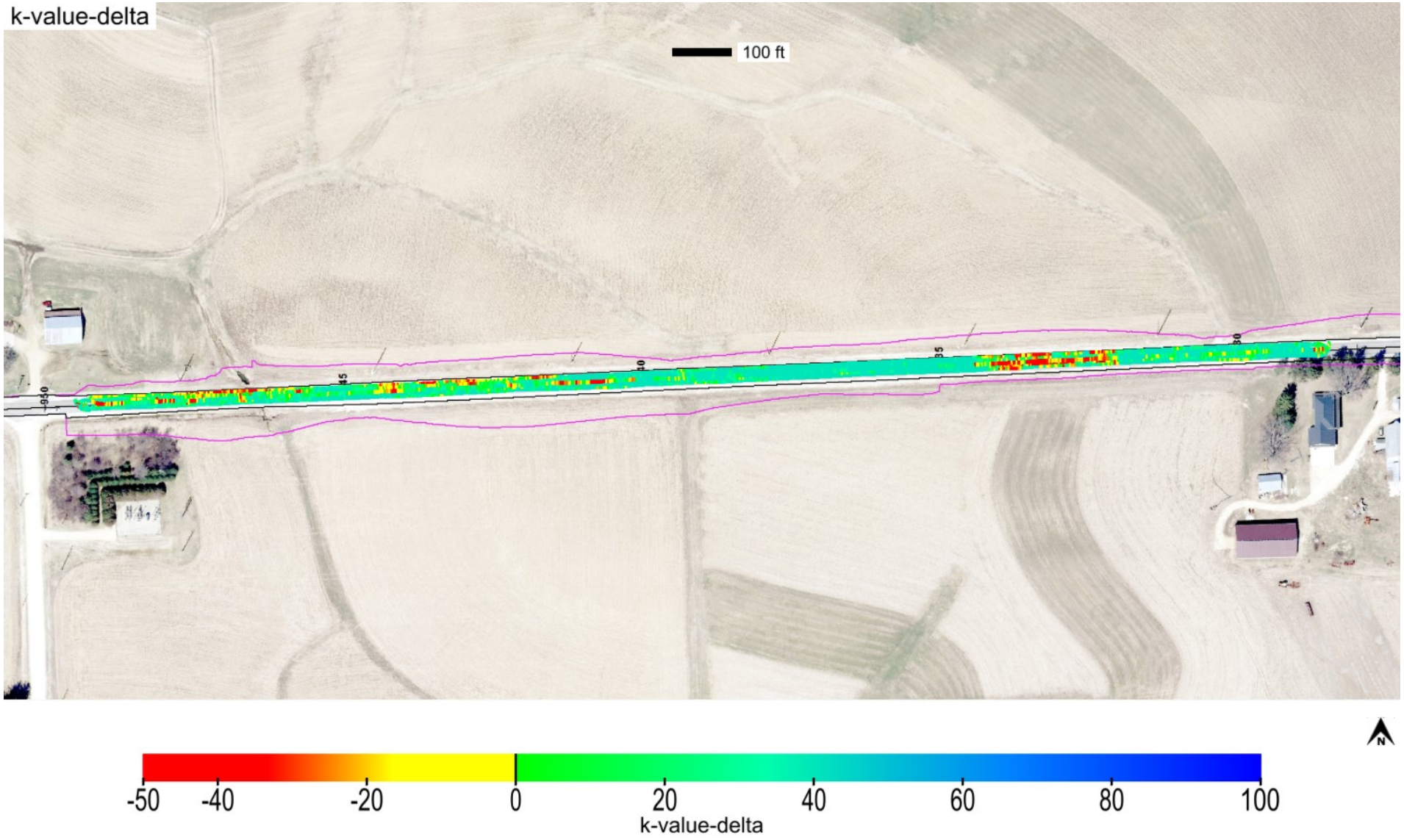
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_075113a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	81.3	103.97	1.21	150	38.25	171.6	190	25.14	14.66	-111.75	21.6	40



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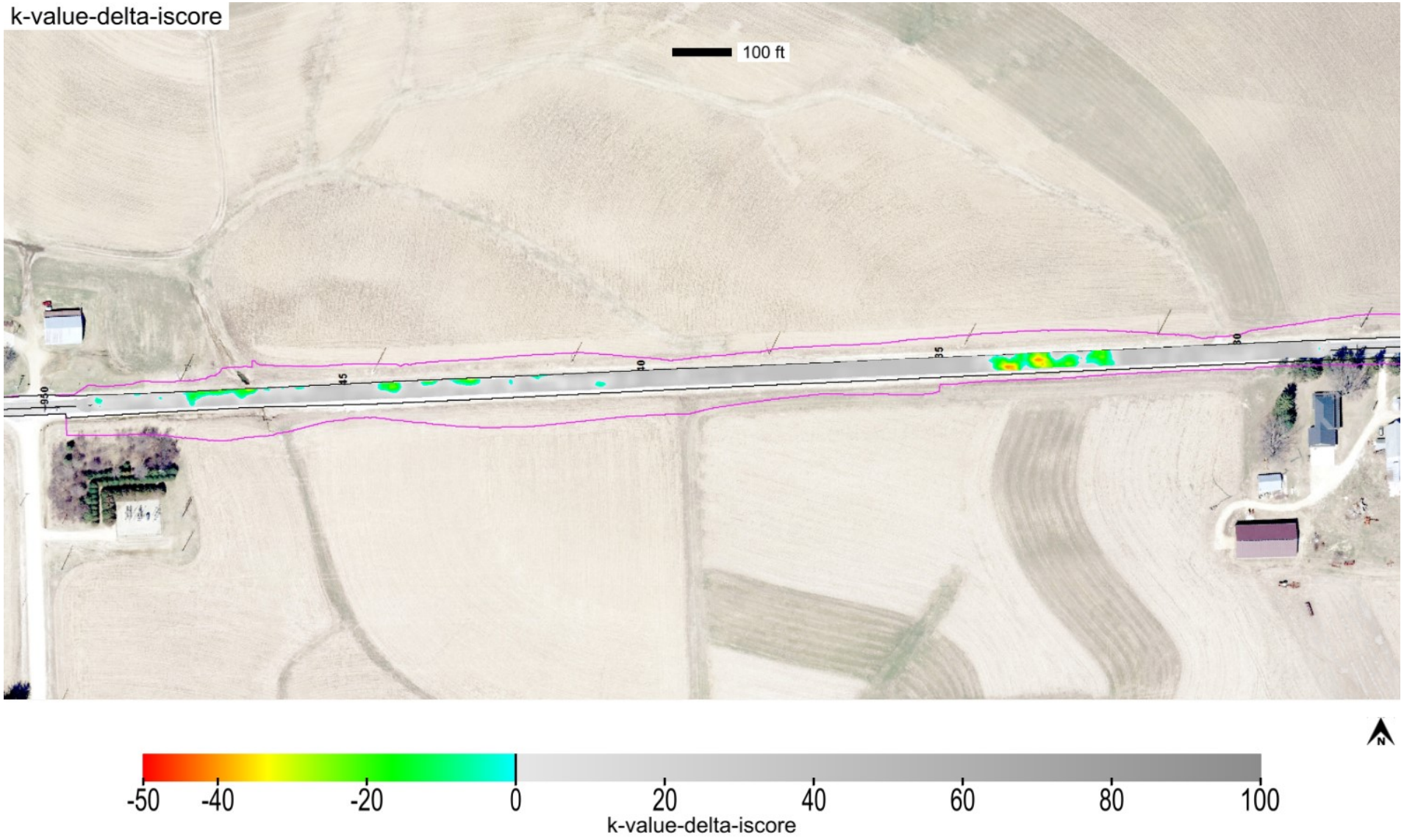
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_075113a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	81.3	150	-111.75	21.6	40	-41.52	21.42	40



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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_075113a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	5	6332	11.72	none	0

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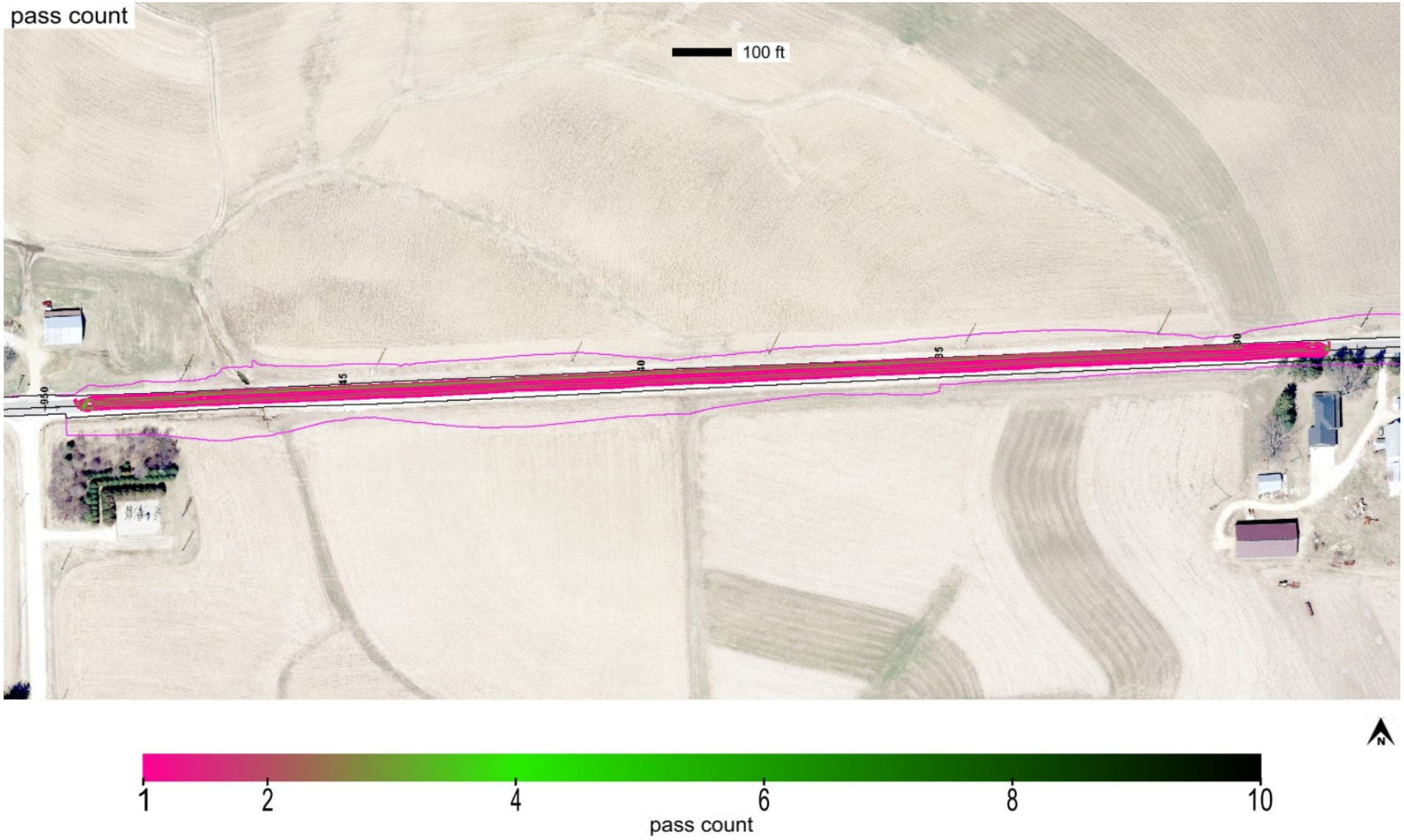
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_075113a

minimum	average	maximum
1	1.61	6



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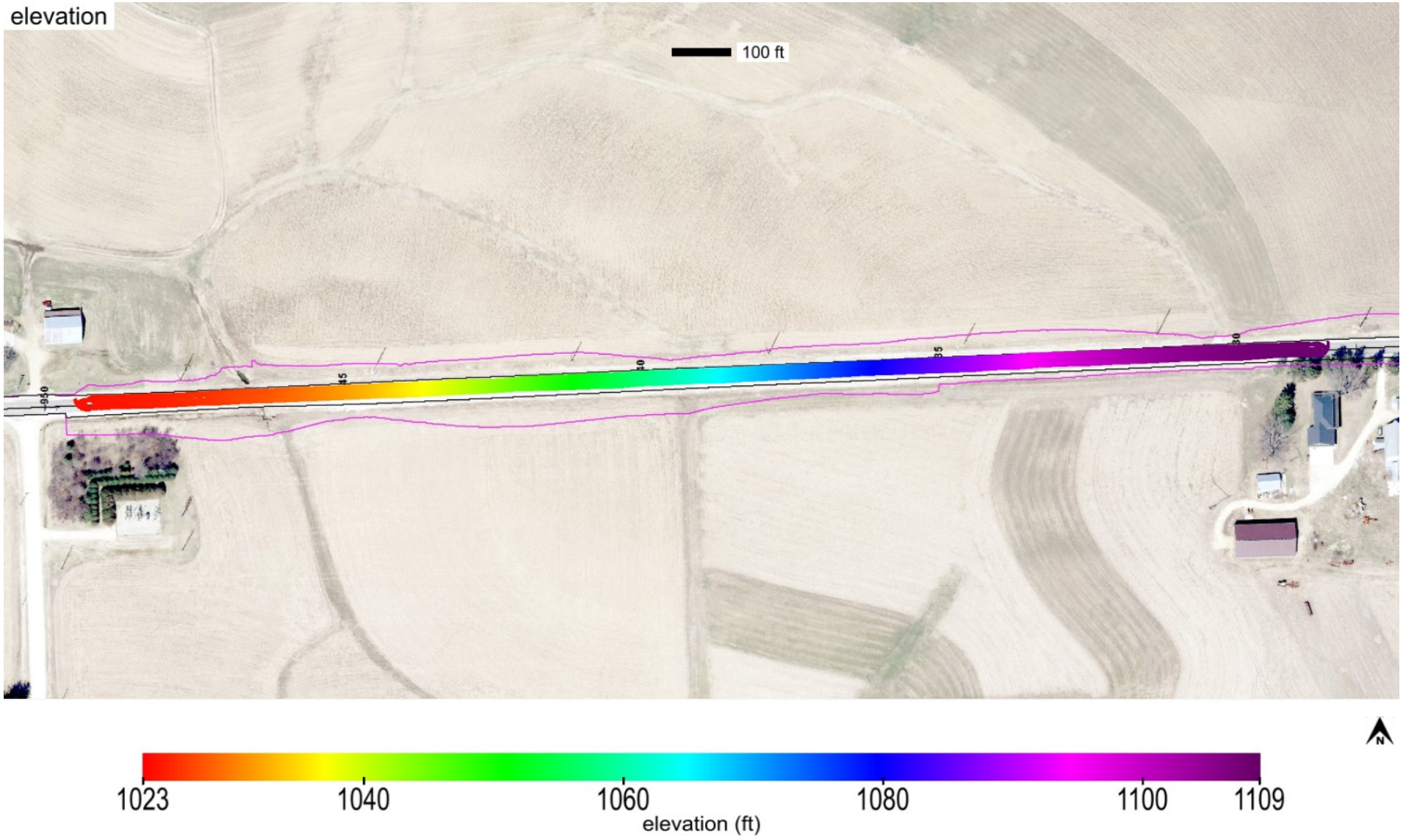
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_075113a

minimum	average	maximum
1023.702	1064.782	1108.056



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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_075113a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	54045	1.241	12	9037	150	40

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.55	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_18_083447a	No. of Measurements:	61198	Machine ID:	Ingios_FCS00210
Date and Time:	8/18/2020 8:34:47 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	Yes	100	117.42	0.46	9037	10245.85	44502.5	56000	11197.92	25.16	1208.85	35465.5	46963
k-value	Yes	94.8	120.29	1.78	150	43.35	182.4	190	16.38	8.98	-106.65	32.4	40
Moisture Content	No												

Mapped Area

square feet	acres
61198	1.4

Pass Count

min.	avg.	max.
1	1.25	4

Elevation (ft)

min.	avg.	max.
1080.96	1096.02	1106.4

Velocity (fps)

min.	avg.	max.
0.98	5.62	6.51

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	61198	1.405	12	9037	150	40

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.55	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_18_083447a	No. of Measurements:	61198	Machine ID:	Ingios_FCS00210
Date and Time:	8/18/2020 8:34:47 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
117.42	CQI > = 95
100	80% of Resilient Modulus MVs >= 9037
25.16	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.55	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_18_083447a	No. of Measurements:	61198	Machine ID:	Ingios_FCS00210
Date and Time:	8/18/2020 8:34:47 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
120.29	CQI > = 95
94.8	80% of k-Value MVs >= 150
8.98	COV <= 20
0.87	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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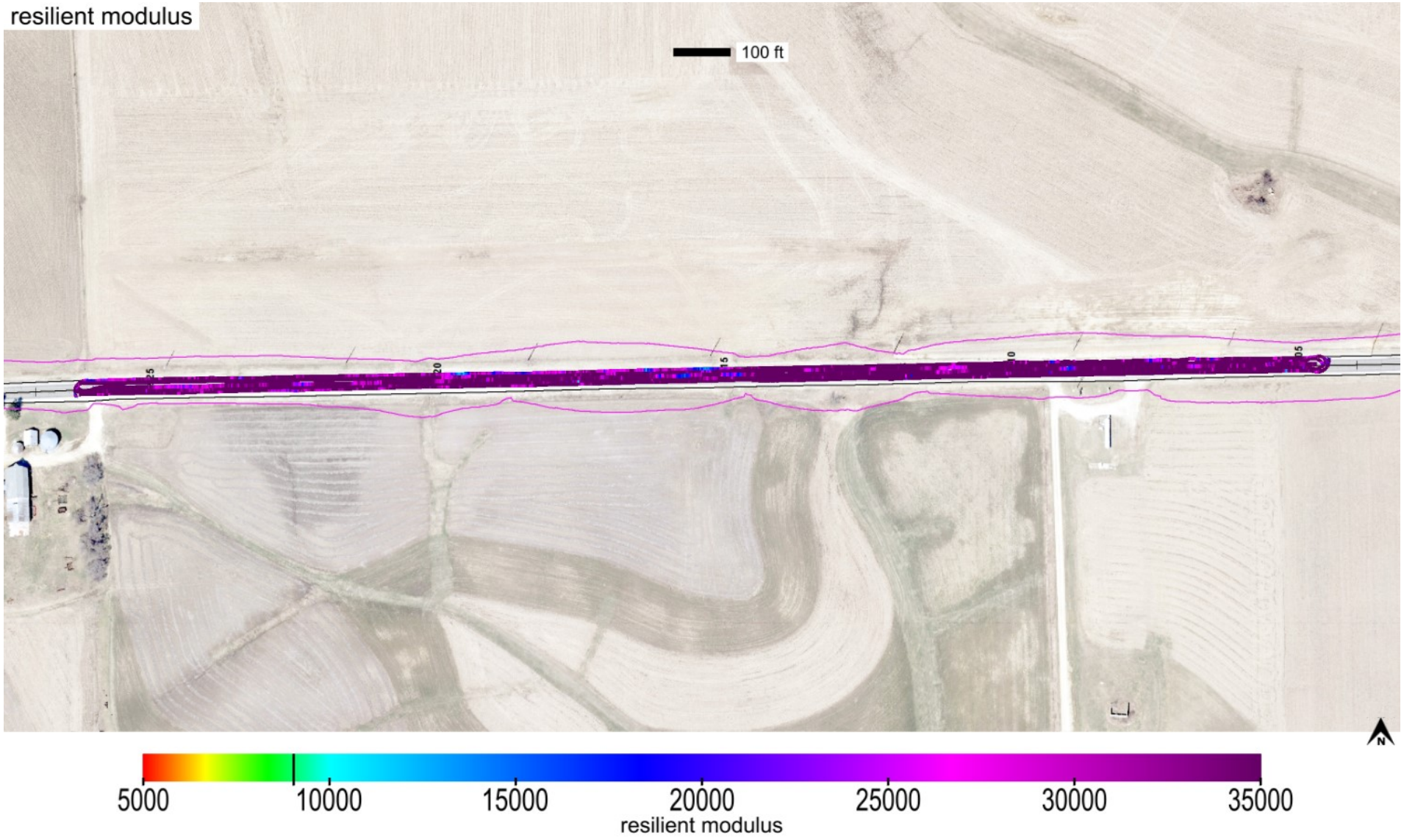
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_083447a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	117.42	0.46	9037	10245.85	44502.5	56000	11197.92	25.16	1208.85	35465.5	46963



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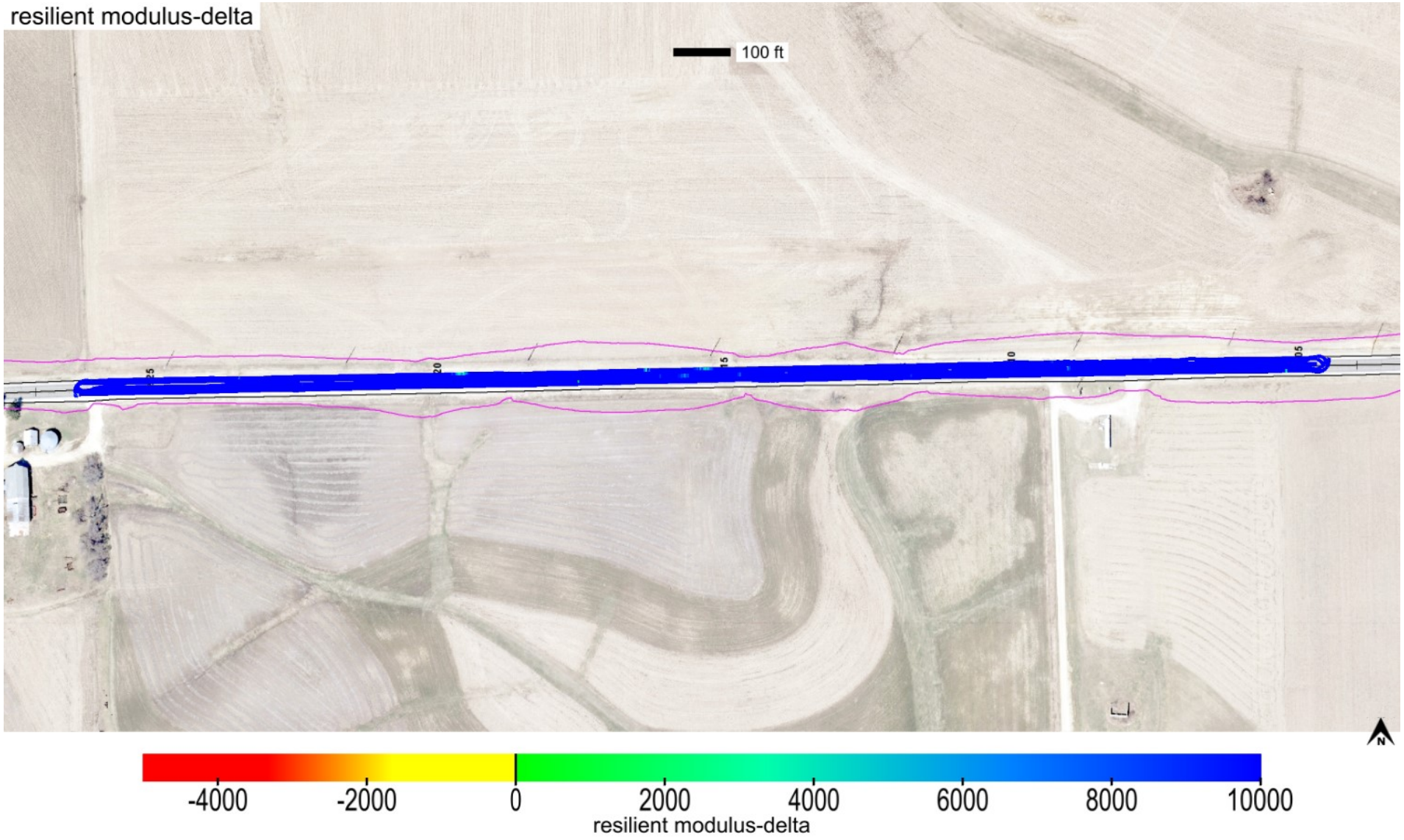
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_083447a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	117.42	0.46	9037	10245.85	44502.5	56000	11197.92	25.16	1208.85	35465.5	46963



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ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_083447a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	100	9037	1208.85	35465.5	46963	11248.07	35698.04	46963

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

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_083447a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

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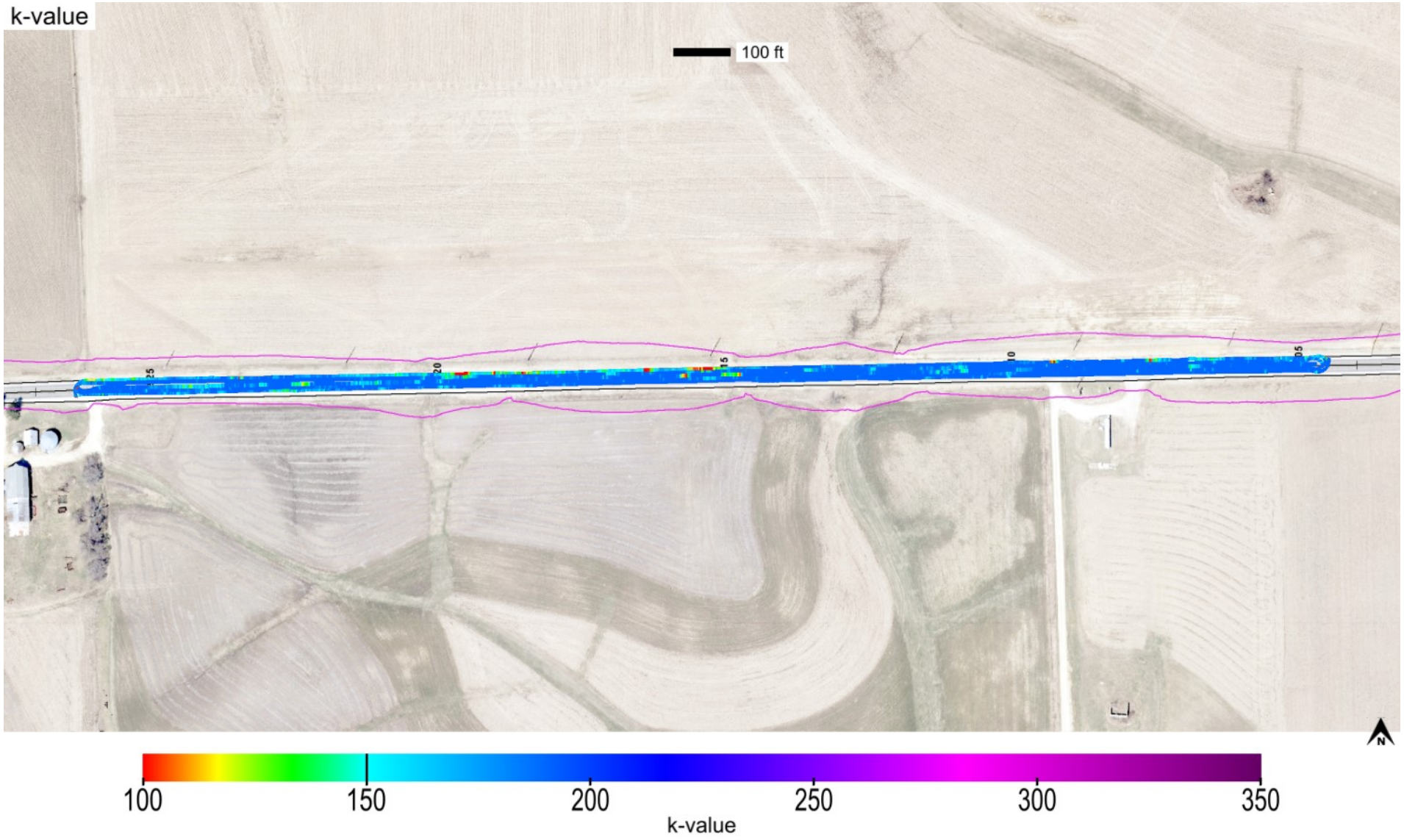
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_083447a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	94.8	120.29	1.78	150	43.35	182.4	190	16.38	8.98	-106.65	32.4	40



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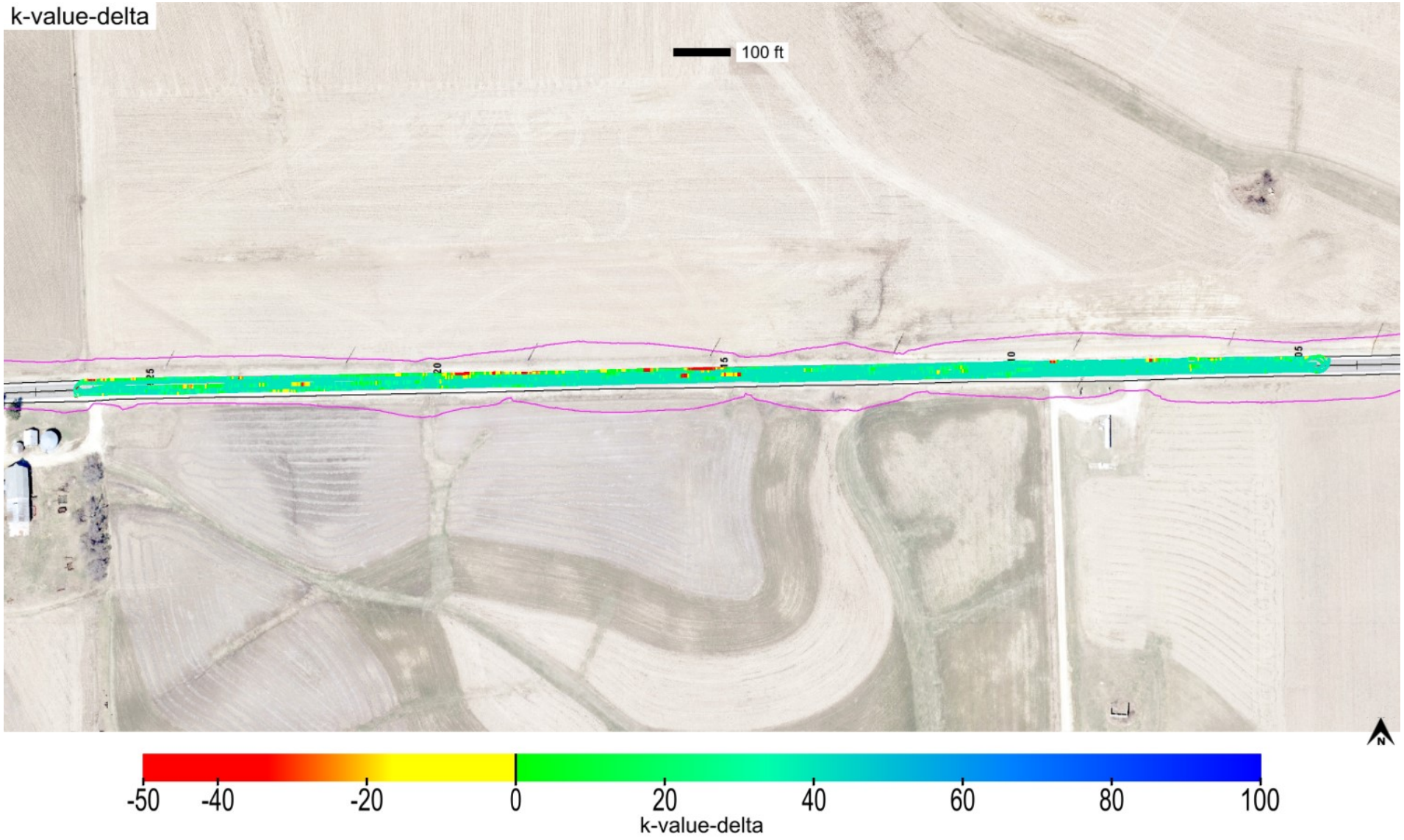
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_083447a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	94.8	120.29	1.78	150	43.35	182.4	190	16.38	8.98	-106.65	32.4	40



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ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_083447a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	94.8	150	-106.65	32.4	40	-45.38	32.89	40

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

ingios GEOTECHNICS

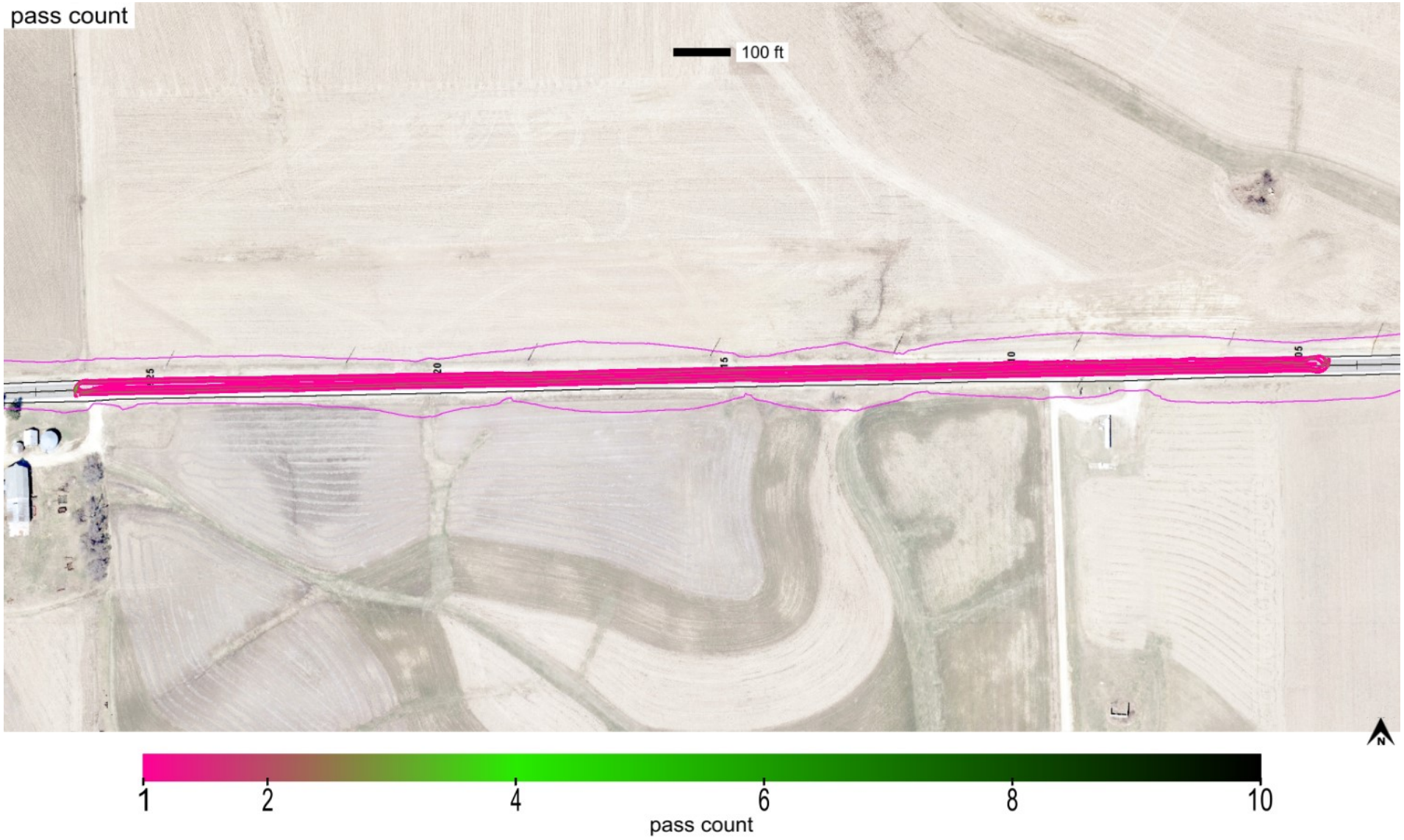
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_083447a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	2	535	0.87	none	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: iadot_31-us52_cs56-fcs00210_2020_08_18_083447a

minimum	average	maximum
1	1.25	4

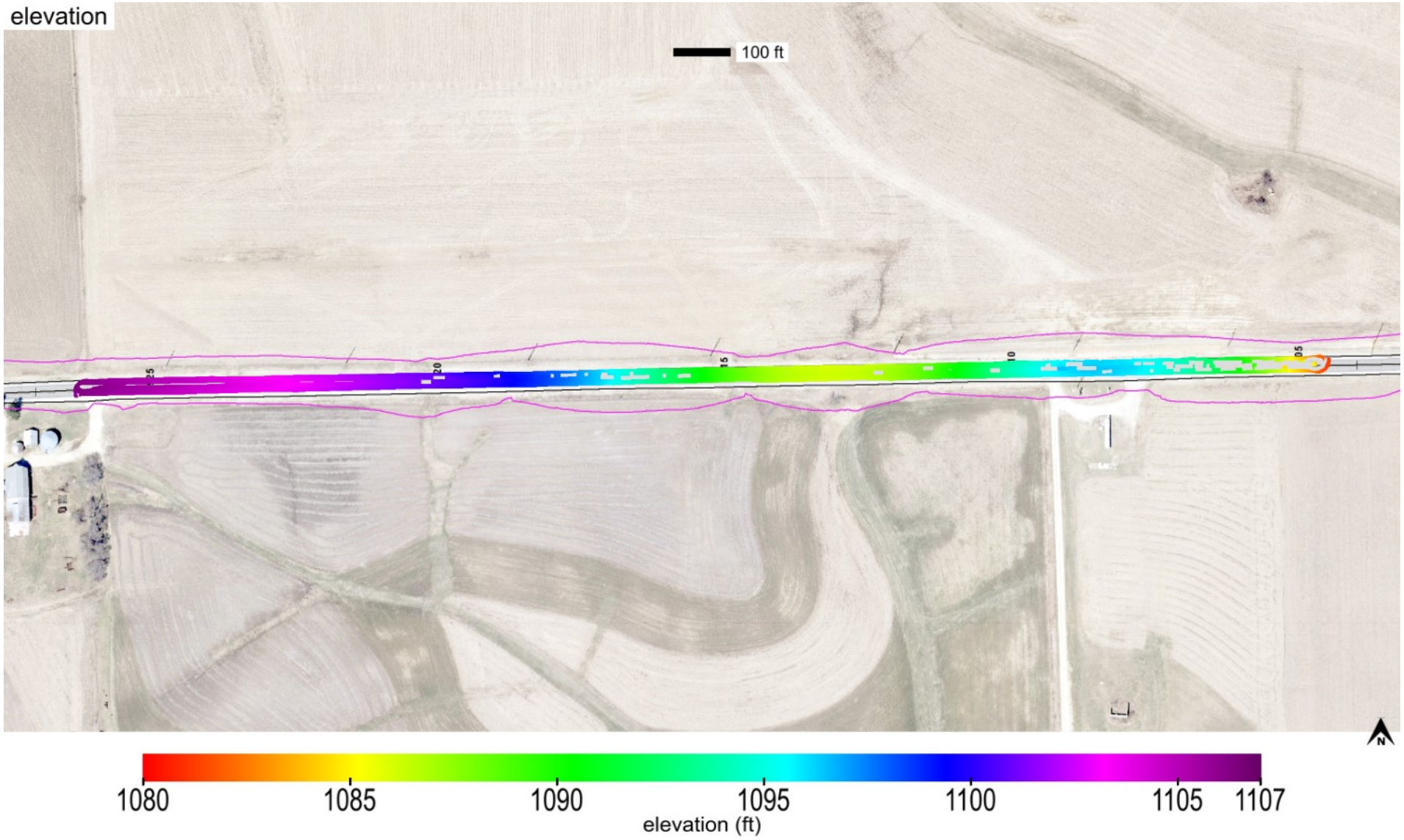


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_083447a

minimum	average	maximum
1080.956	1096.022	1106.402



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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_083447a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	61198	1.405	12	9037	150	40

Modified Subbase_IADOT (2115)

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

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_083447a

IMG_20200813_131432538.jpg

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.34	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_18_092546a	No. of Measurements:	34976	Machine ID:	Ingios_FCS00210
Date and Time:	8/18/2020 9:25:46 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	Yes	100	114.5	0.65	9037	10472.04	37295.5	56000	11561.36	31	1435.04	28258.5	46963
k-value	Yes	84.4	107.46	1.29	150	42.73	173.1	190	24.09	13.92	-107.27	23.1	40
Moisture Content	No												

Mapped Area

square feet	acres
34976	0.8

Pass Count

min.	avg.	max.
1	1.32	4

Elevation (ft)

min.	avg.	max.
1010.06	1018.01	1023.72

Velocity (fps)

min.	avg.	max.
0.7	5.57	6.5

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	34976	0.803	12	9037	150	40

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

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.34	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_18_092546a	No. of Measurements:	34976	Machine ID:	Ingios_FCS00210
Date and Time:	8/18/2020 9:25:46 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
114.5	CQI > = 95
100	80% of Resilient Modulus MVs >= 9037
31	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US52 Dubuque County	Mapping Duration (hrs):	0.34	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us52_cs56-fcs00210_2020_08_18_092546a	No. of Measurements:	34976	Machine ID:	Ingios_FCS00210
Date and Time:	8/18/2020 9:25:46 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
107.46	CQI > = 95
84.4	80% of k-Value MVs >= 150
13.92	COV <= 20
4.61	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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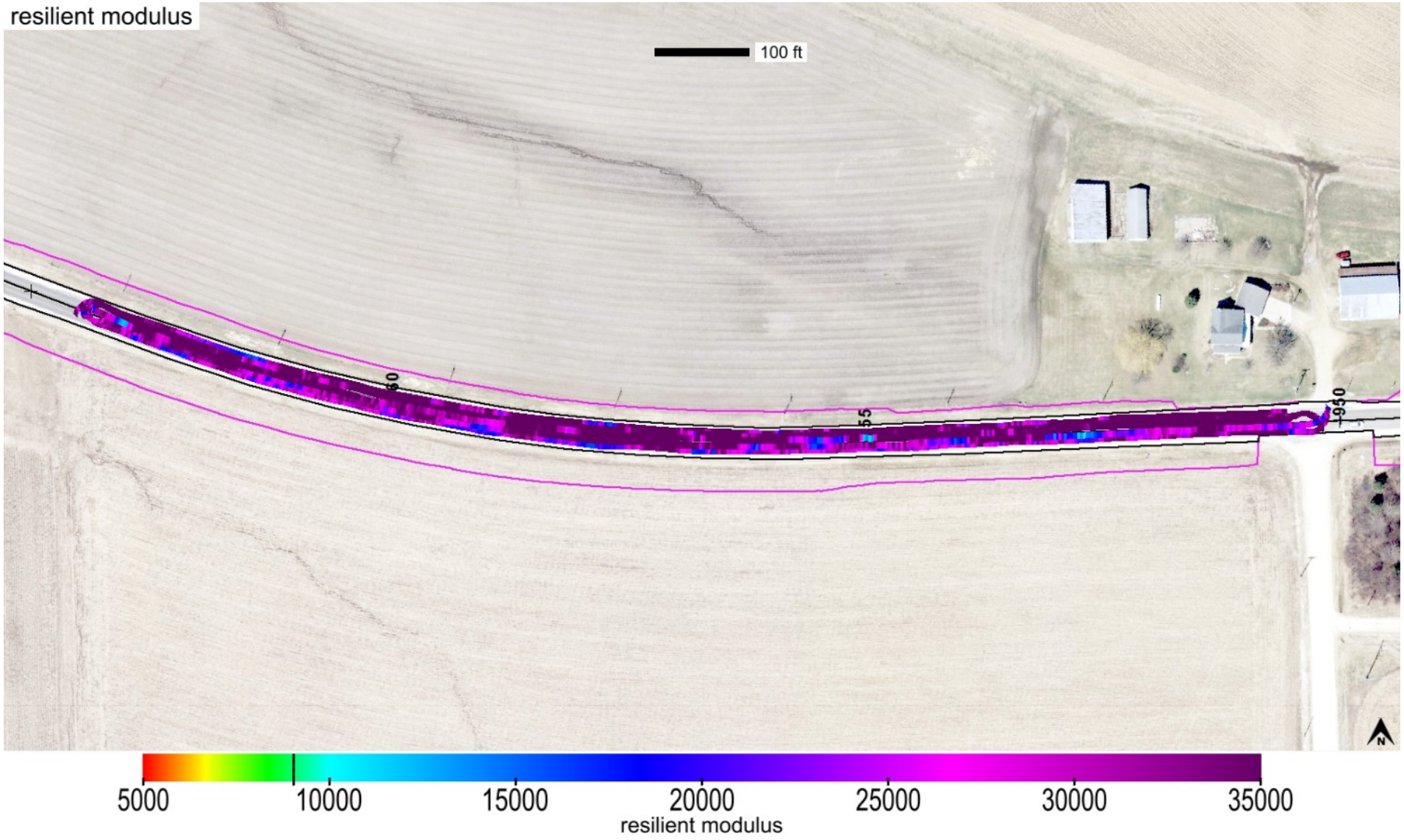
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_092546a

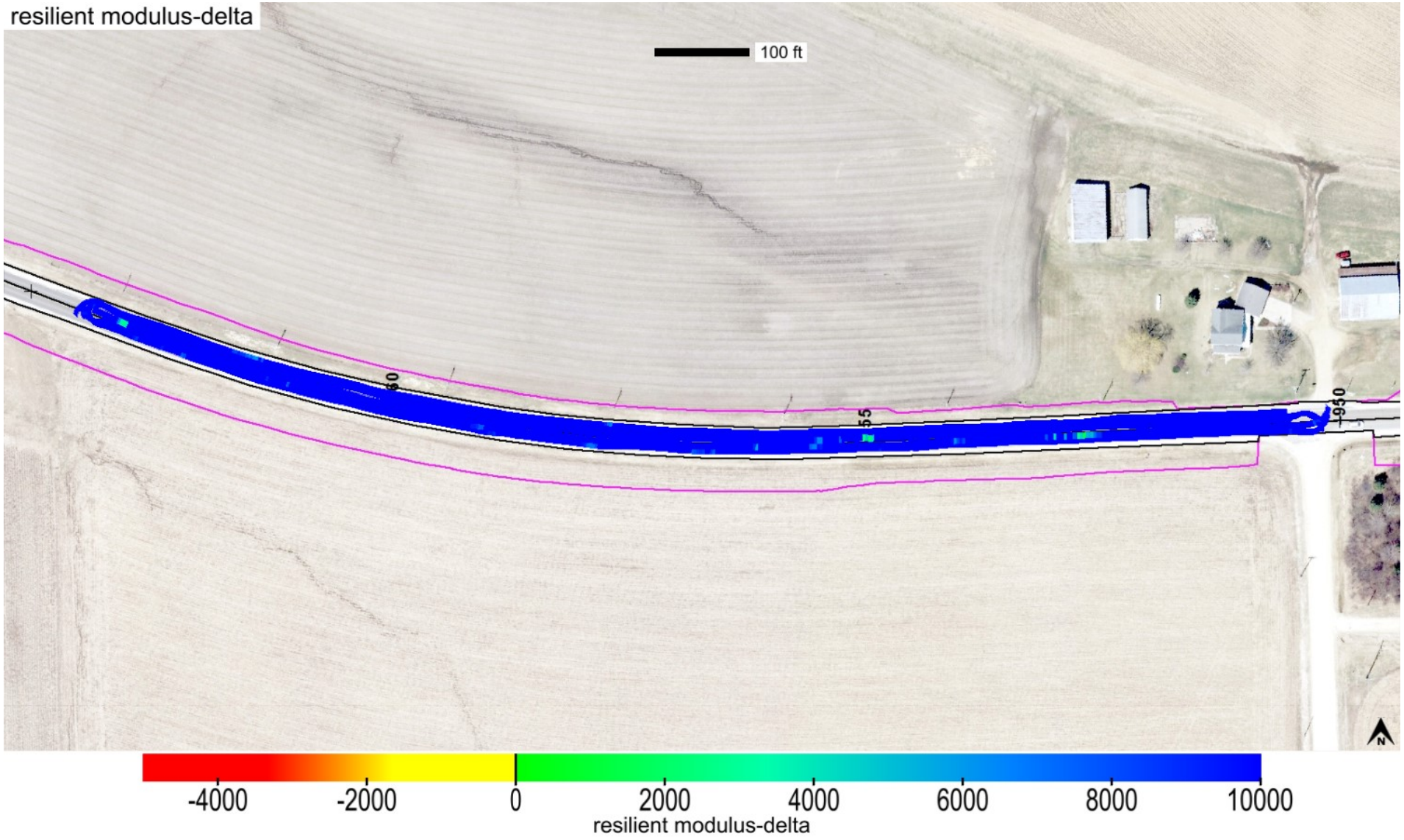
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	114.5	0.65	9037	10472.04	37295.5	56000	11561.36	31	1435.04	28258.5	46963



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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_092546a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	114.5	0.65	9037	10472.04	37295.5	56000	11561.36	31	1435.04	28258.5	46963



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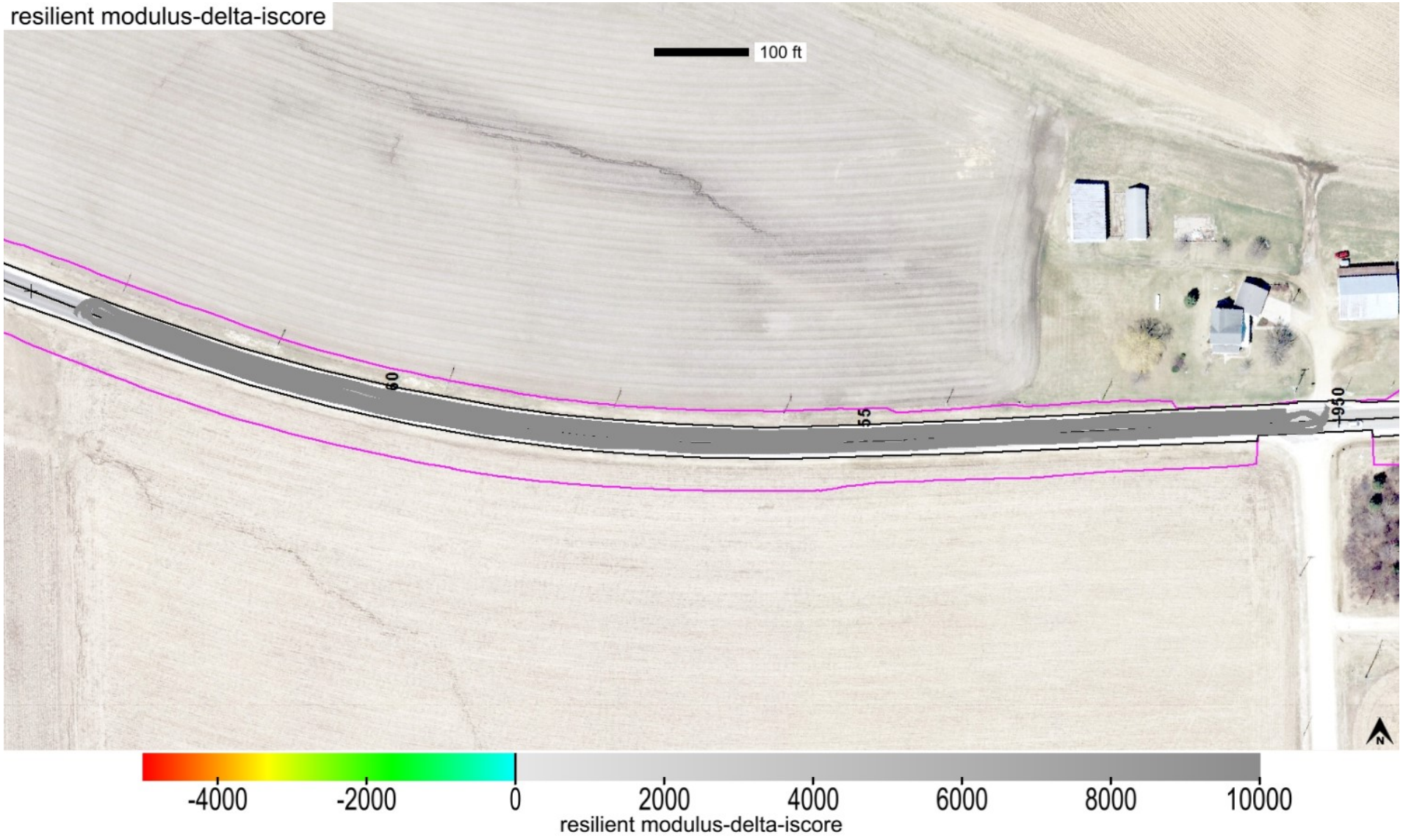
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_092546a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	100	9037	1435.04	28258.5	46963	7429.79	28499.15	45688.21



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ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_092546a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

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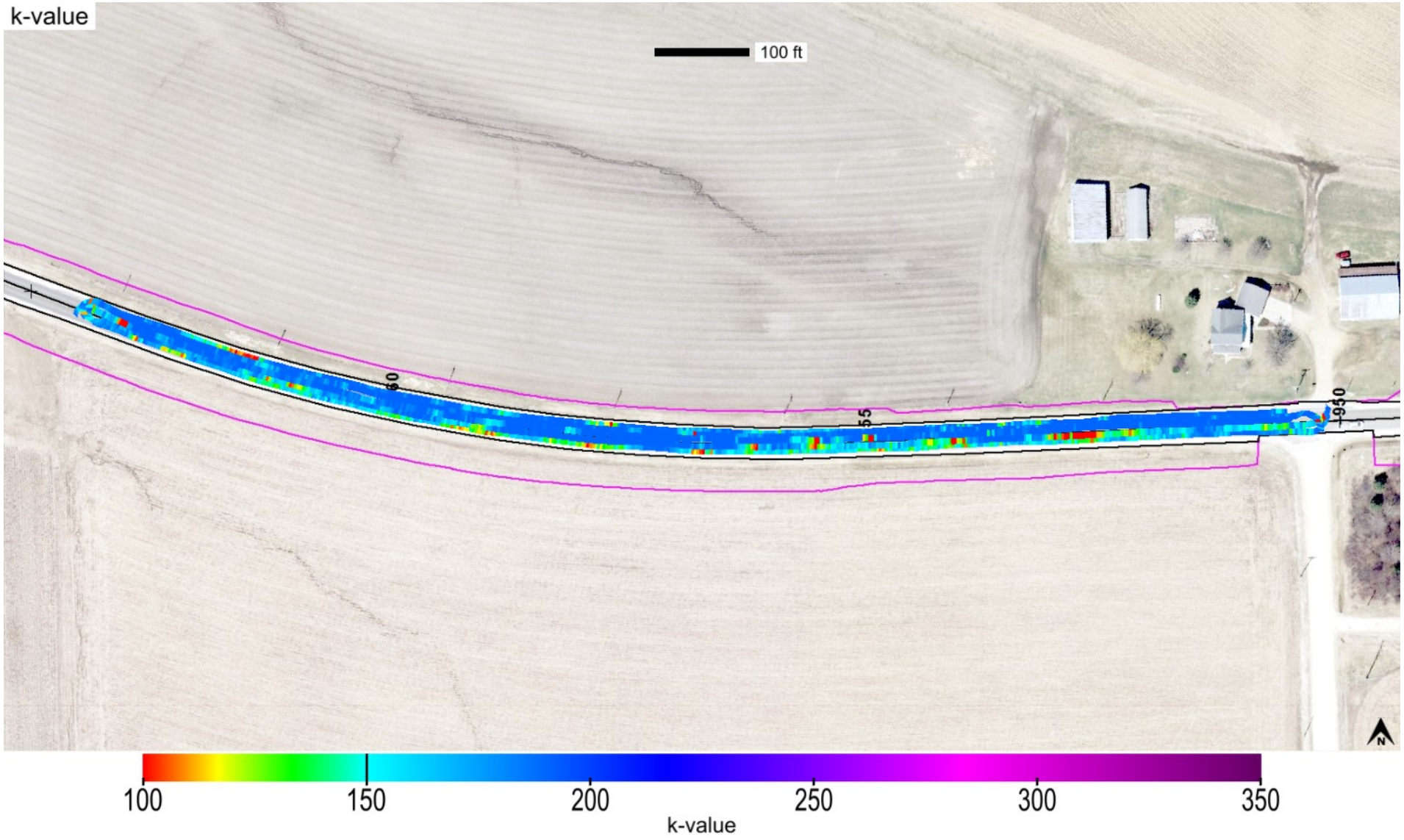
ingios GEOTECHNICS

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_092546a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	84.4	107.46	1.29	150	42.73	173.1	190	24.09	13.92	-107.27	23.1	40



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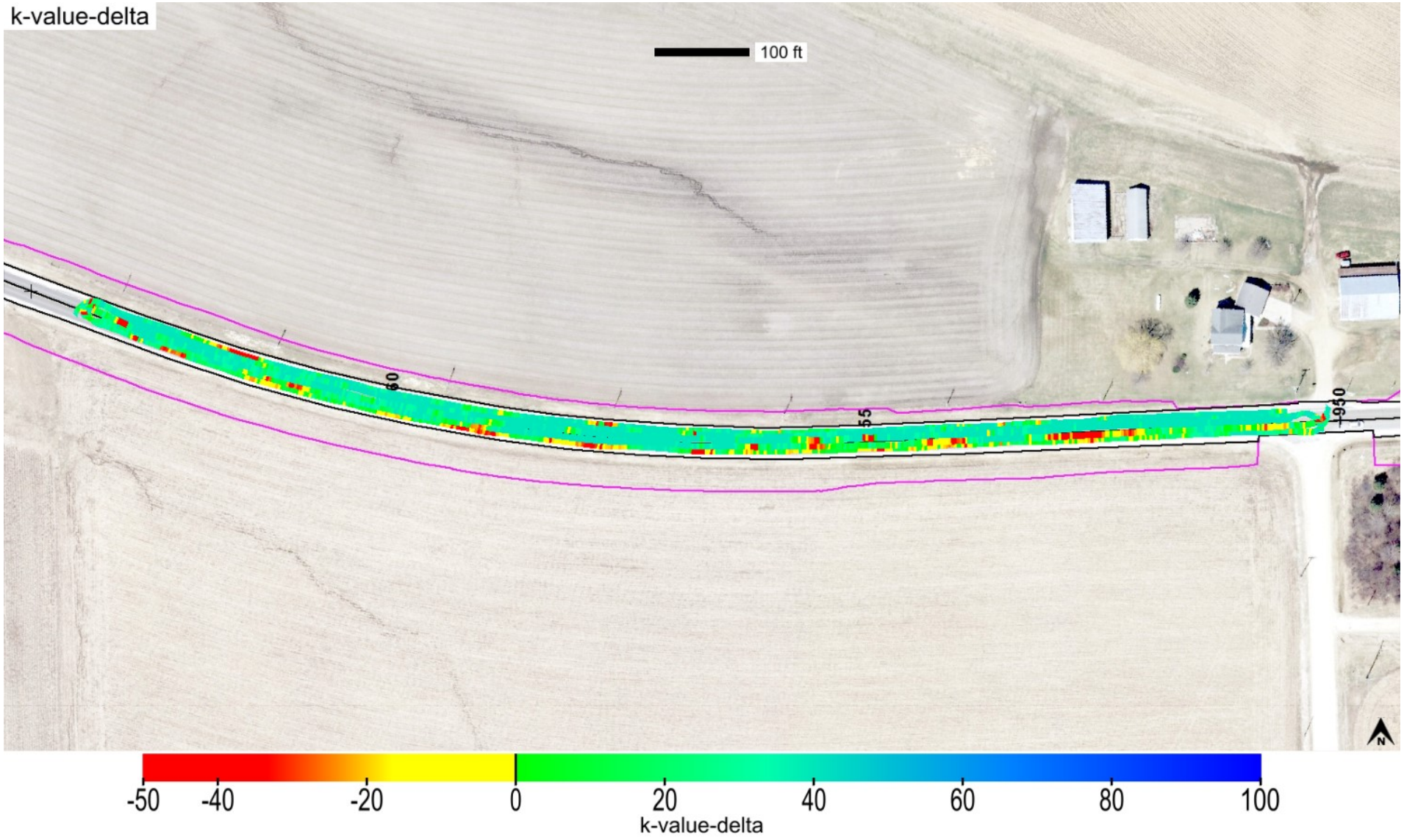
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_092546a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	84.4	107.46	1.29	150	42.73	173.1	190	24.09	13.92	-107.27	23.1	40



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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_092546a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	84.4	150	-107.27	23.1	40	-50.64	23.59	40

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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_092546a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	4	1614	4.61	none	0

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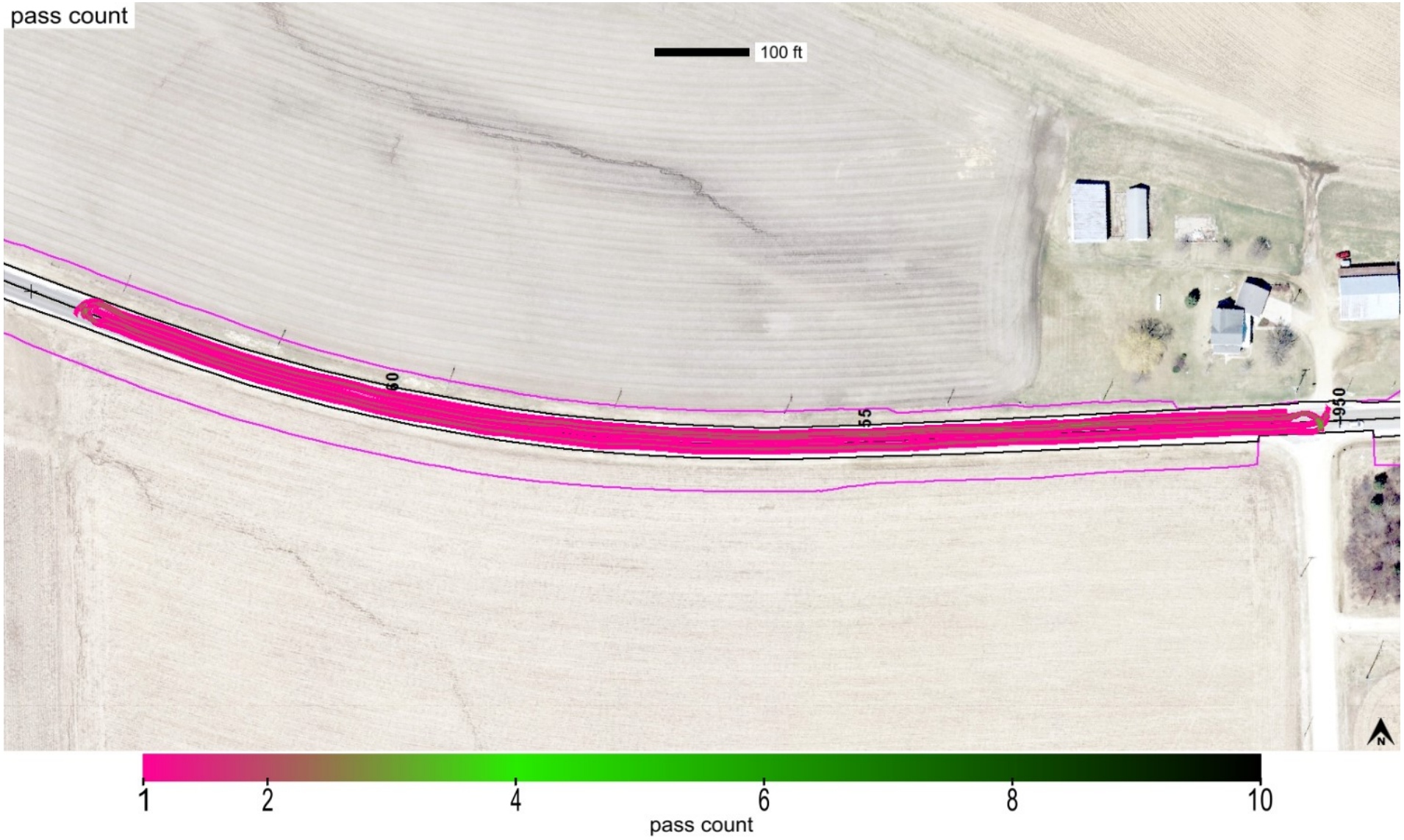
Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_092546a

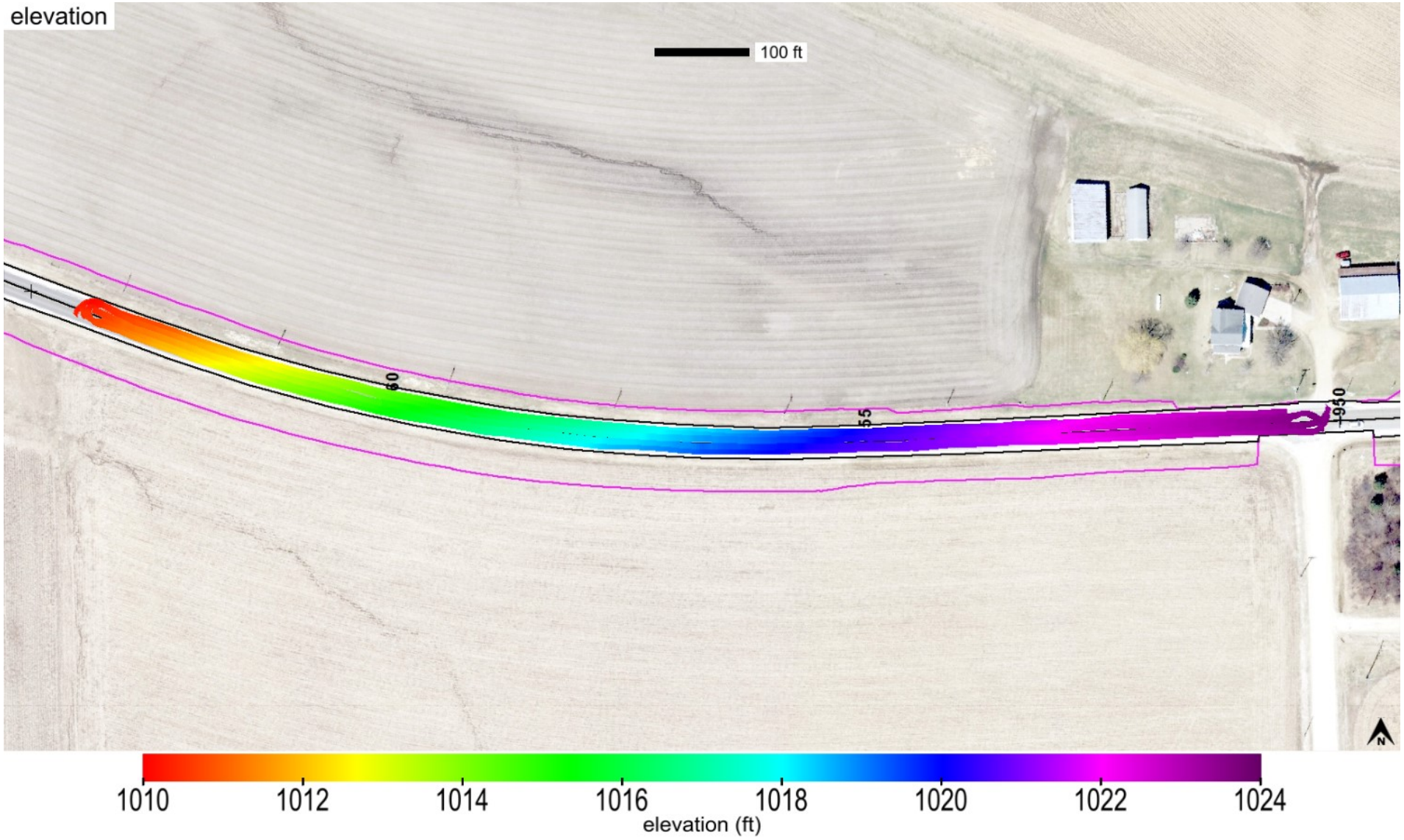
minimum	average	maximum
1	1.32	4



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

Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_092546a

minimum	average	maximum
1010.057	1018.013	1023.722



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Map ID: iadot_31-us52_cs56-fcs00210_2020_08_18_092546a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modifield Subbase	41014	100	34976	0.803	12	9037	150	40

Modified Subbase_IADOT (2115)

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IOWADOT

E-Compaction Report

Project:	I35 IA175 Intersection	Mapping Duration (hrs):	0.32	Operator:	Ingios Geotechnics inc
Map ID:	iadot_40-i35_cs56-fcs00210_2019_09_03_102604	No. of Measurements:	20882	Machine ID:	Ingios_FCS00210
Date and Time:	9/3/2019 10:26:04 AM	Location:	Hamilton County	State Plane:	4 IOWA Sioux City-Iowa Falls

Review Status: Review Required

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	Yes	99.9	119.15	1.37	9037	8923.33	18034.9	36001.13	3890.02	21.57	-113.67	8997.9	26964.13
k-value	Yes	12.2	30.62	0.52	150	20	117.4	190	27.11	23.09	-130	-32.6	40
Moisture Content	No												

Mapped Area

square feet	acres
20882	0.48

Pass Count

min.	avg.	max.
1	1.24	3

Elevation (ft)

min.	avg.	max.
1000.2	1004.47	1008.12

Velocity (fps)

min.	avg.	max.
0.32	5.45	6.19

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	20882	0.479	12	9037	150	40

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	I35 IA175 Intersection	Mapping Duration (hrs):	0.32	Operator:	Ingios Geotechnics inc
Map ID:	iadot_40-i35_cs56-fcs00210_2019_09_03_102604	No. of Measurements:	20882	Machine ID:	Ingios_FCS00210
Date and Time:	9/3/2019 10:26:04 AM	Location:	Hamilton County	State Plane:	4 IOWA Sioux City-Iowa Falls

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
119.15	CQI > = 95
99.9	80% of Resilient Modulus MVs >= 9037
21.57	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	I35 IA175 Intersection	Mapping Duration (hrs):	0.32	Operator:	Ingios Geotechnics inc
Map ID:	iadot_40-i35_cs56-fcs00210_2019_09_03_102604	No. of Measurements:	20882	Machine ID:	Ingios_FCS00210
Date and Time:	9/3/2019 10:26:04 AM	Location:	Hamilton County	State Plane:	4 IOWA Sioux City-Iowa Falls

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
30.62	CQI > = 95
12.2	80% of k-Value MVs >= 150
23.09	COV <= 20
93.19	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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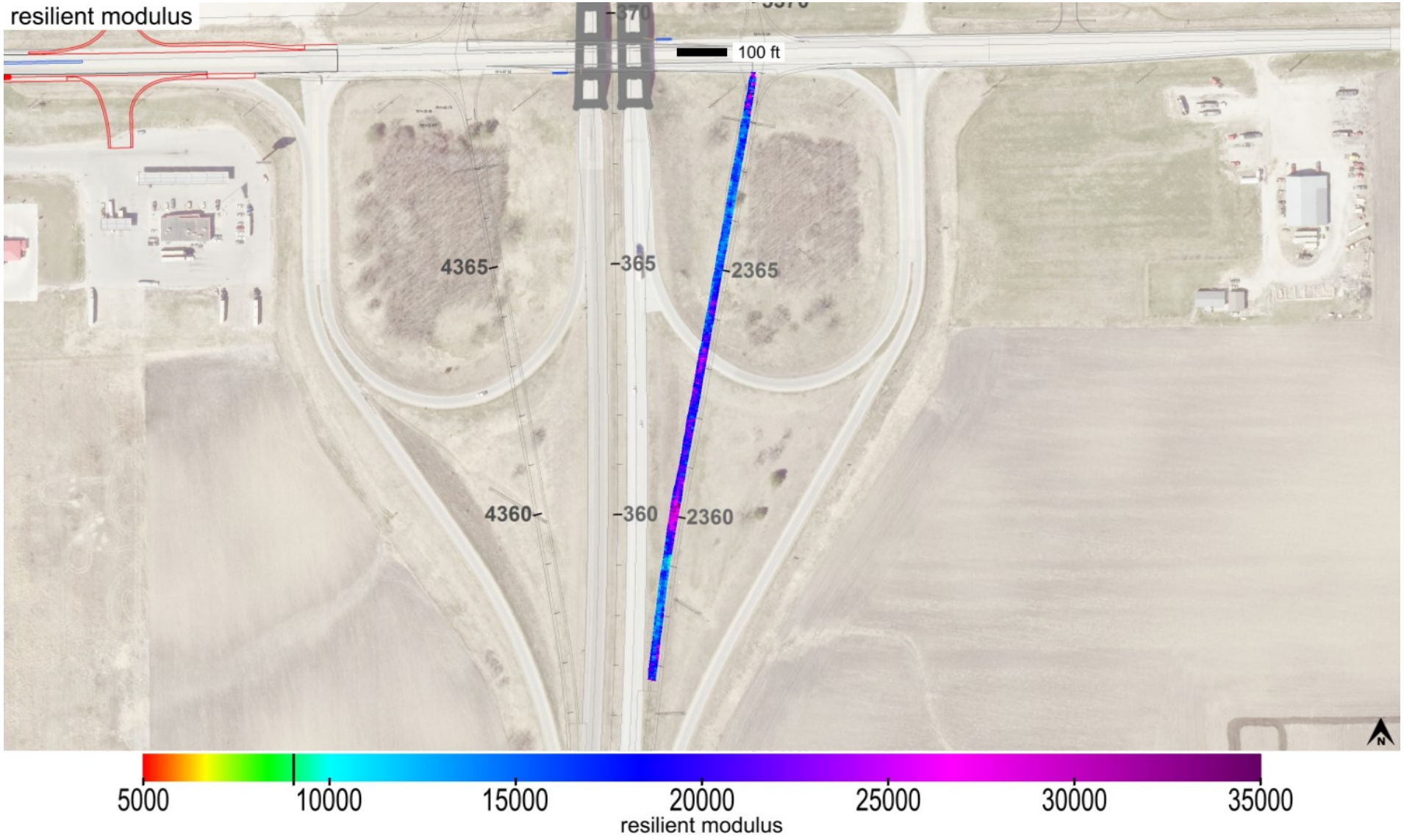
Map ID: IADOT_40-I35_CS56-FCS00210_2019_09_03_102604

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.9	119.15	1.37	9037	8923.33	18034.9	36001.13	3890.02	21.57	-113.67	8997.9	26964.13



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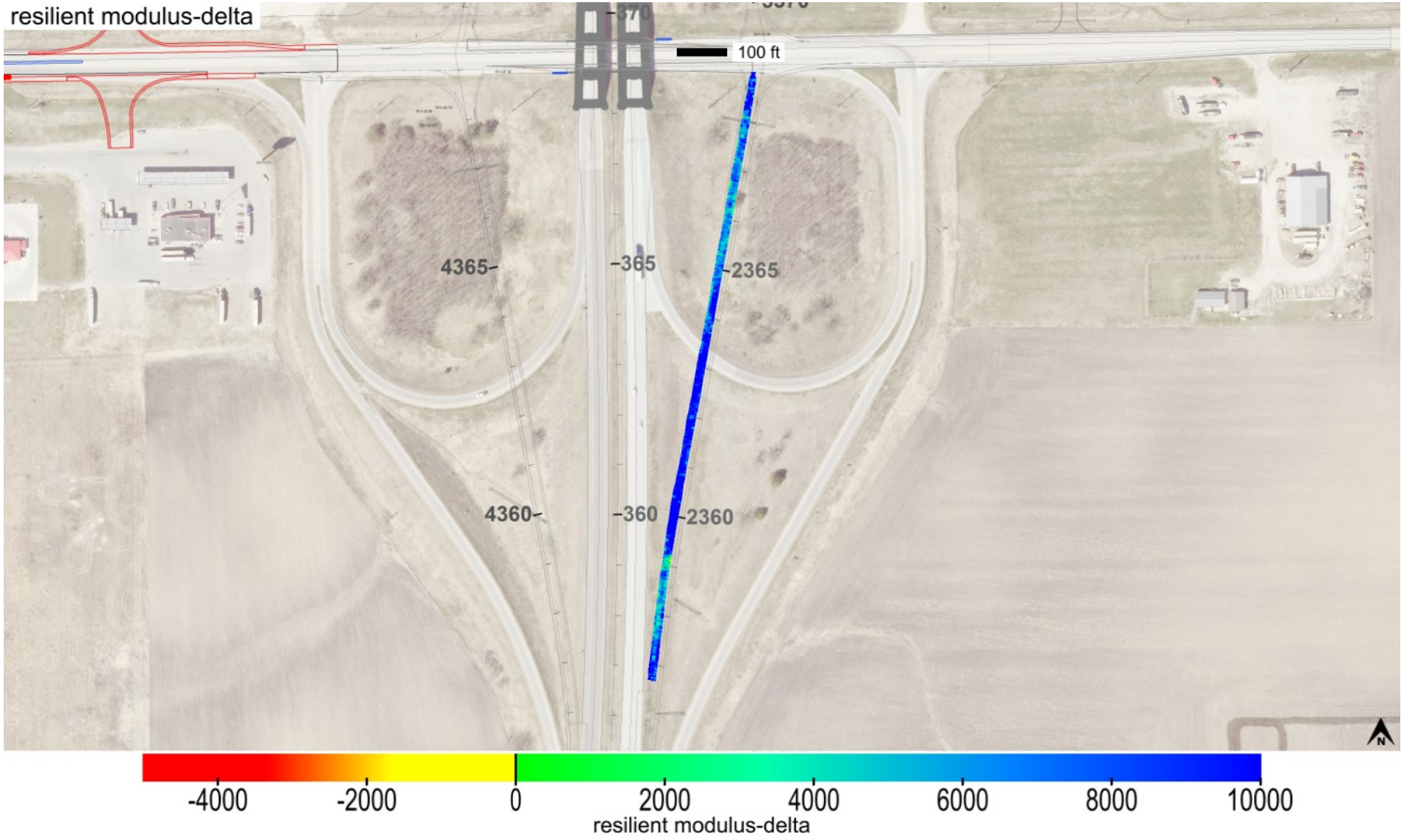
Map ID: IADOT_40-I35_CS56-FCS00210_2019_09_03_102604

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.9	119.15	1.37	9037	8923.33	18034.9	36001.13	3890.02	21.57	-113.67	8997.9	26964.13



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ingios GEOTECHNICS

Map ID: IADOT_40-I35_CS56-FCS00210_2019_09_03_102604

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	99.9	9037	-113.67	8997.9	26964.13	2557.37	9083.21	20673.71

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

ingios GEOTECHNICS

Map ID: IADOT_40-I35_CS56-FCS00210_2019_09_03_102604

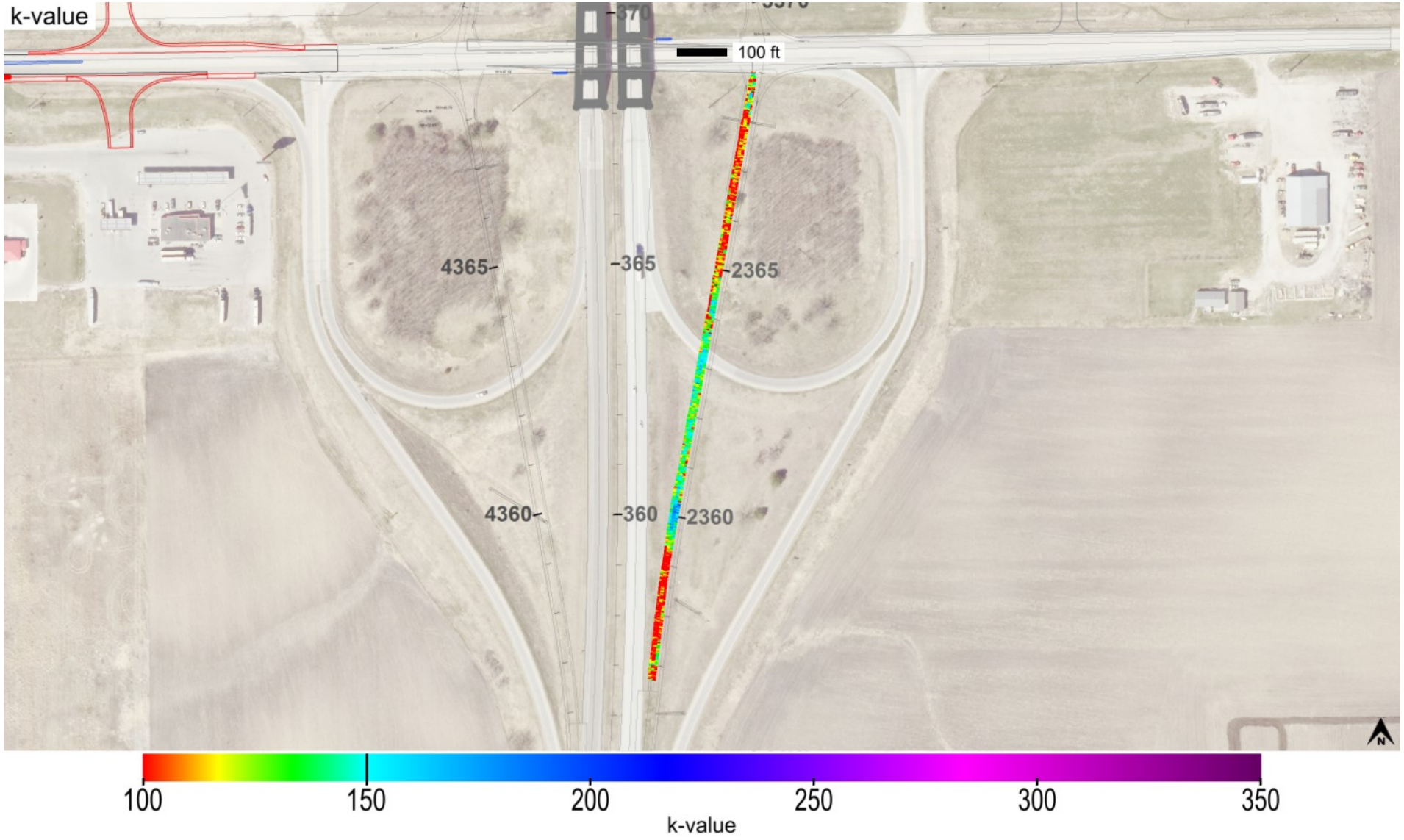
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

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

ingios GEOTECHNICS

Map ID: IADOT_40-I35_CS56-FCS00210_2019_09_03_102604

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	12.2	30.62	0.52	150	20	117.4	190	27.11	23.09	-130	-32.6	40



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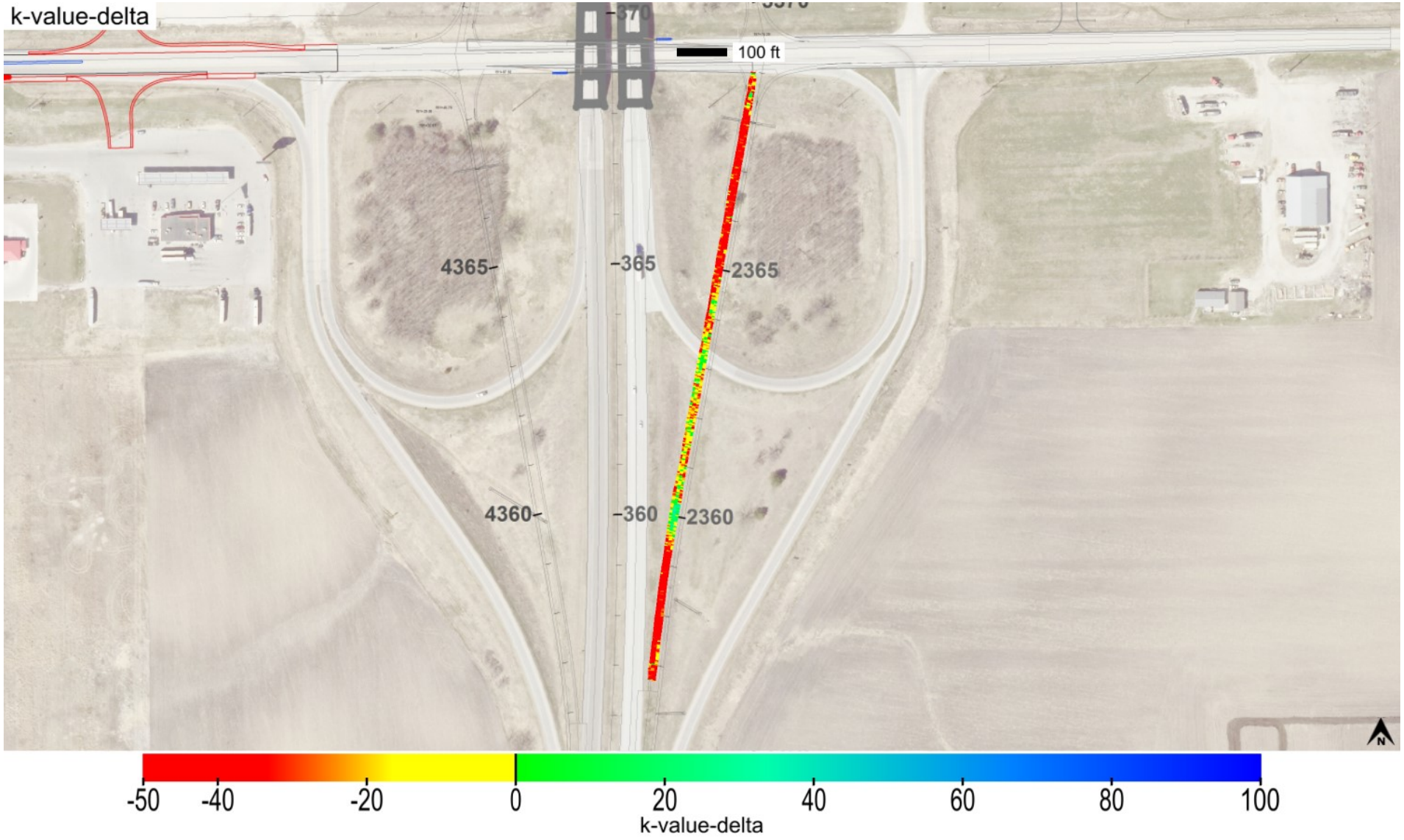
Map ID: IADOT_40-I35_CS56-FCS00210_2019_09_03_102604

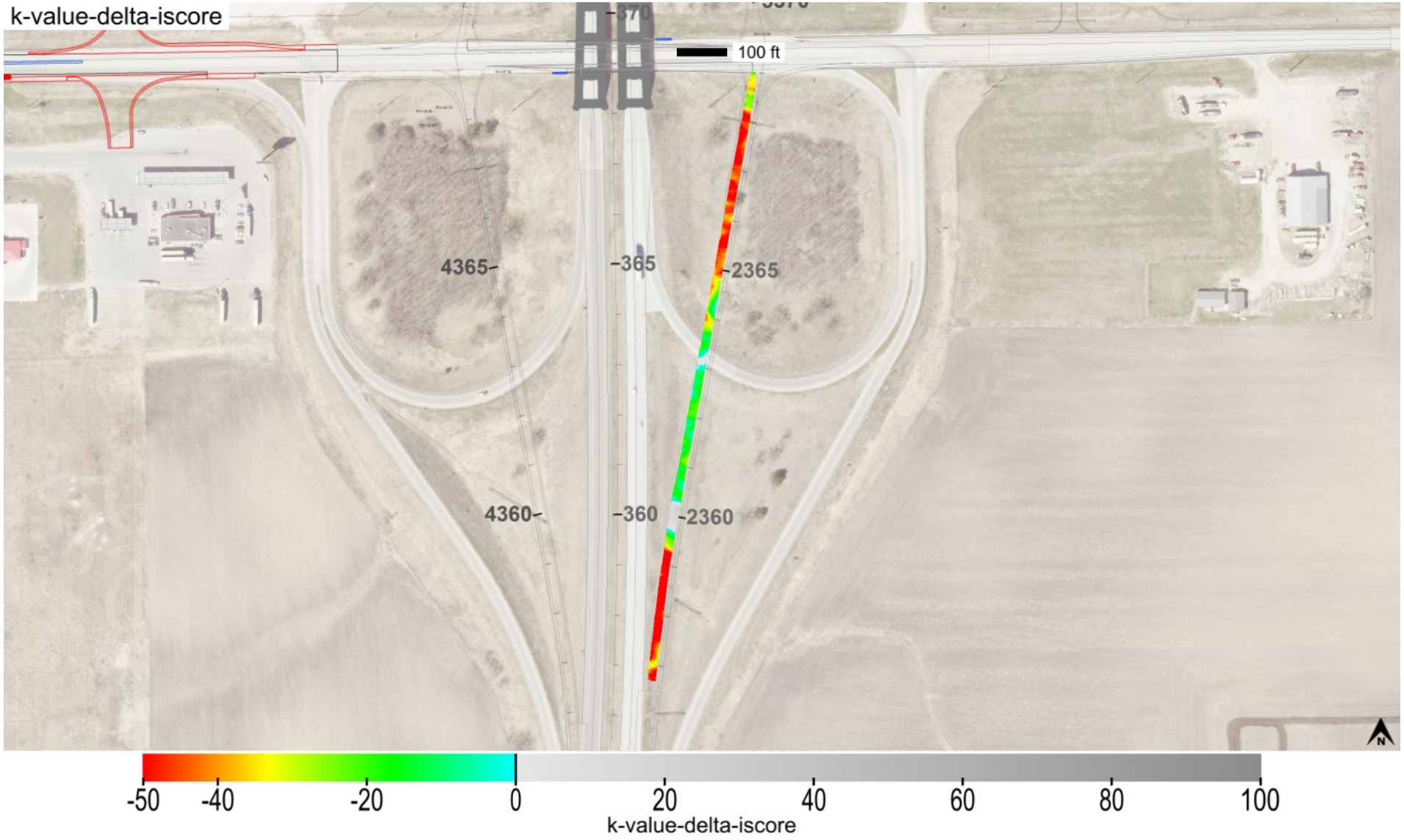
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	12.2	30.62	0.52	150	20	117.4	190	27.11	23.09	-130	-32.6	40



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

Map ID: IADOT_40-I35_CS56-FCS00210_2019_09_03_102604

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	12.2	150	-130	-32.6	40	-84.22	-32.07	26.33

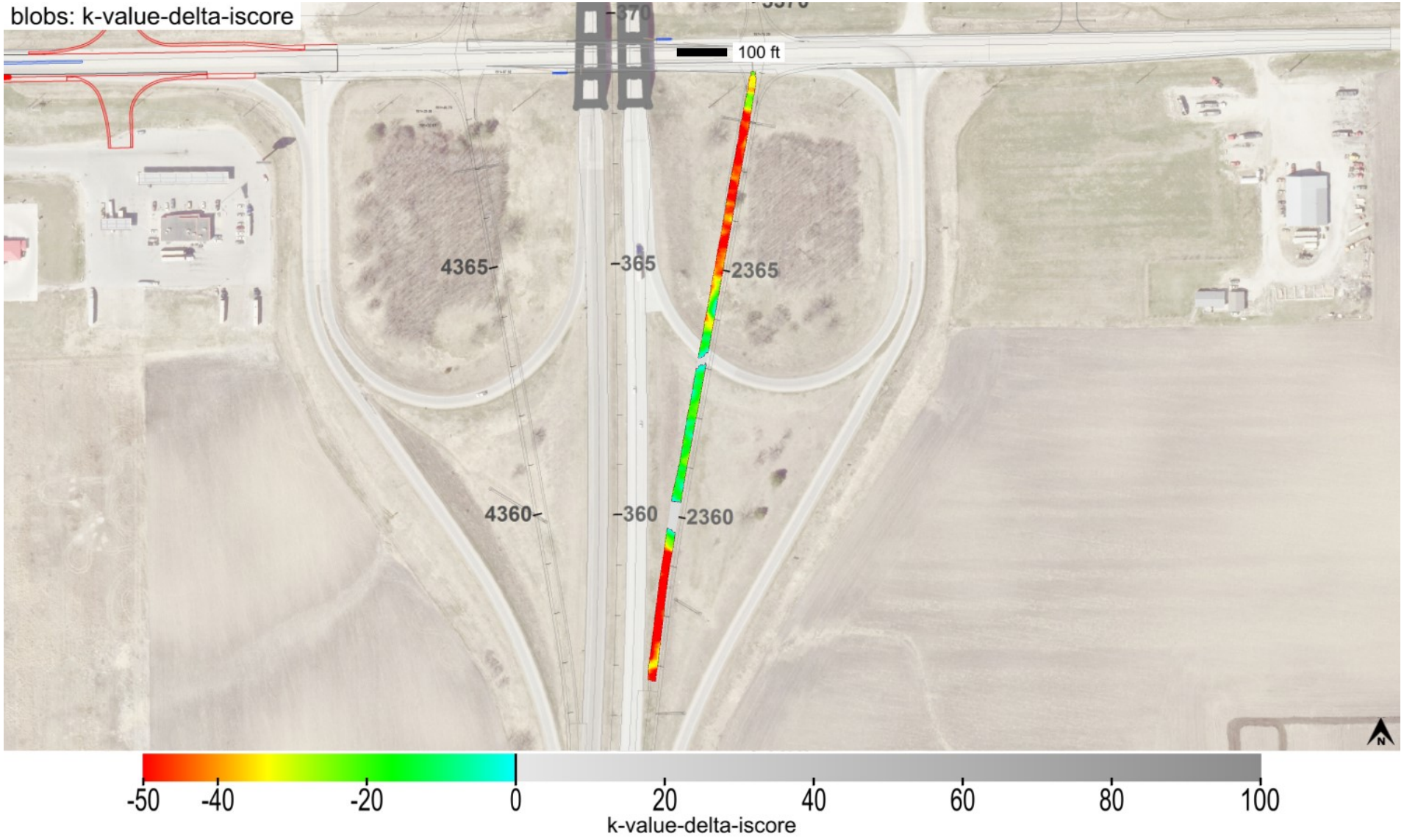


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: IADOT_40-I35_CS56-FCS00210_2019_09_03_102604

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	3	19459	93.19	none	0

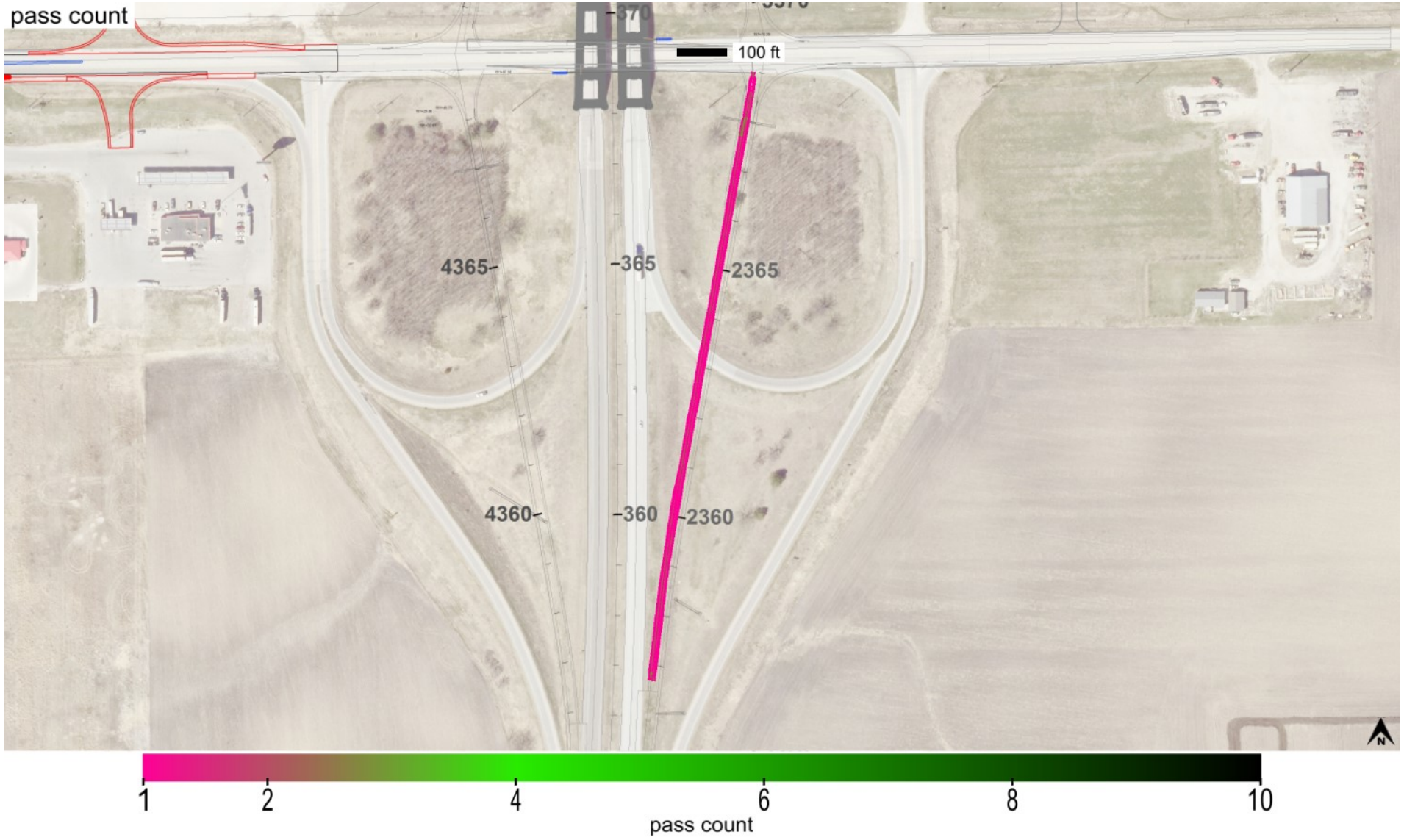


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: IADOT_40-I35_CS56-FCS00210_2019_09_03_102604

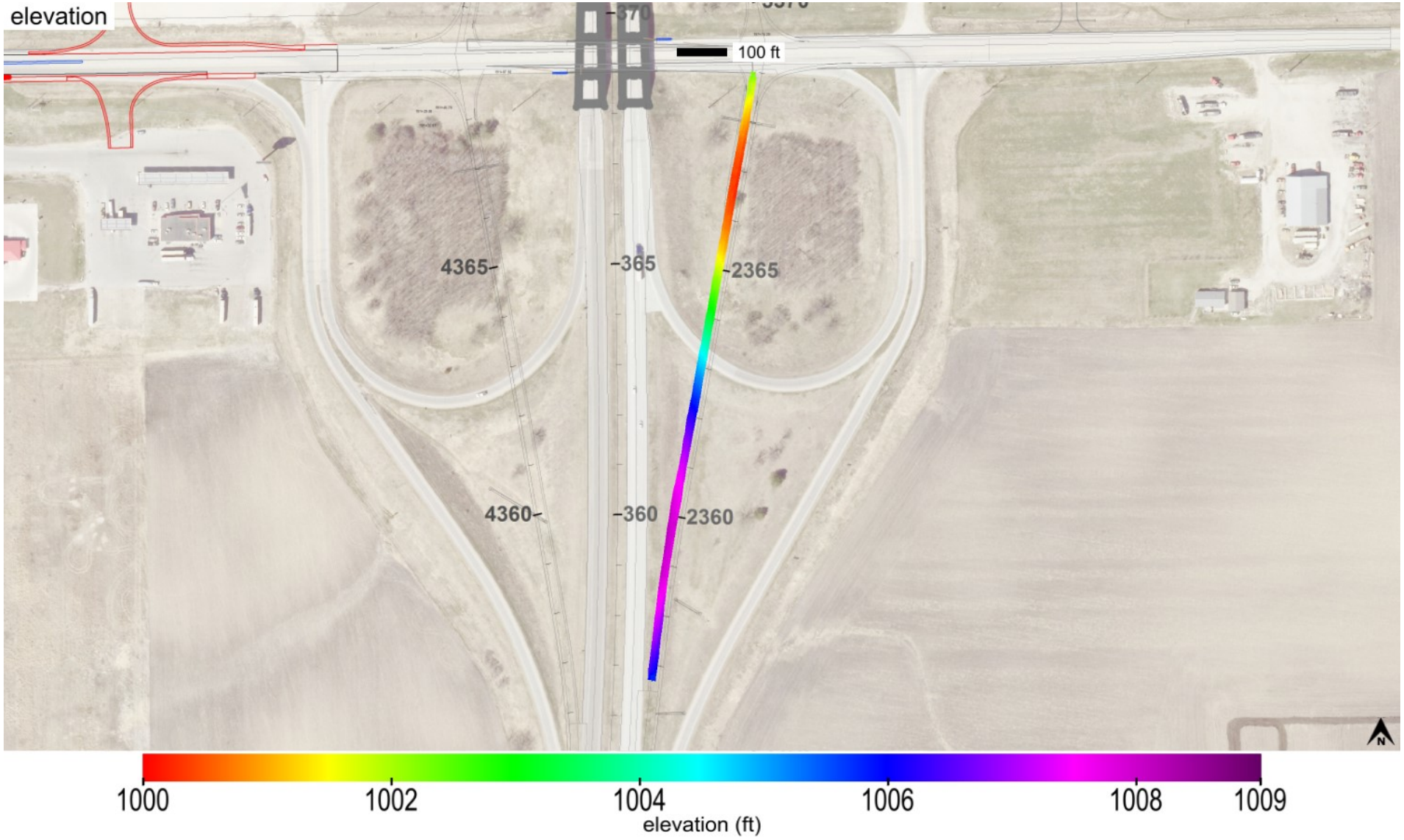
minimum	average	maximum
1	1.24	3



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

Map ID: IADOT_40-I35_CS56-FCS00210_2019_09_03_102604

minimum	average	maximum
1000.201	1004.474	1008.125



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

ingios GEOTECHNICS

Map ID: IADOT_40-I35_CS56-FCS00210_2019_09_03_102604

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	20882	0.479	12	9037	150	40

Modified Subbase_IADOT (2115)

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

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	I35 IA175 Intersection	Mapping Duration (hrs):	0.35	Operator:	Ingios Geotechnics inc
Map ID:	iadot_40-i35_cs56-fcs00210_2019_09_03_155533	No. of Measurements:	29803	Machine ID:	Ingios_FCS00210
Date and Time:	9/3/2019 3:55:33 PM	Location:	Hamilton County	State Plane:	4 IOWA Sioux City-Iowa Falls

Review Status: Review Required

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	0.2	7.5	-0.2	150	35	58.7	159.64	26.64	45.35	-115	-91.3	9.64
Moisture Content	No												

Mapped Area

square feet	acres
29803	0.68

Pass Count

min.	avg.	max.
1	1.34	4

Elevation (ft)

min.	avg.	max.
989.28	992.01	998.41

Velocity (fps)

min.	avg.	max.
0.12	5.25	6.26

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	29803	0.684	12	3000	150	40

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

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	I35 IA175 Intersection	Mapping Duration (hrs):	0.35	Operator:	Ingios Geotechnics inc
Map ID:	iadot_40-i35_cs56-fcs00210_2019_09_03_155533	No. of Measurements:	29803	Machine ID:	Ingios_FCS00210
Date and Time:	9/3/2019 3:55:33 PM	Location:	Hamilton County	State Plane:	4 IOWA Sioux City-Iowa Falls

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
7.5	CQI > = 95
0.2	80% of k-Value MVs >= 150
45.35	COV <= 20
100	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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ingios GEOTECHNICS

Map ID: IADOT_40-I35_CS56-FCS00210_2019_09_03_155533

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.2	7.5	-0.2	150	35	58.7	159.64	26.64	45.35	-115	-91.3	9.64

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

Map ID: IADOT_40-I35_CS56-FCS00210_2019_09_03_155533

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.2	7.5	-0.2	150	35	58.7	159.64	26.64	45.35	-115	-91.3	9.64

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

ingios GEOTECHNICS

Map ID: IADOT_40-I35_CS56-FCS00210_2019_09_03_155533

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	0.2	150	-115	-91.3	9.64	-115	-91.17	-29.06

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ingios GEOTECHNICS

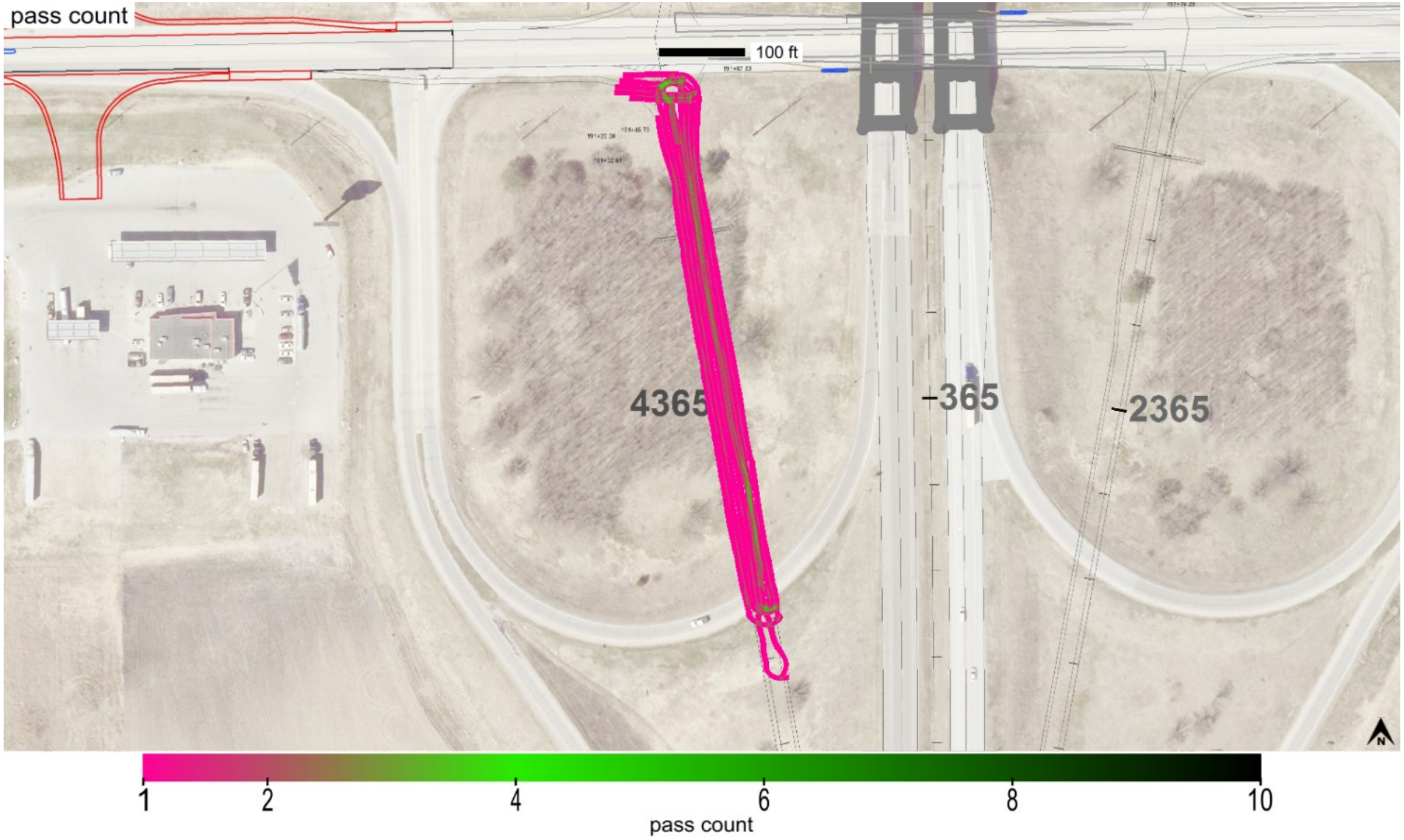
Map ID: IADOT_40-I35_CS56-FCS00210_2019_09_03_155533

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	29802	100	none	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: IADOT_40-I35_CS56-FCS00210_2019_09_03_155533

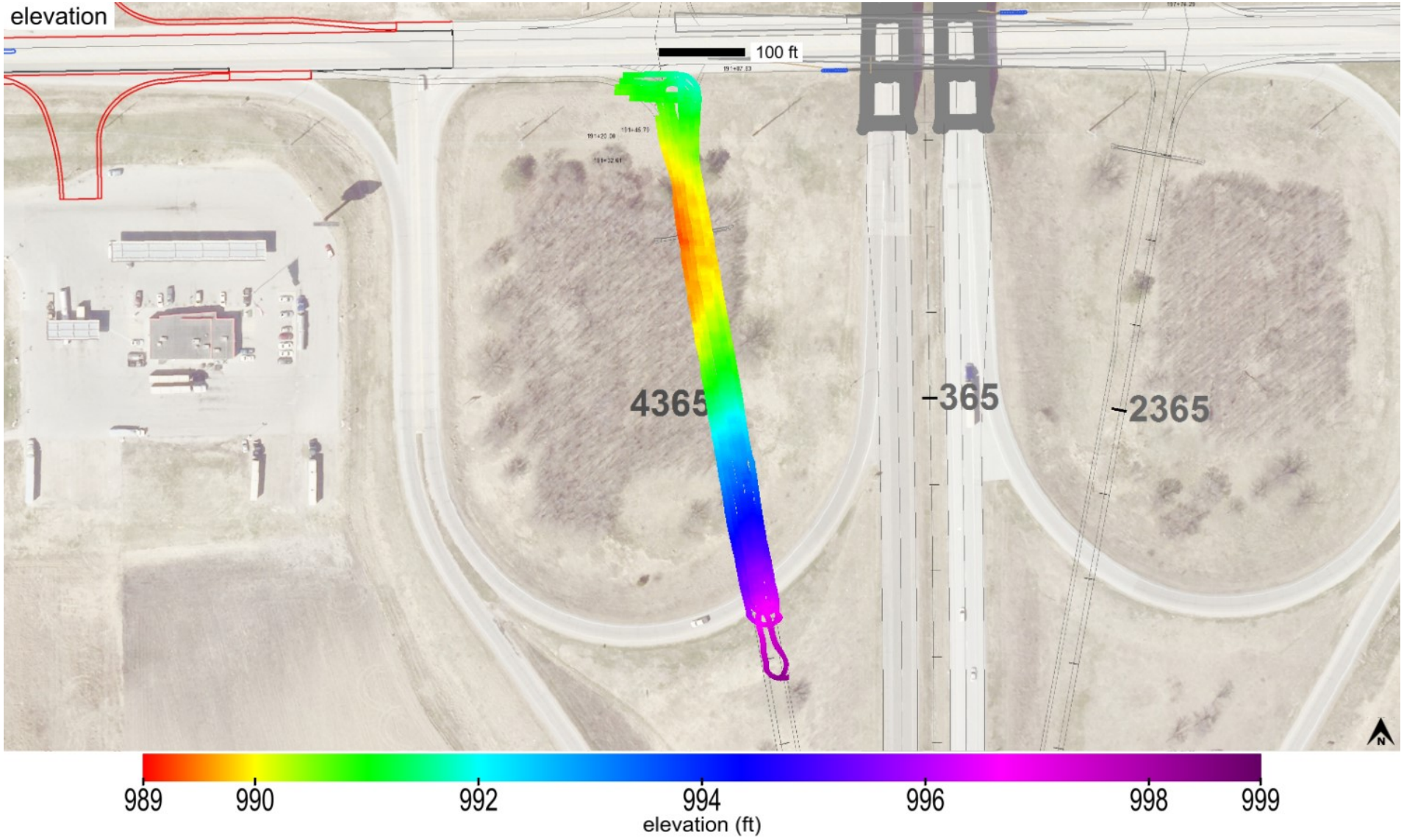
minimum	average	maximum
1	1.34	4



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

Map ID: IADOT_40-I35_CS56-FCS00210_2019_09_03_155533

minimum	average	maximum
989.28	992.01	998.413



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

Map ID: IADOT_40-I35_CS56-FCS00210_2019_09_03_155533

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	29803	0.684	12	3000	150	40

Subgrade_Treatment Select Cohesive_IADOT (2102.02D)

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	I80 Jasper County	Mapping Duration (hrs):	0.8	Operator:	Ingios Geotechnics inc
Map ID:	iadot_50-i80_cs56-fcs00210_2020_06_17_142722a	No. of Measurements:	58488	Machine ID:	Ingios_FCS00210
Date and Time:	6/17/2020 2:27:22 PM	Location:	Jasper County	State Plane:	1402 IOWA SOUTH

Review Status: Review Required

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	Yes	100	105.47	0.62	3600	5500	22830.8	56000	11199.72	49.06	1900	19230.8	52400
k-value	Yes	30.3	36.81	0.24	150	55	113.2	202	53.1	46.89	-95	-36.8	52
Moisture Content	No												

Mapped Area

square feet	acres
58488	1.34

Pass Count

min.	avg.	max.
1	1.81	7

Elevation (ft)

min.	avg.	max.
0	0	0

Velocity (fps)

min.	avg.	max.
0.32	5.47	7.36

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade Treatment	21011	100	58488	1.343	12	3600	150	40

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

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IOWADOT

E-Compaction Report

Project:	I80 Jasper County	Mapping Duration (hrs):	0.8	Operator:	Ingios Geotechnics inc
Map ID:	iadot_50-i80_cs56-fcs00210_2020_06_17_142722a	No. of Measurements:	58488	Machine ID:	Ingios_FCS00210
Date and Time:	6/17/2020 2:27:22 PM	Location:	Jasper County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
105.47	CQI > = 95
100	80% of Resilient Modulus MVs >= 3600
49.06	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	I80 Jasper County	Mapping Duration (hrs):	0.8	Operator:	Ingios Geotechnics inc
Map ID:	iadot_50-i80_cs56-fcs00210_2020_06_17_142722a	No. of Measurements:	58488	Machine ID:	Ingios_FCS00210
Date and Time:	6/17/2020 2:27:22 PM	Location:	Jasper County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
36.81	CQI > = 95
30.3	80% of k-Value MVs >= 150
46.89	COV <= 20
71.39	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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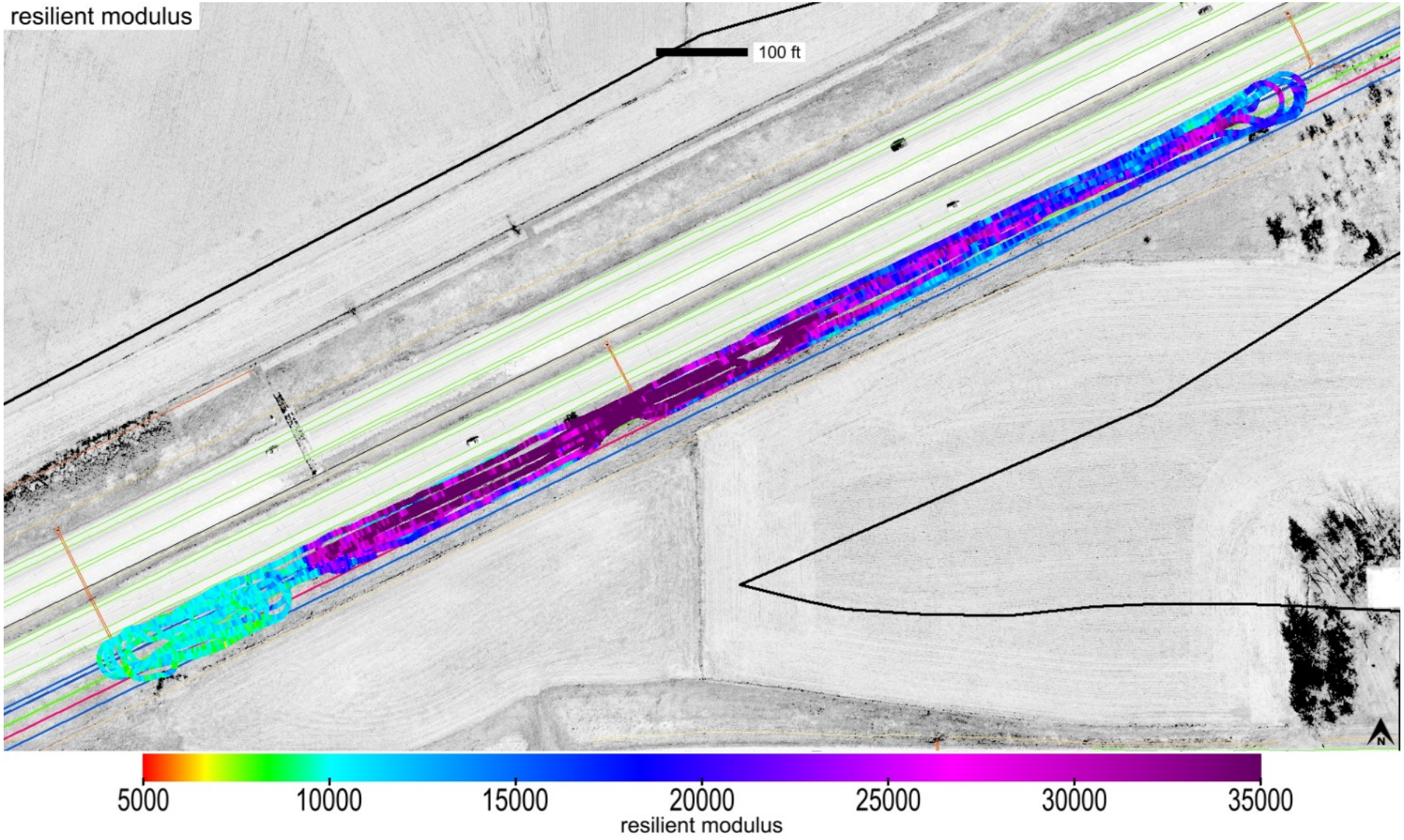
Map ID: iadot_50-i80_cs56-fcs00210_2020_06_17_142722a

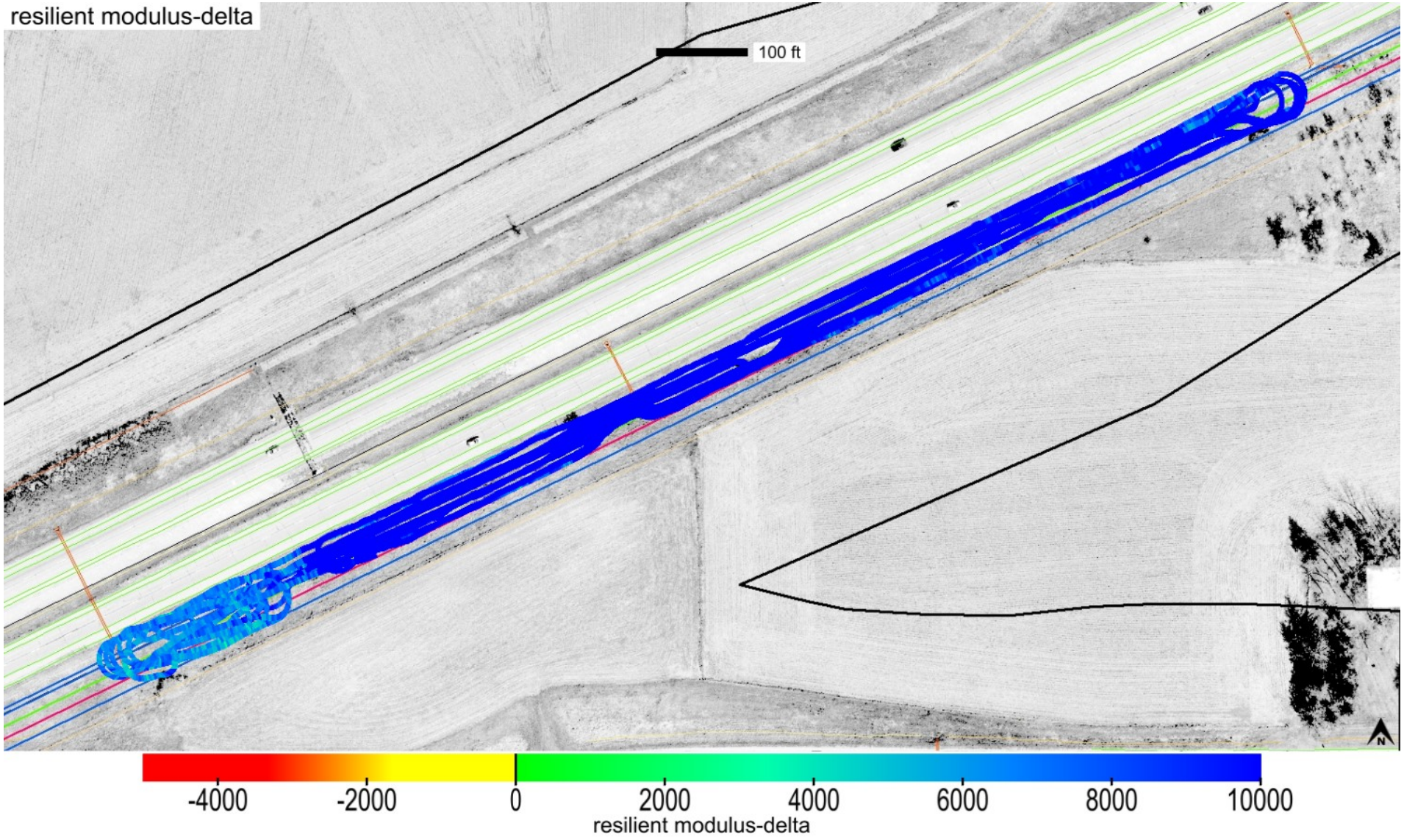
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	105.47	0.62	3600	5500	22830.8	56000	11199.72	49.06	1900	19230.8	52400



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

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_17_142722a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	105.47	0.62	3600	5500	22830.8	56000	11199.72	49.06	1900	19230.8	52400



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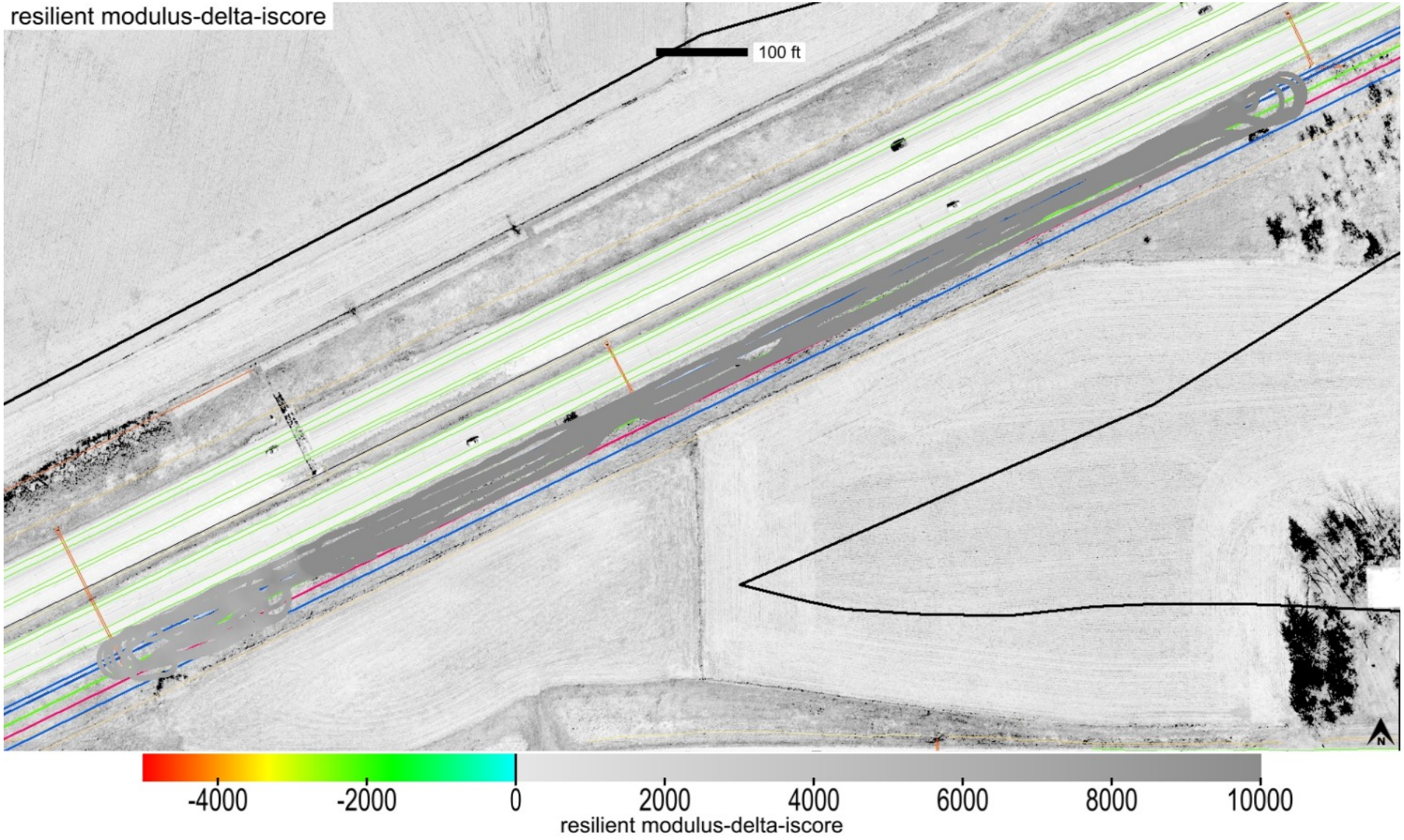
ingios GEOTECHNICS

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_17_142722a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	100	3600	1900	19230.8	52400	5110.37	19369.85	44613.76



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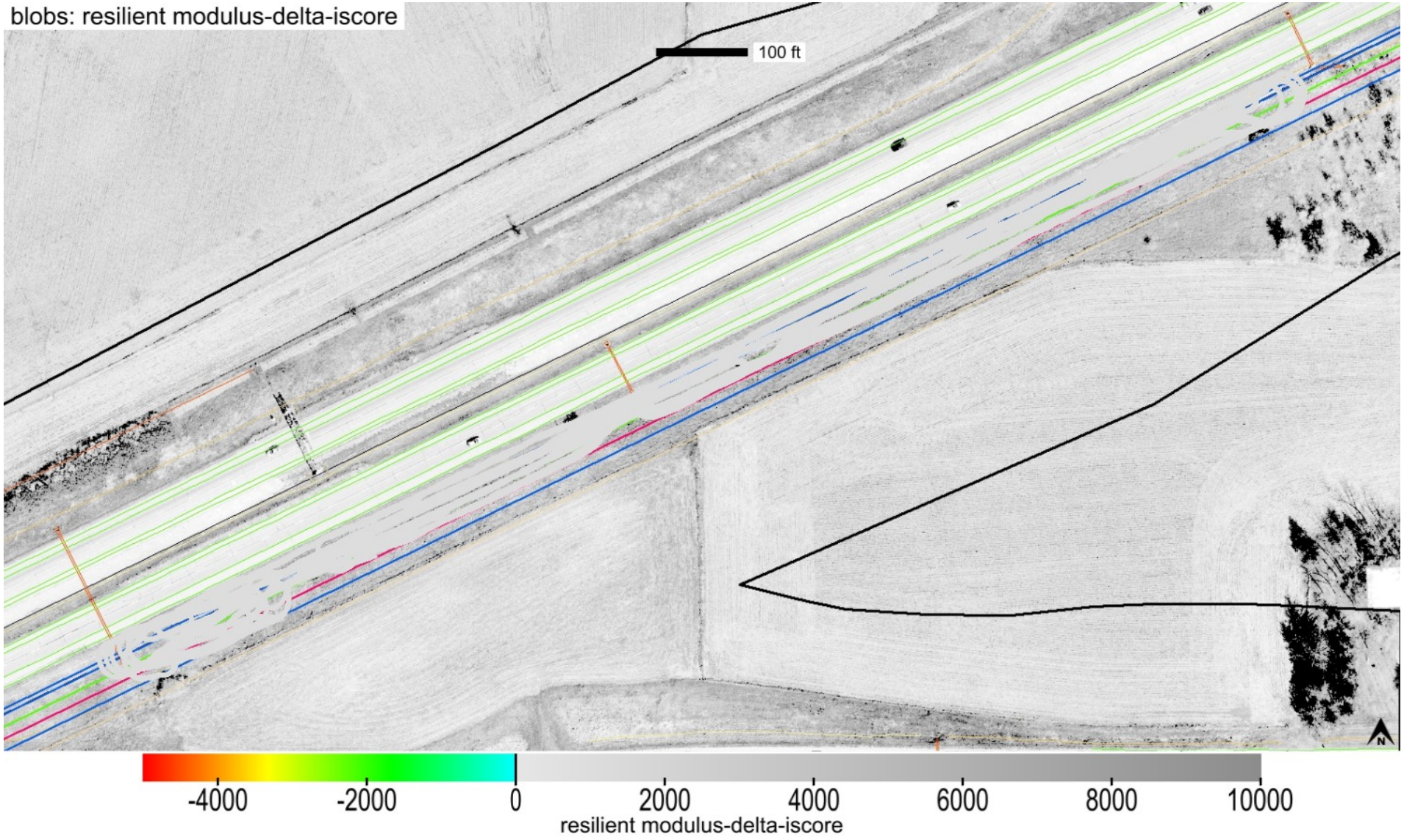
ingios GEOTECHNICS

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_17_142722a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0



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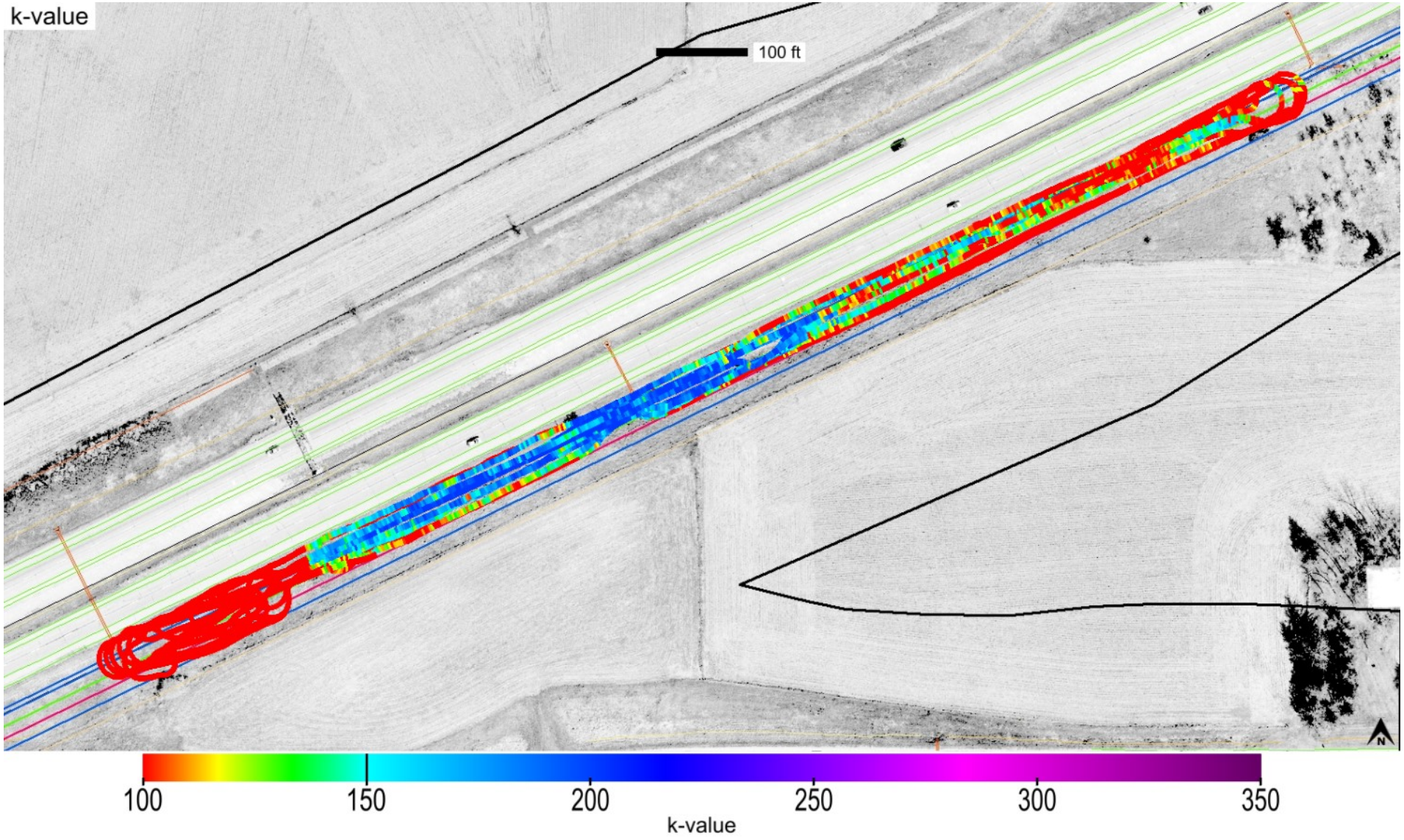
ingios GEOTECHNICS

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_17_142722a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	30.3	36.81	0.24	150	55	113.2	202	53.1	46.89	-95	-36.8	52



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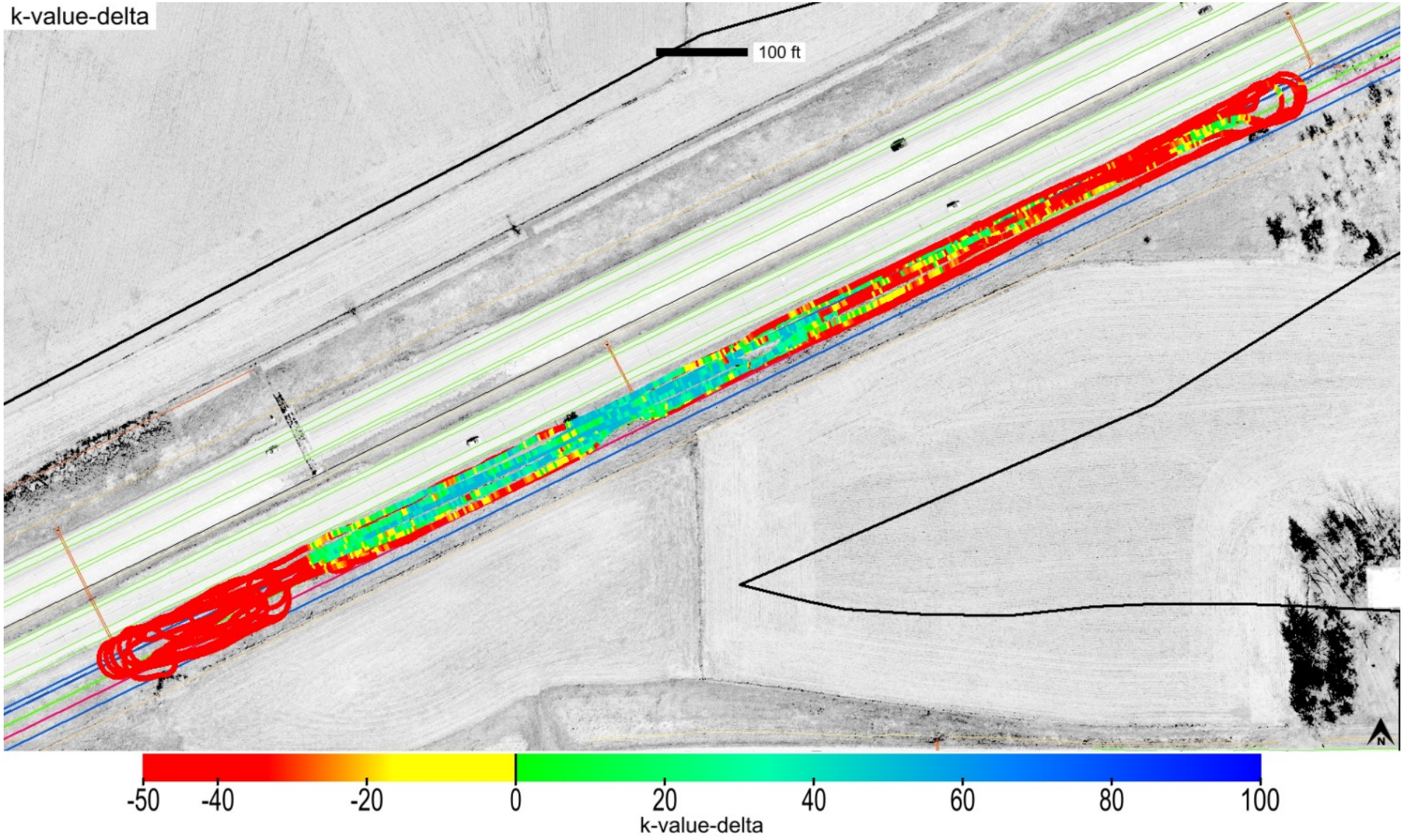
Map ID: iadot_50-i80_cs56-fcs00210_2020_06_17_142722a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	30.3	36.81	0.24	150	55	113.2	202	53.1	46.89	-95	-36.8	52



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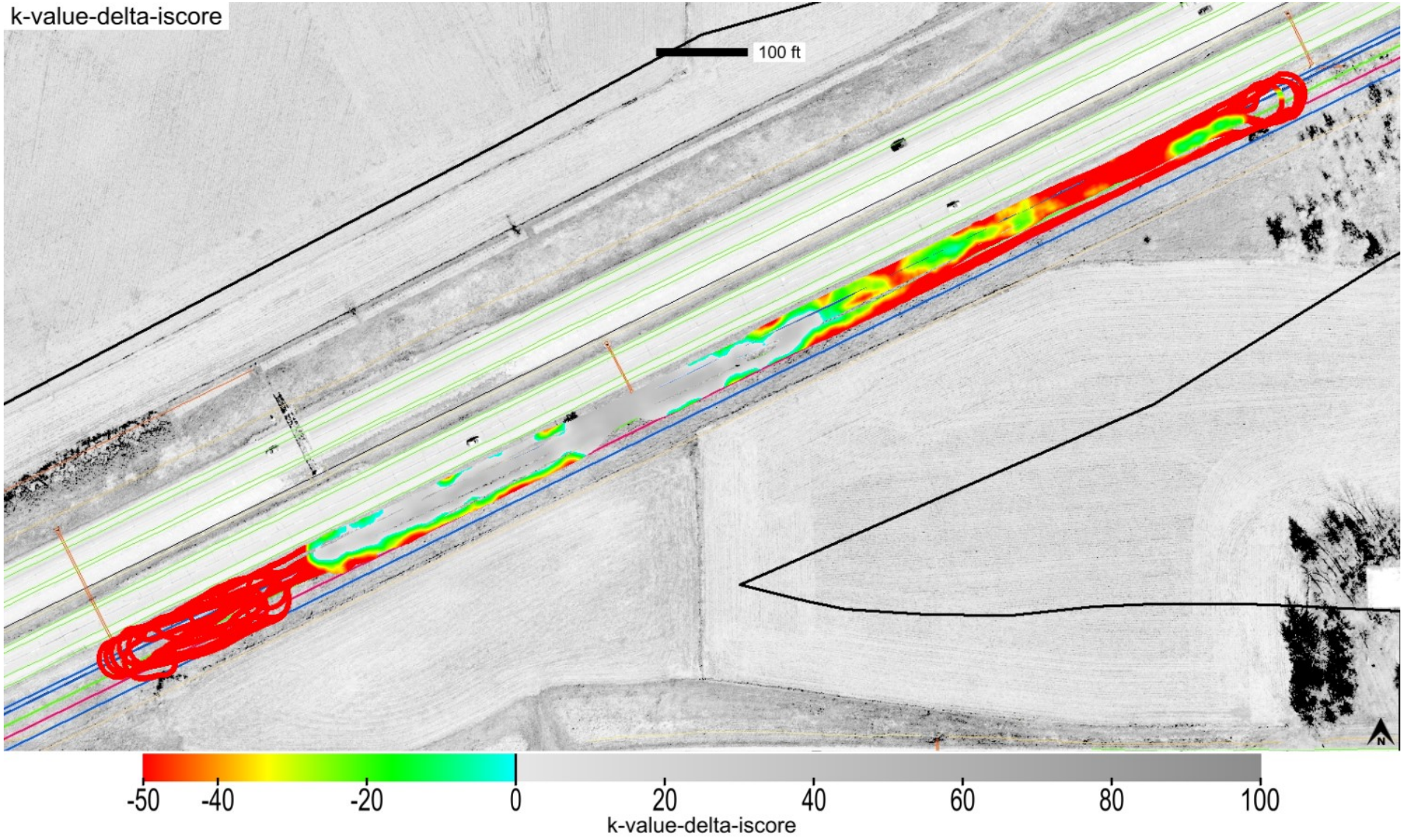
Map ID: iadot_50-i80_cs56-fcs00210_2020_06_17_142722a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	30.3	150	-95	-36.8	52	-95	-36.05	50.34



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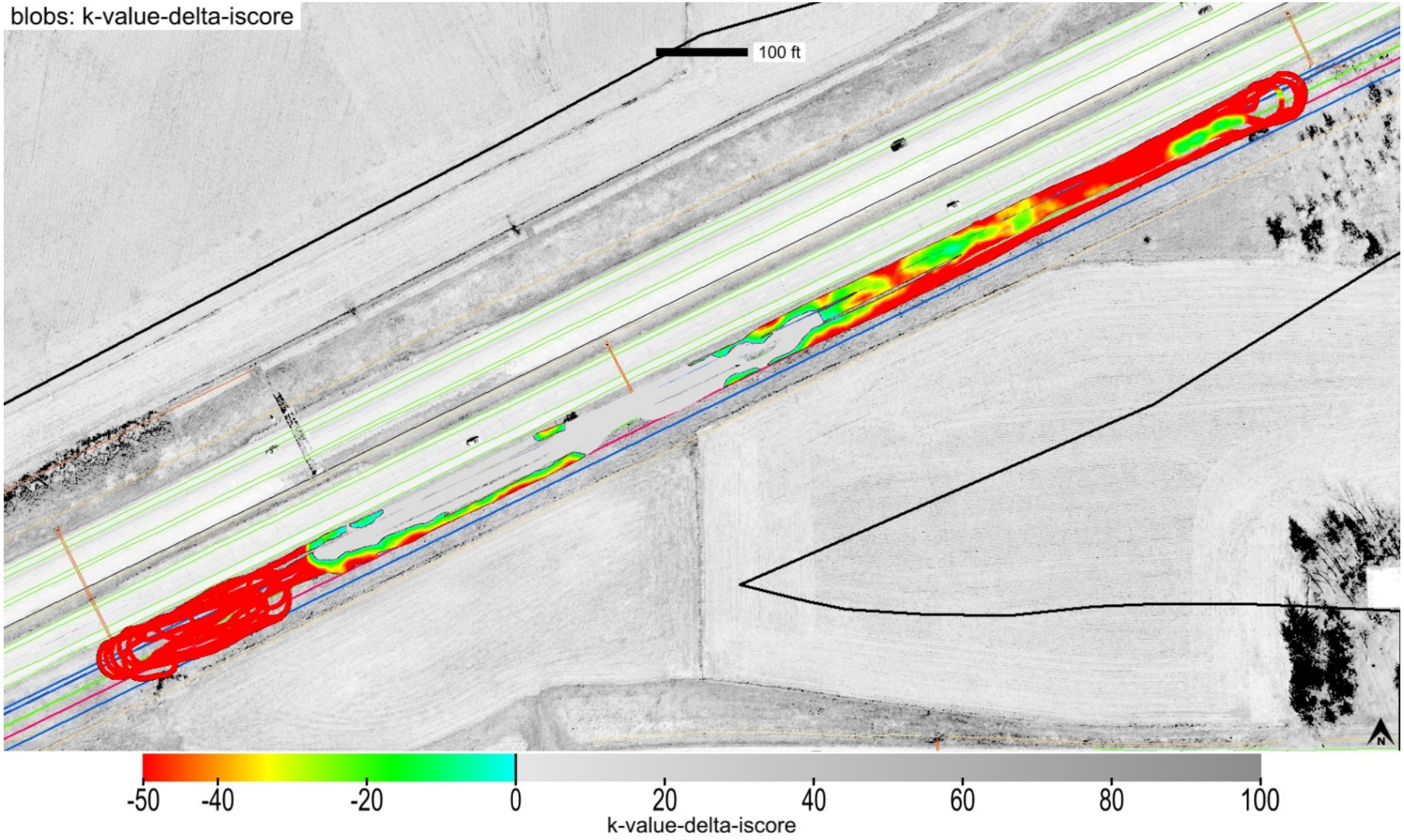
ingios GEOTECHNICS

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_17_142722a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	5	41752	71.39	none	0



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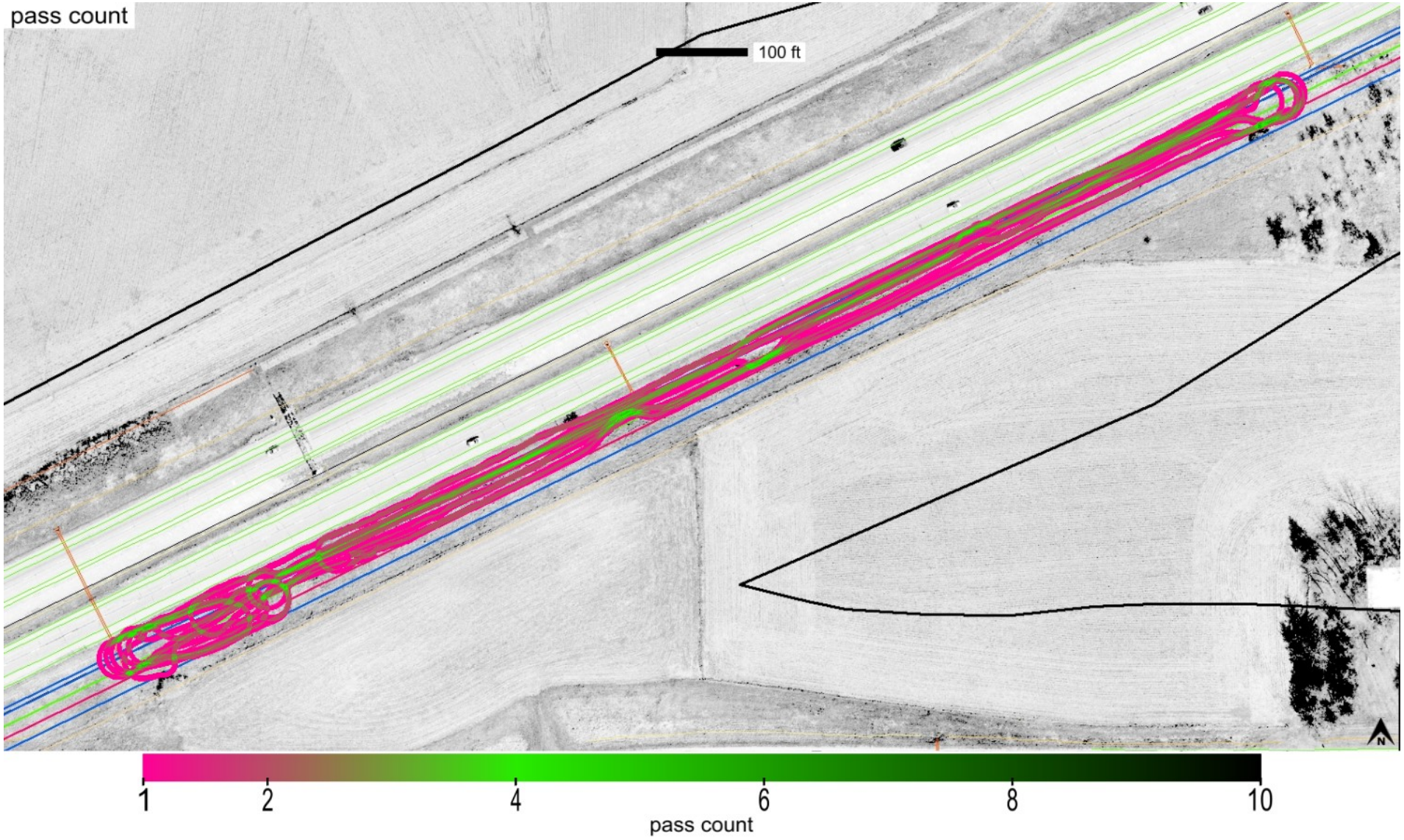
ingios GEOTECHNICS

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_17_142722a

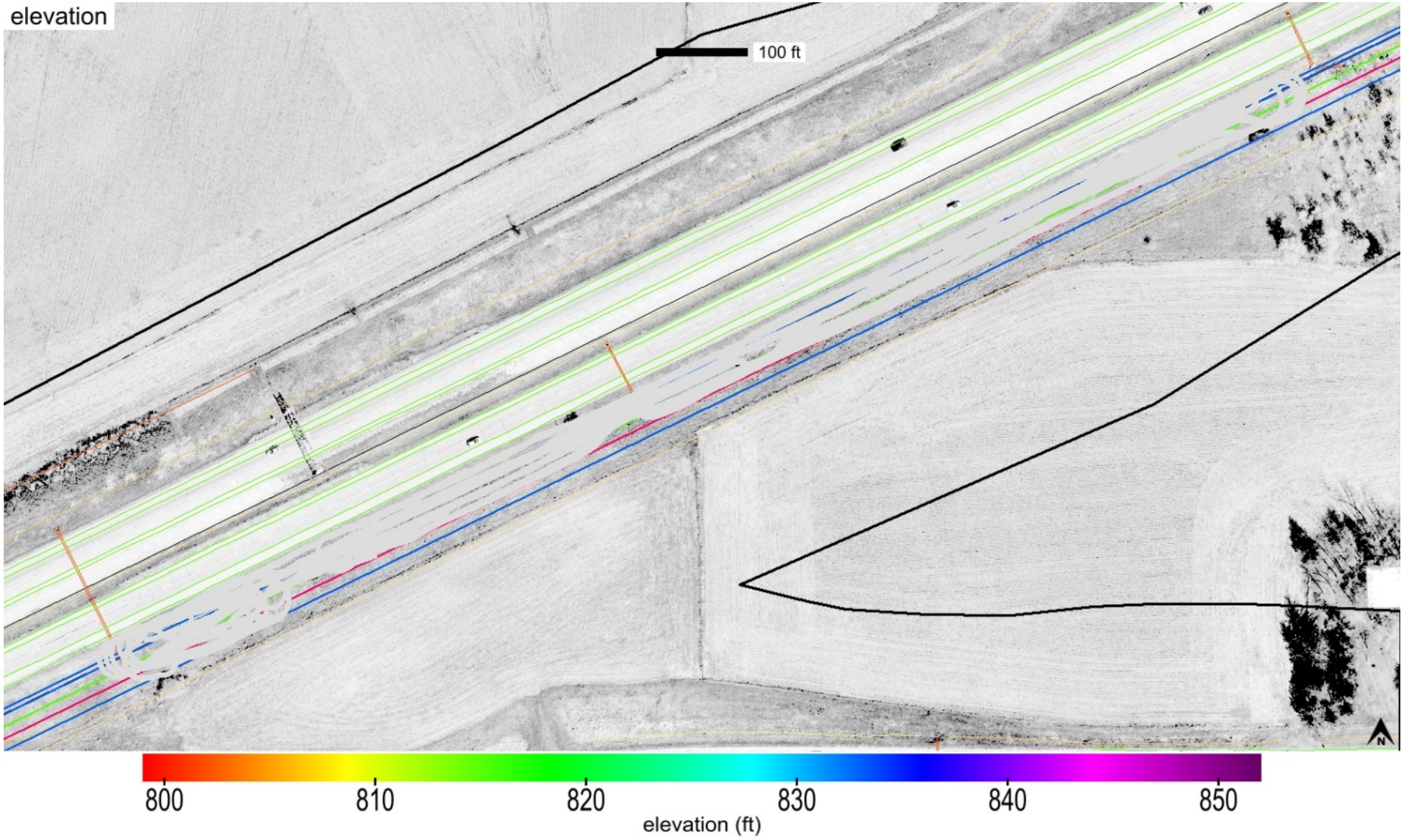
minimum	average	maximum
1	1.81	7



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

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_17_142722a

minimum	average	maximum
0	0	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: iadot_50-i80_cs56-fcs00210_2020_06_17_142722a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade Treatment	21011	100	58488	1.343	12	3600	150	40

Subgrade_Treatment Modified Subbase_IADOT (2102.02D)

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

ingios GEOTECHNICS

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_17_142722a

IMG_20200617_182524161.jpg

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

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Map ID: iadot_50-i80_cs56-fcs00210_2020_06_17_142722a

IMG_20200617_182733198.jpg

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

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	I80 Jasper County	Mapping Duration (hrs):	0.49	Operator:	Ingios Geotechnics inc
Map ID:	iadot_50-i80_cs56-fcs00210_2020_06_18_090751a	No. of Measurements:	44587	Machine ID:	Ingios_FCS00210
Date and Time:	6/18/2020 9:07:51 AM	Location:	Jasper County	State Plane:	1402 IOWA SOUTH

Review Status: Review Required

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	10.05	-0.48	150	35	47.5	155.55	19.02	40.06	-115	-102.5	5.55
Moisture Content	No												

Mapped Area

square feet	acres
44587	1.02

Pass Count

min.	avg.	max.
1	1.28	3

Elevation (ft)

min.	avg.	max.
0	0	0

Velocity (fps)

min.	avg.	max.
0.22	5.52	9.14

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	44587	1.024	12	3600	150	40

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	I80 Jasper County	Mapping Duration (hrs):	0.49	Operator:	Ingios Geotechnics inc
Map ID:	iadot_50-i80_cs56-fcs00210_2020_06_18_090751a	No. of Measurements:	44587	Machine ID:	Ingios_FCS00210
Date and Time:	6/18/2020 9:07:51 AM	Location:	Jasper County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
10.05	CQI > = 95
0.1	80% of k-Value MVs >= 150
40.06	COV <= 20
99.6	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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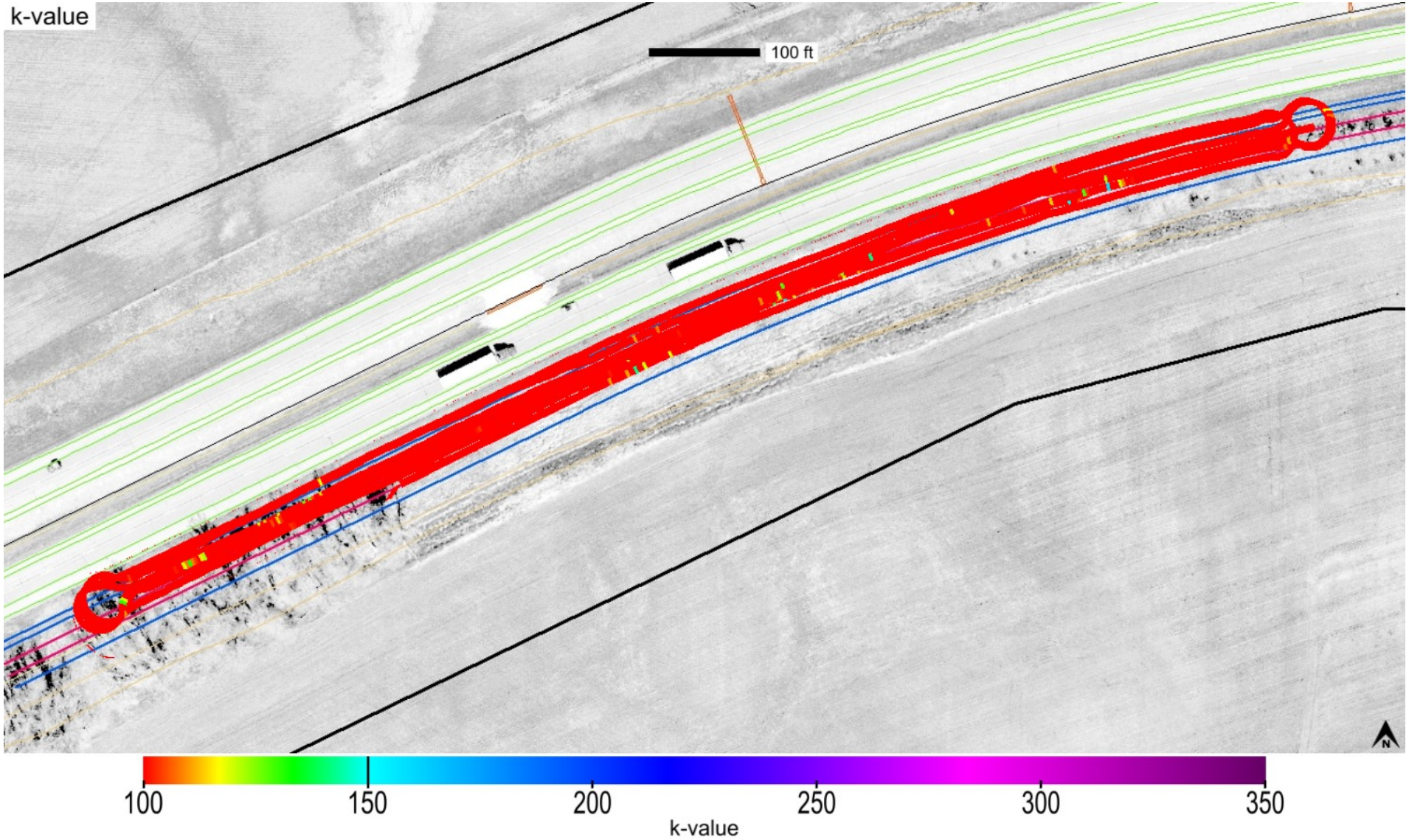
ingios GEOTECHNICS

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_18_090751a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.1	10.05	-0.48	150	35	47.5	155.55	19.02	40.06	-115	-102.5	5.55



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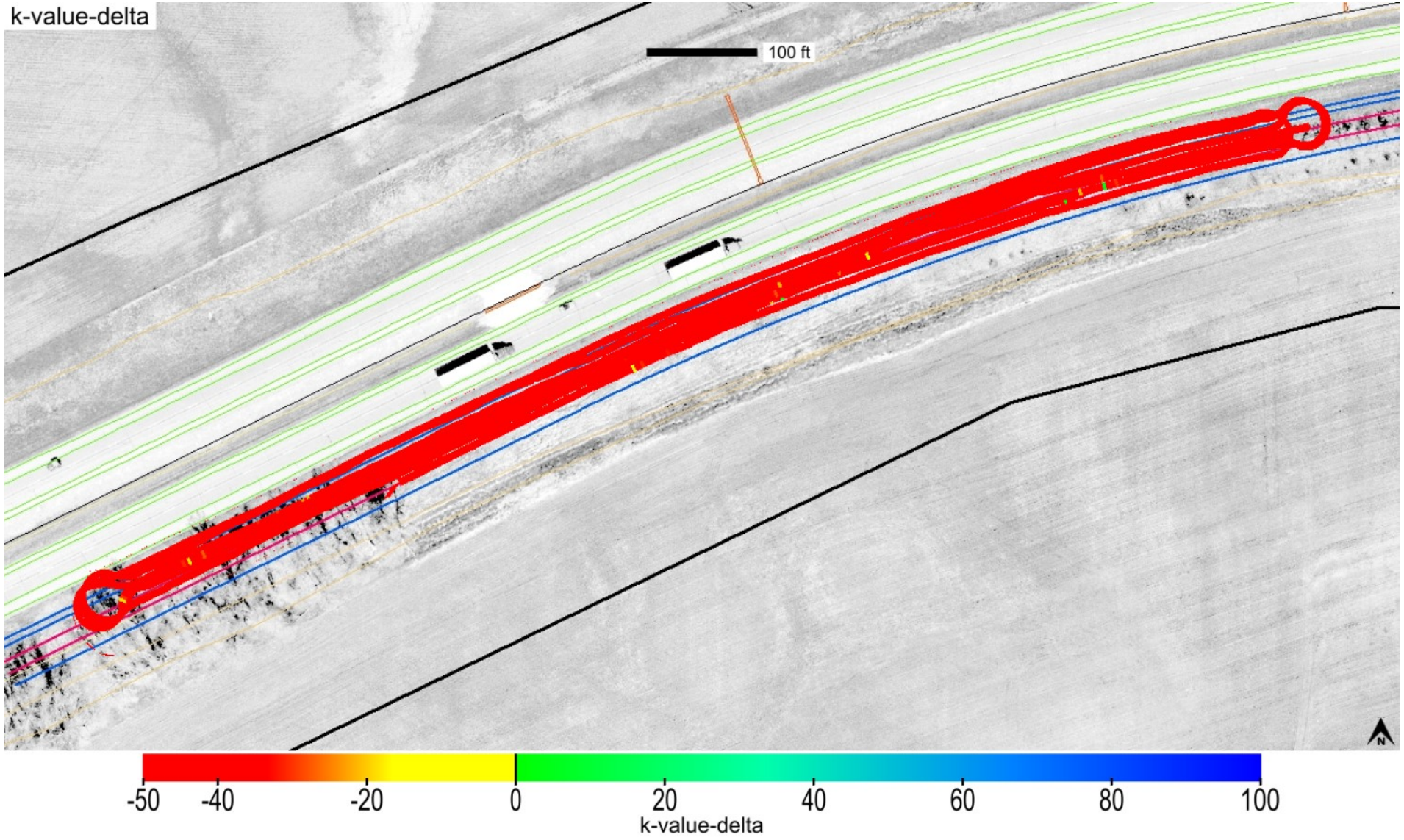
ingios GEOTECHNICS

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_18_090751a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.1	10.05	-0.48	150	35	47.5	155.55	19.02	40.06	-115	-102.5	5.55



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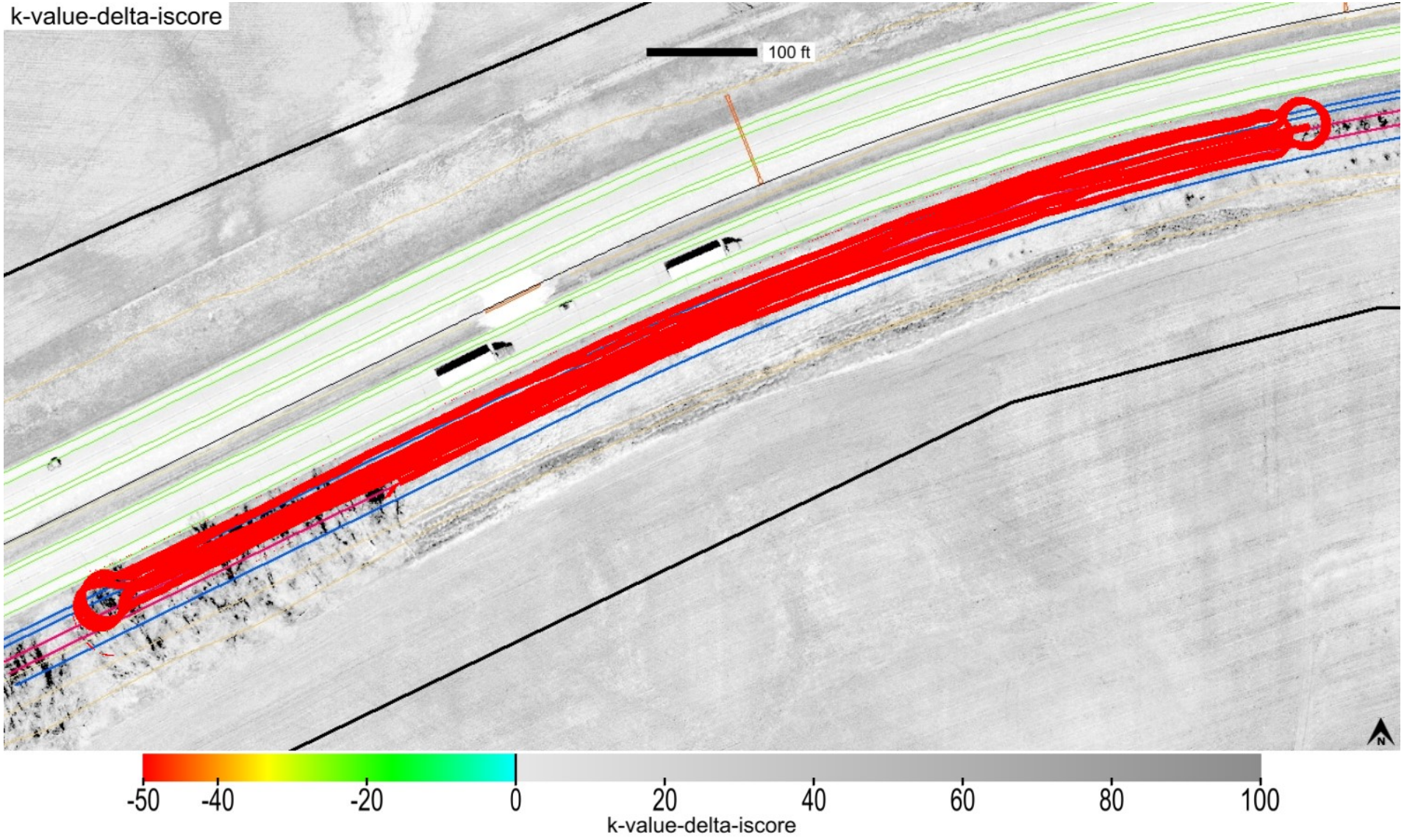
ingios GEOTECHNICS

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_18_090751a

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	-115	-102.5	5.55	-115	-102.43	-47.9



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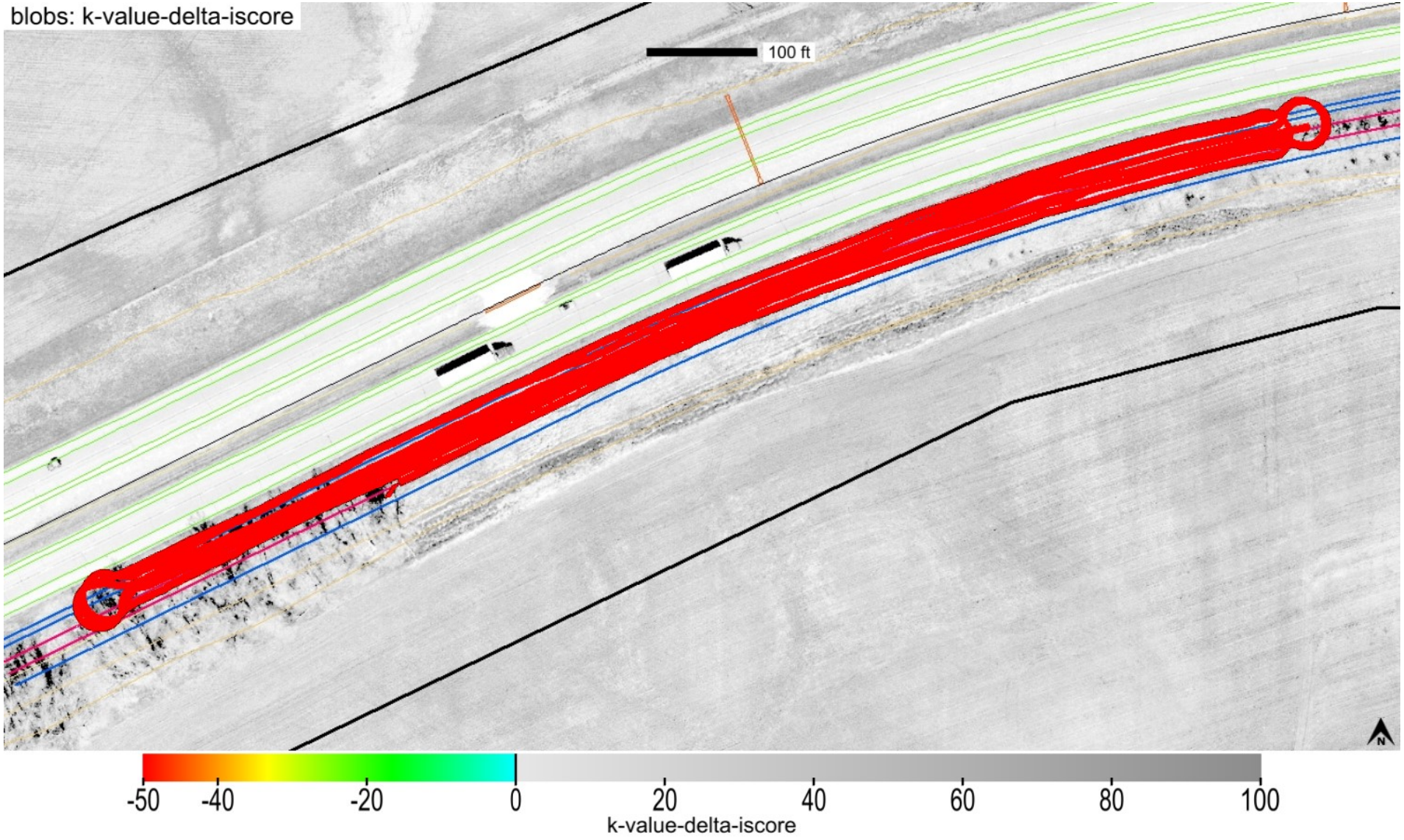
ingios GEOTECHNICS

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_18_090751a

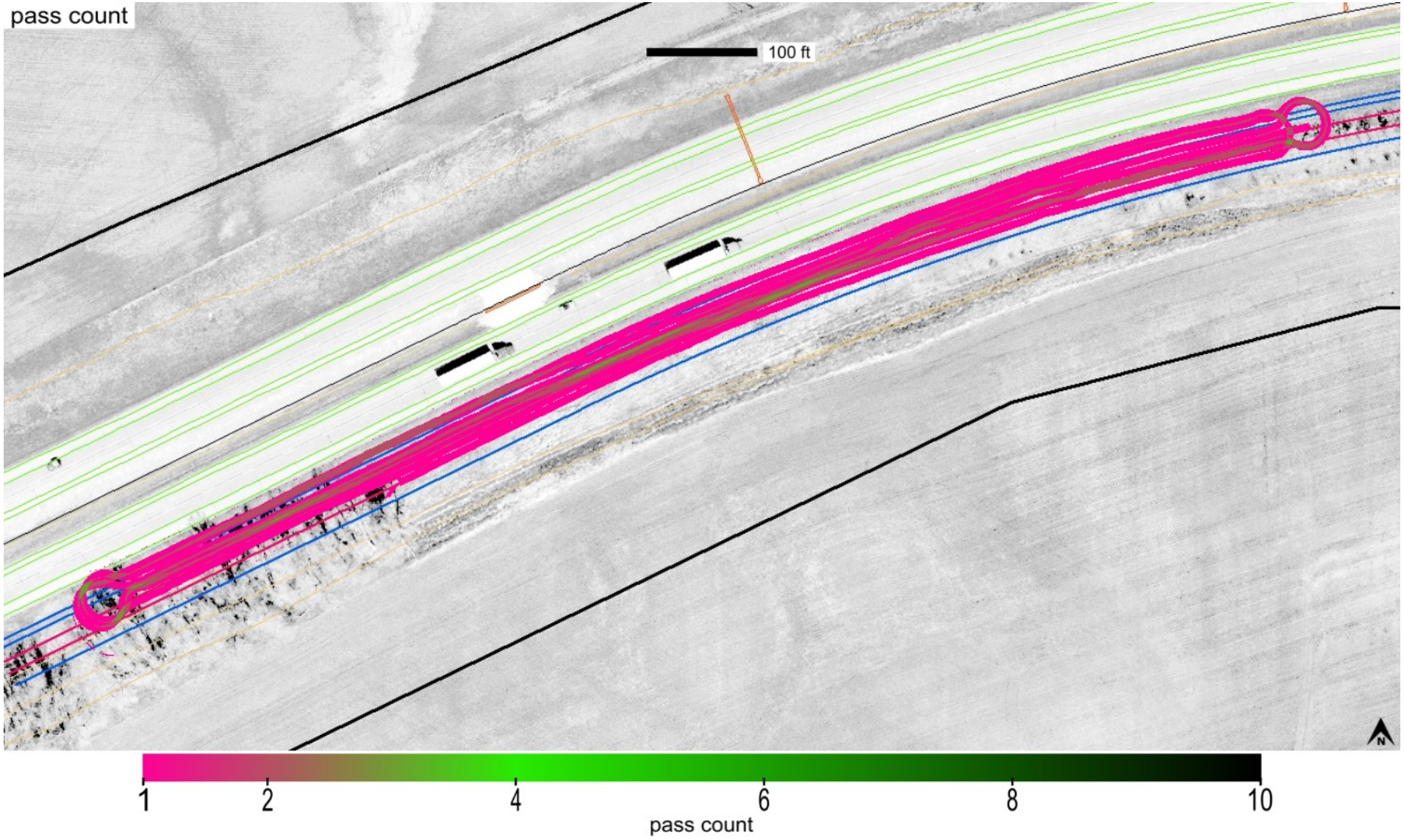
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	44407	99.6	none	0



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

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_18_090751a

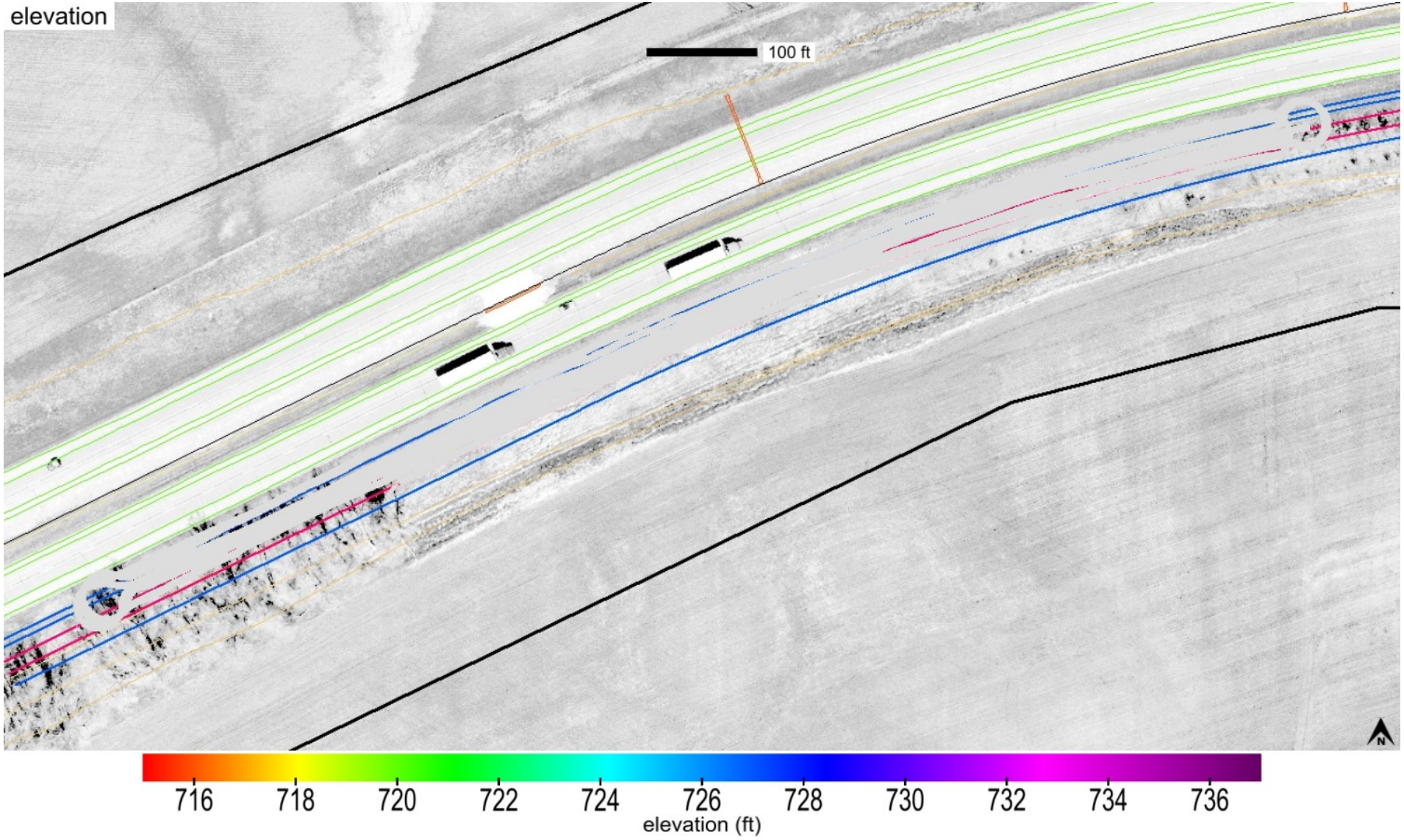
minimum	average	maximum
1	1.28	3



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

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_18_090751a

minimum	average	maximum
0	0	0



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Map ID: iadot_50-i80_cs56-fcs00210_2020_06_18_090751a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	44587	1.024	12	3600	150	40

Subgrade_Treatment Select Cohesive_IADOT (2102.02D)

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IOWADOT

E-Compaction Report

Project:	I80 Jasper County	Mapping Duration (hrs):	0.68	Operator:	Ingios Geotechnics inc
Map ID:	iadot_50-i80_cs56-fcs00210_2020_06_18_101638a	No. of Measurements:	83480	Machine ID:	Ingios_FCS00210
Date and Time:	6/18/2020 10:16:38 AM	Location:	Jasper County	State Plane:	1402 IOWA SOUTH

Review Status: Review Required

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	13.12	-0.47	150	35	50.8	157.12	17.19	33.84	-115	-99.2	7.12
Moisture Content	No												

Mapped Area

square feet	acres
83480	1.92

Pass Count

min.	avg.	max.
1	1.12	4

Elevation (ft)

min.	avg.	max.
0	0	0

Velocity (fps)

min.	avg.	max.
0.58	5.51	6.4

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	83480	1.916	12	3000	150	40

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IOWADOT

E-Compaction Report

Project:	I80 Jasper County	Mapping Duration (hrs):	0.68	Operator:	Ingios Geotechnics inc
Map ID:	iadot_50-i80_cs56-fcs00210_2020_06_18_101638a	No. of Measurements:	83480	Machine ID:	Ingios_FCS00210
Date and Time:	6/18/2020 10:16:38 AM	Location:	Jasper County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
13.12	CQI > = 95
0	80% of k-Value MVs >= 150
33.84	COV <= 20
100	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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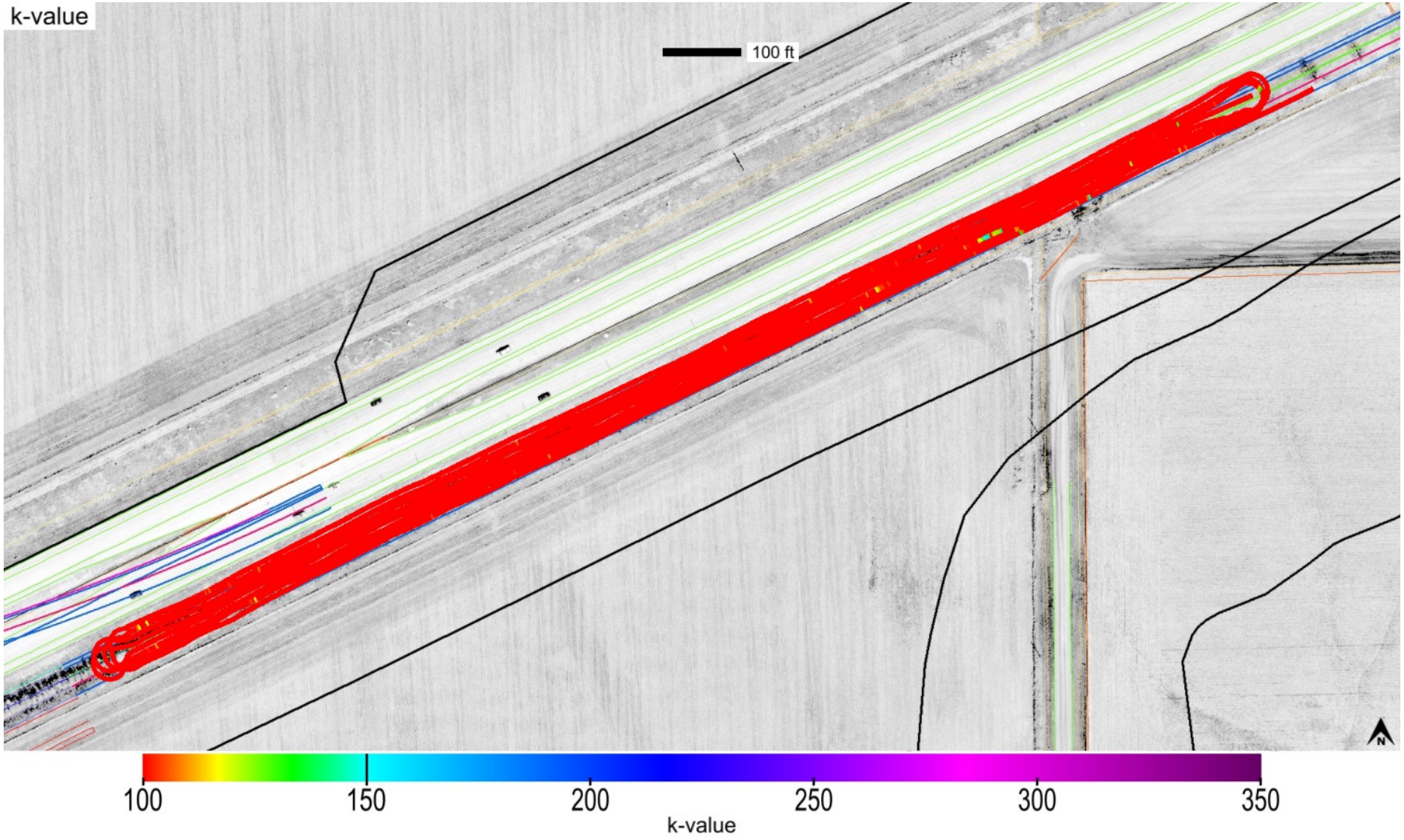
ingios GEOTECHNICS

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_18_101638a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0	13.12	-0.47	150	35	50.8	157.12	17.19	33.84	-115	-99.2	7.12



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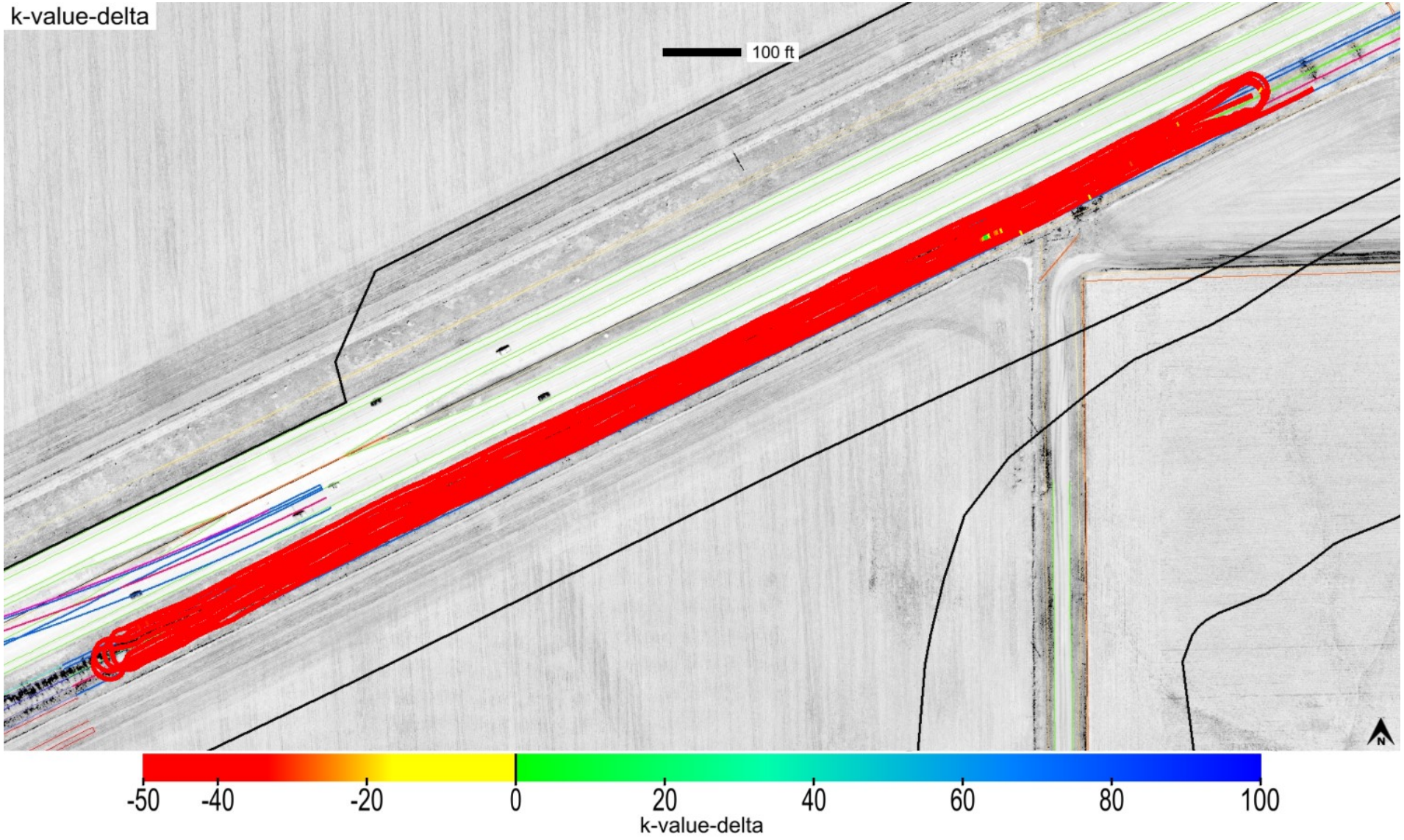
ingios GEOTECHNICS

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_18_101638a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0	13.12	-0.47	150	35	50.8	157.12	17.19	33.84	-115	-99.2	7.12



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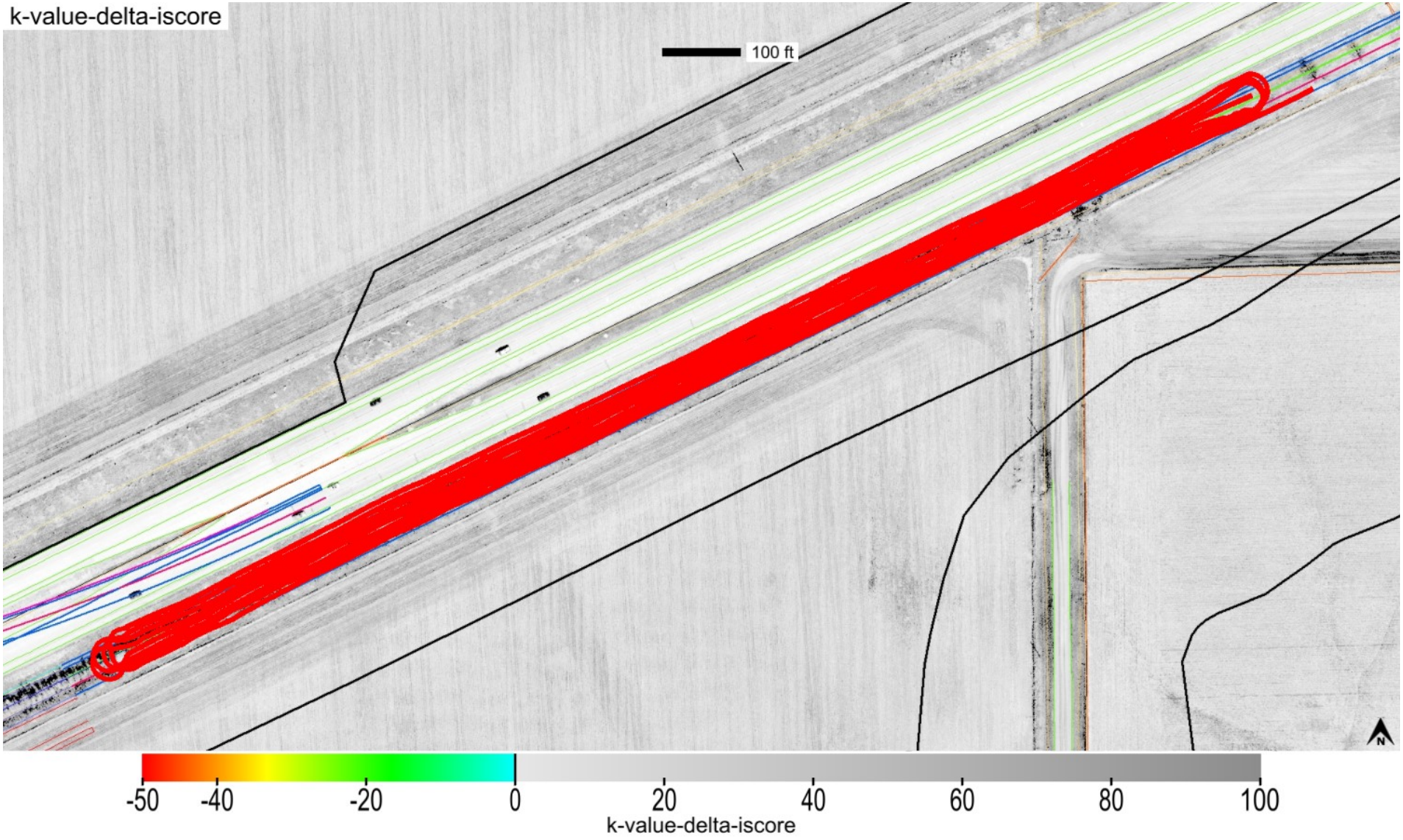
ingios GEOTECHNICS

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_18_101638a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	0	150	-115	-99.2	7.12	-115	-99.2	-61.39



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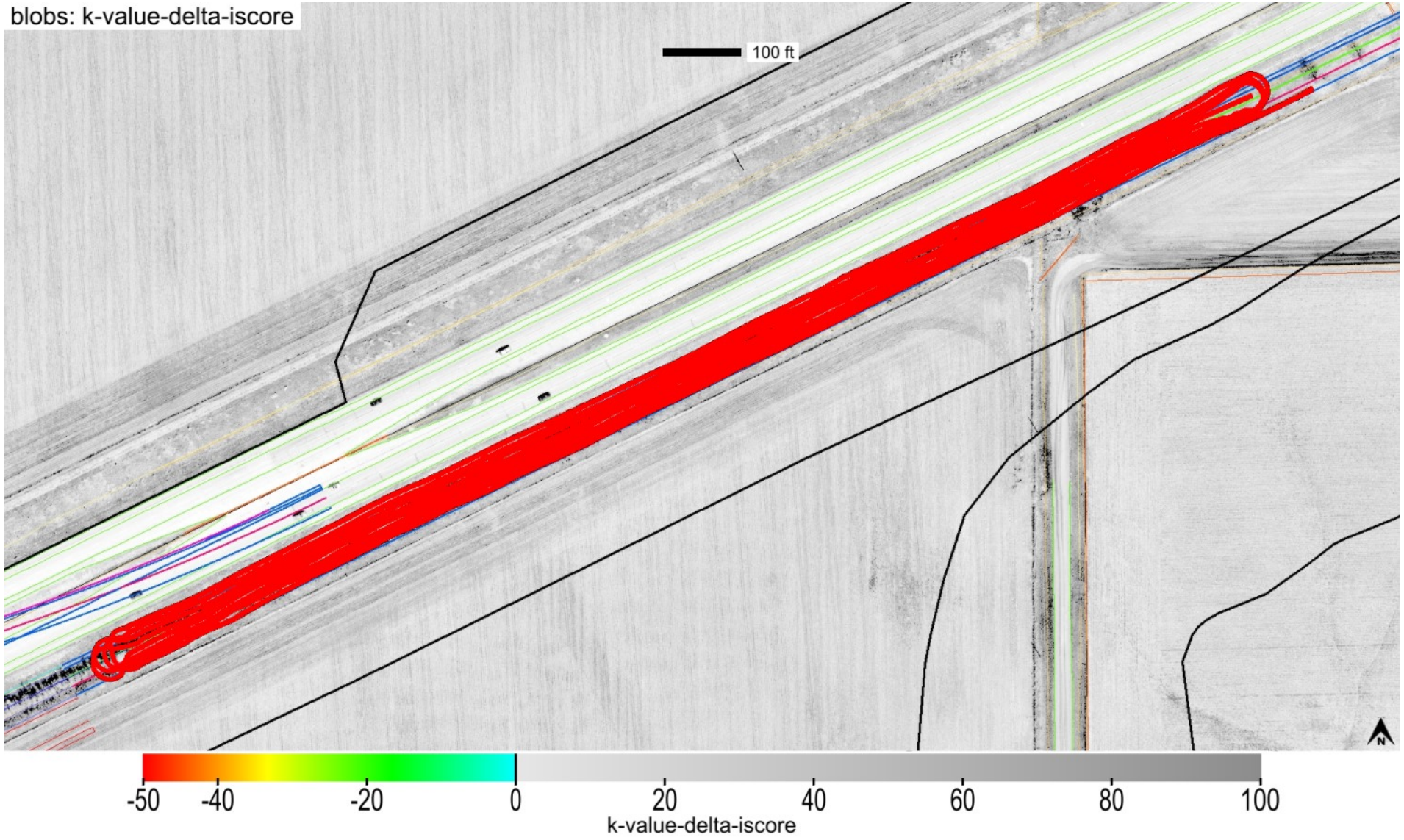
ingios GEOTECHNICS

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_18_101638a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	83480	100	none	0



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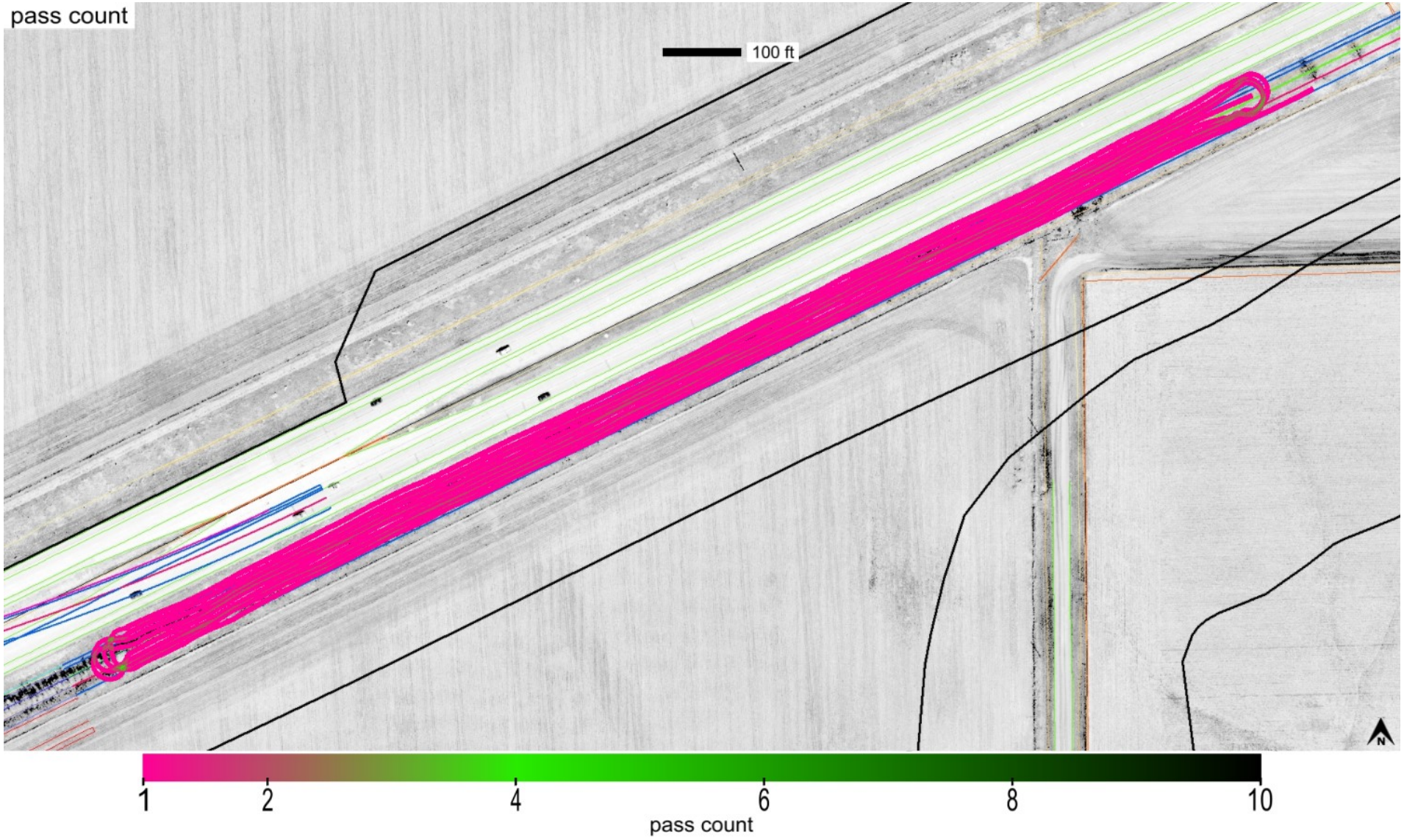
ingios GEOTECHNICS

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_18_101638a

minimum	average	maximum
1	1.12	4



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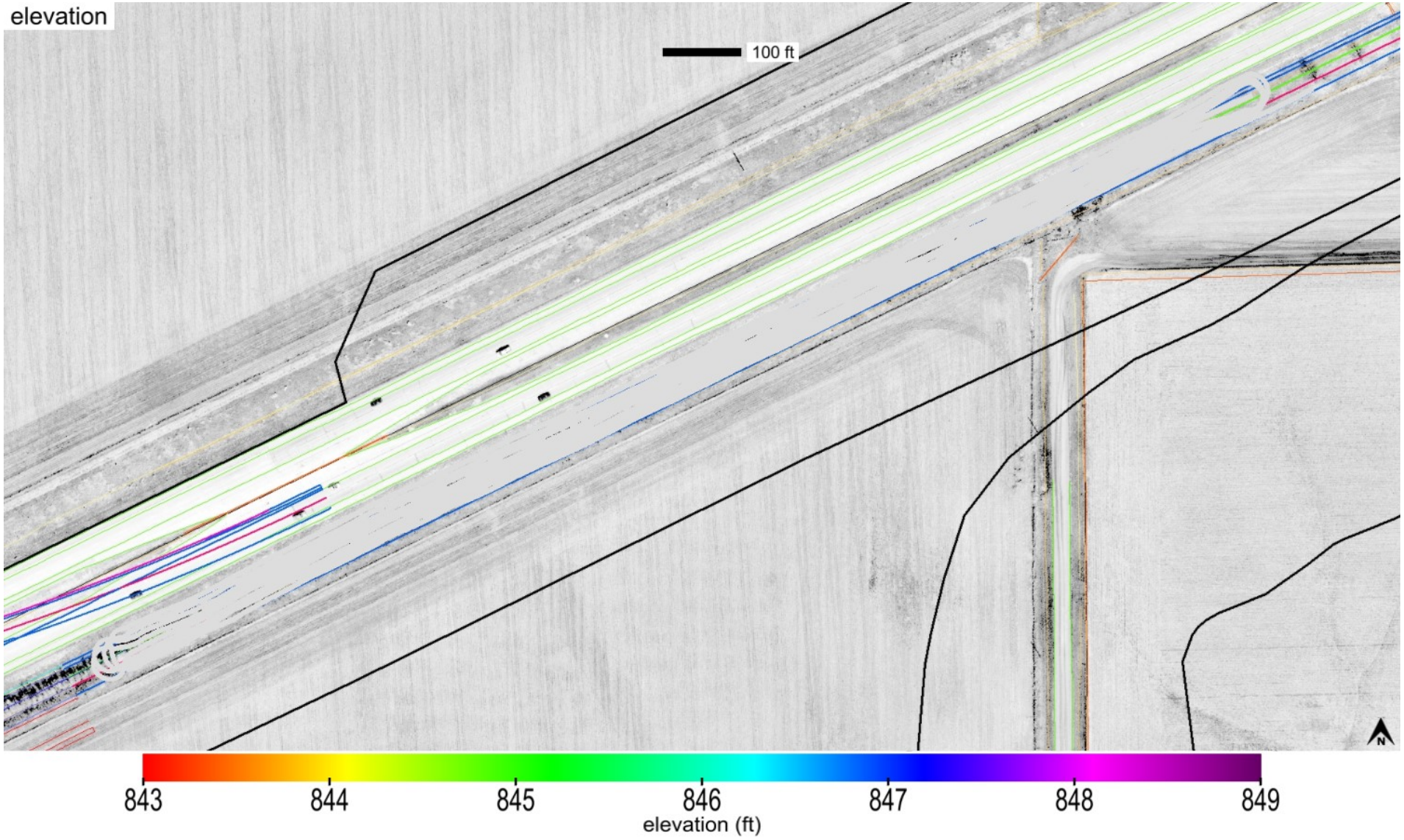
ingios GEOTECHNICS

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_18_101638a

minimum	average	maximum
0	0	0



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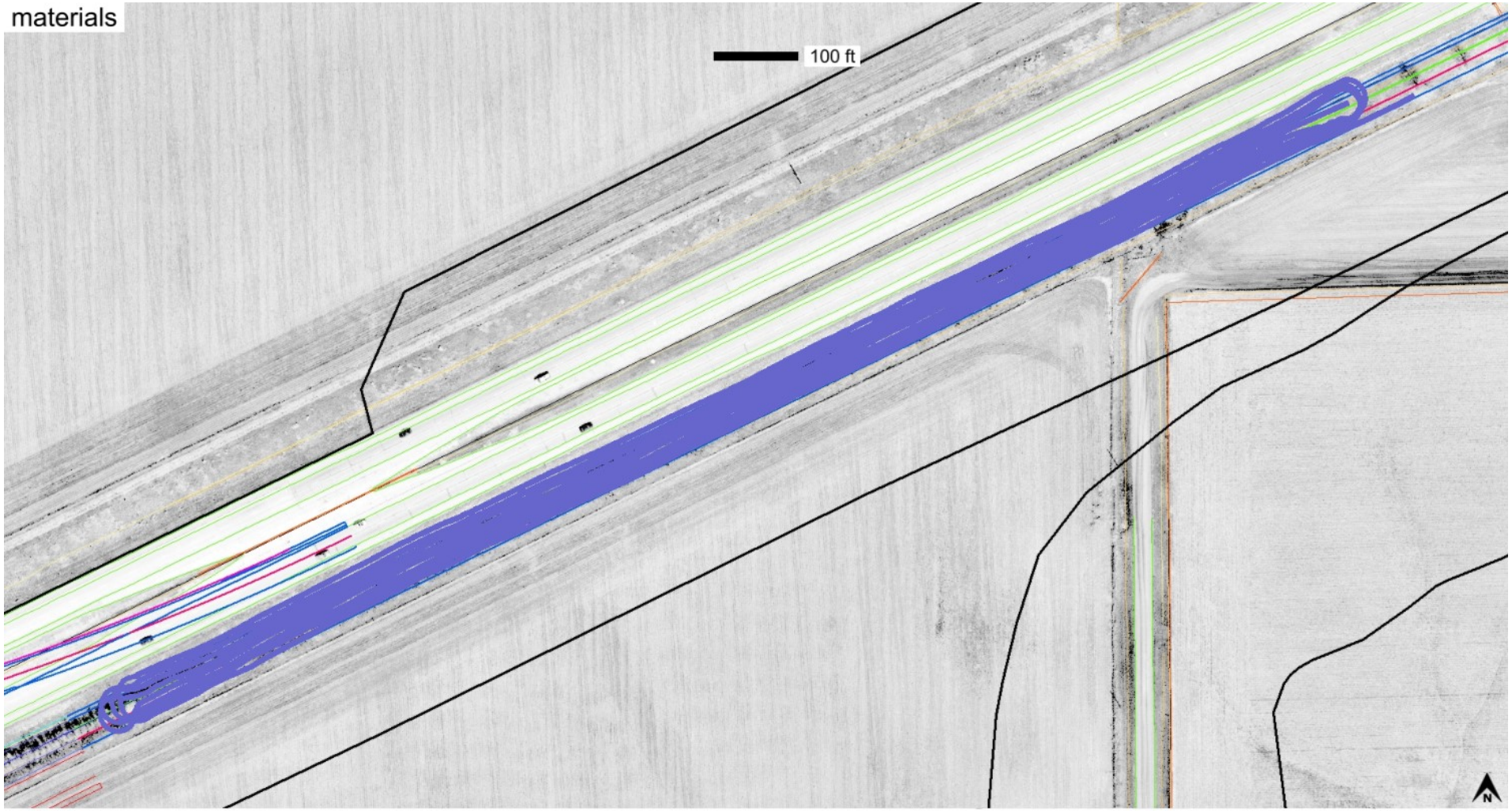
Map ID: iadot_50-i80_cs56-fcs00210_2020_06_18_101638a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	83480	1.916	12	3000	150	40



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IOWADOT

E-Compaction Report

Project:	I80 Jasper County	Mapping Duration (hrs):	0.57	Operator:	Ingios Geotechnics inc
Map ID:	iadot_50-i80_cs56-fcs00210_2020_06_18_110628a	No. of Measurements:	58885	Machine ID:	Ingios_FCS00210
Date and Time:	6/18/2020 11:06:28 AM	Location:	Jasper County	State Plane:	1402 IOWA SOUTH

Review Status: Review Required

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	Yes	100	105.11	0.61	3000	7445.95	22982.2	56000	11441.36	49.78	4445.95	19982.2	53000
k-value	Yes	30.6	37.17	0.24	150	55	113.4	202	53.07	46.81	-95	-36.6	52
Moisture Content	No												

Mapped Area

square feet	acres
58885	1.35

Pass Count

min.	avg.	max.
1	1.33	5

Elevation (ft)

min.	avg.	max.
0	0	0

Velocity (fps)

min.	avg.	max.
1.85	5.47	6.31

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade Treatment	21011	100	58885	1.352	12	3000	150	40

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IOWADOT

E-Compaction Report

Project:	I80 Jasper County	Mapping Duration (hrs):	0.57	Operator:	Ingios Geotechnics inc
Map ID:	iadot_50-i80_cs56-fcs00210_2020_06_18_110628a	No. of Measurements:	58885	Machine ID:	Ingios_FCS00210
Date and Time:	6/18/2020 11:06:28 AM	Location:	Jasper County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
105.11	CQI > = 95
100	80% of Resilient Modulus MVs >= 3000
49.78	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	I80 Jasper County	Mapping Duration (hrs):	0.57	Operator:	Ingios Geotechnics inc
Map ID:	iadot_50-i80_cs56-fcs00210_2020_06_18_110628a	No. of Measurements:	58885	Machine ID:	Ingios_FCS00210
Date and Time:	6/18/2020 11:06:28 AM	Location:	Jasper County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
37.17	CQI > = 95
30.6	80% of k-Value MVs >= 150
46.81	COV <= 20
74.65	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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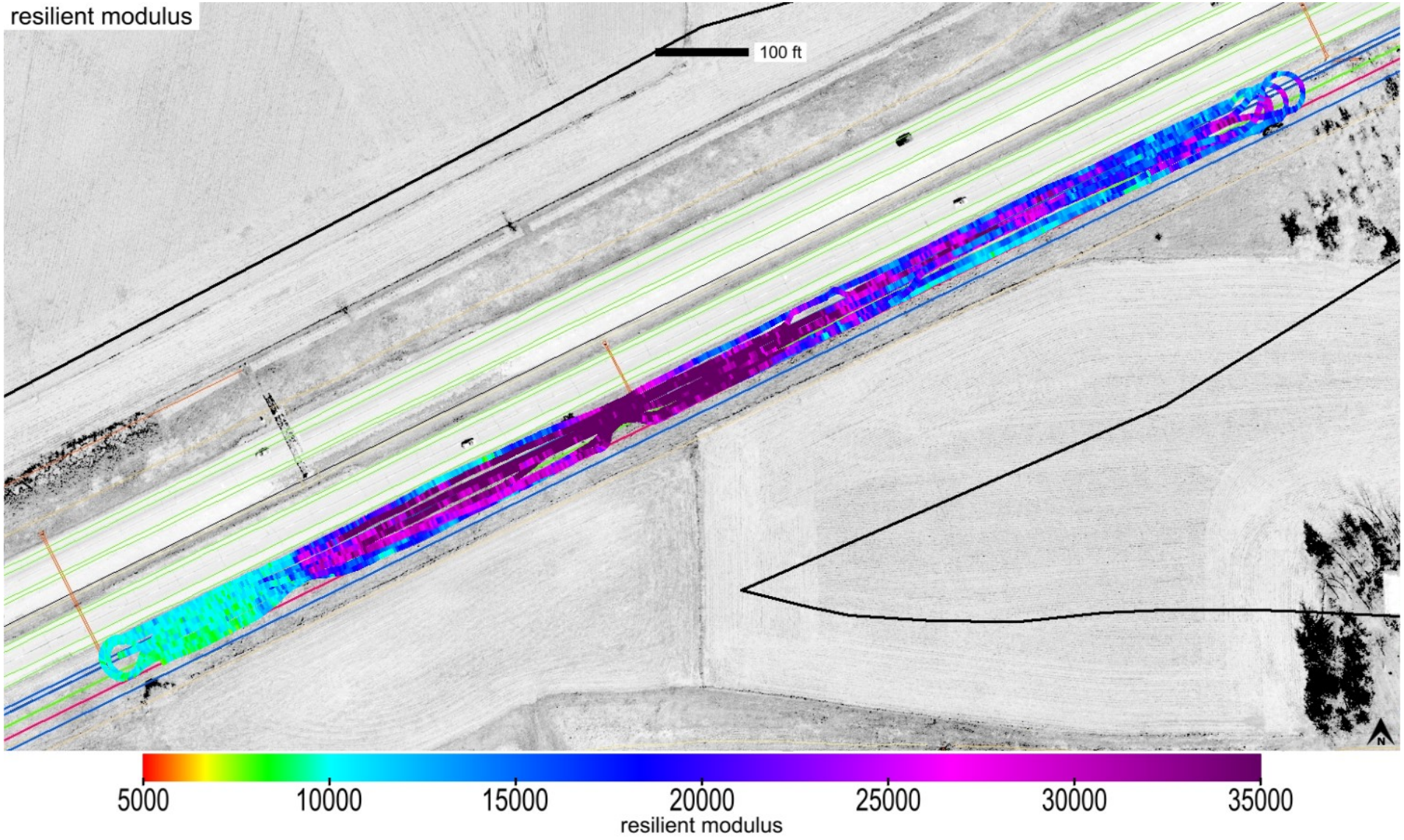
ingios GEOTECHNICS

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_18_110628a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	105.11	0.61	3000	7445.95	22982.2	56000	11441.36	49.78	4445.95	19982.2	53000



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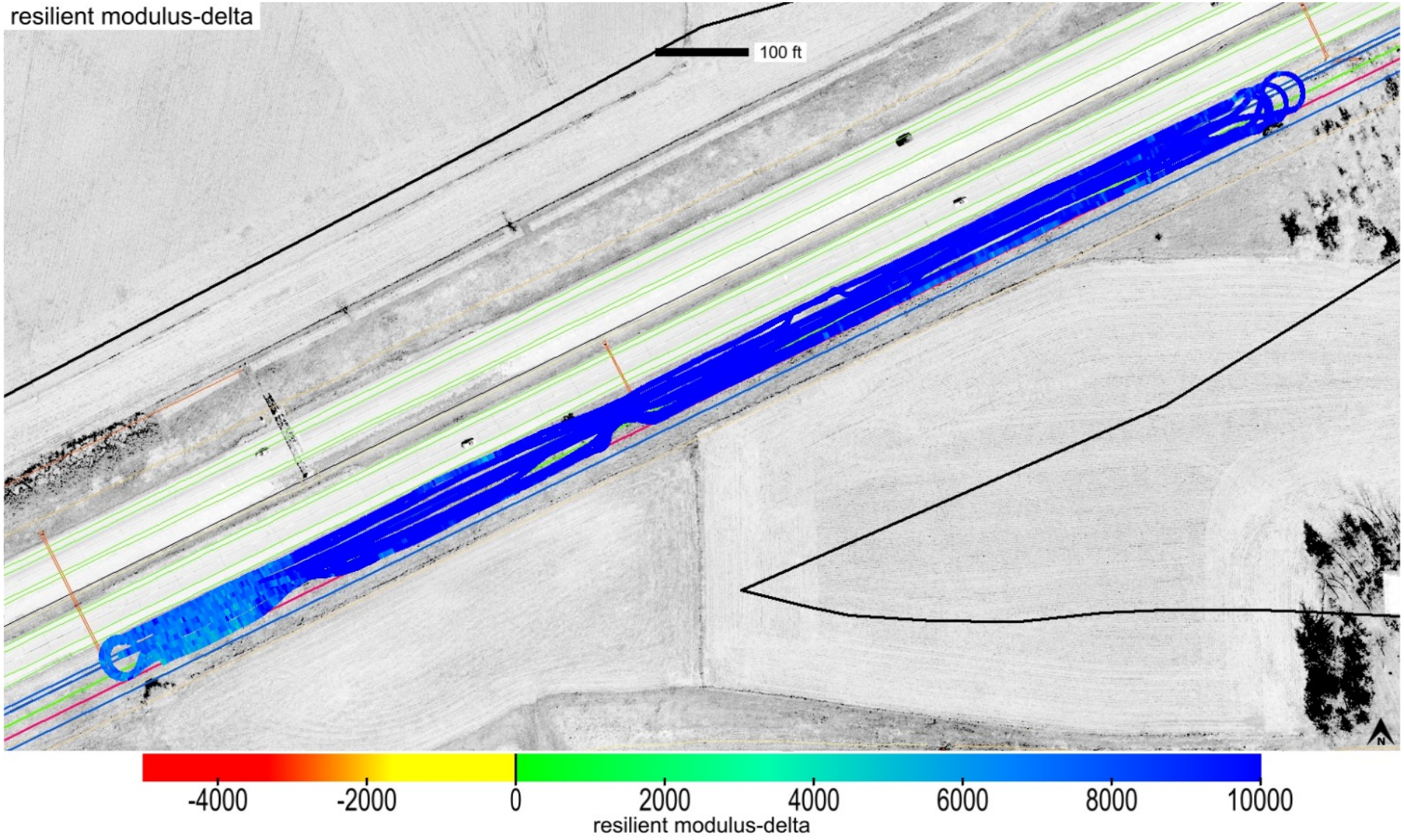
ingios GEOTECHNICS

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_18_110628a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	105.11	0.61	3000	7445.95	22982.2	56000	11441.36	49.78	4445.95	19982.2	53000



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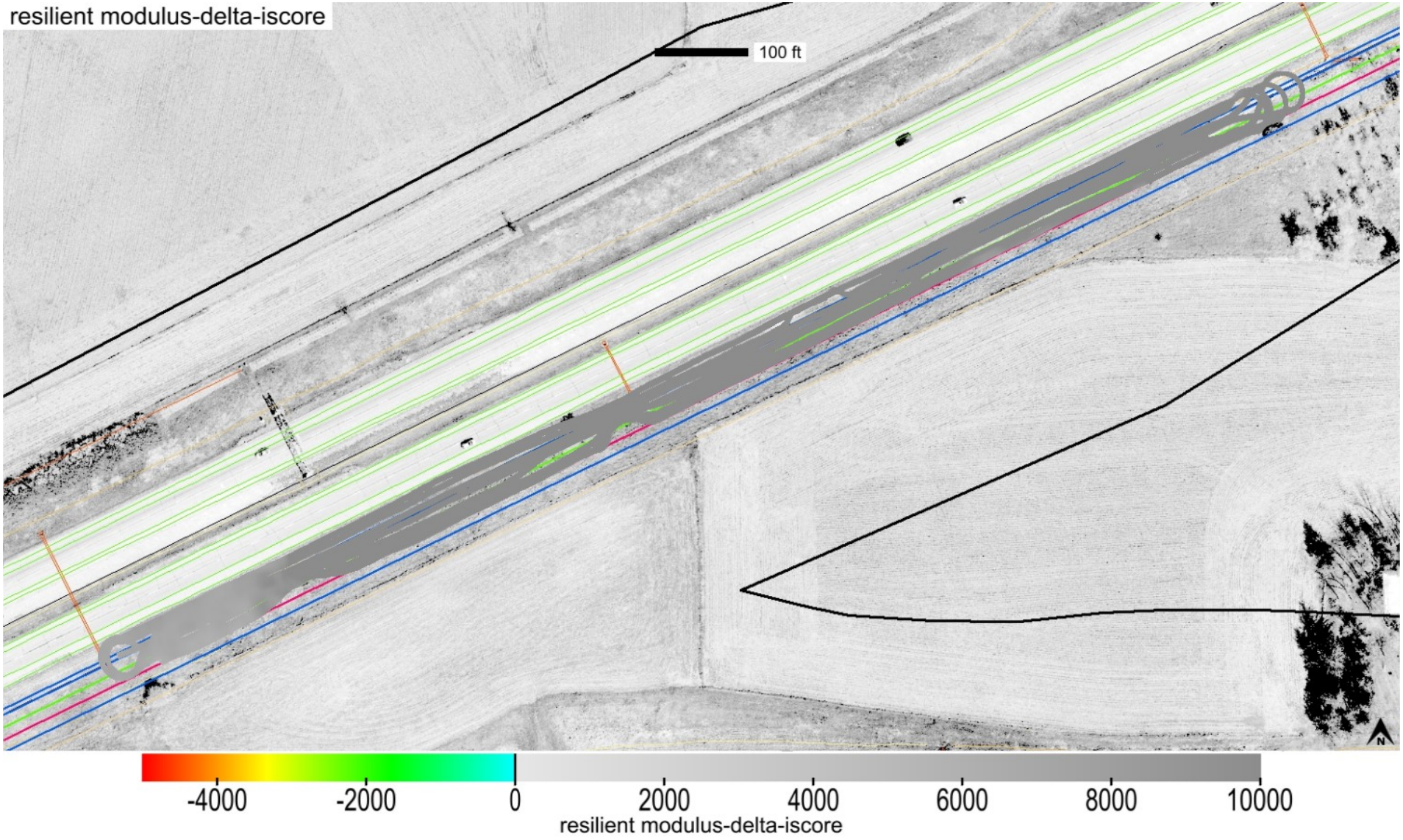
ingios GEOTECHNICS

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_18_110628a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	100	3000	4445.95	19982.2	53000	5769.5	20158.3	44244.89



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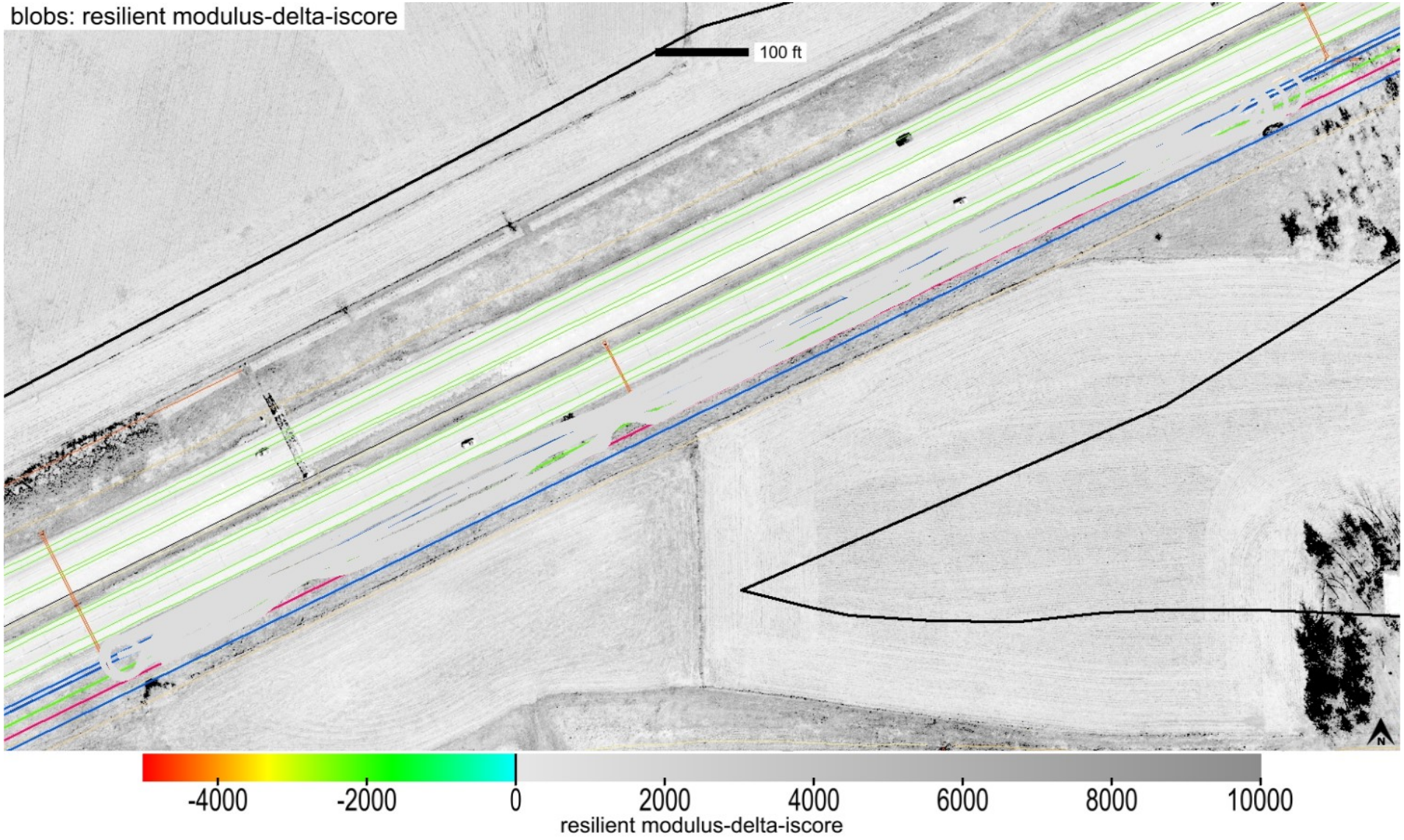
ingios GEOTECHNICS

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_18_110628a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0



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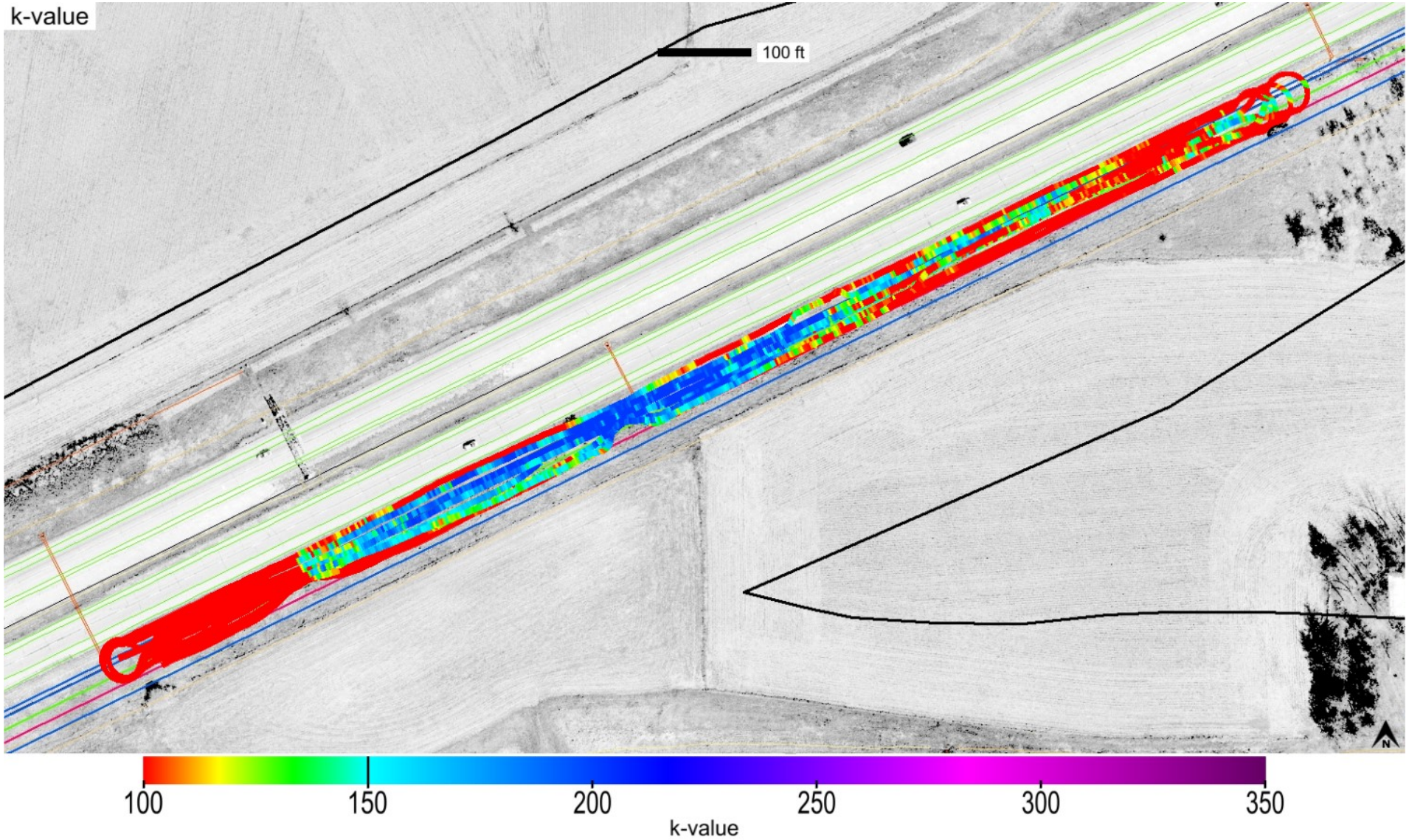
ingios GEOTECHNICS

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_18_110628a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	30.6	37.17	0.24	150	55	113.4	202	53.07	46.81	-95	-36.6	52

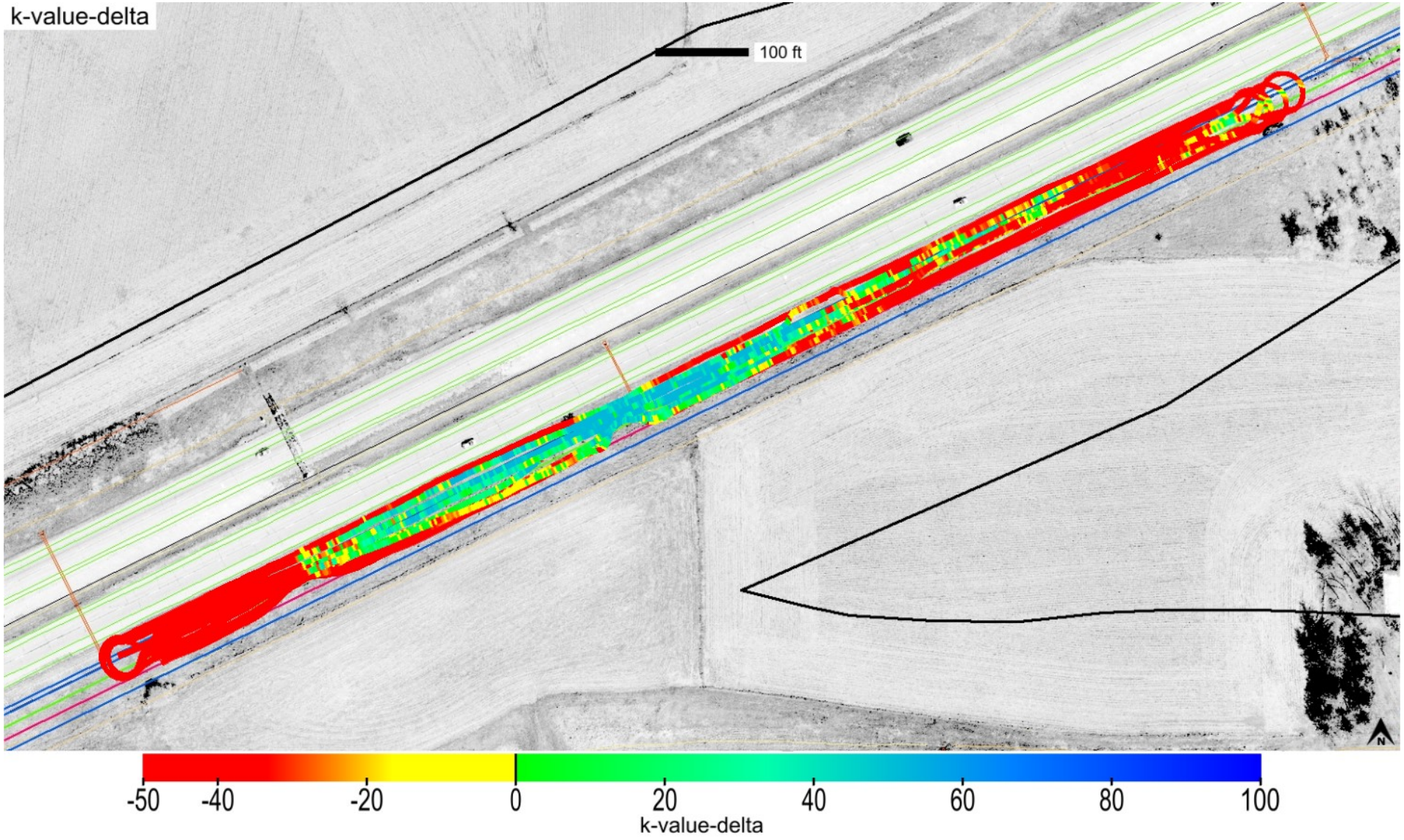


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_18_110628a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	30.6	37.17	0.24	150	55	113.4	202	53.07	46.81	-95	-36.6	52



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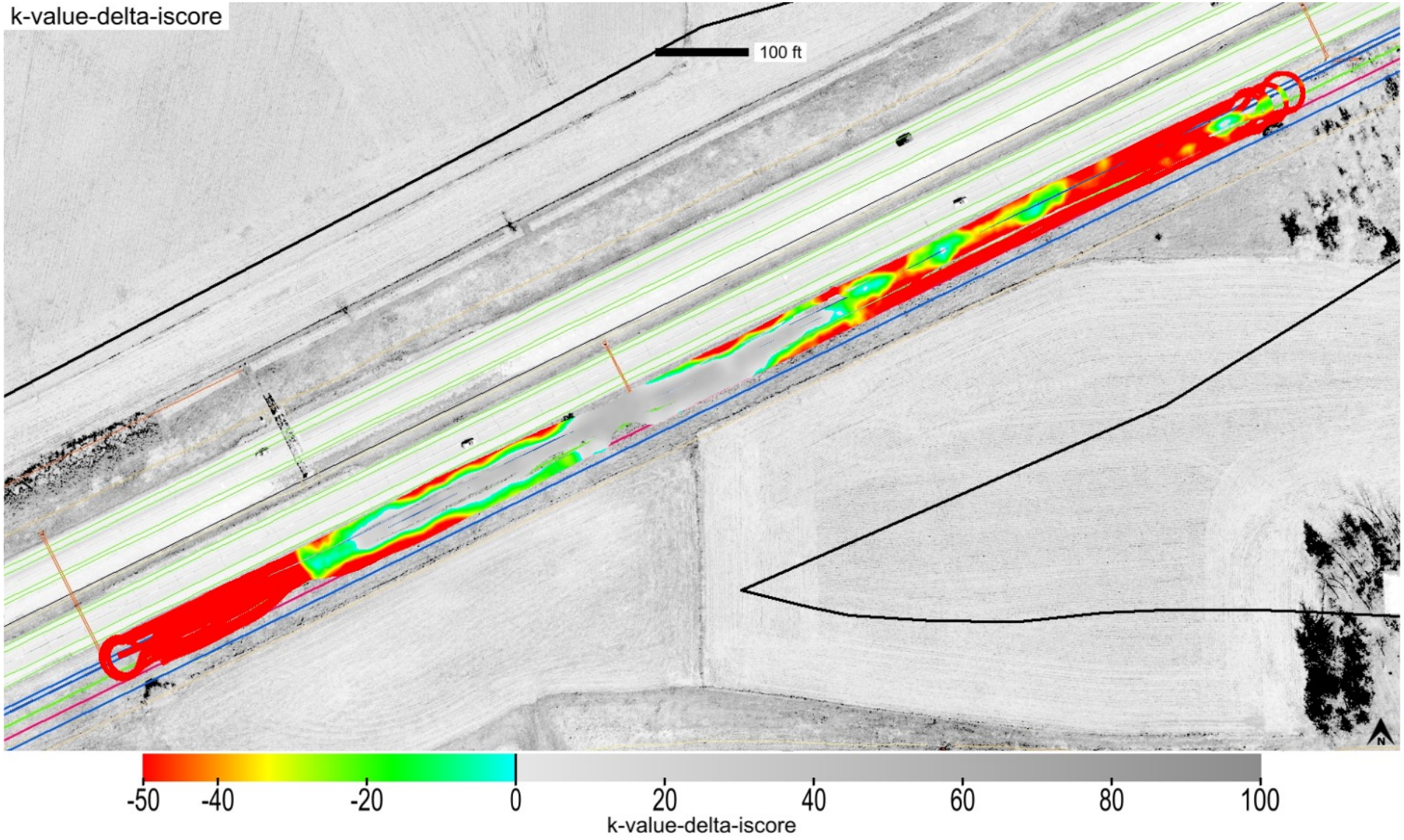
Map ID: iadot_50-i80_cs56-fcs00210_2020_06_18_110628a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	30.6	150	-95	-36.6	52	-95	-35.75	51.03



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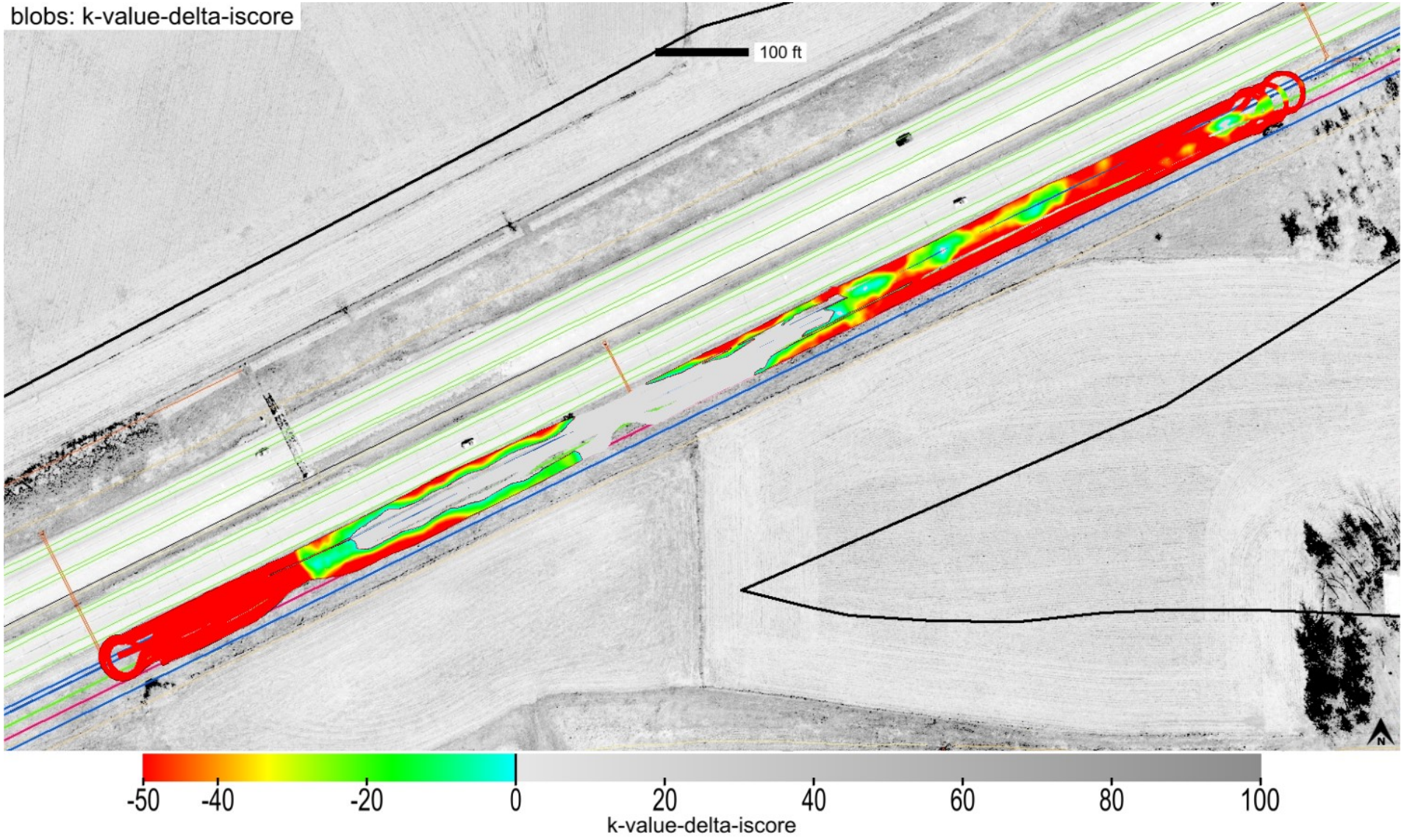
ingios GEOTECHNICS

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_18_110628a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	2	43955	74.65	none	0



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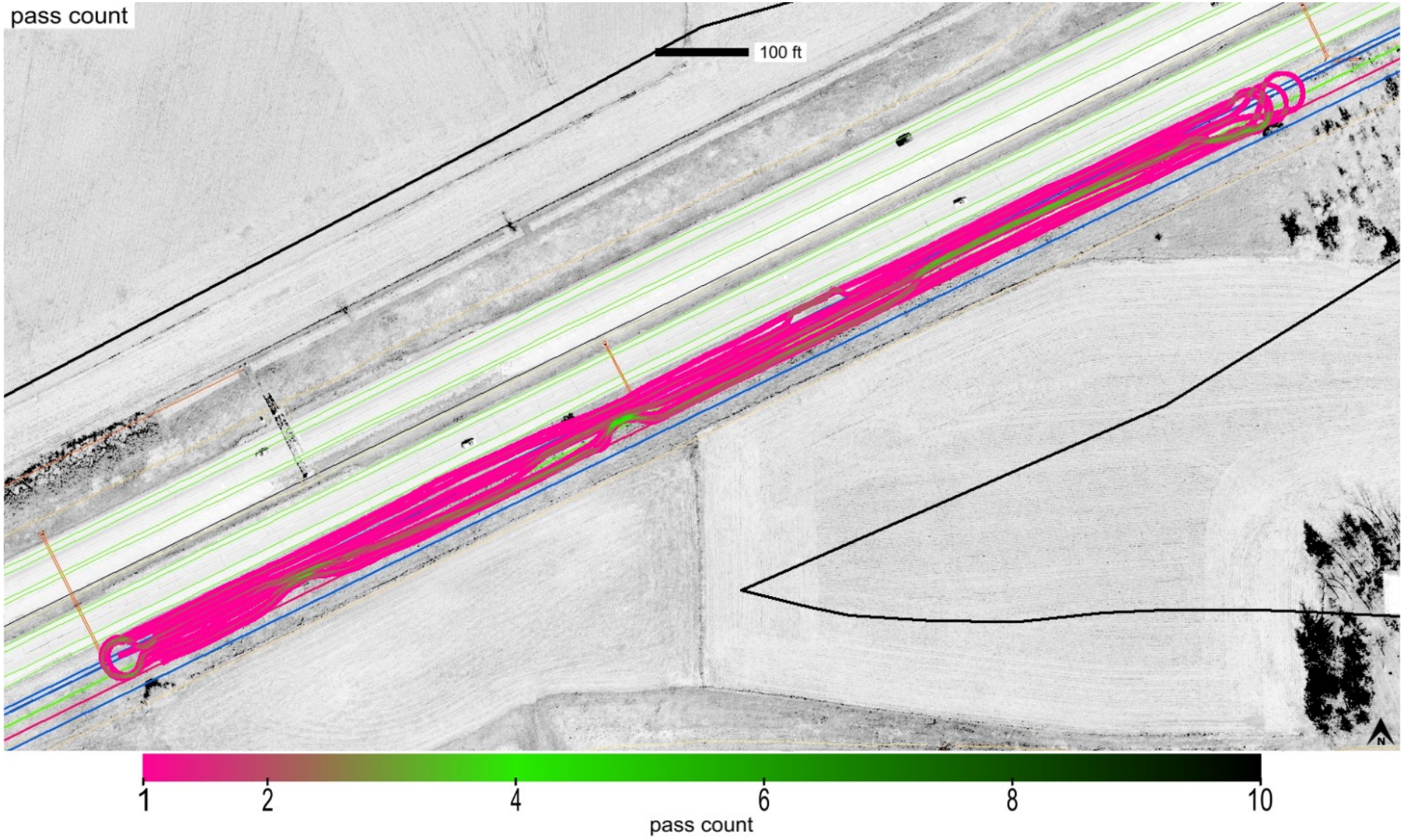
ingios GEOTECHNICS

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_18_110628a

minimum	average	maximum
1	1.33	5



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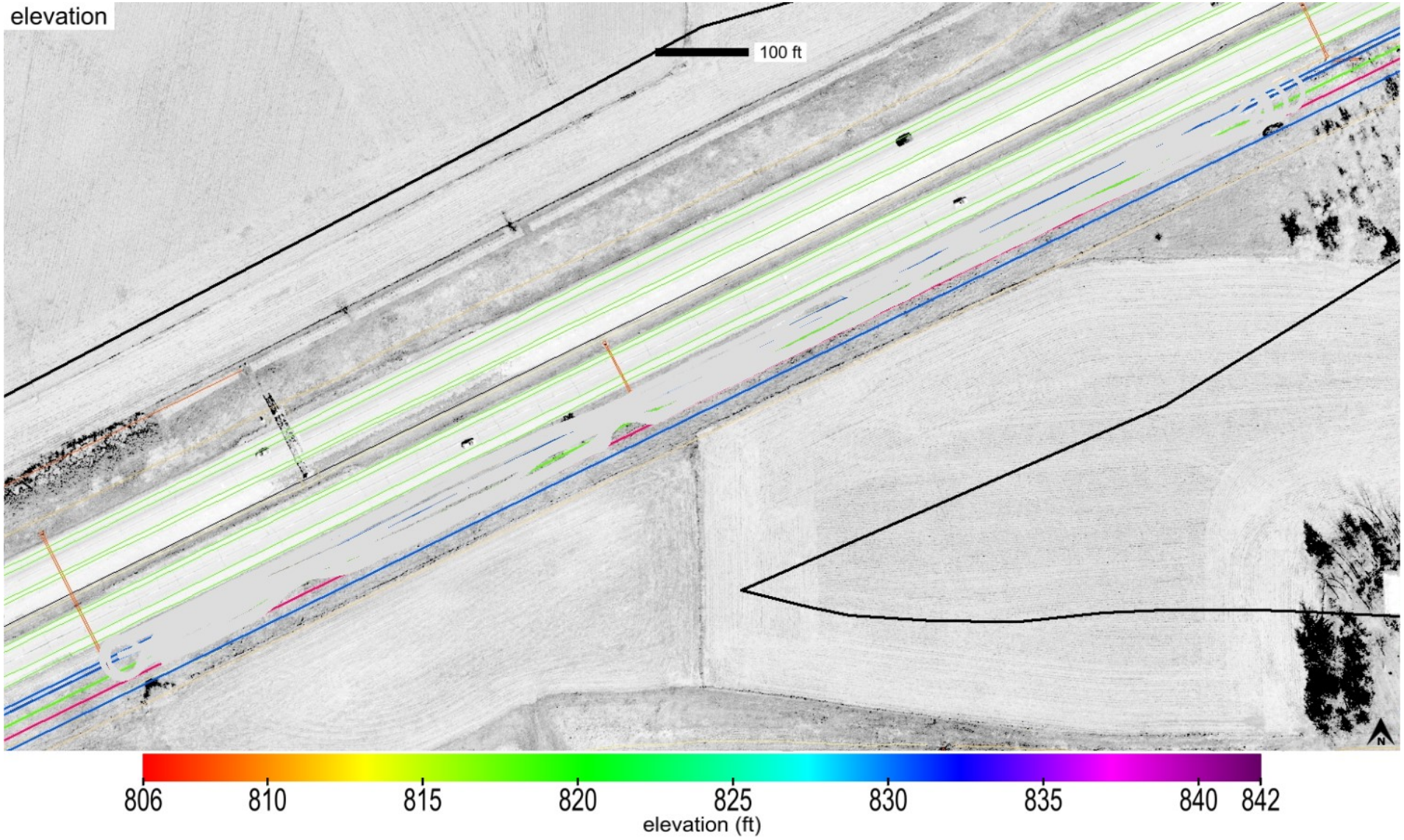
ingios GEOTECHNICS

Map ID: iadot_50-i80_cs56-fcs00210_2020_06_18_110628a

minimum	average	maximum
0	0	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: iadot_50-i80_cs56-fcs00210_2020_06_18_110628a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade Treatment	21011	100	58885	1.352	12	3000	150	40

Subgrade_Treatment Modified Subbase_IADOT (2102.02D)

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

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.26	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_19_170808a	No. of Measurements:	2846	Machine ID:	Ingios_FCS00210
Date and Time:	8/19/2020 5:08:08 PM	Location:	Linn County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	Yes	73	85.98	0.81	8554	5500	11649.3	21551.15	3969.8	34.08	-3054	3095.3	12997.15
k-value	Yes	0	22.81	-0.73	150	55	60.8	94.36	8.75	14.38	-95	-89.2	-55.64
Moisture Content	No												

Mapped Area

square feet	acres
2846	0.07

Pass Count

min.	avg.	max.
1	6.12	8

Elevation (ft)

min.	avg.	max.
769.96	773.59	776.98

Velocity (fps)

min.	avg.	max.
0.09	5.4	5.97

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	24006	100	2846	0.065	12	8554	150	40

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.26	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_19_170808a	No. of Measurements:	2846	Machine ID:	Ingios_FCS00210
Date and Time:	8/19/2020 5:08:08 PM	Location:	Linn County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
85.98	CQI > = 95
73	80% of Resilient Modulus MVs >= 8554
34.08	COV <= 20
24	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.26	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_19_170808a	No. of Measurements:	2846	Machine ID:	Ingios_FCS00210
Date and Time:	8/19/2020 5:08:08 PM	Location:	Linn County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
22.81	CQI > = 95
0	80% of k-Value MVs >= 150
14.38	COV <= 20
100	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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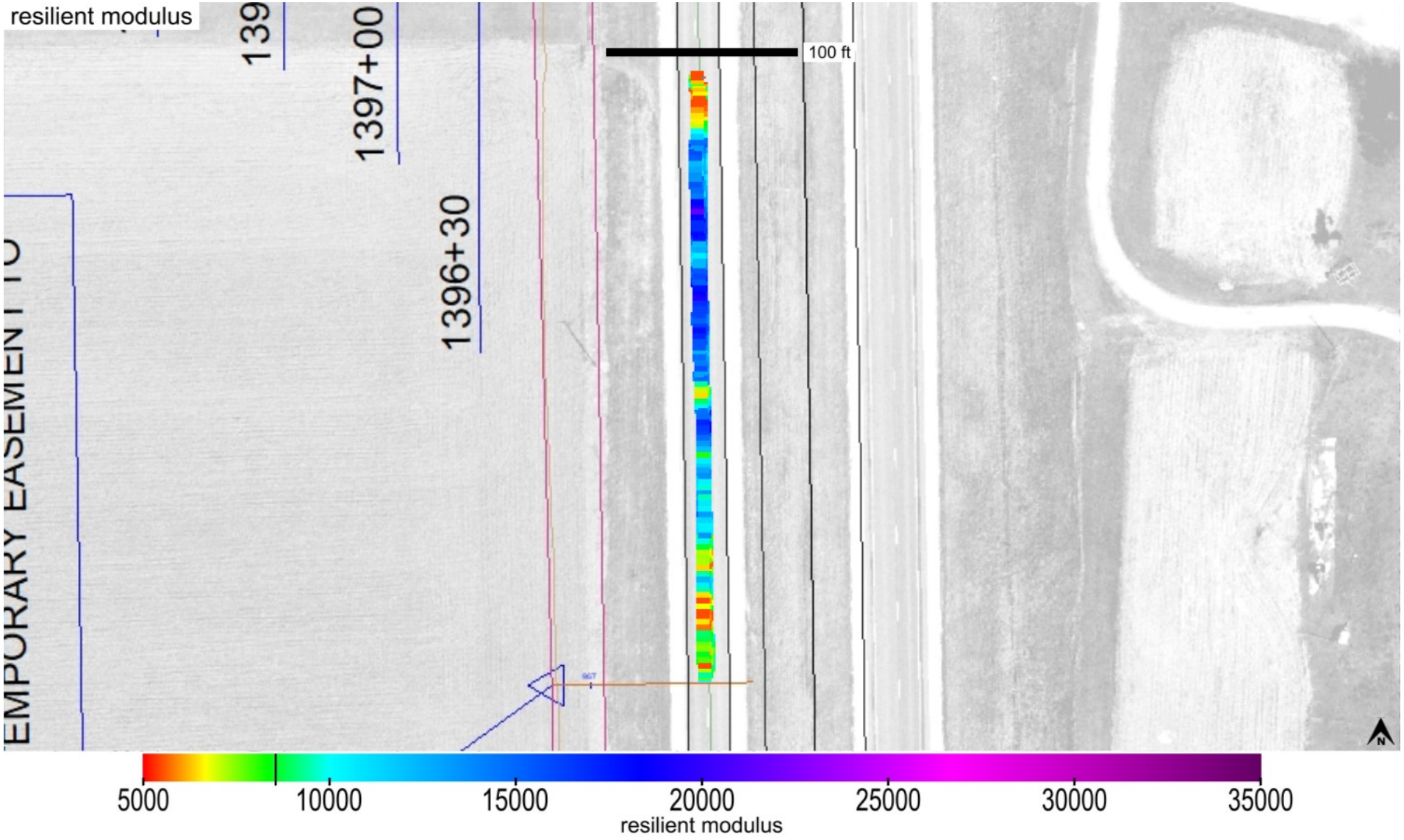
ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_170808a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	73	85.98	0.81	8554	5500	11649.3	21551.15	3969.8	34.08	-3054	3095.3	12997.15



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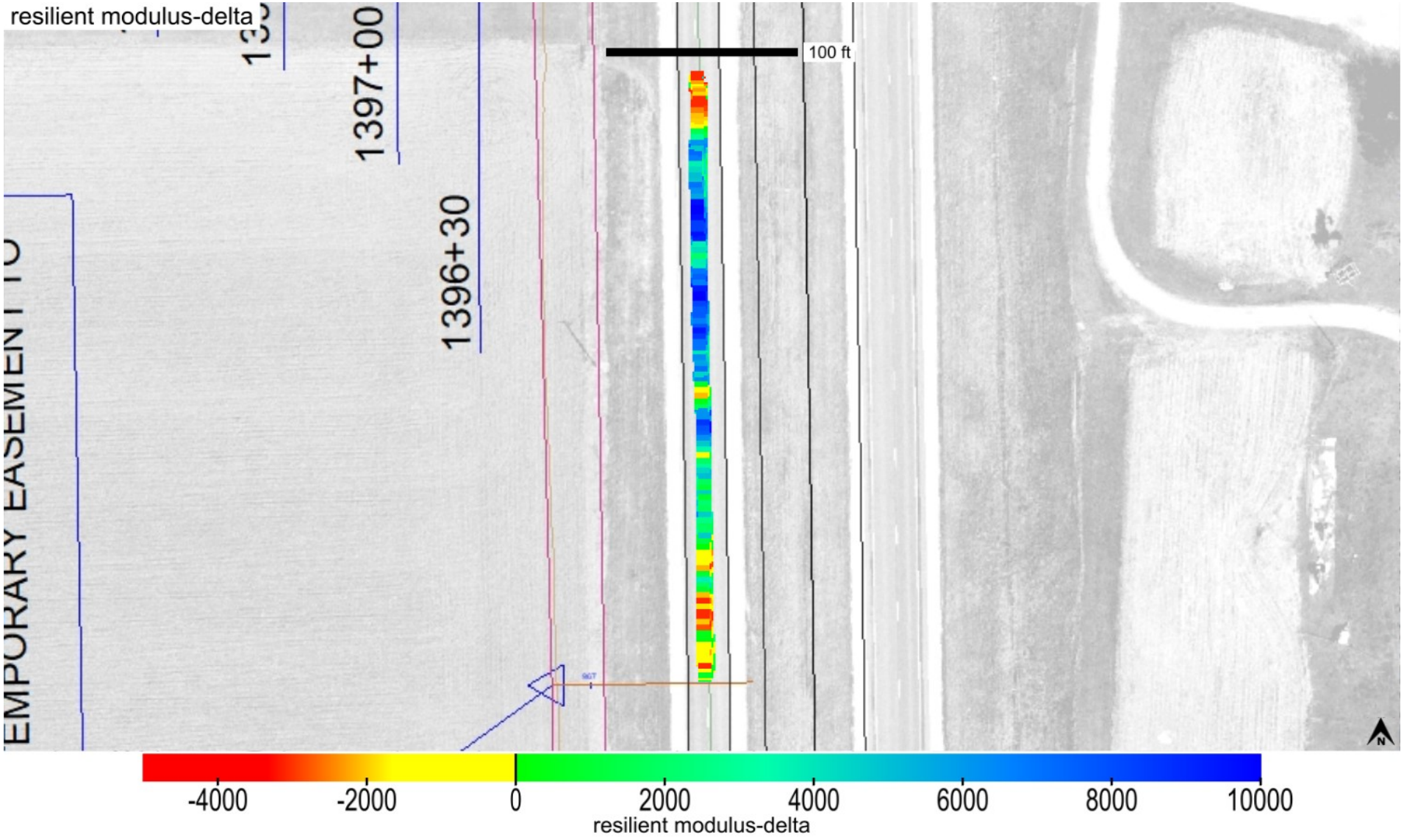
ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_170808a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	73	85.98	0.81	8554	5500	11649.3	21551.15	3969.8	34.08	-3054	3095.3	12997.15



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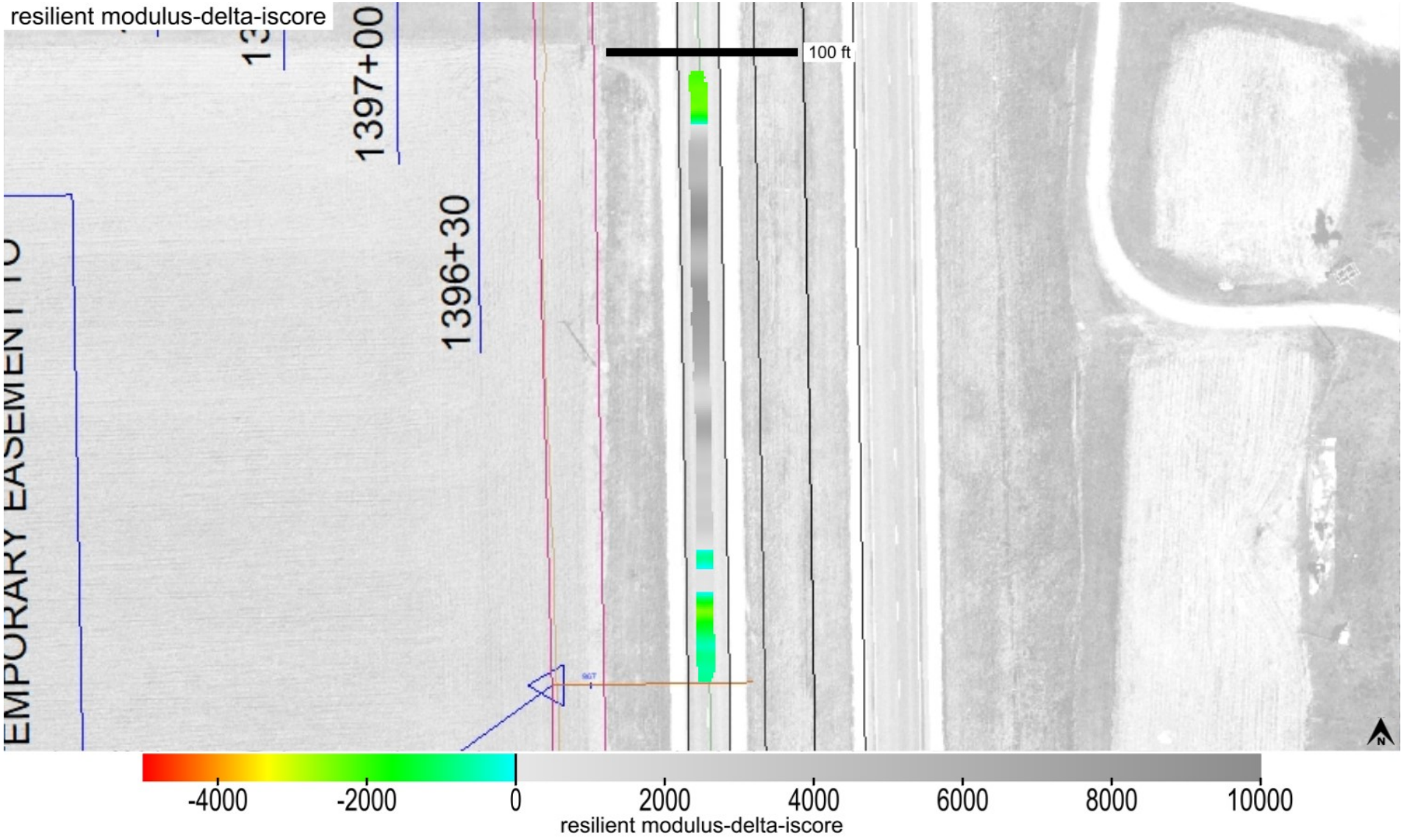
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_170808a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	73	8554	-3054	3095.3	12997.15	-2487.76	3092.8	9415.78



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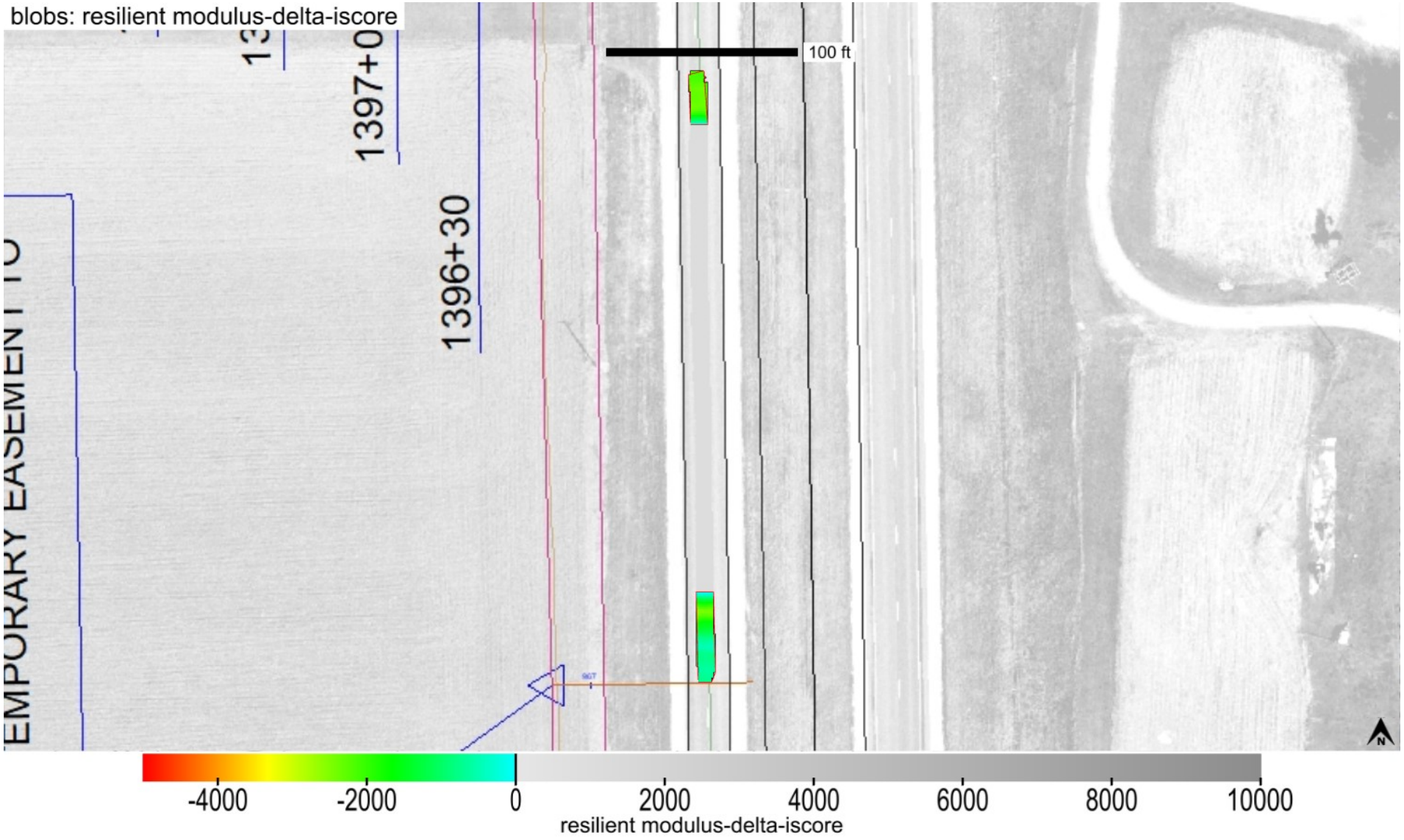
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_170808a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	2	683	24	none	0



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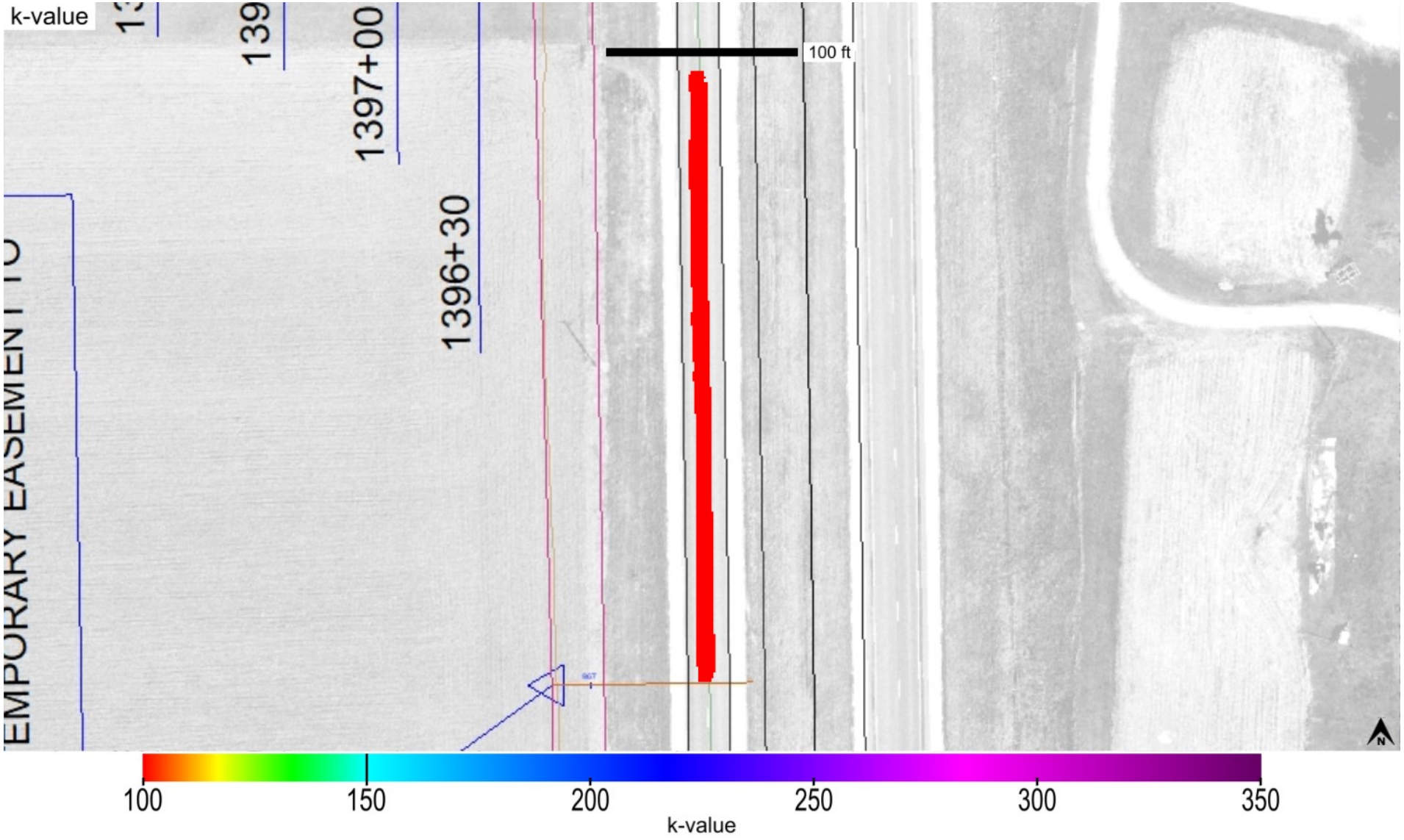
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_170808a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0	22.81	-0.73	150	55	60.8	94.36	8.75	14.38	-95	-89.2	-55.64



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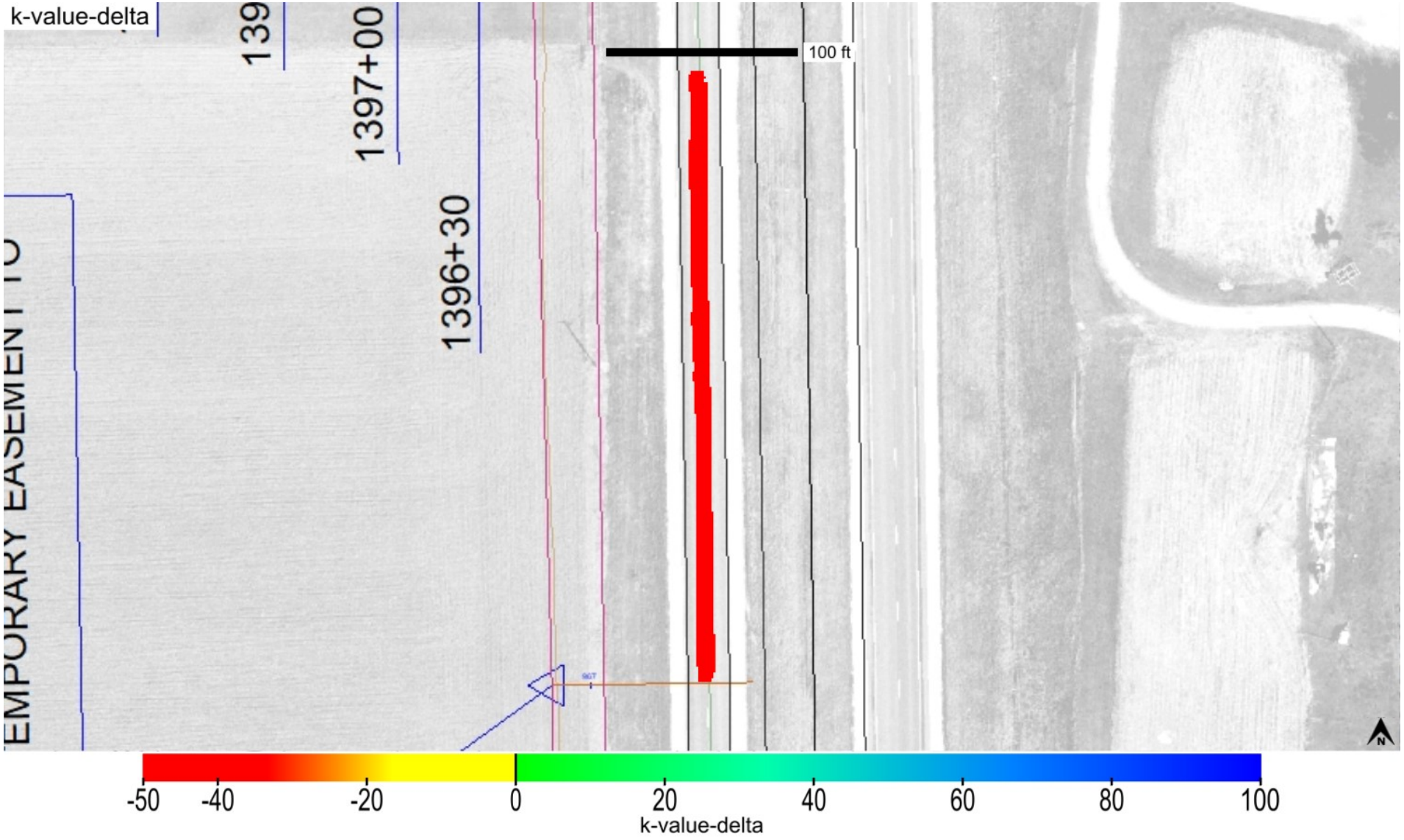
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_170808a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0	22.81	-0.73	150	55	60.8	94.36	8.75	14.38	-95	-89.2	-55.64



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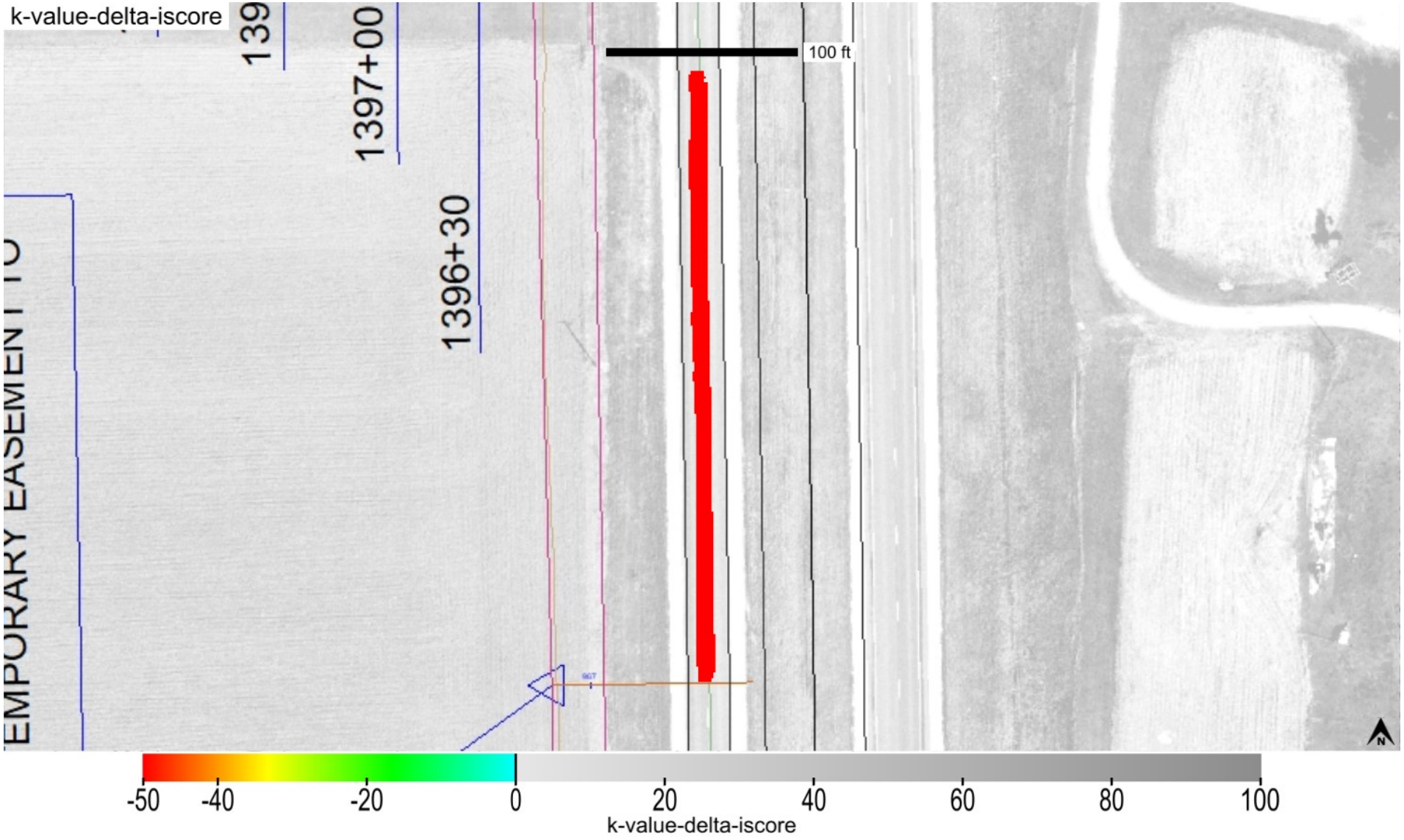
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_170808a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	0	150	-95	-89.2	-55.64	-95	-89.12	-72.37



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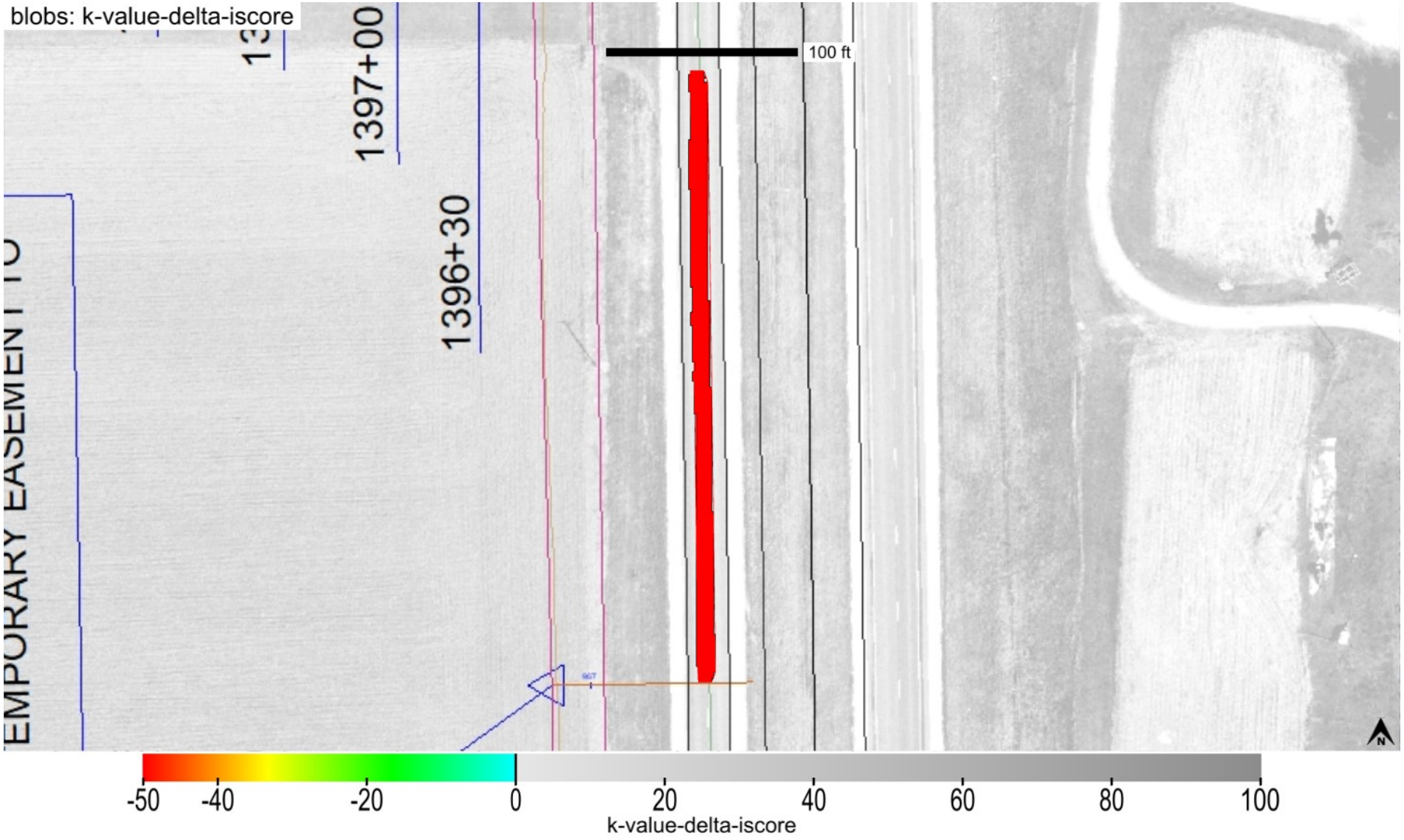
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_170808a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	2846	100	none	0



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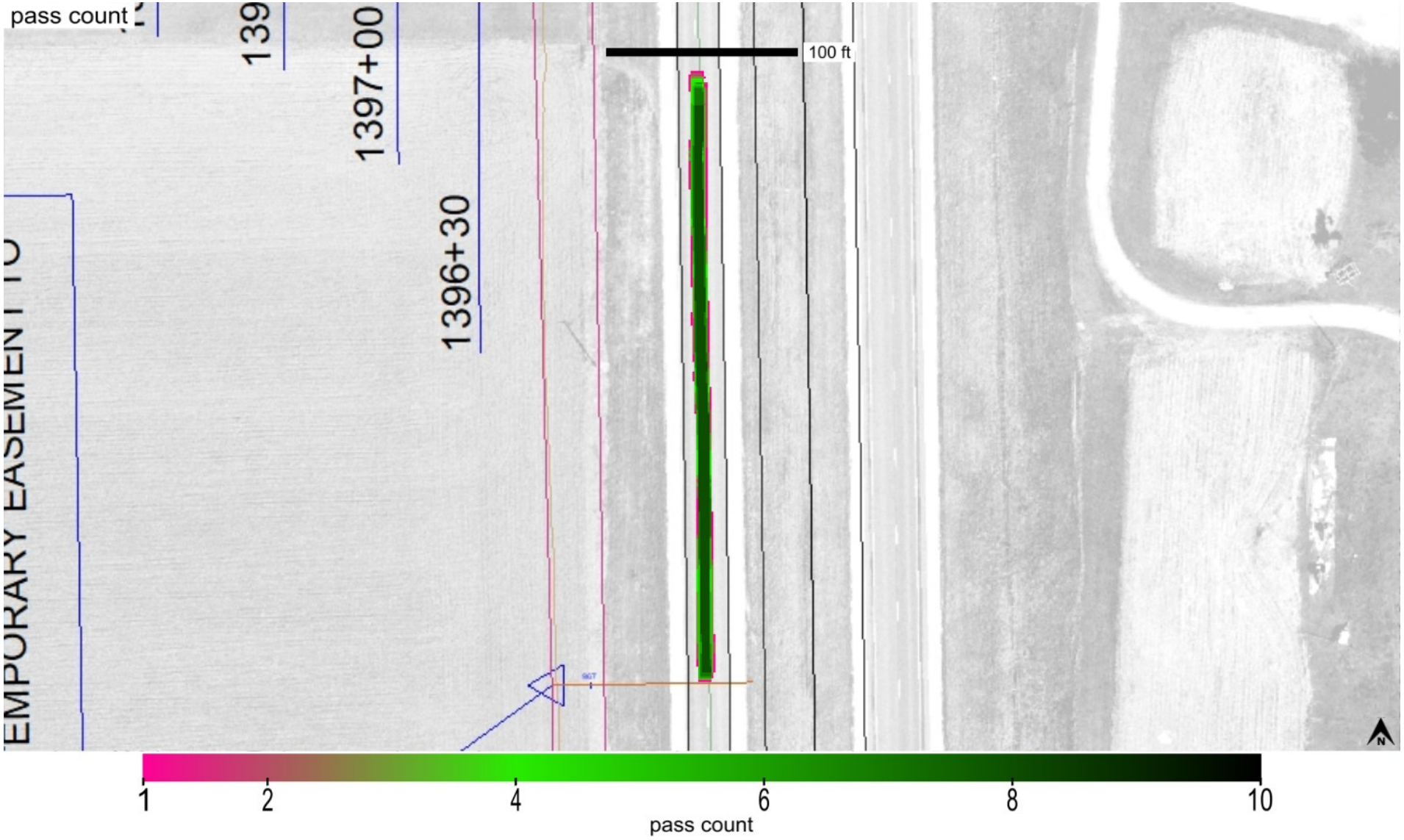
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_170808a

minimum	average	maximum
1	6.12	8



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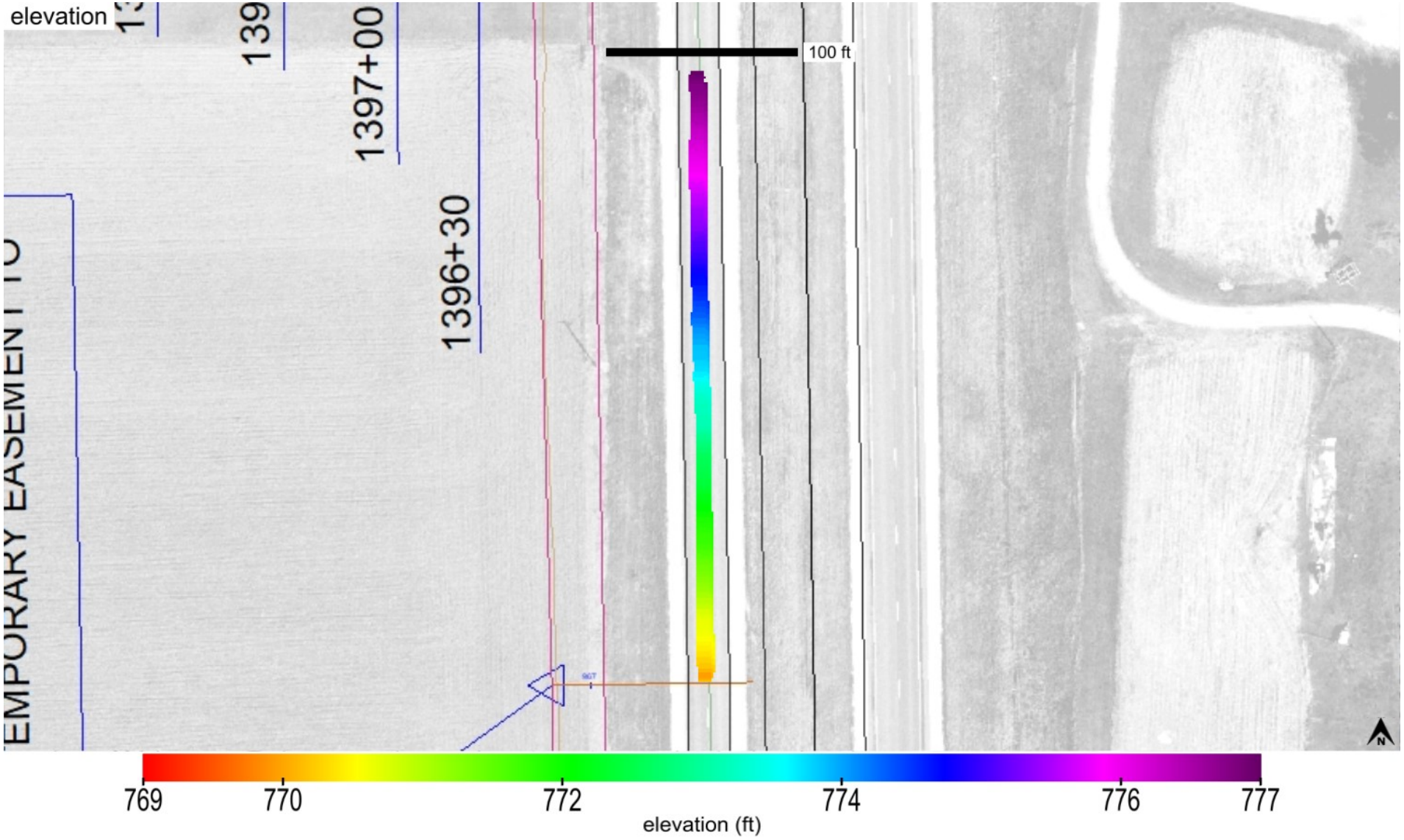
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_170808a

minimum	average	maximum
769.959	773.59	776.983



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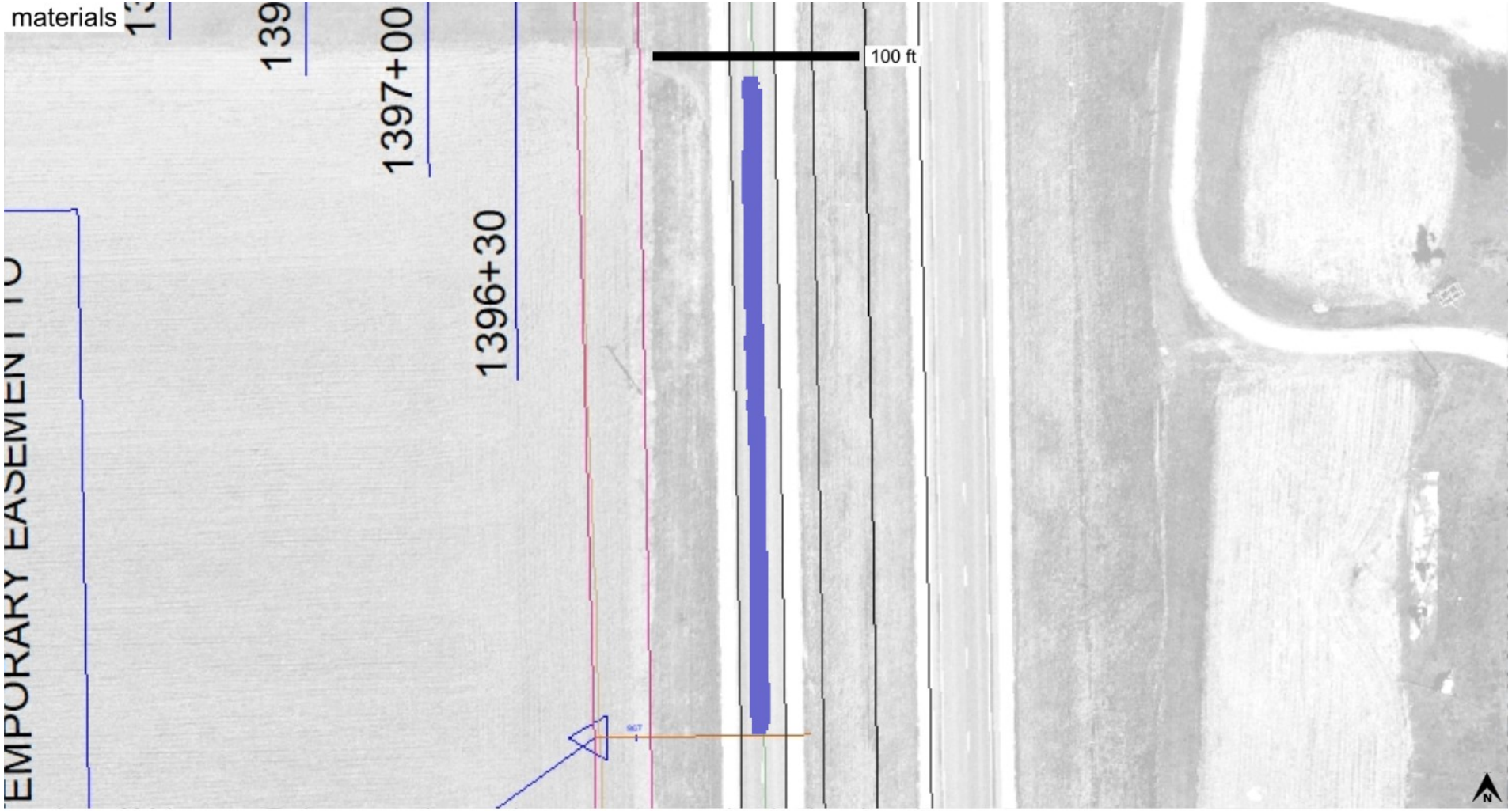
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_170808a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	24006	100	2846	0.065	12	8554	150	40



Subgrade_Treatment Select Cohesive_IADOT (2102.02D)

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IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.31	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_19_172916a	No. of Measurements:	30222	Machine ID:	Ingios_FCS00210
Date and Time:	8/19/2020 5:29:16 PM	Location:	Linn County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	Yes	85.2	88.08	0.55	8554	5500	19412.2	56000	10531.06	54.25	-3054	10858.2	47446
k-value	Yes	5.5	16.3	0.1	150	55	89.9	202	34.59	38.45	-95	-60.1	52
Moisture Content	No												

Mapped Area

square feet	acres
30222	0.69

Pass Count

min.	avg.	max.
1	1.37	4

Elevation (ft)

min.	avg.	max.
760.31	771.26	781.4

Velocity (fps)

min.	avg.	max.
0.23	5.49	6.32

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	30222	0.694	12	8554	150	40

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IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.31	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_19_172916a	No. of Measurements:	30222	Machine ID:	Ingios_FCS00210
Date and Time:	8/19/2020 5:29:16 PM	Location:	Linn County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
88.08	CQI > = 95
85.2	80% of Resilient Modulus MVs >= 8554
54.25	COV <= 20
2.76	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.31	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_19_172916a	No. of Measurements:	30222	Machine ID:	Ingios_FCS00210
Date and Time:	8/19/2020 5:29:16 PM	Location:	Linn County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
16.3	CQI > = 95
5.5	80% of k-Value MVs >= 150
38.45	COV <= 20
98.15	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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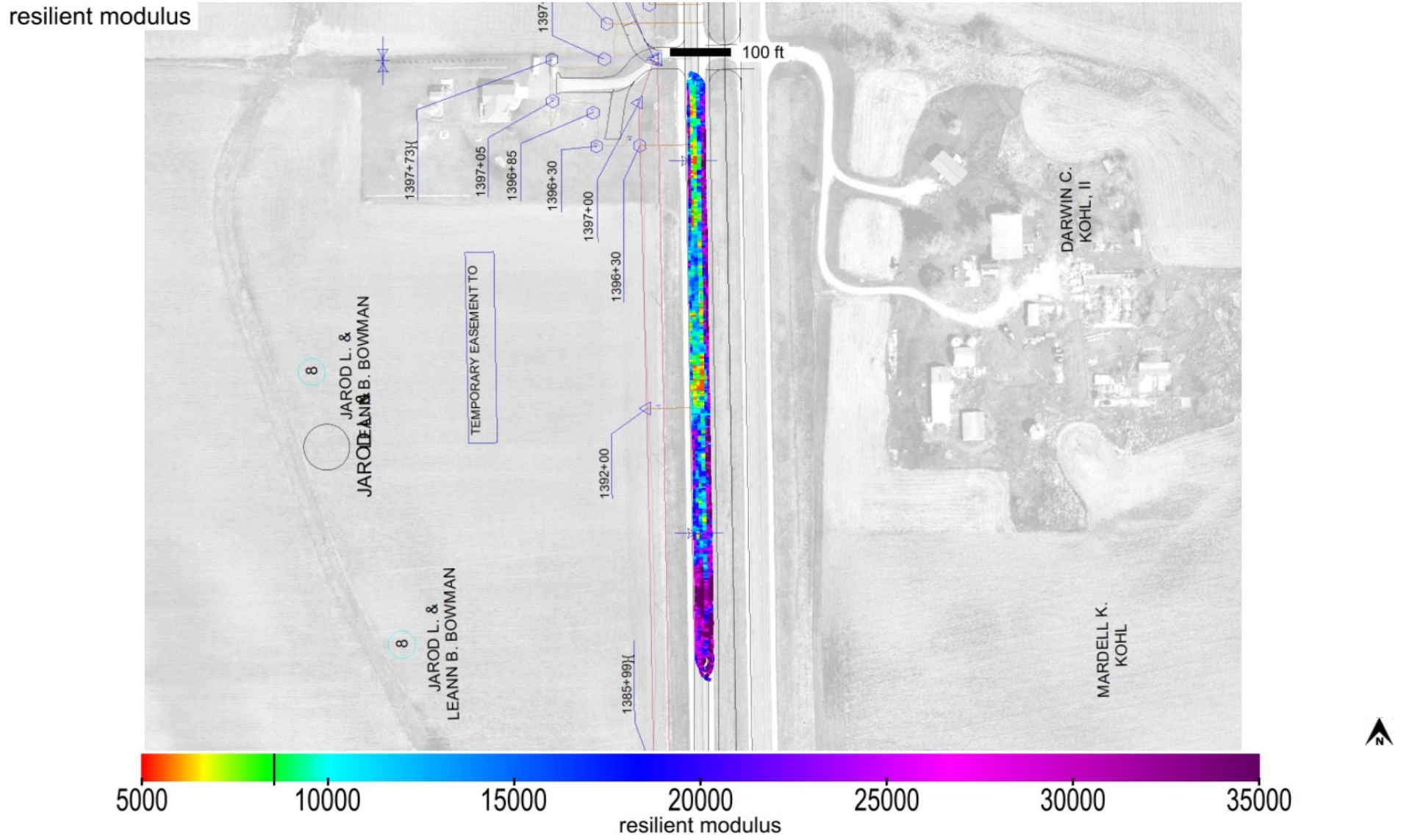
ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_172916a

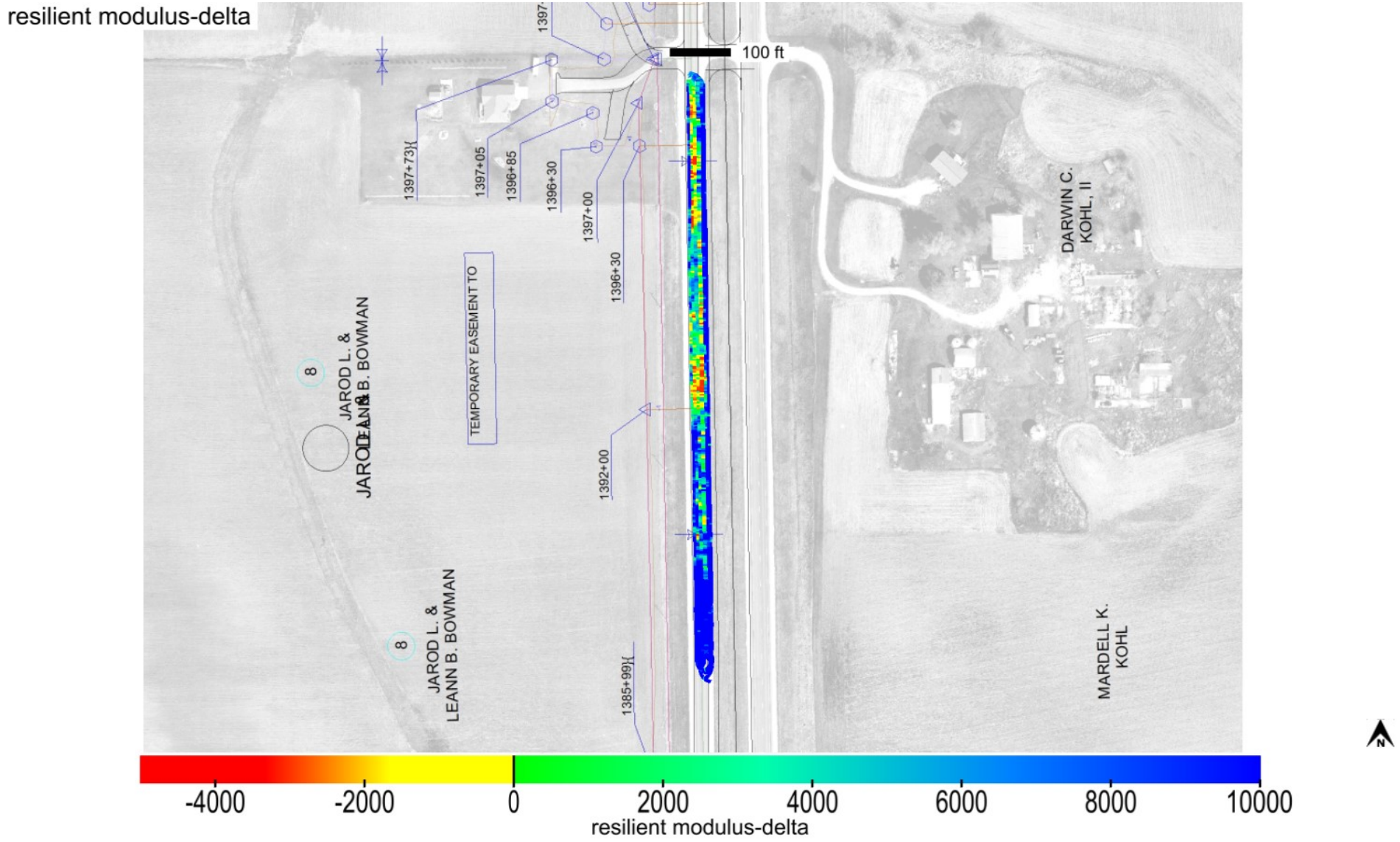
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	85.2	88.08	0.55	8554	5500	19412.2	56000	10531.06	54.25	-3054	10858.2	47446



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

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_172916a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	85.2	88.08	0.55	8554	5500	19412.2	56000	10531.06	54.25	-3054	10858.2	47446

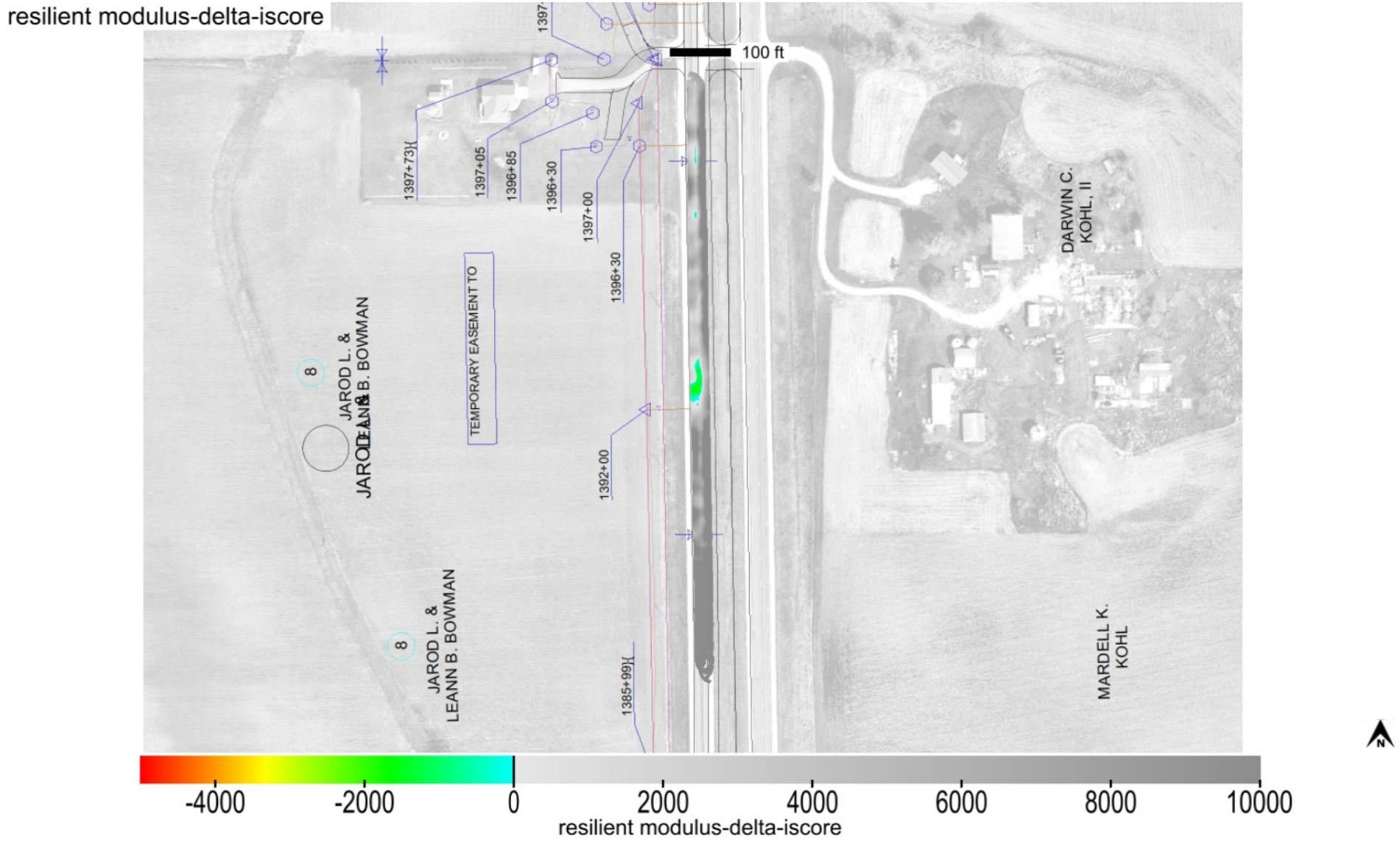


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_172916a

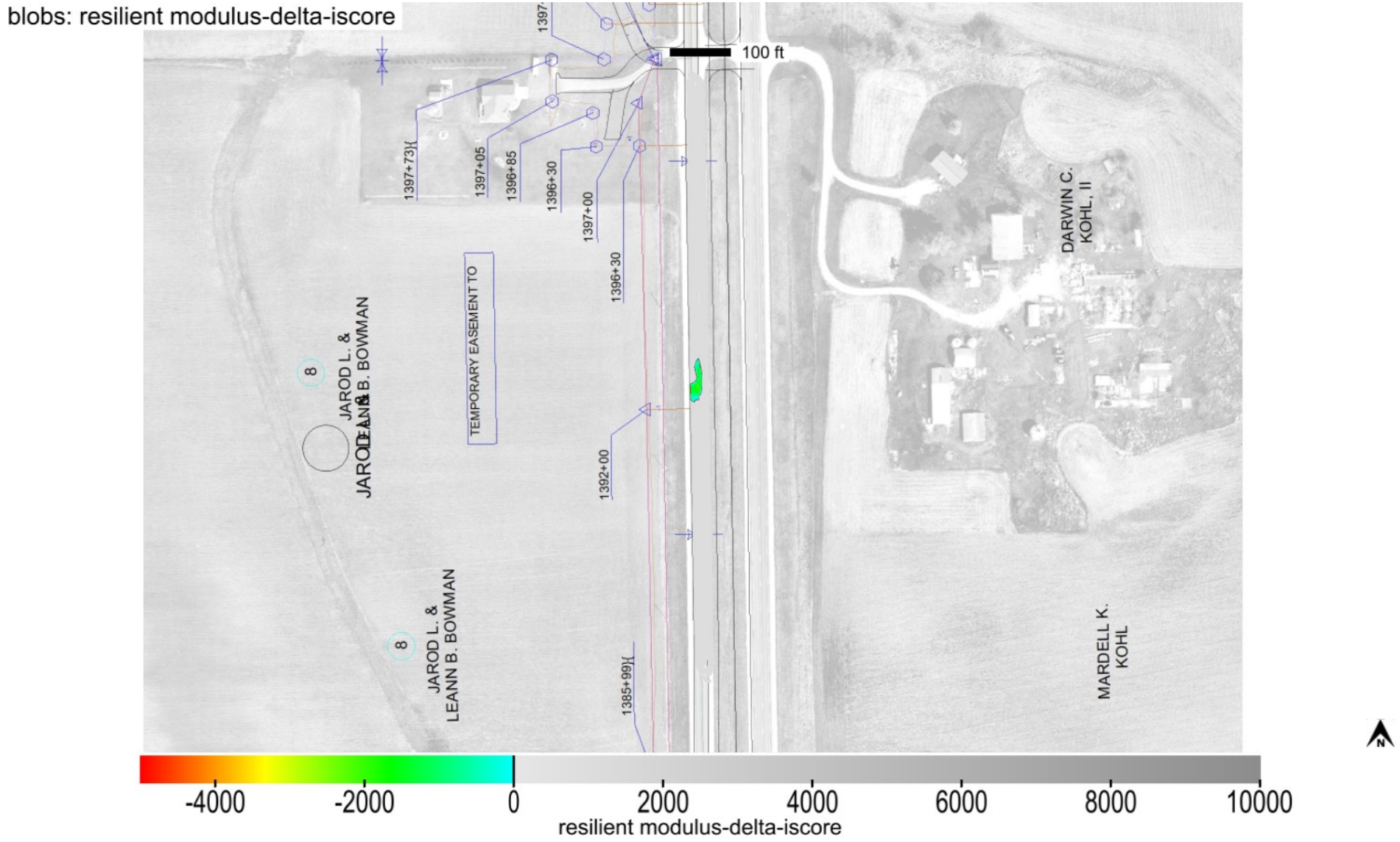
Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	85.2	8554	-3054	10858.2	47446	-2215.45	10454.26	36084.92



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

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_172916a

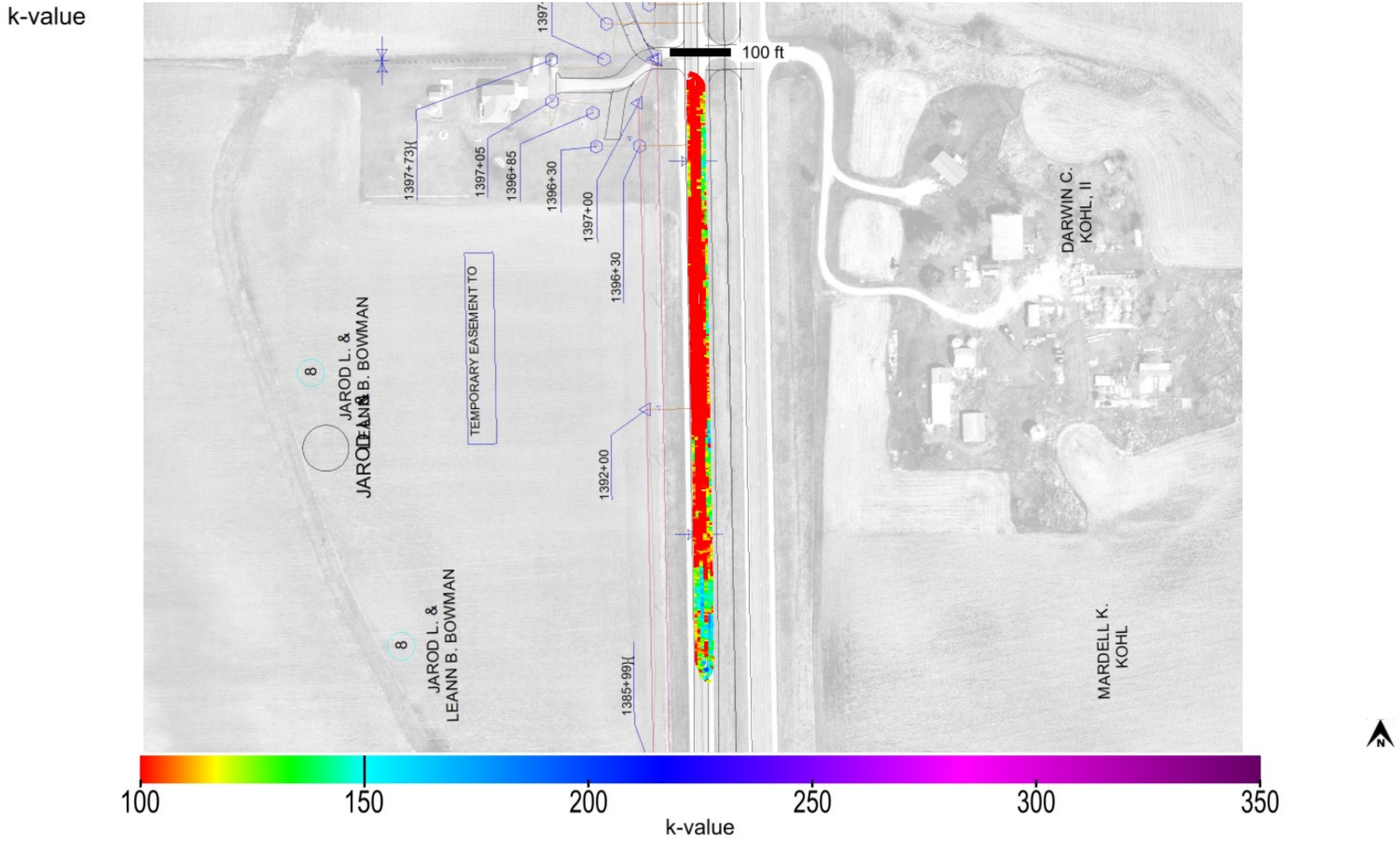
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	834	2.76	none	0



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

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_172916a

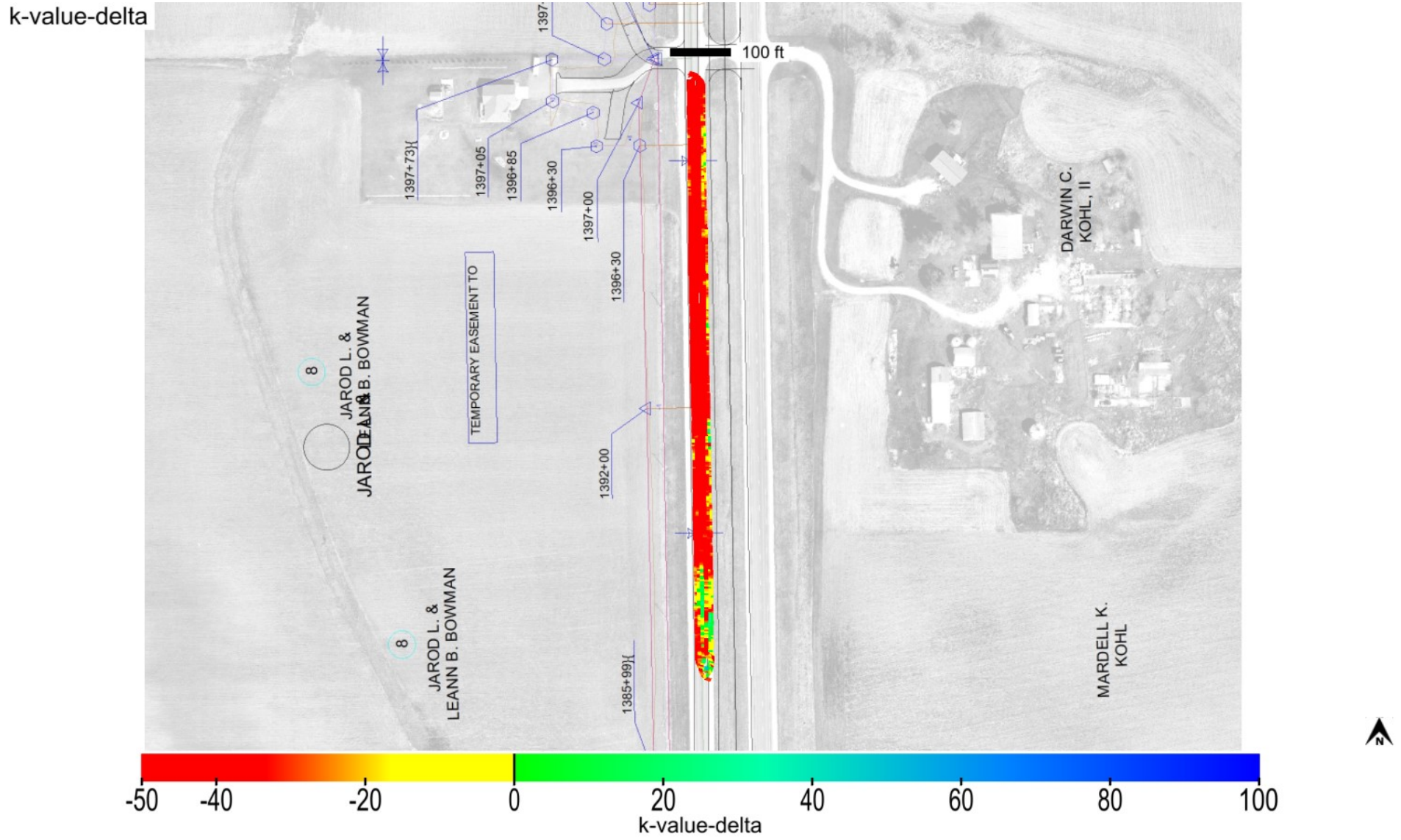
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	5.5	16.3	0.1	150	55	89.9	202	34.59	38.45	-95	-60.1	52



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

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_172916a

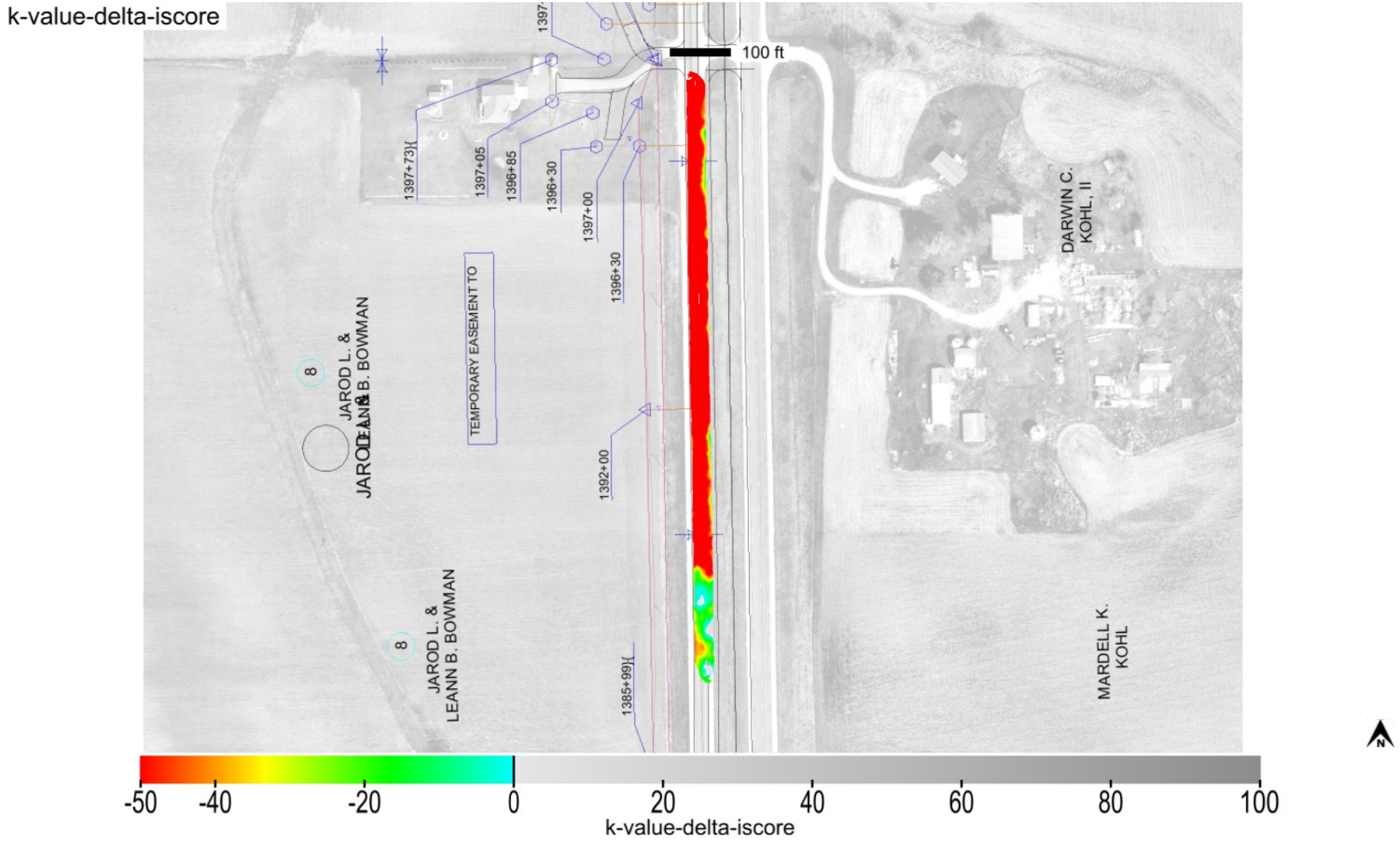
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	5.5	16.3	0.1	150	55	89.9	202	34.59	38.45	-95	-60.1	52



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

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_172916a

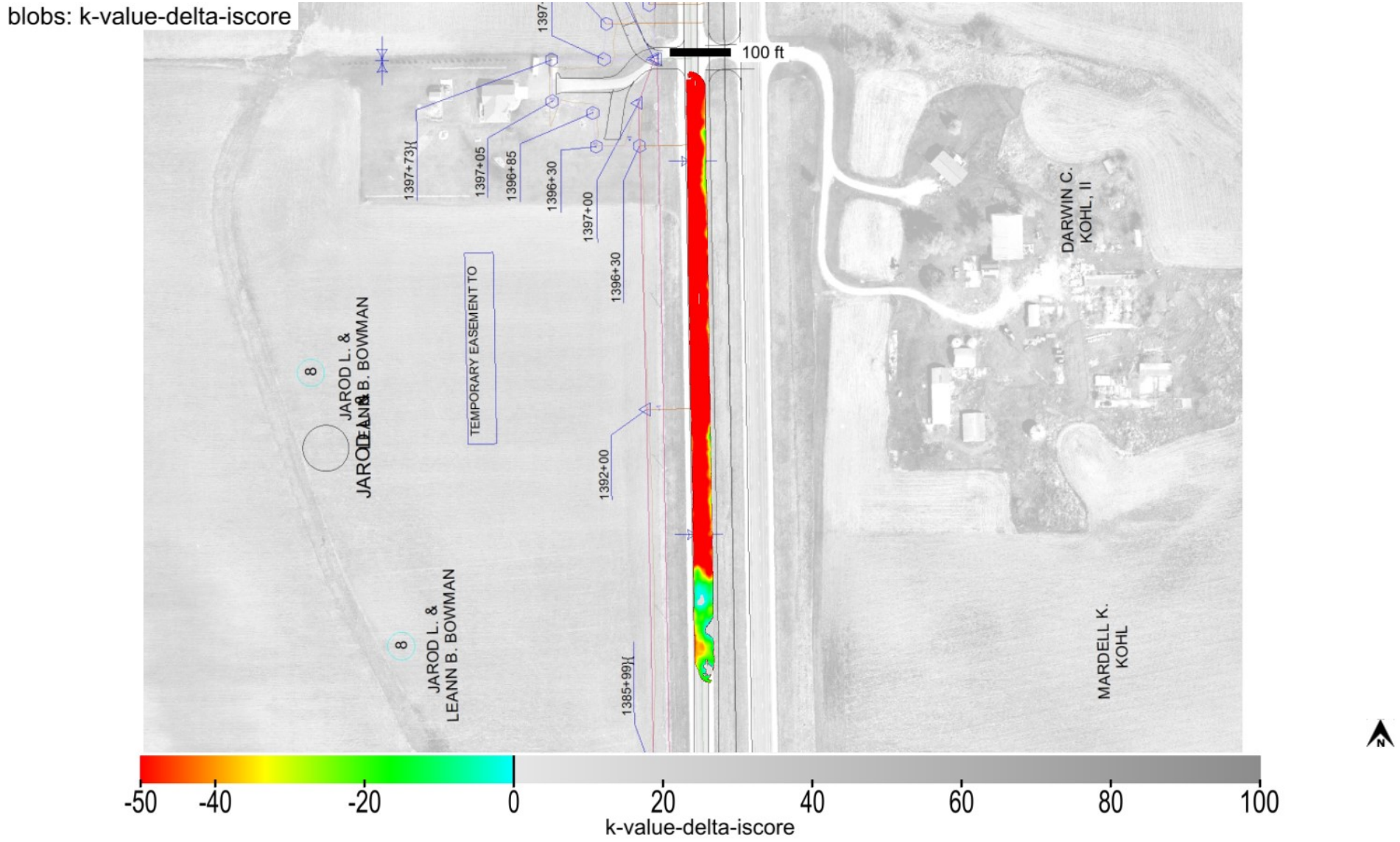
Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	5.5	150	-95	-60.1	52	-95	-61.31	14.57



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

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_172916a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	29664	98.15	none	0

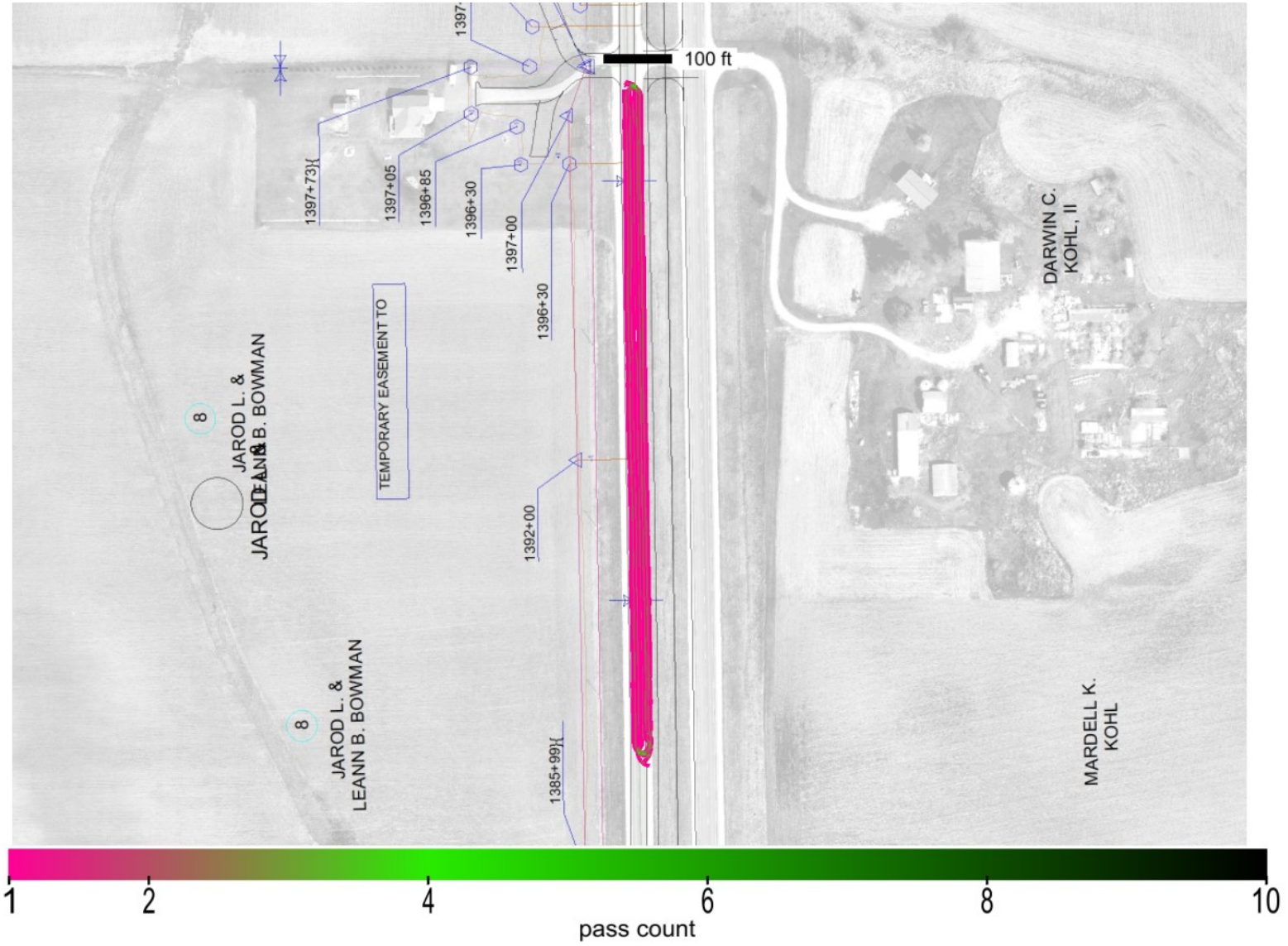


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_172916a

minimum	average	maximum
1	1.37	4

pass count

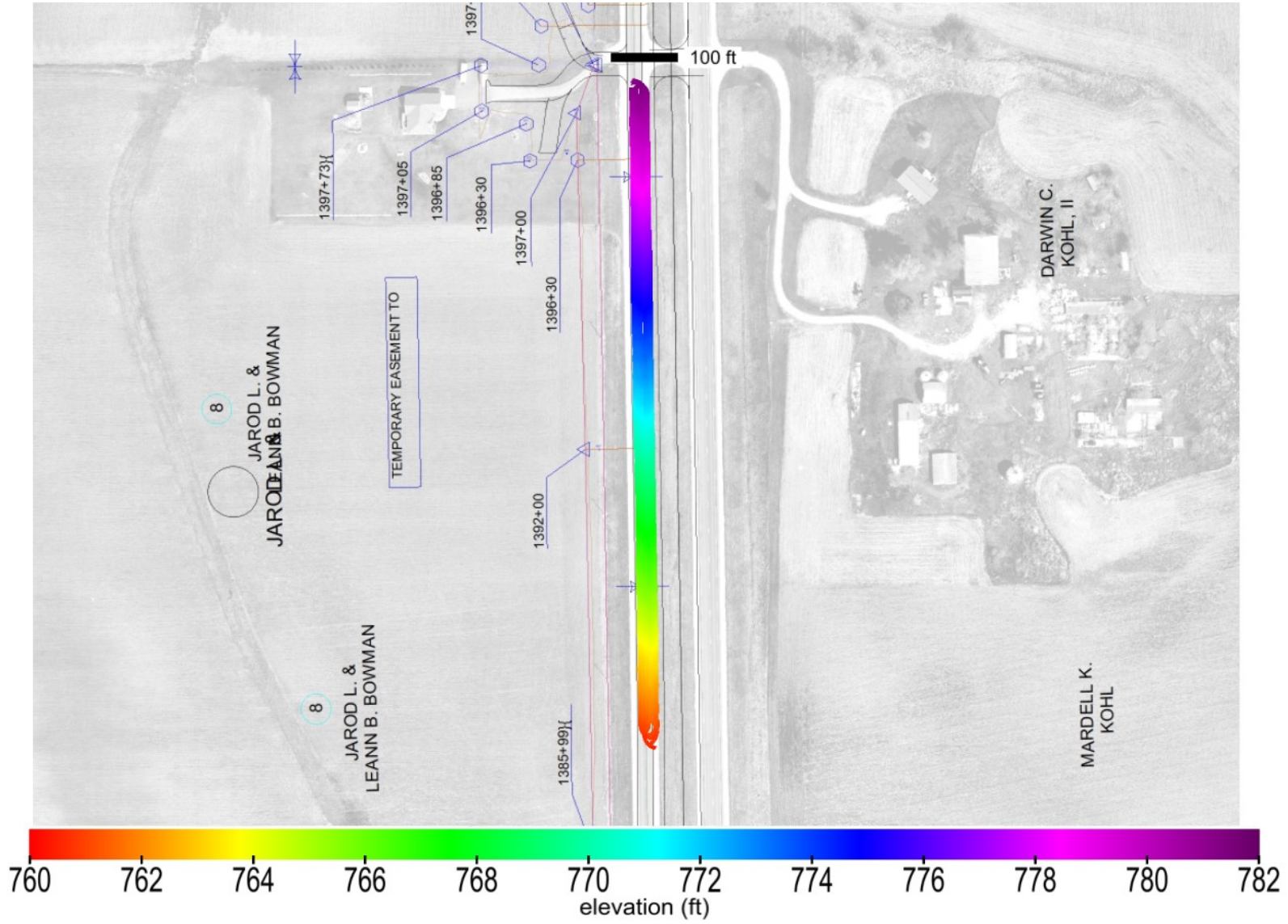


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_172916a

minimum	average	maximum
760.313	771.255	781.399

elevation



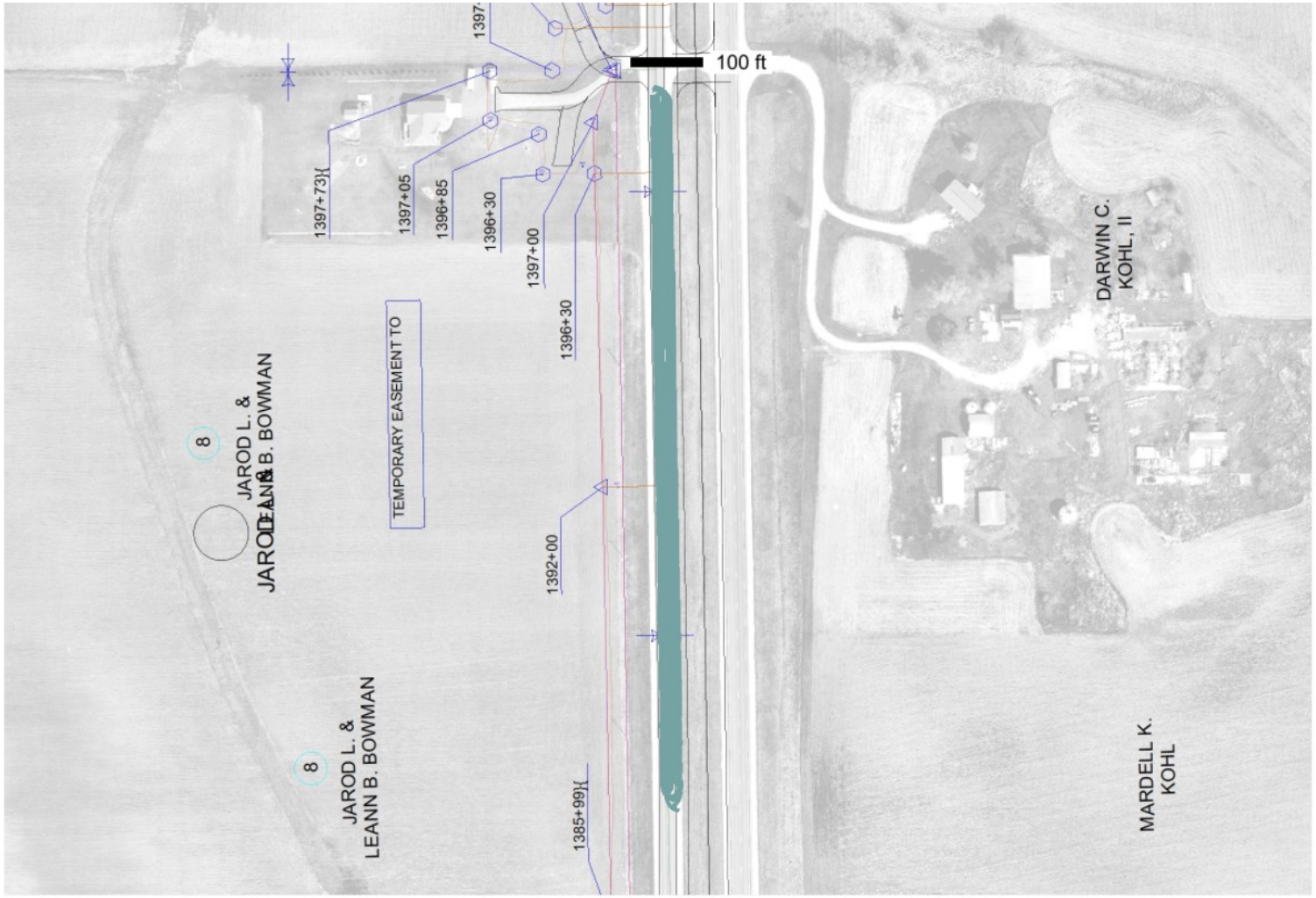
This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_172916a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	30222	0.694	12	8554	150	40

materials



Granular Subbase_IADOT (2111)

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

IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.31	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_19_174847a	No. of Measurements:	30737	Machine ID:	Ingios_FCS00210
Date and Time:	8/19/2020 5:48:47 PM	Location:	Linn County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	Yes	88.3	92.97	0.59	8554	5500	19947.7	56000	10121.03	50.74	-3054	11393.7	47446
k-value	Yes	8.2	18.06	0.12	150	55	93.2	202	37.47	40.18	-95	-56.8	52
Moisture Content	No												

Mapped Area

square feet	acres
30737	0.71

Pass Count

min.	avg.	max.
1	1.37	4

Elevation (ft)

min.	avg.	max.
760.04	771.23	781.43

Velocity (fps)

min.	avg.	max.
0.65	5.49	6.32

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	30737	0.706	12	8554	150	40

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

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.31	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_19_174847a	No. of Measurements:	30737	Machine ID:	Ingios_FCS00210
Date and Time:	8/19/2020 5:48:47 PM	Location:	Linn County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
92.97	CQI > = 95
88.3	80% of Resilient Modulus MVs >= 8554
50.74	COV <= 20
2.4	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.31	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_19_174847a	No. of Measurements:	30737	Machine ID:	Ingios_FCS00210
Date and Time:	8/19/2020 5:48:47 PM	Location:	Linn County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
18.06	CQI > = 95
8.2	80% of k-Value MVs >= 150
40.18	COV <= 20
95.92	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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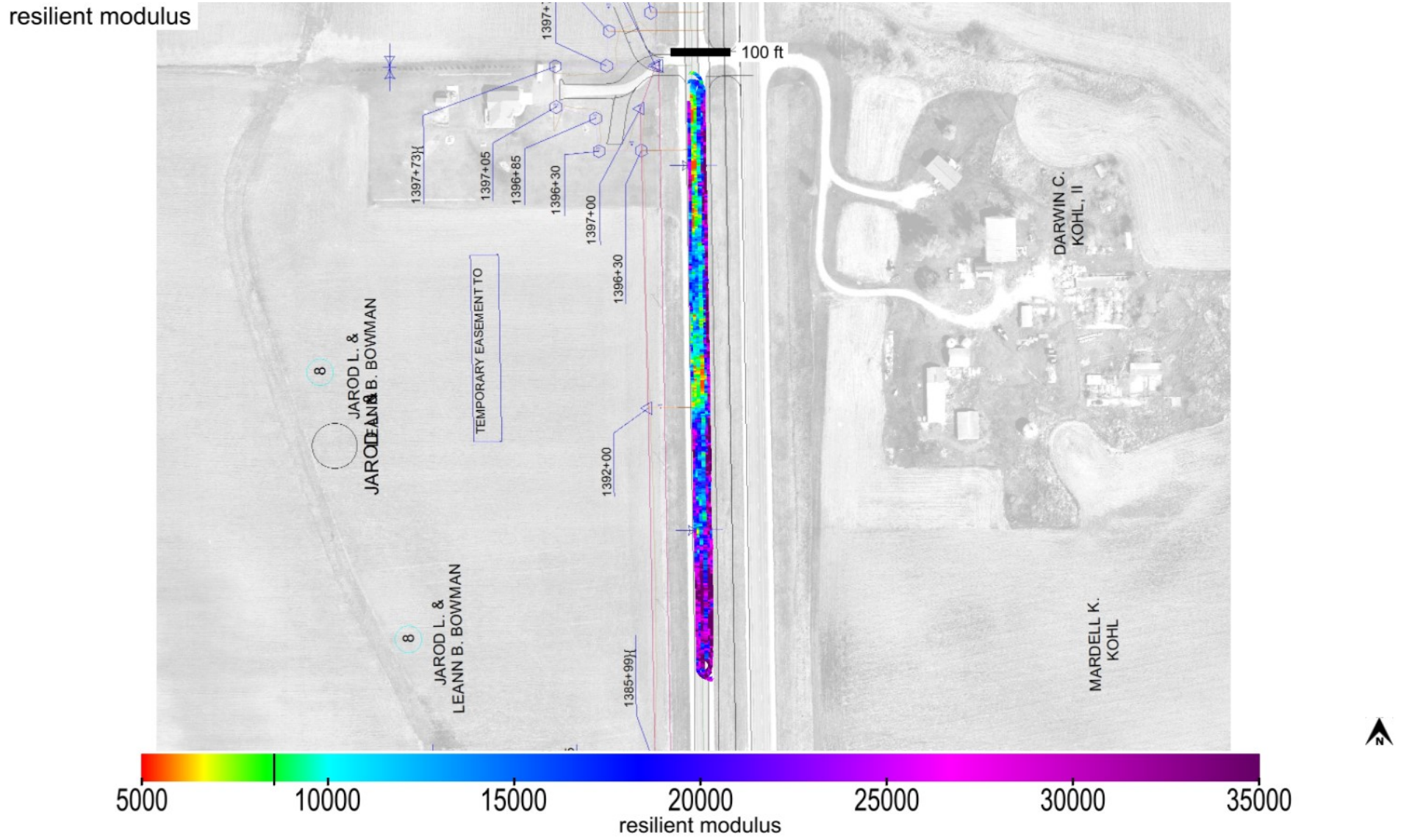
ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_174847a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	88.3	92.97	0.59	8554	5500	19947.7	56000	10121.03	50.74	-3054	11393.7	47446



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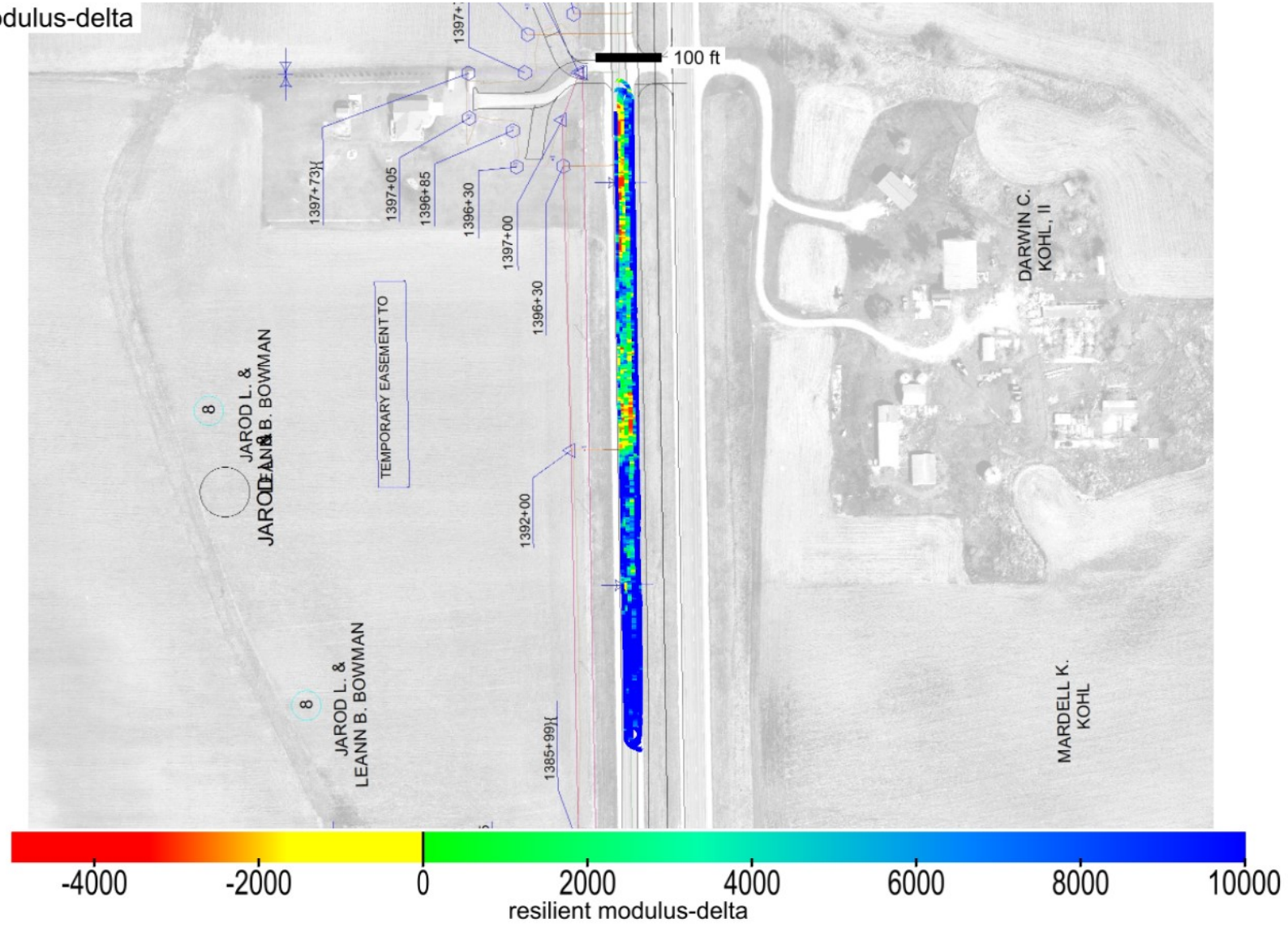
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_174847a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	88.3	92.97	0.59	8554	5500	19947.7	56000	10121.03	50.74	-3054	11393.7	47446

resilient modulus-delta



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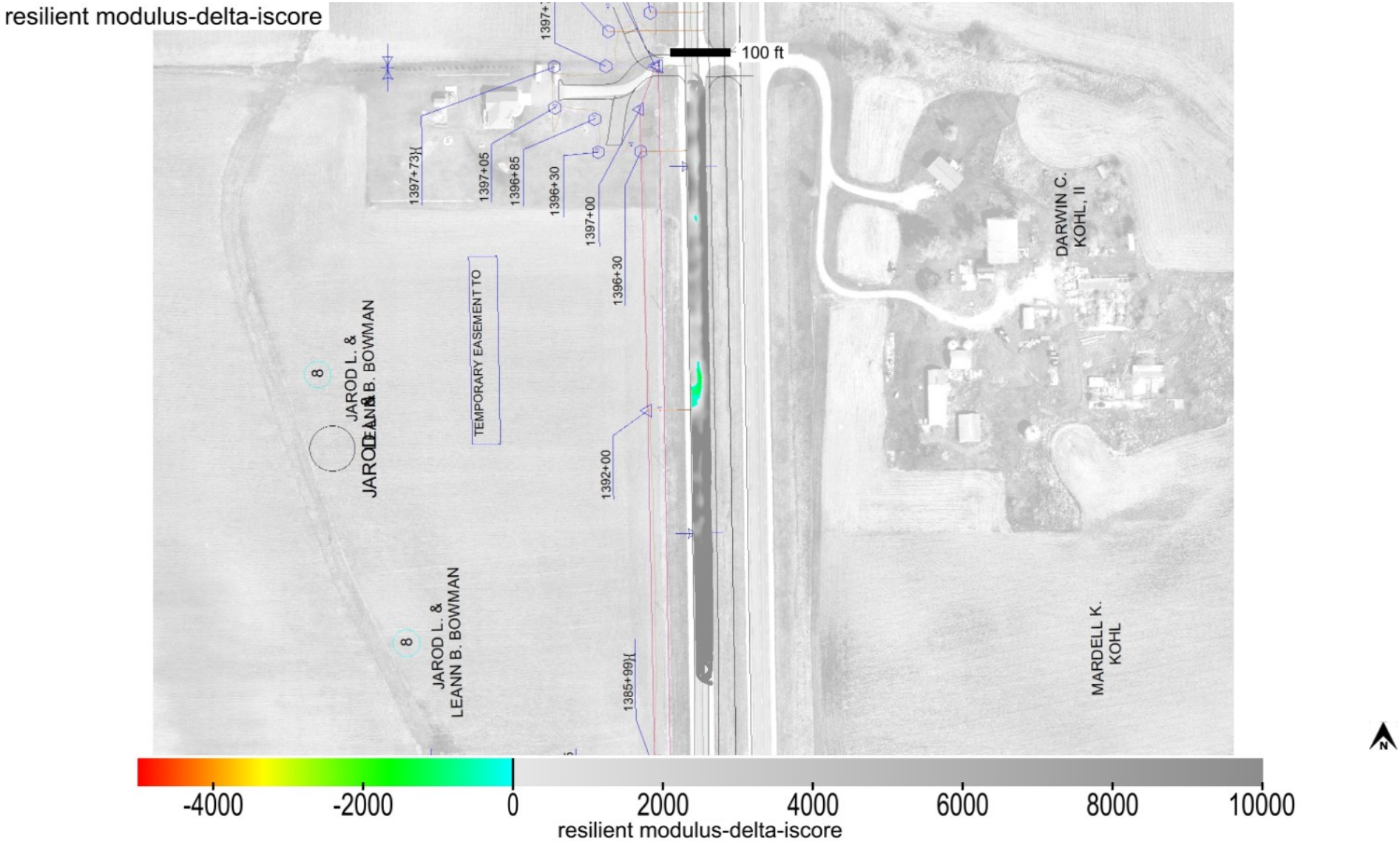
ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_174847a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	88.3	8554	-3054	11393.7	47446	-1478.09	10966.69	32718.29



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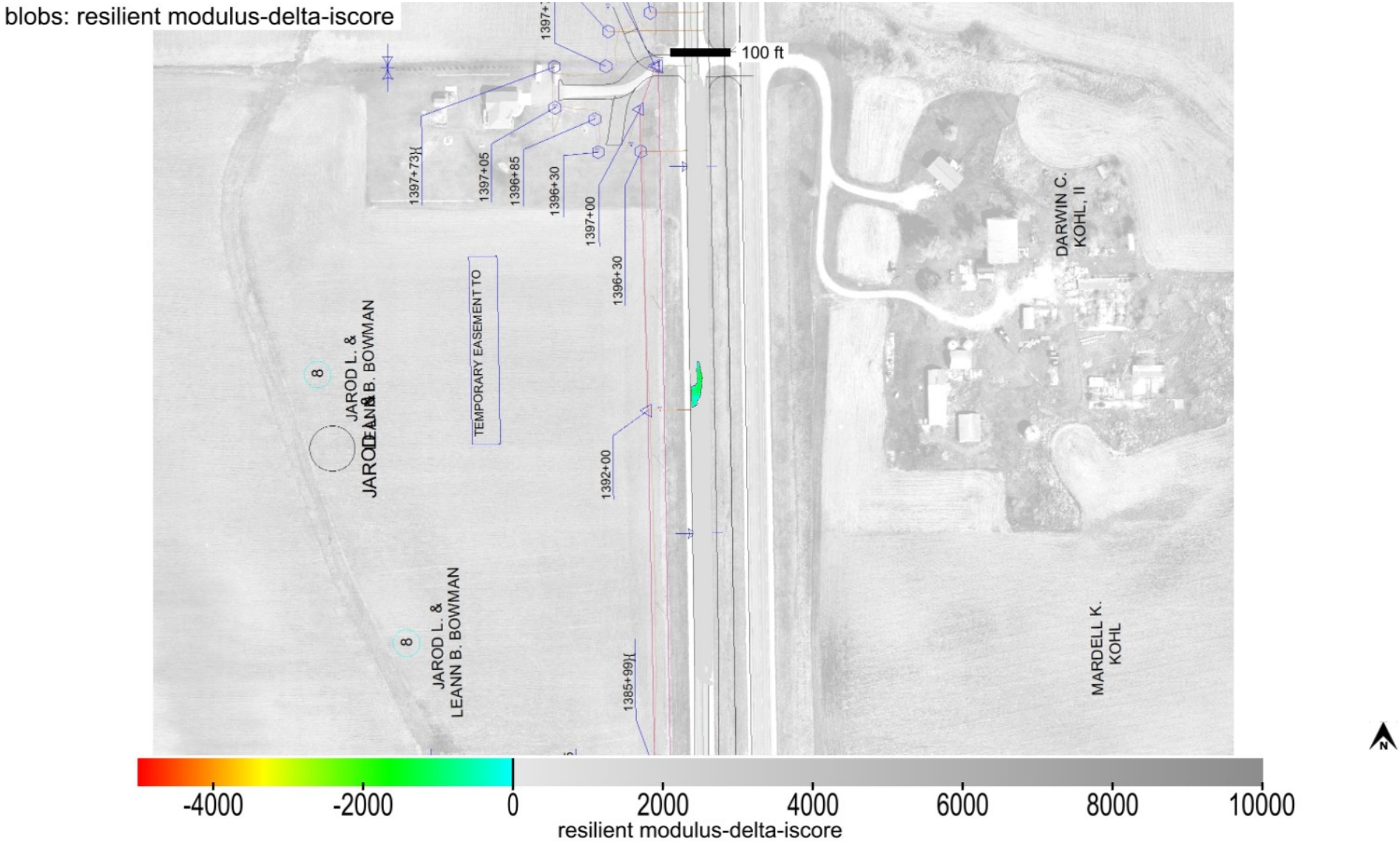
ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_174847a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	737	2.4	none	0



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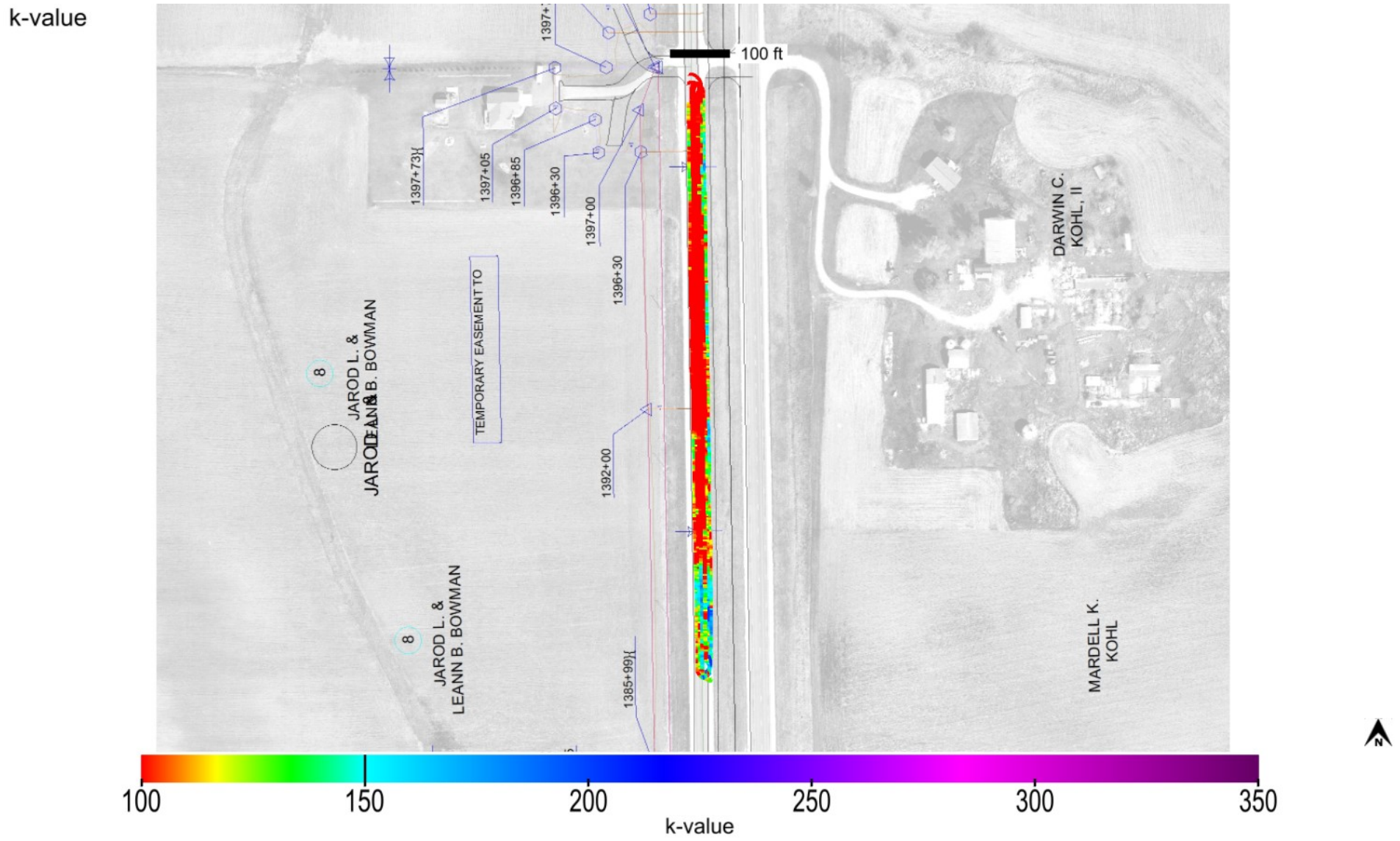
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_174847a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	8.2	18.06	0.12	150	55	93.2	202	37.47	40.18	-95	-56.8	52



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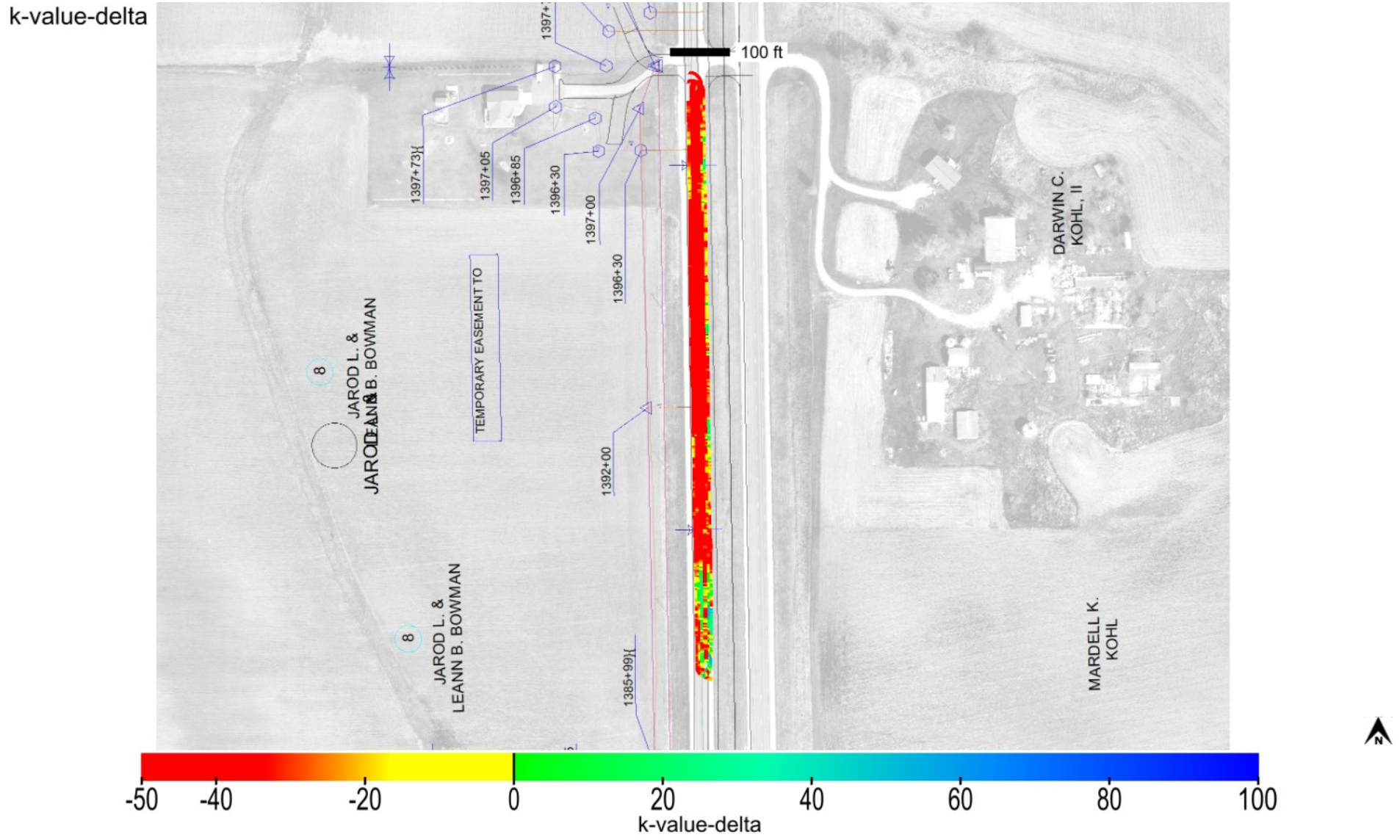
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_174847a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	8.2	18.06	0.12	150	55	93.2	202	37.47	40.18	-95	-56.8	52



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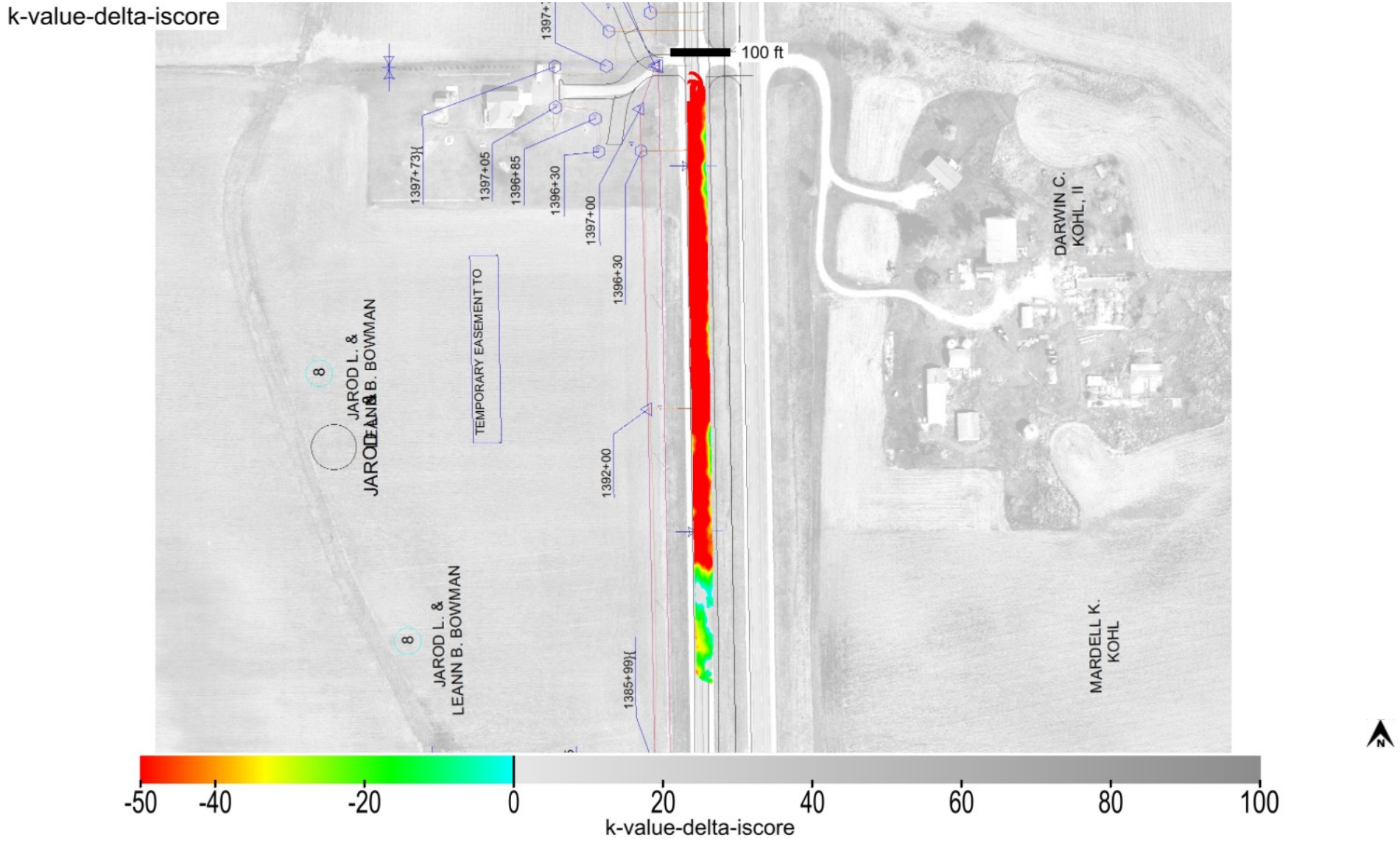
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_174847a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	8.2	150	-95	-56.8	52	-95	-58.27	33.69



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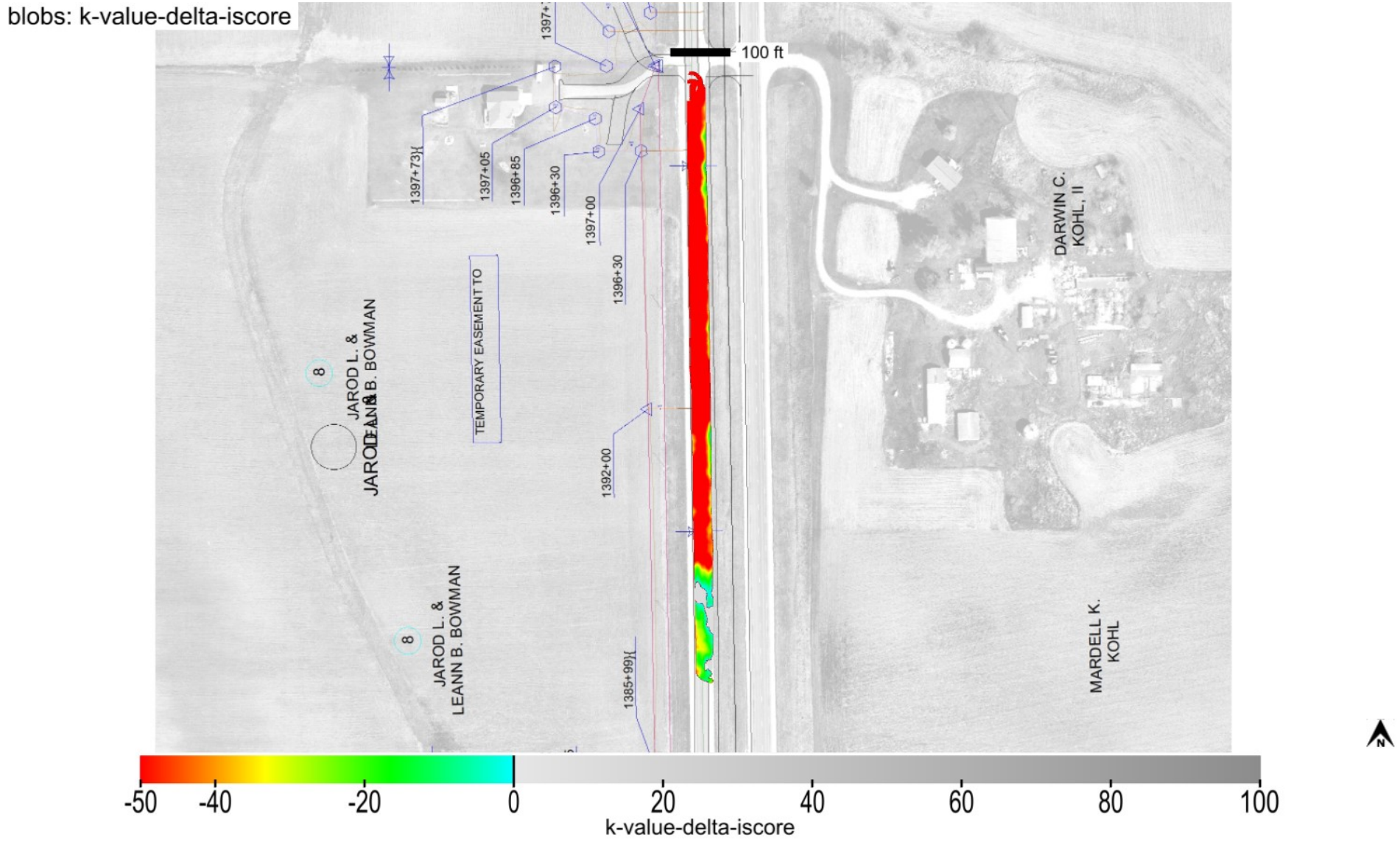
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_174847a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	2	29483	95.92	none	0

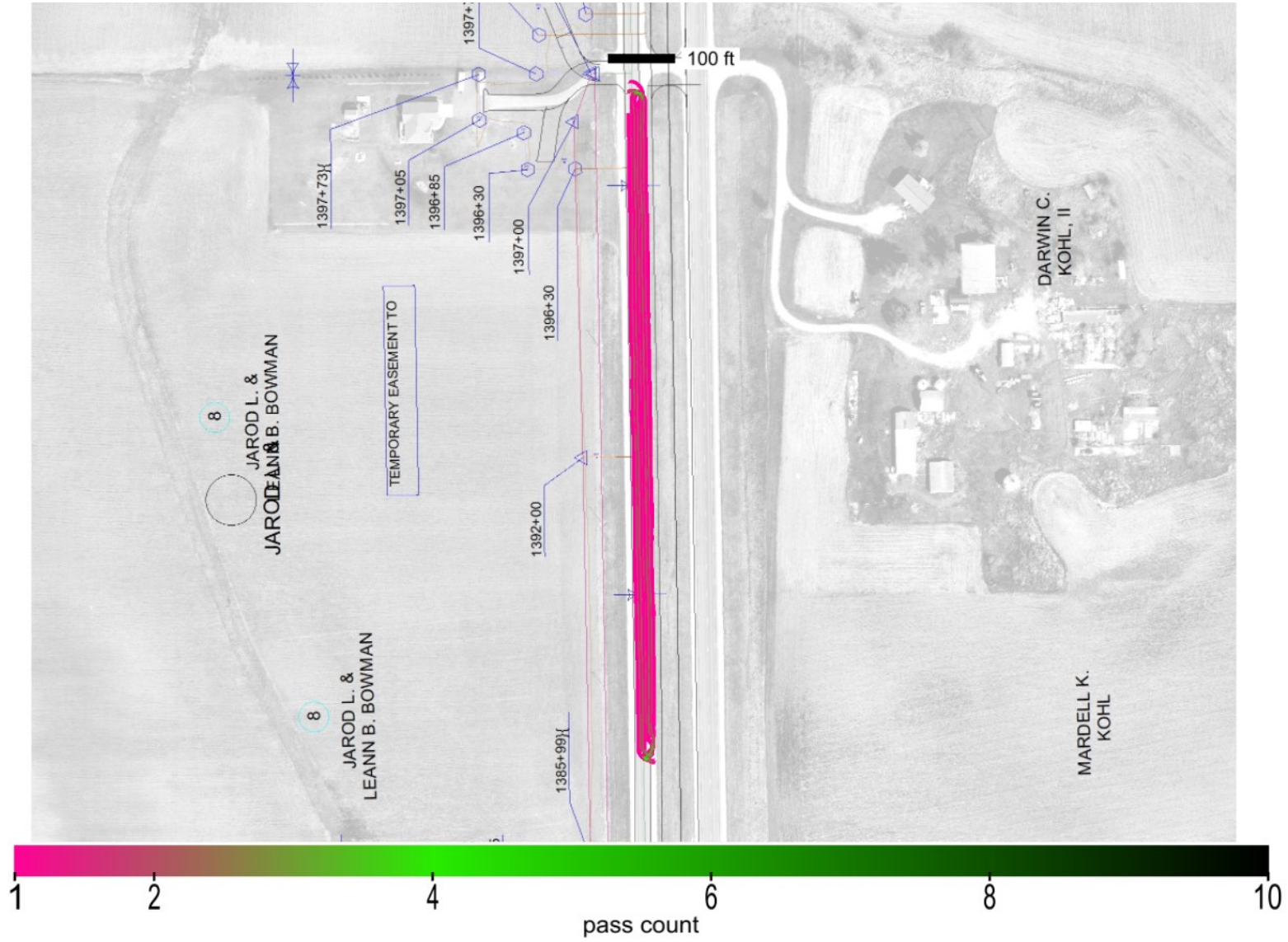


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_174847a

minimum	average	maximum
1	1.37	4

pass count



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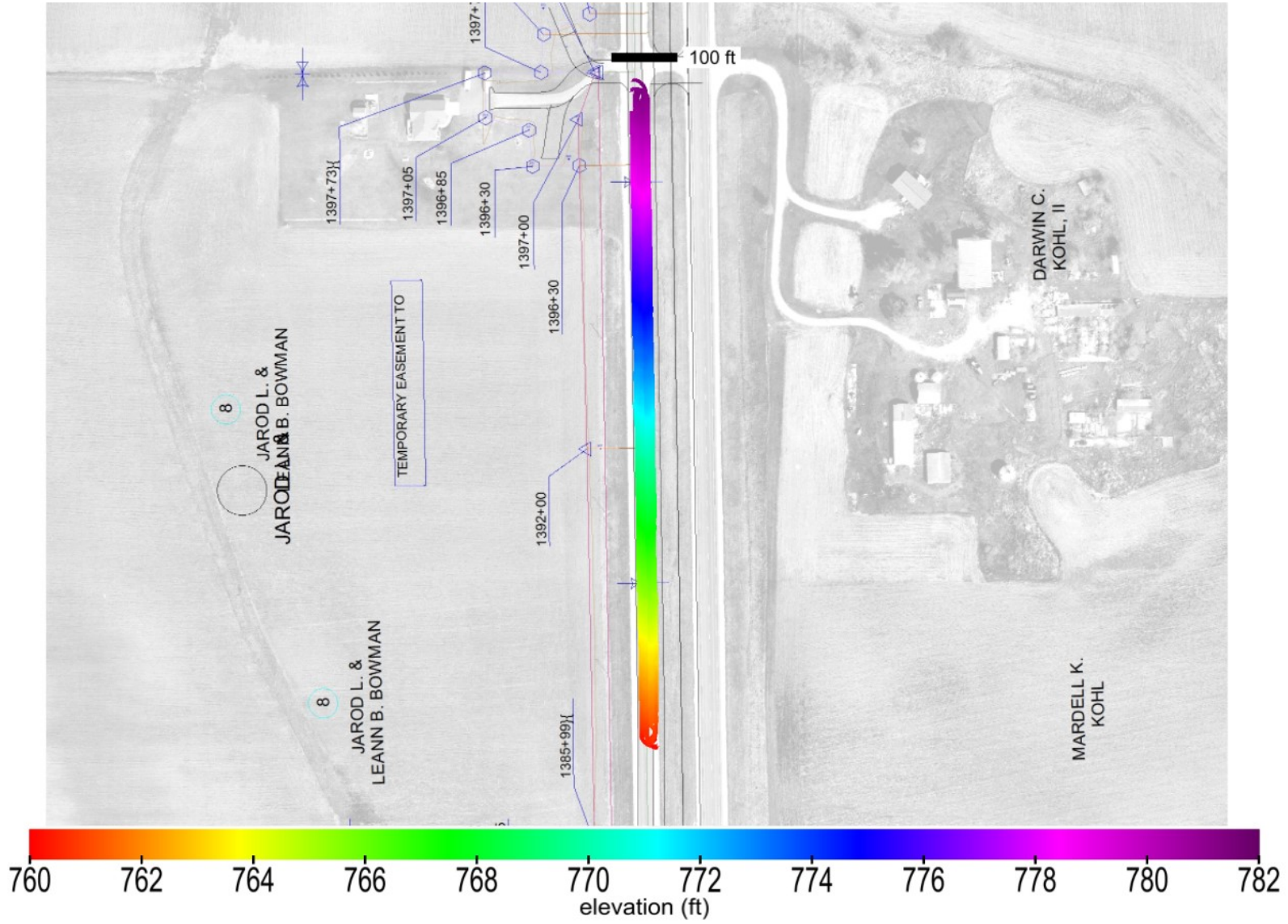
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_174847a

minimum	average	maximum
760.038	771.228	781.426

elevation



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ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_174847a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	30737	0.706	12	8554	150	40

materials

Granular Subbase_IADOT (2111)

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

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.31	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_19_180808a	No. of Measurements:	30192	Machine ID:	Ingios_FCS00210
Date and Time:	8/19/2020 6:08:08 PM	Location:	Linn County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	Yes	87.2	91.67	0.59	8554	5500	20465.3	56000	10449.83	51.06	-3054	11911.3	47446
k-value	Yes	12.1	20.52	0.13	150	55	96.6	202	41.71	43.17	-95	-53.4	52
Moisture Content	No												

Mapped Area

square feet	acres
30192	0.69

Pass Count

min.	avg.	max.
1	1.38	5

Elevation (ft)

min.	avg.	max.
759.81	771.13	781.45

Velocity (fps)

min.	avg.	max.
0.67	5.49	6.51

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	30192	0.693	12	8554	150	40

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IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.31	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_19_180808a	No. of Measurements:	30192	Machine ID:	Ingios_FCS00210
Date and Time:	8/19/2020 6:08:08 PM	Location:	Linn County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
91.67	CQI > = 95
87.2	80% of Resilient Modulus MVs >= 8554
51.06	COV <= 20
4.06	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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

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IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.31	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_19_180808a	No. of Measurements:	30192	Machine ID:	Ingios_FCS00210
Date and Time:	8/19/2020 6:08:08 PM	Location:	Linn County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
20.52	CQI > = 95
12.1	80% of k-Value MVs >= 150
43.17	COV <= 20
89.78	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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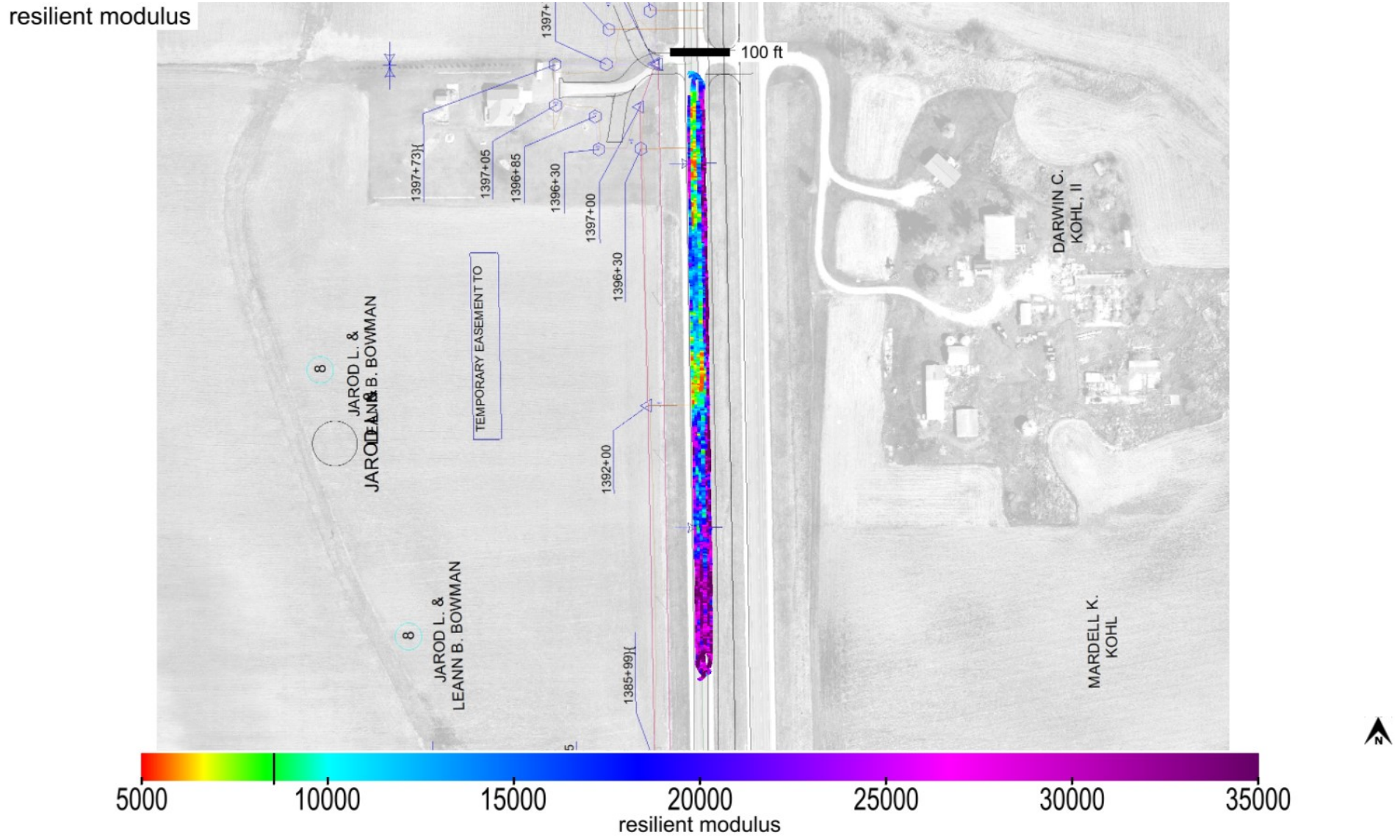
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_180808a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	87.2	91.67	0.59	8554	5500	20465.3	56000	10449.83	51.06	-3054	11911.3	47446



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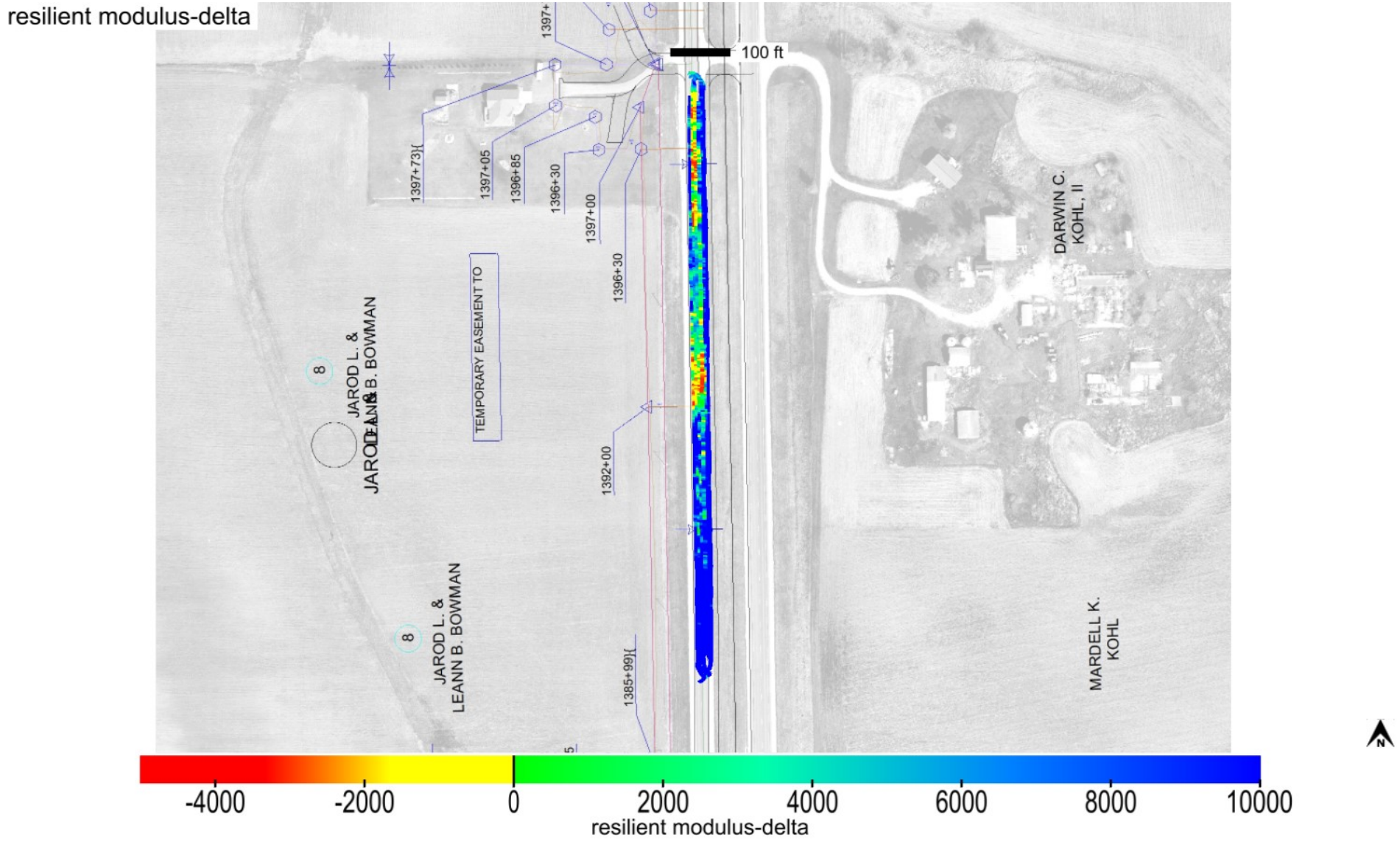
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_180808a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	87.2	91.67	0.59	8554	5500	20465.3	56000	10449.83	51.06	-3054	11911.3	47446

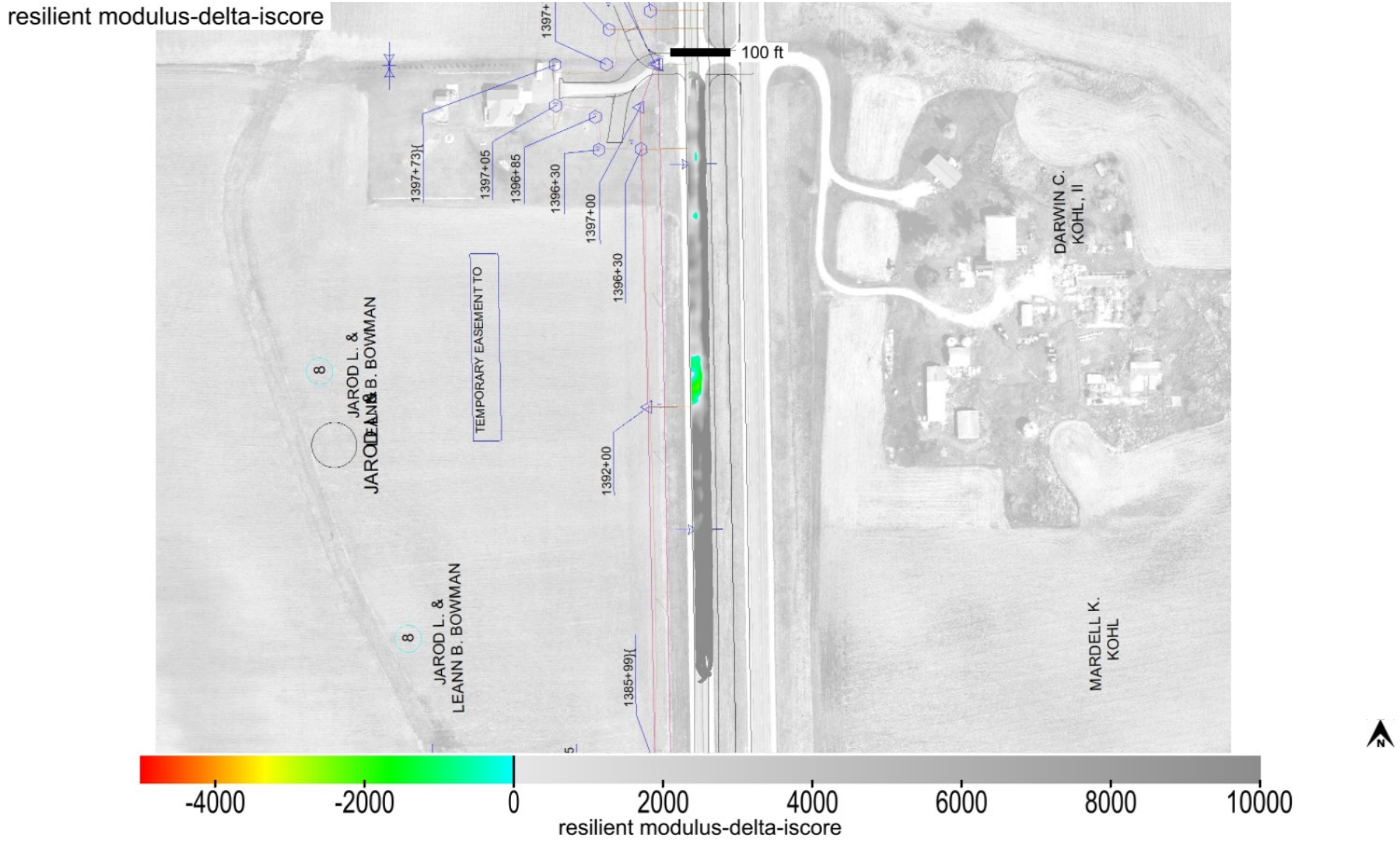


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_180808a

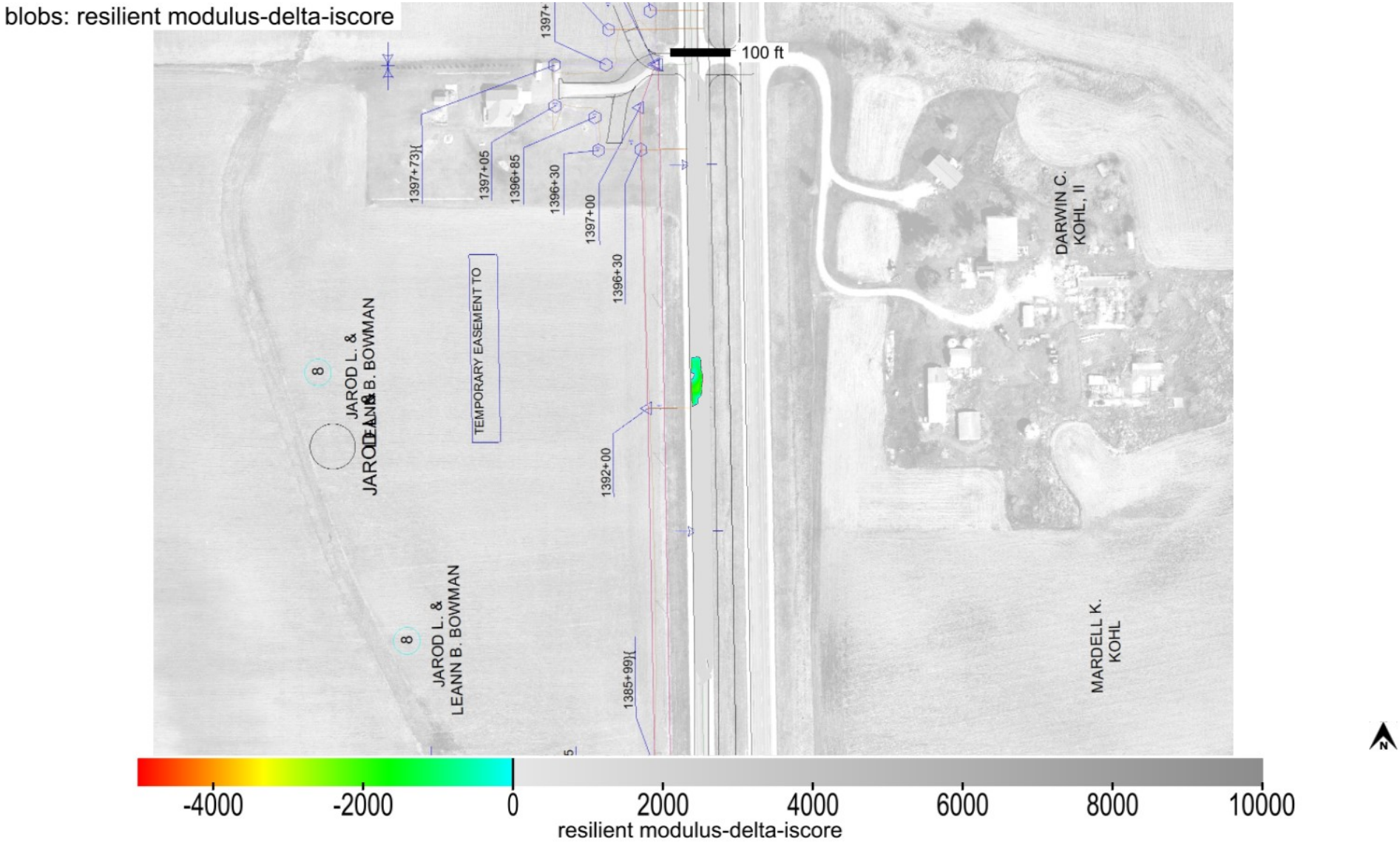
Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	87.2	8554	-3054	11911.3	47446	-2207.25	11519.34	30871.58



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

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_180808a

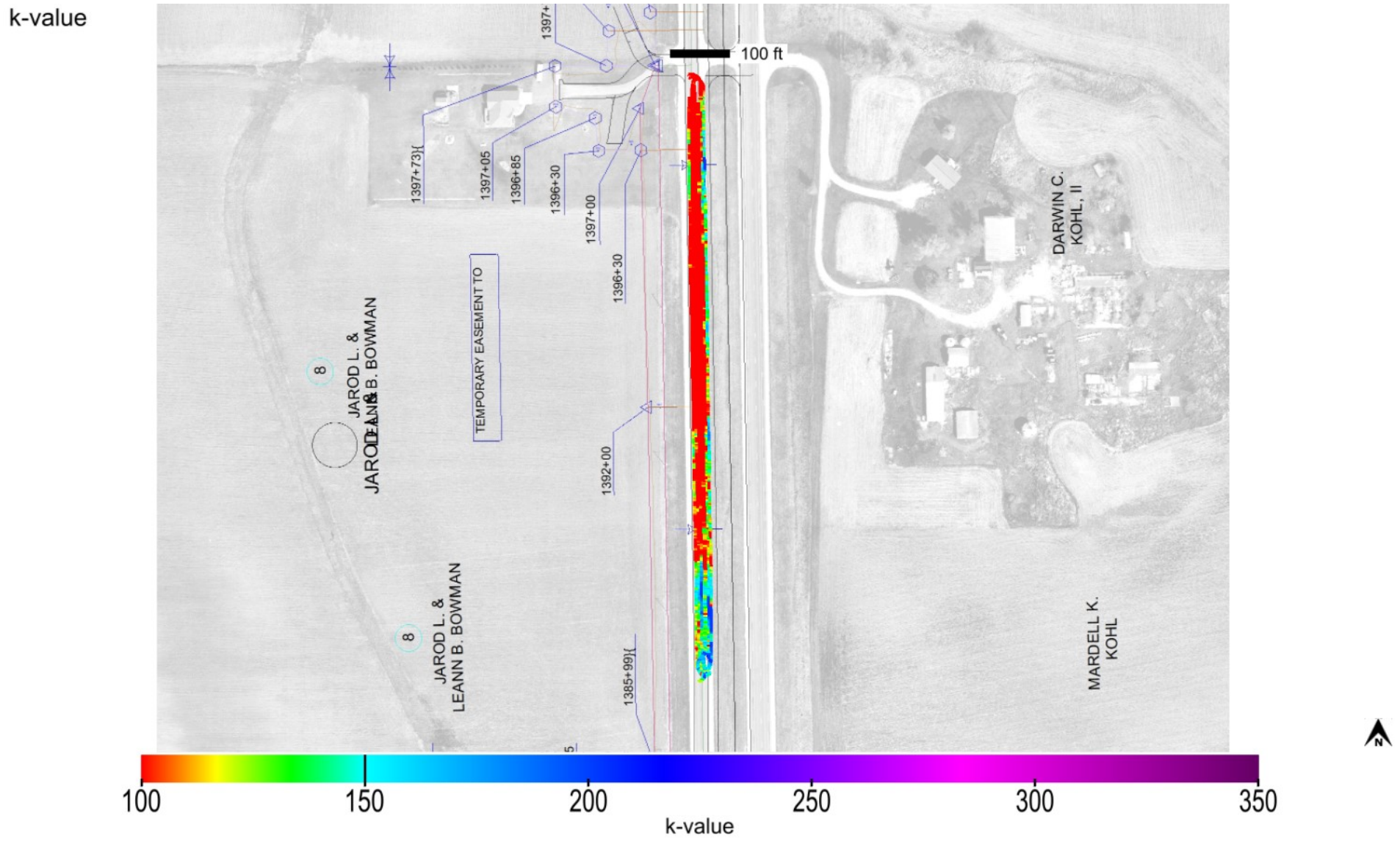
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	1226	4.06	none	0



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

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_180808a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	12.1	20.52	0.13	150	55	96.6	202	41.71	43.17	-95	-53.4	52



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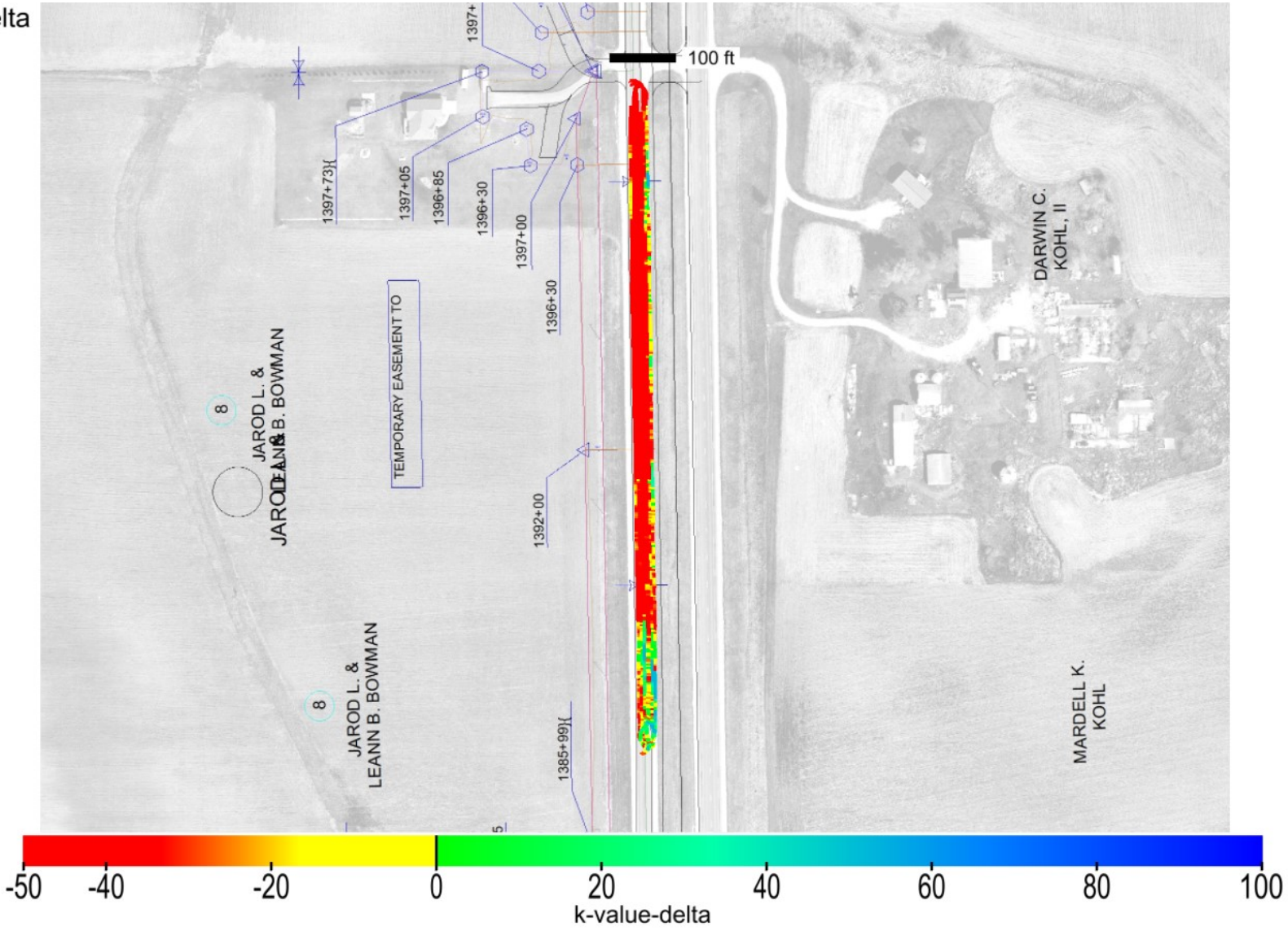
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_180808a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	12.1	20.52	0.13	150	55	96.6	202	41.71	43.17	-95	-53.4	52

k-value-delta



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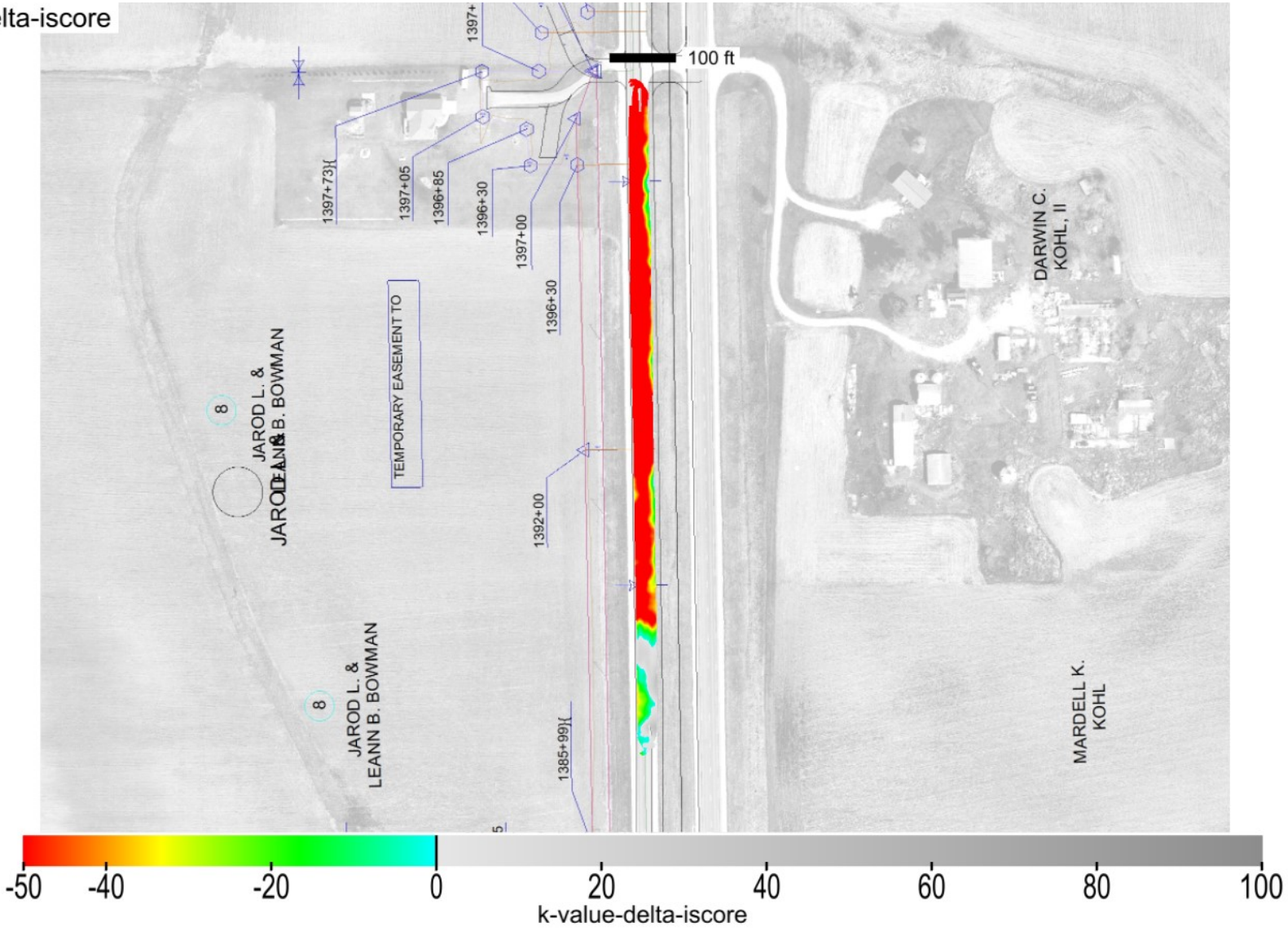
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_180808a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	12.1	150	-95	-53.4	52	-95	-54.85	46.27

k-value-delta-iscore



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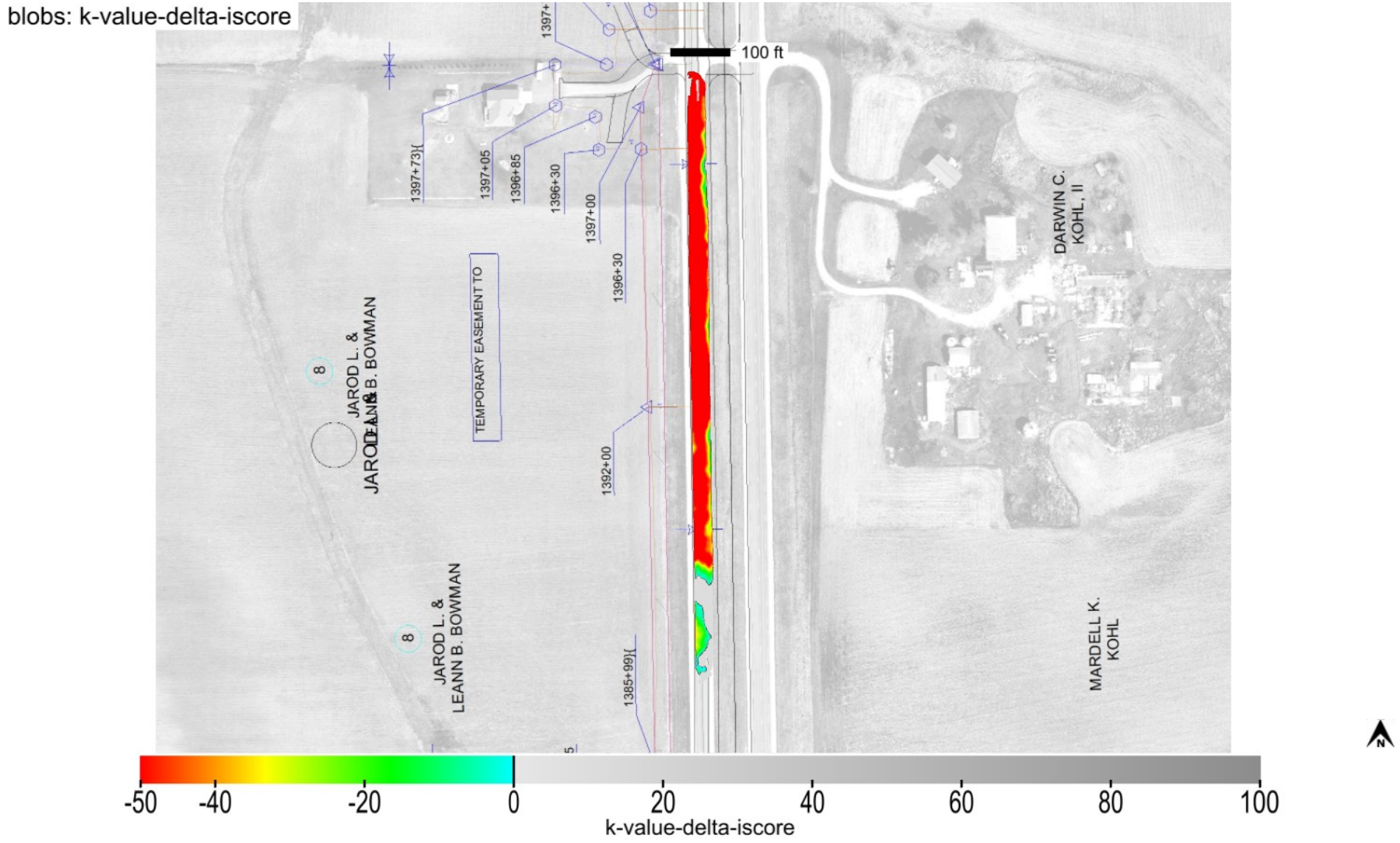
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_180808a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	2	27105	89.78	none	0



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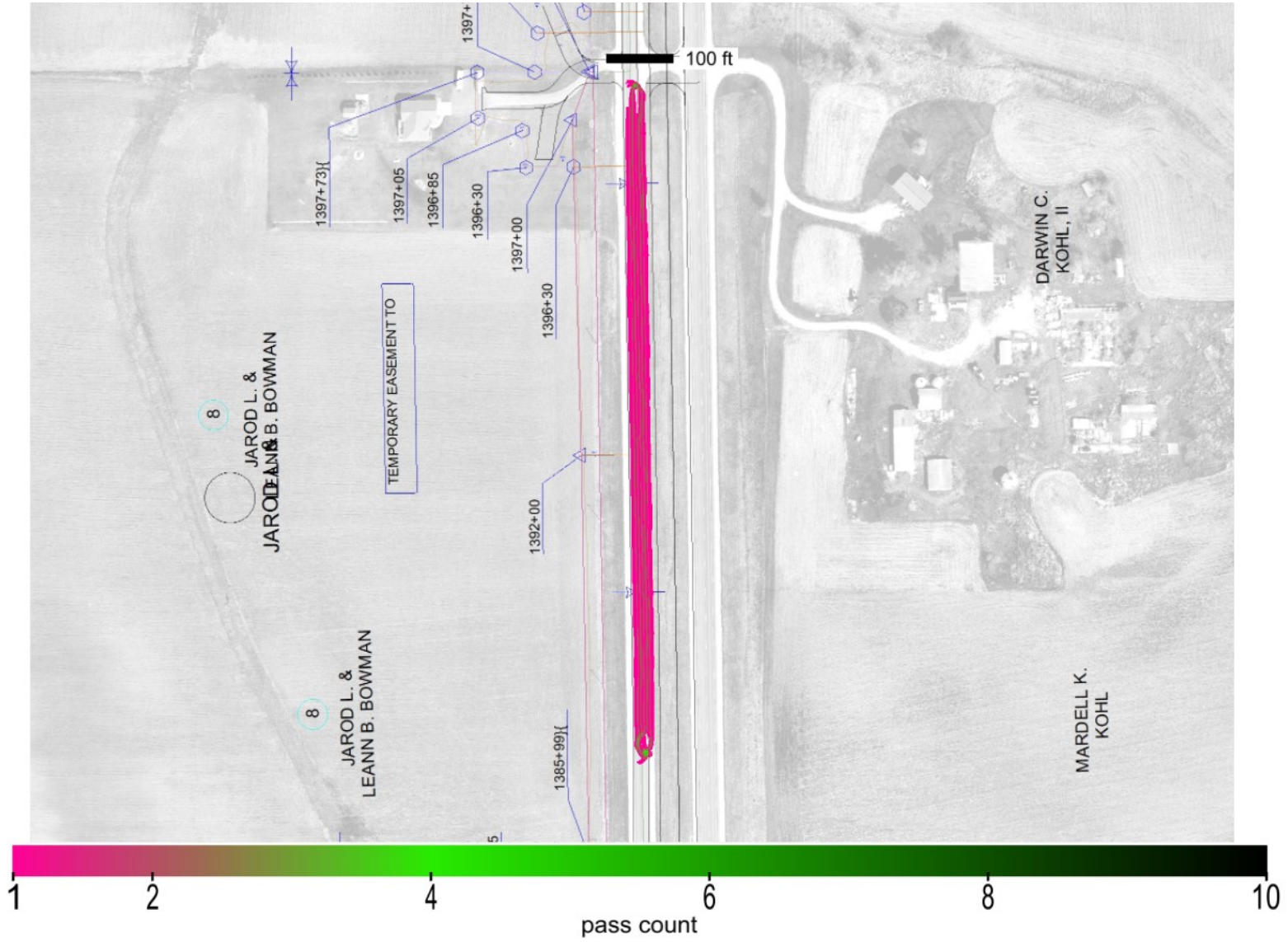
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_180808a

minimum	average	maximum
1	1.38	5

pass count



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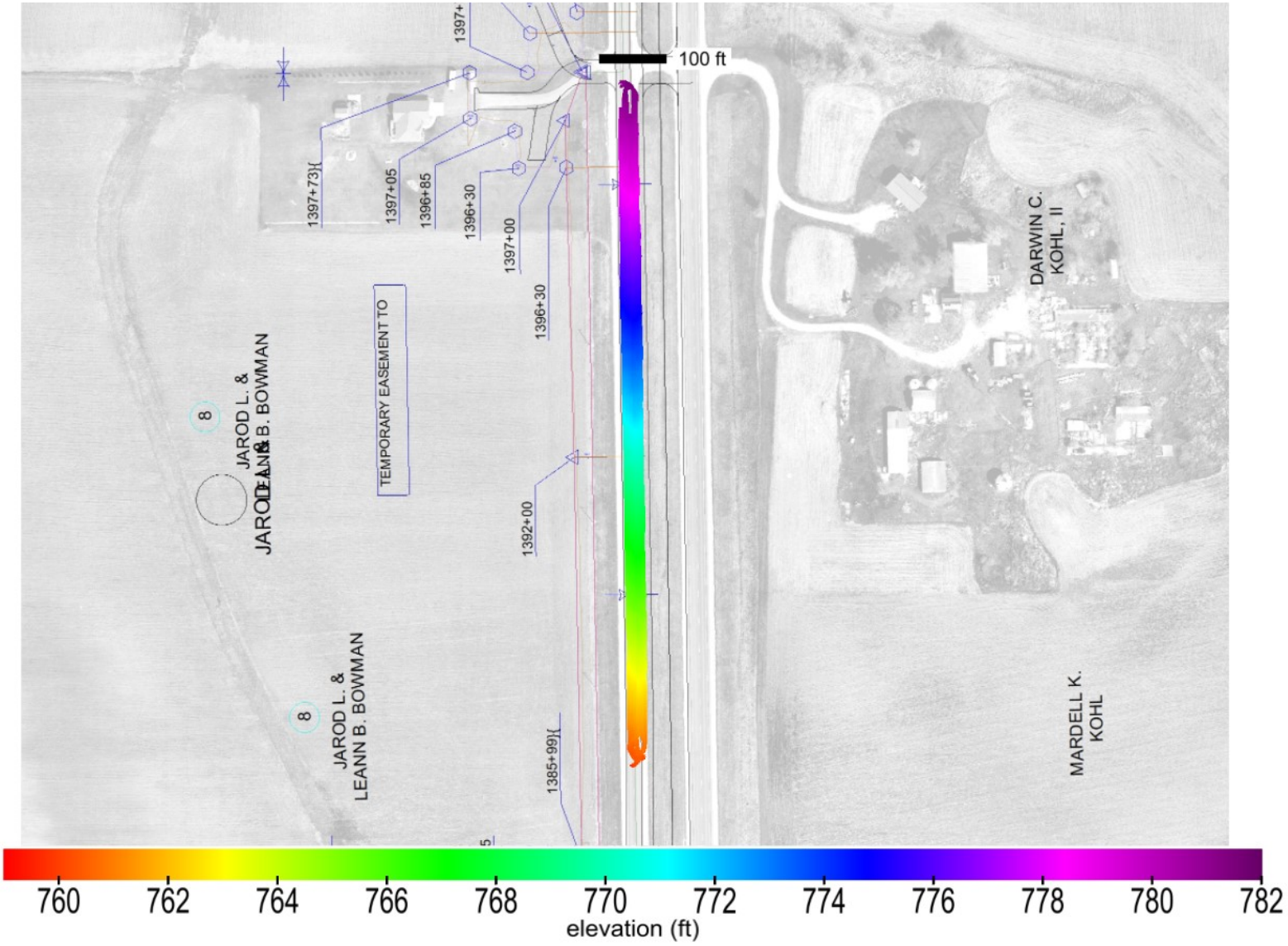
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_180808a

minimum	average	maximum
759.812	771.13	781.449

elevation



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Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_180808a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	30192	0.693	12	8554	150	40

materials

Granular Subbase_IADOT (2111)

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IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.26	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_19_182739a	No. of Measurements:	29580	Machine ID:	Ingios_FCS00210
Date and Time:	8/19/2020 6:27:39 PM	Location:	Linn County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	Yes	85.1	90.41	0.61	8554	5500	19244	56000	9494.03	49.33	-3054	10690	47446
k-value	Yes	10.9	18.92	0.08	150	55	90.1	202	39.56	43.92	-95	-59.9	52
Moisture Content	No												

Mapped Area

square feet	acres
29580	0.68

Pass Count

min.	avg.	max.
1	1.18	3

Elevation (ft)

min.	avg.	max.
759.96	771.29	781.43

Velocity (fps)

min.	avg.	max.
0.52	5.49	6.12

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	29580	0.679	12	8554	150	40

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IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.26	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_19_182739a	No. of Measurements:	29580	Machine ID:	Ingios_FCS00210
Date and Time:	8/19/2020 6:27:39 PM	Location:	Linn County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
90.41	CQI > = 95
85.1	80% of Resilient Modulus MVs >= 8554
49.33	COV <= 20
3.83	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.26	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_19_182739a	No. of Measurements:	29580	Machine ID:	Ingios_FCS00210
Date and Time:	8/19/2020 6:27:39 PM	Location:	Linn County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
18.92	CQI > = 95
10.9	80% of k-Value MVs >= 150
43.92	COV <= 20
88.76	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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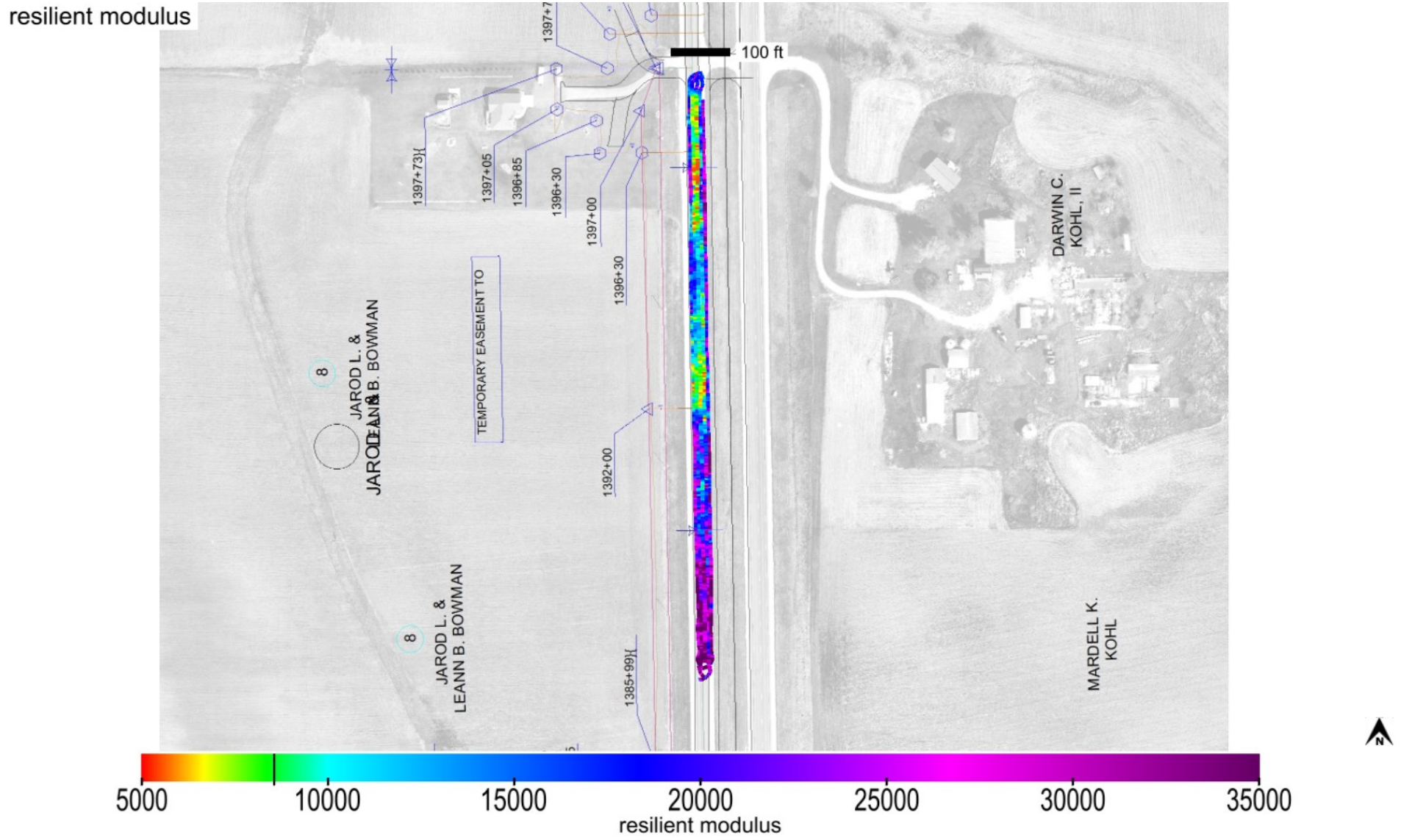
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_182739a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	85.1	90.41	0.61	8554	5500	19244	56000	9494.03	49.33	-3054	10690	47446



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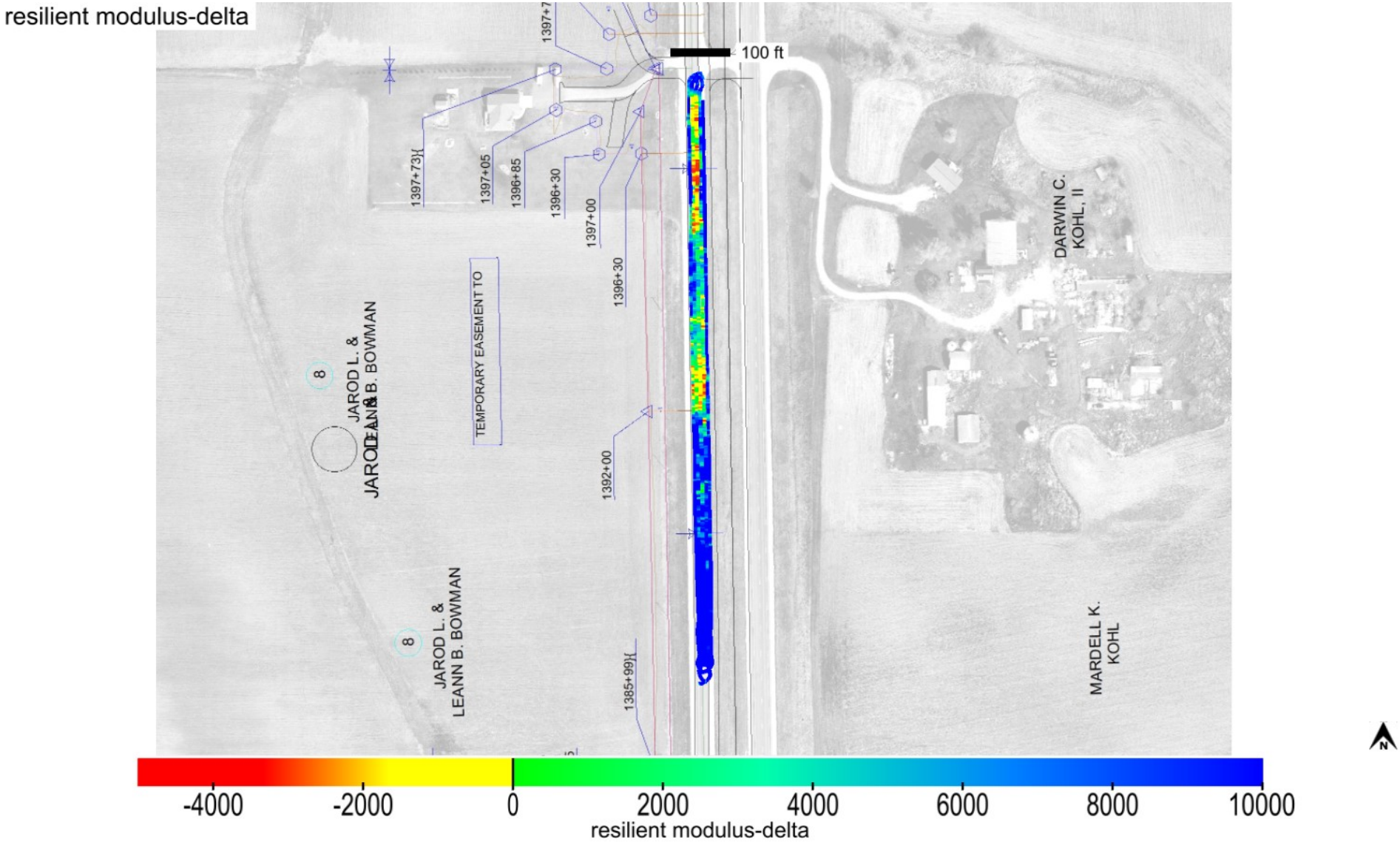
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_182739a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	85.1	90.41	0.61	8554	5500	19244	56000	9494.03	49.33	-3054	10690	47446



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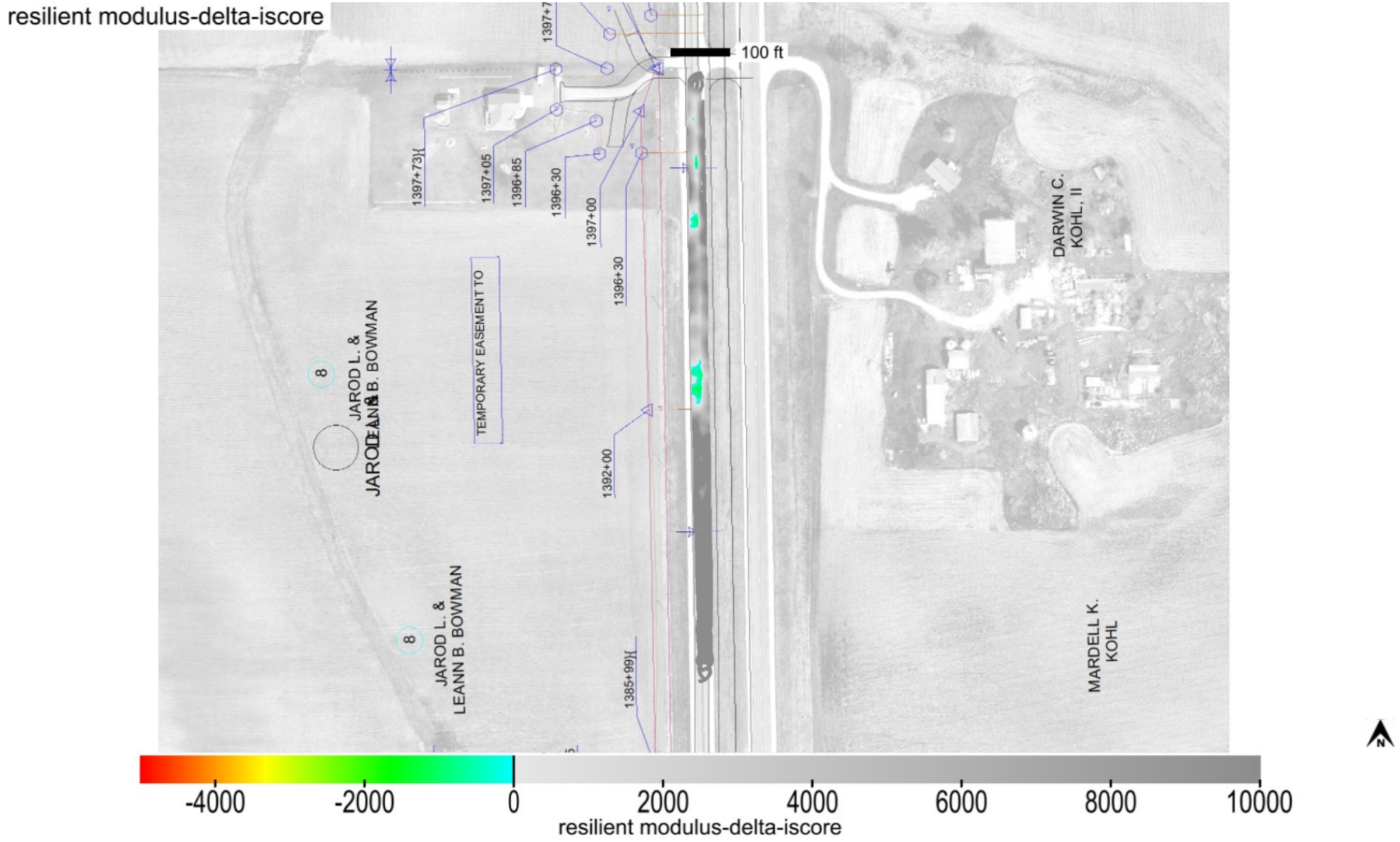
ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_182739a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	85.1	8554	-3054	10690	47446	-1428.47	10342.76	30939.94



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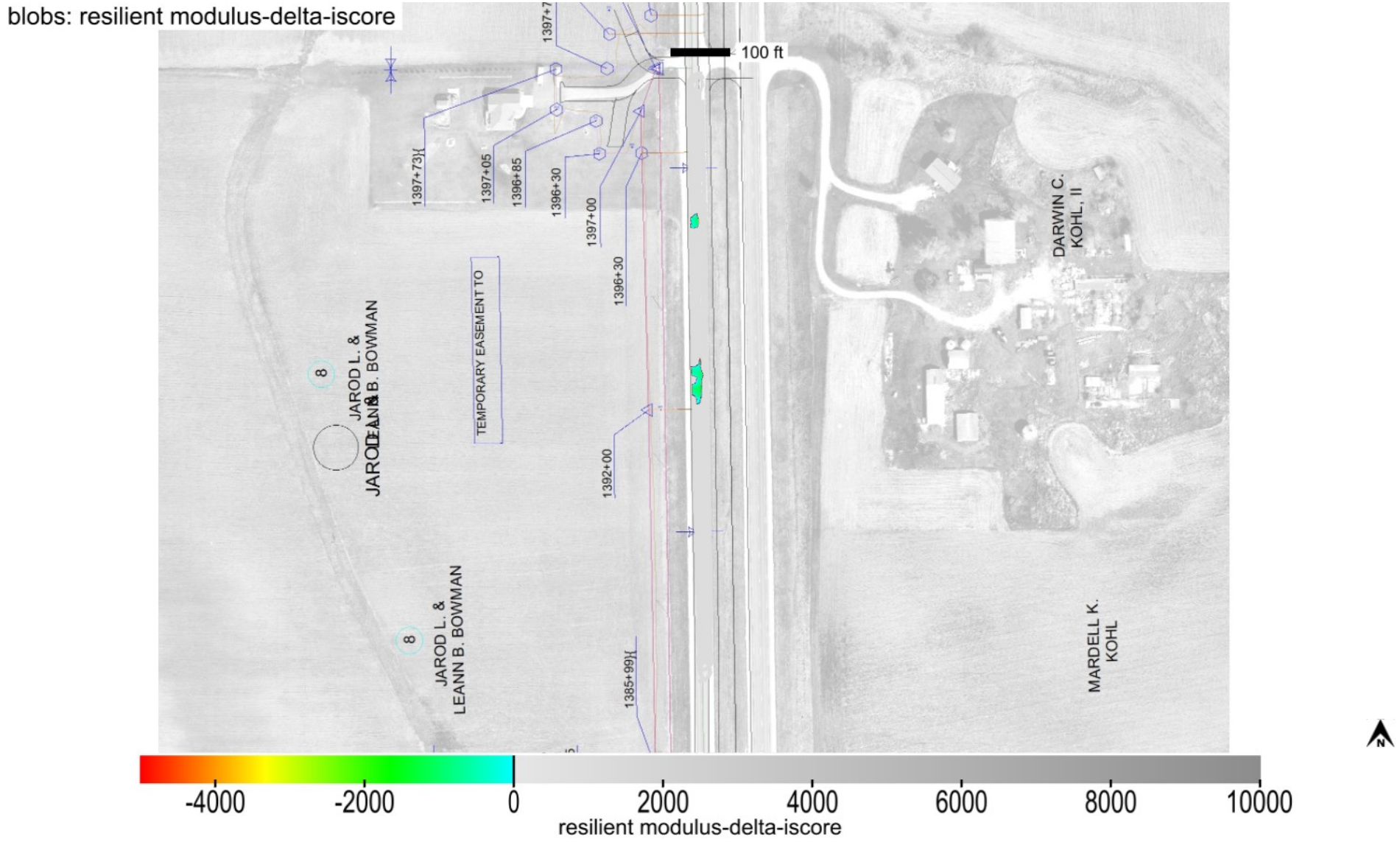
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_182739a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	2	1134	3.83	none	0



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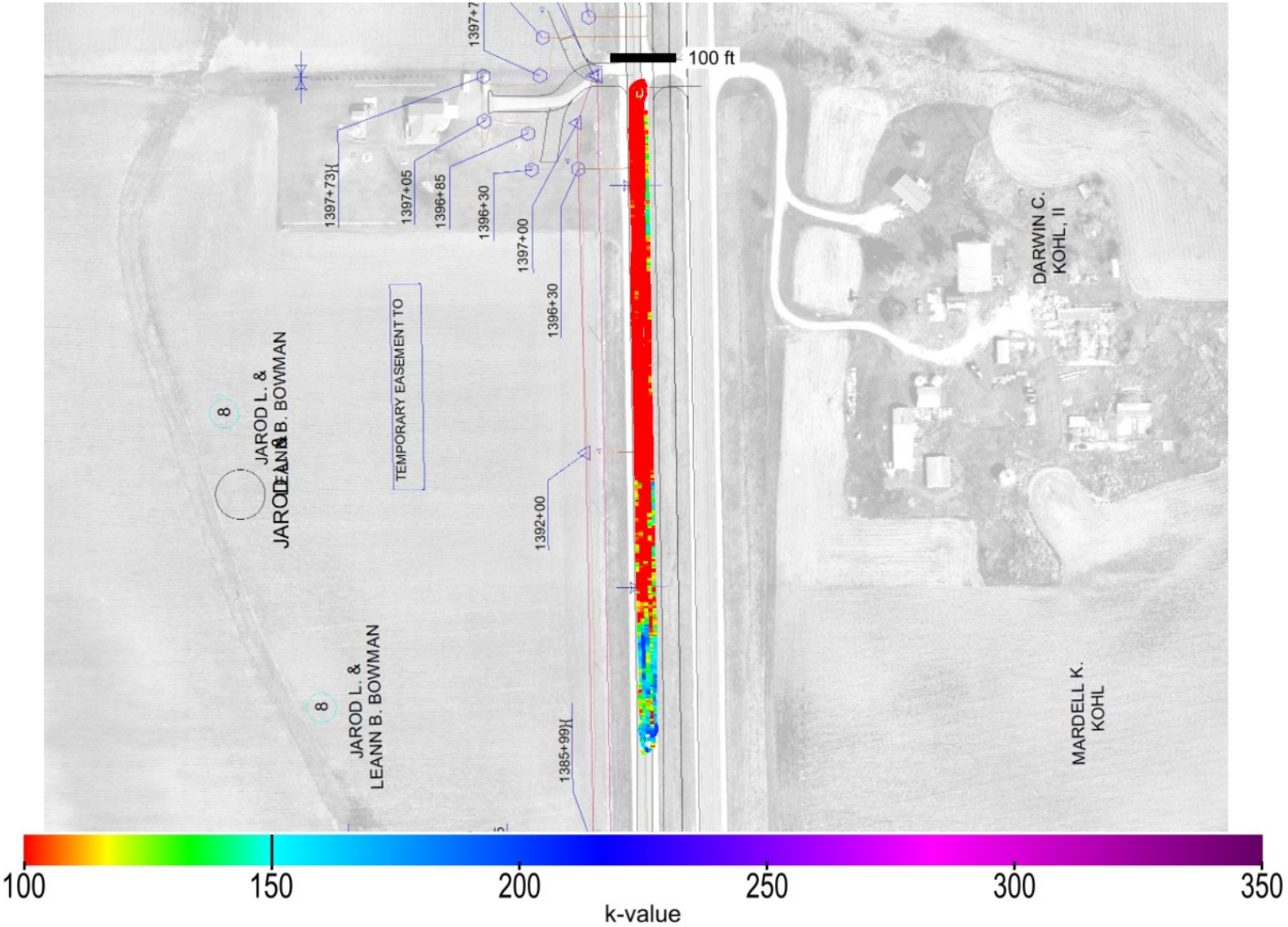
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_182739a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	10.9	18.92	0.08	150	55	90.1	202	39.56	43.92	-95	-59.9	52

k-value



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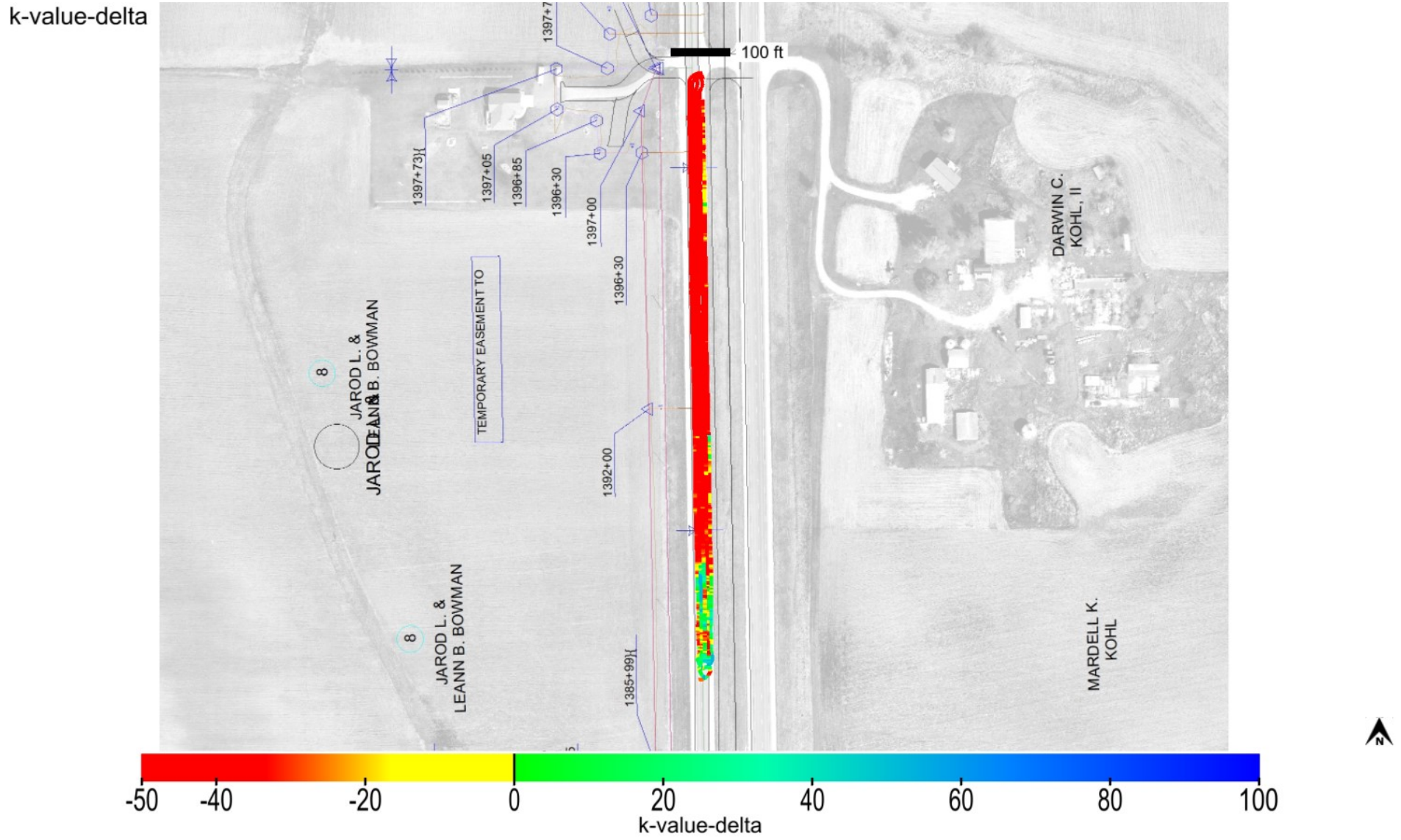
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_182739a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	10.9	18.92	0.08	150	55	90.1	202	39.56	43.92	-95	-59.9	52



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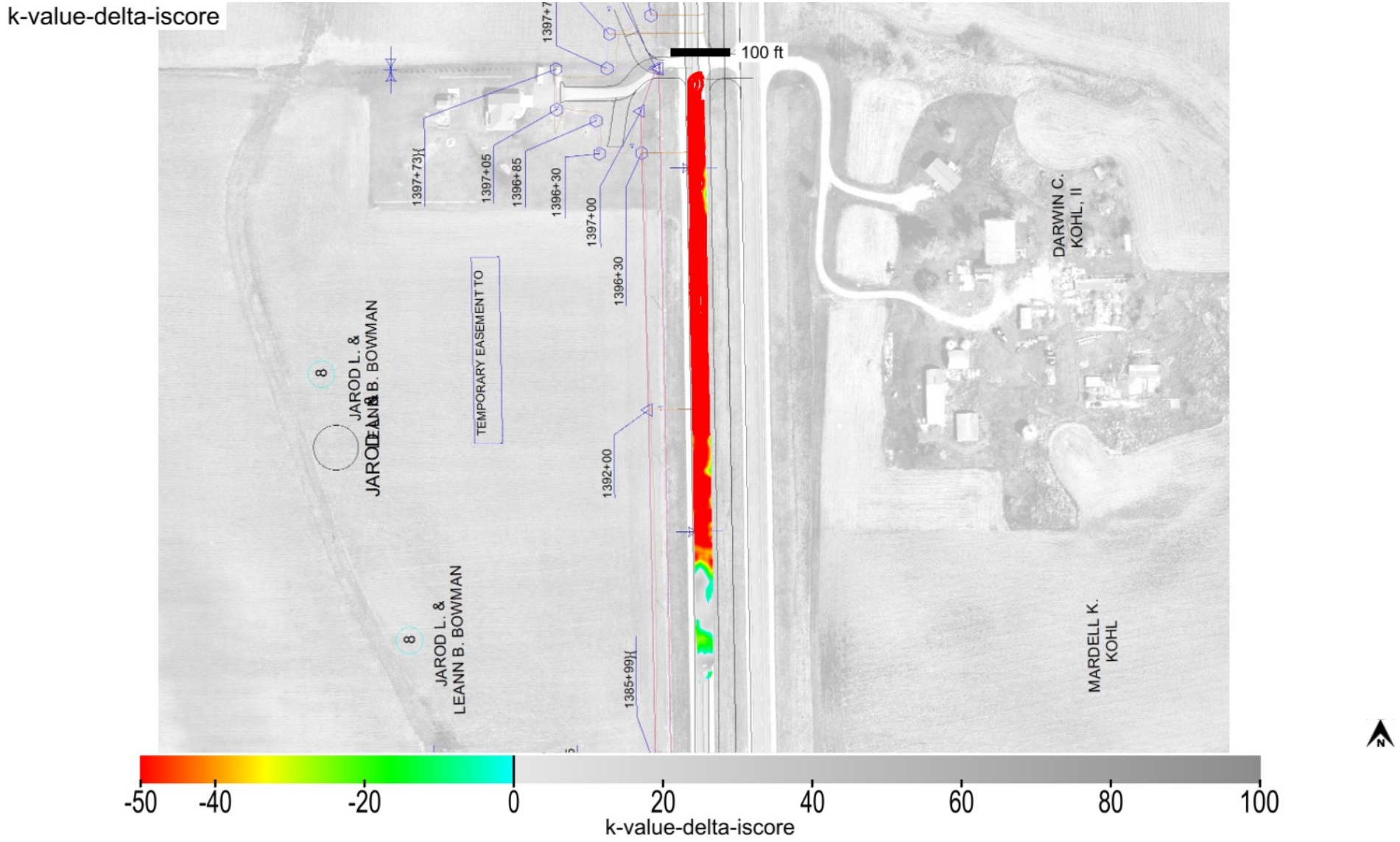
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_182739a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	10.9	150	-95	-59.9	52	-95	-60.78	47.19



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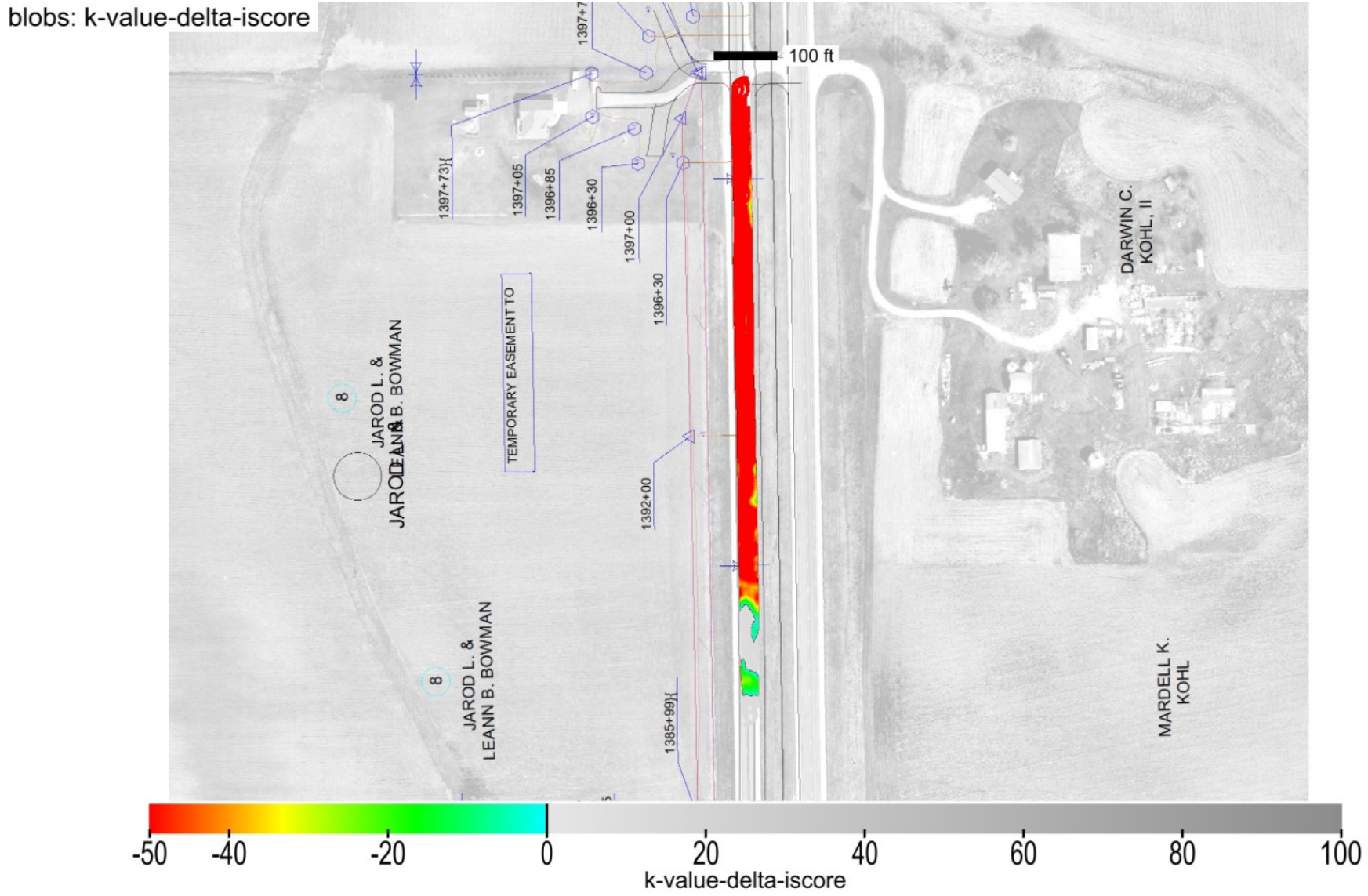
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_182739a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	2	26256	88.76	none	0



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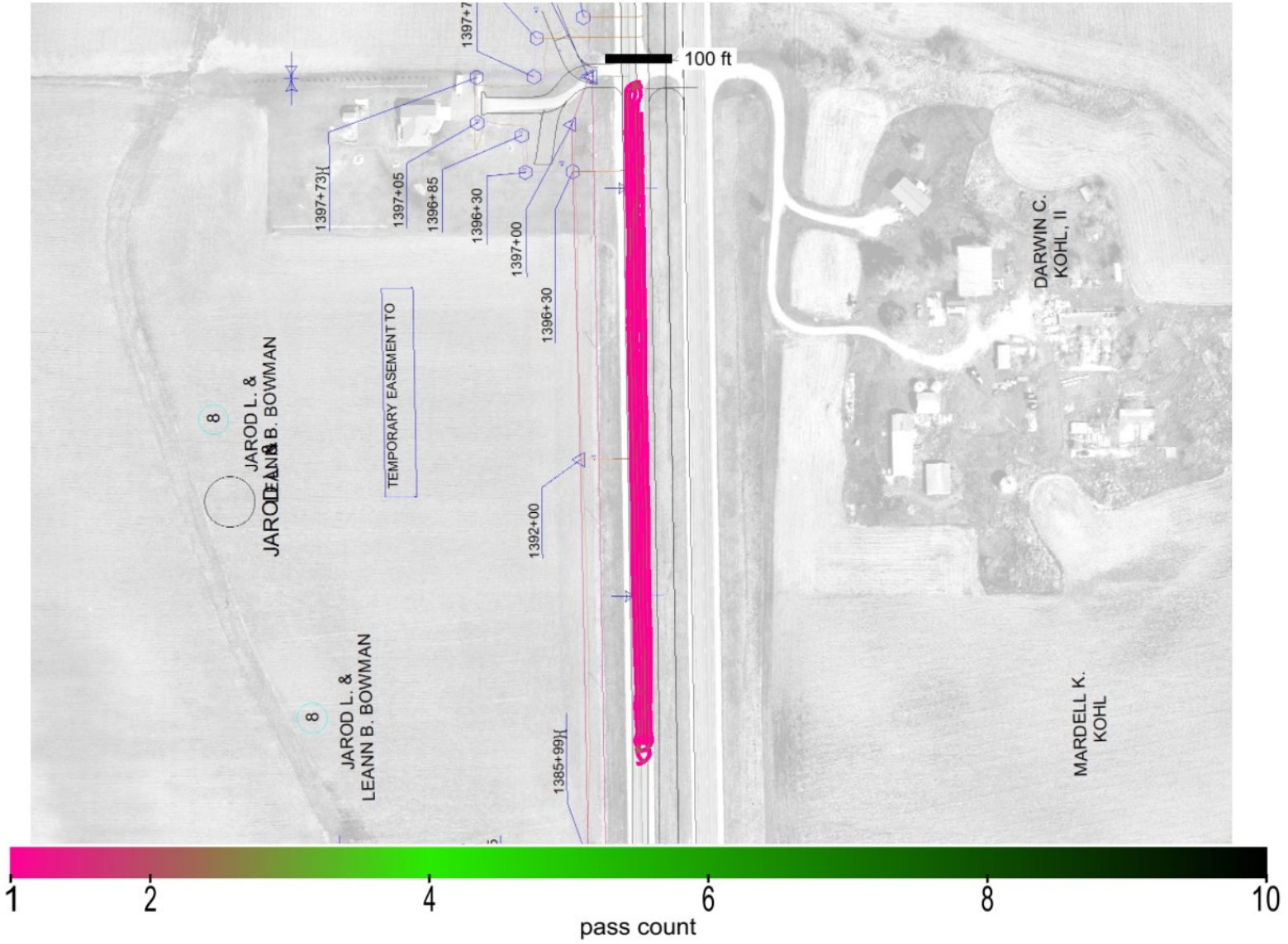
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_182739a

minimum	average	maximum
1	1.18	3

pass count



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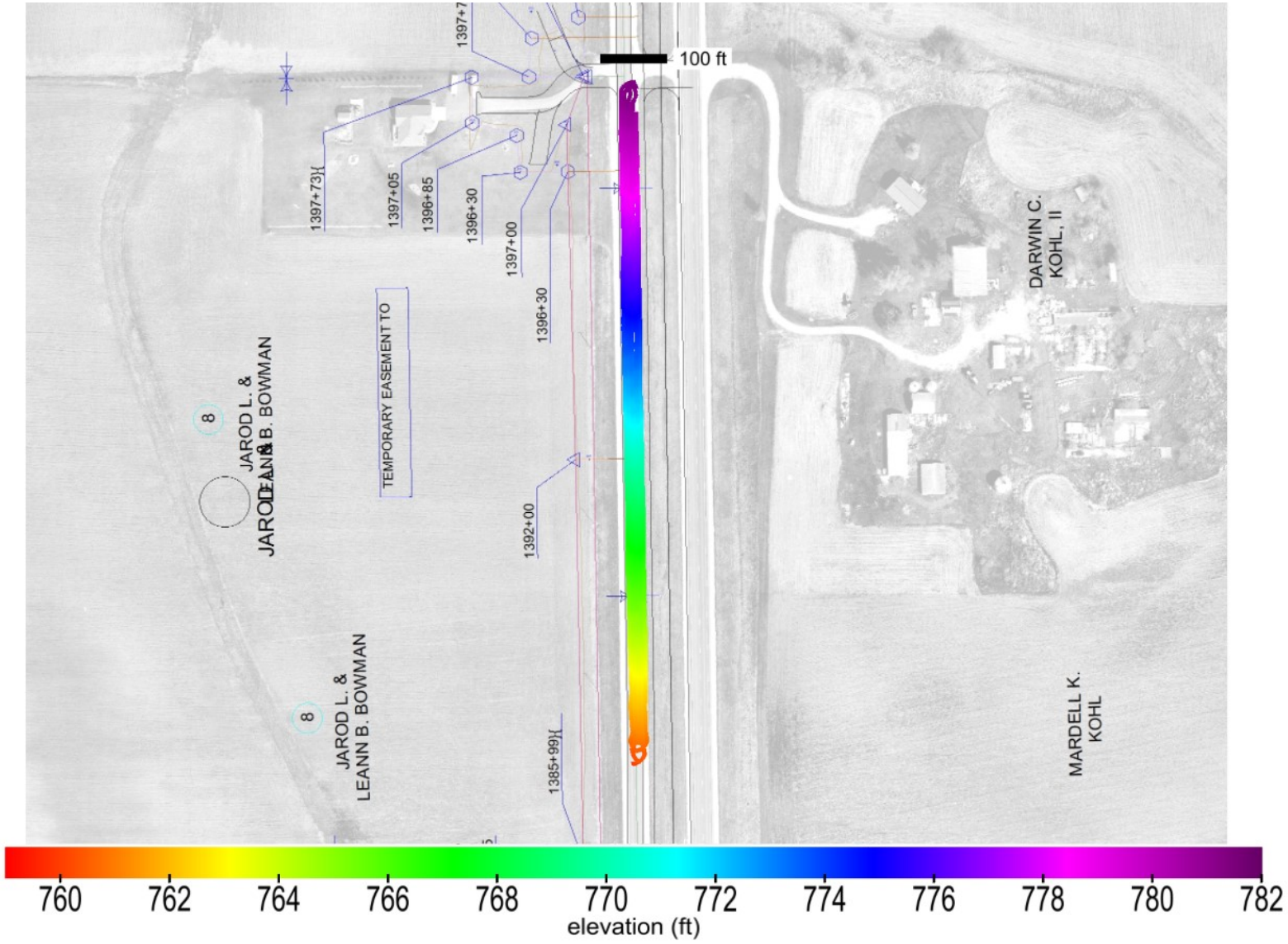
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_182739a

minimum	average	maximum
759.956	771.291	781.432

elevation



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Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_182739a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	29580	0.679	12	8554	150	40

materials

Granular Subbase_IADOT (2111)

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.26	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_19_184401a	No. of Measurements:	28009	Machine ID:	Ingios_FCS00210
Date and Time:	8/19/2020 6:44:01 PM	Location:	Linn County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	Yes	84.4	88.7	0.58	8554	5500	18619.7	56000	9579.52	51.45	-3054	10065.7	47446
k-value	Yes	11.7	18.36	0.08	150	55	89.8	202	41.87	46.62	-95	-60.2	52
Moisture Content	No												

Mapped Area

square feet	acres
28009	0.64

Pass Count

min.	avg.	max.
1	1.26	5

Elevation (ft)

min.	avg.	max.
759.62	771.06	781.36

Velocity (fps)

min.	avg.	max.
0.47	5.48	6.24

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	28009	0.643	12	8554	150	40

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IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.26	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_19_184401a	No. of Measurements:	28009	Machine ID:	Ingios_FCS00210
Date and Time:	8/19/2020 6:44:01 PM	Location:	Linn County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
88.7	CQI > = 95
84.4	80% of Resilient Modulus MVs >= 8554
51.45	COV <= 20
7.66	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.26	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_19_184401a	No. of Measurements:	28009	Machine ID:	Ingios_FCS00210
Date and Time:	8/19/2020 6:44:01 PM	Location:	Linn County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
18.36	CQI > = 95
11.7	80% of k-Value MVs >= 150
46.62	COV <= 20
86.72	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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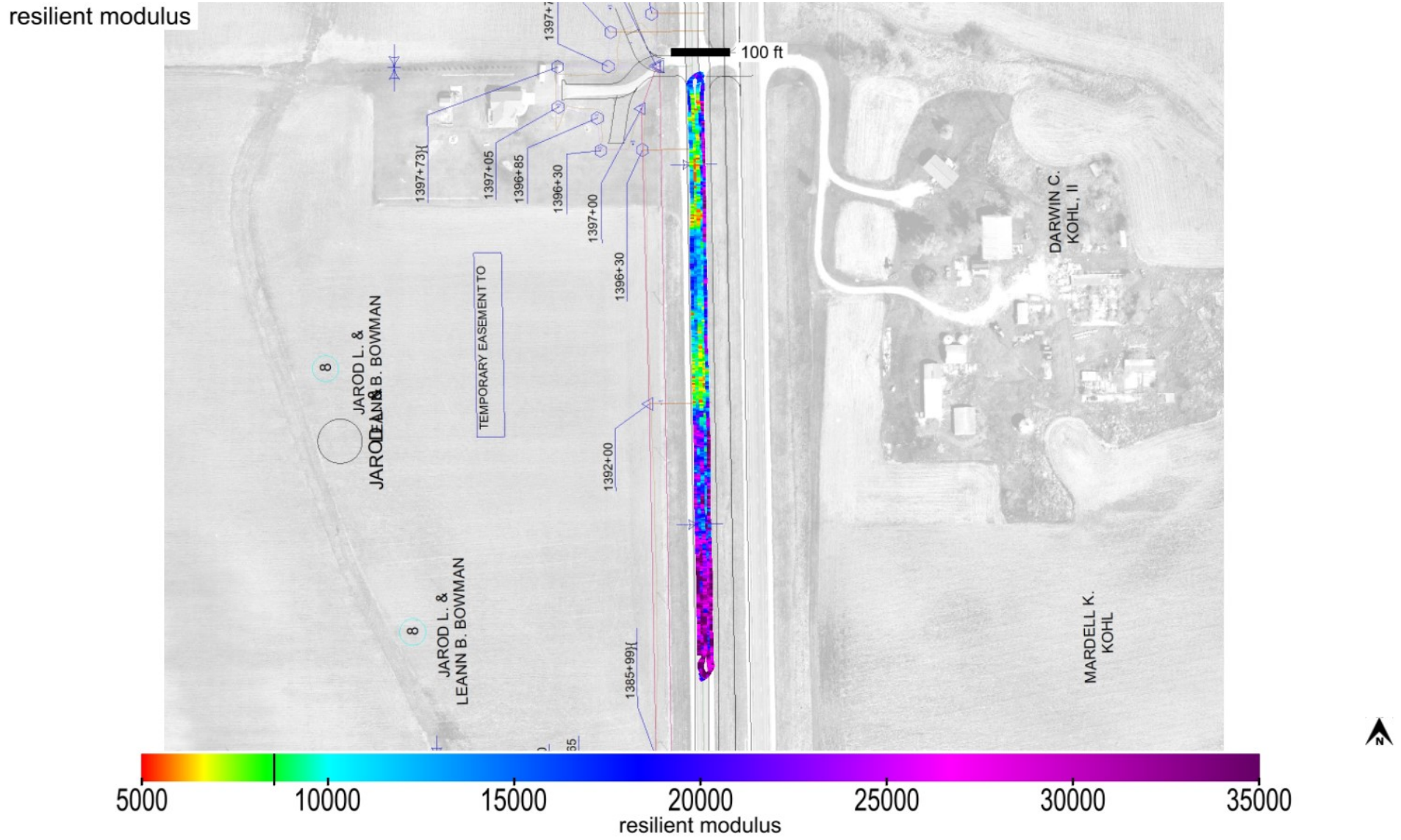
ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_184401a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	84.4	88.7	0.58	8554	5500	18619.7	56000	9579.52	51.45	-3054	10065.7	47446



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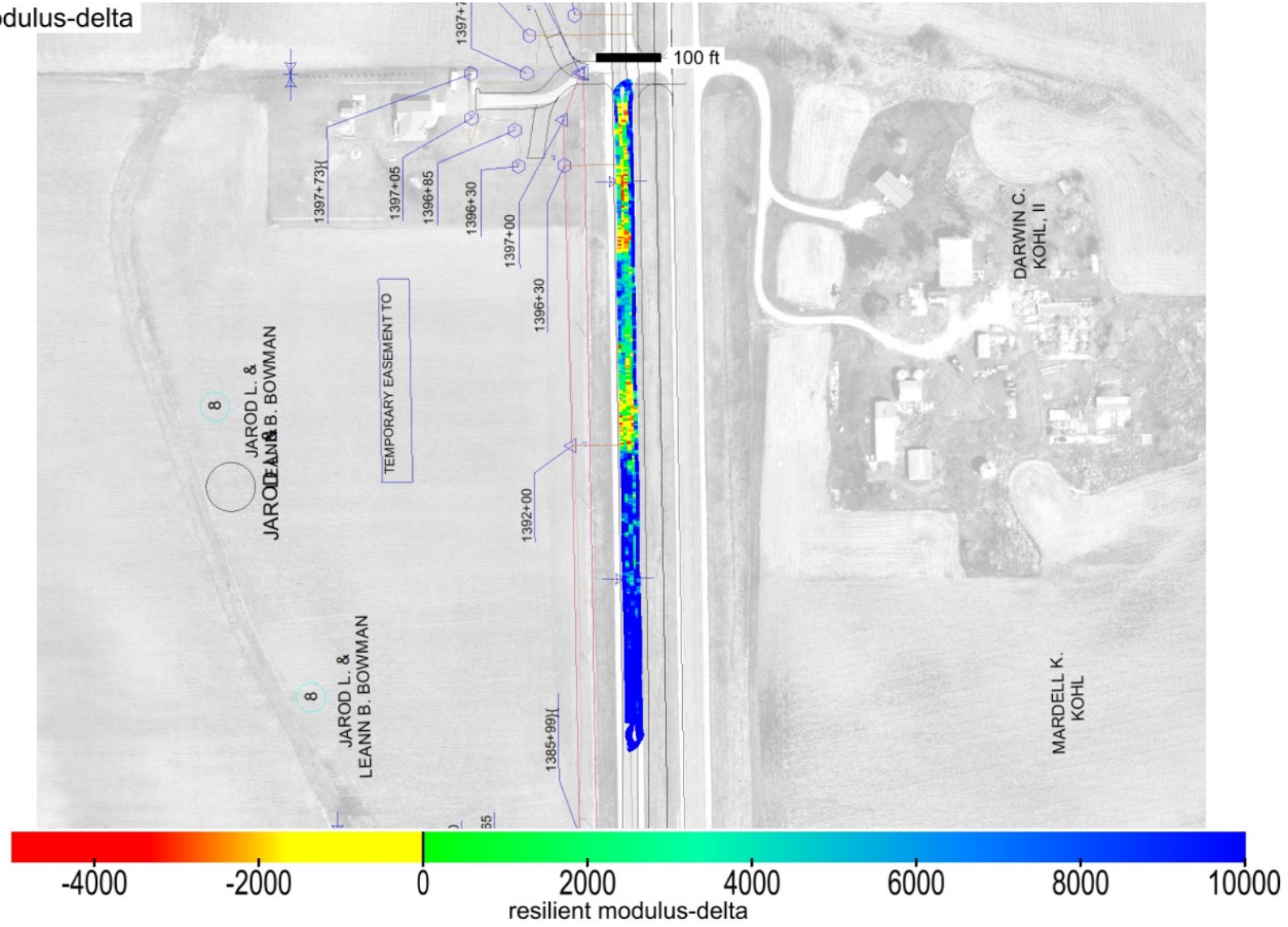
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_184401a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	84.4	88.7	0.58	8554	5500	18619.7	56000	9579.52	51.45	-3054	10065.7	47446

resilient modulus-delta



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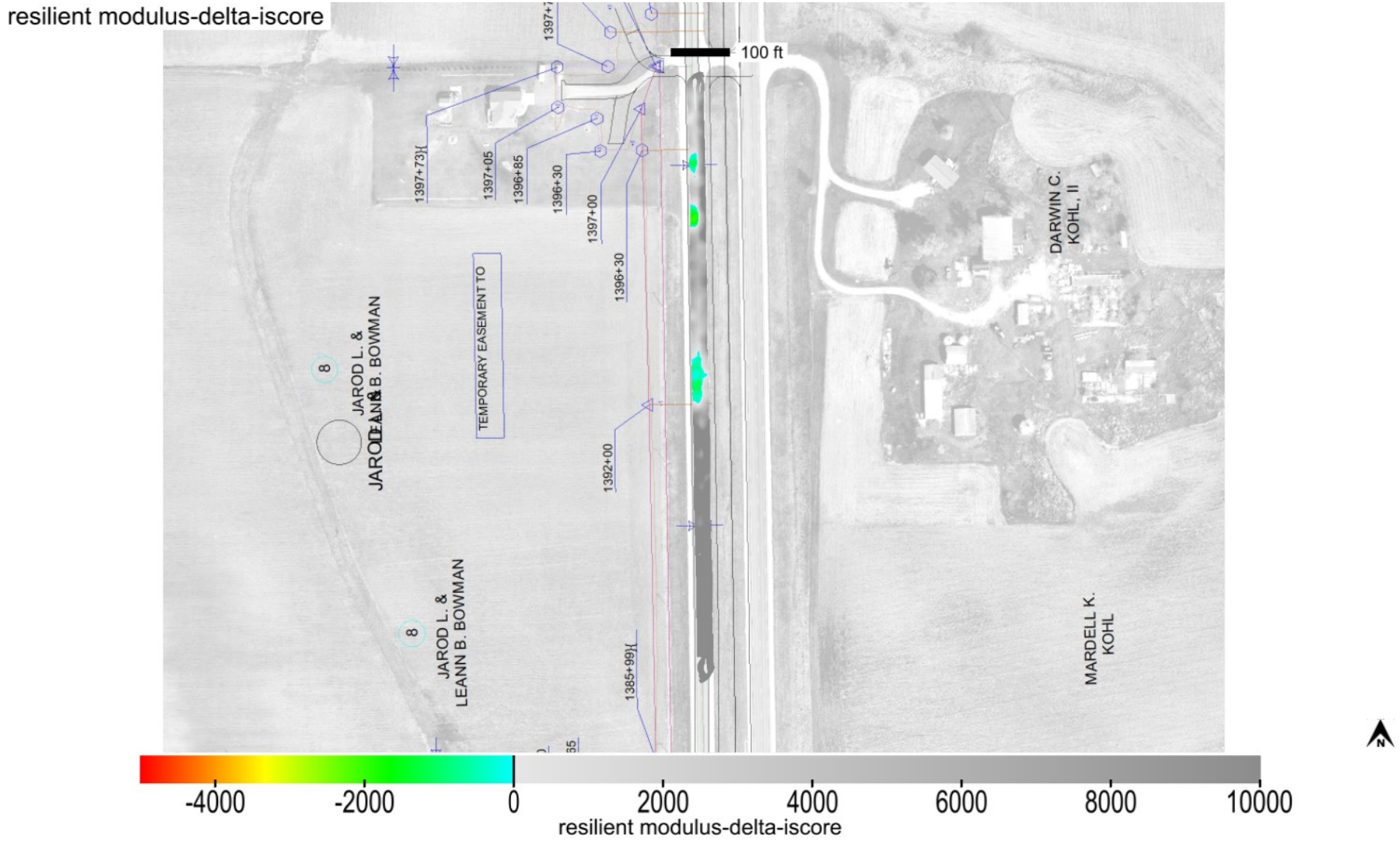
ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_184401a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	84.4	8554	-3054	10065.7	47446	-2071.76	9781.68	29757.17



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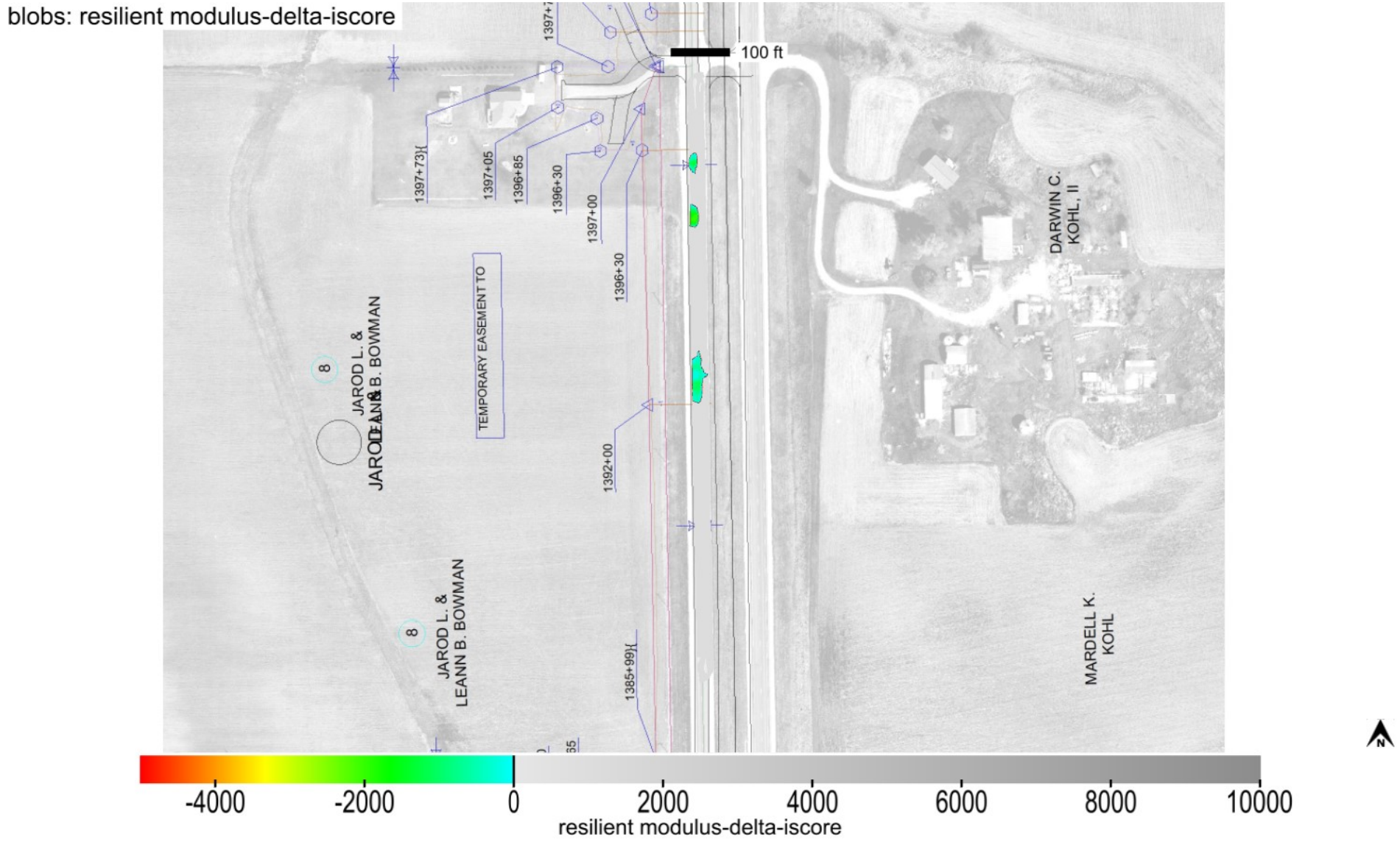
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_184401a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	3	2146	7.66	none	0

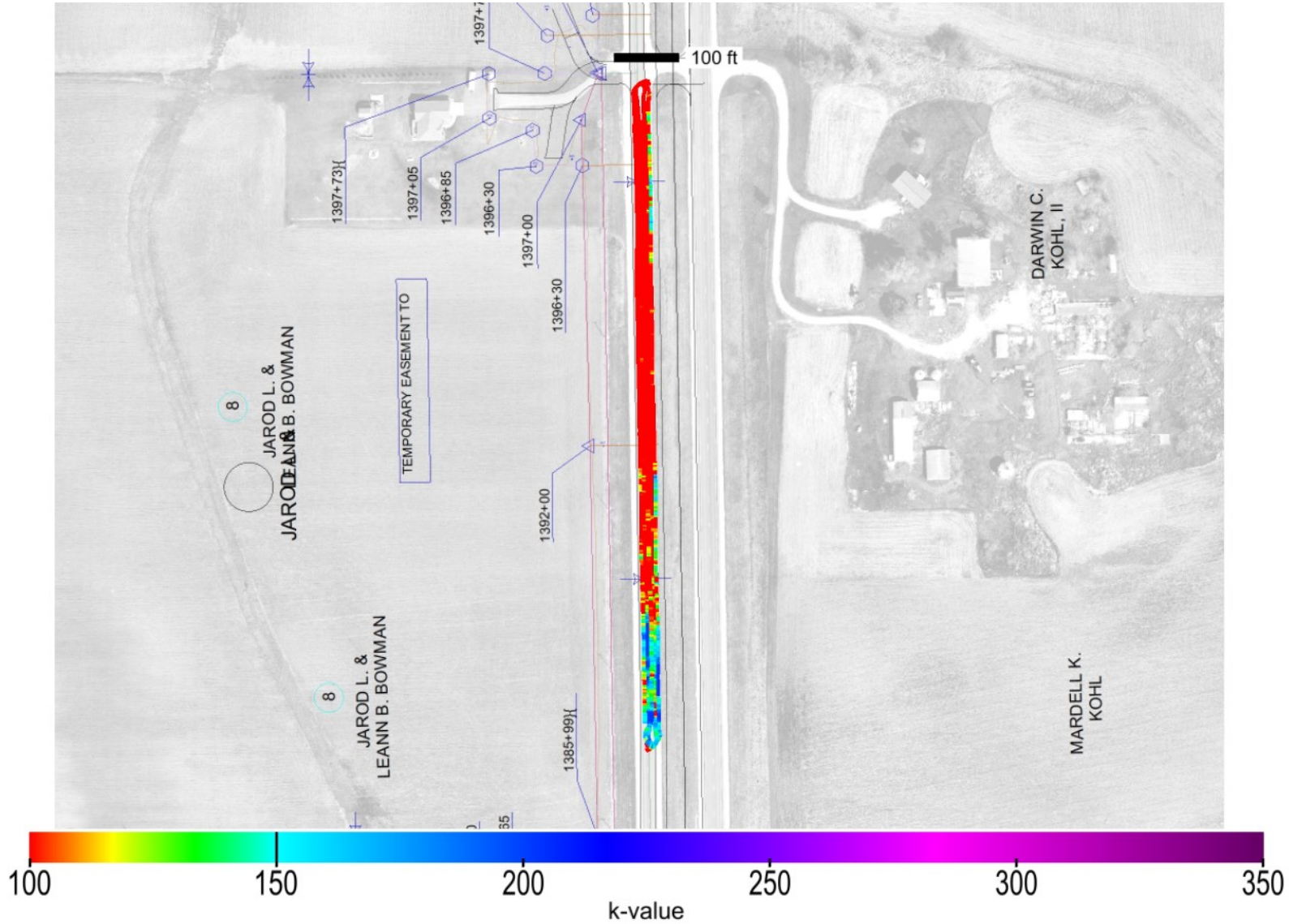


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_184401a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	11.7	18.36	0.08	150	55	89.8	202	41.87	46.62	-95	-60.2	52

k-value



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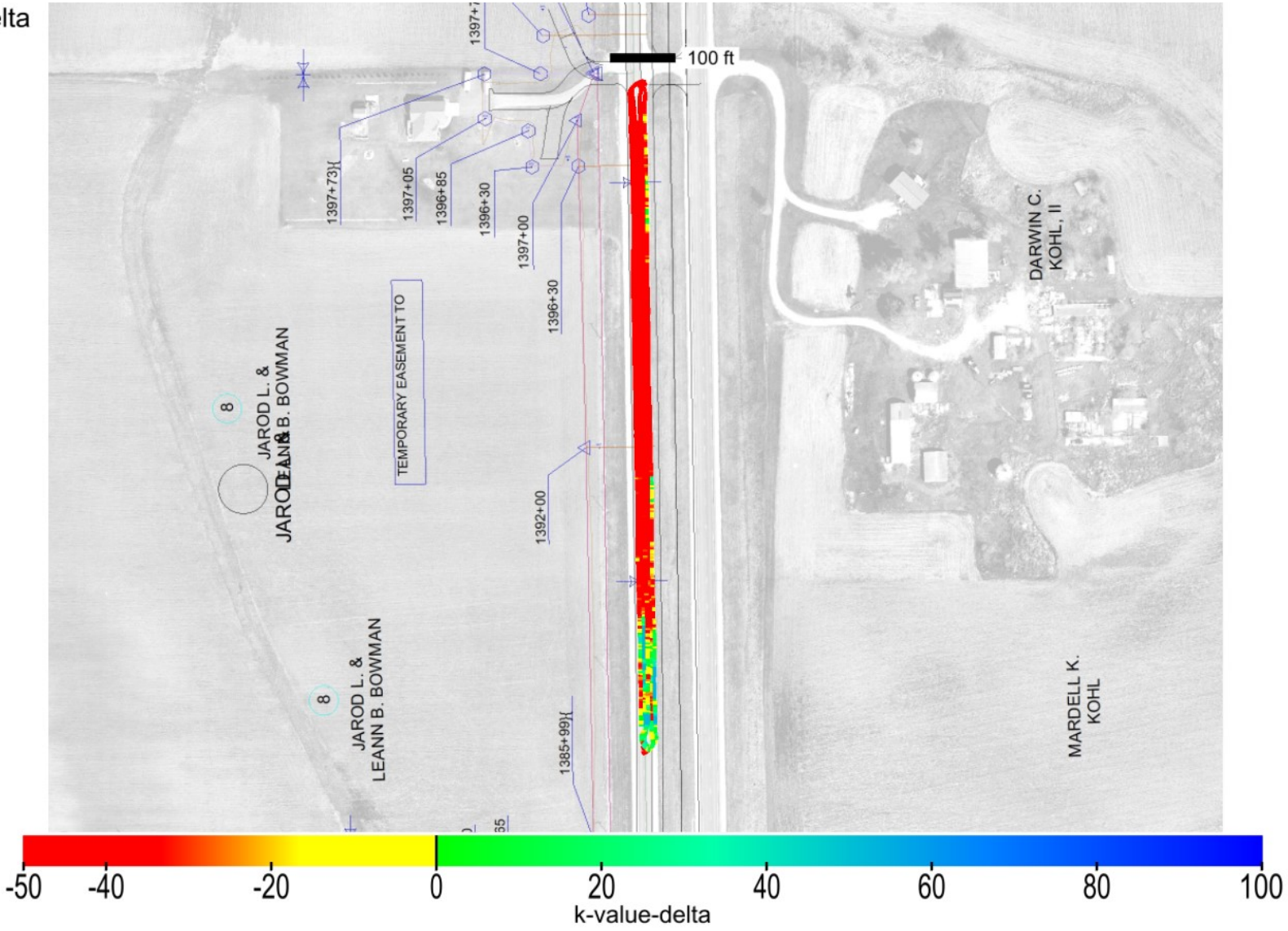
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_184401a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	11.7	18.36	0.08	150	55	89.8	202	41.87	46.62	-95	-60.2	52

k-value-delta



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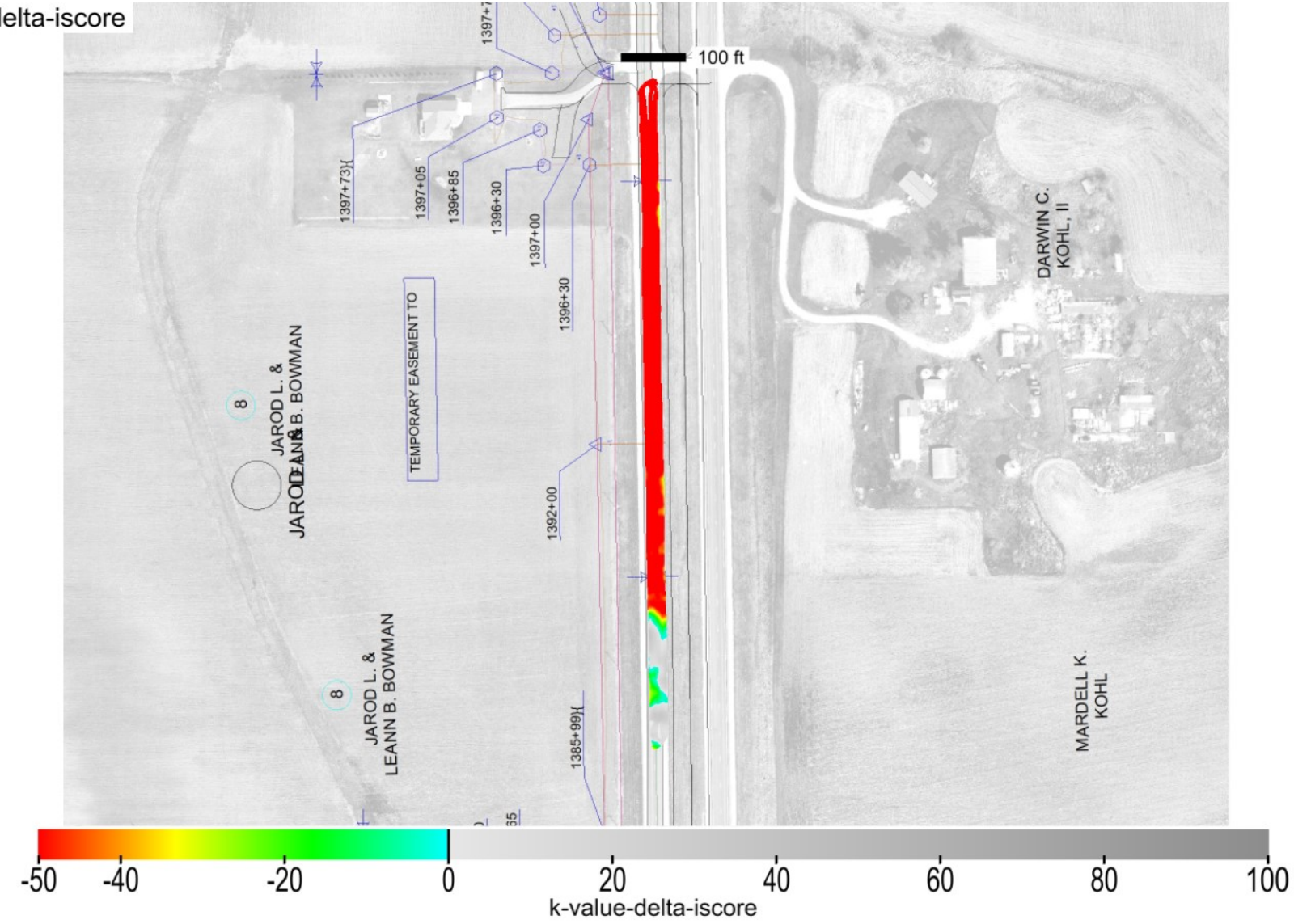
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_184401a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	11.7	150	-95	-60.2	52	-95	-61.01	34.73

k-value-delta-iscore



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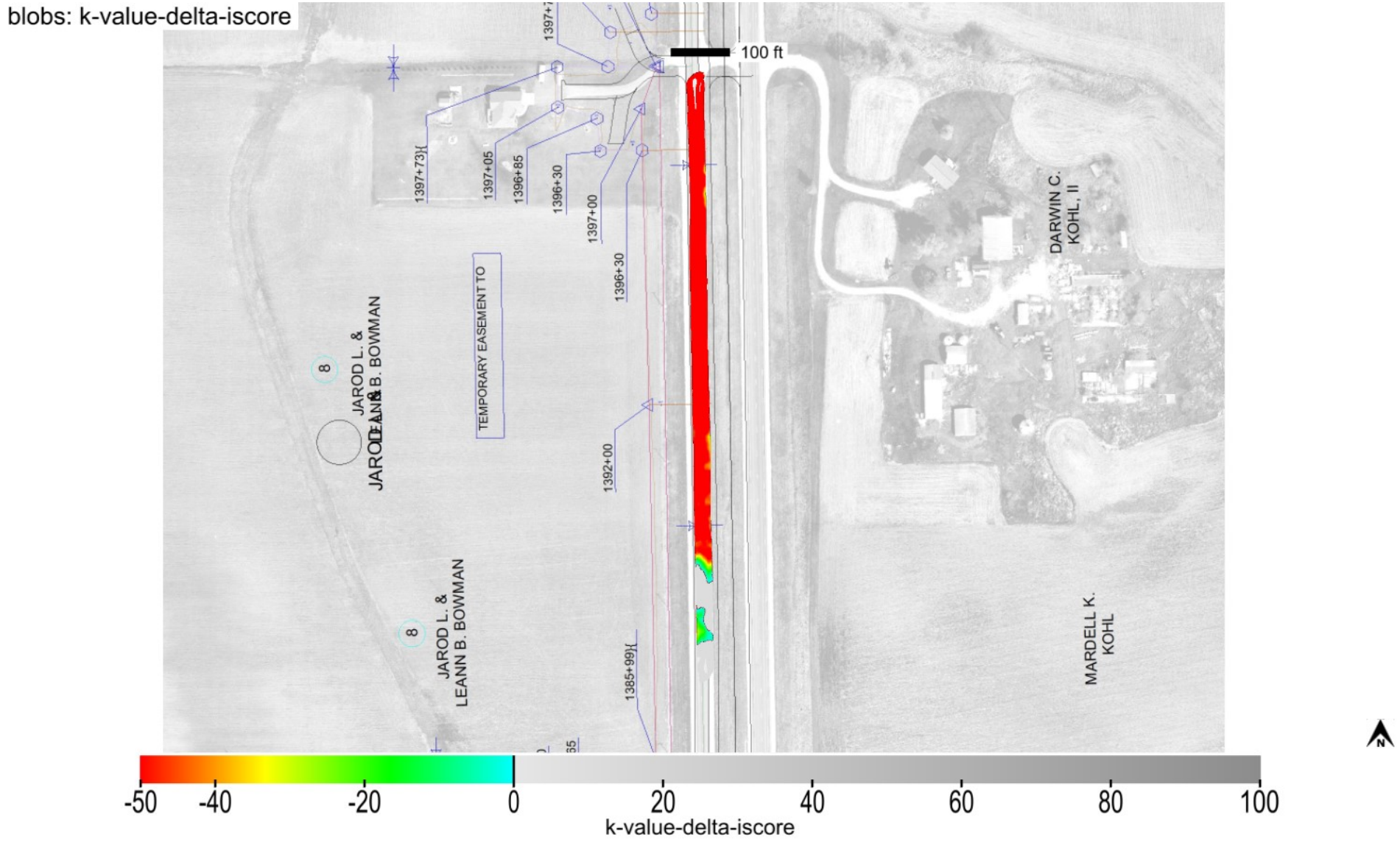
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_184401a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	2	24290	86.72	none	0



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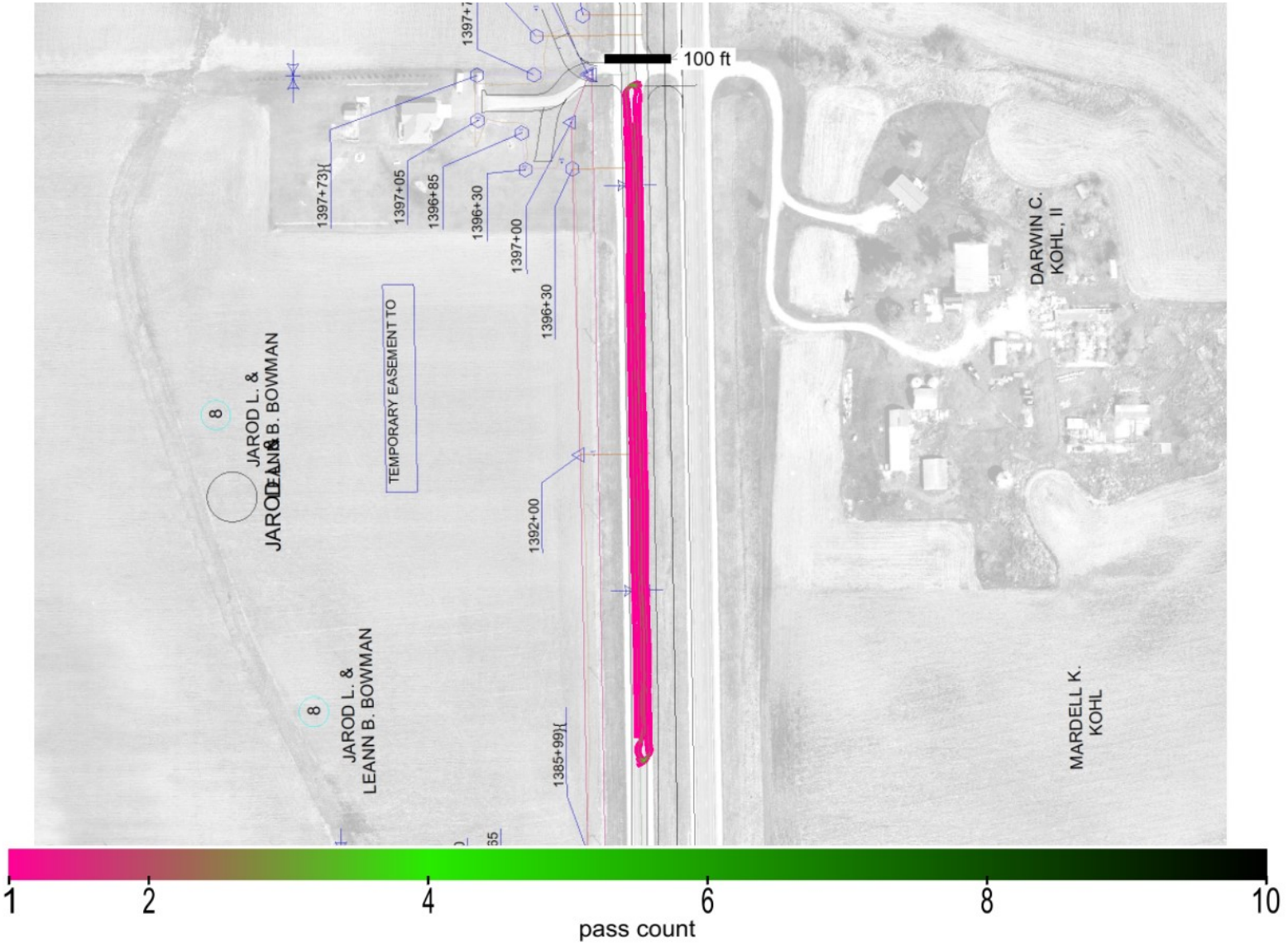
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_184401a

minimum	average	maximum
1	1.26	5

pass count



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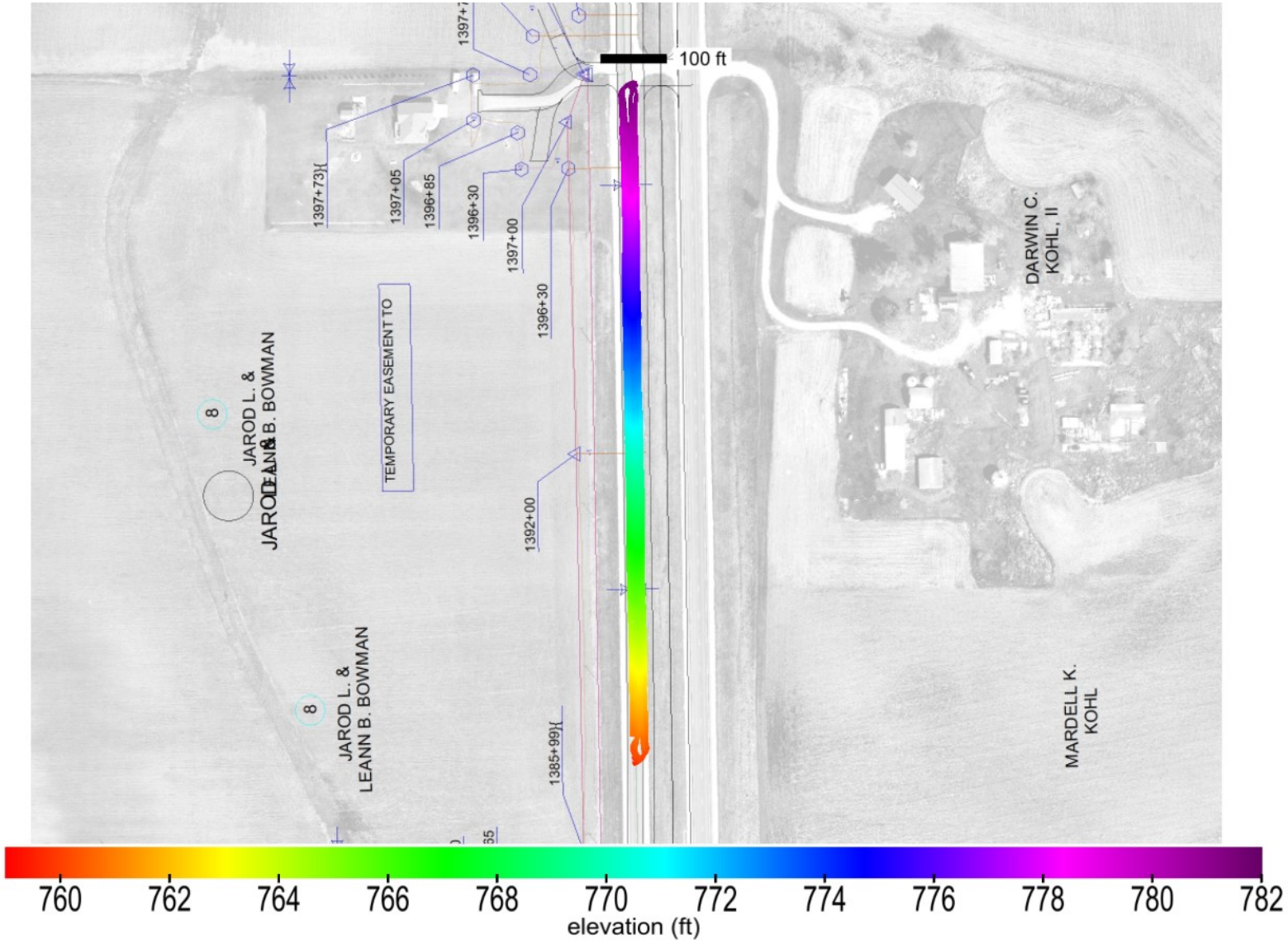
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_184401a

minimum	average	maximum
759.615	771.058	781.363

elevation



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Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_184401a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	28009	0.643	12	8554	150	40

materials

Granular Subbase_IADOT (2111)

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IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.26	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_19_190031a	No. of Measurements:	27733	Machine ID:	Ingios_FCS00210
Date and Time:	8/19/2020 7:00:31 PM	Location:	Linn County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	Yes	85.4	88.33	0.55	8554	5500	19230.3	56000	10405.06	54.11	-3054	10676.3	47446
k-value	Yes	14.5	20.46	0.1	150	55	93.4	202	44.98	48.17	-95	-56.6	52
Moisture Content	No												

Mapped Area

square feet	acres
27733	0.64

Pass Count

min.	avg.	max.
1	1.27	5

Elevation (ft)

min.	avg.	max.
759.74	771.01	781.36

Velocity (fps)

min.	avg.	max.
0.25	5.5	6.41

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	27733	0.637	12	8554	150	40

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IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.26	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_19_190031a	No. of Measurements:	27733	Machine ID:	Ingios_FCS00210
Date and Time:	8/19/2020 7:00:31 PM	Location:	Linn County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
88.33	CQI > = 95
85.4	80% of Resilient Modulus MVs >= 8554
54.11	COV <= 20
7.35	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.26	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_19_190031a	No. of Measurements:	27733	Machine ID:	Ingios_FCS00210
Date and Time:	8/19/2020 7:00:31 PM	Location:	Linn County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
20.46	CQI > = 95
14.5	80% of k-Value MVs >= 150
48.17	COV <= 20
83.52	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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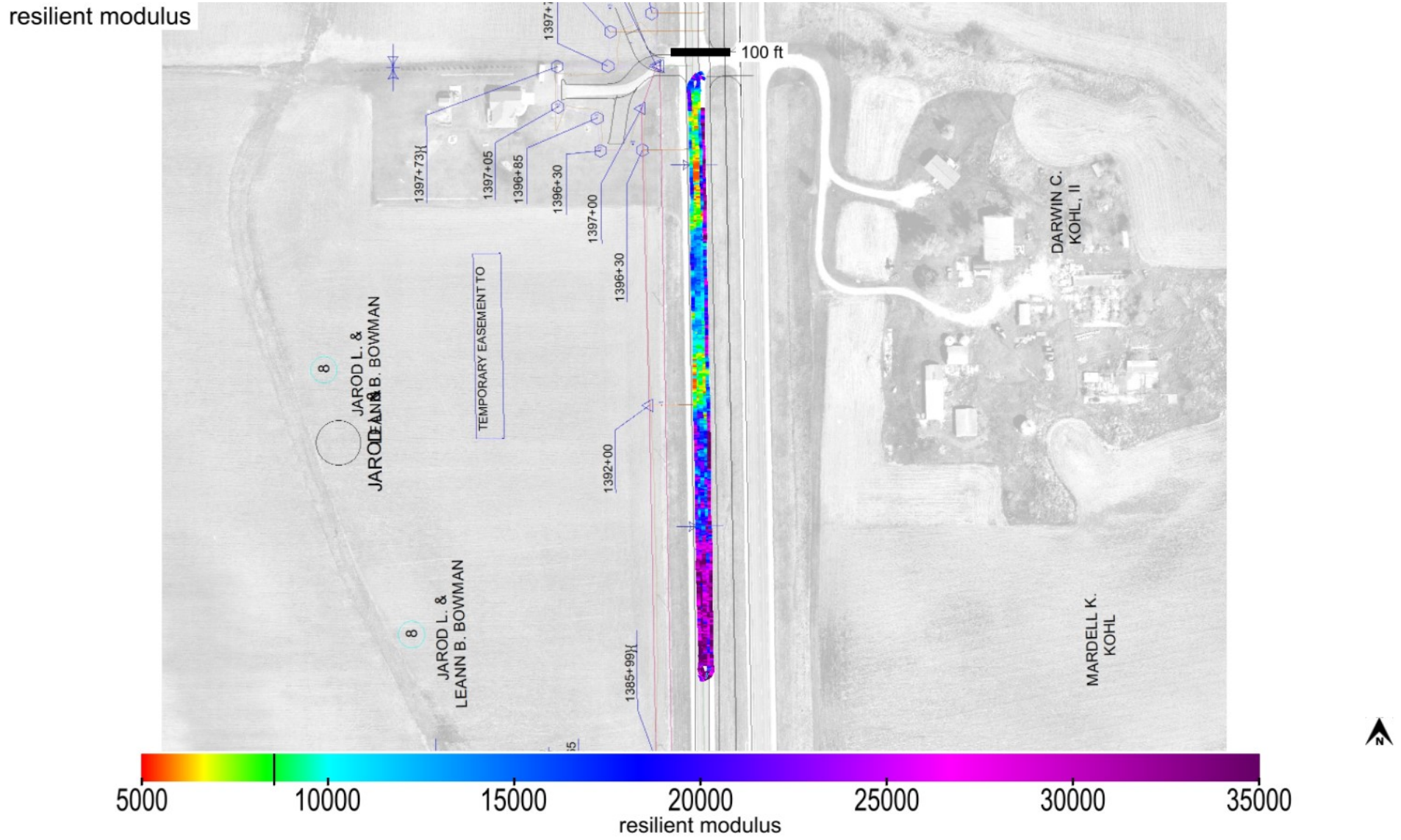
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_190031a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	85.4	88.33	0.55	8554	5500	19230.3	56000	10405.06	54.11	-3054	10676.3	47446



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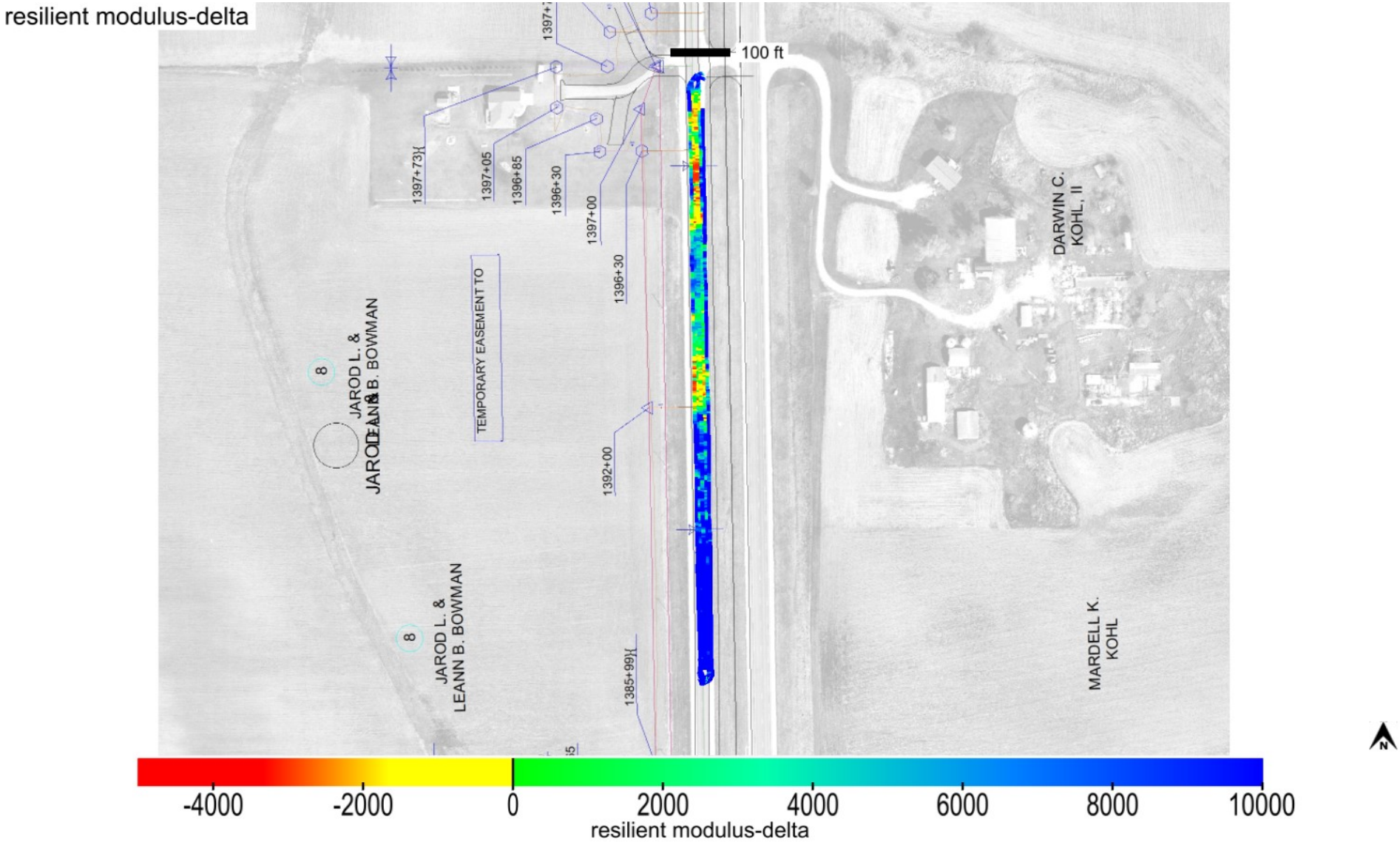
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_190031a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	85.4	88.33	0.55	8554	5500	19230.3	56000	10405.06	54.11	-3054	10676.3	47446



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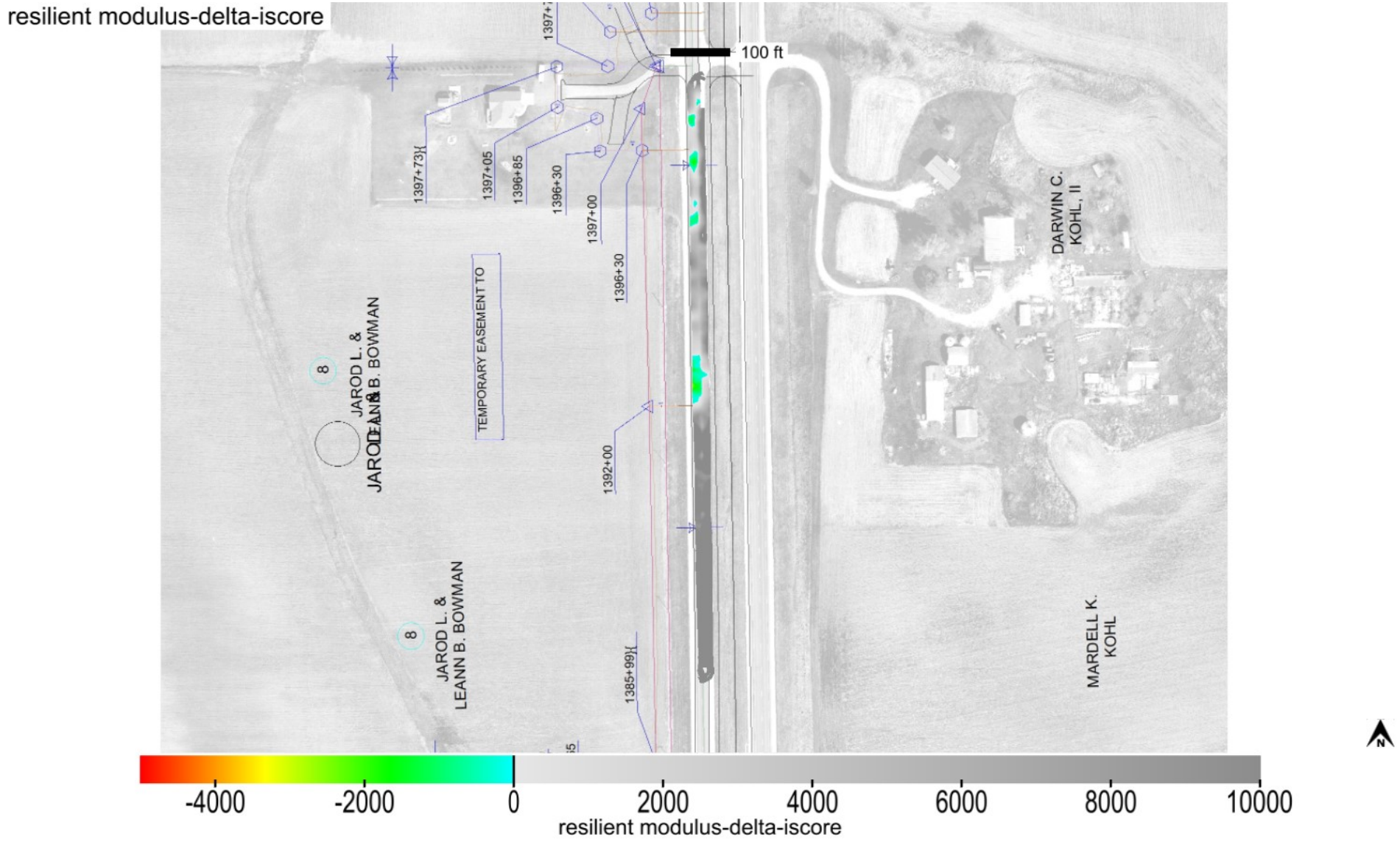
ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_190031a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	85.4	8554	-3054	10676.3	47446	-2487.81	10357.8	32931.89



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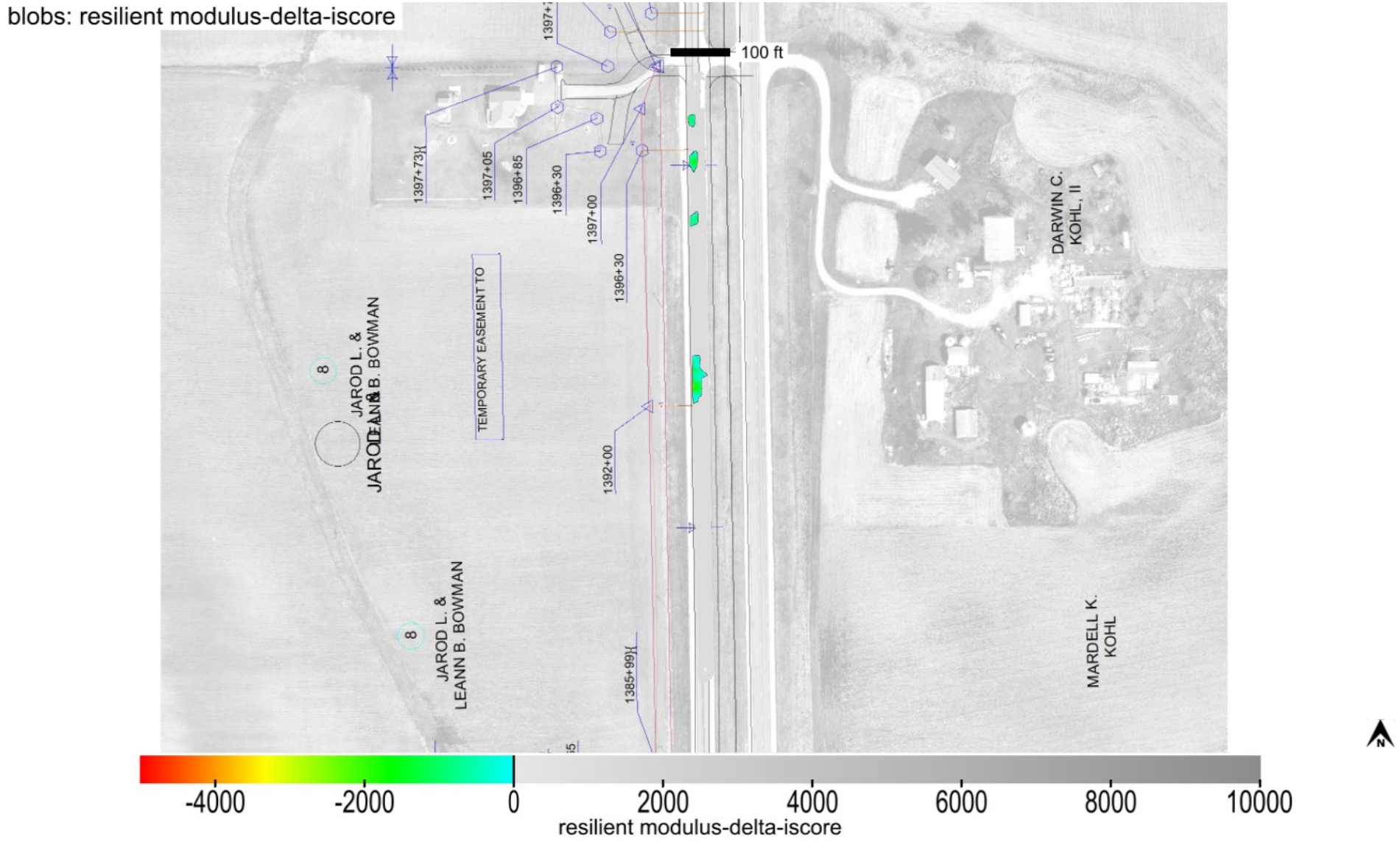
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_190031a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	4	2038	7.35	none	0



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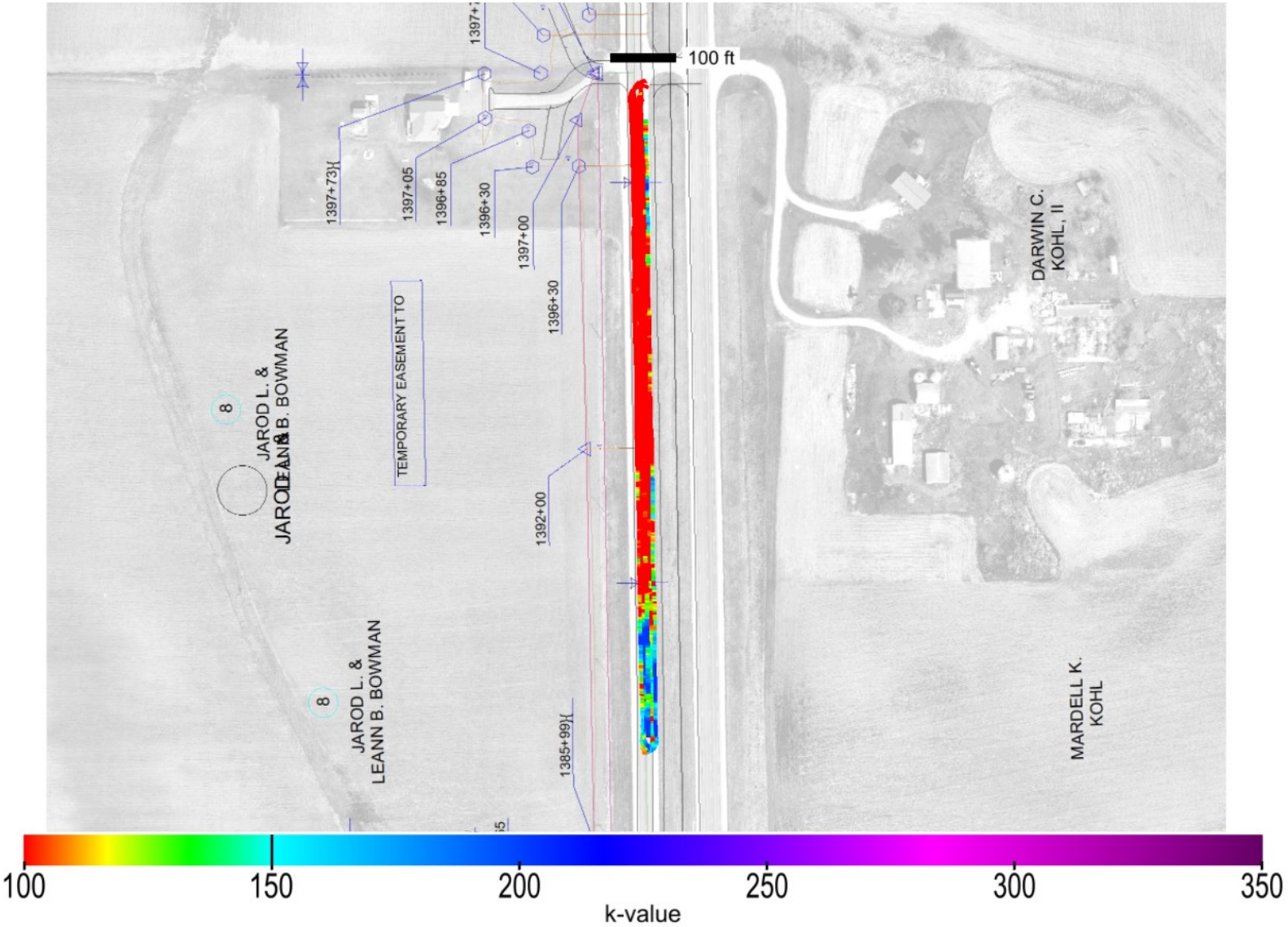
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_190031a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	14.5	20.46	0.1	150	55	93.4	202	44.98	48.17	-95	-56.6	52

k-value



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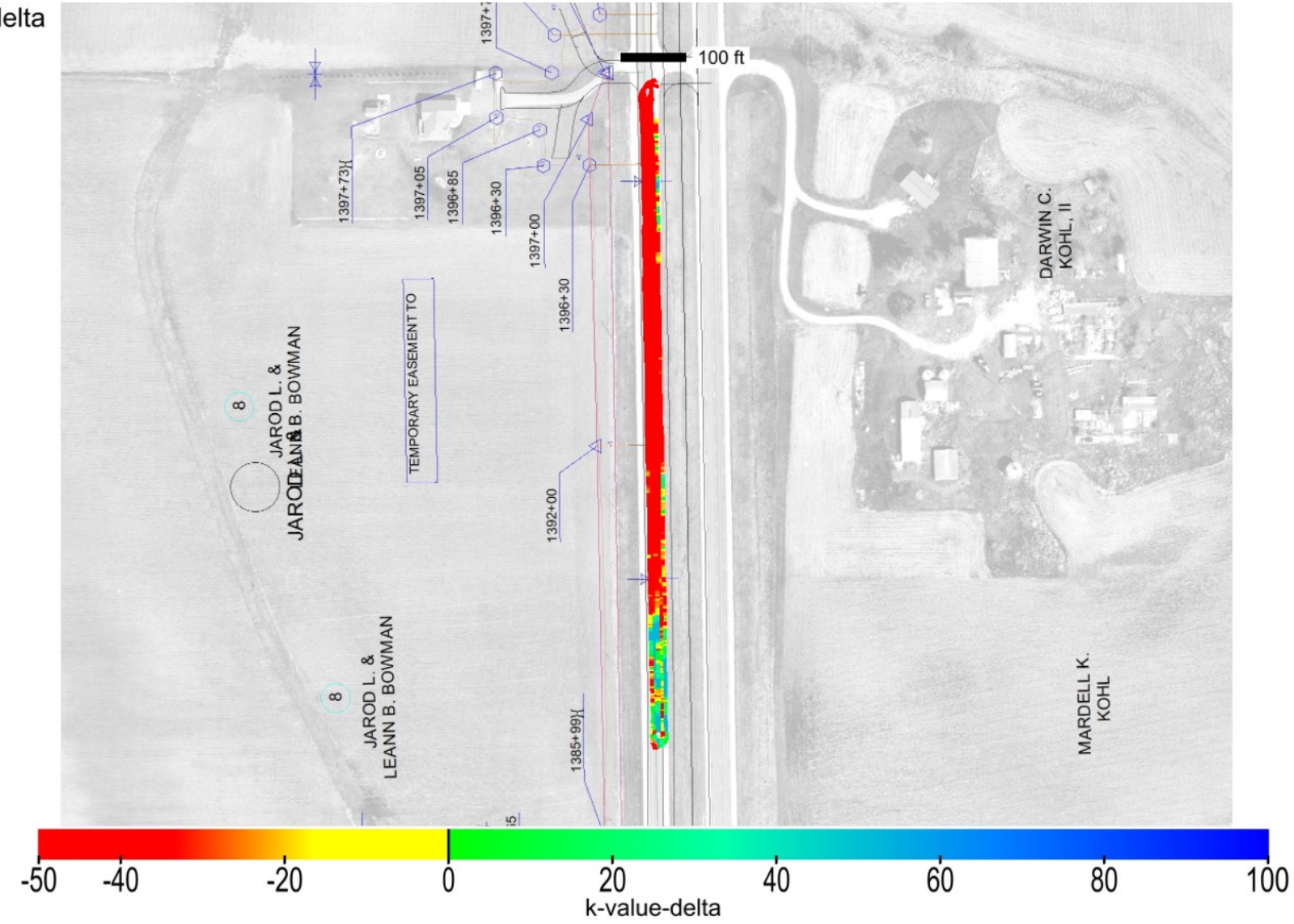
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_190031a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	14.5	20.46	0.1	150	55	93.4	202	44.98	48.17	-95	-56.6	52

k-value-delta



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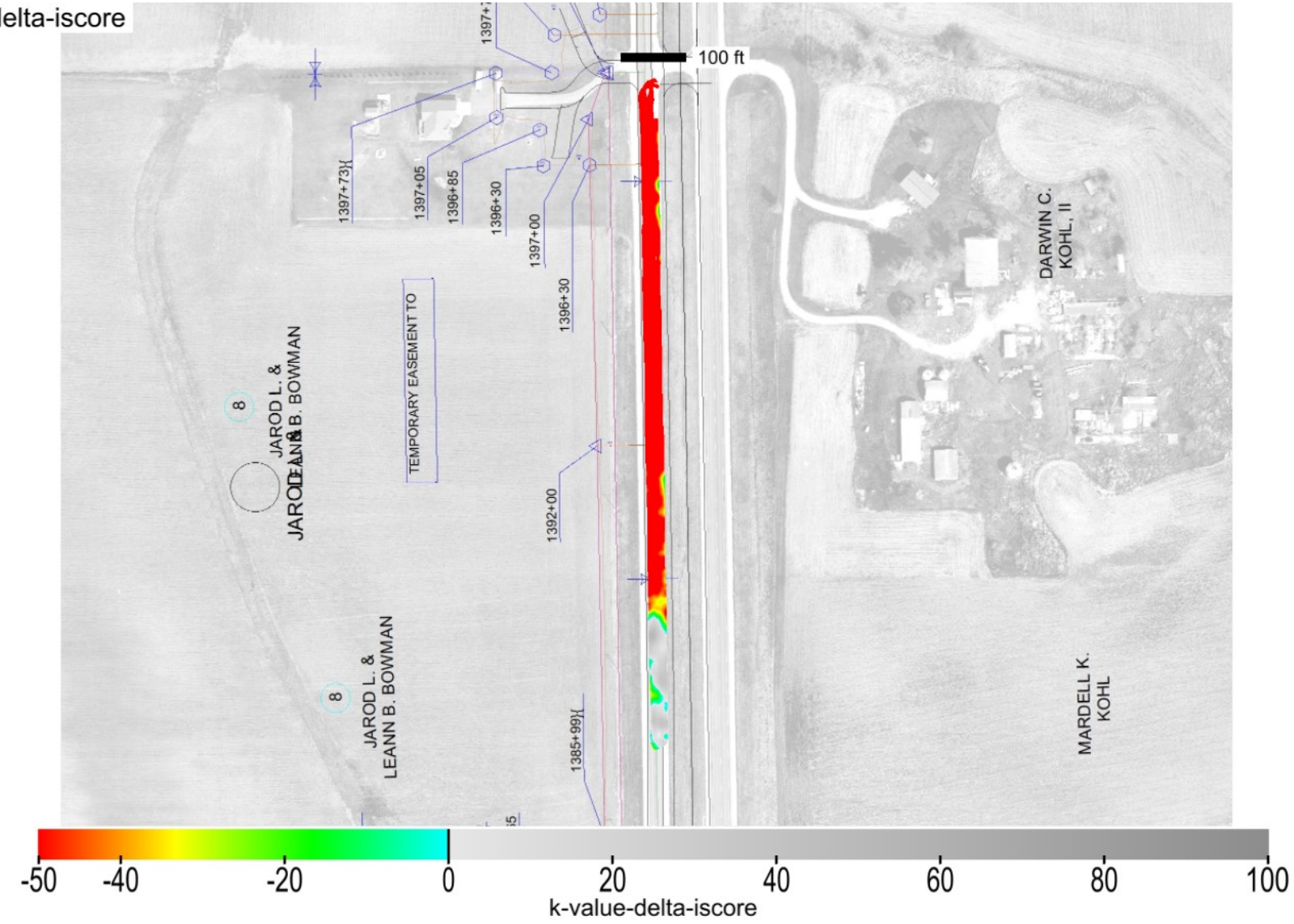
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_190031a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	14.5	150	-95	-56.6	52	-95	-57.6	50.2

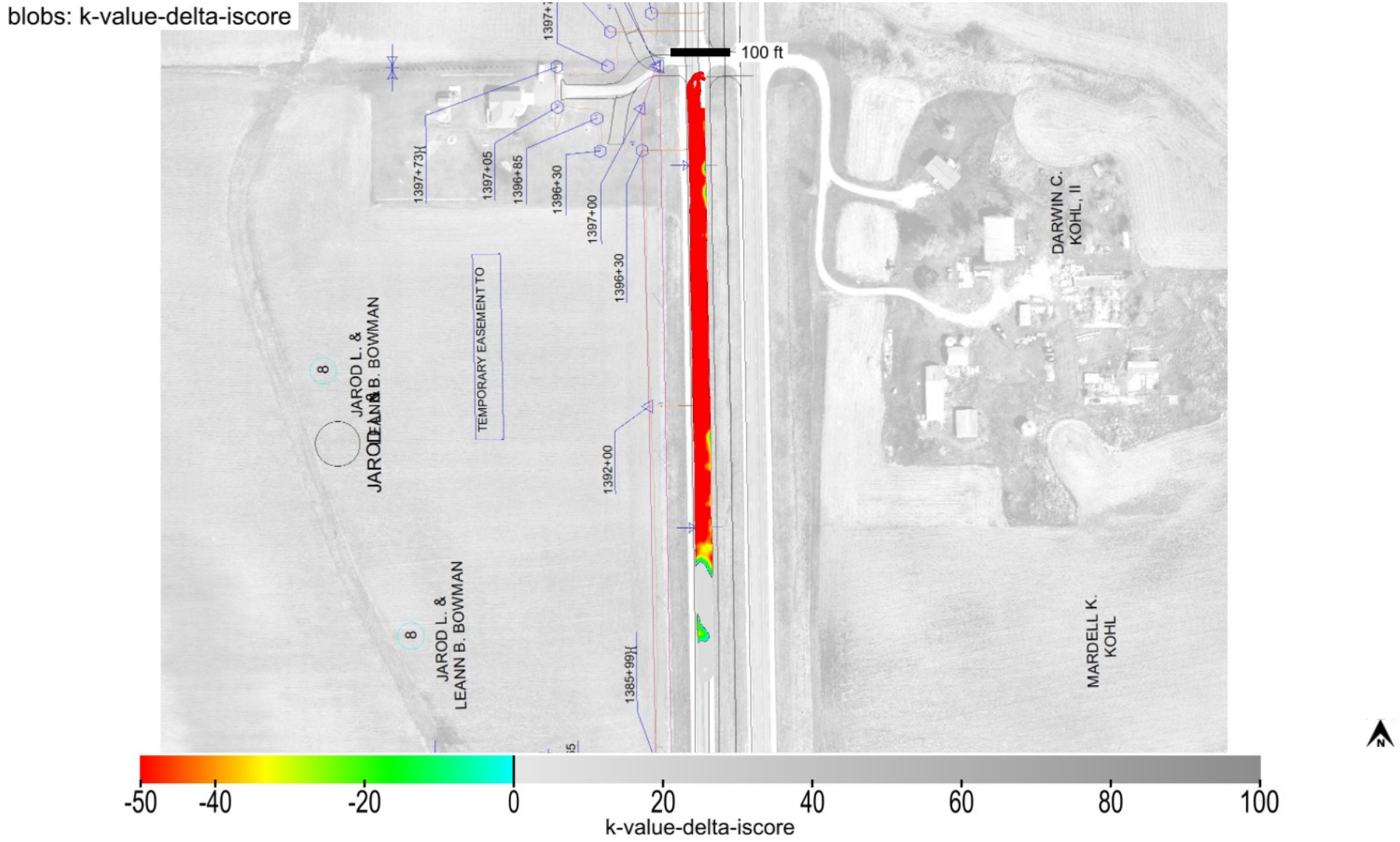
k-value-delta-iscore



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

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_190031a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	2	23162	83.52	none	0

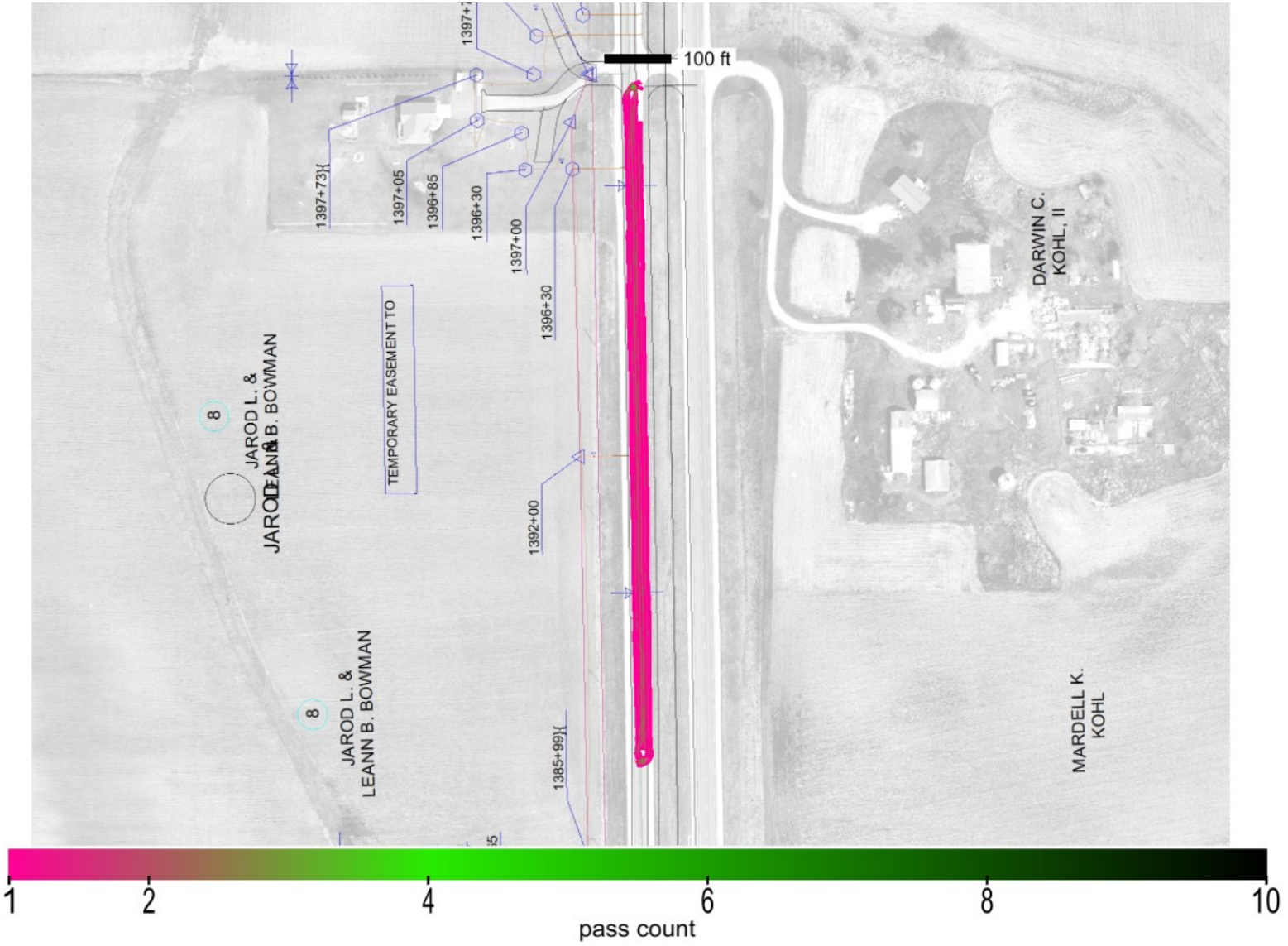


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_190031a

minimum	average	maximum
1	1.27	5

pass count



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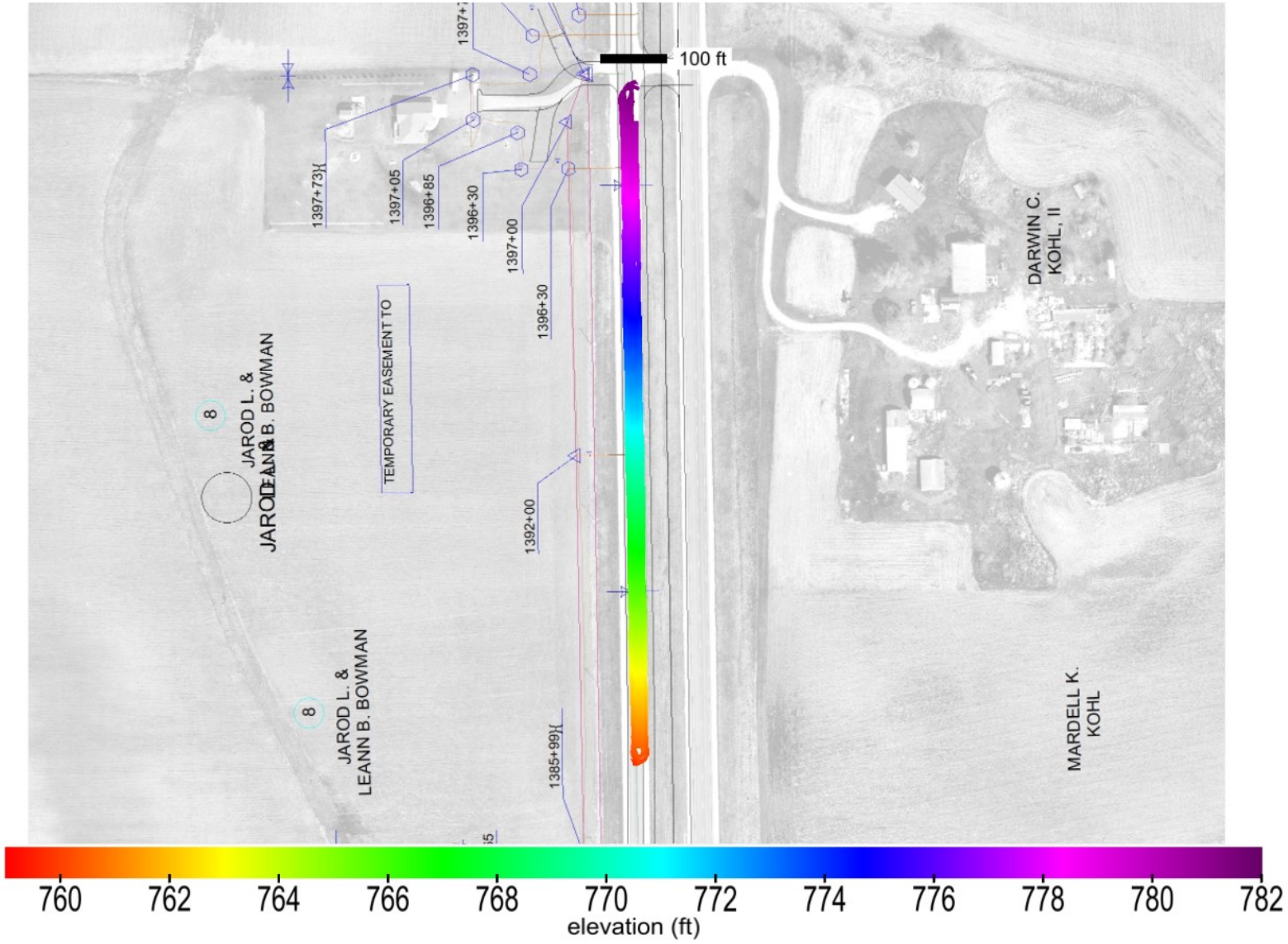
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_190031a

minimum	average	maximum
759.739	771.011	781.363

elevation



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

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_19_190031a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	27733	0.637	12	8554	150	40

materials

Granular Subbase_IADOT (2111)

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

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.27	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_20_072643a	No. of Measurements:	29878	Machine ID:	Ingios_FCS00210
Date and Time:	8/20/2020 7:26:43 AM	Location:	Linn County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	Yes	87.8	92.04	0.59	8554	5500	24428.8	56000	12608.21	51.61	-3054	15874.8	47446
k-value	Yes	19.2	27.54	0.2	150	55	107.4	202	46.6	43.39	-95	-42.6	52
Moisture Content	No												

Mapped Area

square feet	acres
29878	0.69

Pass Count

min.	avg.	max.
1	1.17	5

Elevation (ft)

min.	avg.	max.
762.06	773.3	783.65

Velocity (fps)

min.	avg.	max.
1.54	5.48	5.99

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	29878	0.686	12	8554	150	40

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IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.27	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_20_072643a	No. of Measurements:	29878	Machine ID:	Ingios_FCS00210
Date and Time:	8/20/2020 7:26:43 AM	Location:	Linn County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
92.04	CQI > = 95
87.8	80% of Resilient Modulus MVs >= 8554
51.61	COV <= 20
1.36	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.27	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_20_072643a	No. of Measurements:	29878	Machine ID:	Ingios_FCS00210
Date and Time:	8/20/2020 7:26:43 AM	Location:	Linn County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
27.54	CQI > = 95
19.2	80% of k-Value MVs >= 150
43.39	COV <= 20
84.52	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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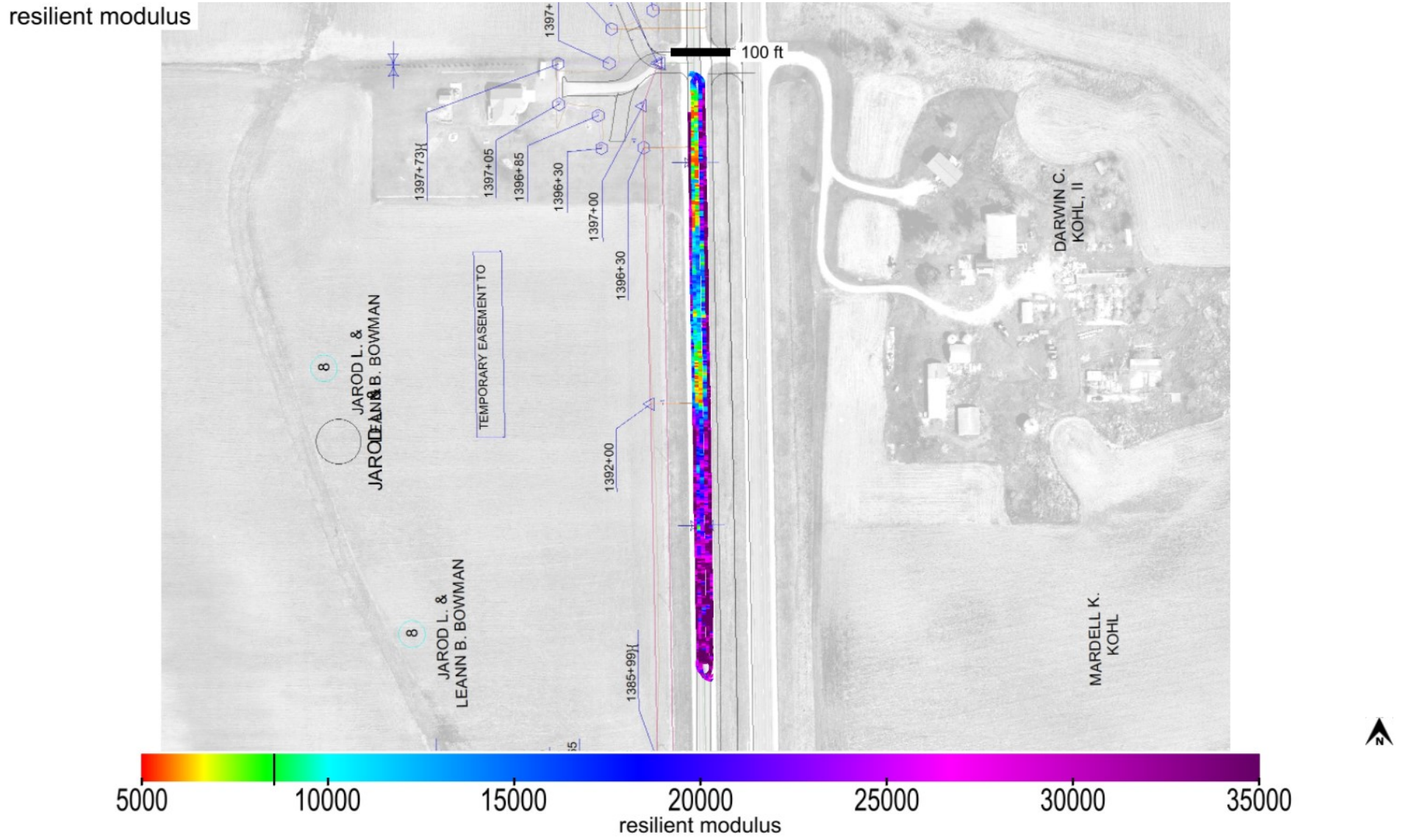
ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_072643a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	87.8	92.04	0.59	8554	5500	24428.8	56000	12608.21	51.61	-3054	15874.8	47446



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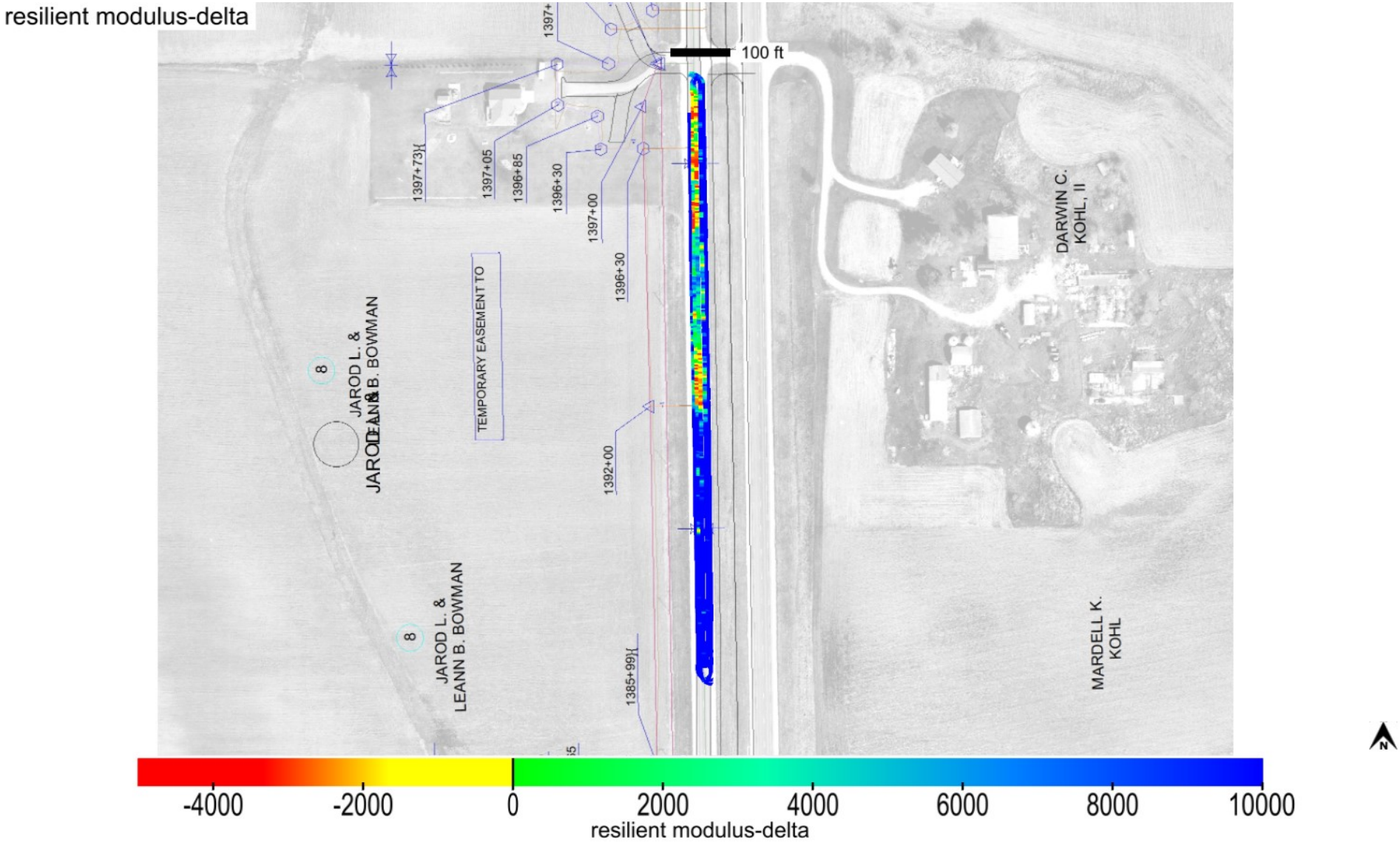
ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_072643a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	87.8	92.04	0.59	8554	5500	24428.8	56000	12608.21	51.61	-3054	15874.8	47446



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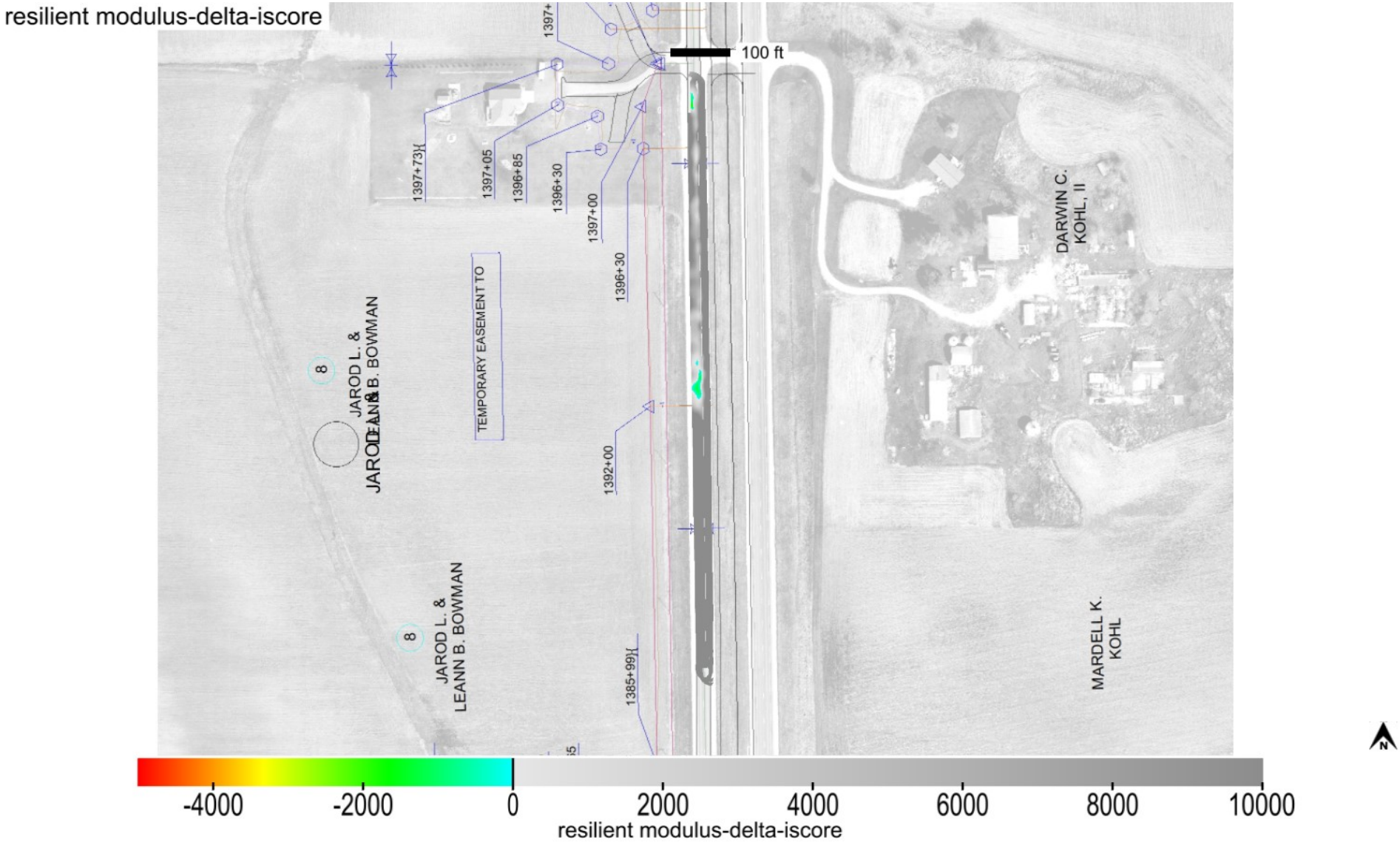
ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_072643a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	87.8	8554	-3054	15874.8	47446	-1866.12	15328.23	45103.72



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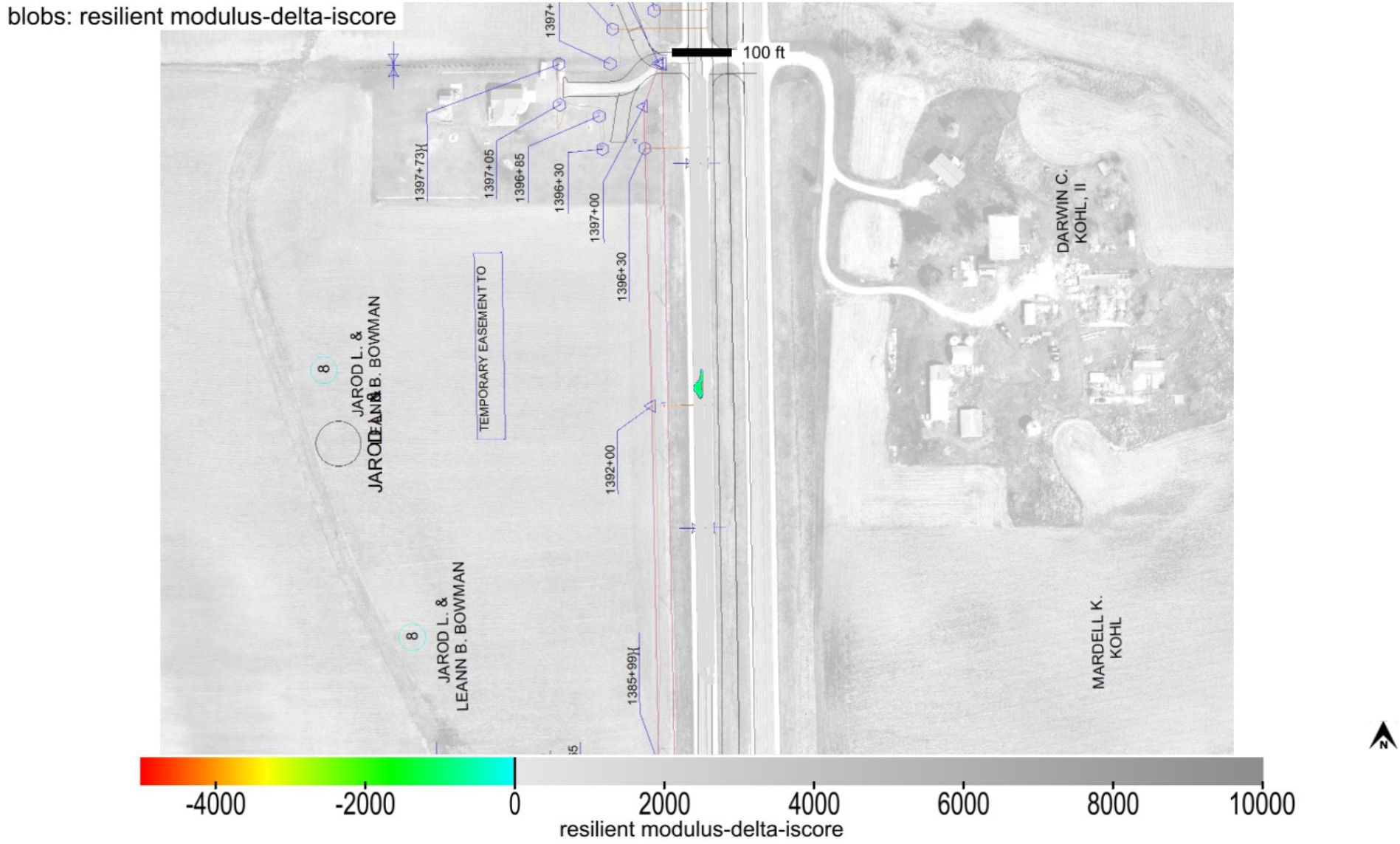
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_072643a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	407	1.36	none	0



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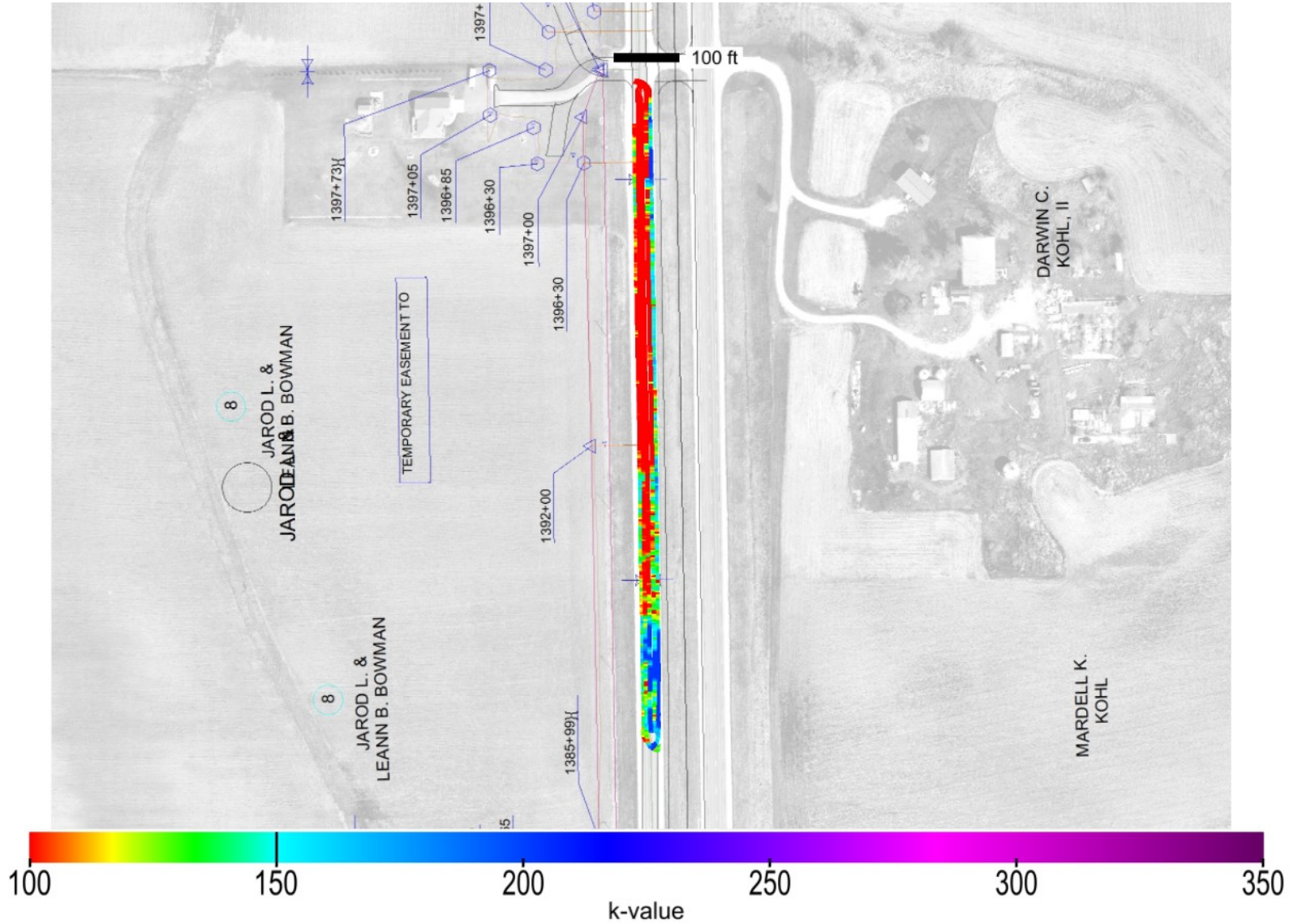
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_072643a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	19.2	27.54	0.2	150	55	107.4	202	46.6	43.39	-95	-42.6	52

k-value



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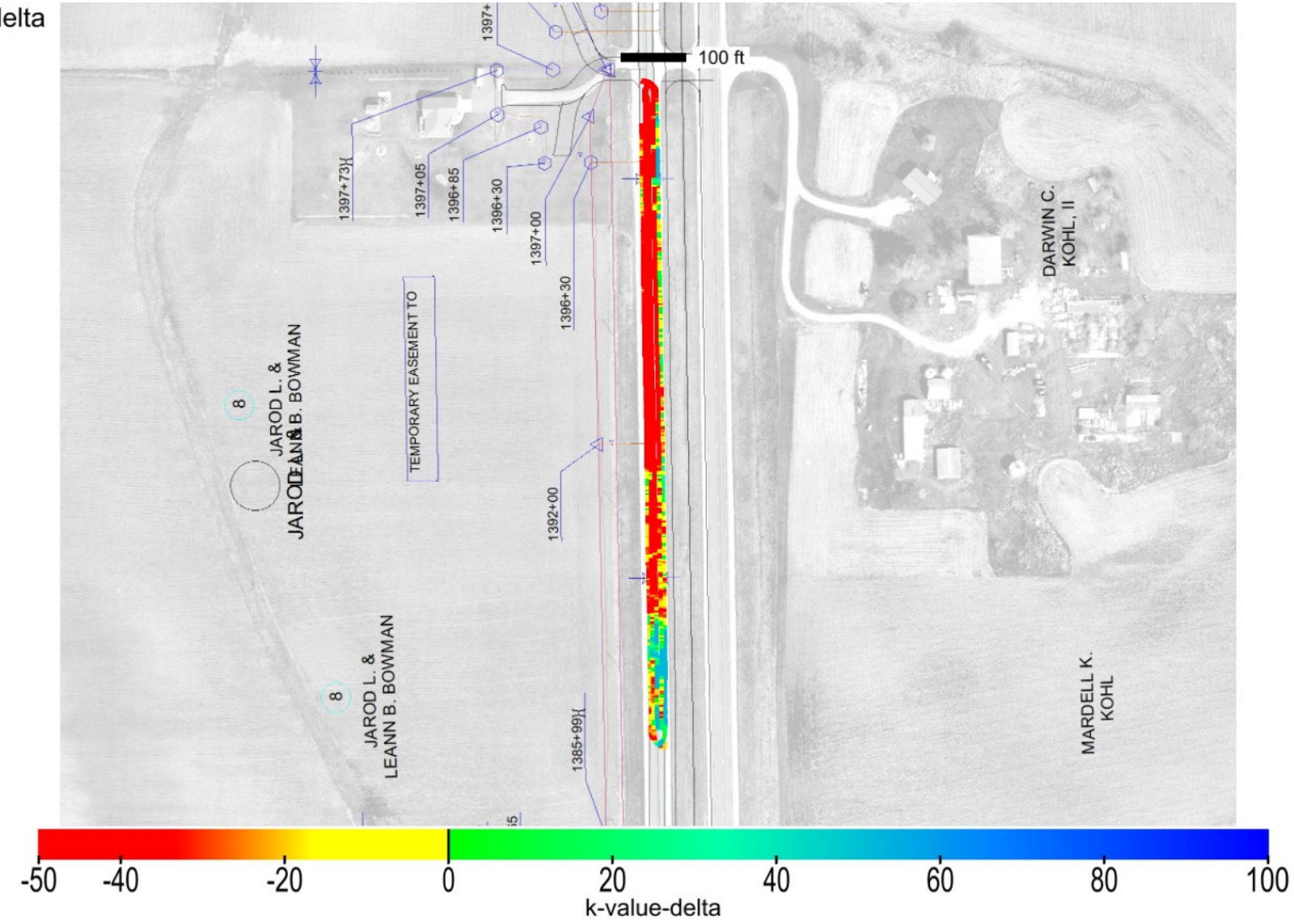
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_072643a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	19.2	27.54	0.2	150	55	107.4	202	46.6	43.39	-95	-42.6	52

k-value-delta



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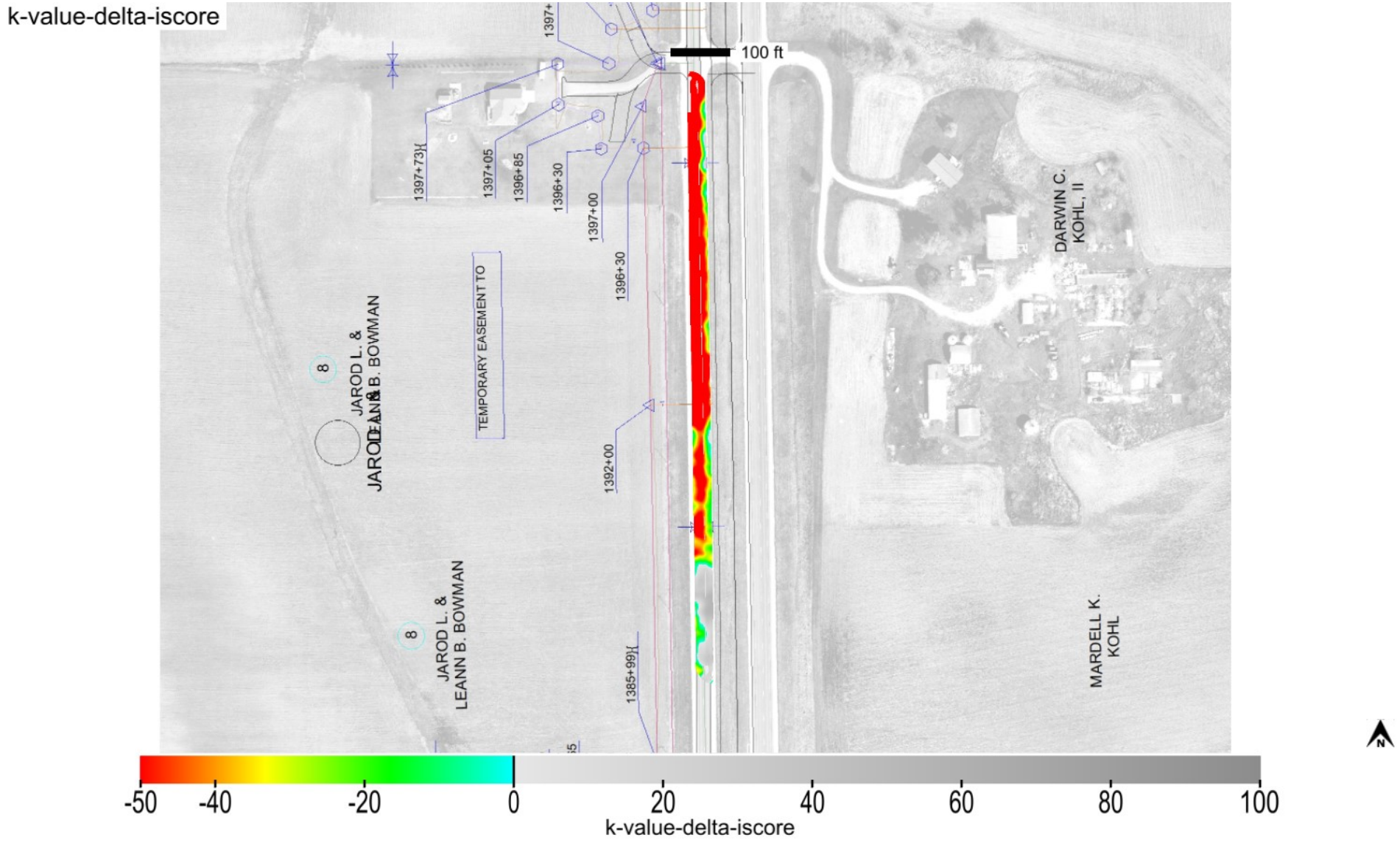
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_072643a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	19.2	150	-95	-42.6	52	-95	-44.39	52



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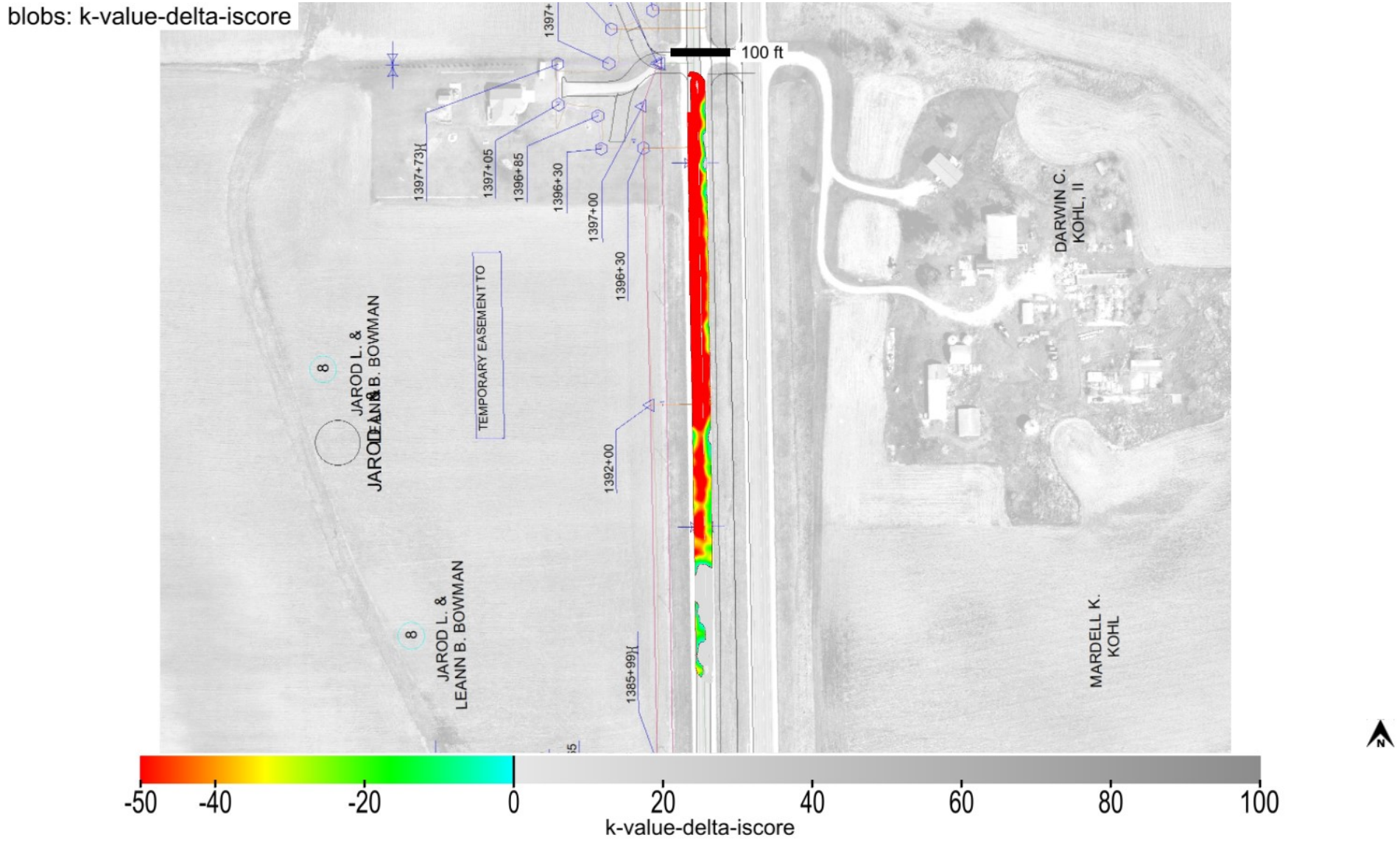
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_072643a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	2	25252	84.52	none	0



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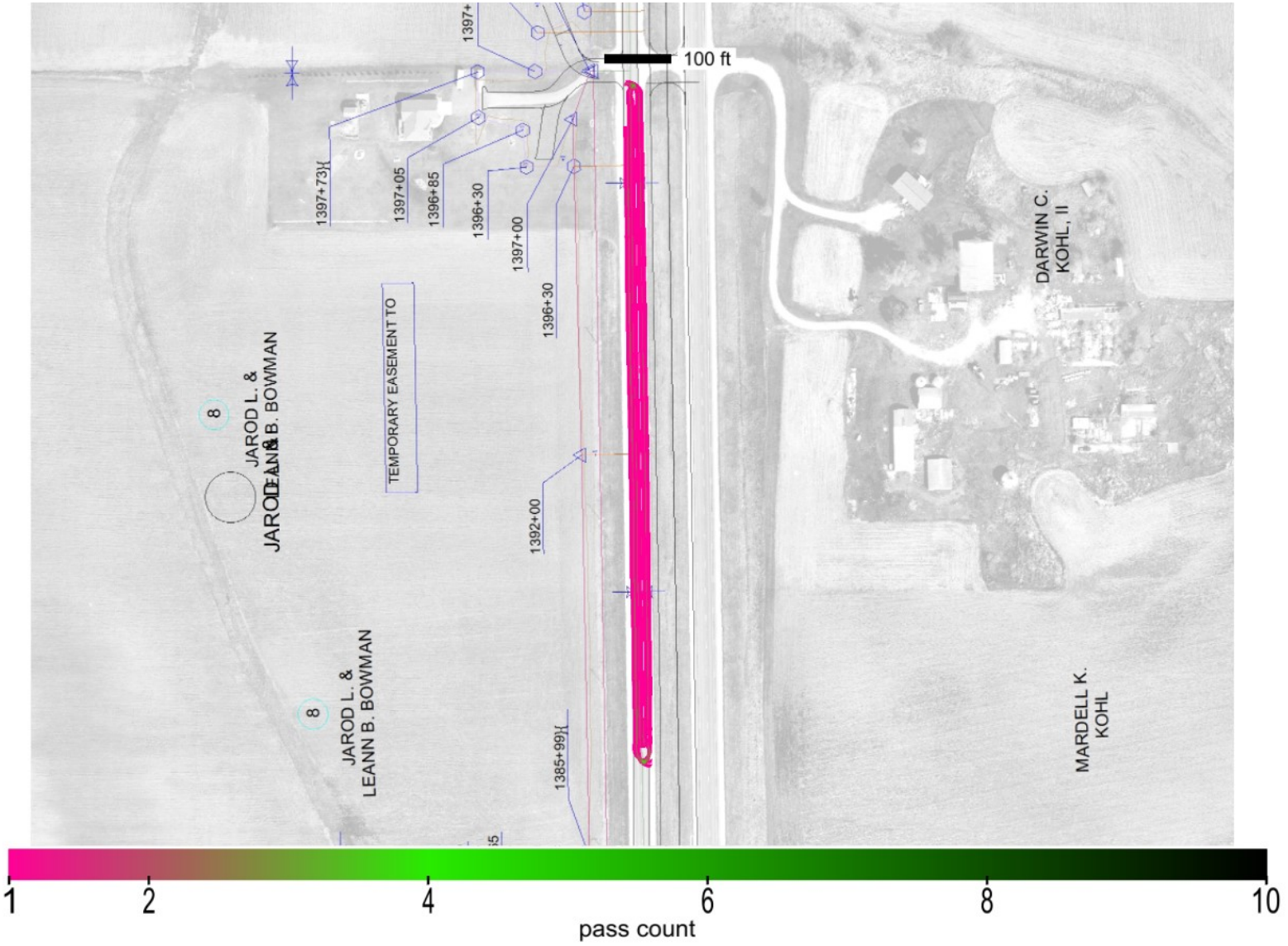
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_072643a

minimum	average	maximum
1	1.17	5

pass count



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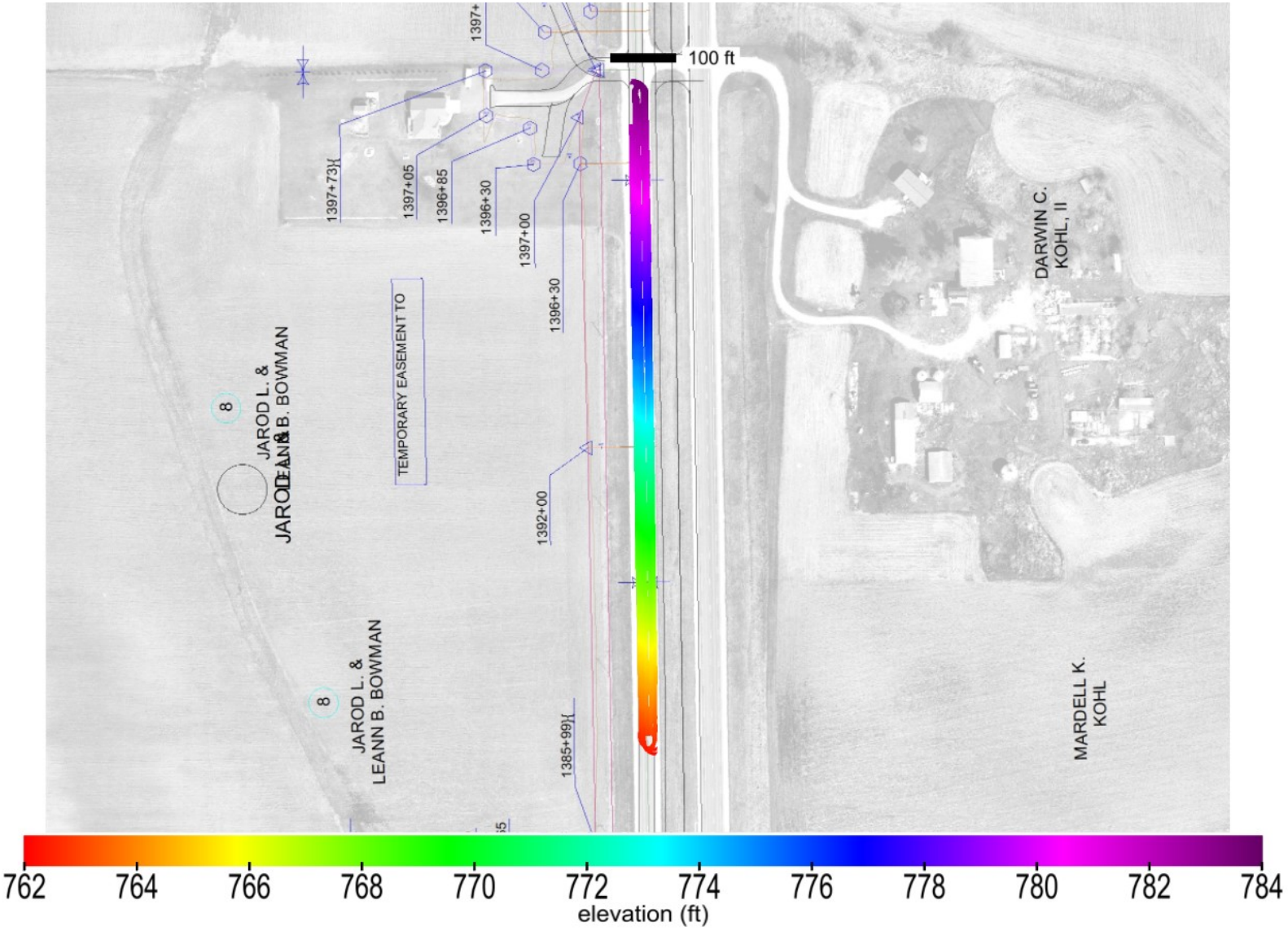
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_072643a

minimum	average	maximum
762.062	773.301	783.65

elevation



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Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_072643a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	29878	0.686	12	8554	150	40

materials

Granular Subbase_IADOT (2111)

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IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.27	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_20_074338a	No. of Measurements:	27269	Machine ID:	Ingios_FCS00210
Date and Time:	8/20/2020 7:43:38 AM	Location:	Linn County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	Yes	83.7	83.42	0.5	8554	5500	21839.3	56000	13224.36	60.55	-3054	13285.3	47446
k-value	Yes	17.9	23.42	0.14	150	55	100	202	48.99	49	-95	-50	52
Moisture Content	No												

Mapped Area

square feet	acres
27269	0.63

Pass Count

min.	avg.	max.
1	1.3	4

Elevation (ft)

min.	avg.	max.
761.85	773.32	783.6

Velocity (fps)

min.	avg.	max.
0.51	5.47	6.14

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	27269	0.626	12	8554	150	40

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IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.27	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_20_074338a	No. of Measurements:	27269	Machine ID:	Ingios_FCS00210
Date and Time:	8/20/2020 7:43:38 AM	Location:	Linn County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
83.42	CQI > = 95
83.7	80% of Resilient Modulus MVs >= 8554
60.55	COV <= 20
8.56	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.27	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_20_074338a	No. of Measurements:	27269	Machine ID:	Ingios_FCS00210
Date and Time:	8/20/2020 7:43:38 AM	Location:	Linn County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
23.42	CQI > = 95
17.9	80% of k-Value MVs >= 150
49	COV <= 20
83.21	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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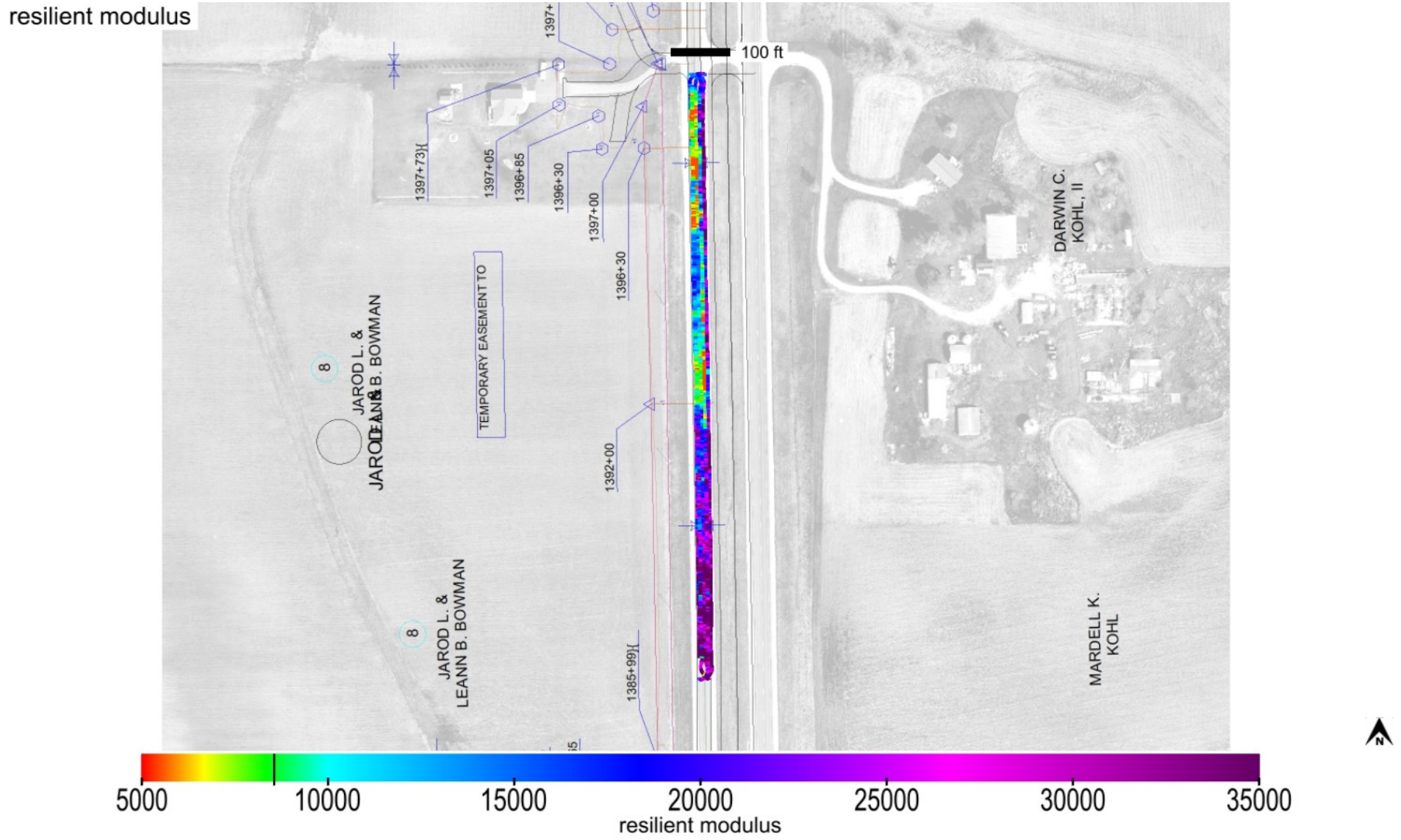
ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_074338a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	83.7	83.42	0.5	8554	5500	21839.3	56000	13224.36	60.55	-3054	13285.3	47446



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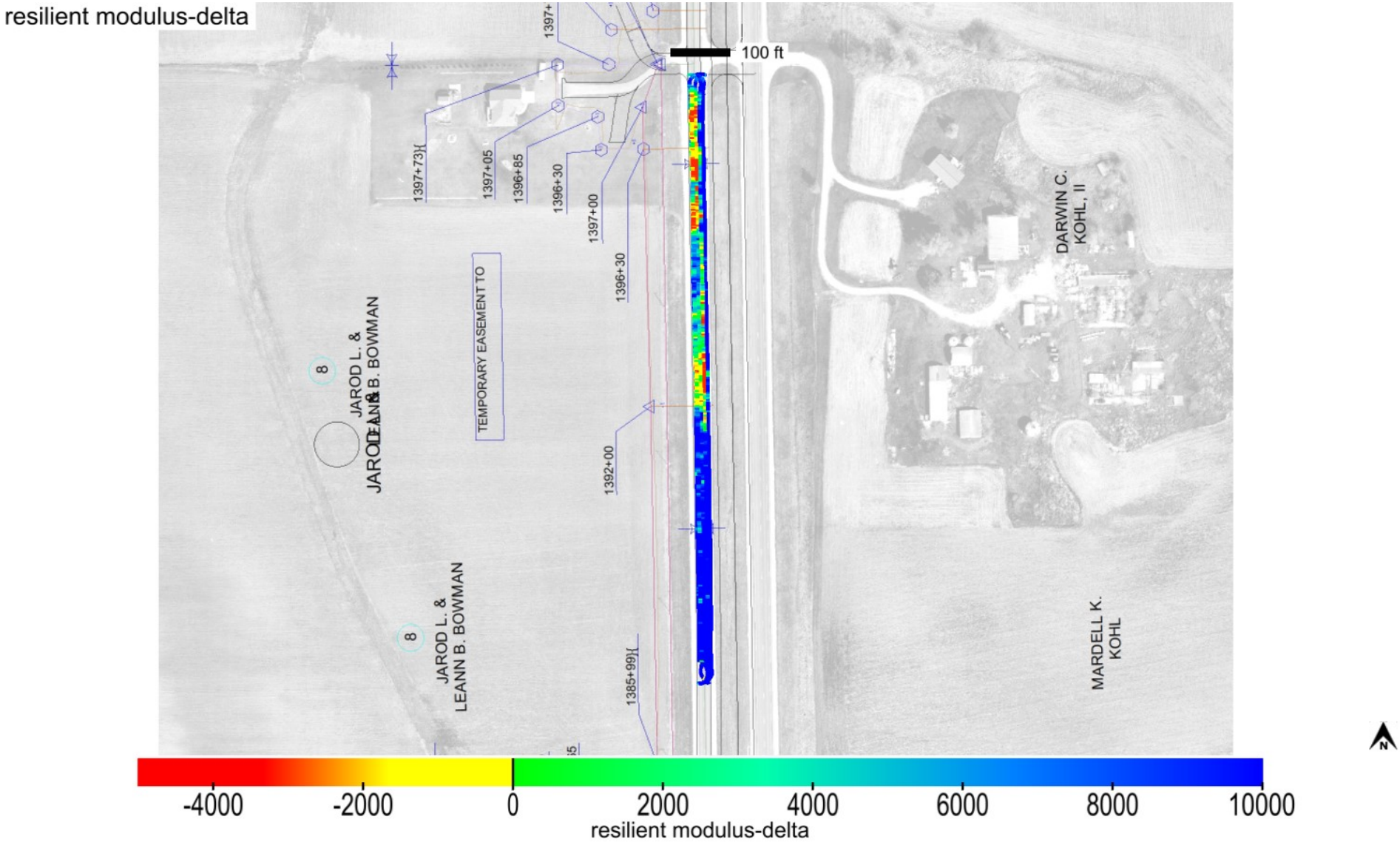
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_074338a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	83.7	83.42	0.5	8554	5500	21839.3	56000	13224.36	60.55	-3054	13285.3	47446



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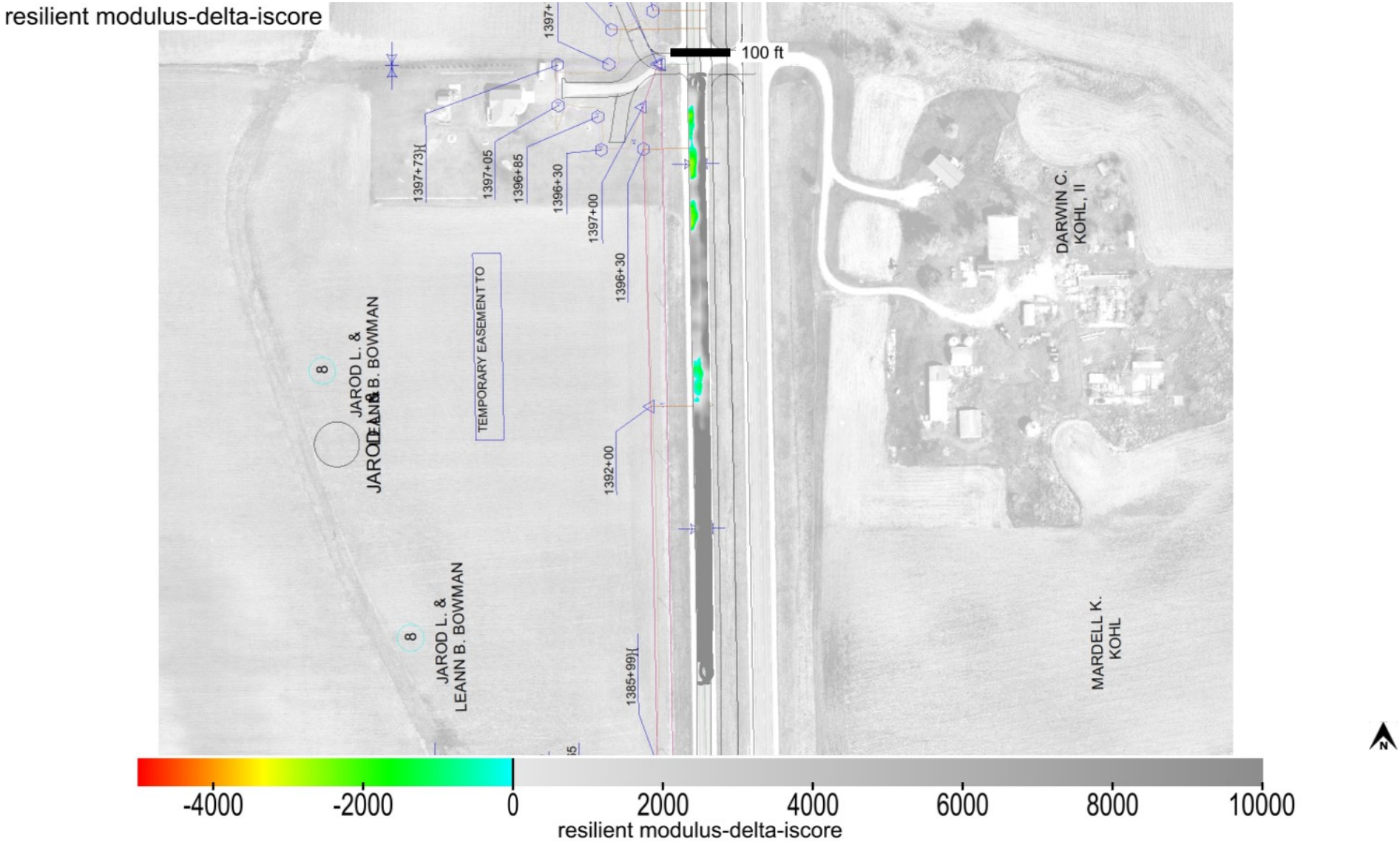
ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_074338a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	83.7	8554	-3054	13285.3	47446	-2838.8	12917.12	43111.39



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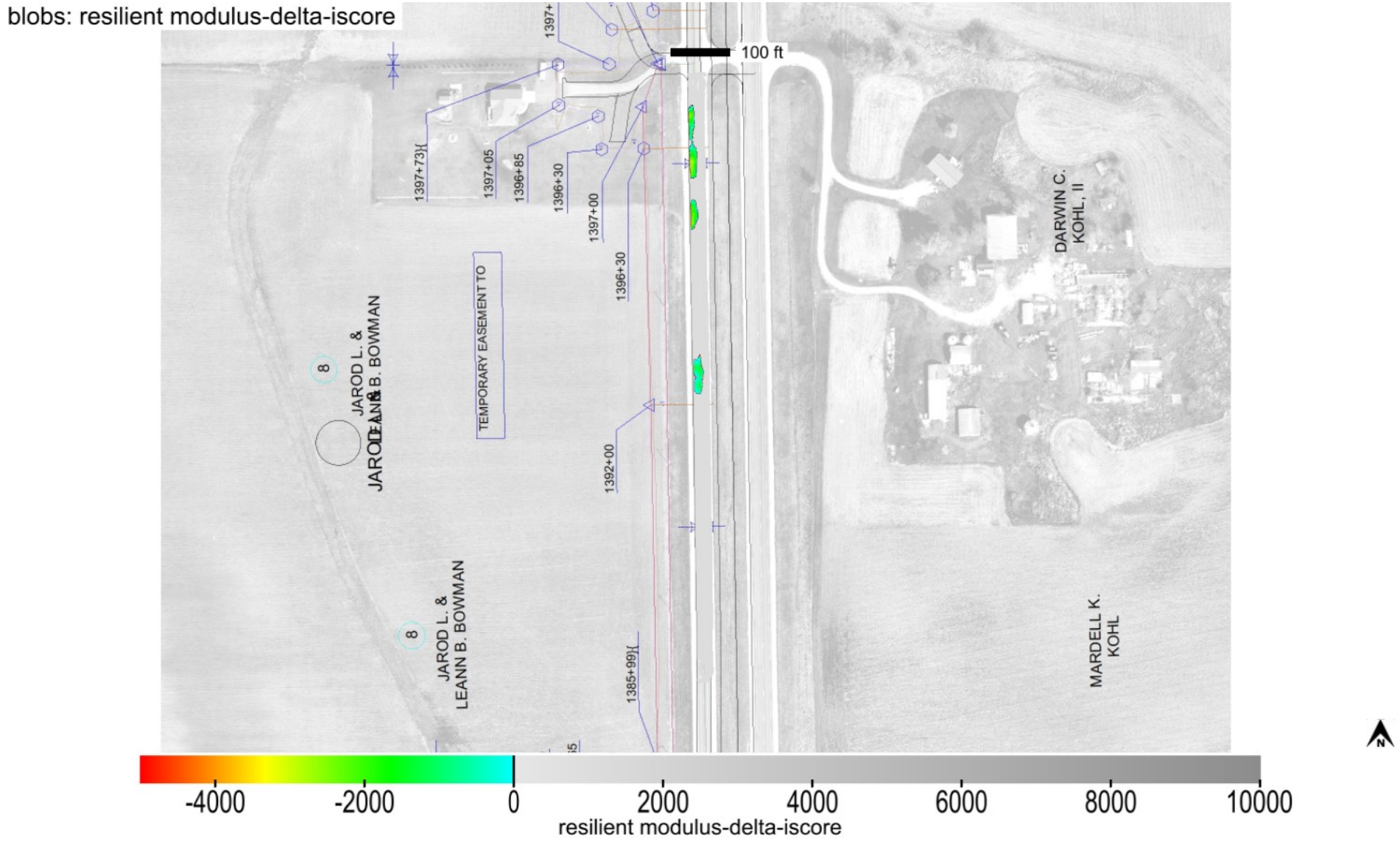
ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_074338a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	3	2335	8.56	none	0

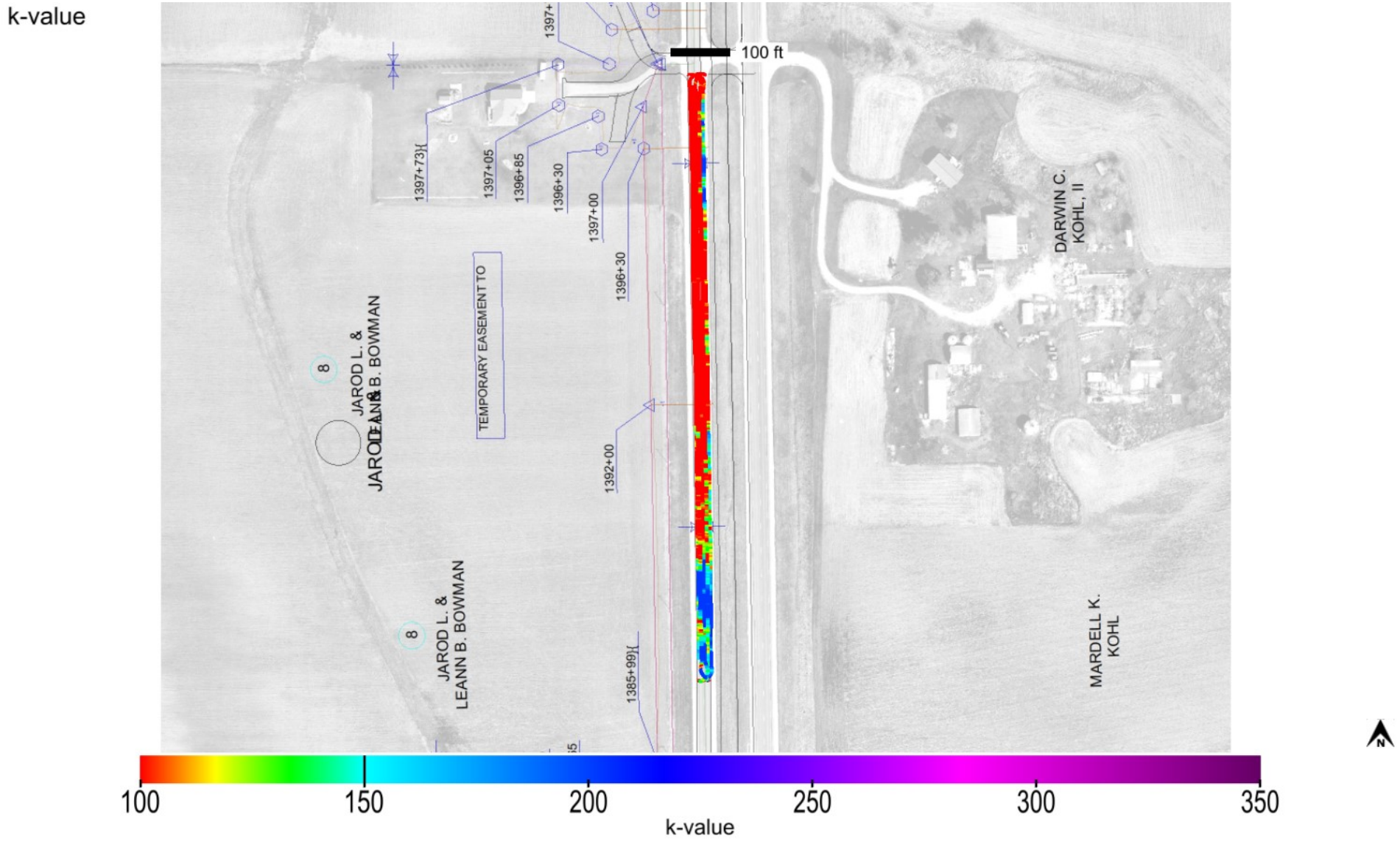


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_074338a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	17.9	23.42	0.14	150	55	100	202	48.99	49	-95	-50	52



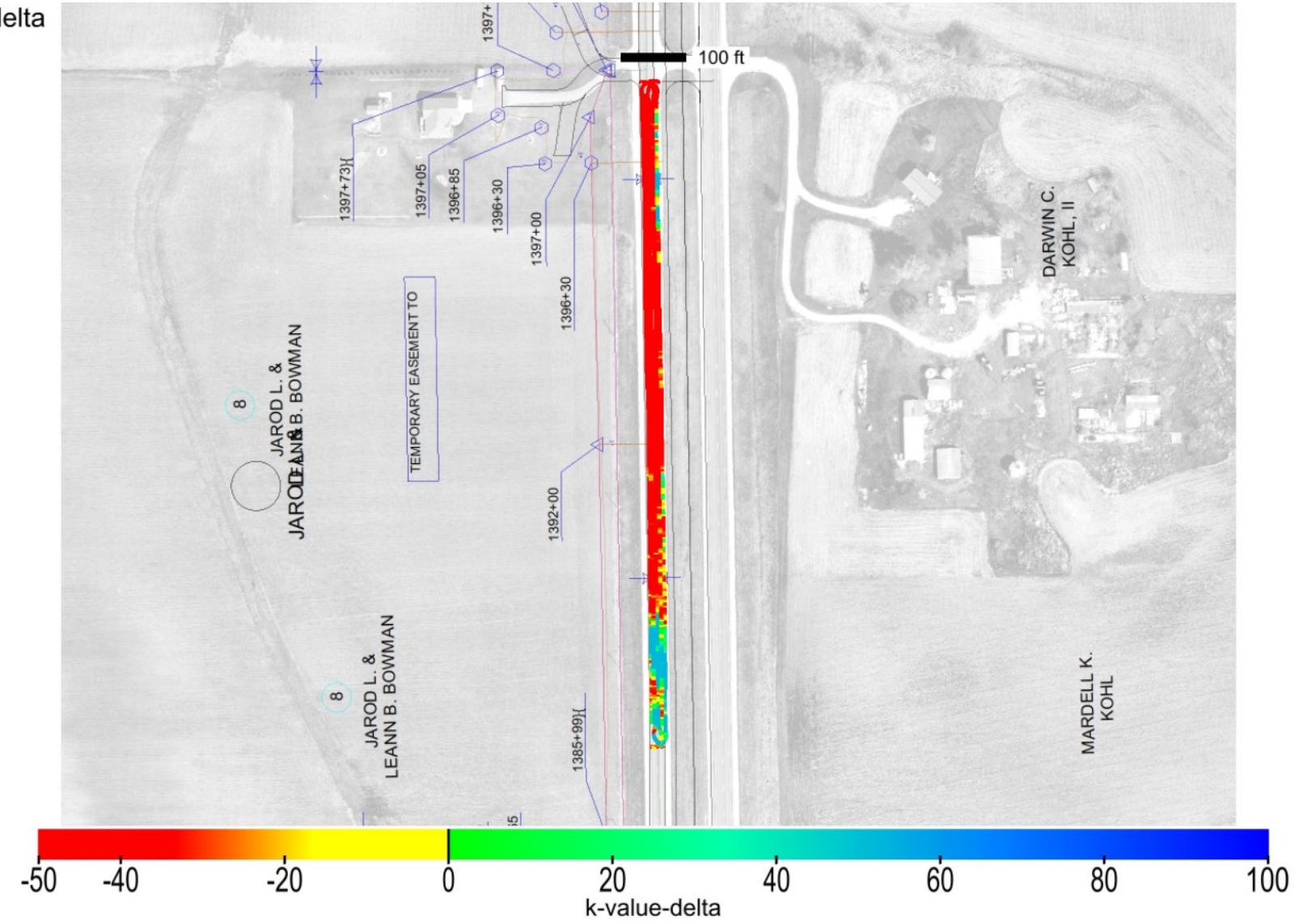
This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_074338a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	17.9	23.42	0.14	150	55	100	202	48.99	49	-95	-50	52

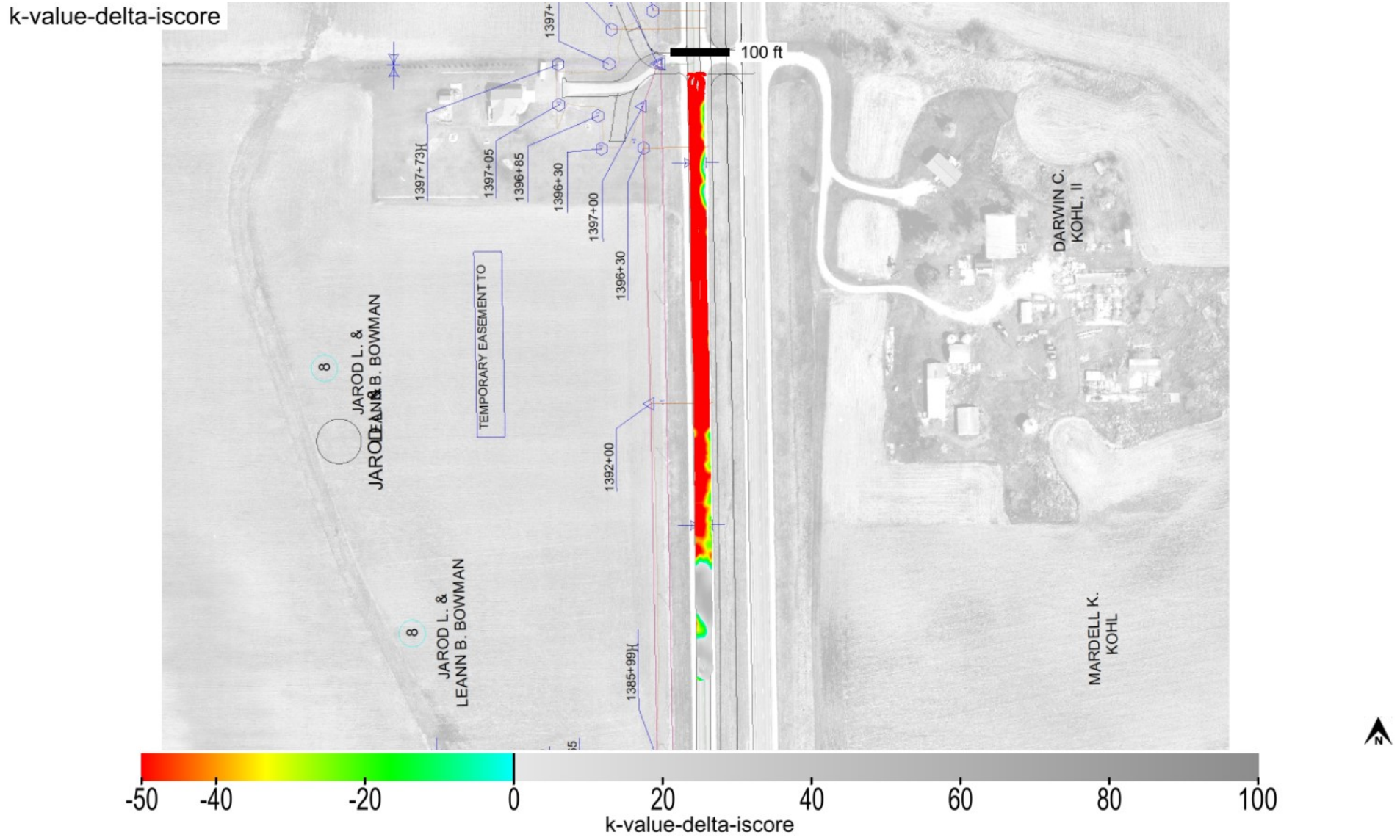
k-value-delta



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

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_074338a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	17.9	150	-95	-50	52	-95	-51.05	52

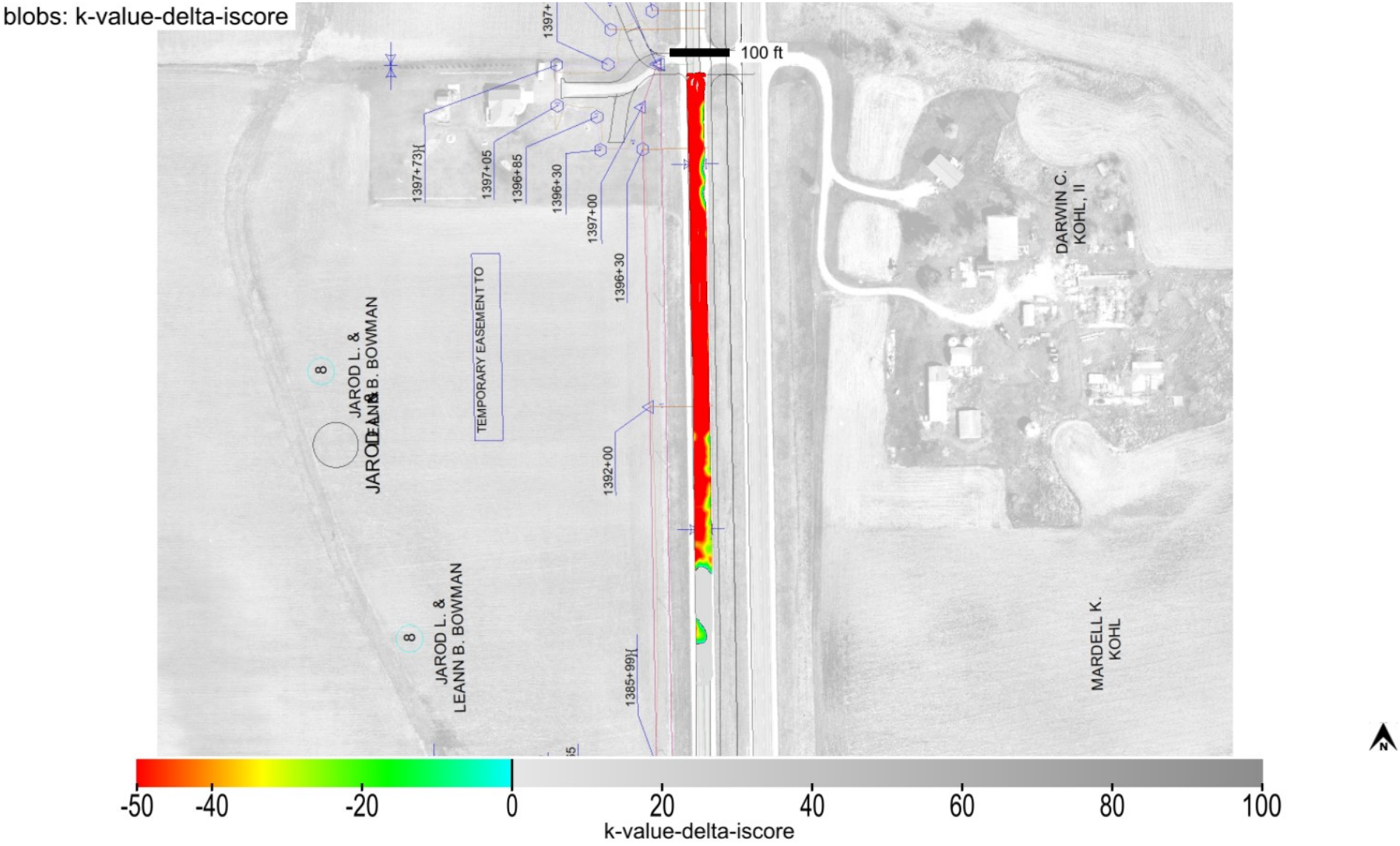


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_074338a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	2	22691	83.21	none	0

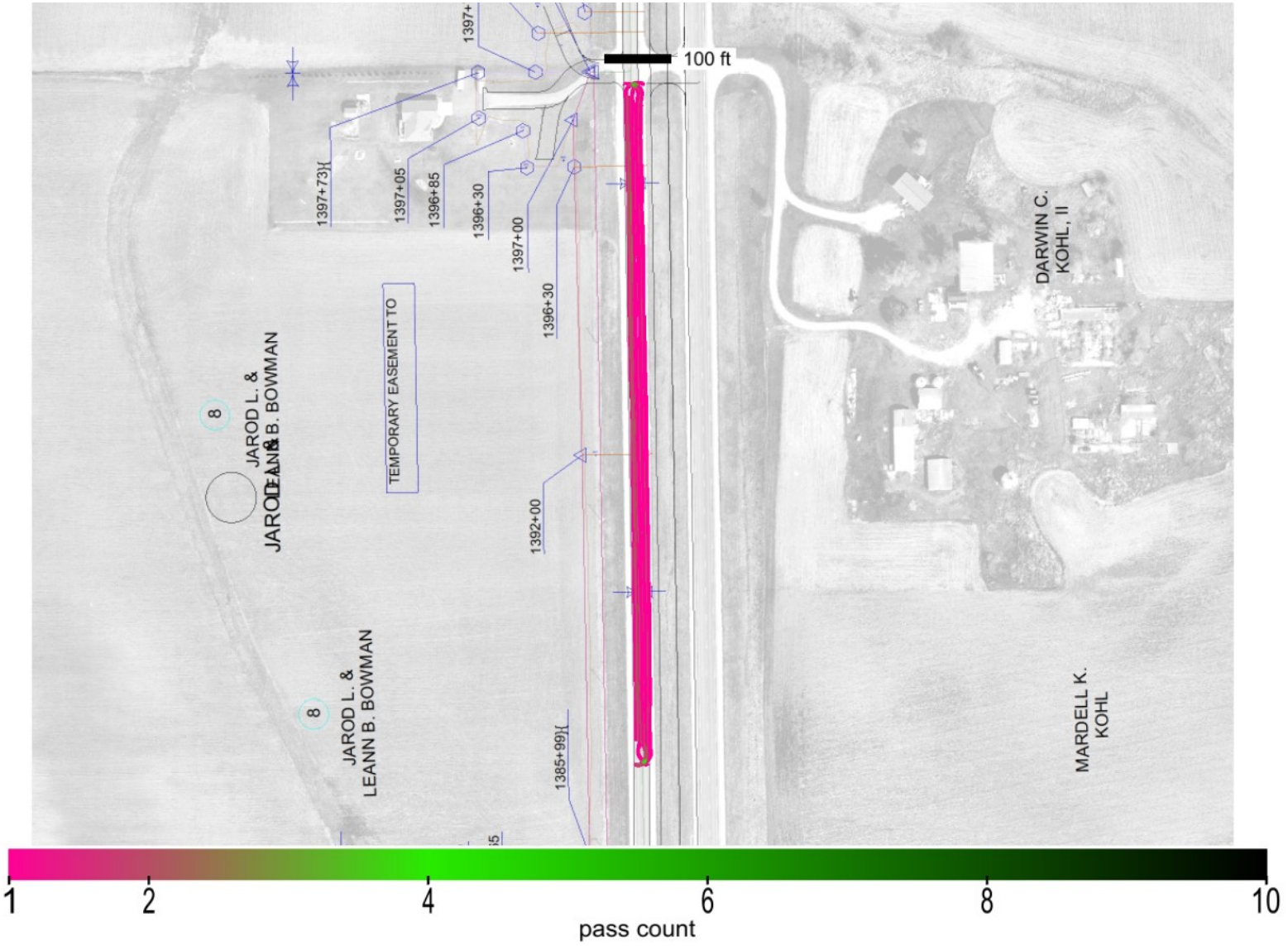


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_074338a

minimum	average	maximum
1	1.3	4

pass count



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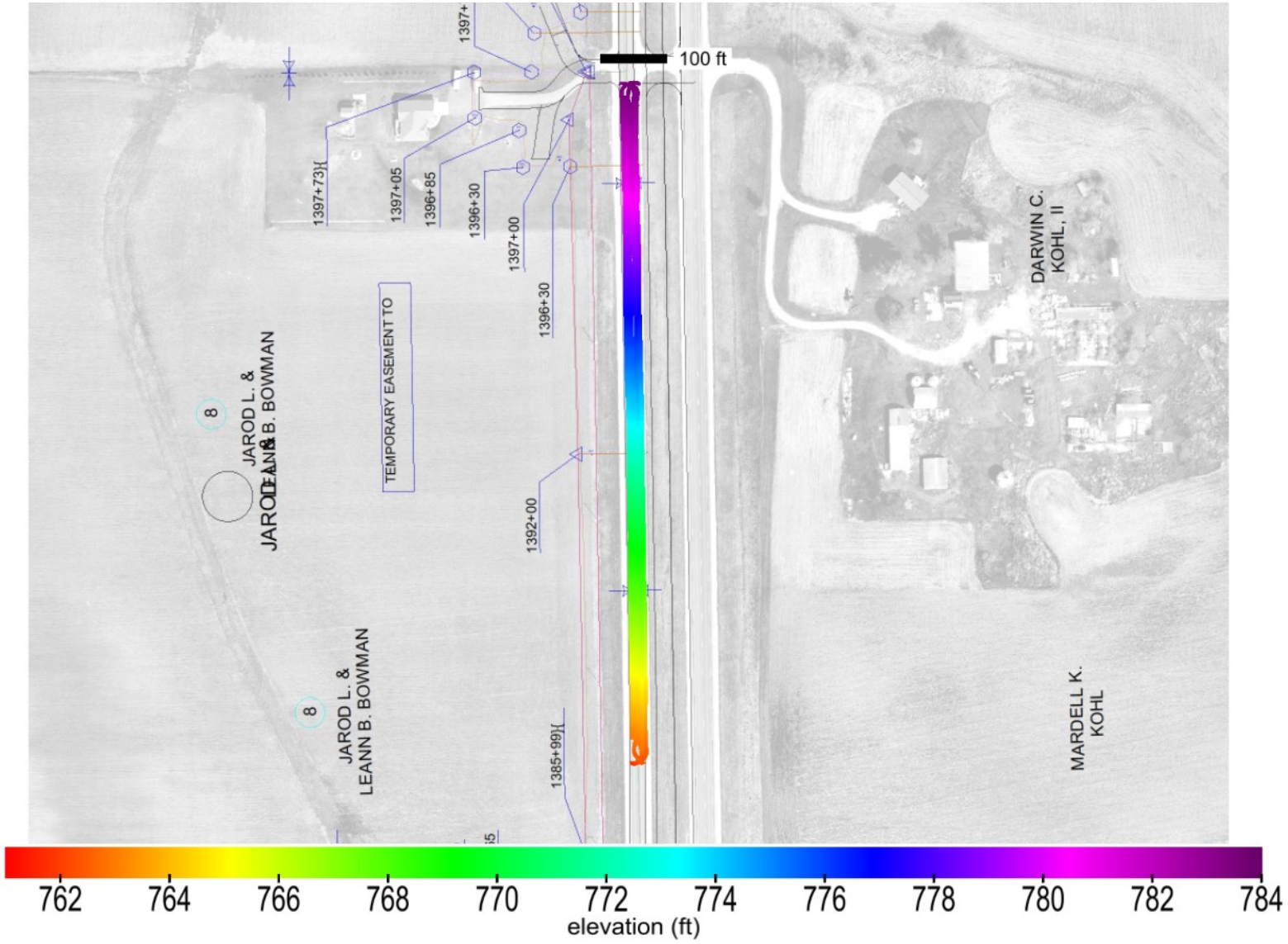
ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_074338a

minimum	average	maximum
761.849	773.325	783.601

elevation



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

ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_074338a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	27269	0.626	12	8554	150	40

materials

Granular Subbase_IADOT (2111)

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

IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.59	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_20_095207a	No. of Measurements:	6558	Machine ID:	Ingios_FCS00210
Date and Time:	8/20/2020 9:52:07 AM	Location:	Linn County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	Yes	100	118.34	1.33	8554	10171.13	28272.4	56000	6596.67	23.33	1617.13	19718.4	47446
k-value	Yes	6.3	25.49	0.46	150	55	113.8	189.57	24.68	21.68	-95	-36.2	39.57
Moisture Content	No												

Mapped Area

square feet	acres
6558	0.15

Pass Count

min.	avg.	max.
1	5.86	8

Elevation (ft)

min.	avg.	max.
786.24	791.6	797.3

Velocity (fps)

min.	avg.	max.
0.23	5.41	6

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	6558	0.151	12	8554	150	40

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

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.59	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_20_095207a	No. of Measurements:	6558	Machine ID:	Ingios_FCS00210
Date and Time:	8/20/2020 9:52:07 AM	Location:	Linn County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
118.34	CQI > = 95
100	80% of Resilient Modulus MVs >= 8554
23.33	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.59	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_20_095207a	No. of Measurements:	6558	Machine ID:	Ingios_FCS00210
Date and Time:	8/20/2020 9:52:07 AM	Location:	Linn County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
25.49	CQI > = 95
6.3	80% of k-Value MVs >= 150
21.68	COV <= 20
95.84	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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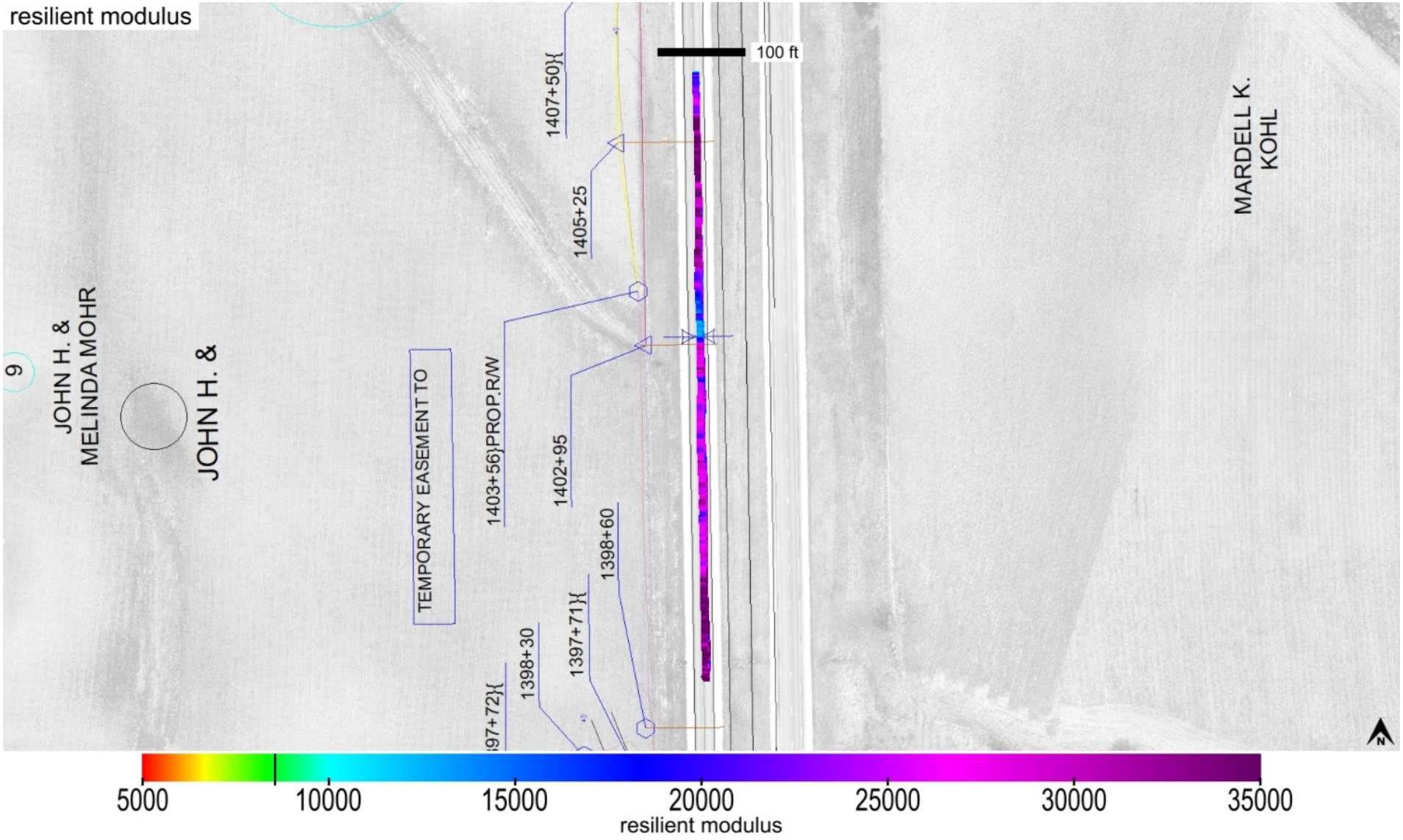
ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_095207a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	118.34	1.33	8554	10171.13	28272.4	56000	6596.67	23.33	1617.13	19718.4	47446



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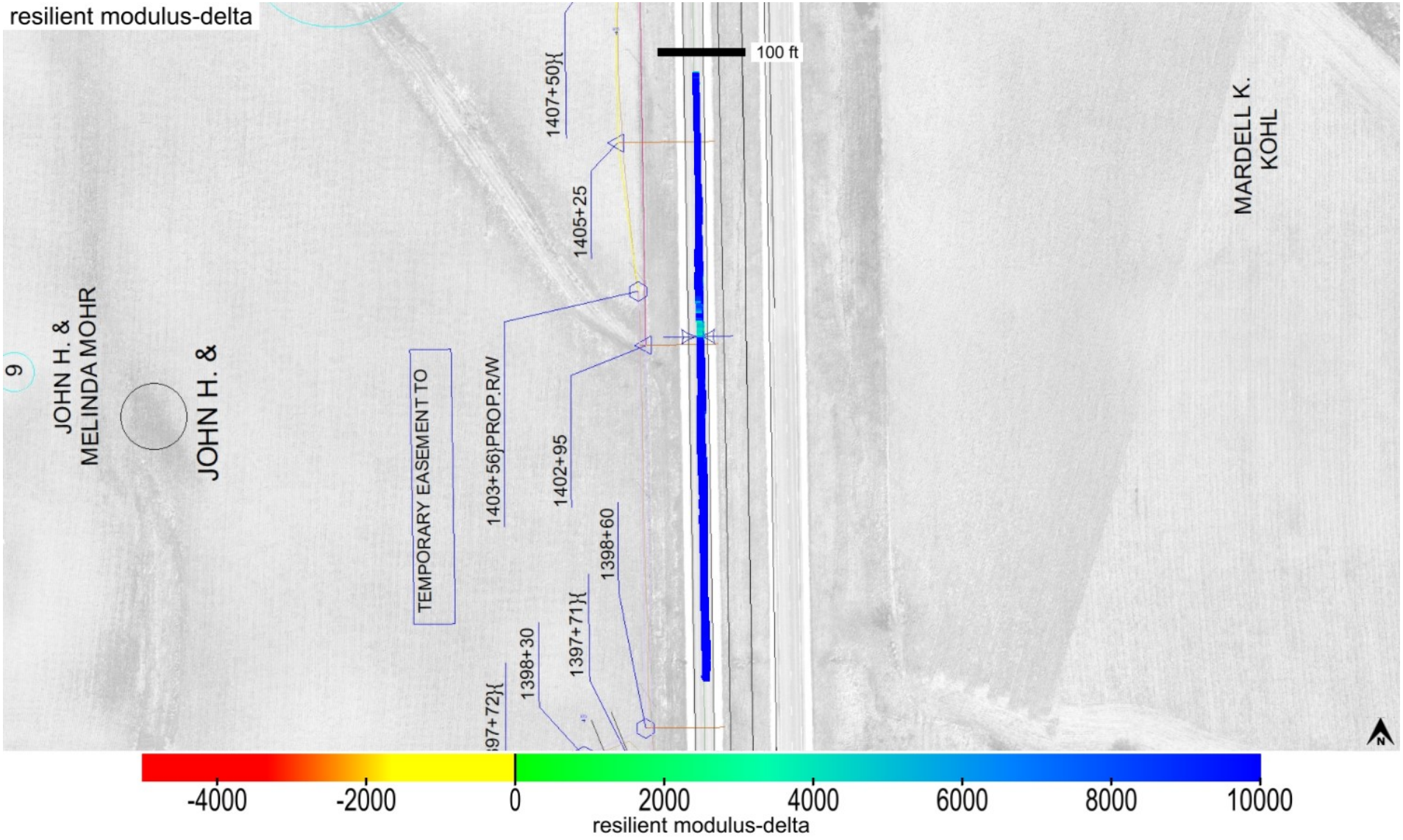
ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_095207a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	118.34	1.33	8554	10171.13	28272.4	56000	6596.67	23.33	1617.13	19718.4	47446



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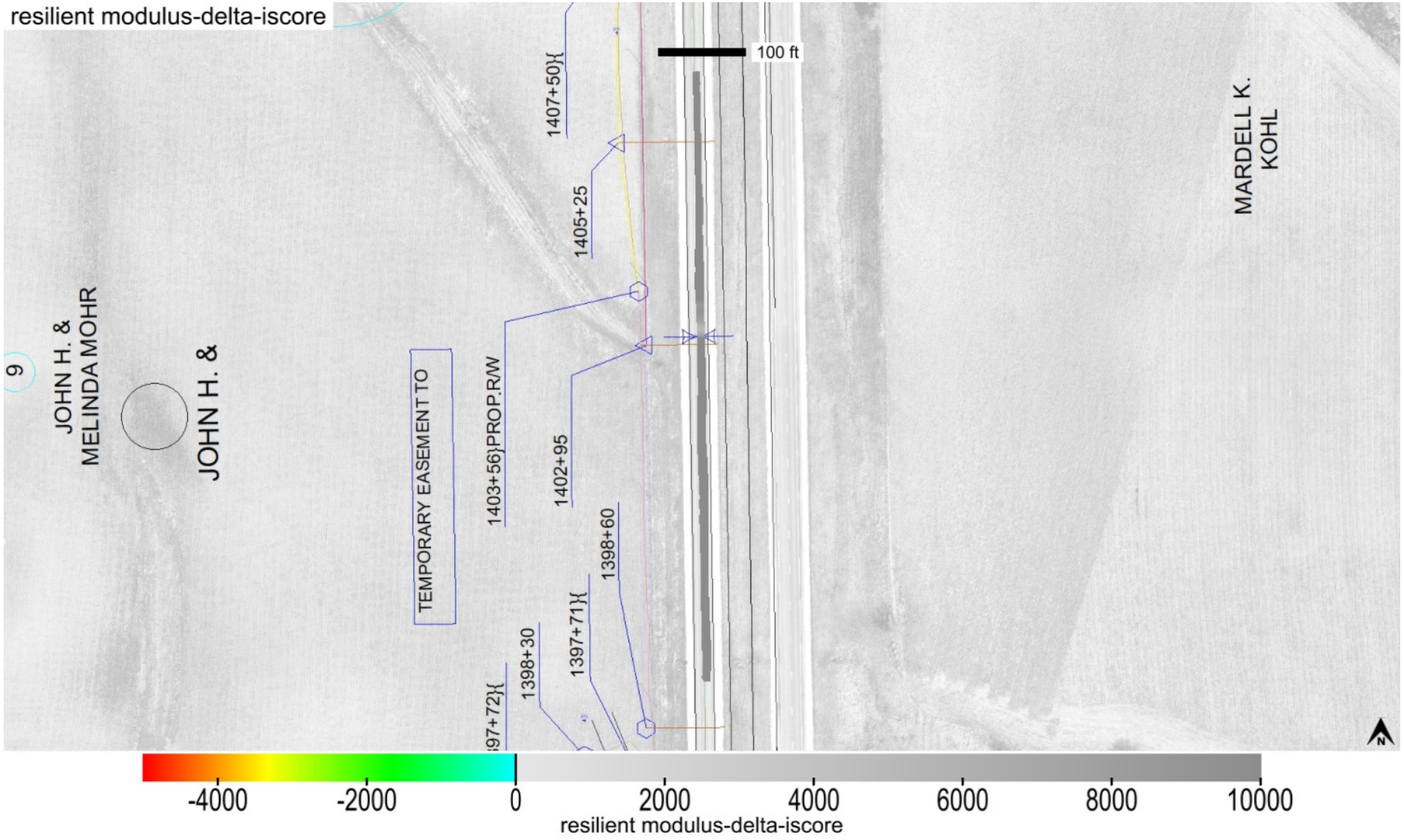
ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_095207a

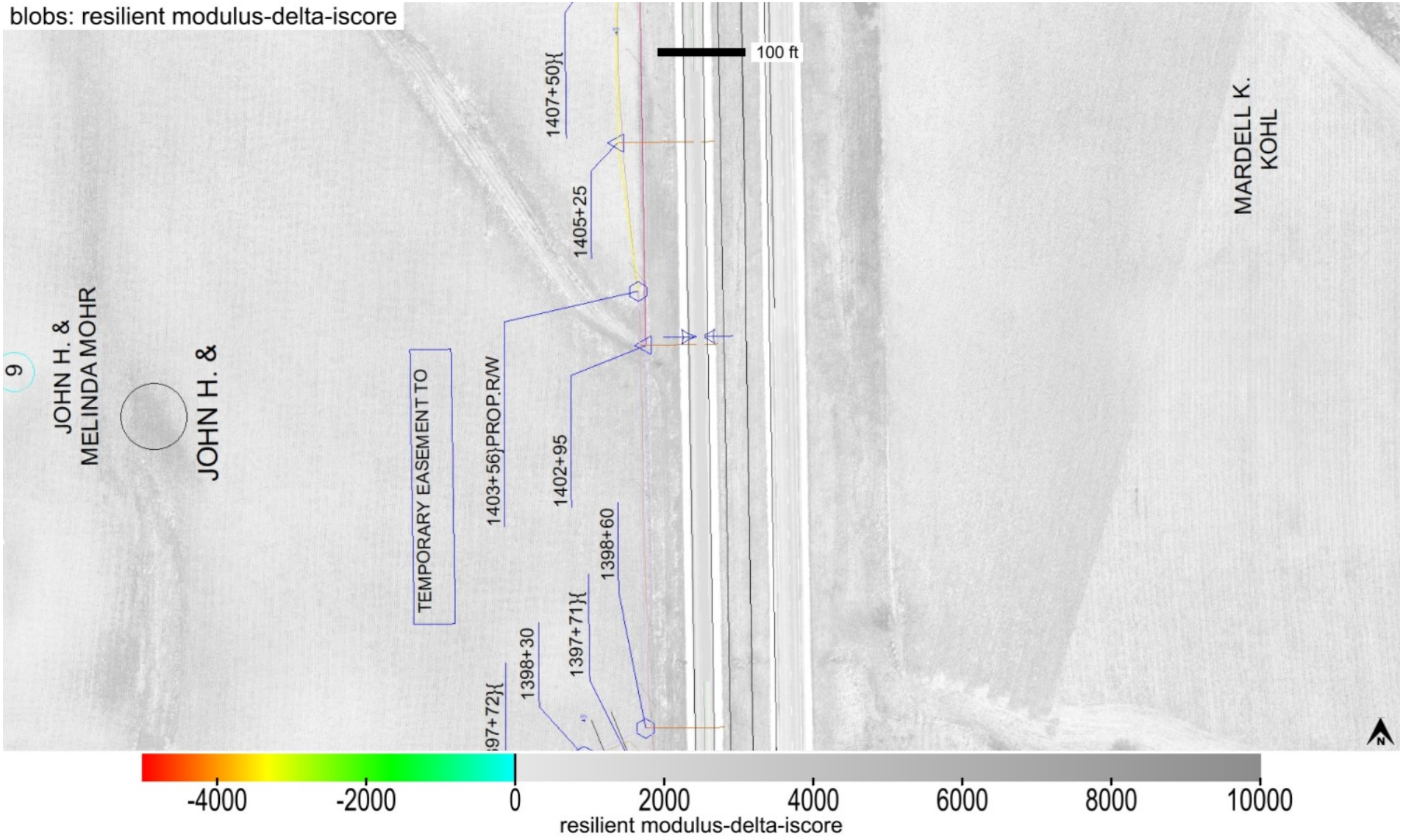
Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	100	8554	1617.13	19718.4	47446	4670.71	19727.23	32511.83



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

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_095207a

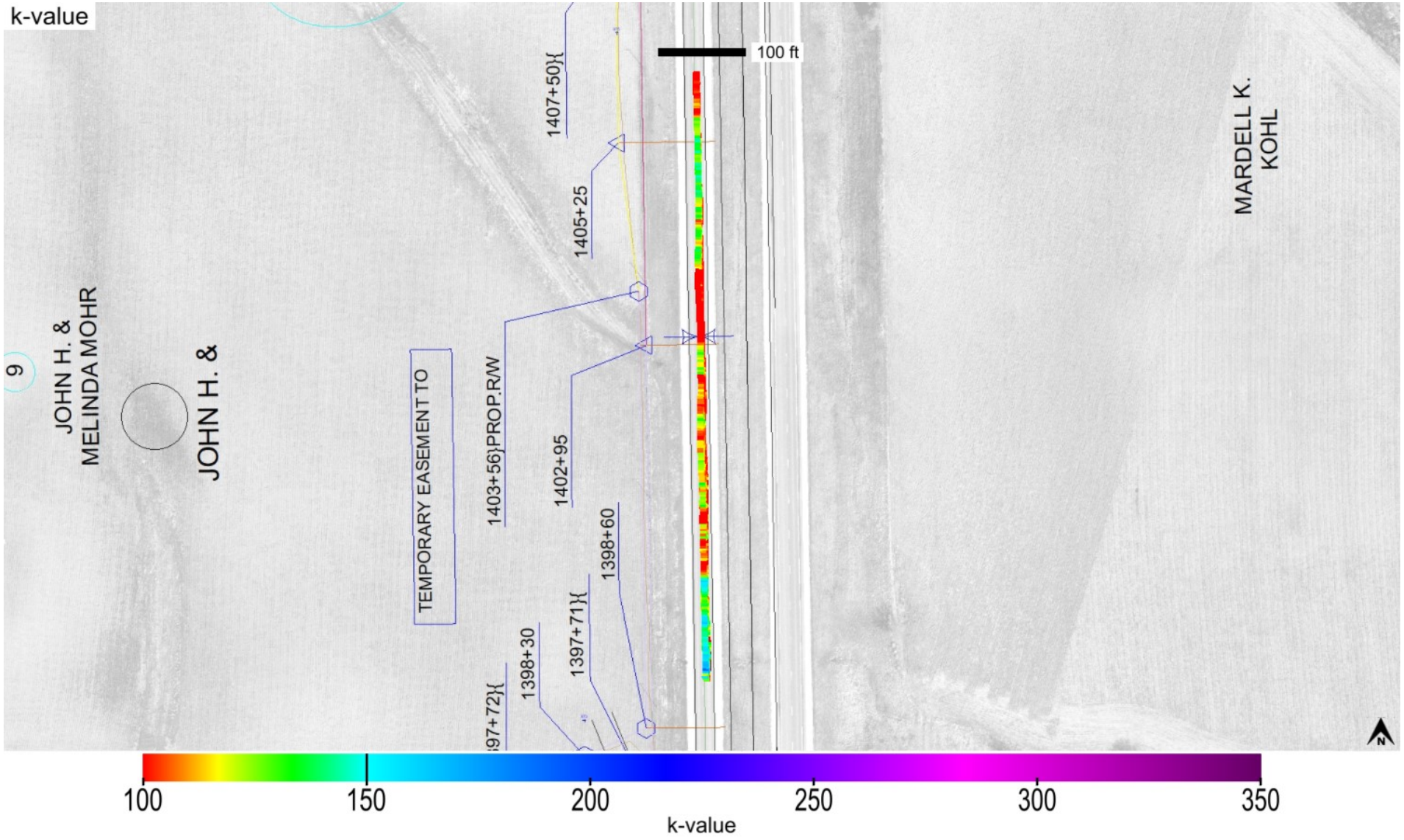
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0



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

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_095207a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	6.3	25.49	0.46	150	55	113.8	189.57	24.68	21.68	-95	-36.2	39.57



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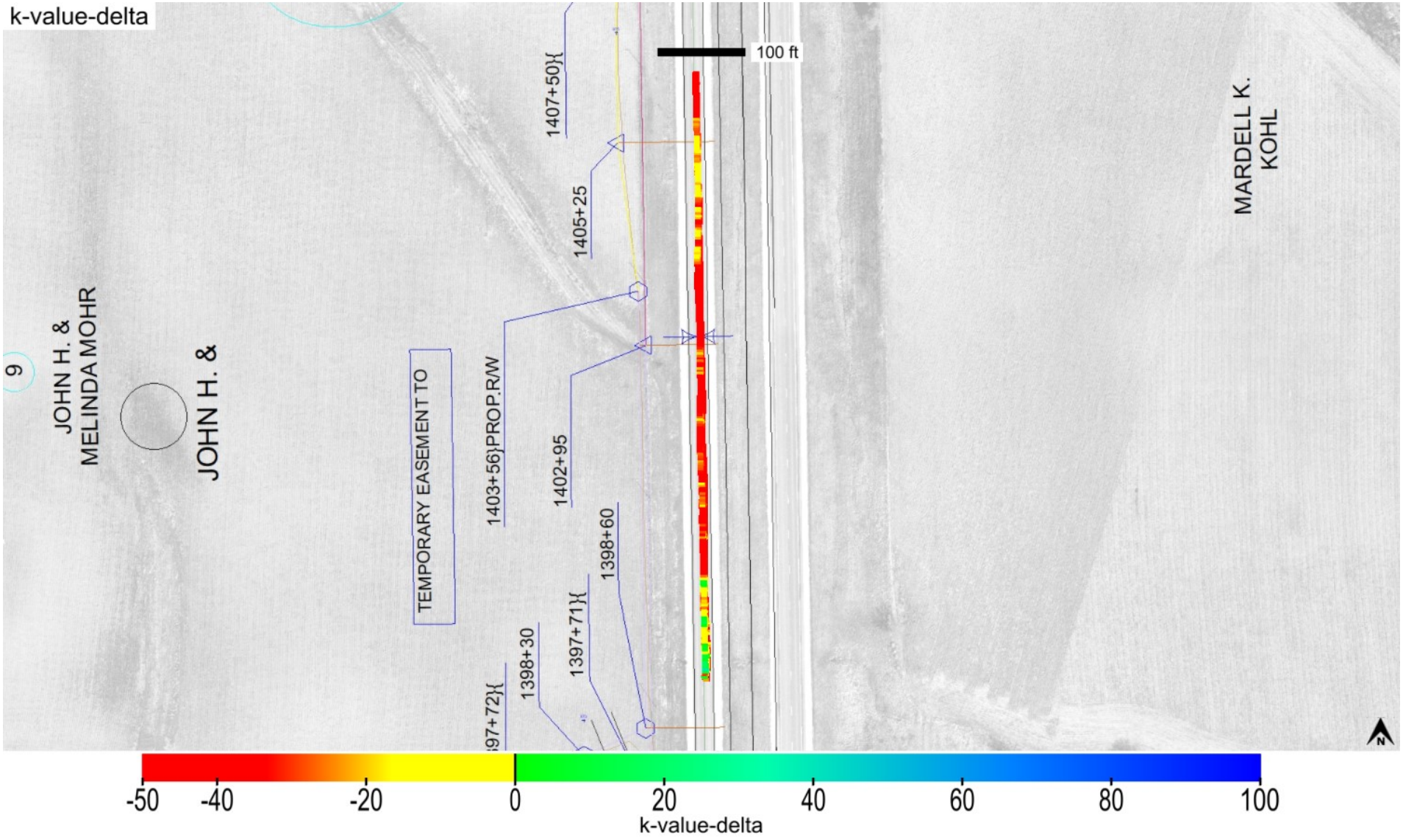
ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_095207a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	6.3	25.49	0.46	150	55	113.8	189.57	24.68	21.68	-95	-36.2	39.57



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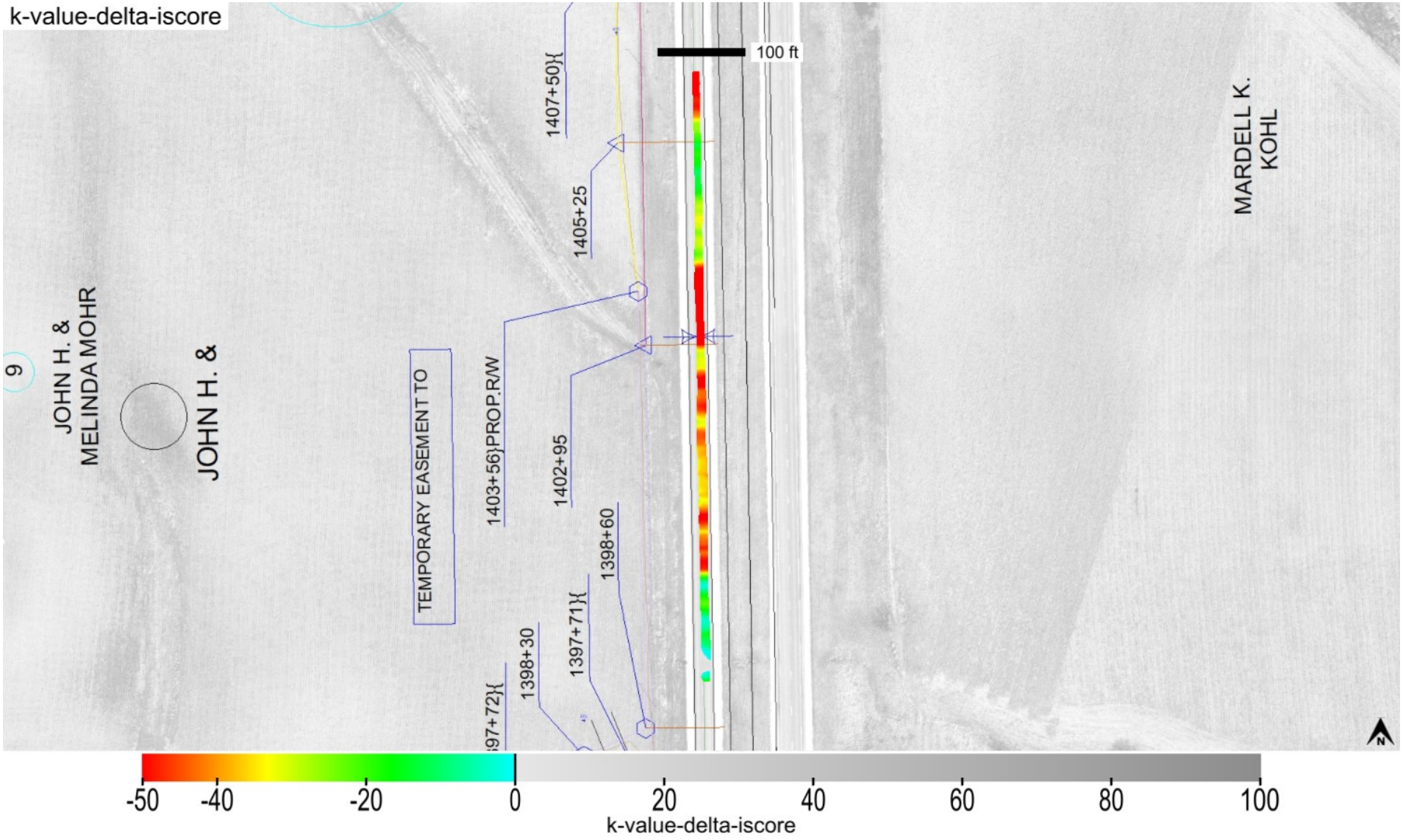
ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_095207a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	6.3	150	-95	-36.2	39.57	-92.65	-35.96	8.34



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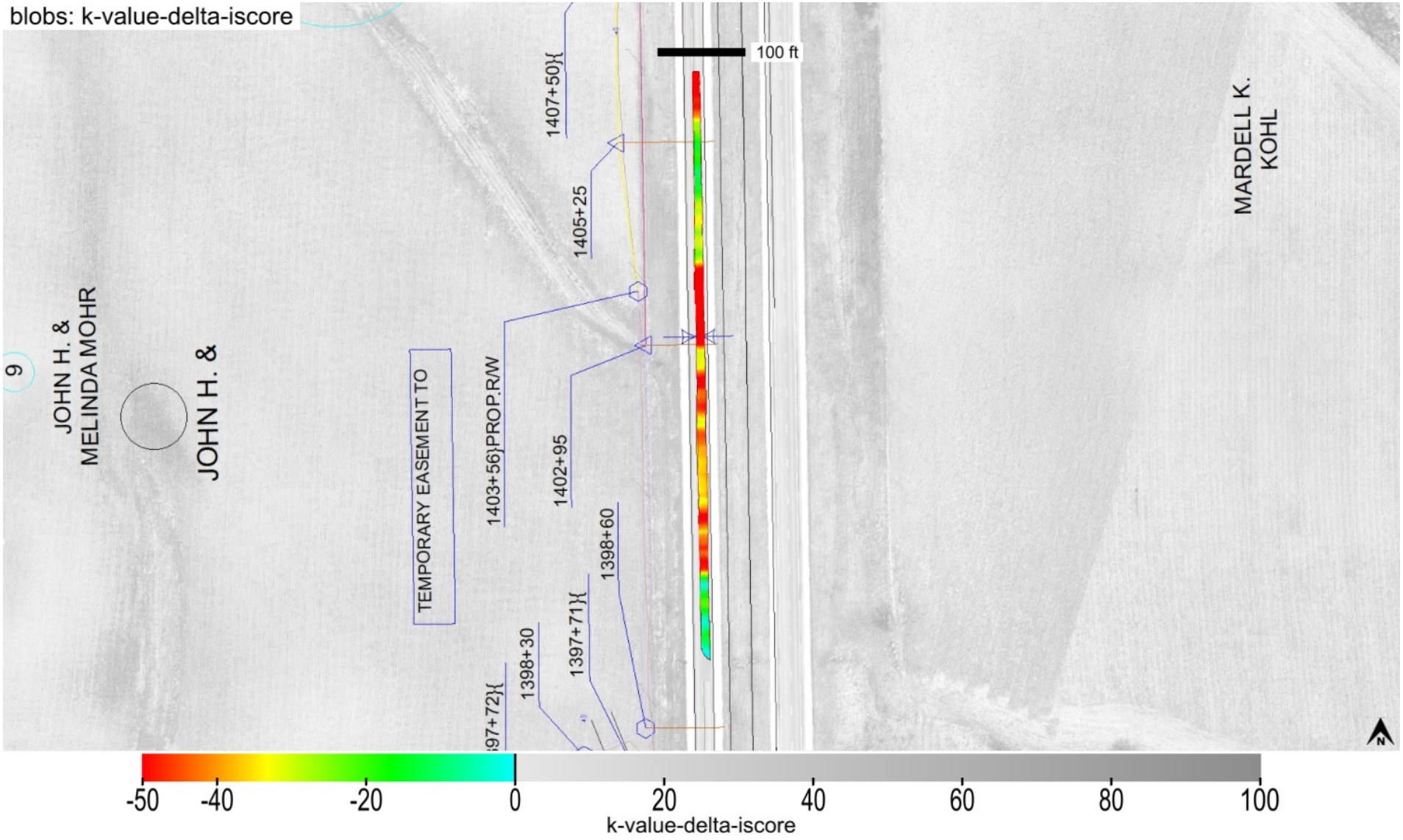
ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_095207a

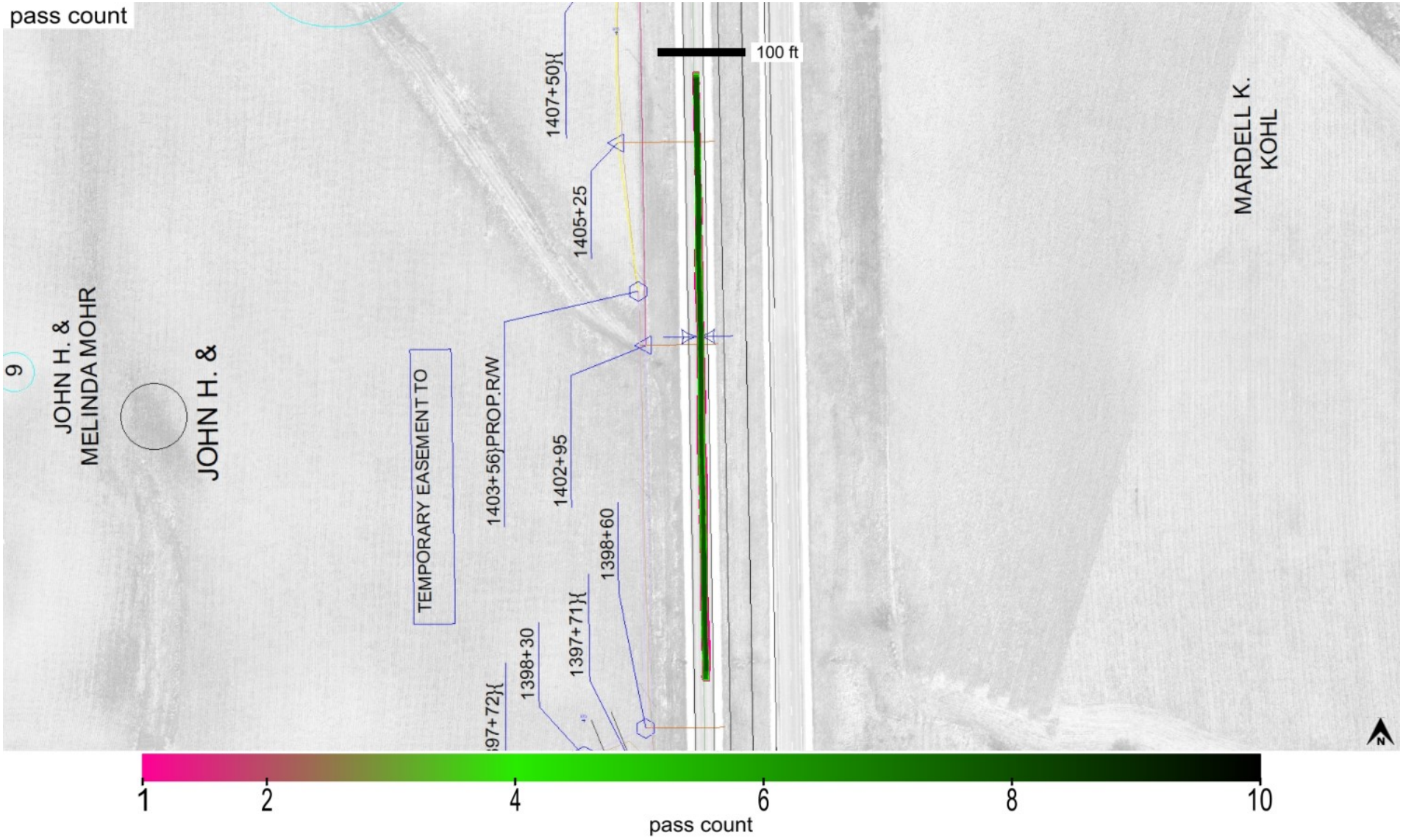
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	6285	95.84	none	0



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

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_095207a

minimum	average	maximum
1	5.86	8



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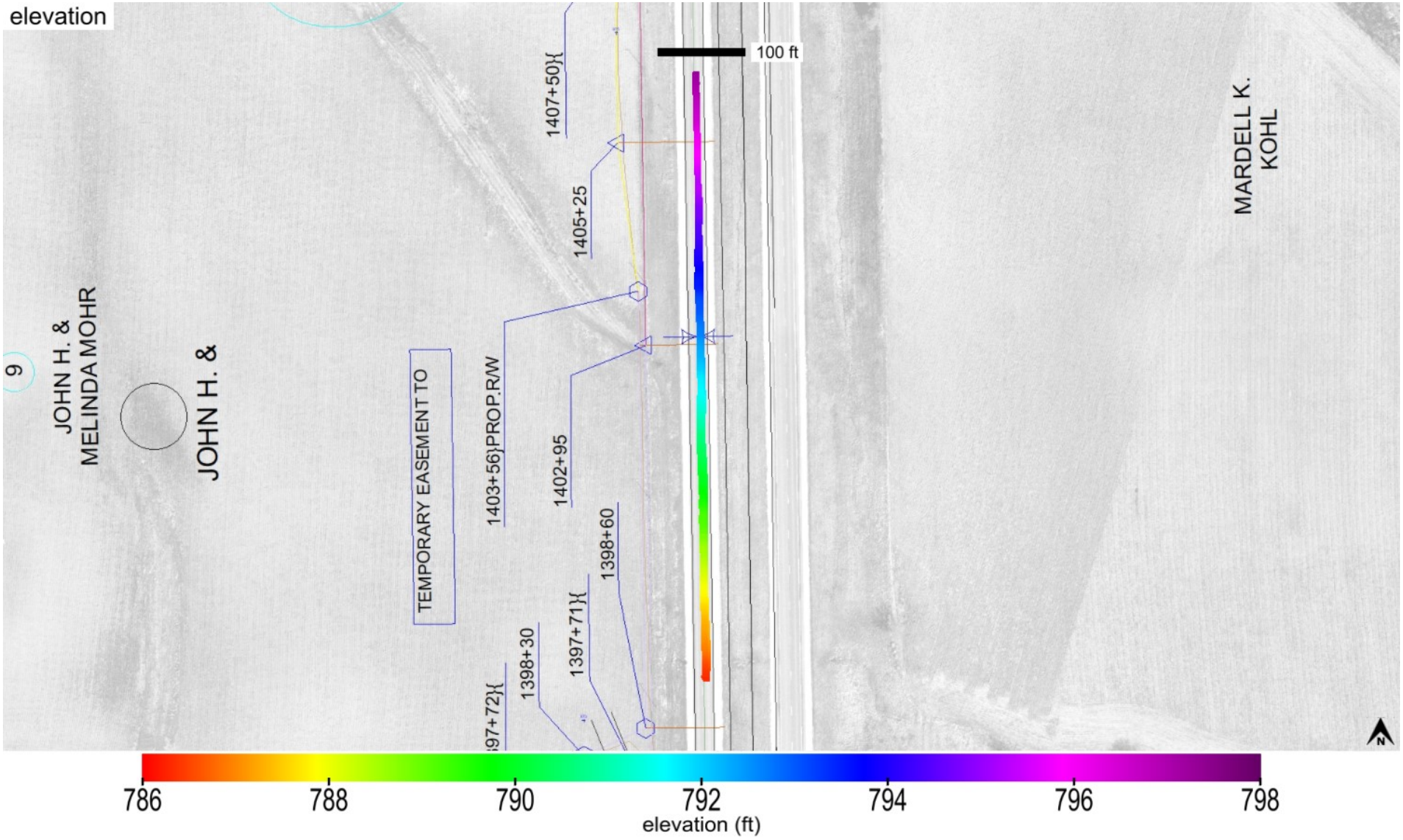
ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_095207a

minimum	average	maximum
786.239	791.597	797.298



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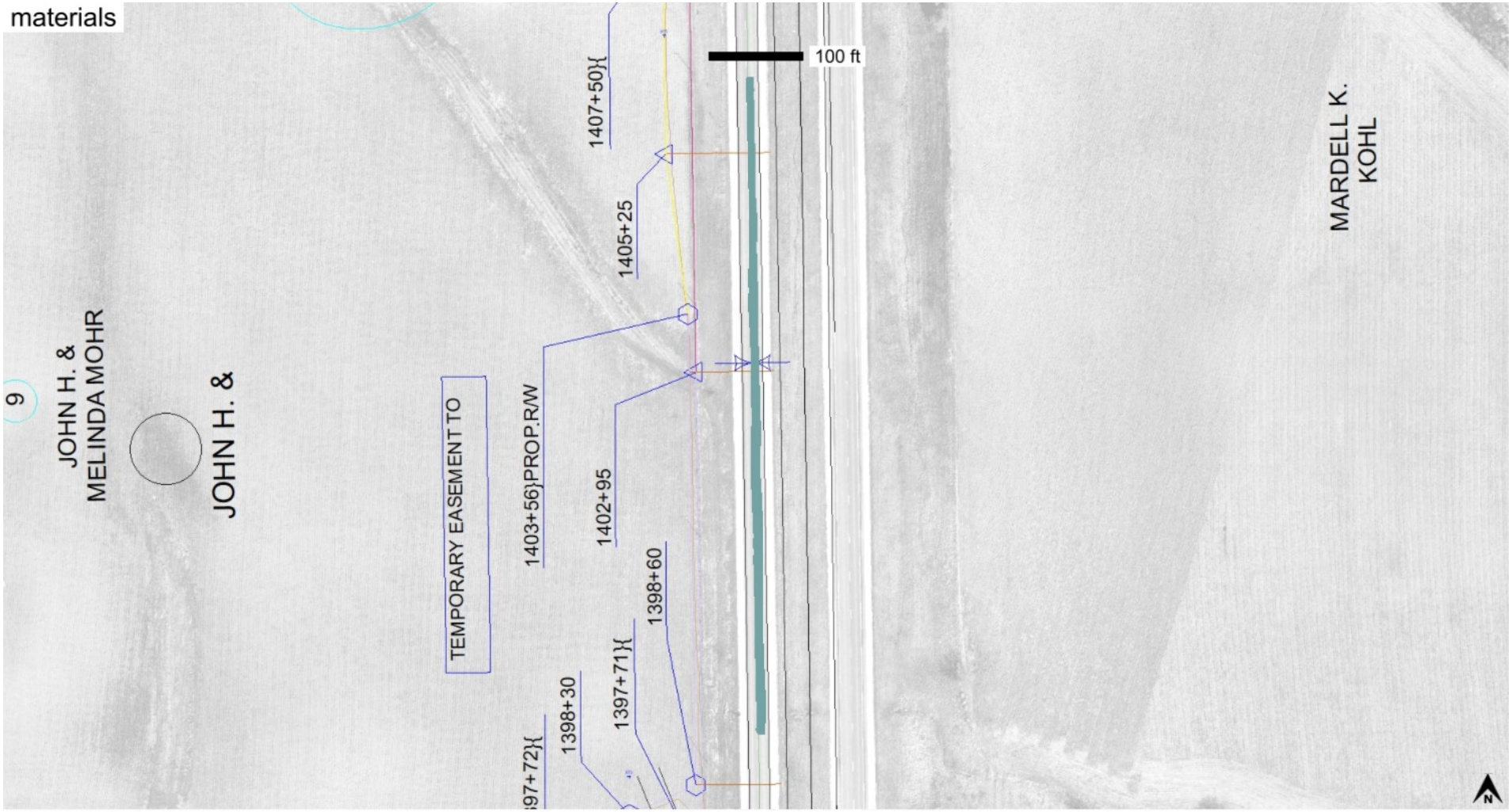
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_095207a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	6558	0.151	12	8554	150	40



Granular Subbase_IADOT (2111)

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

ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_095207a

20200820_102509.jpg

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

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_095207a

20200820_104719.jpg

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

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.29	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_20_111229a	No. of Measurements:	27003	Machine ID:	Ingios_FCS00210
Date and Time:	8/20/2020 11:12:29 AM	Location:	Linn County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	Yes	98.6	110.34	0.83	8554	5925.81	22126.1	56000	8060.23	36.43	-2628.19	13572.1	47446
k-value	Yes	8.9	21.76	0.21	150	55	101.8	183.17	34.92	34.29	-95	-48.2	33.17
Moisture Content	No												

Mapped Area

square feet	acres
27003	0.62

Pass Count

min.	avg.	max.
1	1.38	6

Elevation (ft)

min.	avg.	max.
785.6	793.14	800.28

Velocity (fps)

min.	avg.	max.
0.78	5.46	6.32

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	27003	0.62	12	8554	150	40

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.29	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_20_111229a	No. of Measurements:	27003	Machine ID:	Ingios_FCS00210
Date and Time:	8/20/2020 11:12:29 AM	Location:	Linn County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
110.34	CQI > = 95
98.6	80% of Resilient Modulus MVs >= 8554
36.43	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.29	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_20_111229a	No. of Measurements:	27003	Machine ID:	Ingios_FCS00210
Date and Time:	8/20/2020 11:12:29 AM	Location:	Linn County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
21.76	CQI > = 95
8.9	80% of k-Value MVs >= 150
34.29	COV <= 20
99.6	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

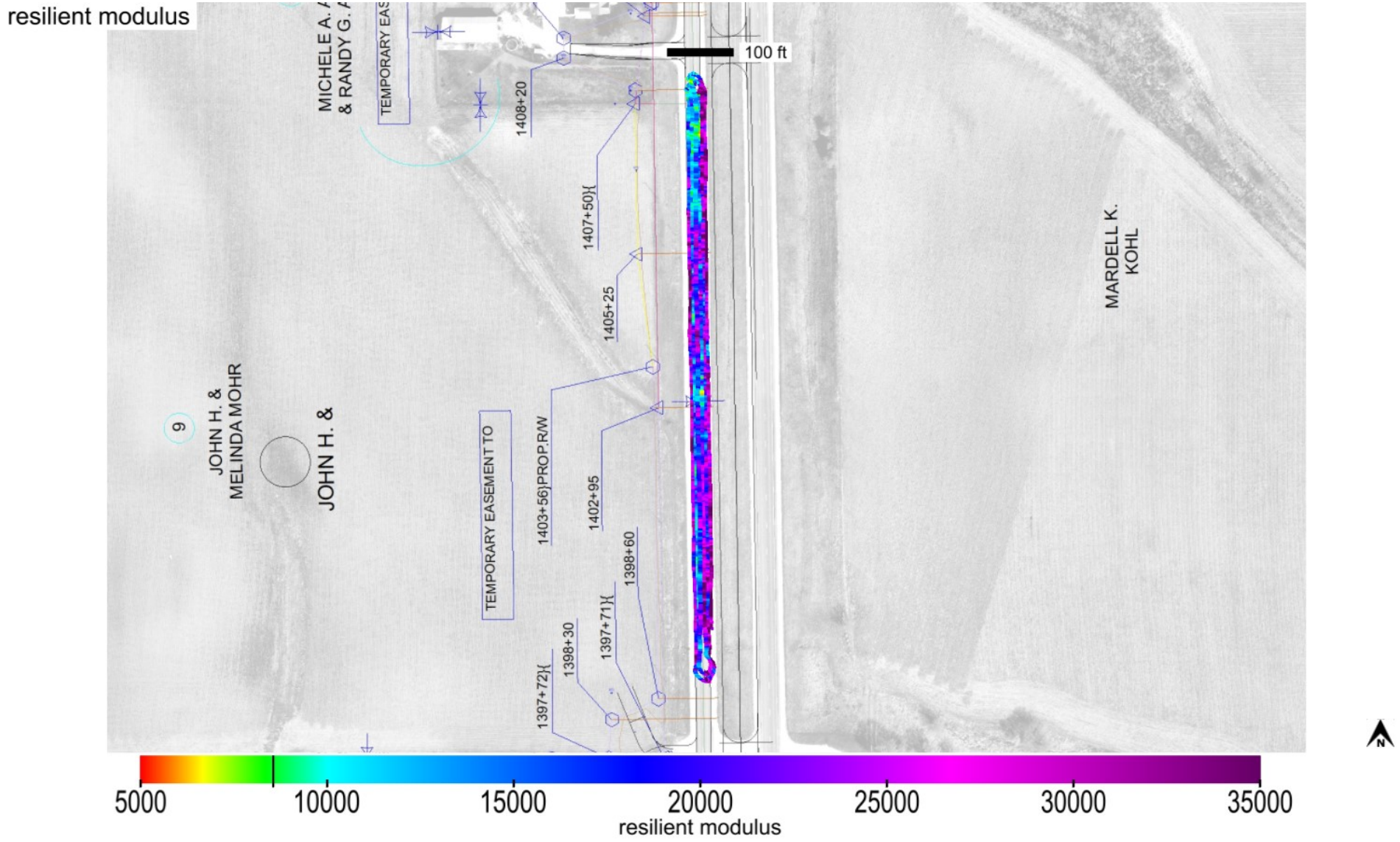
i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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

ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_111229a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	98.6	110.34	0.83	8554	5925.81	22126.1	56000	8060.23	36.43	-2628.19	13572.1	47446

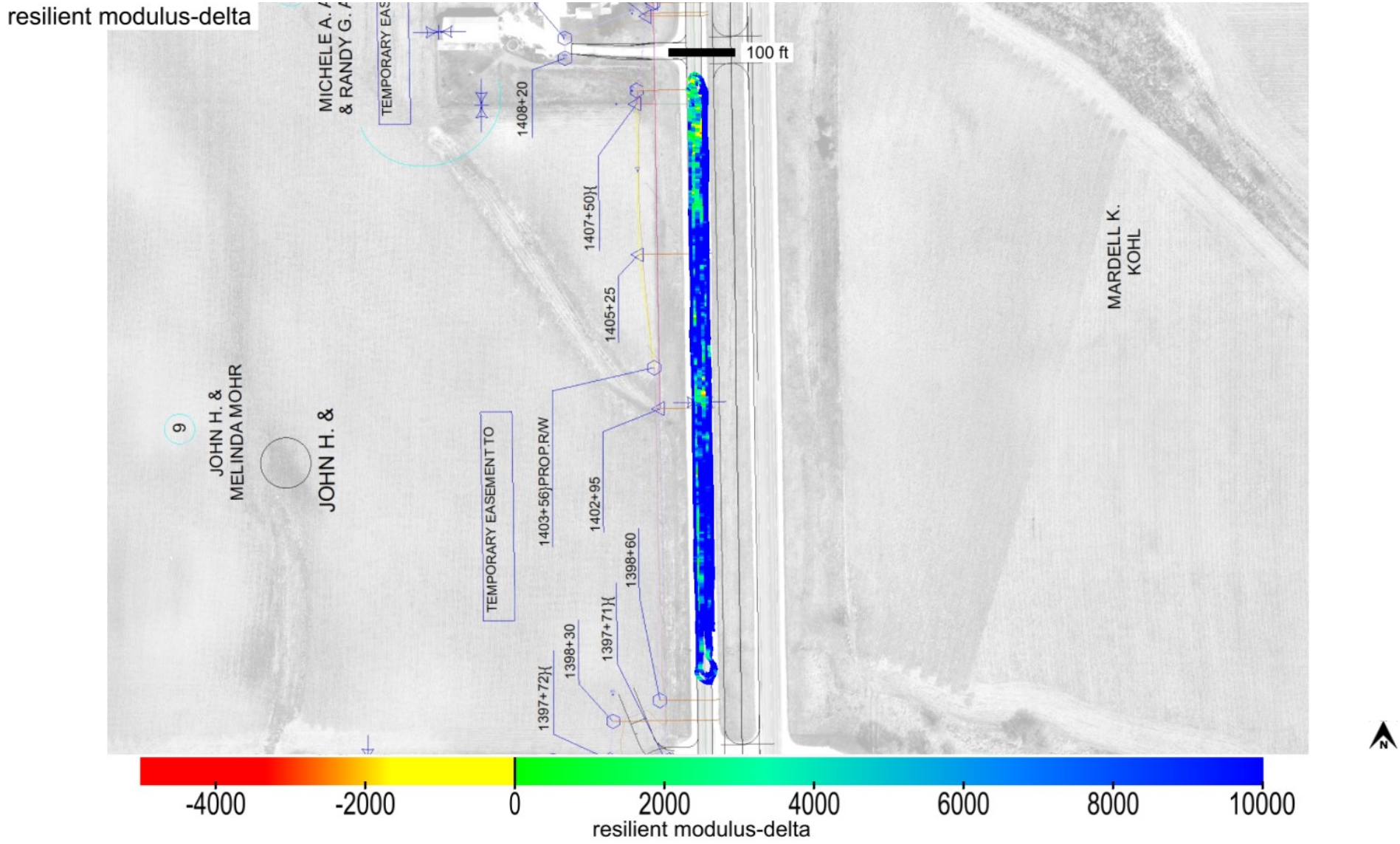


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_111229a

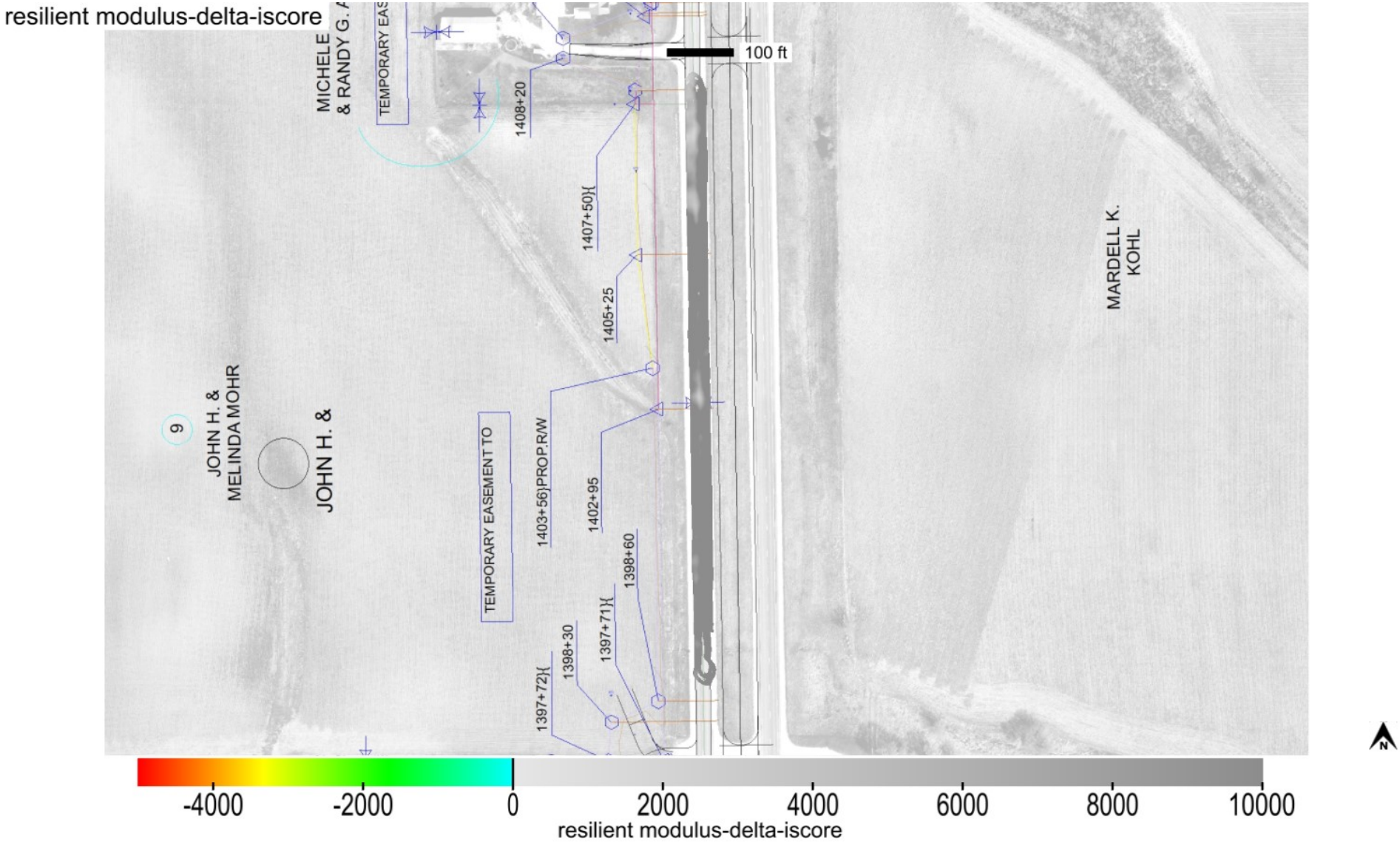
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	98.6	110.34	0.83	8554	5925.81	22126.1	56000	8060.23	36.43	-2628.19	13572.1	47446



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

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_111229a

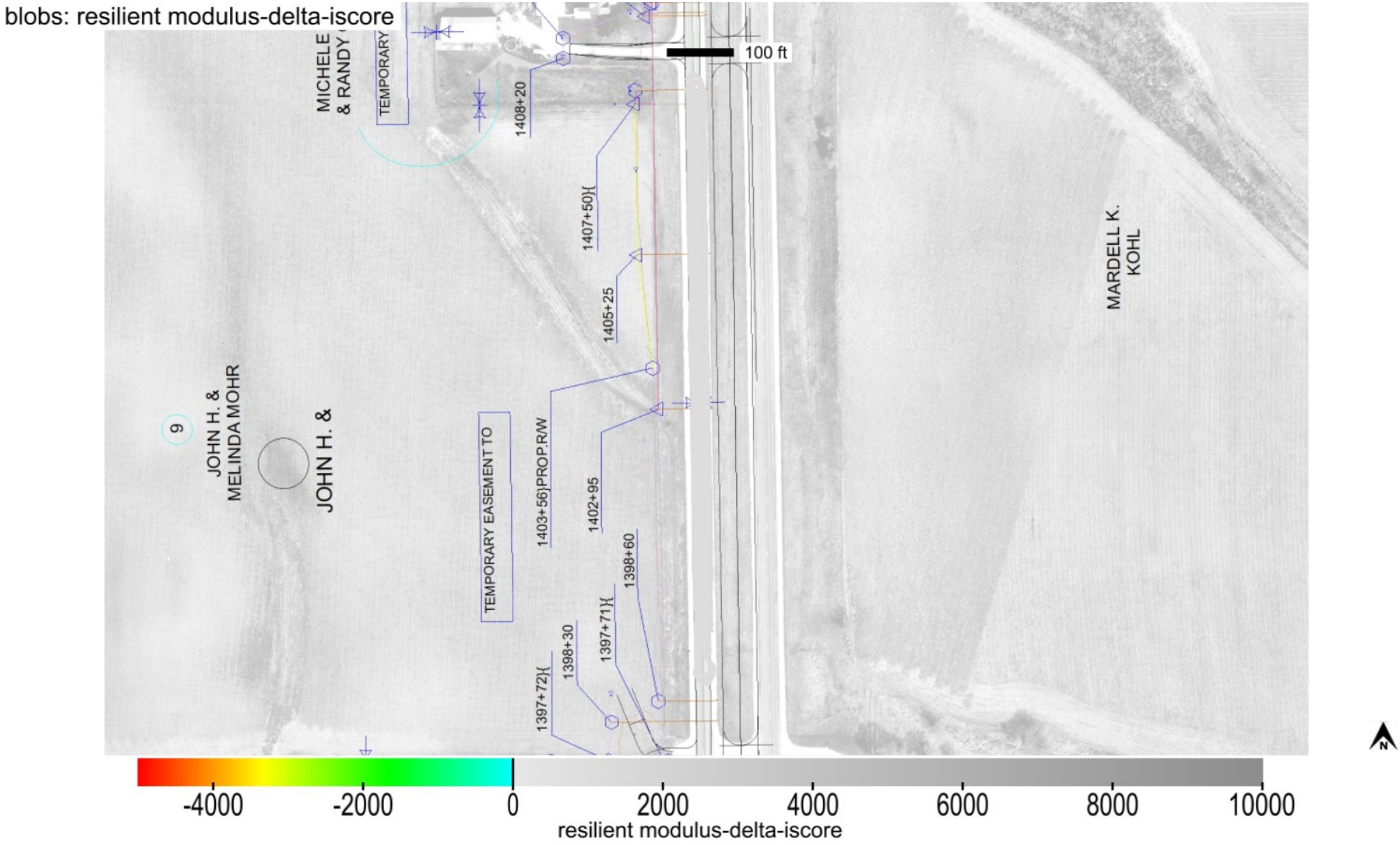
Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	98.6	8554	-2628.19	13572.1	47446	1673.27	13197.42	25899.38



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

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_111229a

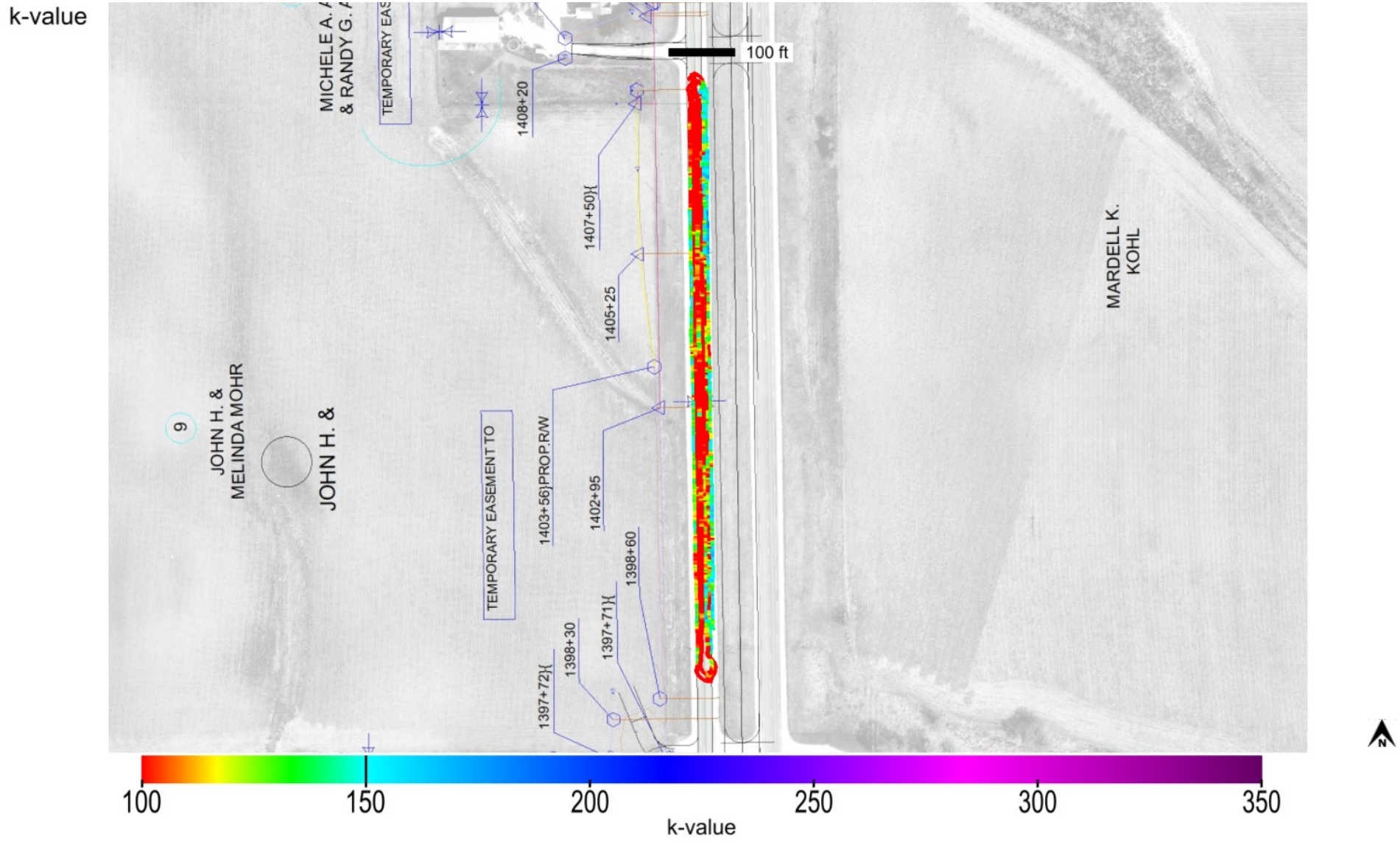
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0



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

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_111229a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	8.9	21.76	0.21	150	55	101.8	183.17	34.92	34.29	-95	-48.2	33.17



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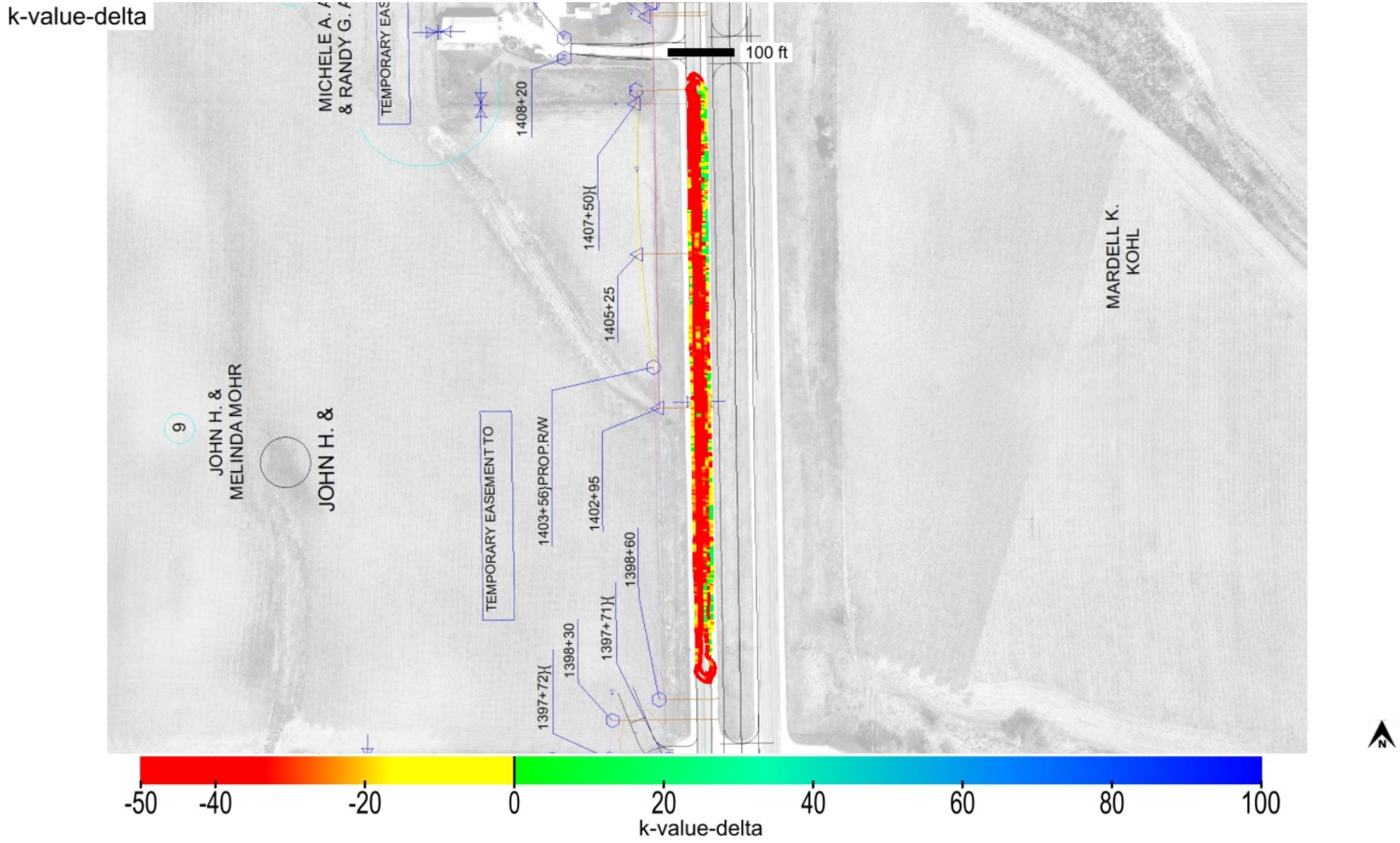
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_111229a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	8.9	21.76	0.21	150	55	101.8	183.17	34.92	34.29	-95	-48.2	33.17



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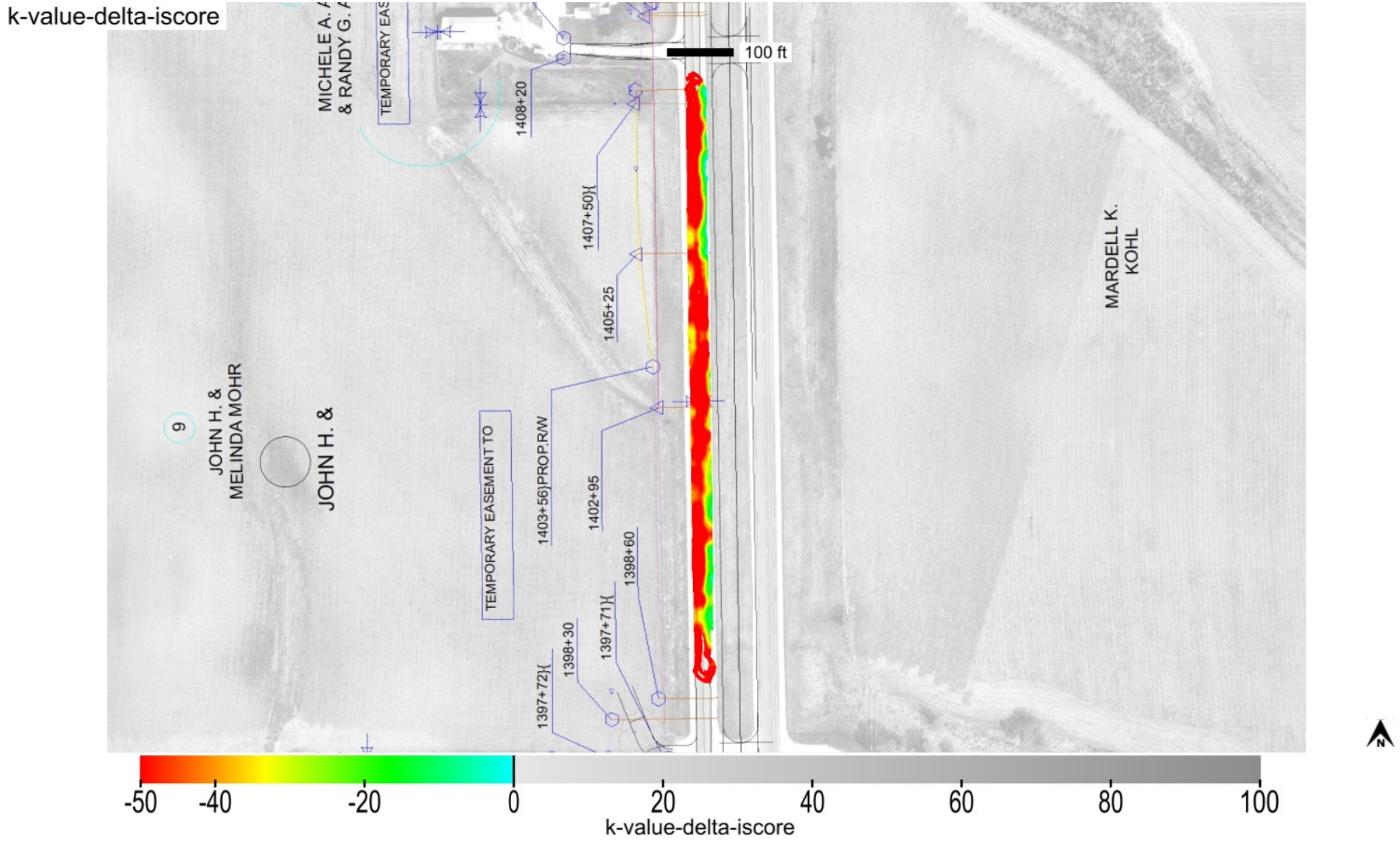
ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_111229a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	8.9	150	-95	-48.2	33.17	-93.98	-50.21	8.72



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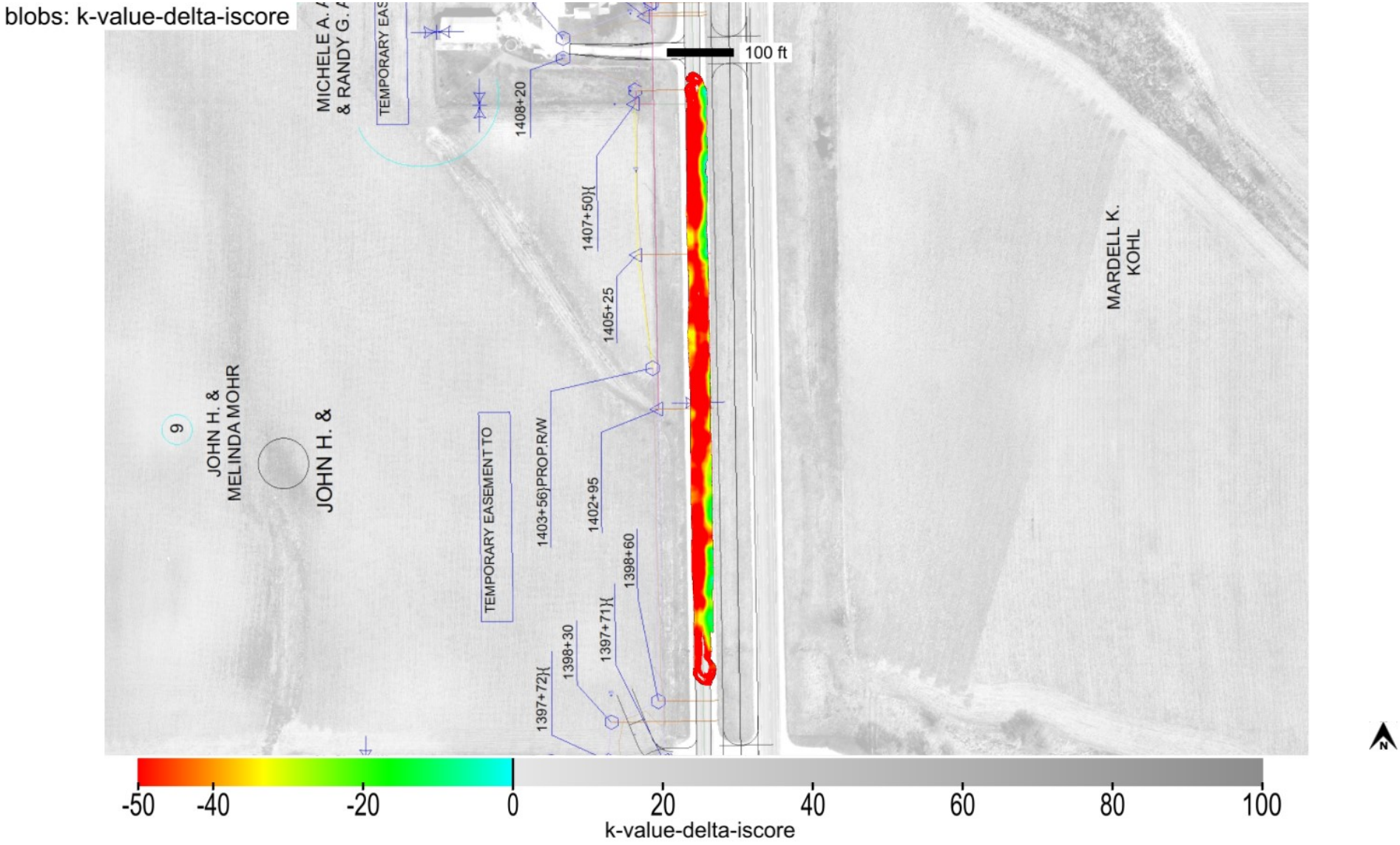
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_111229a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	26896	99.6	none	0



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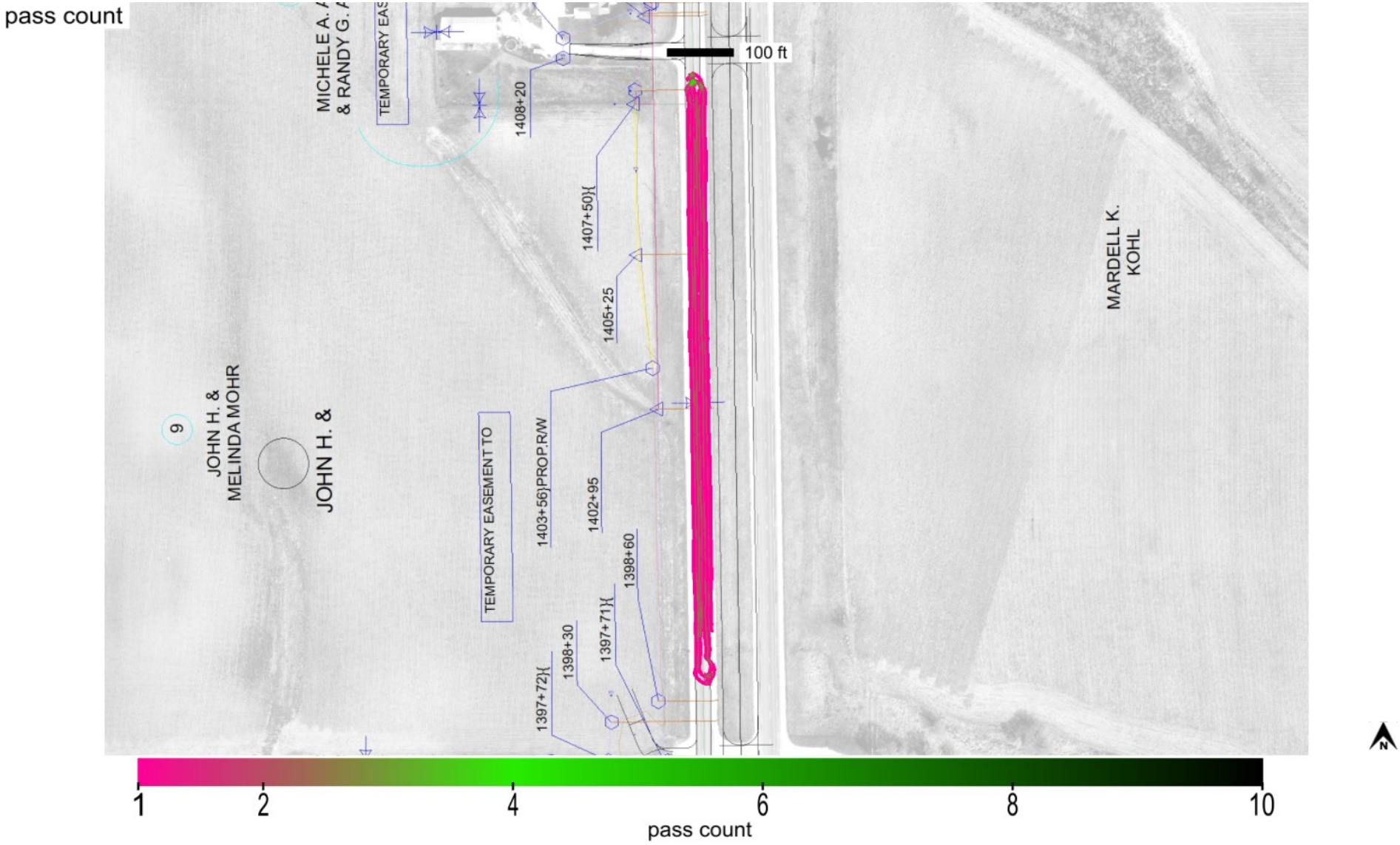
ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_111229a

minimum	average	maximum
1	1.38	6



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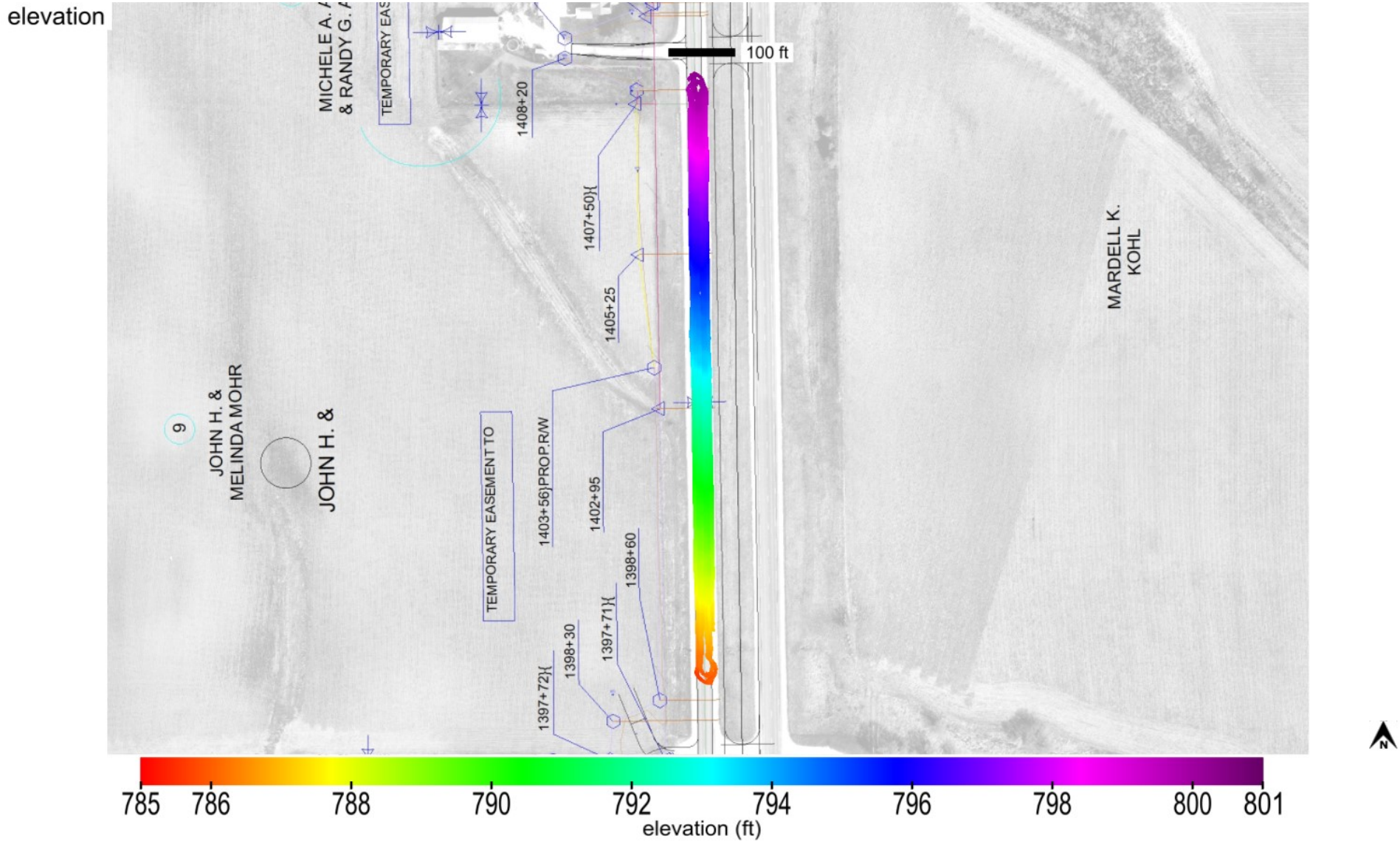
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_111229a

minimum	average	maximum
785.602	793.142	800.277

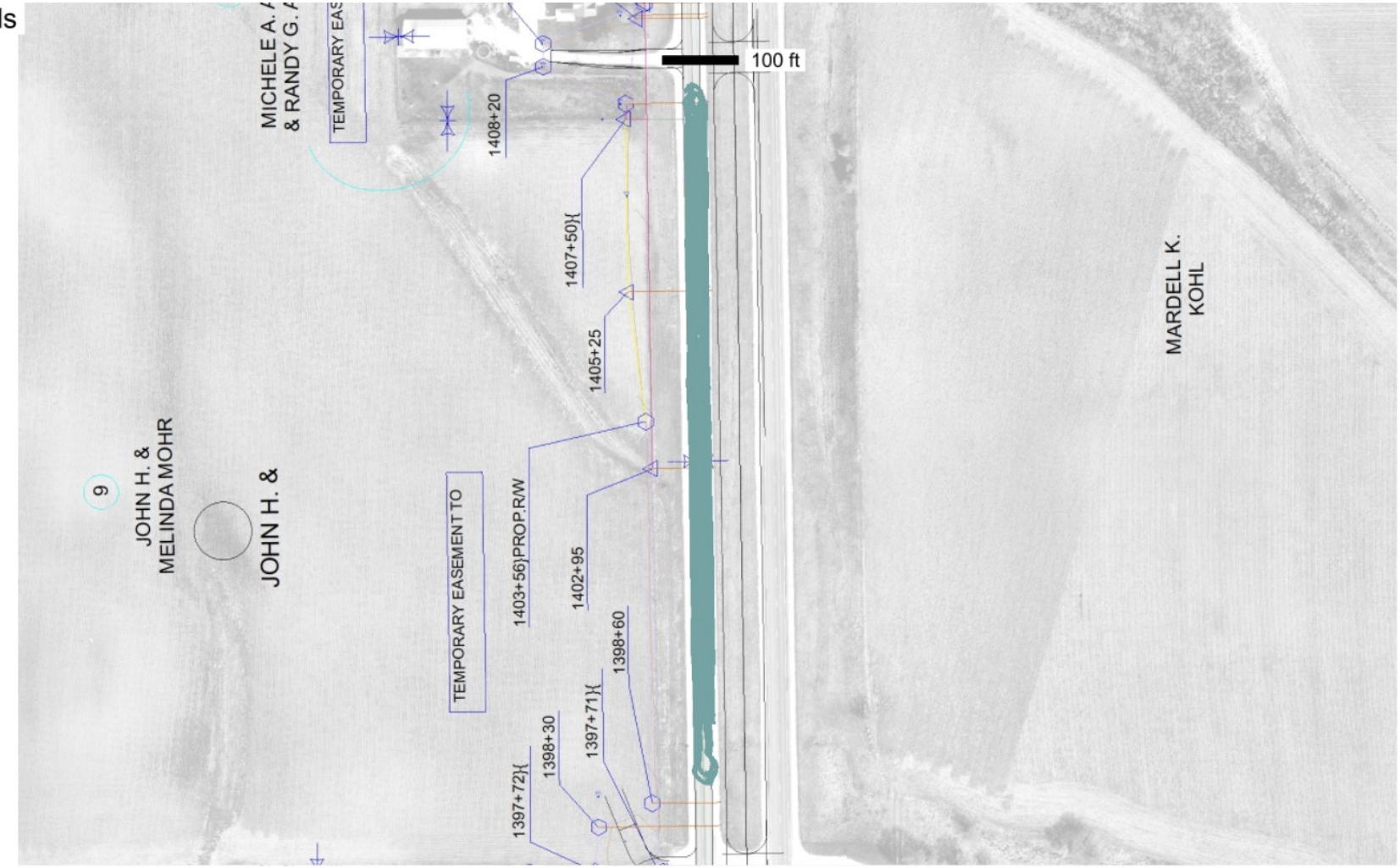


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_20_111229a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	27003	0.62	12	8554	150	40

materials



Granular Subbase_IADOT (2111)

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

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.58	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_21_092115a	No. of Measurements:	54370	Machine ID:	Ingios_FCS00210
Date and Time:	8/21/2020 9:21:15 AM	Location:	Linn County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	Yes	100	111.84	0.52	3000	5500	38394.6	56000	13945.15	36.32	2500	35394.6	53000
k-value	Yes	39.8	53.39	0.42	150	55	136.2	202	44.68	32.79	-95	-13.8	52
Moisture Content	No												

Mapped Area

square feet	acres
54370	1.25

Pass Count

min.	avg.	max.
1	1.44	8

Elevation (ft)

min.	avg.	max.
821.08	824.86	828.86

Velocity (fps)

min.	avg.	max.
0.55	5.66	6.06

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	54370	1.248	12	3000	150	40

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.58	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_21_092115a	No. of Measurements:	54370	Machine ID:	Ingios_FCS00210
Date and Time:	8/21/2020 9:21:15 AM	Location:	Linn County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
111.84	CQI > = 95
100	80% of Resilient Modulus MVs >= 3000
36.32	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US13 Linn County	Mapping Duration (hrs):	0.58	Operator:	Ingios Geotechnics inc
Map ID:	iadot_57-us13_cs56-fcs00210_2020_08_21_092115a	No. of Measurements:	54370	Machine ID:	Ingios_FCS00210
Date and Time:	8/21/2020 9:21:15 AM	Location:	Linn County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
53.39	CQI > = 95
39.8	80% of k-Value MVs >= 150
32.79	COV <= 20
61.11	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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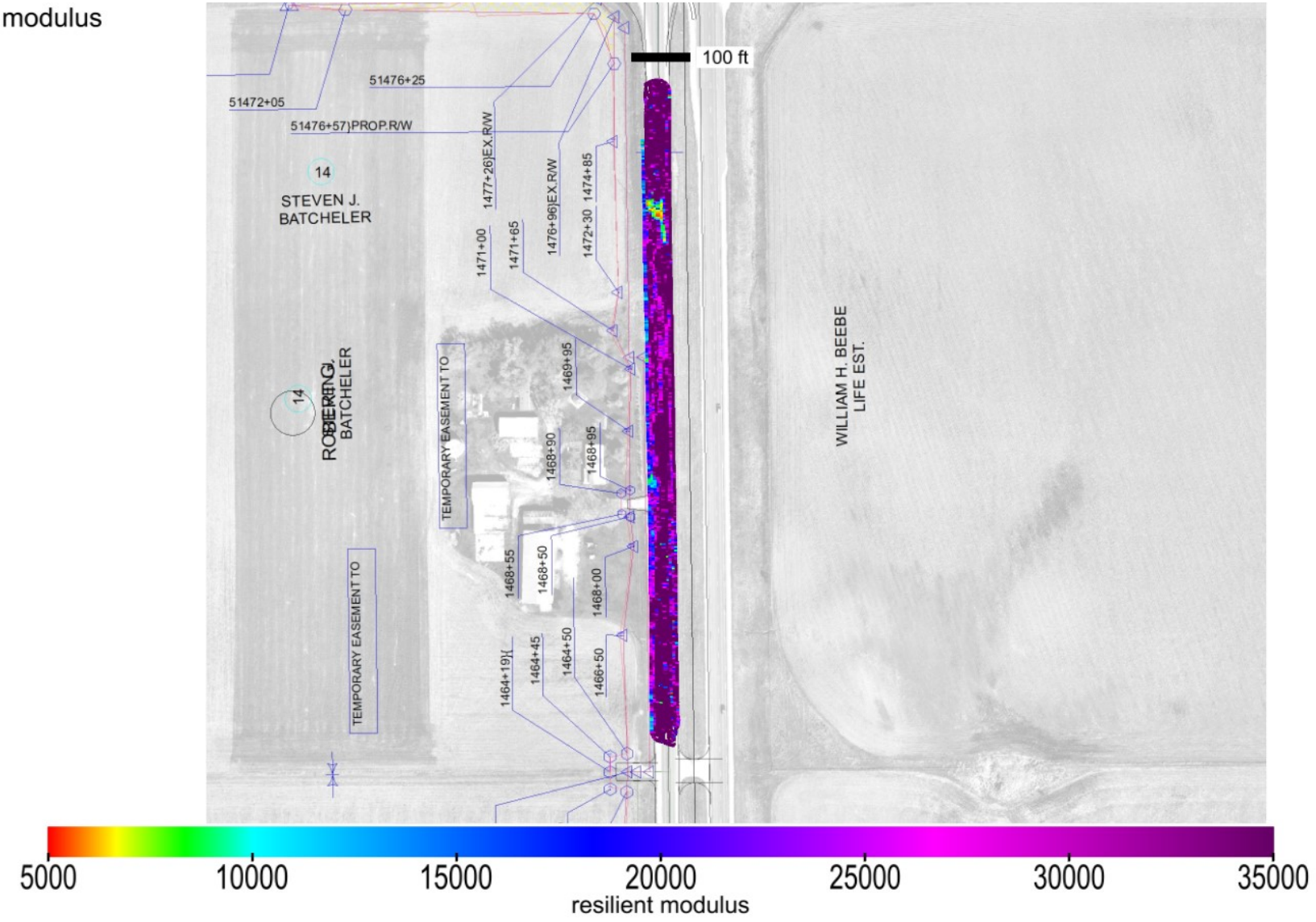
ingios GEOTECHNICS

Map ID: iadot_57-us13_cs56-fcs00210_2020_08_21_092115a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	111.84	0.52	3000	5500	38394.6	56000	13945.15	36.32	2500	35394.6	53000

resilient modulus



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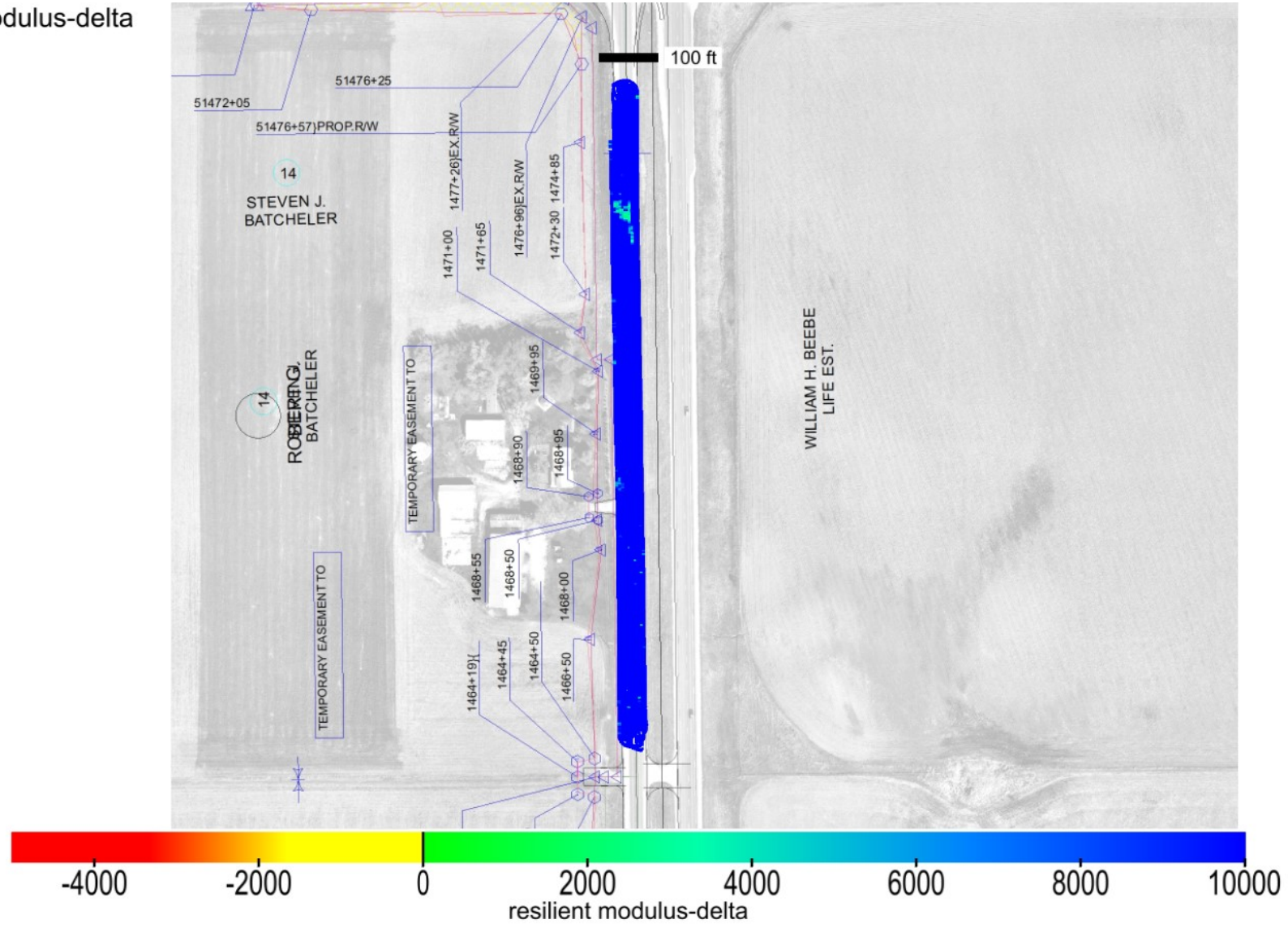
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_21_092115a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	111.84	0.52	3000	5500	38394.6	56000	13945.15	36.32	2500	35394.6	53000

resilient modulus-delta



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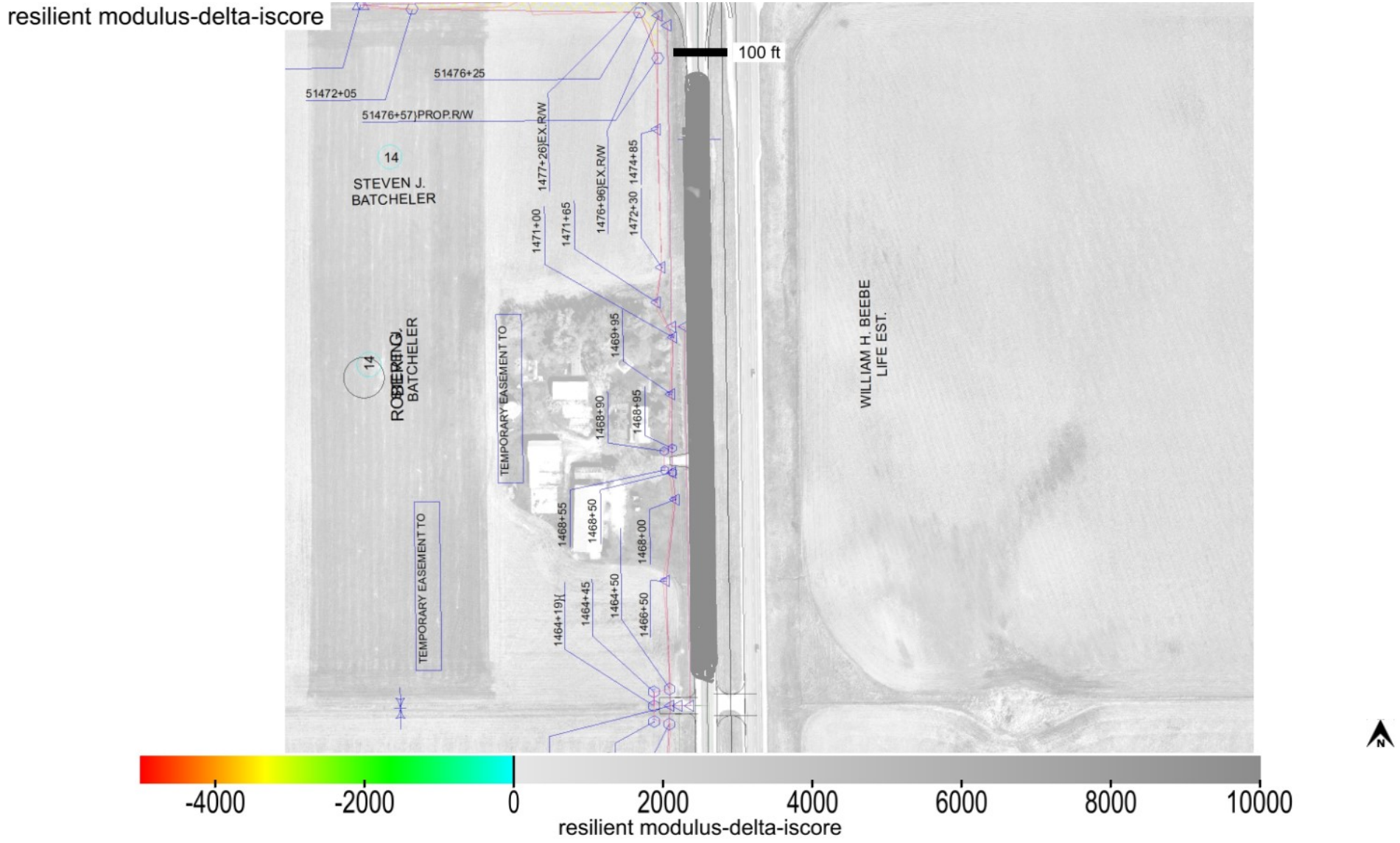
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_21_092115a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	100	3000	2500	35394.6	53000	4741.78	35475.19	53000



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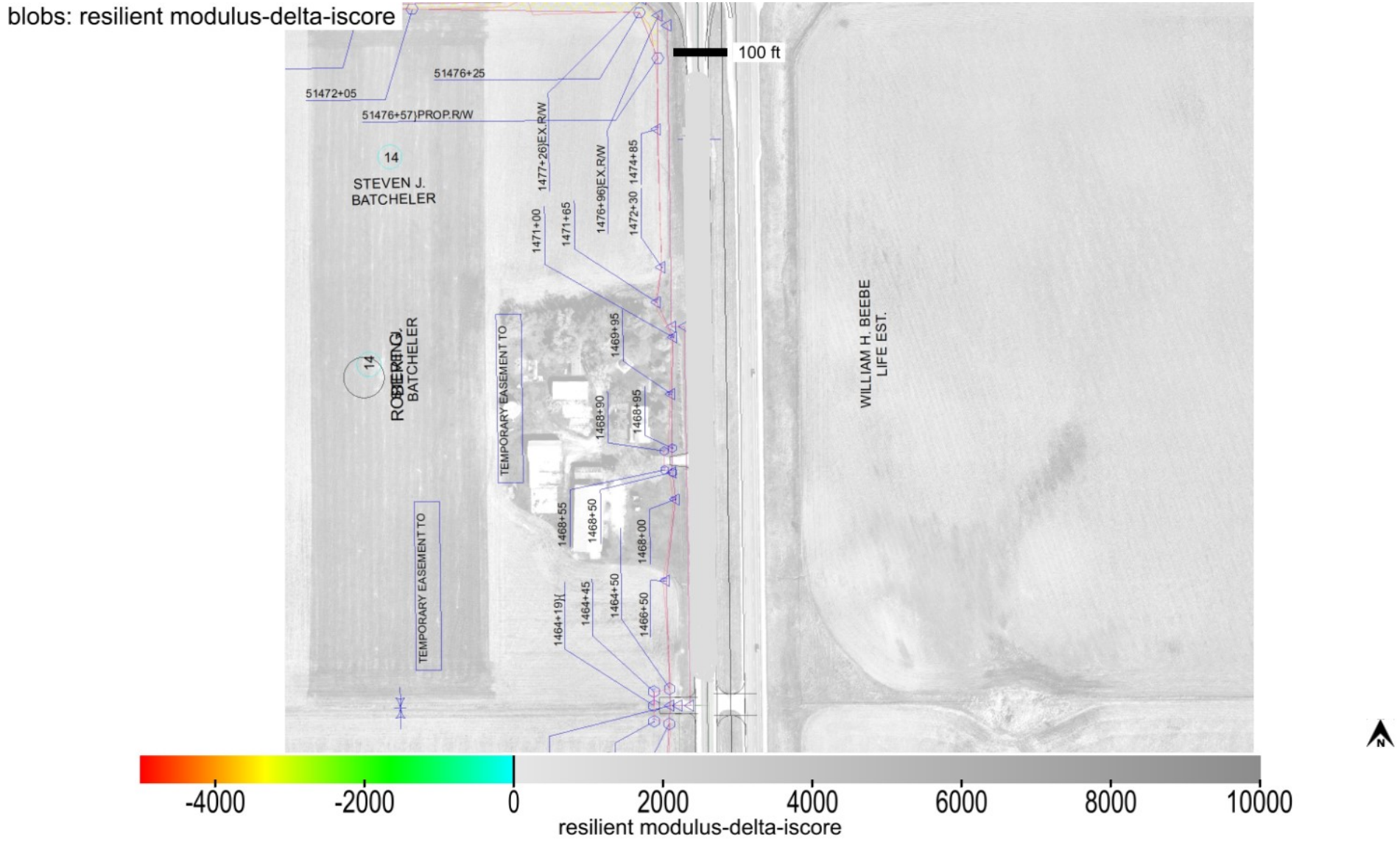
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_21_092115a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0



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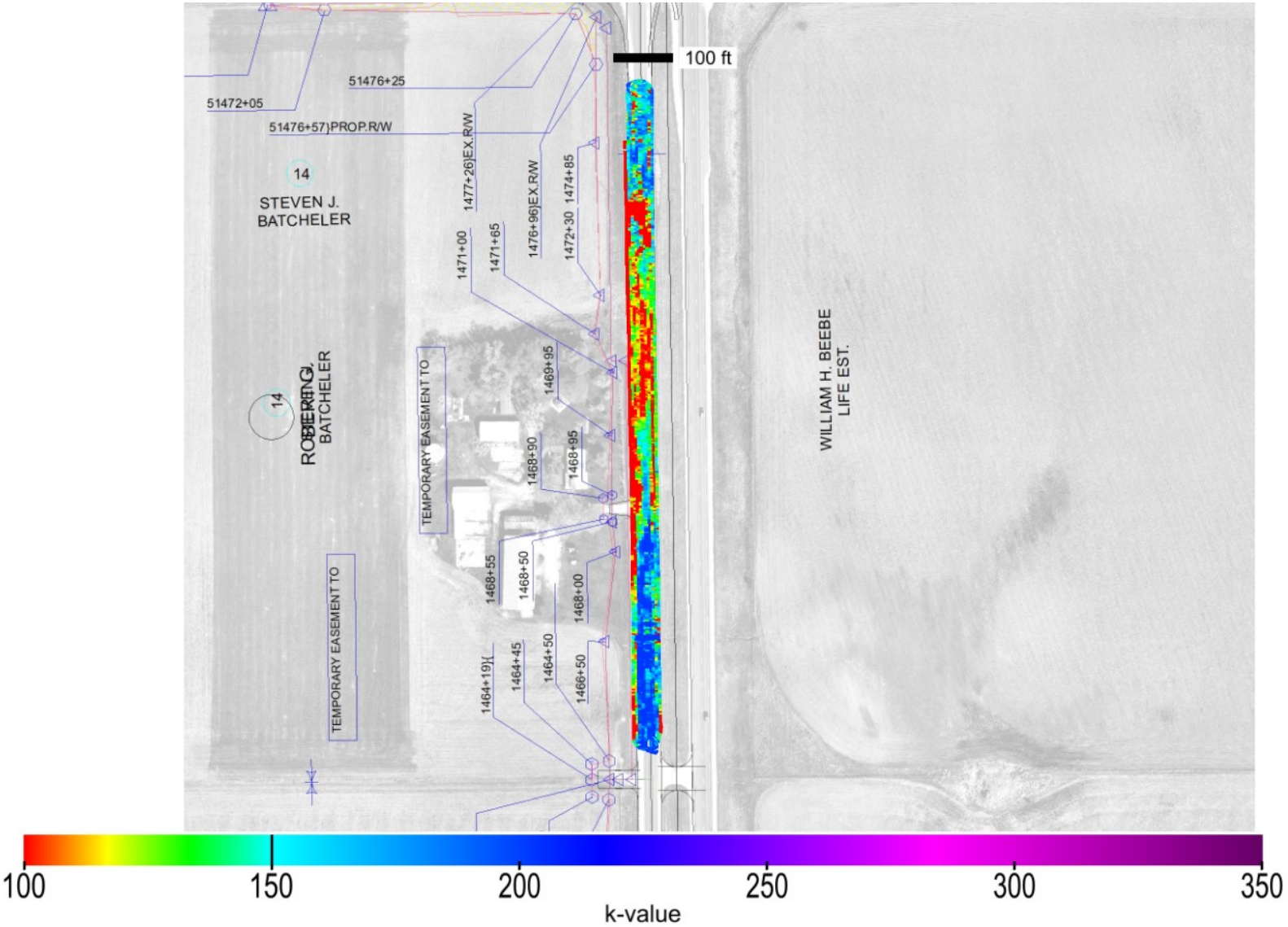
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_21_092115a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	39.8	53.39	0.42	150	55	136.2	202	44.68	32.79	-95	-13.8	52

k-value



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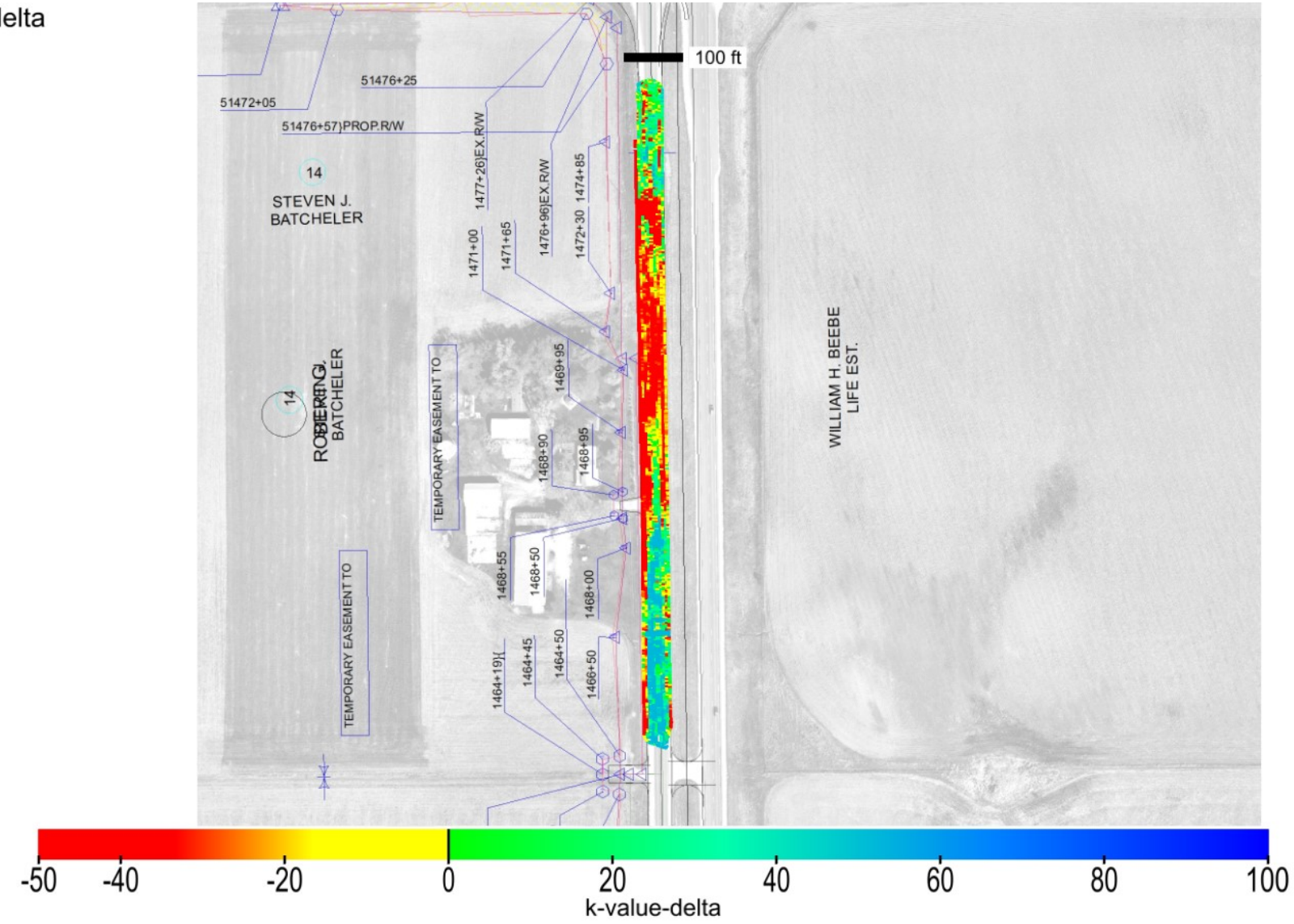
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_21_092115a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	39.8	53.39	0.42	150	55	136.2	202	44.68	32.79	-95	-13.8	52

k-value-delta



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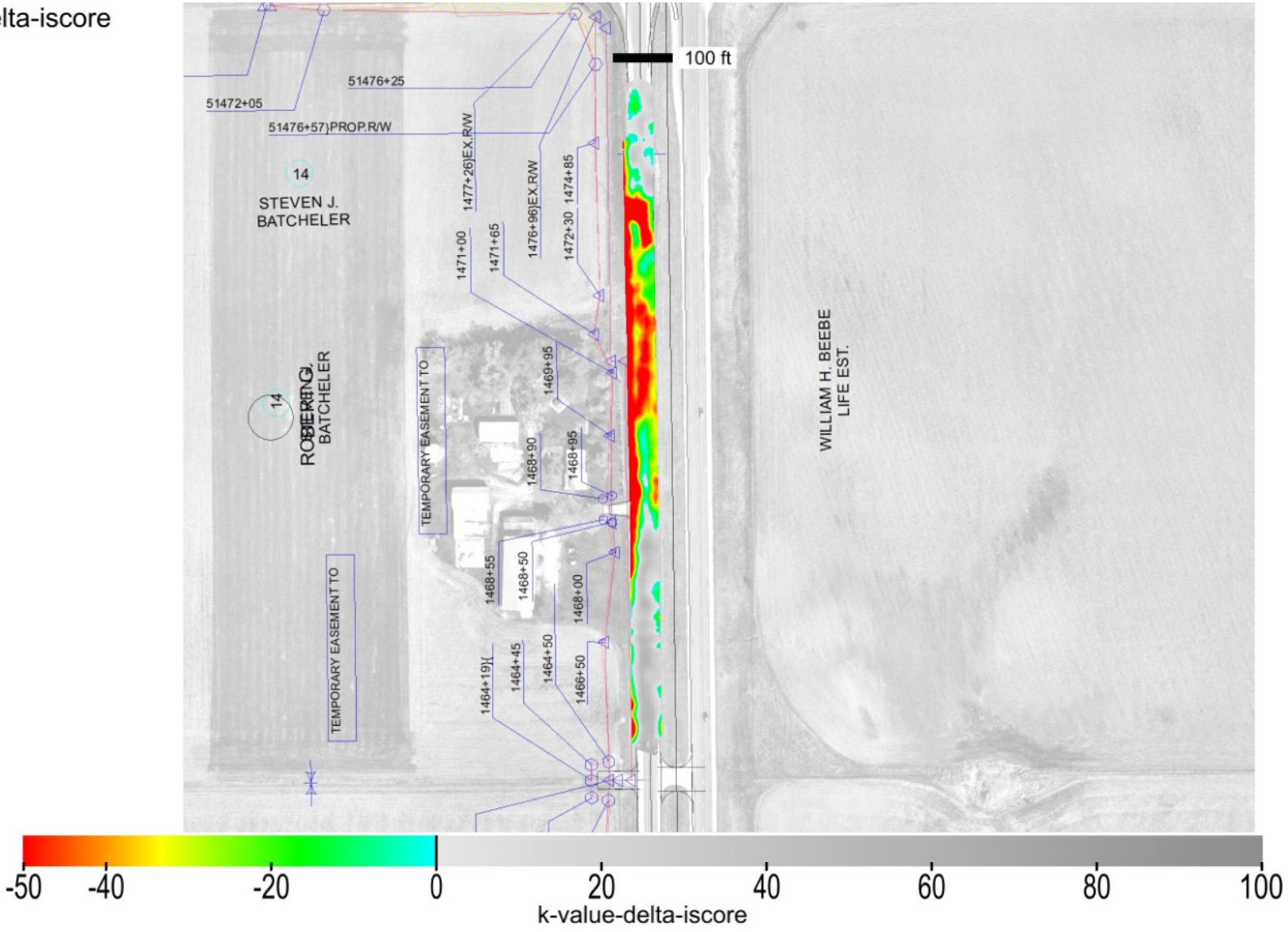
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_21_092115a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	39.8	150	-95	-13.8	52	-95	-13.36	51.89

k-value-delta-iscore



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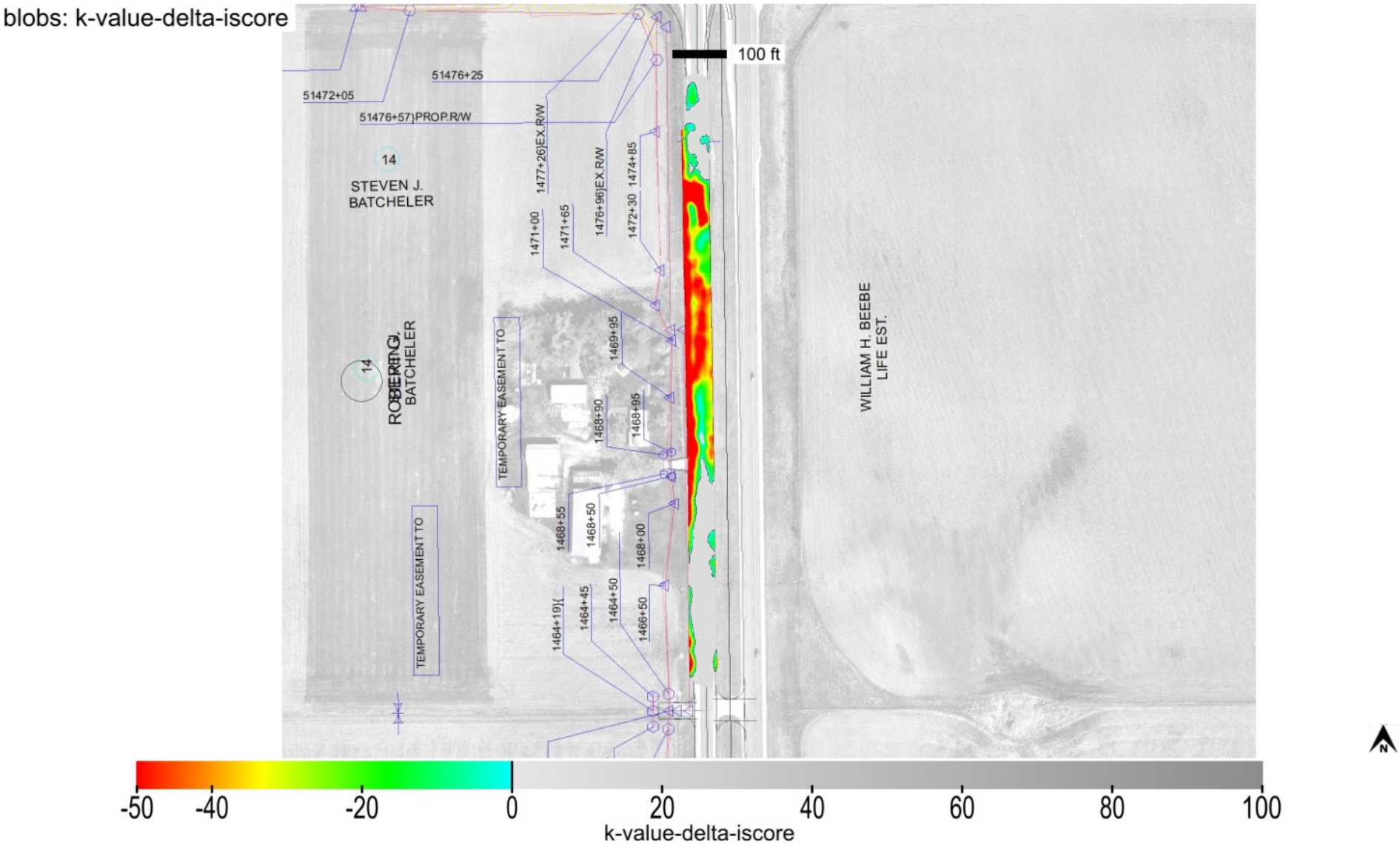
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_21_092115a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	7	33227	61.11	none	0



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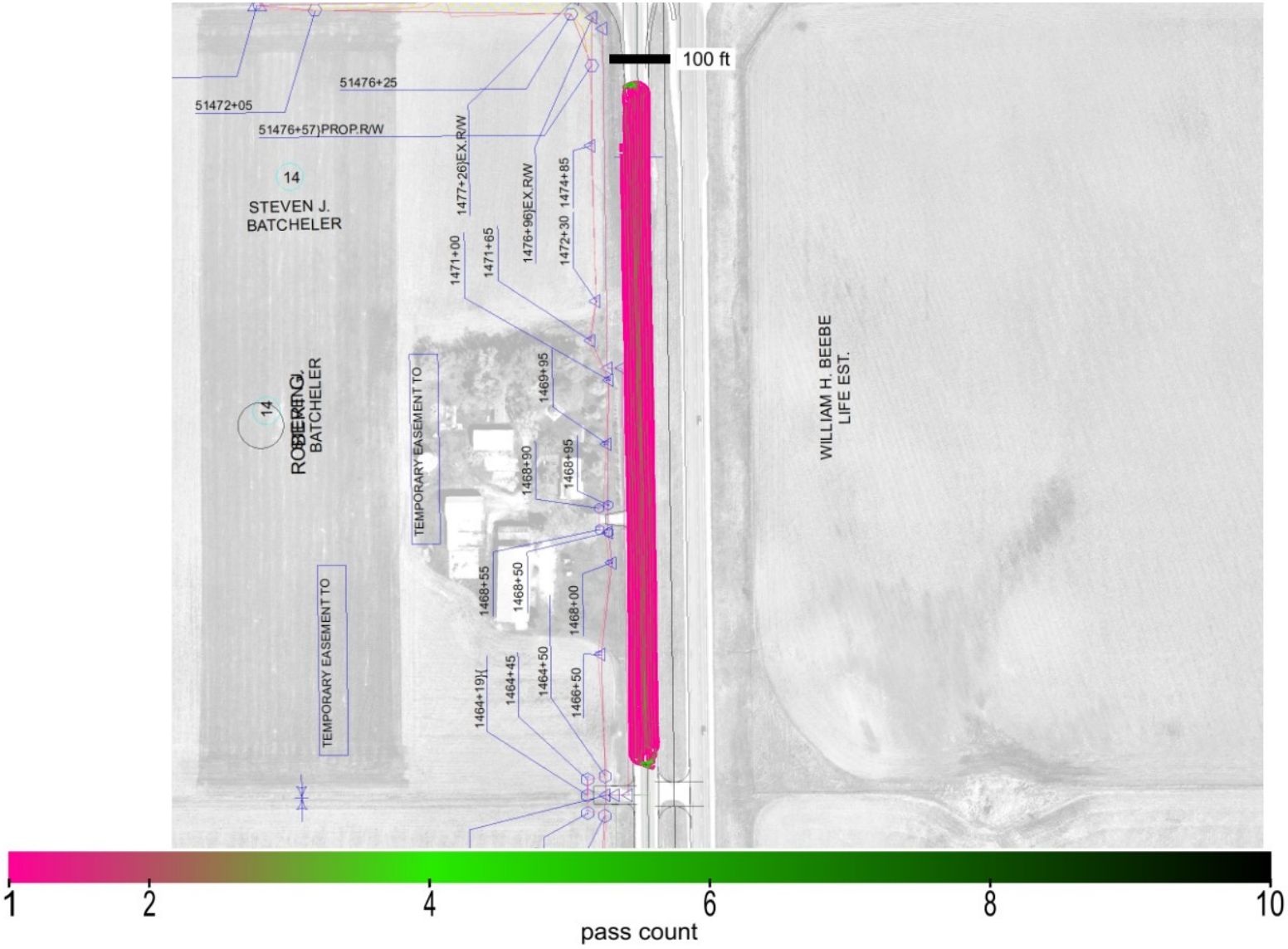
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_21_092115a

minimum	average	maximum
1	1.44	8

pass count



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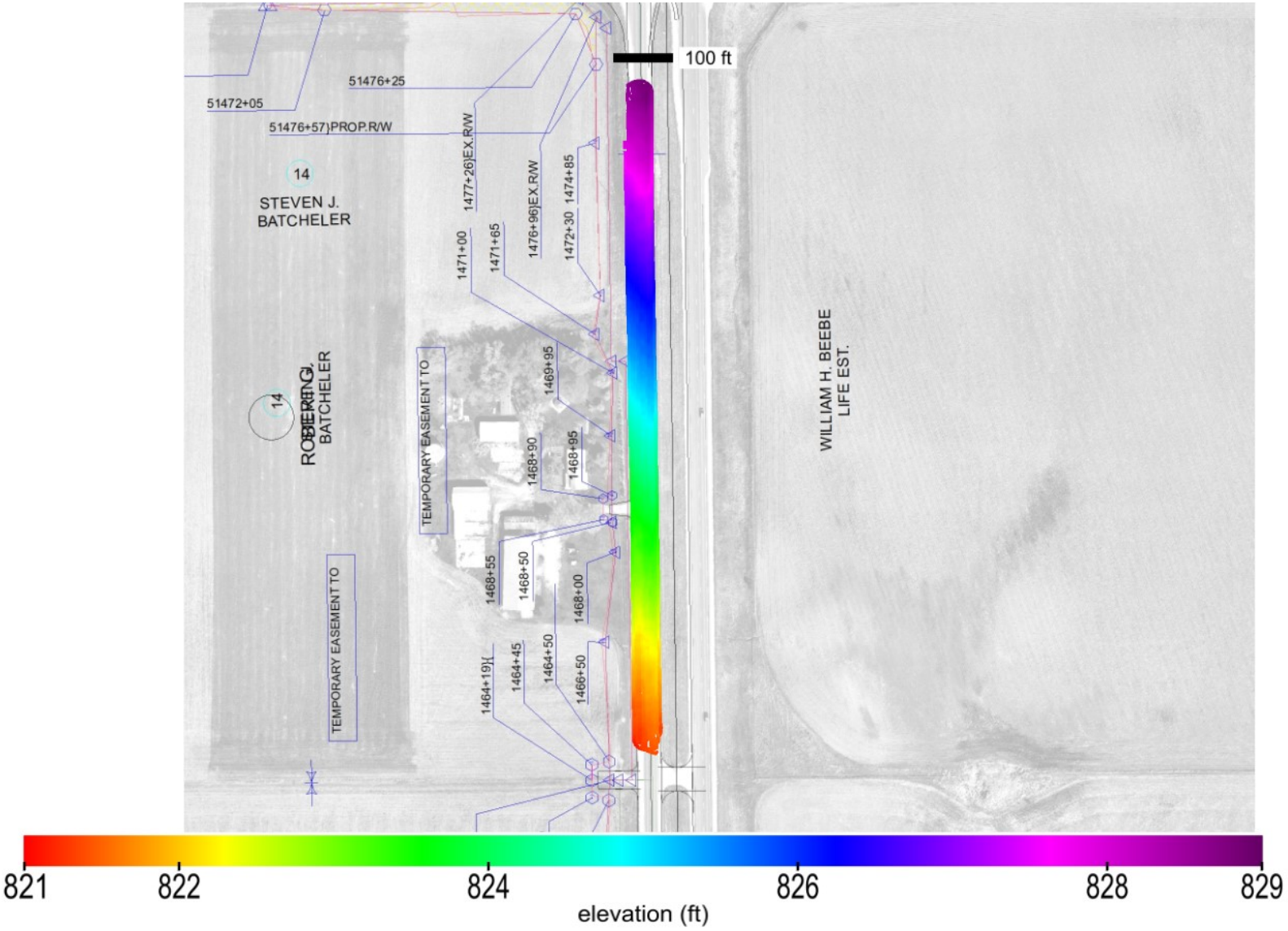
Map ID: iadot_57-us13_cs56-fcs00210_2020_08_21_092115a

minimum	average	maximum
821.078	824.855	828.86

elevation



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Map ID: iadot_57-us13_cs56-fcs00210_2020_08_21_092115a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	54370	1.248	12	3000	150	40

materials

Granular Subbase_IADOT (2111)

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

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US75 Plymouth County	Mapping Duration (hrs):	0.31	Operator:	Ingios Geotechnics inc
Map ID:	iadot_75-us75_cs56-fcs00210_2020_07_28_105318a	No. of Measurements:	24762	Machine ID:	Ingios_FCS00210
Date and Time:	7/28/2020 10:53:18 AM	Location:	Plymouth County	State Plane:	4 IOWA Sioux City-Iowa Falls

Review Status: Review Required

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	1.8	6.74	-0.07	150	35	67.4	185.62	33.78	50.11	-115	-82.6	35.62
Moisture Content	No												

Mapped Area

square feet	acres
24762	0.57

Pass Count

min.	avg.	max.
1	1.62	7

Elevation (ft)

min.	avg.	max.
0	0	0

Velocity (fps)

min.	avg.	max.
0.3	5.5	6.72

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade Class 10	24005	100	24762	0.568	12	3000	150	40

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

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US75 Plymouth County	Mapping Duration (hrs):	0.31	Operator:	Ingios Geotechnics inc
Map ID:	iadot_75-us75_cs56-fcs00210_2020_07_28_105318a	No. of Measurements:	24762	Machine ID:	Ingios_FCS00210
Date and Time:	7/28/2020 10:53:18 AM	Location:	Plymouth County	State Plane:	4 IOWA Sioux City-Iowa Falls

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
6.74	CQI > = 95
1.8	80% of k-Value MVs >= 150
50.11	COV <= 20
100	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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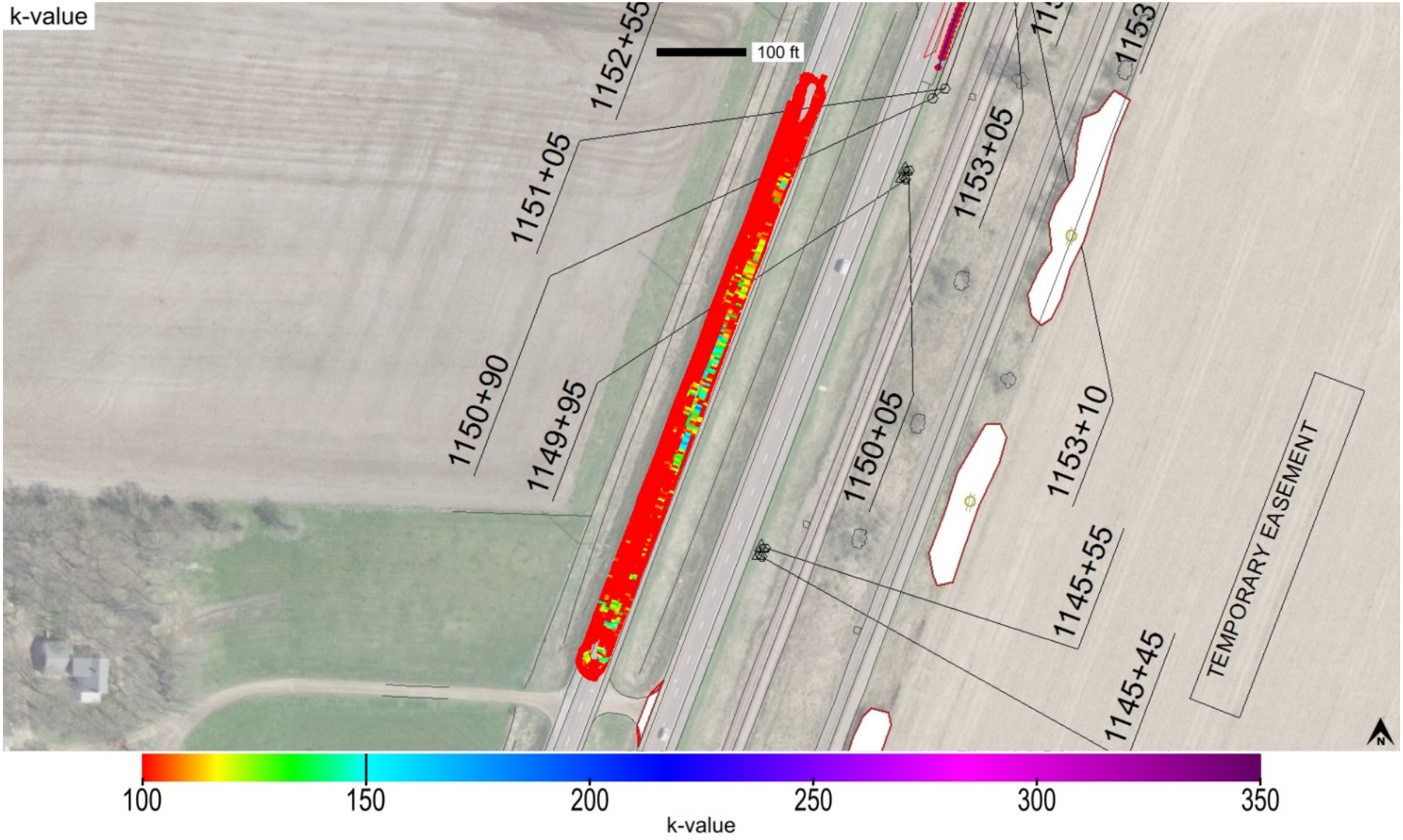
Map ID: iadot_75-us75_cs56-fcs00210_2020_07_28_105318a

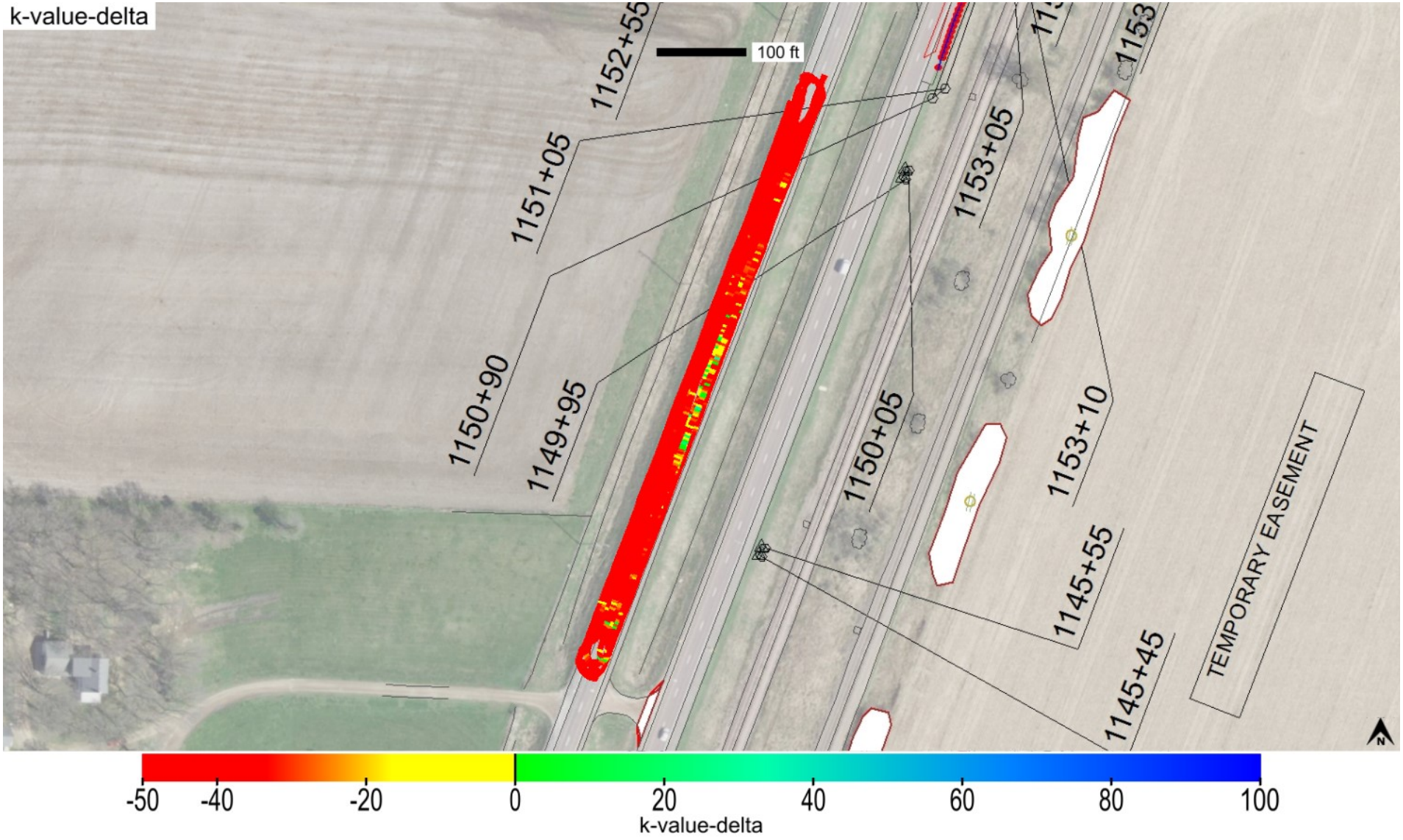
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	1.8	6.74	-0.07	150	35	67.4	185.62	33.78	50.11	-115	-82.6	35.62



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

Map ID: iadot_75-us75_cs56-fcs00210_2020_07_28_105318a

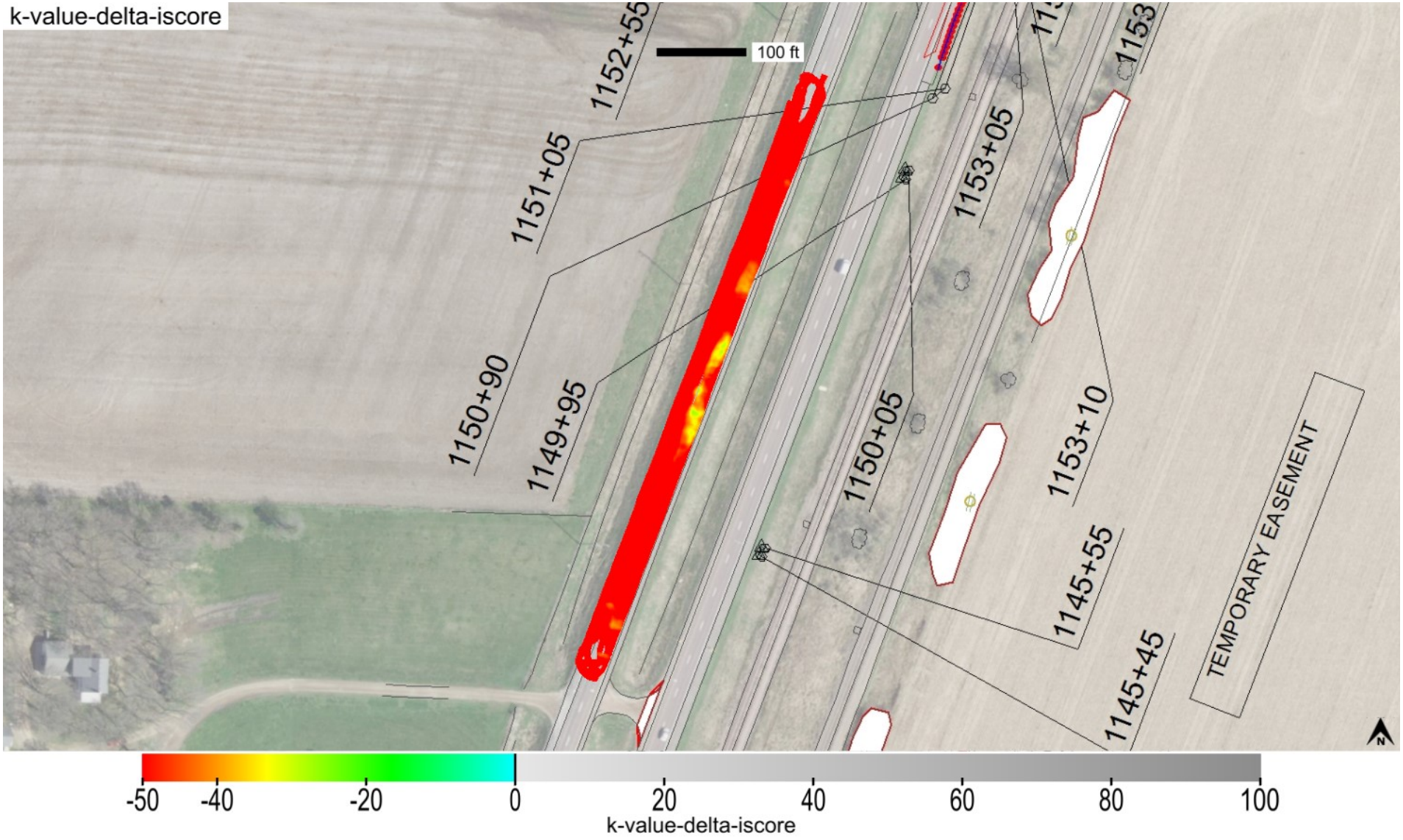
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	1.8	6.74	-0.07	150	35	67.4	185.62	33.78	50.11	-115	-82.6	35.62



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

Map ID: iadot_75-us75_cs56-fcs00210_2020_07_28_105318a

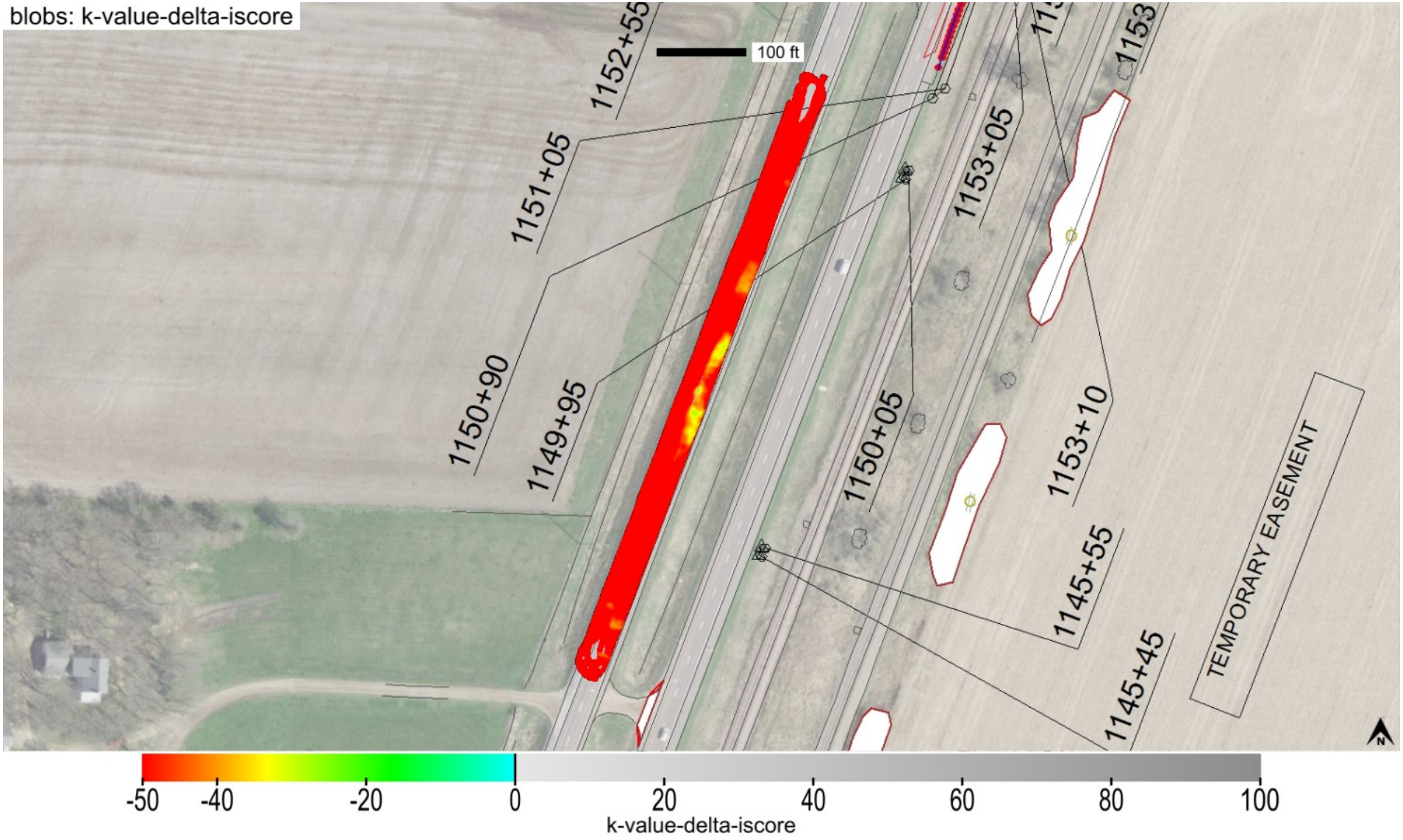
Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	1.8	150	-115	-82.6	35.62	-115	-81.95	-27.28



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

Map ID: iadot_75-us75_cs56-fcs00210_2020_07_28_105318a

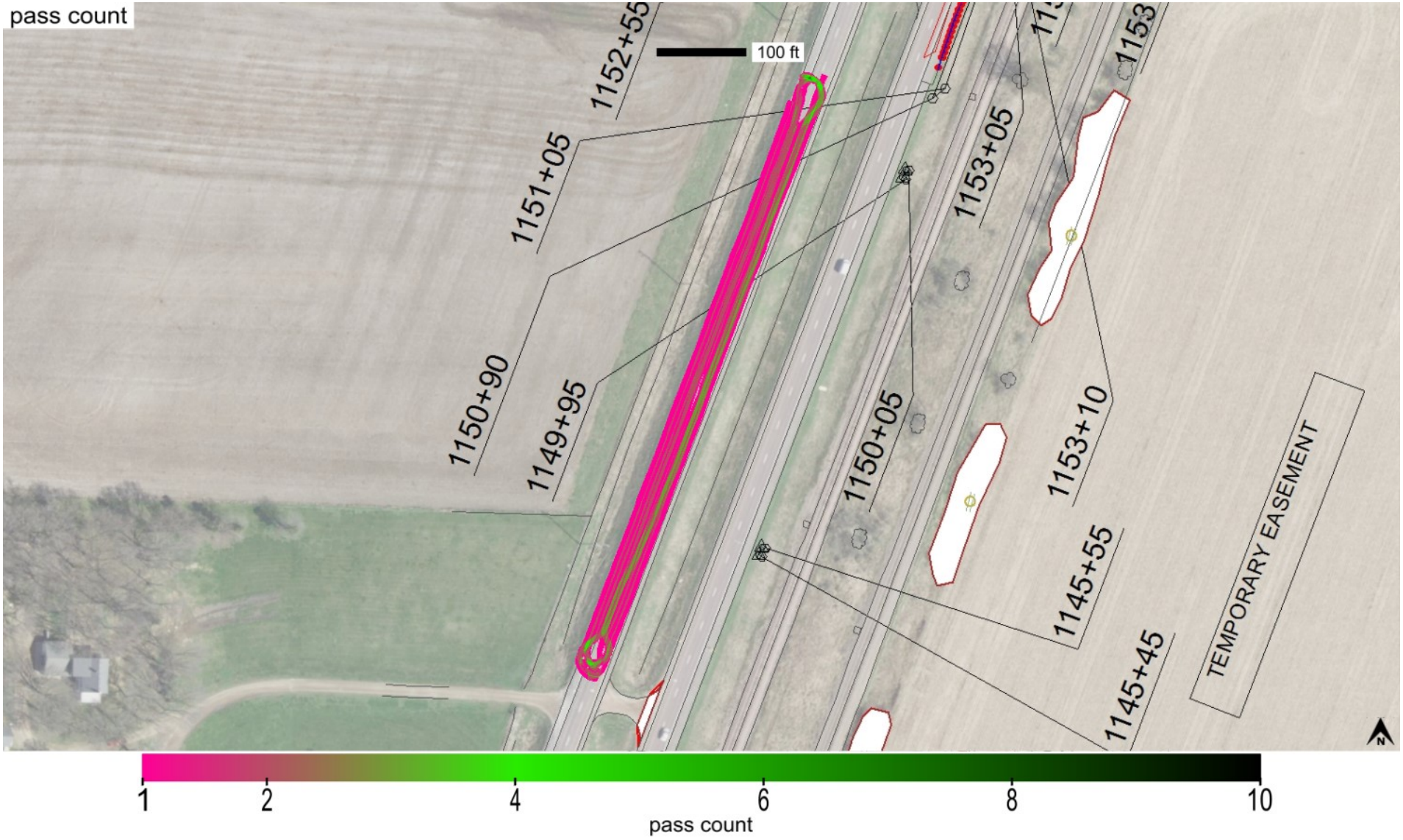
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	24762	100	none	0



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

Map ID: iadot_75-us75_cs56-fcs00210_2020_07_28_105318a

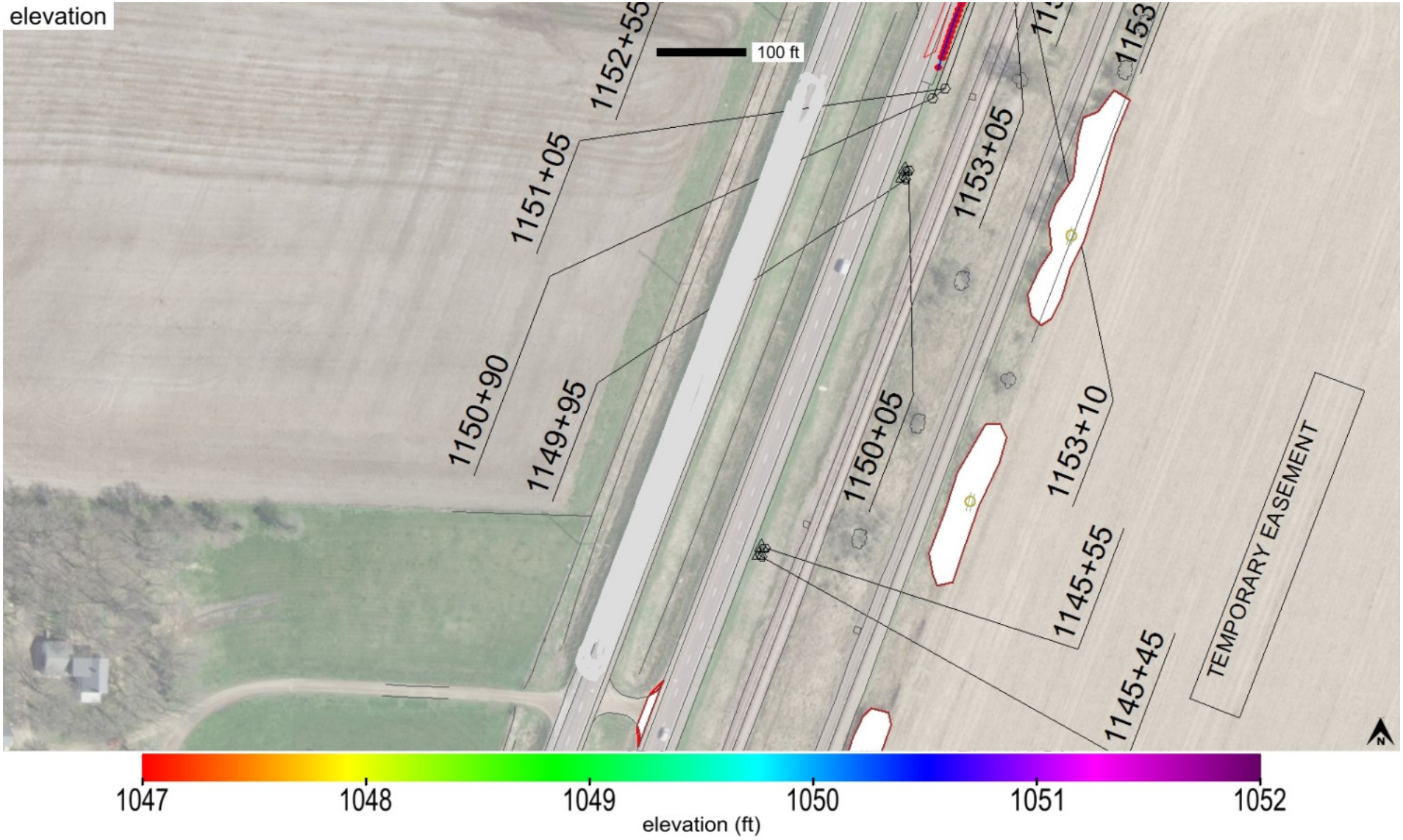
minimum	average	maximum
1	1.62	7



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

Map ID: iadot_75-us75_cs56-fcs00210_2020_07_28_105318a

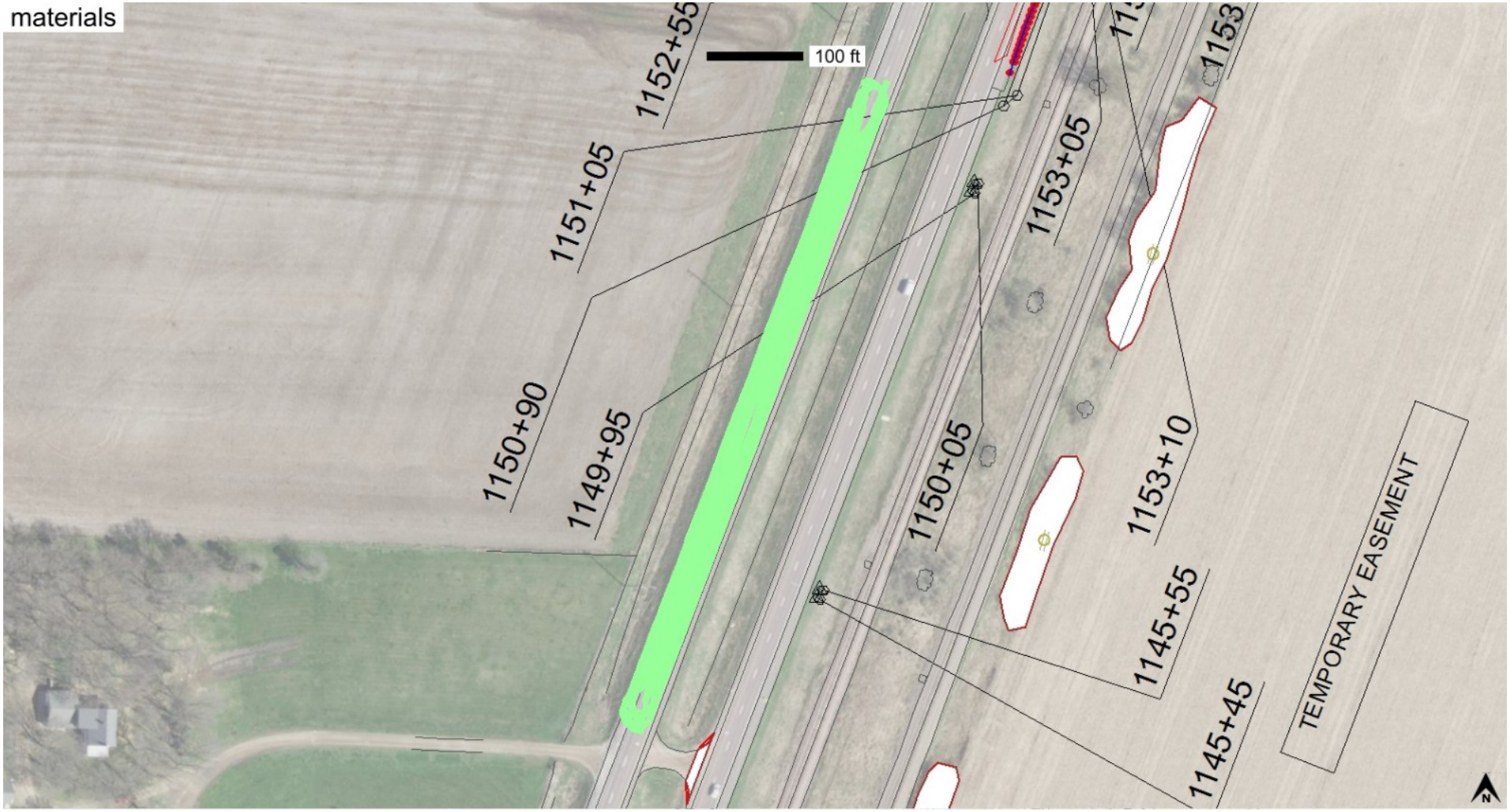
minimum	average	maximum
0	0	0



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

Map ID: iadot_75-us75_cs56-fcs00210_2020_07_28_105318a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Subgrade Class 10	24005	100	24762	0.568	12	3000	150	40



Subgrade_Class 10 (Clay)_IADOT (2102.02A)

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

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Map ID: iadot_75-us75_cs56-fcs00210_2020_07_28_105318a

IMG_20200728_111305310.jpg

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

ingios GEOTECHNICS

Map ID: iadot_75-us75_cs56-fcs00210_2020_07_28_105318a

IMG_20200728_143942849.jpg

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

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IOWADOT

E-Compaction Report

Project:	US75 Plymouth County	Mapping Duration (hrs):	0.8	Operator:	Ingios Geotechnics inc
Map ID:	iadot_75-us75_cs56-fcs00210_2020_07_29_063523a	No. of Measurements:	76861	Machine ID:	Ingios_FCS00210
Date and Time:	7/29/2020 6:35:23 AM	Location:	Plymouth County	State Plane:	4 IOWA Sioux City-Iowa Falls

Review Status: Review Required

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	Yes	100	109.58	0.73	3600	5500	18404.7	56000	7515.84	40.84	1900	14804.7	52400
k-value	Yes	21.8	32.5	0.3	150	20	114.1	190	44.13	38.68	-130	-35.9	40
Moisture Content	No												

Mapped Area

square feet	acres
76861	1.76

Pass Count

min.	avg.	max.
1	1.39	4

Elevation (ft)

min.	avg.	max.
0	0	0

Velocity (fps)

min.	avg.	max.
0.49	5.48	6.6

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Special Backfill	21010	100	76861	1.764	12	3600	150	40

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IOWADOT

E-Compaction Report

Project:	US75 Plymouth County	Mapping Duration (hrs):	0.8	Operator:	Ingios Geotechnics inc
Map ID:	iadot_75-us75_cs56-fcs00210_2020_07_29_063523a	No. of Measurements:	76861	Machine ID:	Ingios_FCS00210
Date and Time:	7/29/2020 6:35:23 AM	Location:	Plymouth County	State Plane:	4 IOWA Sioux City-Iowa Falls

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
109.58	CQI > = 95
100	80% of Resilient Modulus MVs >= 3600
40.84	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US75 Plymouth County	Mapping Duration (hrs):	0.8	Operator:	Ingios Geotechnics inc
Map ID:	iadot_75-us75_cs56-fcs00210_2020_07_29_063523a	No. of Measurements:	76861	Machine ID:	Ingios_FCS00210
Date and Time:	7/29/2020 6:35:23 AM	Location:	Plymouth County	State Plane:	4 IOWA Sioux City-Iowa Falls

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
32.5	CQI > = 95
21.8	80% of k-Value MVs >= 150
38.68	COV <= 20
86.54	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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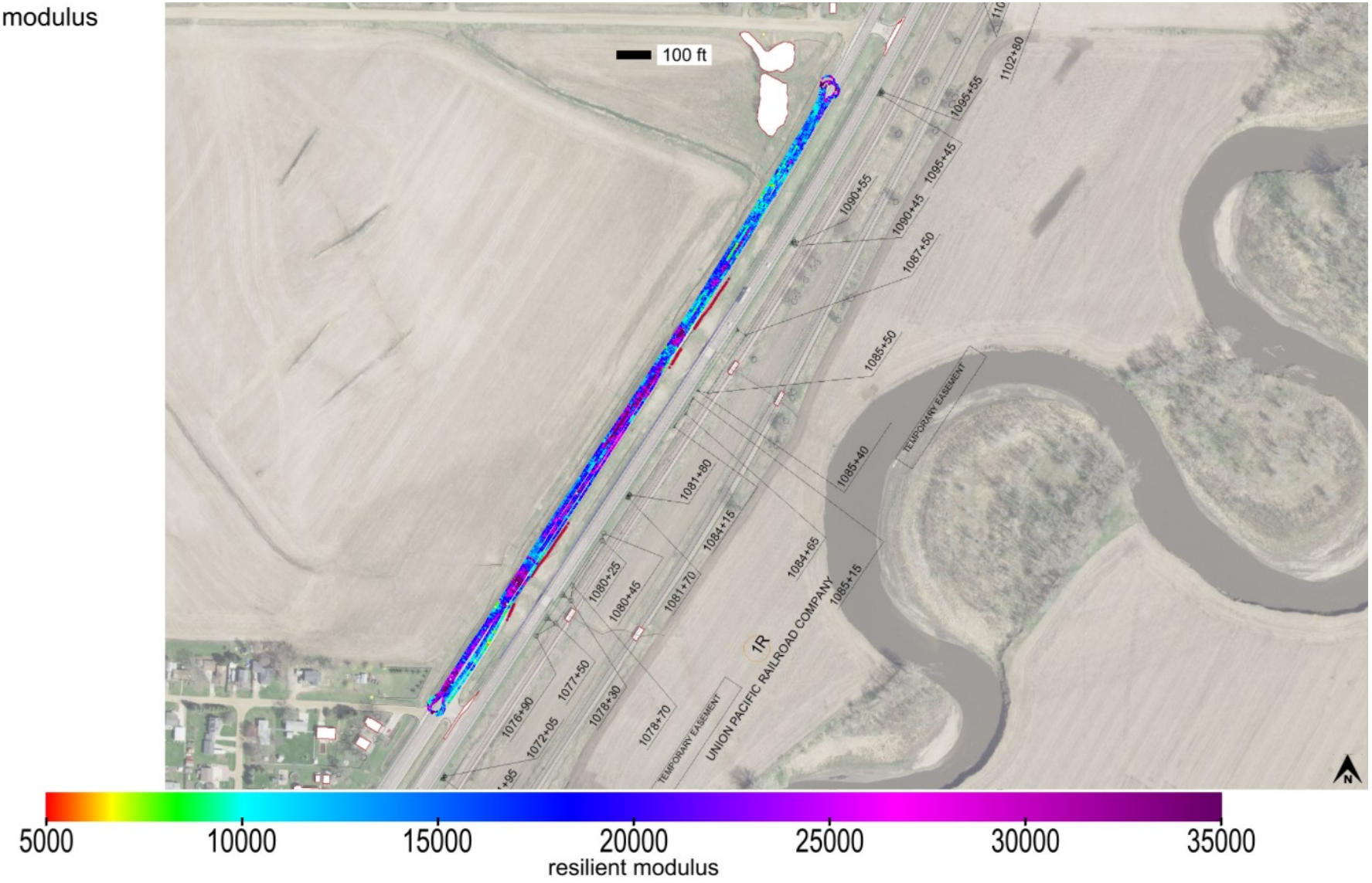
Map ID: iadot_75-us75_cs56-fcs00210_2020_07_29_063523a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	109.58	0.73	3600	5500	18404.7	56000	7515.84	40.84	1900	14804.7	52400

resilient modulus



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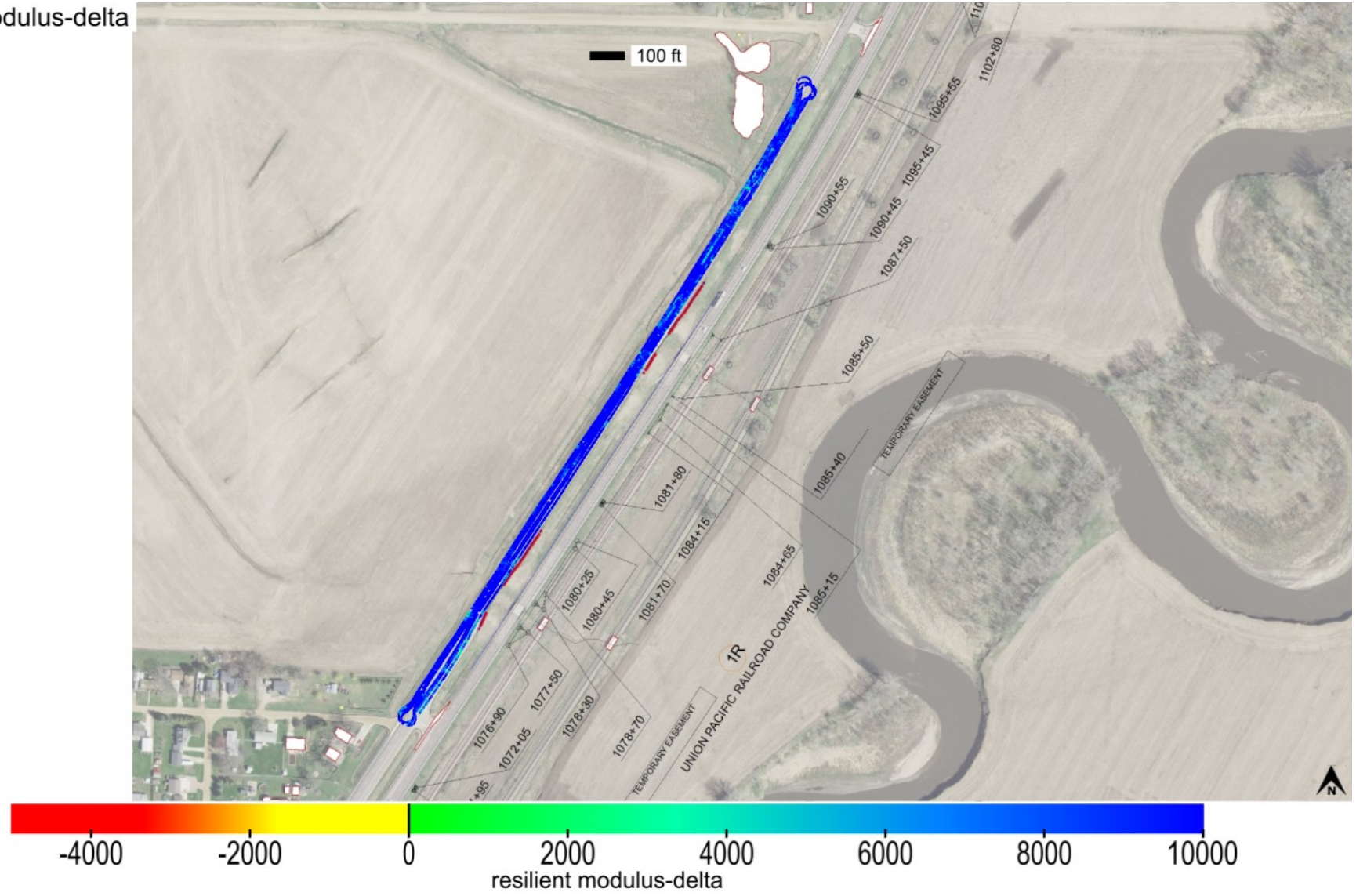
ingios GEOTECHNICS

Map ID: iadot_75-us75_cs56-fcs00210_2020_07_29_063523a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	109.58	0.73	3600	5500	18404.7	56000	7515.84	40.84	1900	14804.7	52400

resilient modulus-delta



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

ingios GEOTECHNICS

Map ID: iadot_75-us75_cs56-fcs00210_2020_07_29_063523a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	100	3600	1900	14804.7	52400	4067.77	14925.29	40606.01

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Map ID: iadot_75-us75_cs56-fcs00210_2020_07_29_063523a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

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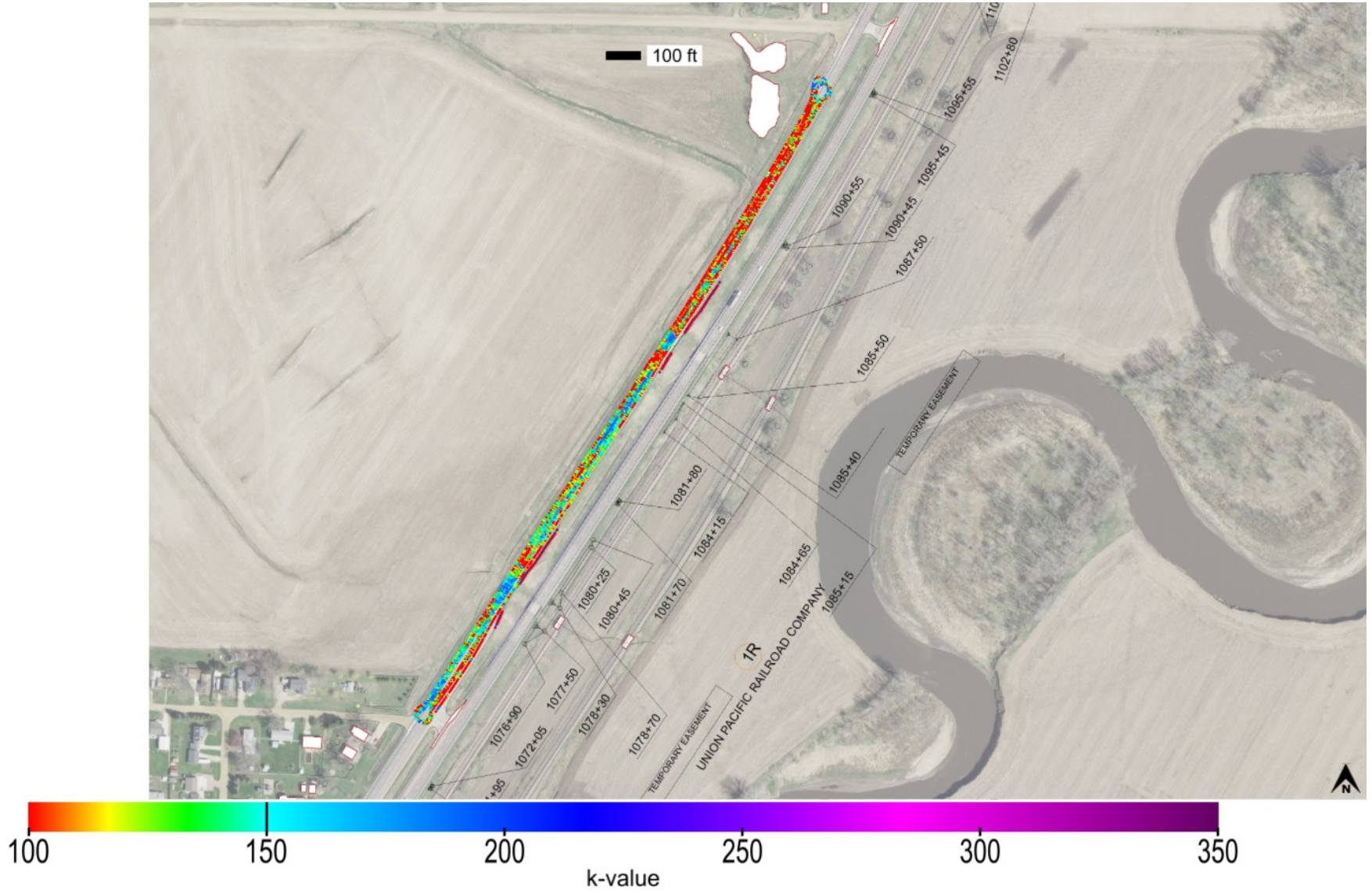
Map ID: iadot_75-us75_cs56-fcs00210_2020_07_29_063523a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	21.8	32.5	0.3	150	20	114.1	190	44.13	38.68	-130	-35.9	40

k-value



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Map ID: iadot_75-us75_cs56-fcs00210_2020_07_29_063523a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	21.8	32.5	0.3	150	20	114.1	190	44.13	38.68	-130	-35.9	40

k-value-delta

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Map ID: iadot_75-us75_cs56-fcs00210_2020_07_29_063523a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	21.8	150	-130	-35.9	40	-126.95	-35.22	39.88

k-value-delta-iscore

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Map ID: iadot_75-us75_cs56-fcs00210_2020_07_29_063523a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	7	66515	86.54	none	0

blobs: k-value-delta-iscore

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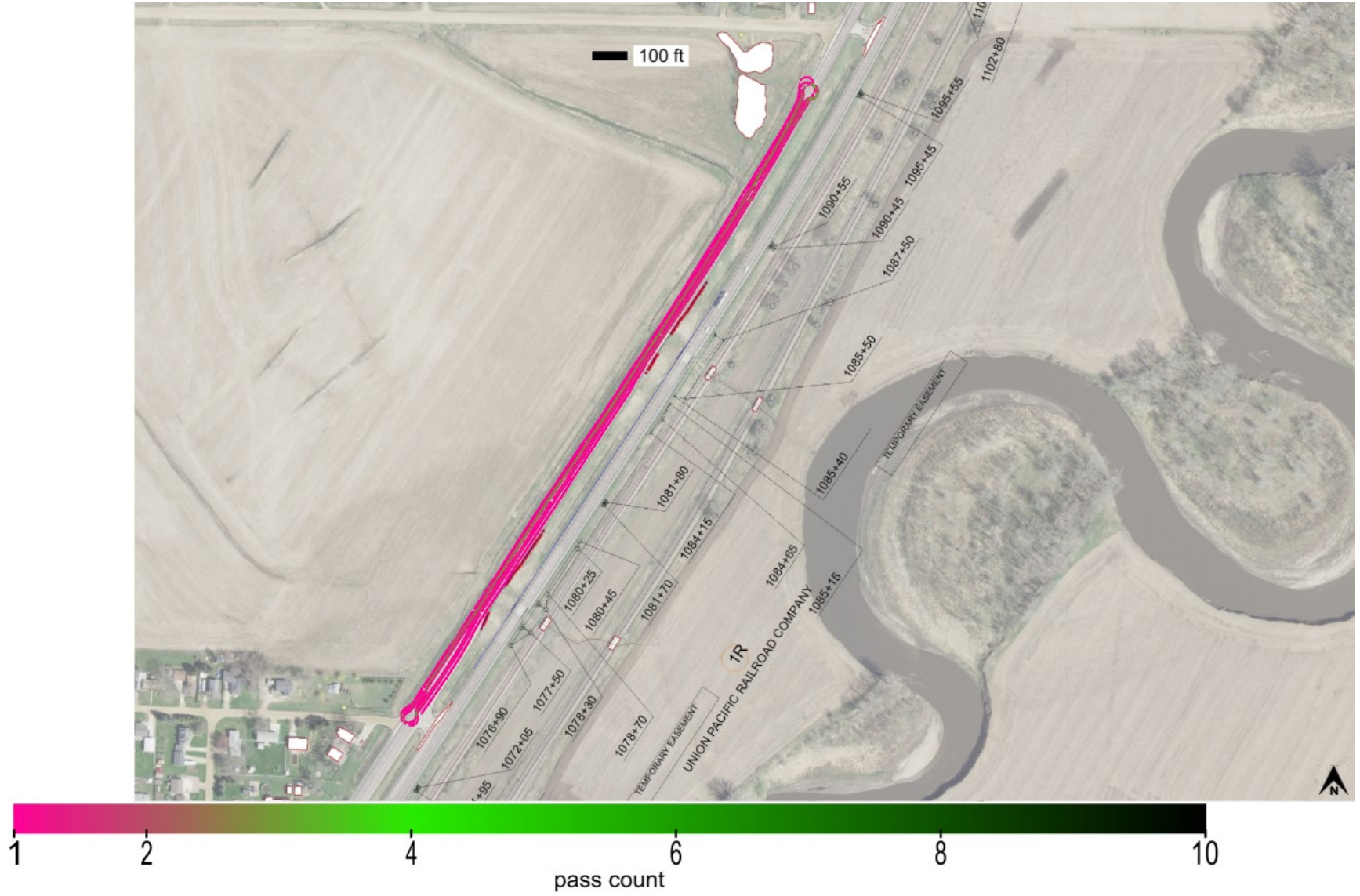
Map ID: iadot_75-us75_cs56-fcs00210_2020_07_29_063523a

minimum	average	maximum
1	1.39	4

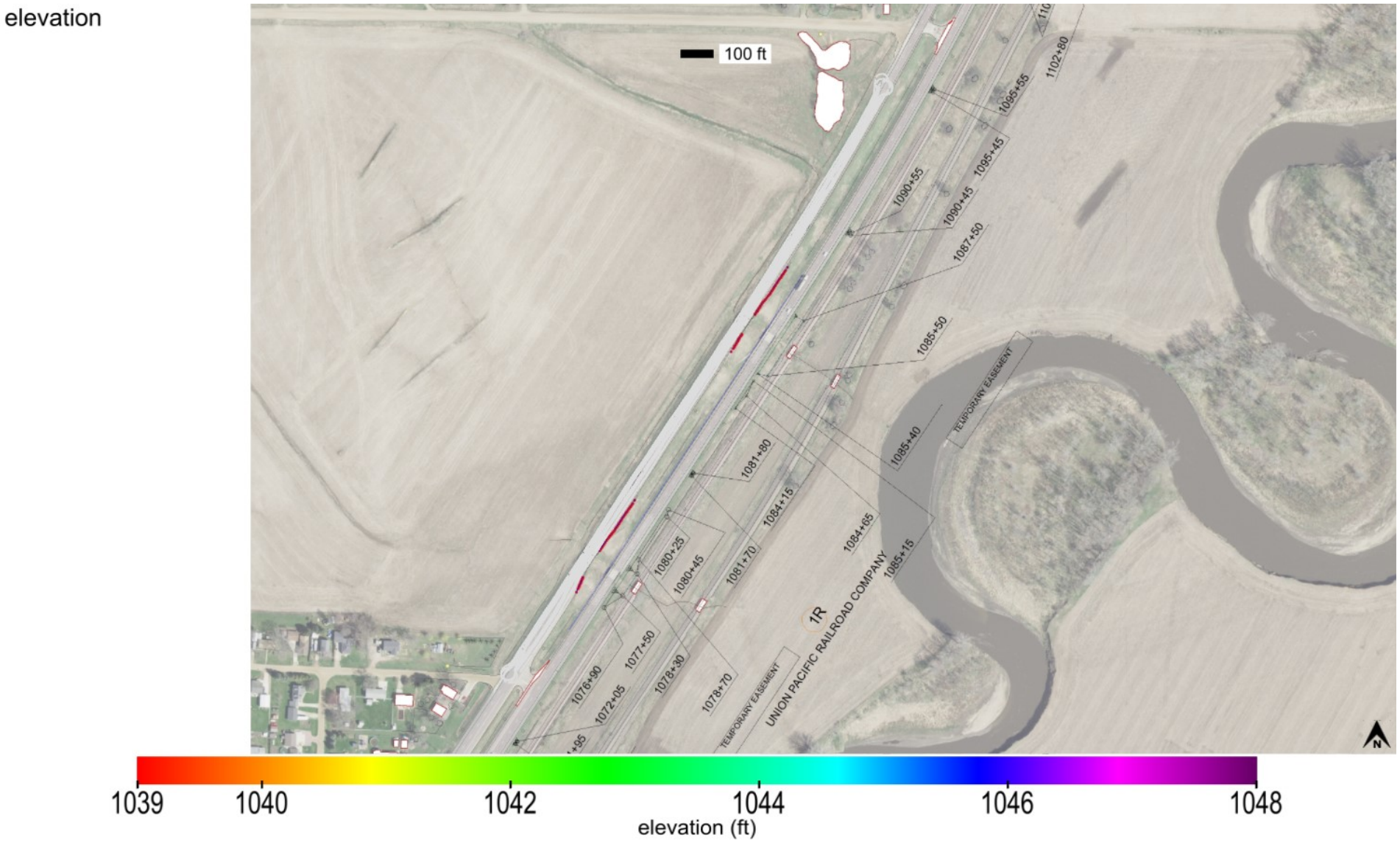
pass count



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

Map ID: iadot_75-us75_cs56-fcs00210_2020_07_29_063523a

minimum	average	maximum
0	0	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: iadot_75-us75_cs56-fcs00210_2020_07_29_063523a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Special Backfill	21010	100	76861	1.764	12	3600	150	40

materials

Subgrade_Treatment Special Backfill_IADOT (2102.02D)

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

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Map ID: iadot_75-us75_cs56-fcs00210_2020_07_29_063523a

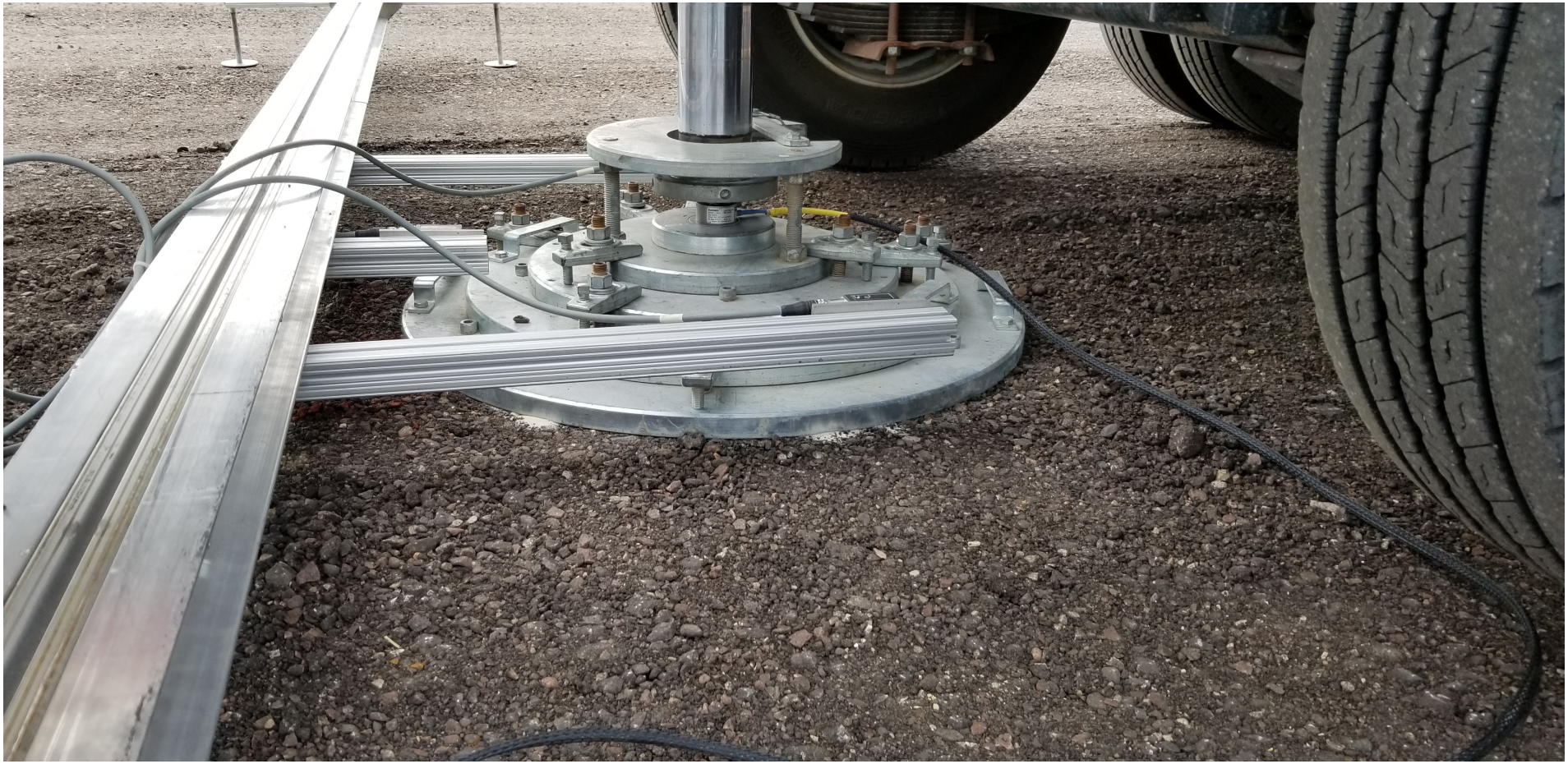
20200729_093329.jpg

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

ingios GEOTECHNICS

Map ID: iadot_75-us75_cs56-fcs00210_2020_07_29_063523a

20200729_100443.jpg



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

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Map ID: iadot_75-us75_cs56-fcs00210_2020_07_29_063523a

IMG_20200729_085150233.jpg

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

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Map ID: iadot_75-us75_cs56-fcs00210_2020_07_29_063523a

IMG_20200729_111239861.jpg

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

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US75 Plymouth County	Mapping Duration (hrs):	0.29	Operator:	Ingios Geotechnics inc
Map ID:	iadot_75-us75_cs56-fcs00210_2020_07_29_083029a	No. of Measurements:	3235	Machine ID:	Ingios_FCS00210
Date and Time:	7/29/2020 8:30:29 AM	Location:	Plymouth County	State Plane:	4 IOWA Sioux City-Iowa Falls

Review Status: Review Required

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	Yes	100	117.89	1.23	3600	6434.05	19322.9	33048.08	4680.48	24.22	2834.05	15722.9	29448.08
k-value	Yes	2.5	19.72	0.44	150	20	112.4	169.67	28.68	25.5	-130	-37.6	19.67
Moisture Content	No												

Mapped Area

square feet	acres
3235	0.07

Pass Count

min.	avg.	max.
1	5.96	8

Elevation (ft)

min.	avg.	max.
0	0	0

Velocity (fps)

min.	avg.	max.
1.02	5.47	5.92

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Special Backfill	21010	100	3235	0.074	12	3600	150	40

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IOWADOT

E-Compaction Report

Project:	US75 Plymouth County	Mapping Duration (hrs):	0.29	Operator:	Ingios Geotechnics inc
Map ID:	iadot_75-us75_cs56-fcs00210_2020_07_29_083029a	No. of Measurements:	3235	Machine ID:	Ingios_FCS00210
Date and Time:	7/29/2020 8:30:29 AM	Location:	Plymouth County	State Plane:	4 IOWA Sioux City-Iowa Falls

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
117.89	CQI > = 95
100	80% of Resilient Modulus MVs >= 3600
24.22	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US75 Plymouth County	Mapping Duration (hrs):	0.29	Operator:	Ingios Geotechnics inc
Map ID:	iadot_75-us75_cs56-fcs00210_2020_07_29_083029a	No. of Measurements:	3235	Machine ID:	Ingios_FCS00210
Date and Time:	7/29/2020 8:30:29 AM	Location:	Plymouth County	State Plane:	4 IOWA Sioux City-Iowa Falls

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
19.72	CQI > = 95
2.5	80% of k-Value MVs >= 150
25.5	COV <= 20
100	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

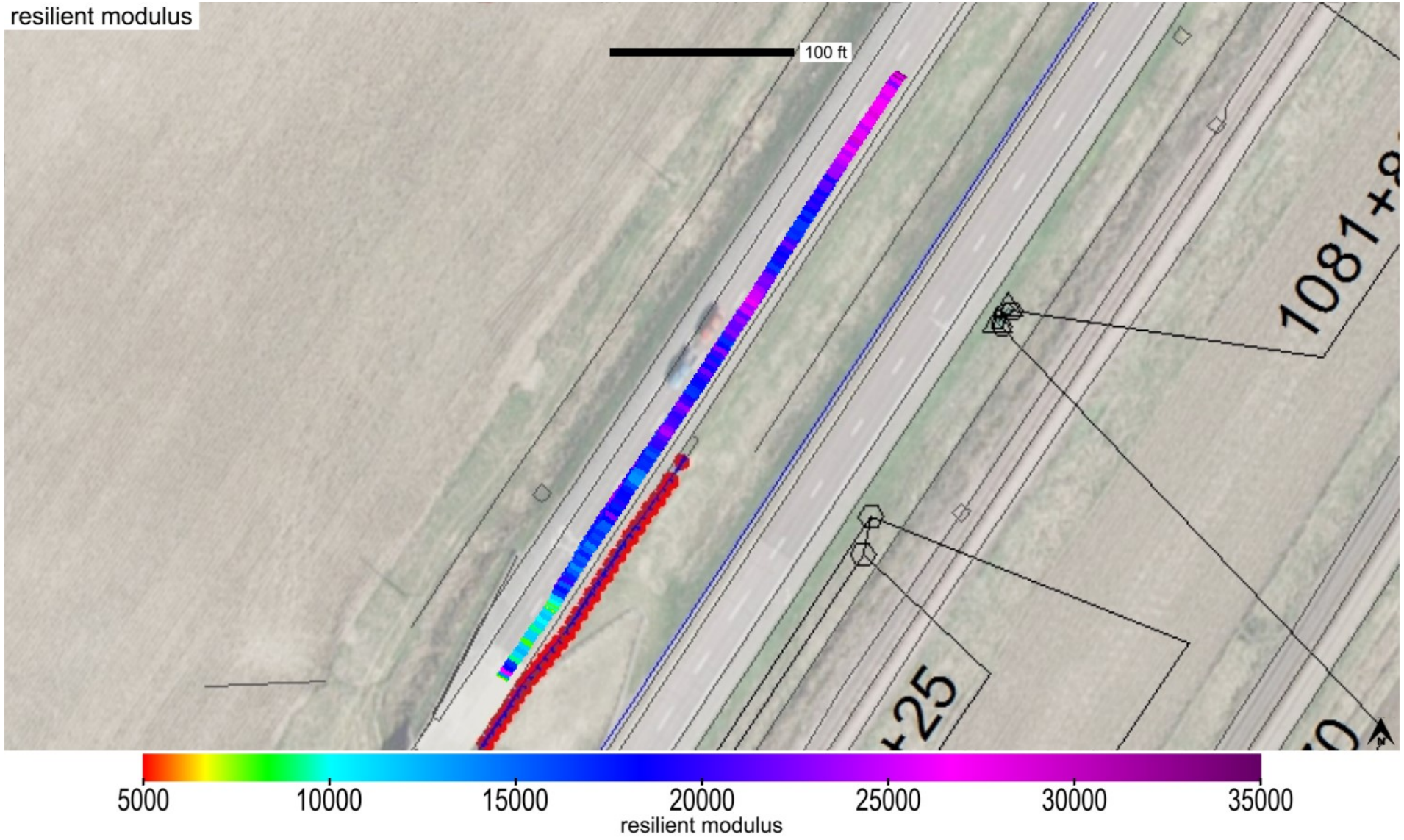
i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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

ingios GEOTECHNICS

Map ID: iadot_75-us75_cs56-fcs00210_2020_07_29_083029a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	117.89	1.23	3600	6434.05	19322.9	33048.08	4680.48	24.22	2834.05	15722.9	29448.08



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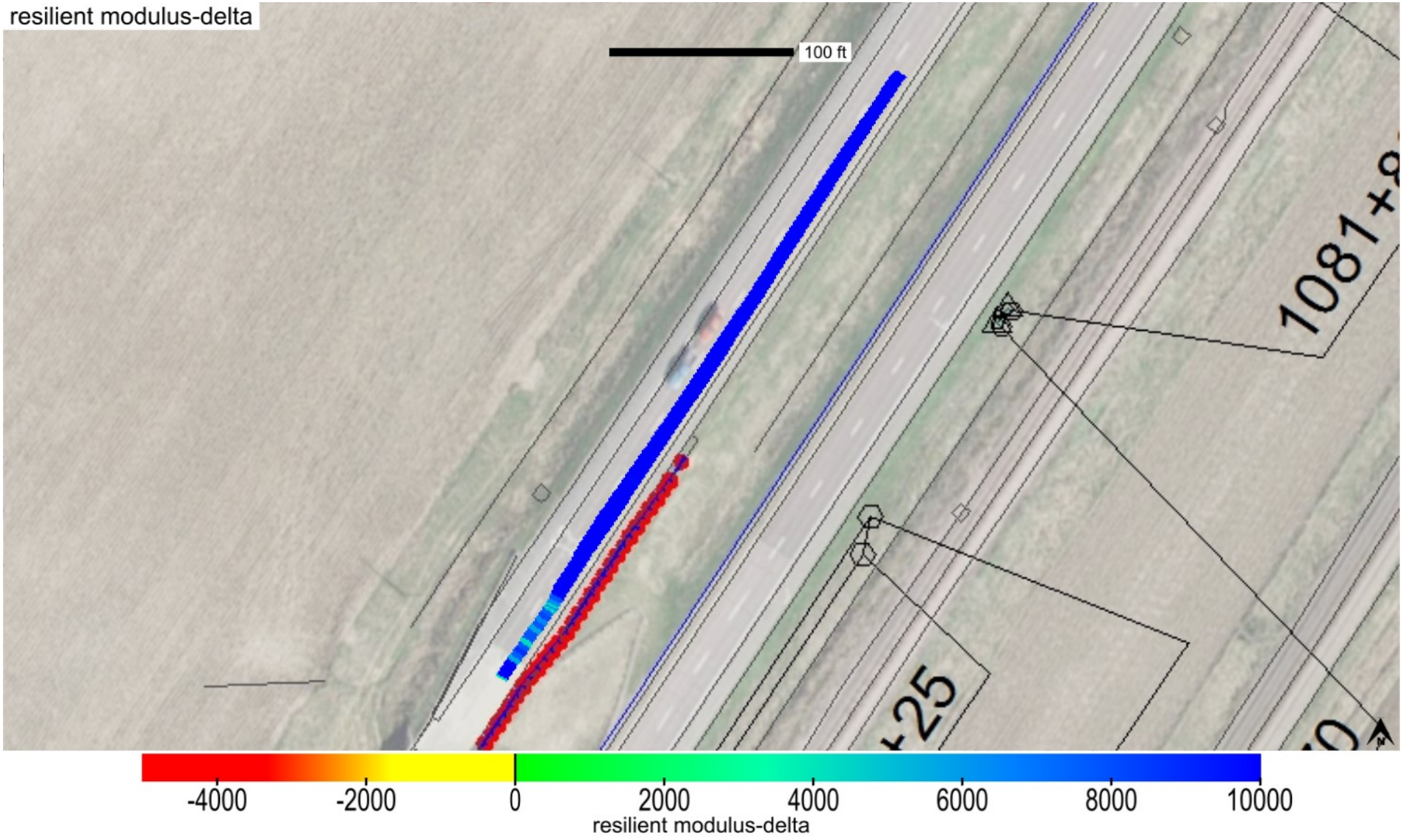
ingios GEOTECHNICS

Map ID: iadot_75-us75_cs56-fcs00210_2020_07_29_083029a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	117.89	1.23	3600	6434.05	19322.9	33048.08	4680.48	24.22	2834.05	15722.9	29448.08



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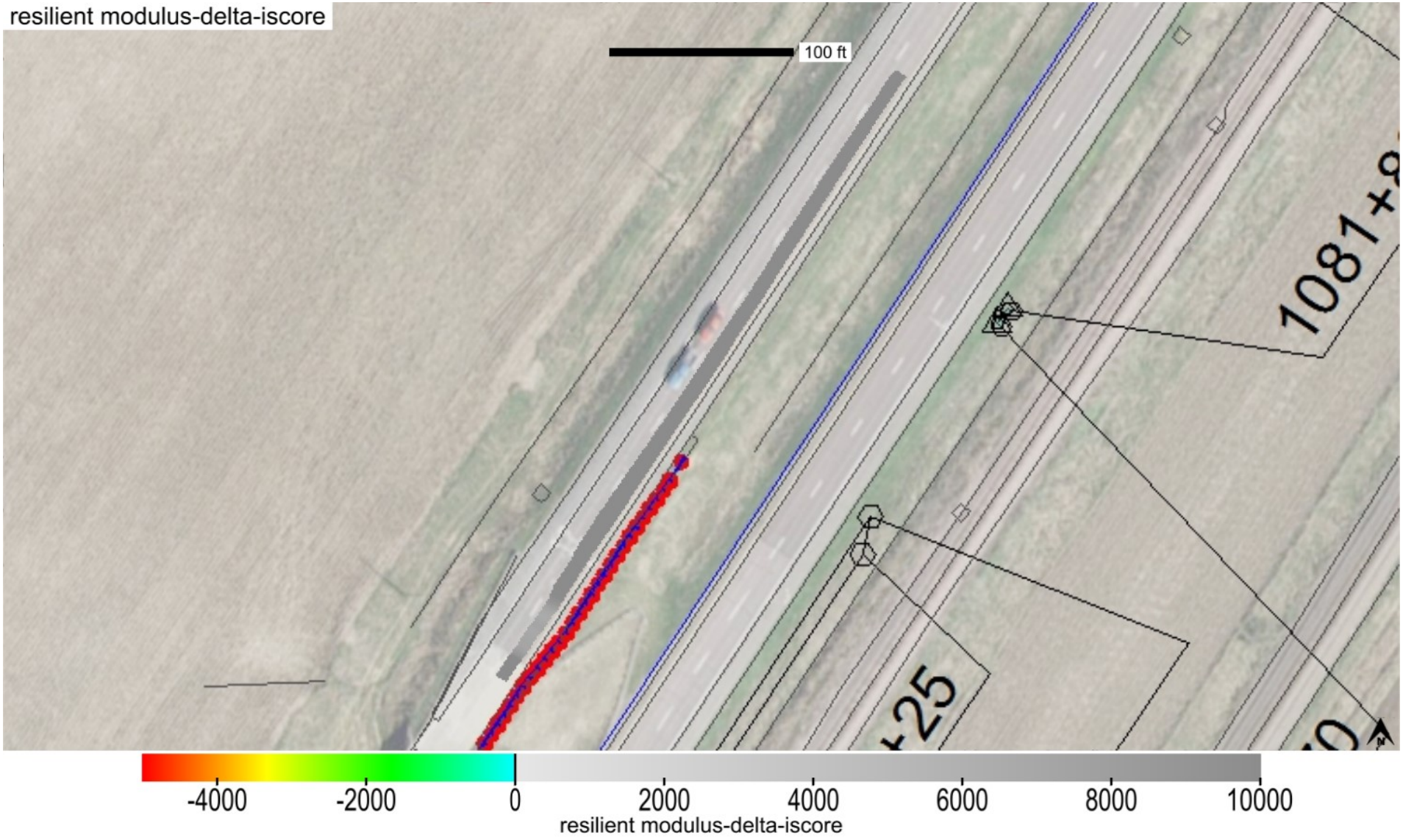
ingios GEOTECHNICS

Map ID: iadot_75-us75_cs56-fcs00210_2020_07_29_083029a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	100	3600	2834.05	15722.9	29448.08	6529.24	15713.34	23542.41



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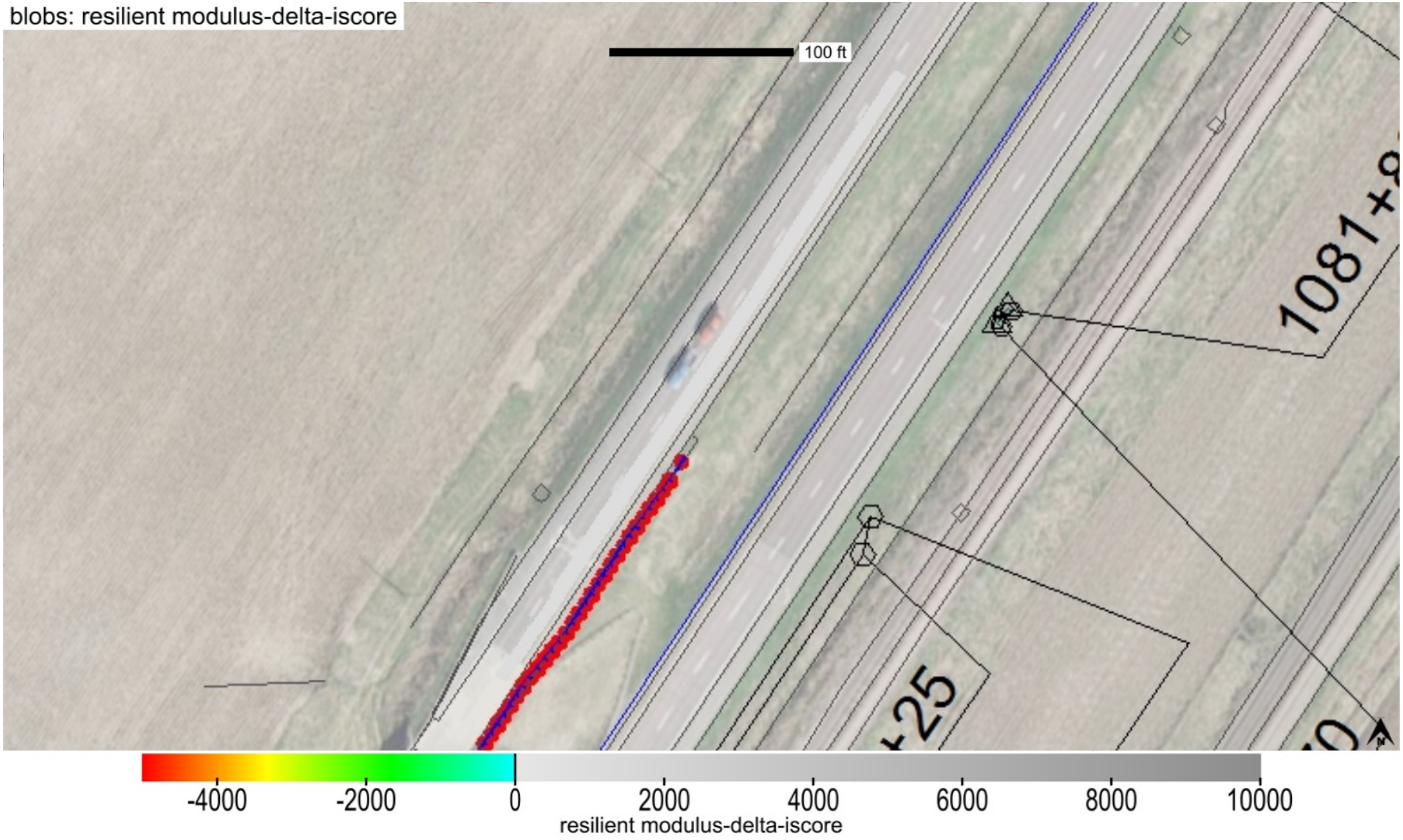
ingios GEOTECHNICS

Map ID: iadot_75-us75_cs56-fcs00210_2020_07_29_083029a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

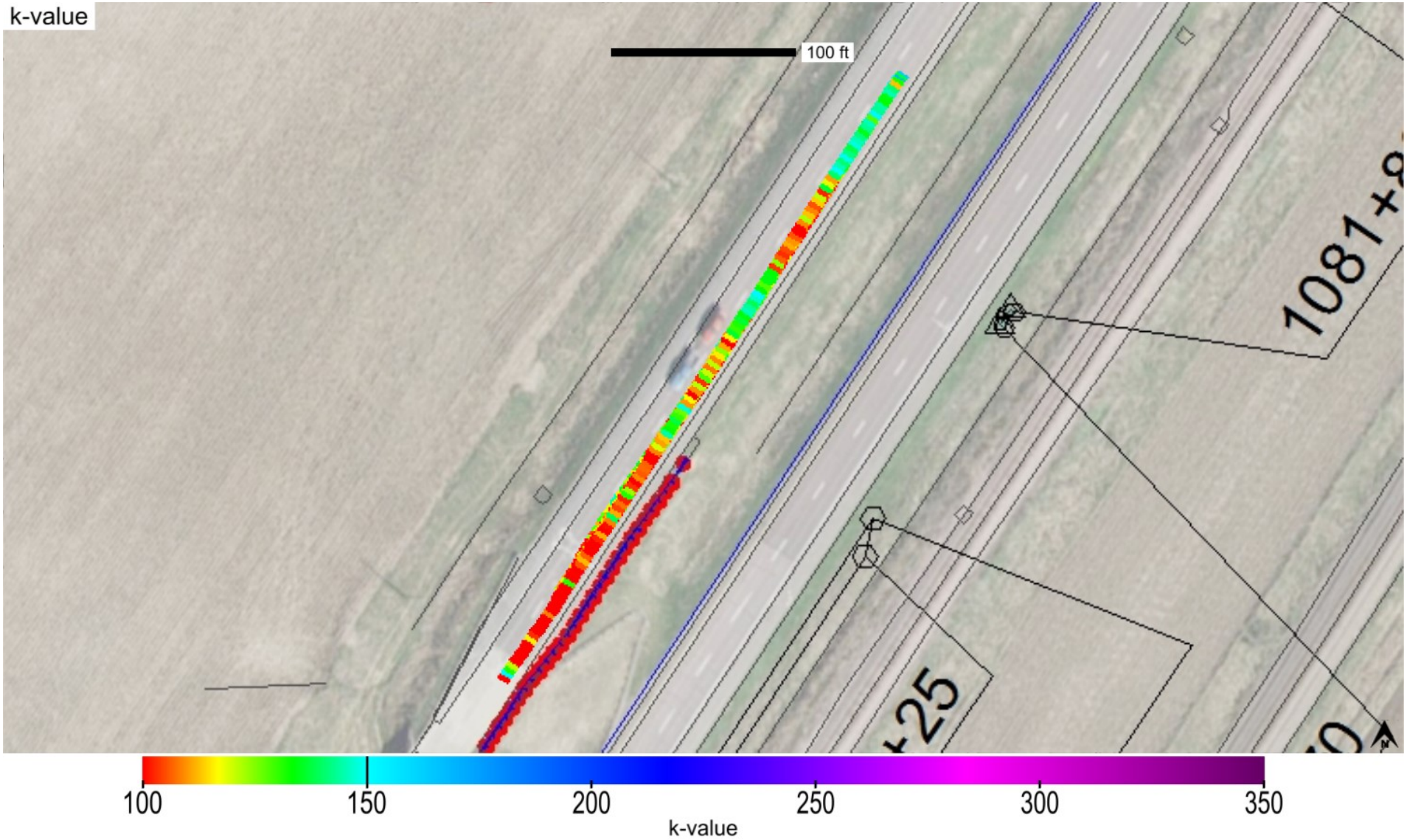


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_75-us75_cs56-fcs00210_2020_07_29_083029a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	2.5	19.72	0.44	150	20	112.4	169.67	28.68	25.5	-130	-37.6	19.67



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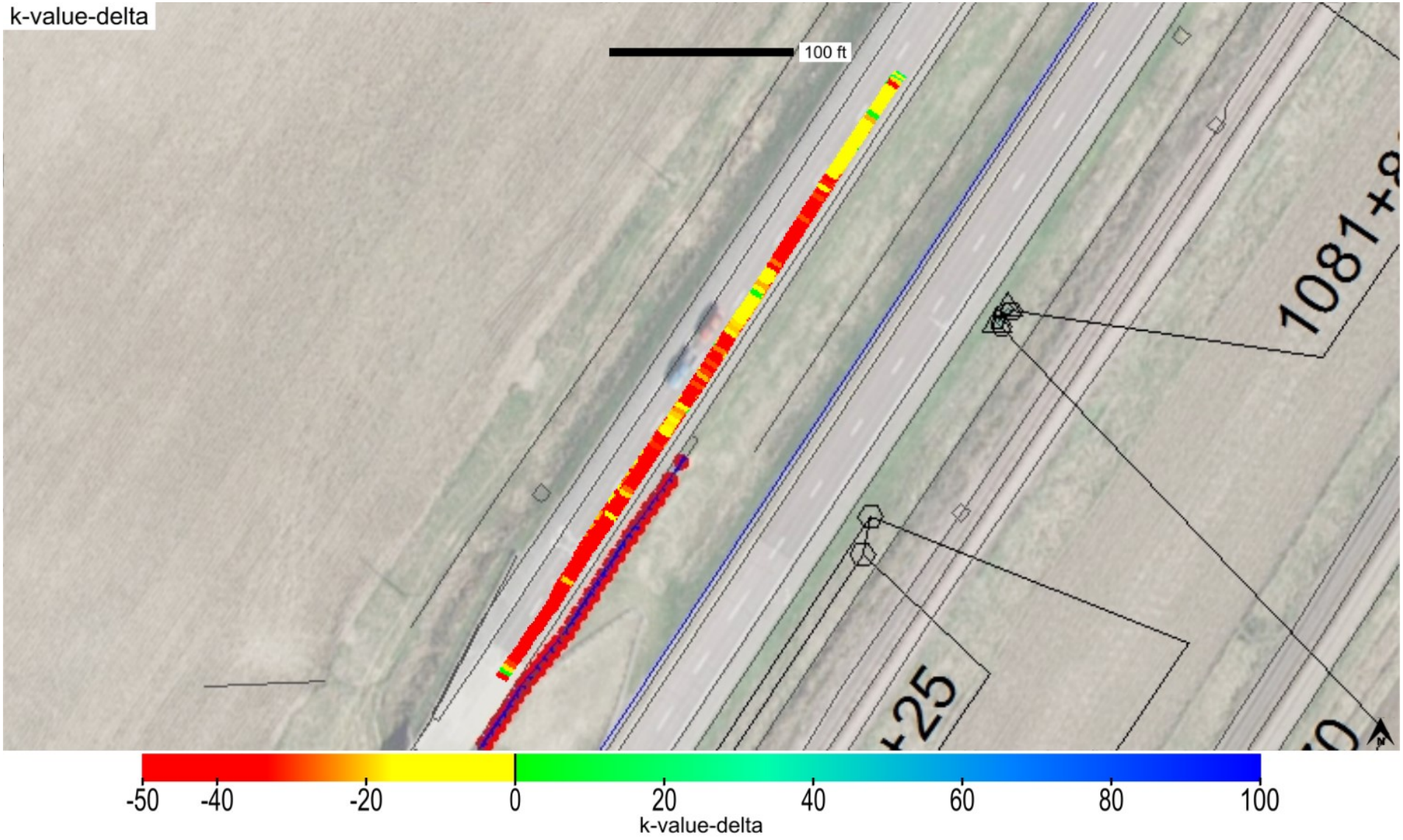
ingios GEOTECHNICS

Map ID: iadot_75-us75_cs56-fcs00210_2020_07_29_083029a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	2.5	19.72	0.44	150	20	112.4	169.67	28.68	25.5	-130	-37.6	19.67



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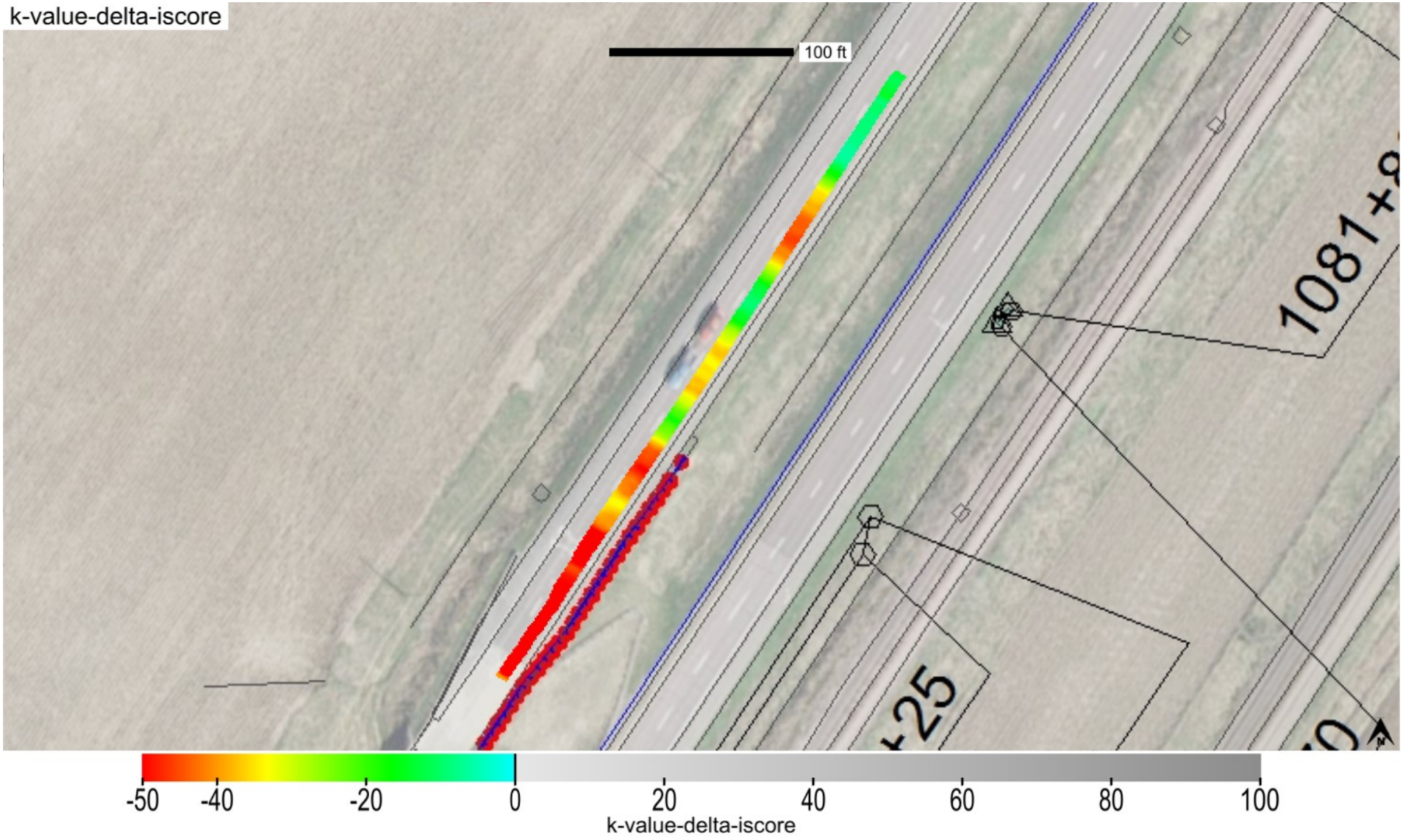
Map ID: iadot_75-us75_cs56-fcs00210_2020_07_29_083029a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	2.5	150	-130	-37.6	19.67	-103.17	-37.55	-5.94



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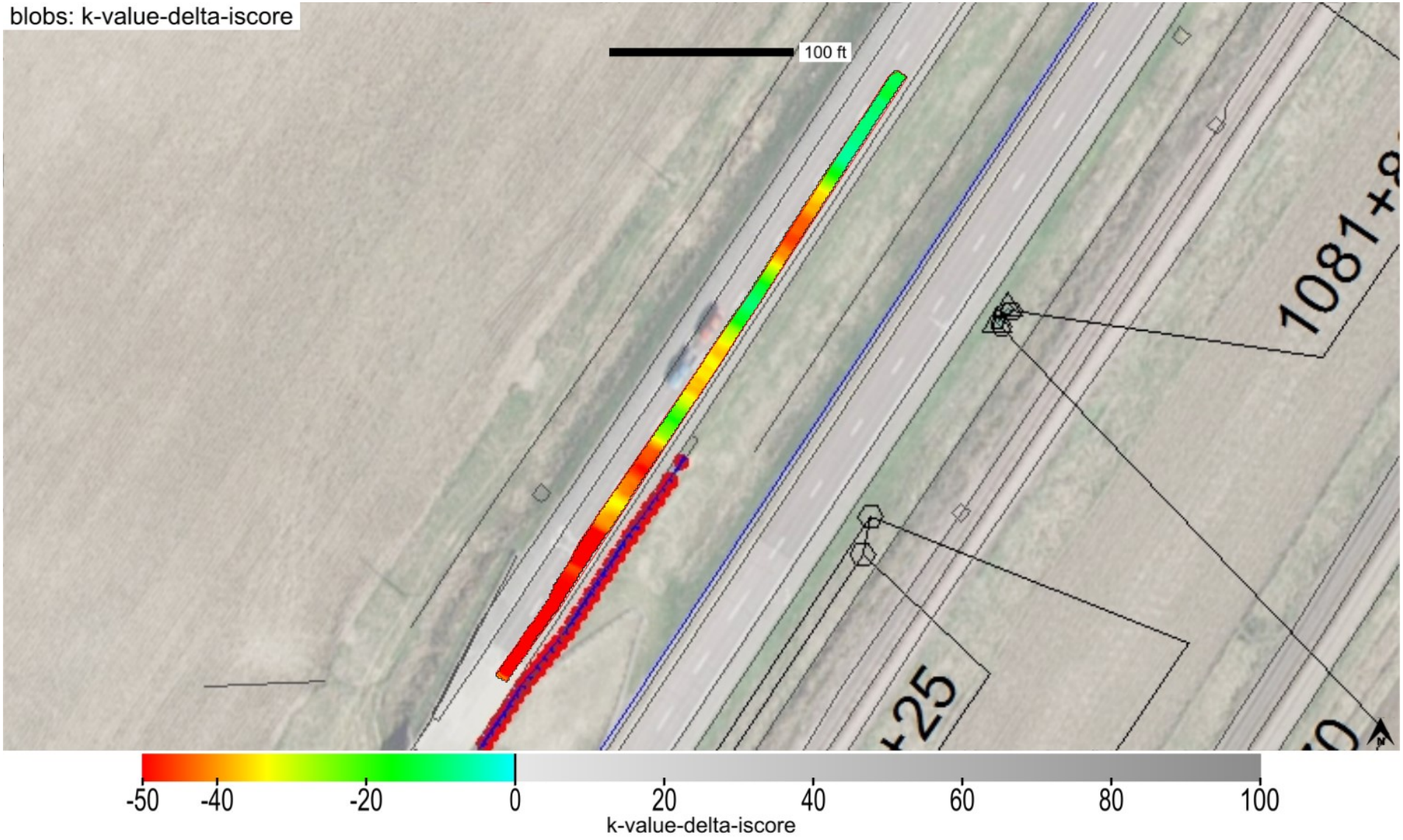
ingios GEOTECHNICS

Map ID: iadot_75-us75_cs56-fcs00210_2020_07_29_083029a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	3235	100	none	0



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ingios GEOTECHNICS

Map ID: iadot_75-us75_cs56-fcs00210_2020_07_29_083029a

minimum	average	maximum
1	5.96	8

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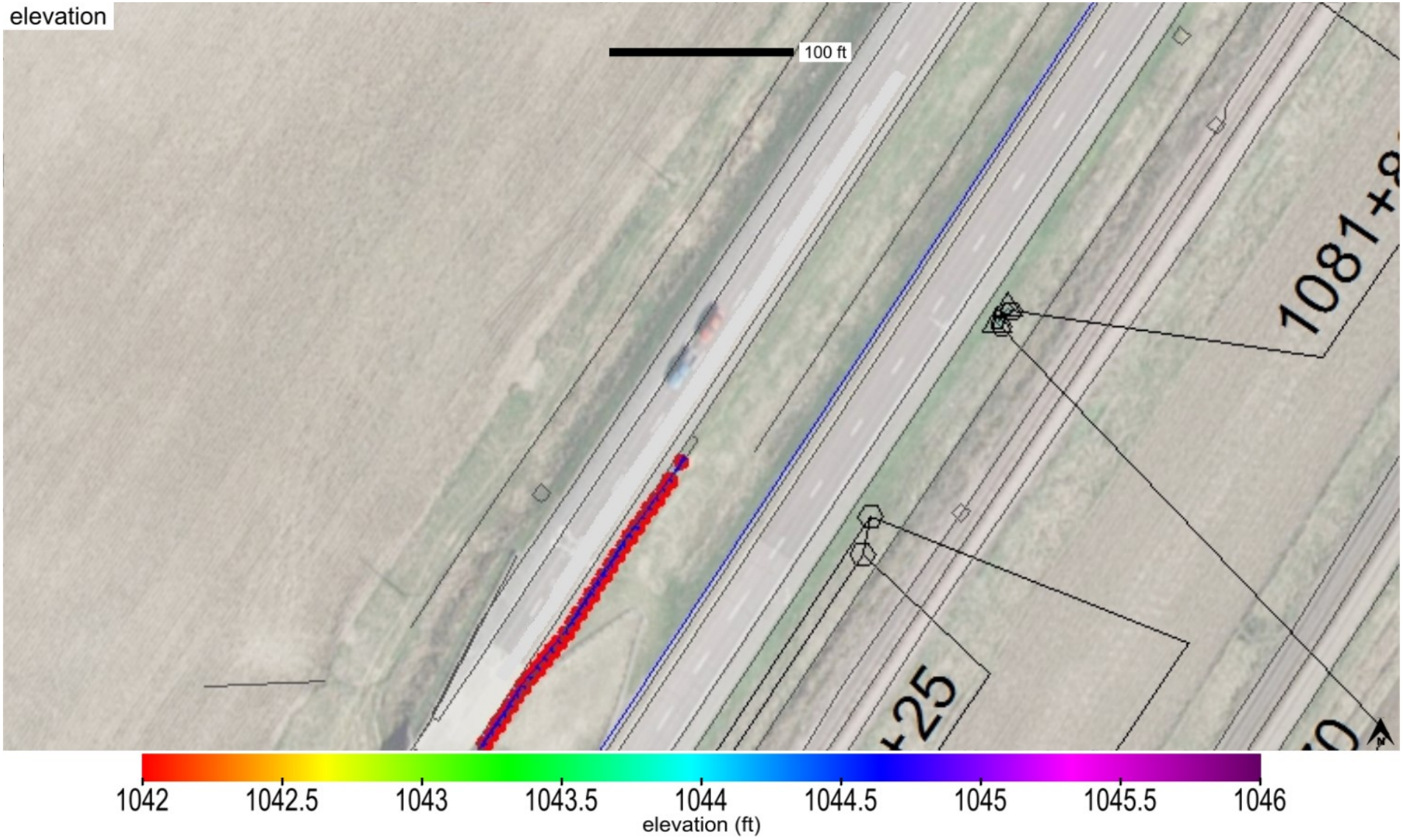
Map ID: iadot_75-us75_cs56-fcs00210_2020_07_29_083029a

minimum	average	maximum
0	0	0



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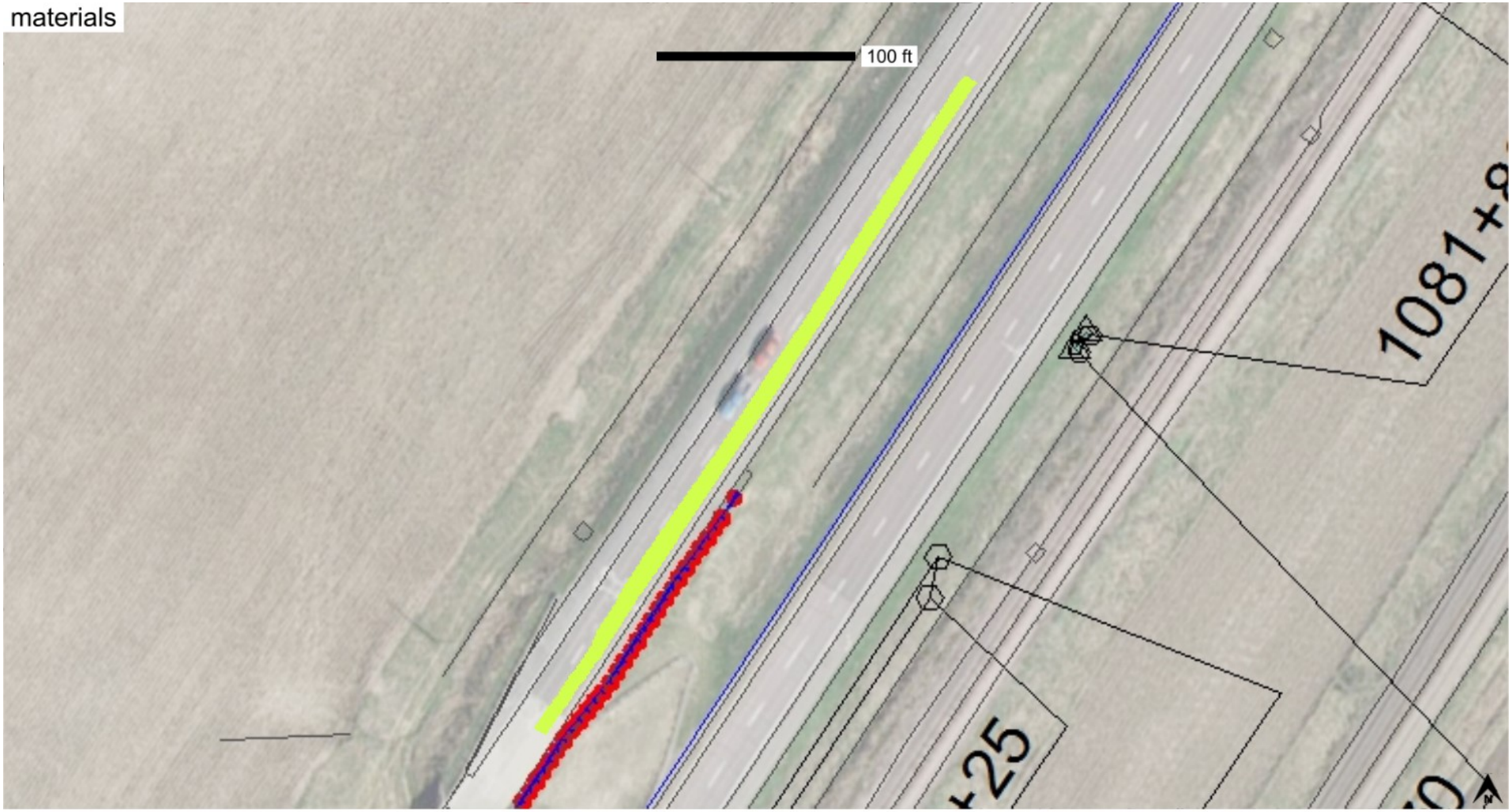
Map ID: iadot_75-us75_cs56-fcs00210_2020_07_29_083029a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Special Backfill	21010	100	3235	0.074	12	3600	150	40



Subgrade_Treatment Special Backfill_IADOT (2102.02D)

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US30 Tama County	Mapping Duration (hrs):	0.55	Operator:	Ingios Geotechnics inc
Map ID:	iadot_86-us30_cs56-fcs00210_2020_06_25_151224a	No. of Measurements:	61851	Machine ID:	Ingios_FCS00210
Date and Time:	6/25/2020 3:12:24 PM	Location:	Tama County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	21.4	-1.9	150	35	37.9	96.49	6.52	17.21	-115	-112.1	-53.51
Moisture Content	No												

Mapped Area

square feet	acres
61851	1.42

Pass Count

min.	avg.	max.
1	1.18	3

Elevation (ft)

min.	avg.	max.
803.54	804.31	804.62

Velocity (fps)

min.	avg.	max.
1.74	5.5	6.9

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	61851	1.42	12	3000	150	40

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

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US30 Tama County	Mapping Duration (hrs):	0.55	Operator:	Ingios Geotechnics inc
Map ID:	iadot_86-us30_cs56-fcs00210_2020_06_25_151224a	No. of Measurements:	61851	Machine ID:	Ingios_FCS00210
Date and Time:	6/25/2020 3:12:24 PM	Location:	Tama County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
21.4	CQI > = 95
0	80% of k-Value MVs >= 150
17.21	COV <= 20
100	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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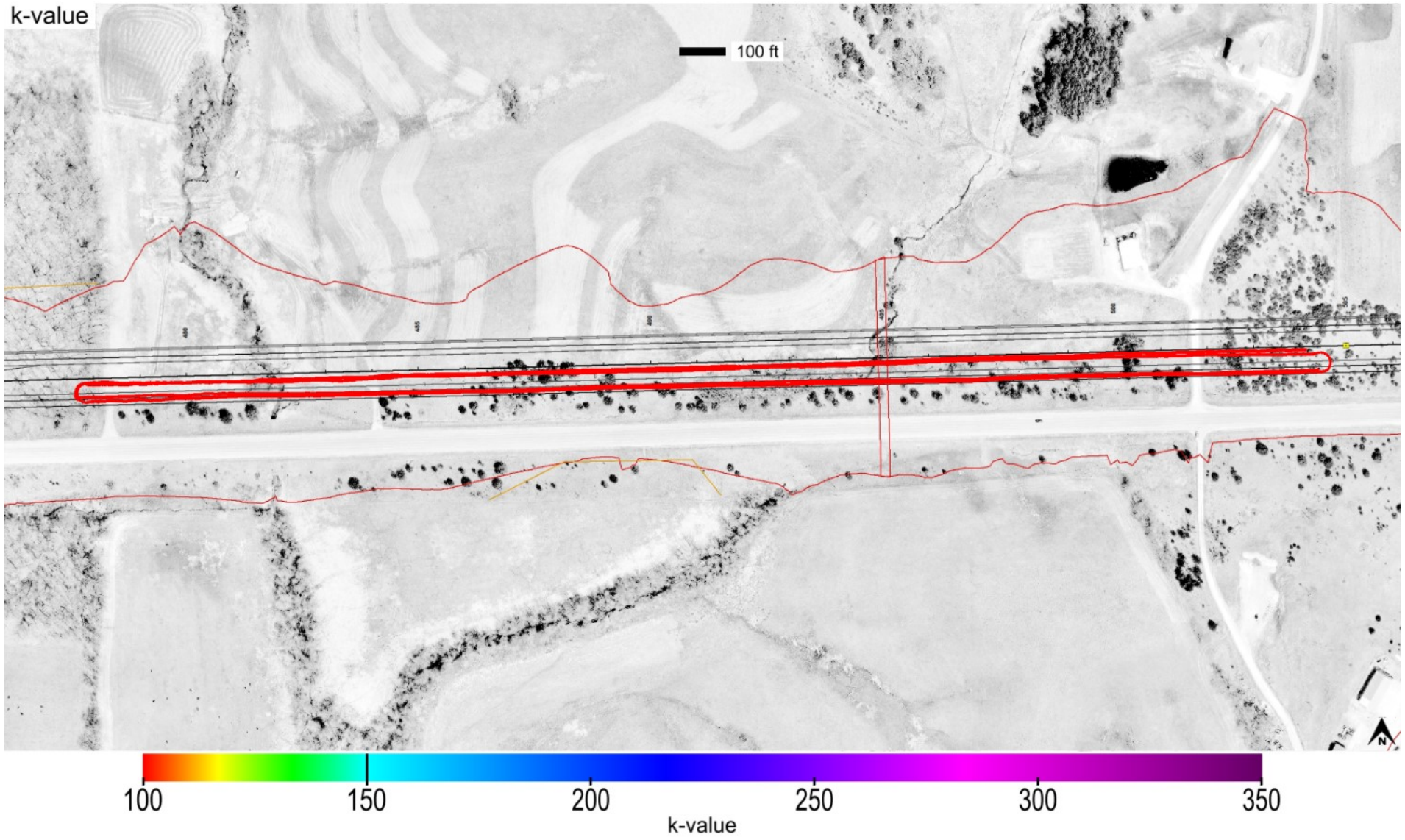
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_25_151224a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0	21.4	-1.9	150	35	37.9	96.49	6.52	17.21	-115	-112.1	-53.51



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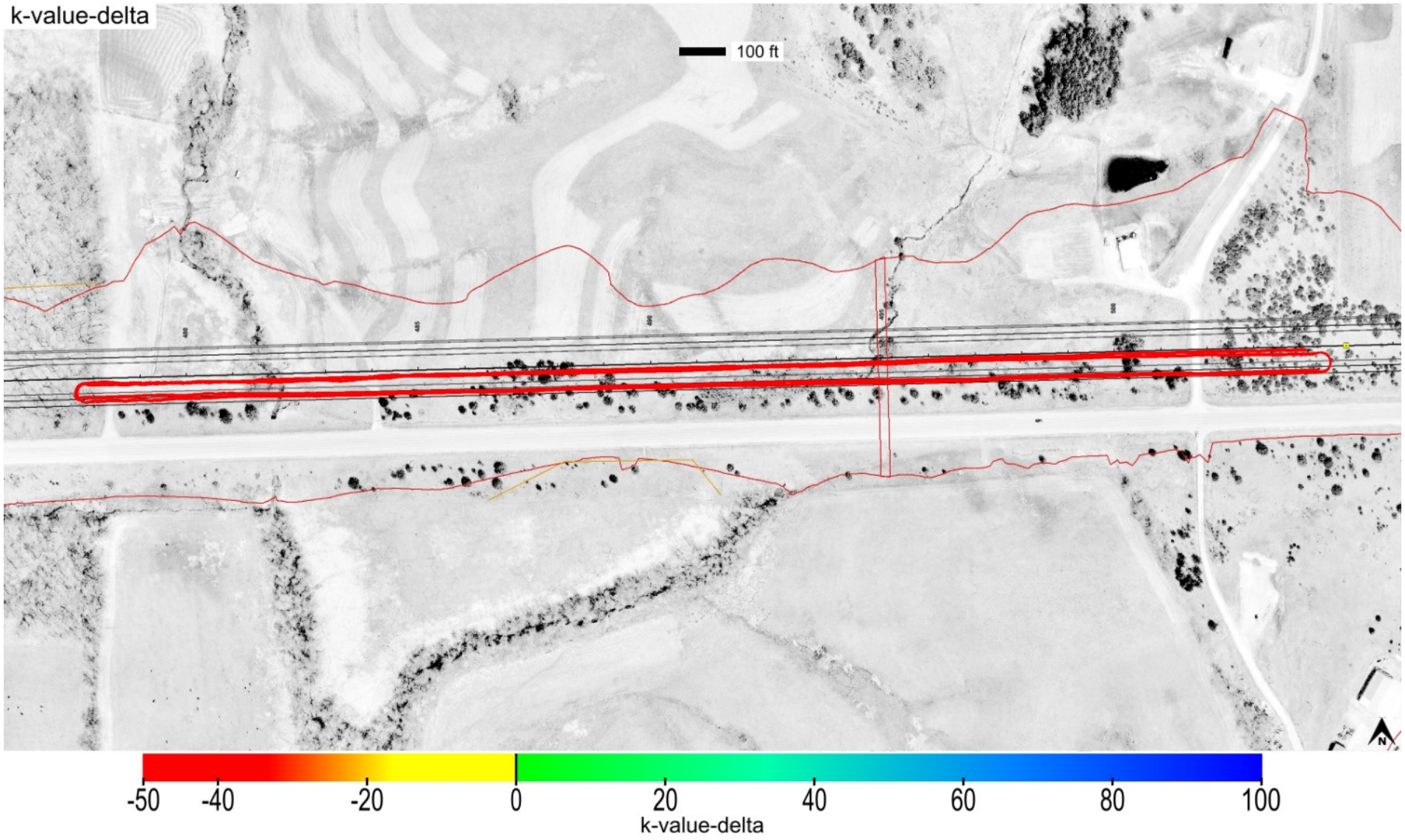
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_25_151224a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0	21.4	-1.9	150	35	37.9	96.49	6.52	17.21	-115	-112.1	-53.51



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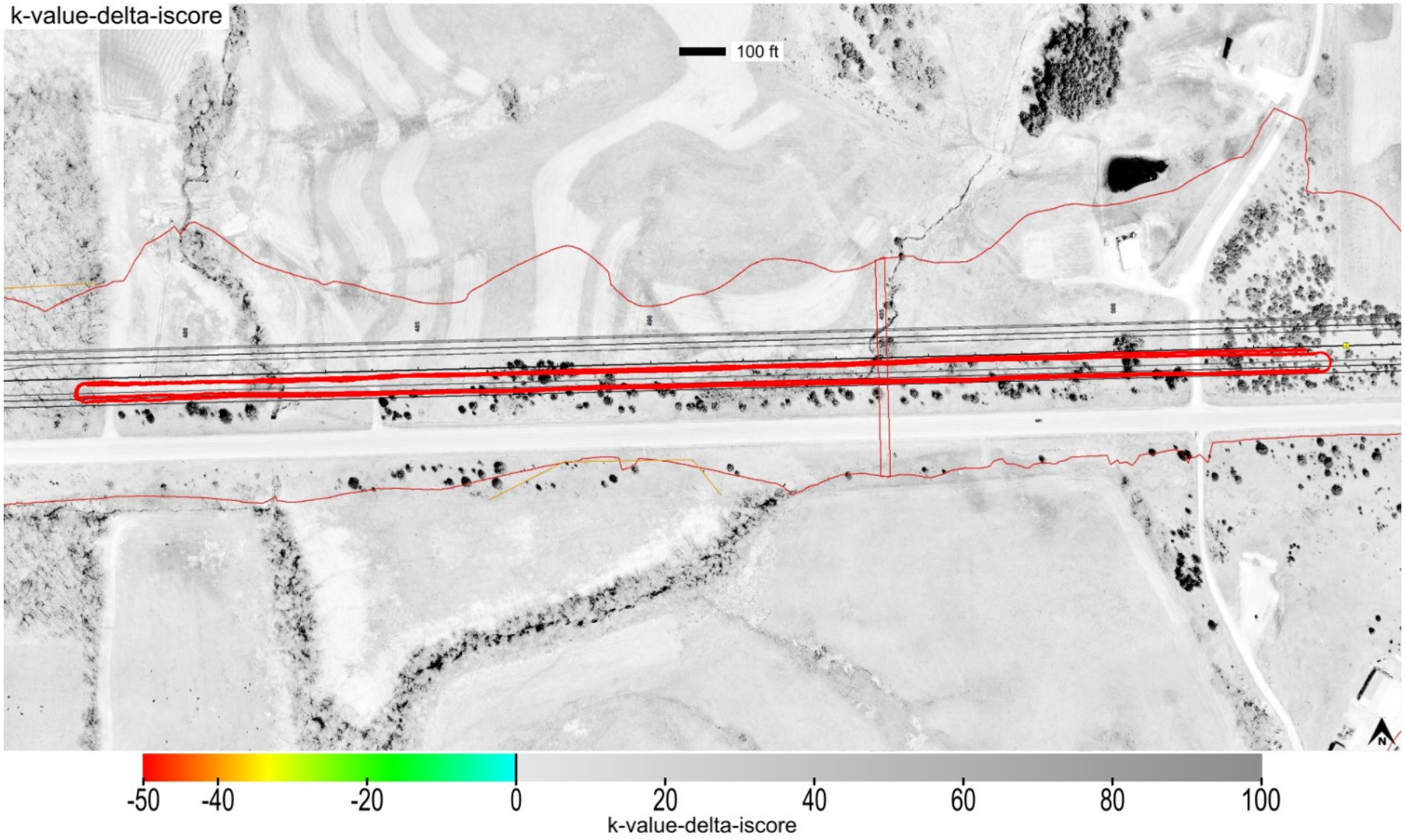
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_25_151224a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	0	150	-115	-112.1	-53.51	-115	-112.11	-74.5



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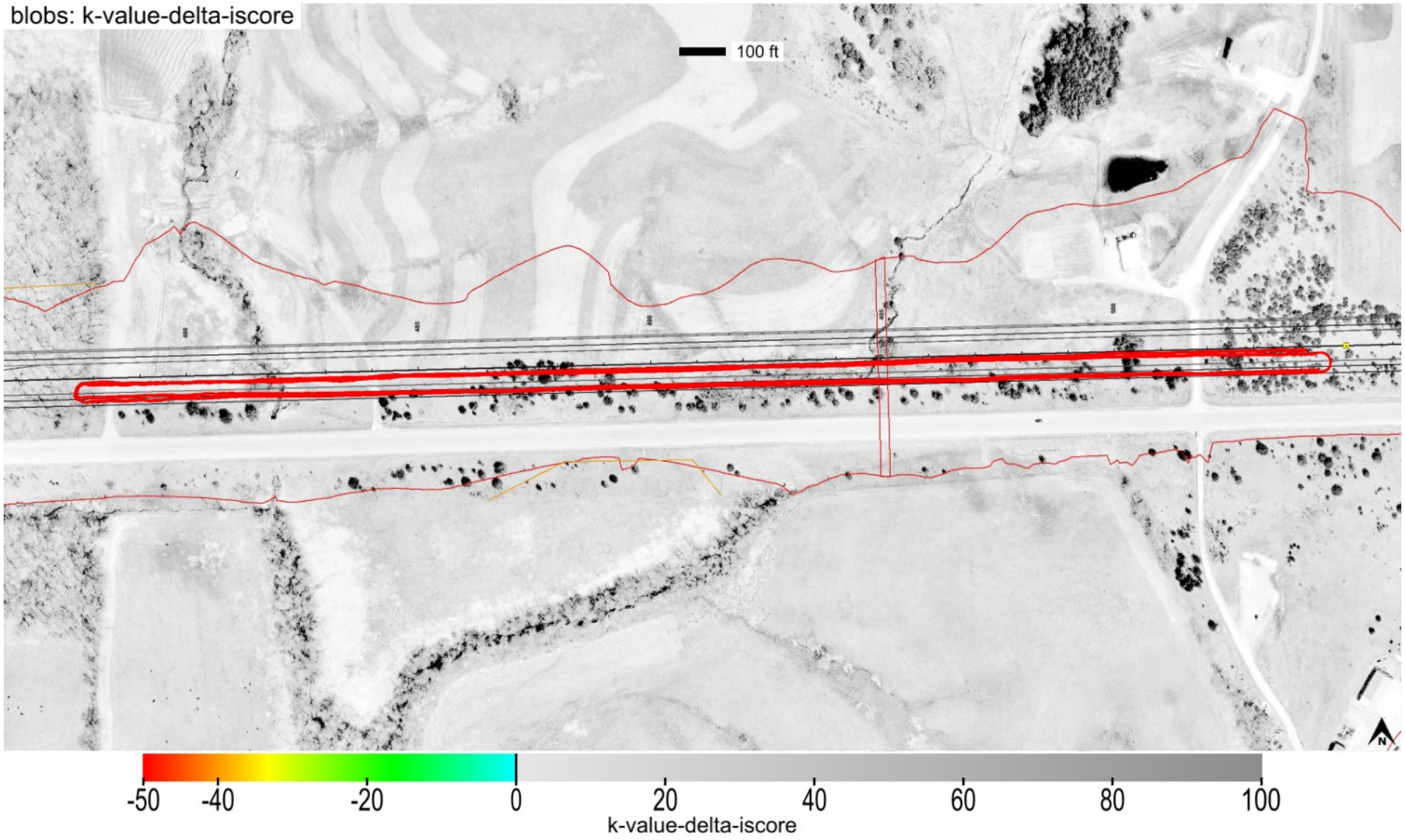
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_25_151224a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	61851	100	none	0



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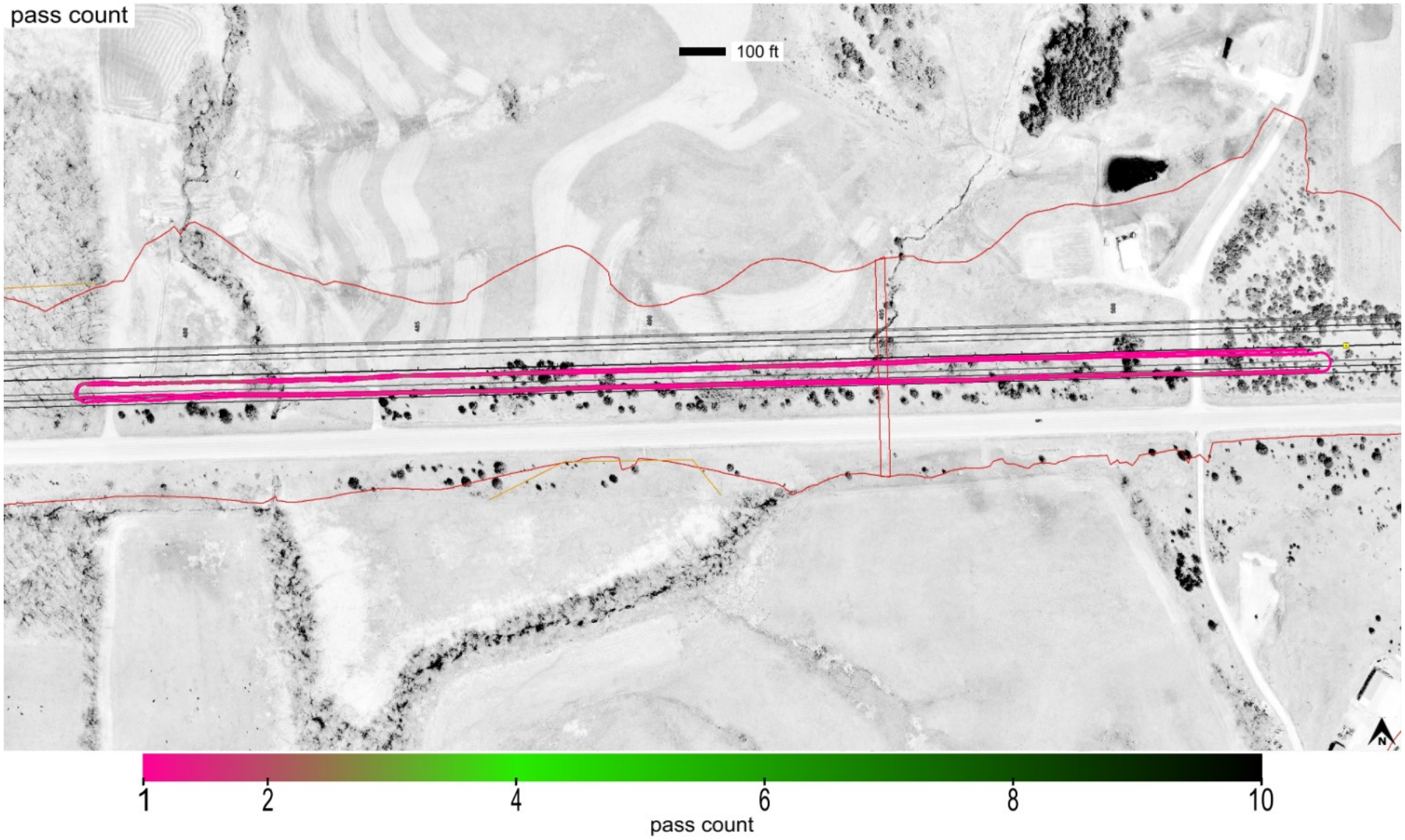
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_25_151224a

minimum	average	maximum
1	1.18	3



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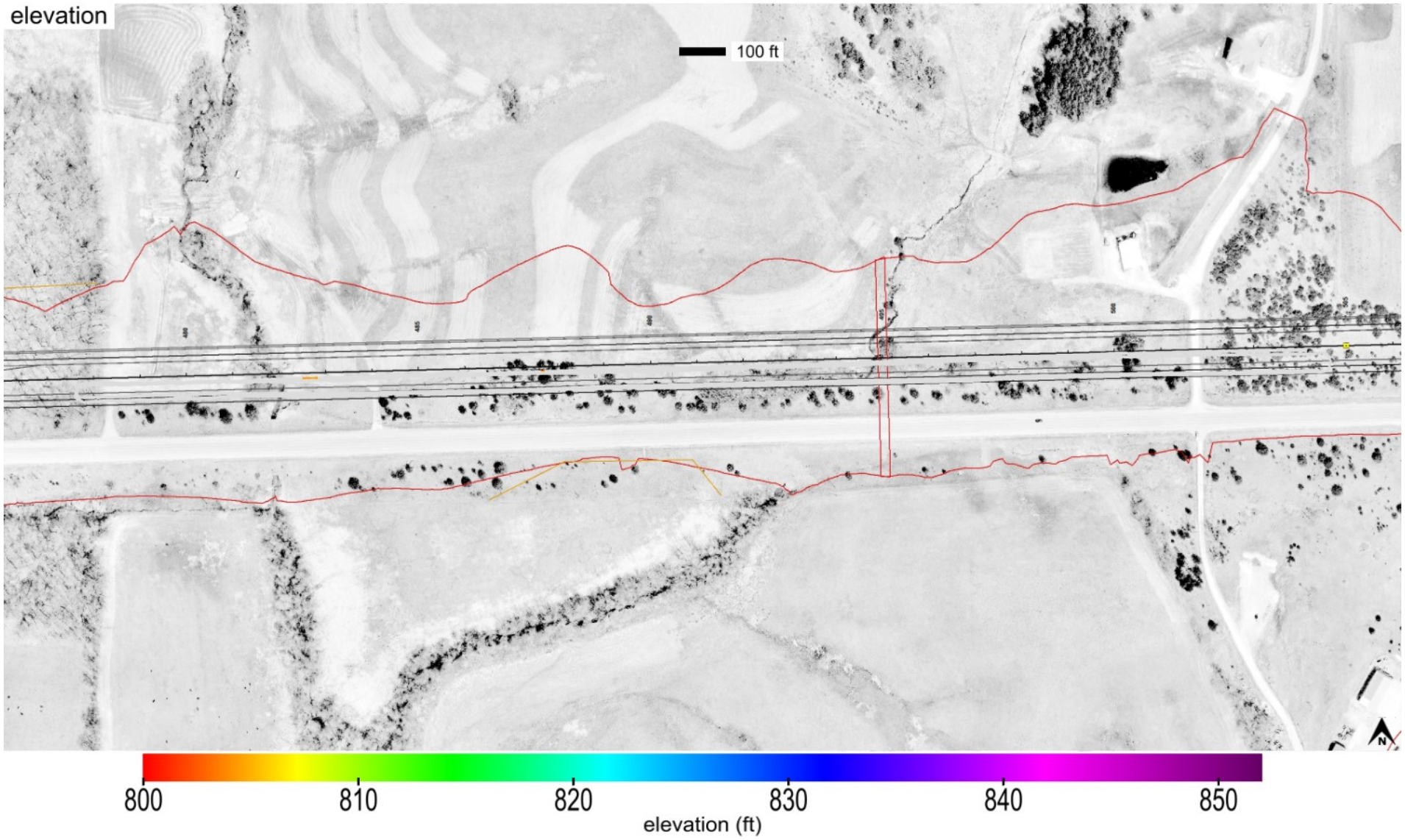
Map ID: iadot_86-us30_cs56-fcs00210_2020_06_25_151224a

minimum	average	maximum
803.542	804.311	804.621



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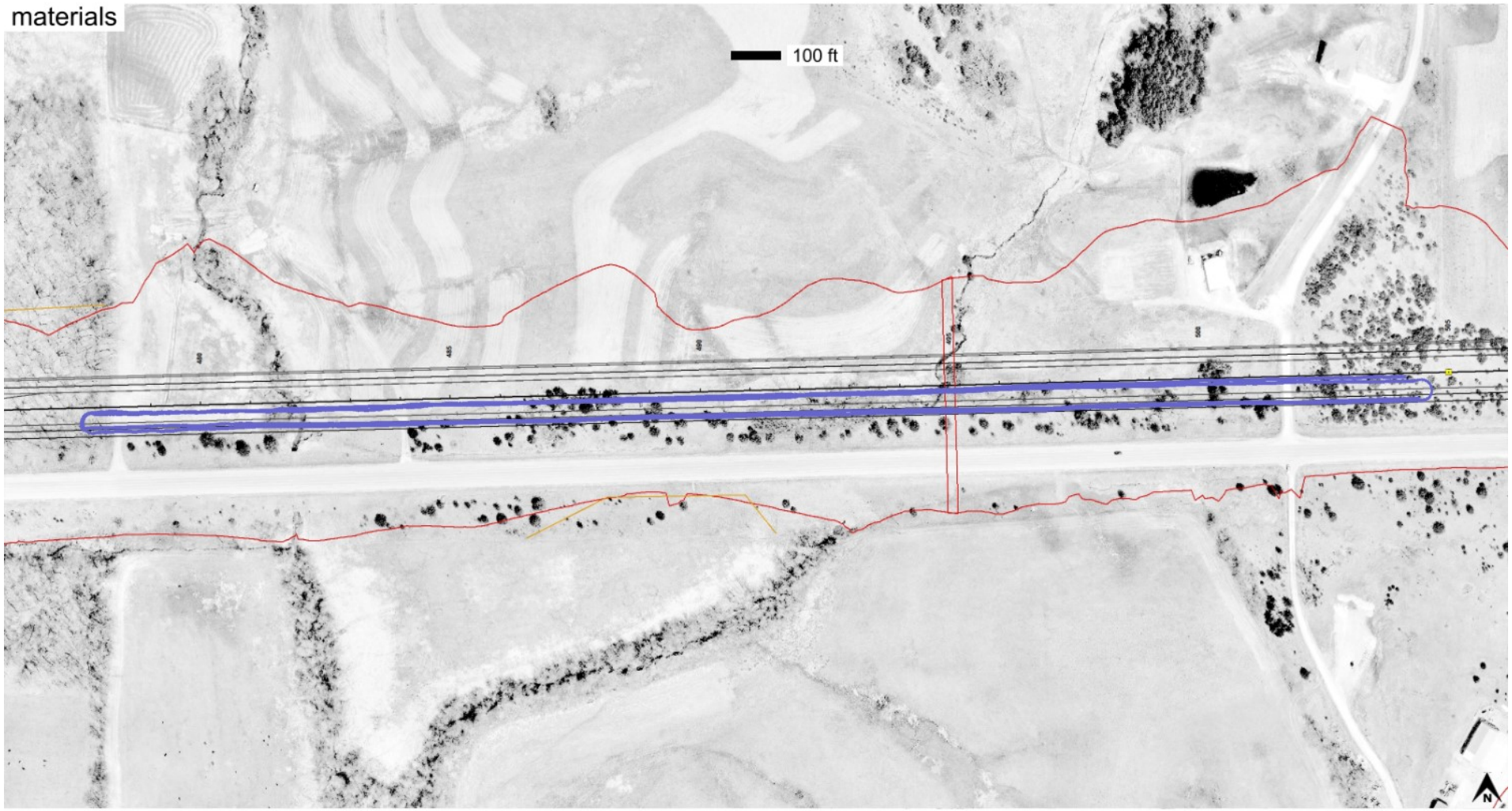
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_25_151224a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	61851	1.42	12	3000	150	40



Subgrade_Treatment Select Cohesive_IADOT (2102.02D)

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US30 Tama County	Mapping Duration (hrs):	1.15	Operator:	Ingios Geotechnics inc
Map ID:	iadot_86-us30_cs56-fcs00210_2020_06_25_160255a	No. of Measurements:	123918	Machine ID:	Ingios_FCS00210
Date and Time:	6/25/2020 4:02:55 PM	Location:	Tama County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	12.73	-0.69	150	35	43.8	148.49	15.13	34.55	-115	-106.2	-1.51
Moisture Content	No												

Mapped Area

square feet	acres
123918	2.84

Pass Count

min.	avg.	max.
1	1.24	6

Elevation (ft)

min.	avg.	max.
798.72	813.83	839.92

Velocity (fps)

min.	avg.	max.
0.85	5.49	5.82

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	123918	2.845	12	3000	150	40

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US30 Tama County	Mapping Duration (hrs):	1.15	Operator:	Ingios Geotechnics inc
Map ID:	iadot_86-us30_cs56-fcs00210_2020_06_25_160255a	No. of Measurements:	123918	Machine ID:	Ingios_FCS00210
Date and Time:	6/25/2020 4:02:55 PM	Location:	Tama County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
12.73	CQI > = 95
0	80% of k-Value MVs >= 150
34.55	COV <= 20
100	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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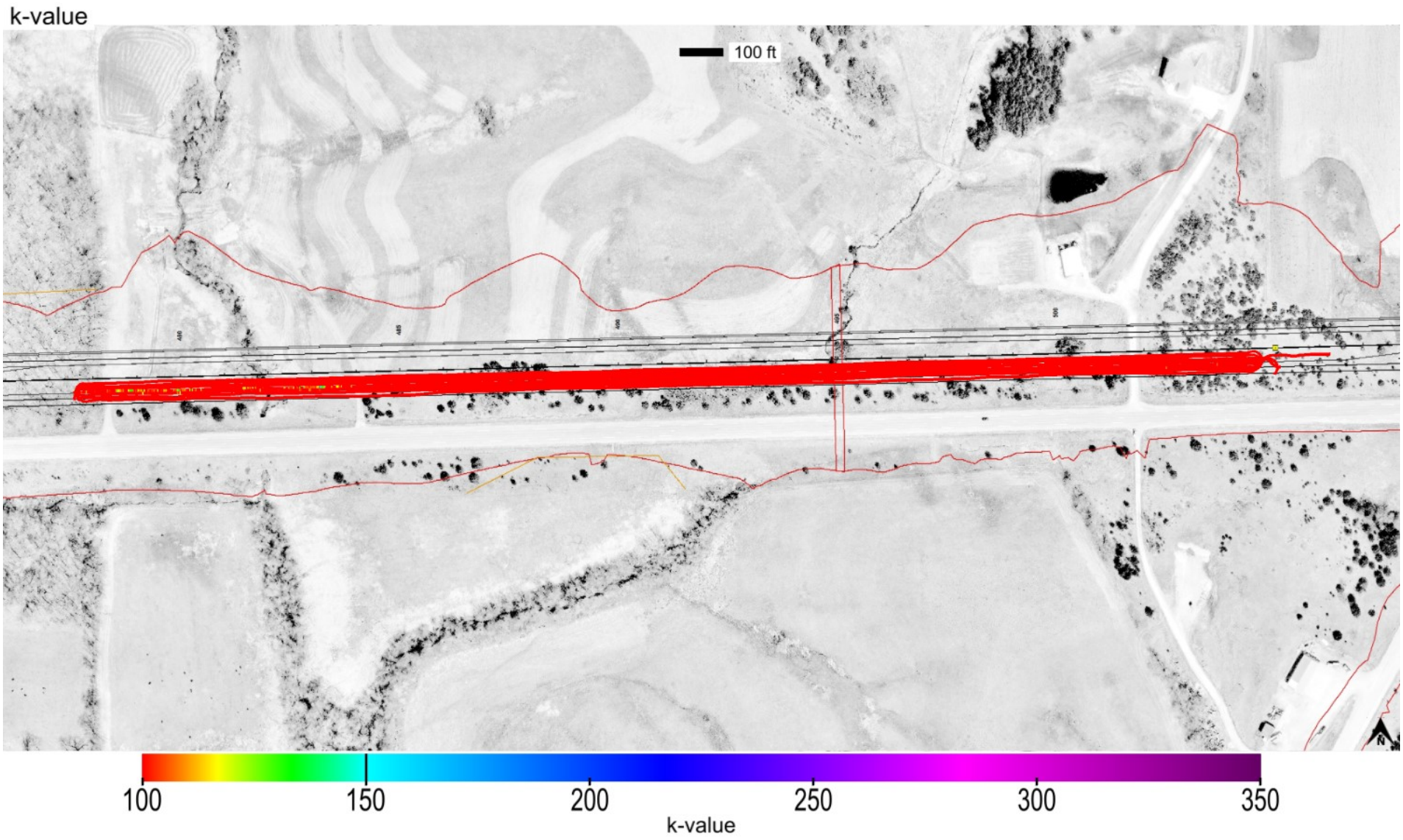
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_25_160255a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0	12.73	-0.69	150	35	43.8	148.49	15.13	34.55	-115	-106.2	-1.51



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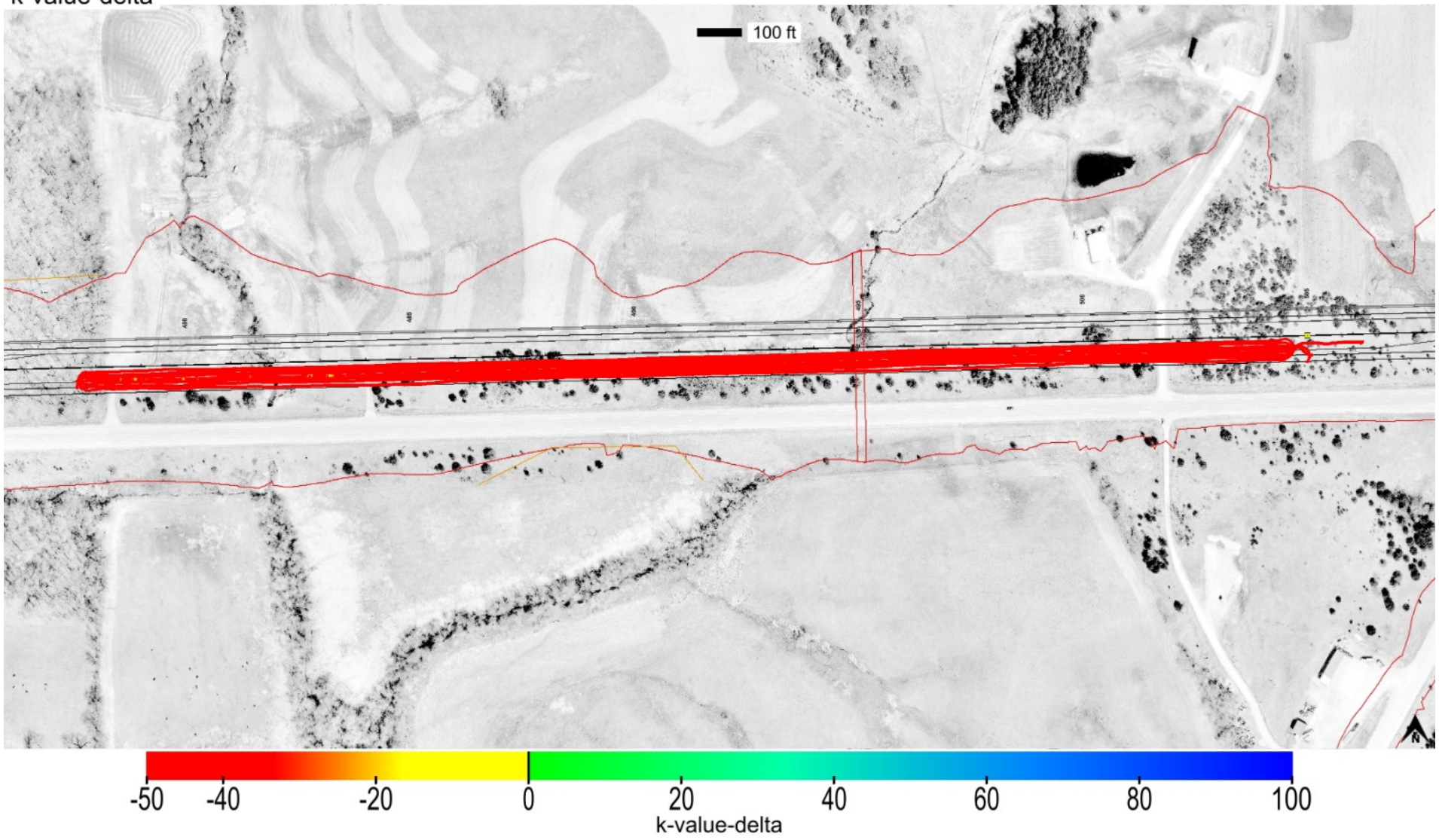
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_25_160255a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0	12.73	-0.69	150	35	43.8	148.49	15.13	34.55	-115	-106.2	-1.51

k-value-delta



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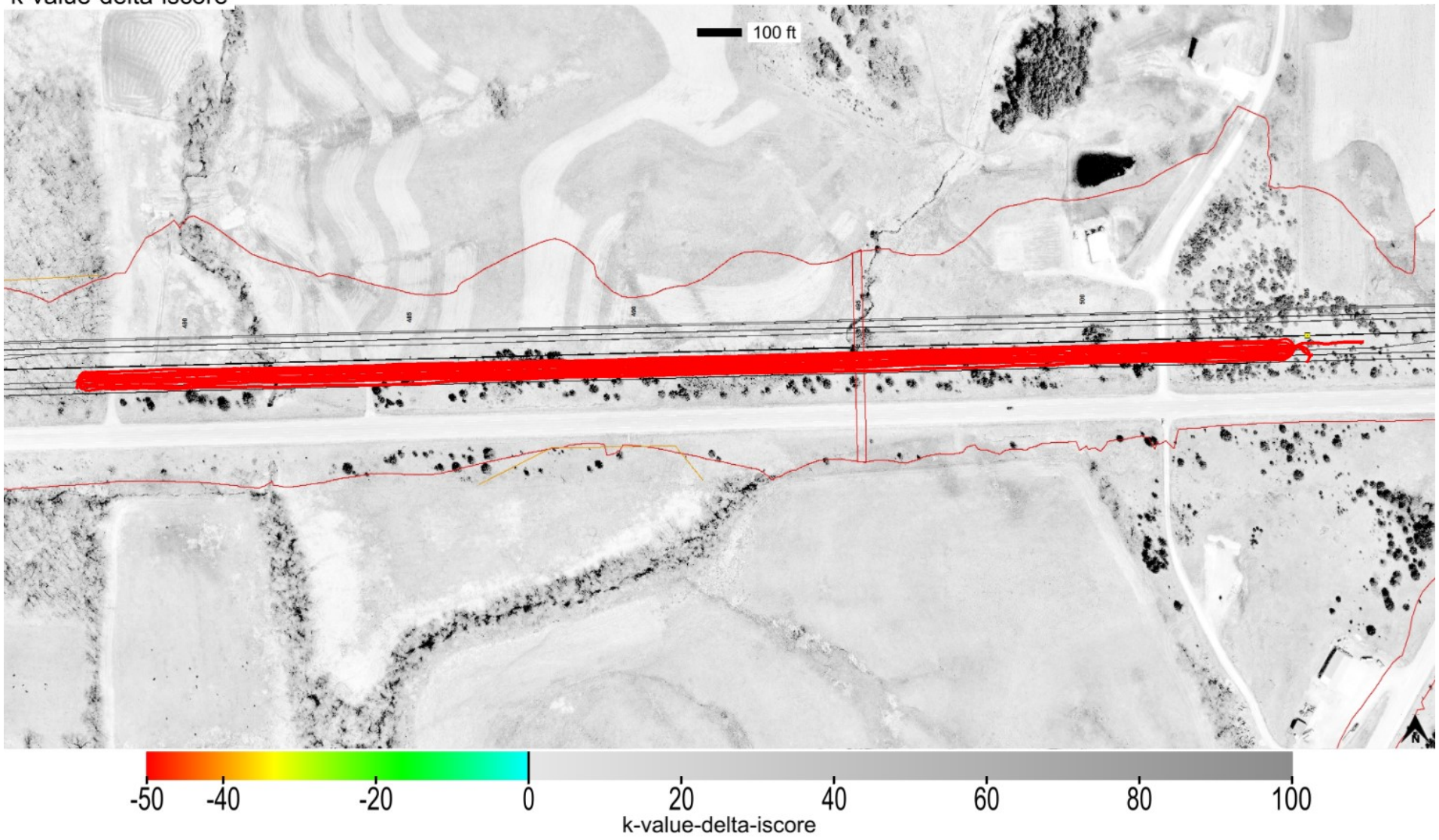
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_25_160255a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	0	150	-115	-106.2	-1.51	-115	-106.13	-50.56

k-value-delta-iscore



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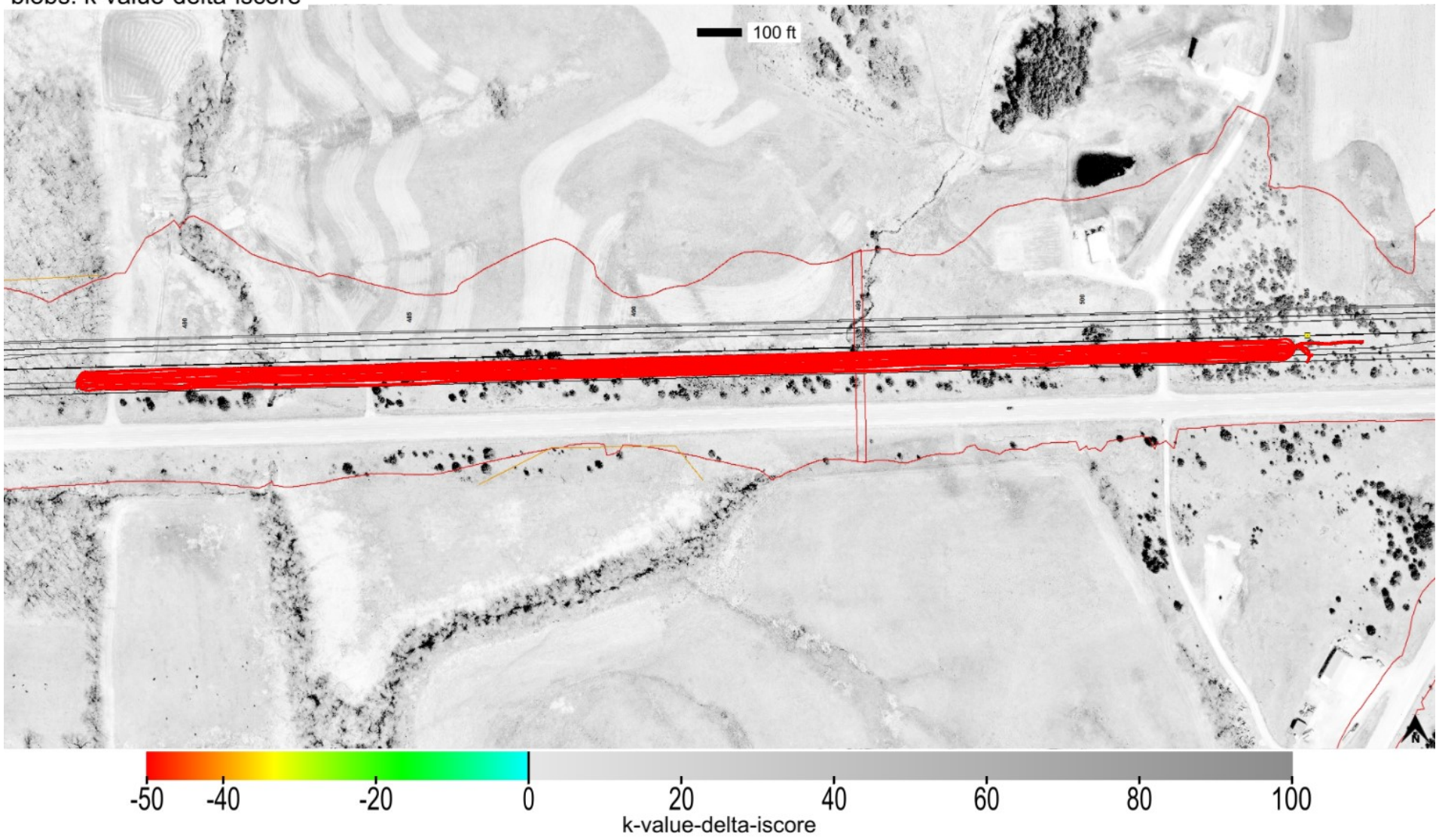
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_25_160255a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	123918	100	none	0

blobs: k-value-delta-iscore



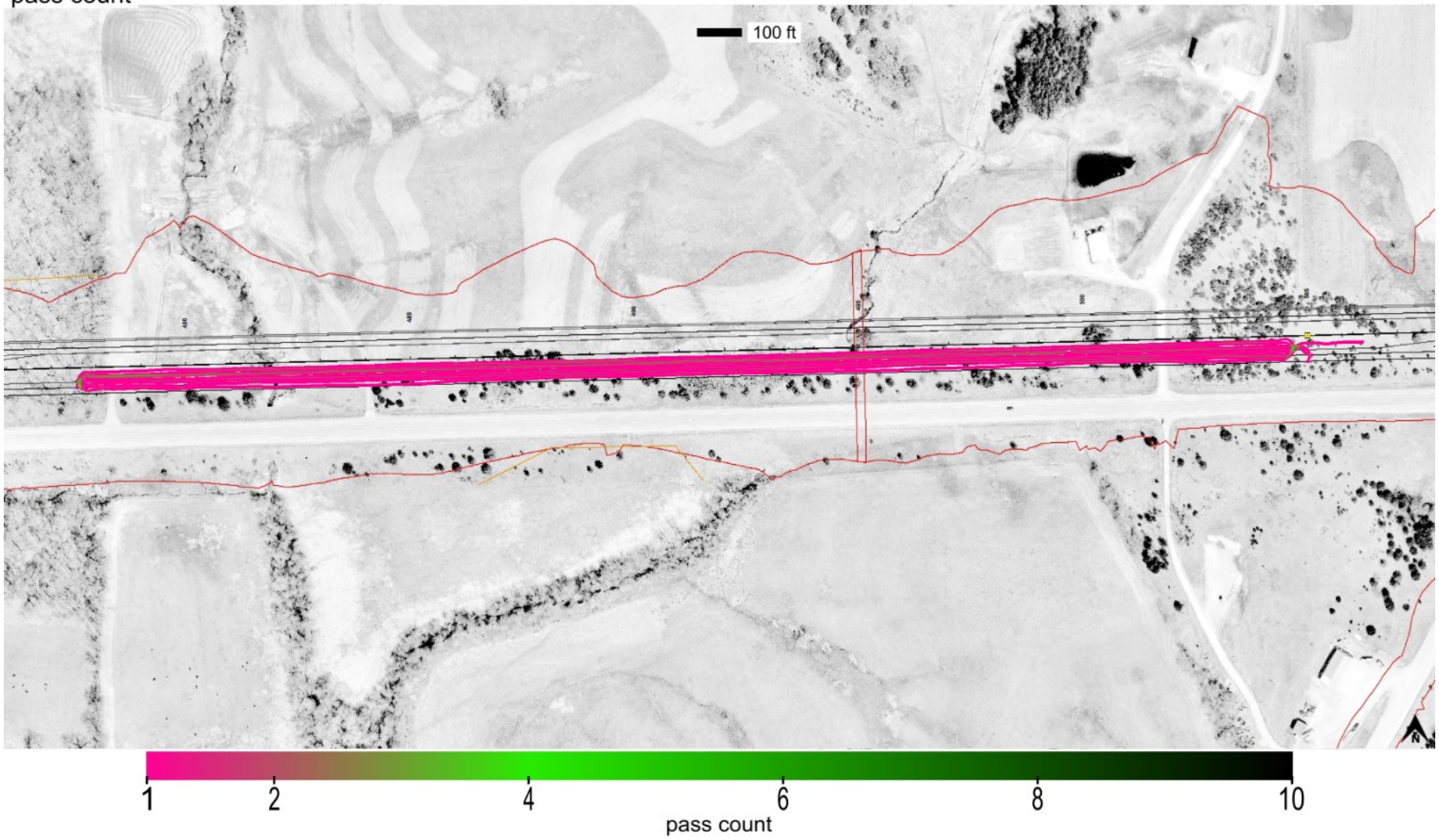
This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_25_160255a

minimum	average	maximum
1	1.24	6

pass count



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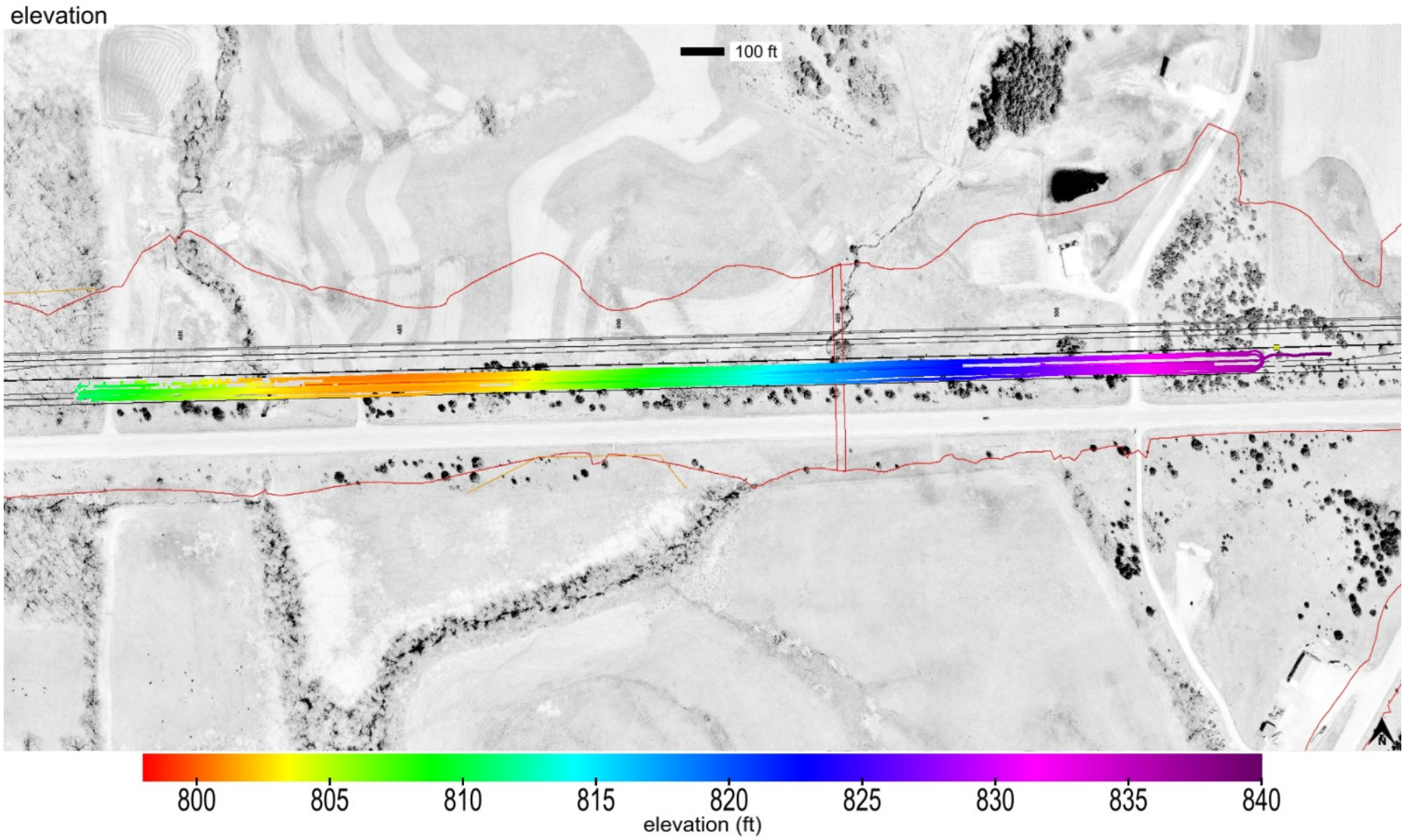
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_25_160255a

minimum	average	maximum
798.725	813.828	839.92



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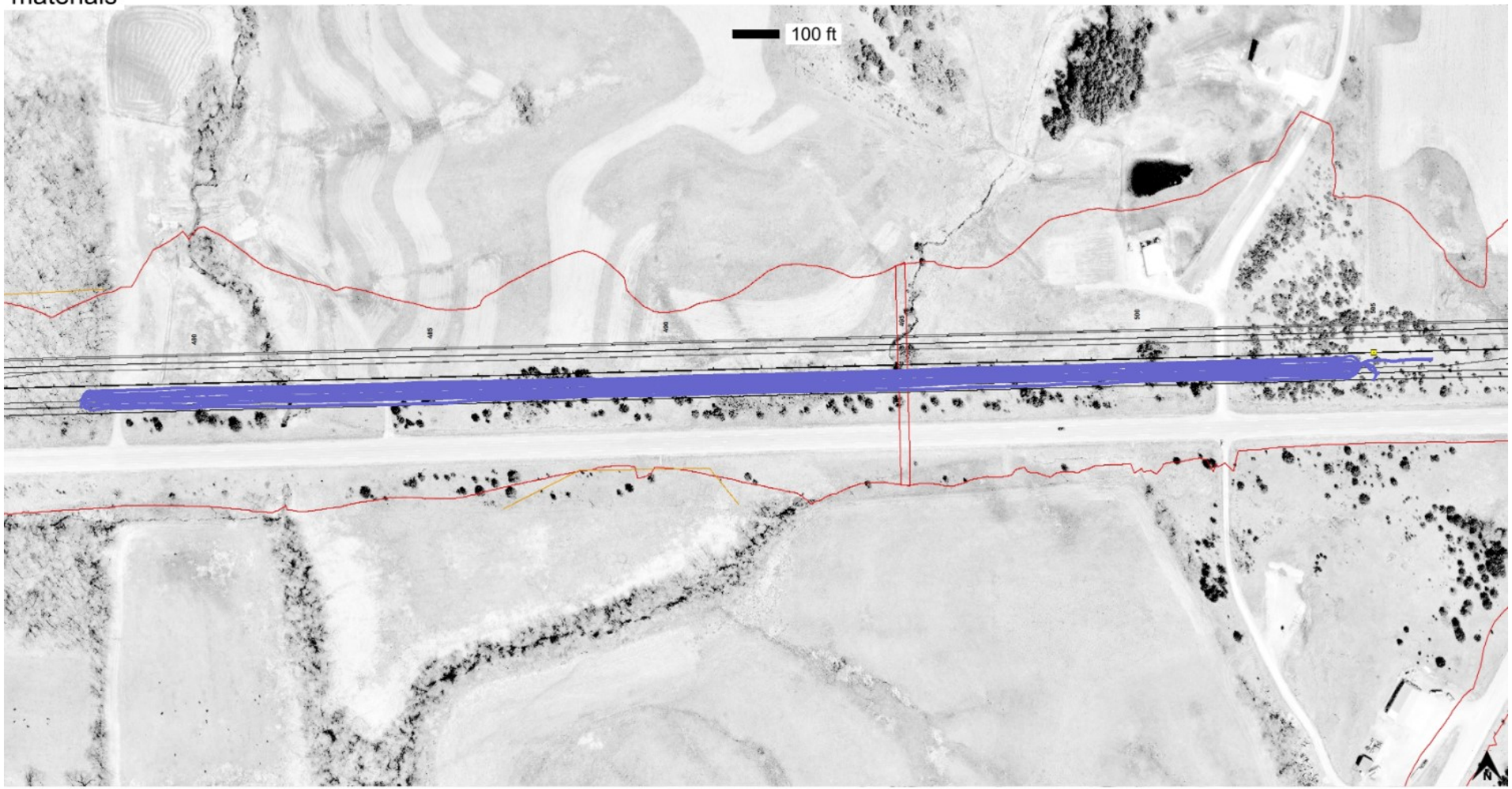
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_25_160255a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	123918	2.845	12	3000	150	40

materials



Subgrade_Treatment Select Cohesive_IADOT (2102.02D)

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

ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_25_160255a

20200623_160313.jpg

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US30 Tama County	Mapping Duration (hrs):	1.58	Operator:	Ingios Geotechnics inc
Map ID:	iadot_86-us30_cs56-fcs00210_2020_06_25_171353a	No. of Measurements:	165411	Machine ID:	Ingios_FCS00210
Date and Time:	6/25/2020 5:13:53 PM	Location:	Tama County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	0.8	2.86	-0.52	150	35	40.2	370	22.46	55.9	-115	-109.8	220
Moisture Content	No												

Mapped Area

square feet	acres
165411	3.8

Pass Count

min.	avg.	max.
1	1.19	5

Elevation (ft)

min.	avg.	max.
841.22	854.89	865.78

Velocity (fps)

min.	avg.	max.
0.35	5.44	6.17

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	165411	3.797	12	3000	150	40

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US30 Tama County	Mapping Duration (hrs):	1.58	Operator:	Ingios Geotechnics inc
Map ID:	iadot_86-us30_cs56-fcs00210_2020_06_25_171353a	No. of Measurements:	165411	Machine ID:	Ingios_FCS00210
Date and Time:	6/25/2020 5:13:53 PM	Location:	Tama County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
2.86	CQI > = 95
0.8	80% of k-Value MVs >= 150
55.9	COV <= 20
99.15	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

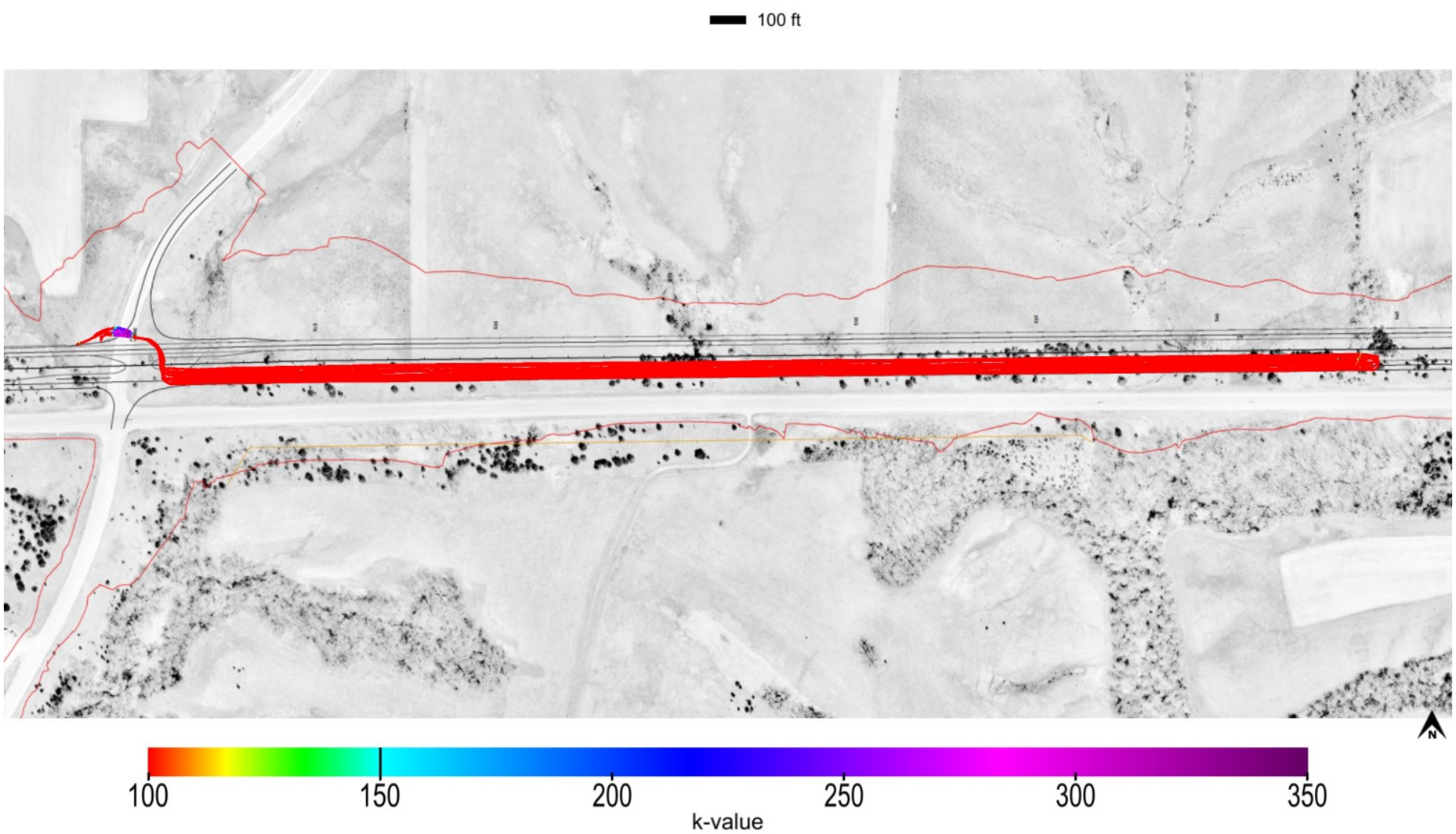
This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_25_171353a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.8	2.86	-0.52	150	35	40.2	370	22.46	55.9	-115	-109.8	220

k-value



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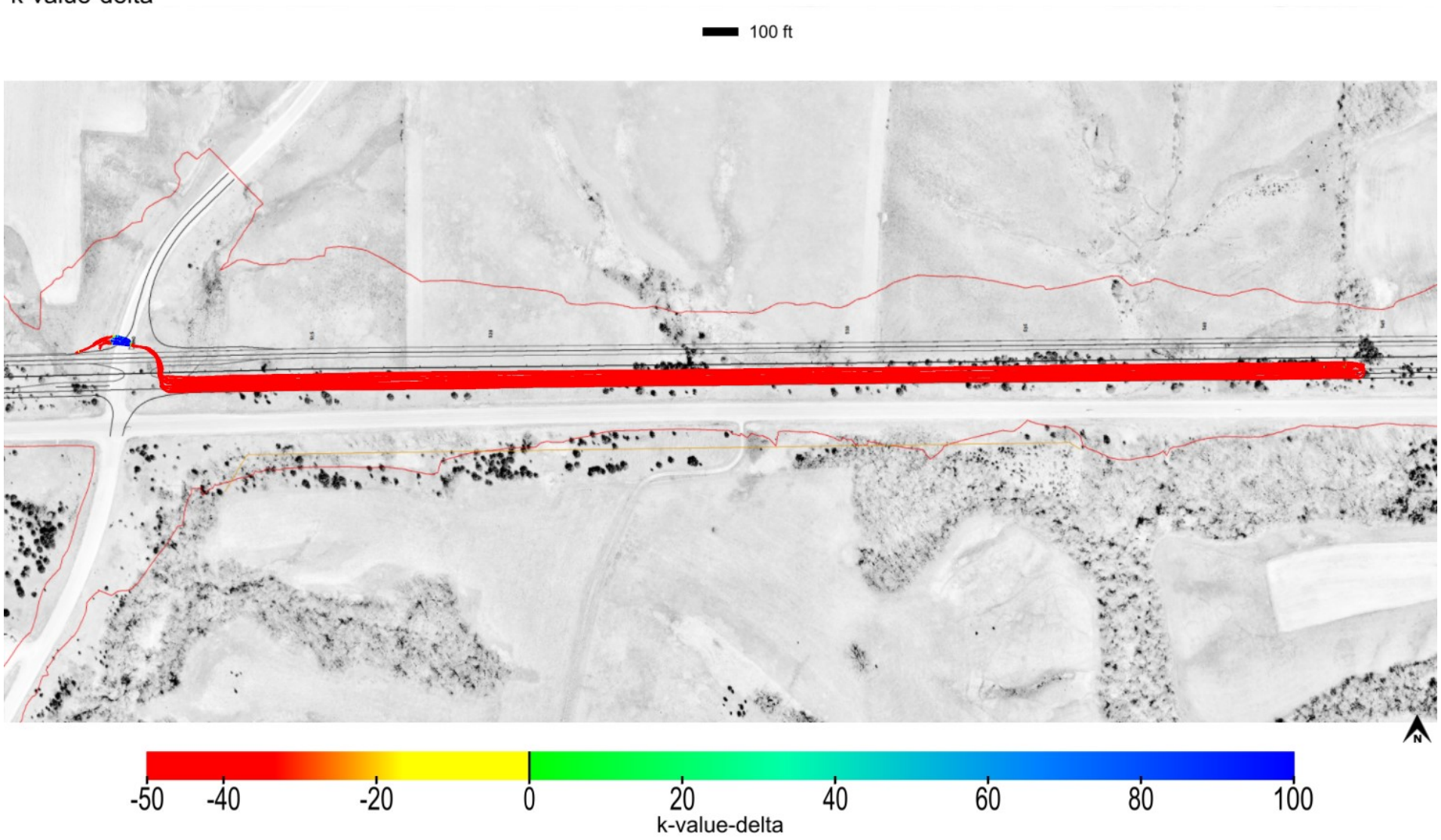
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_25_171353a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.8	2.86	-0.52	150	35	40.2	370	22.46	55.9	-115	-109.8	220

k-value-delta



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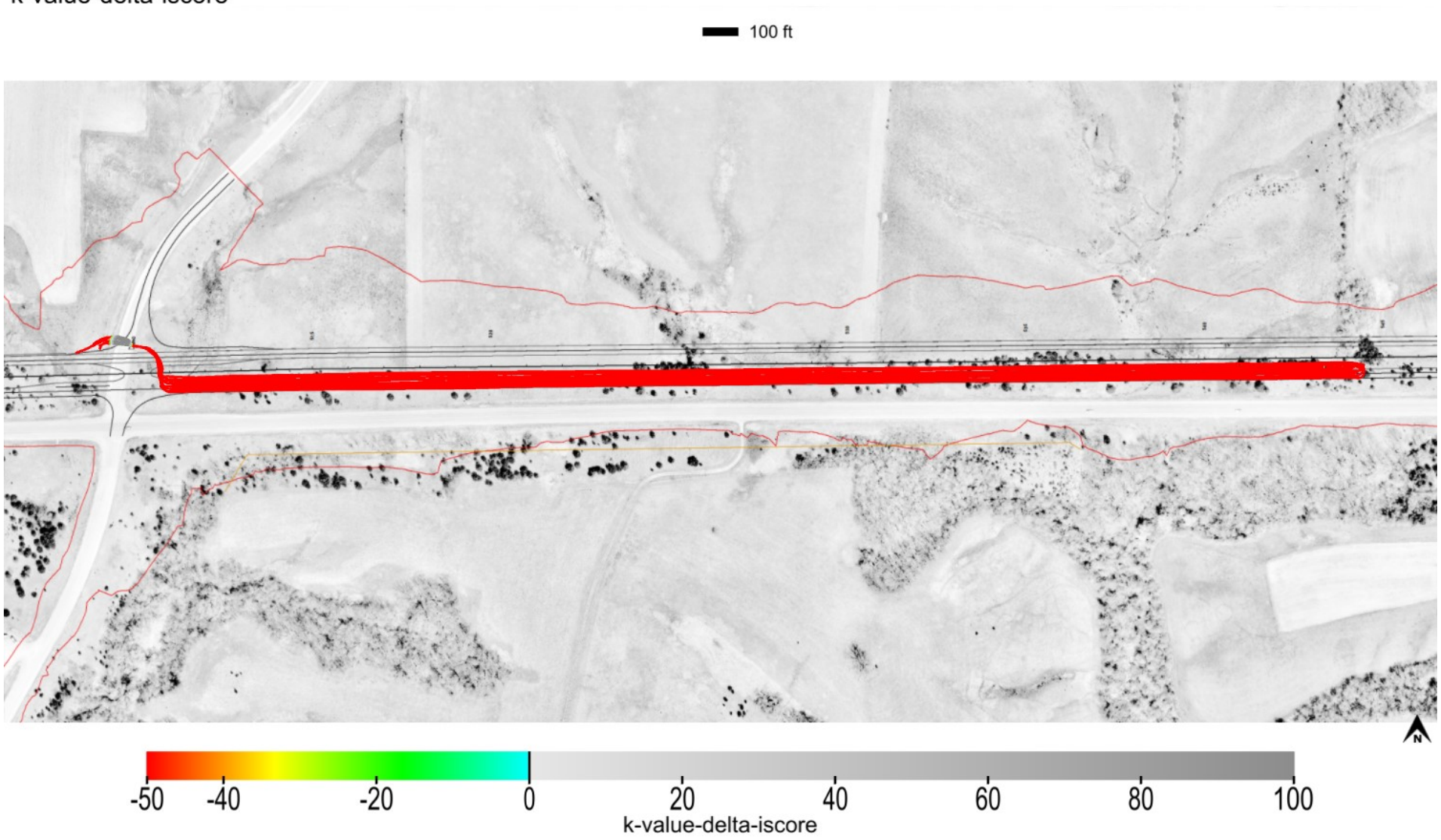
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_25_171353a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	0.8	150	-115	-109.8	220	-115	-109.77	163.25

k-value-delta-iscore



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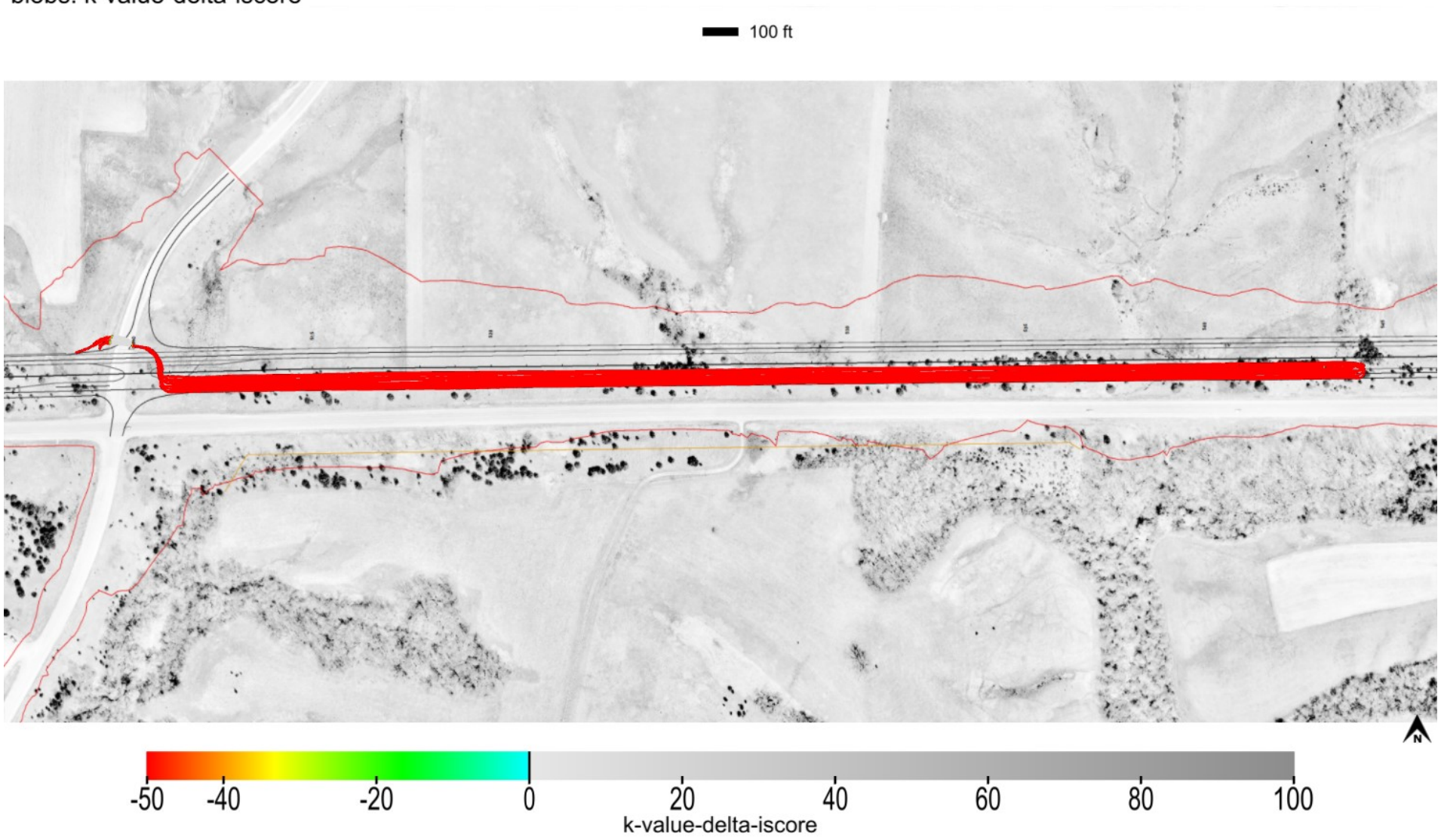
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_25_171353a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	2	164009	99.15	none	0

blobs: k-value-delta-iscore



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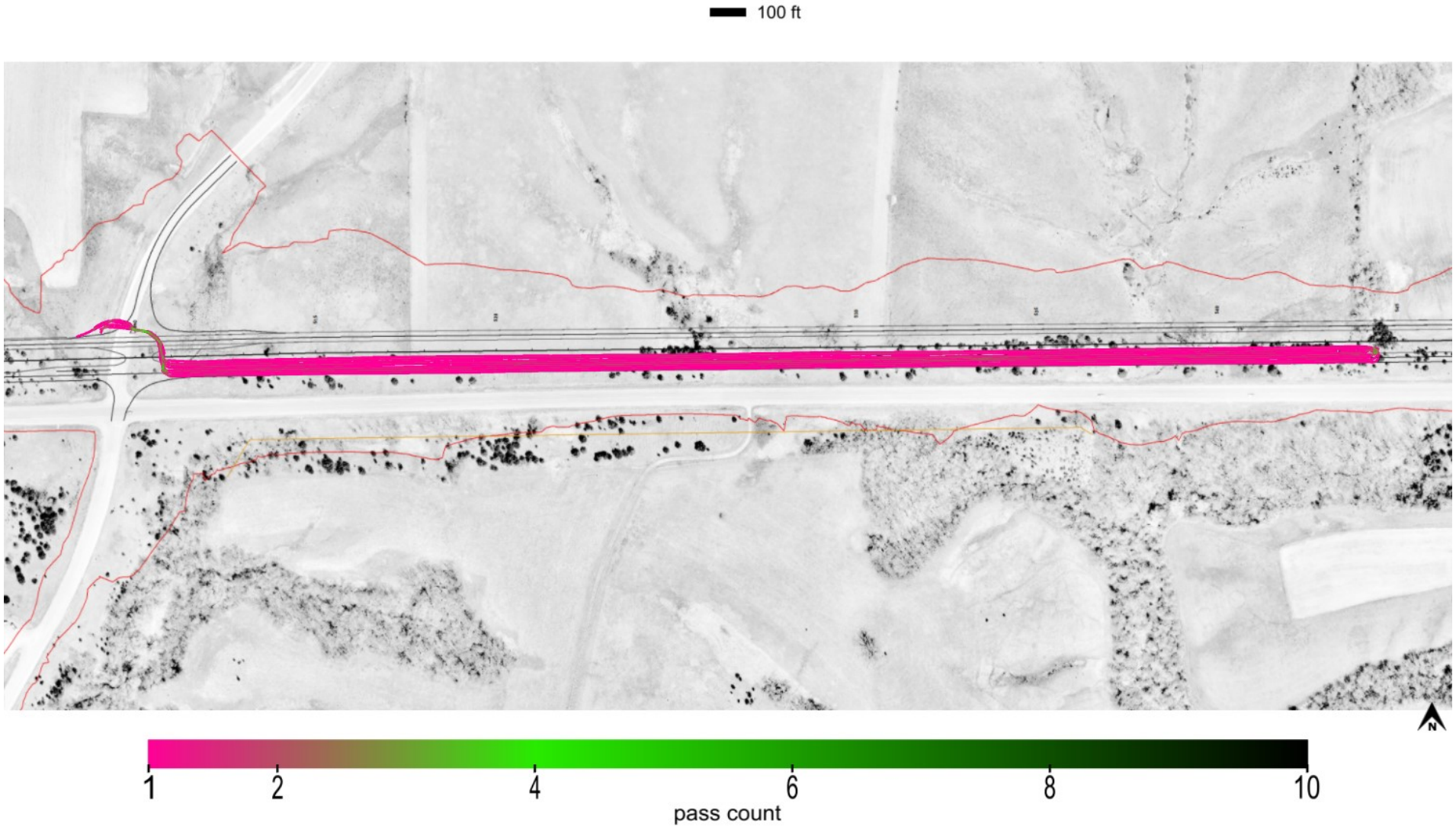
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_25_171353a

minimum	average	maximum
1	1.19	5

pass count



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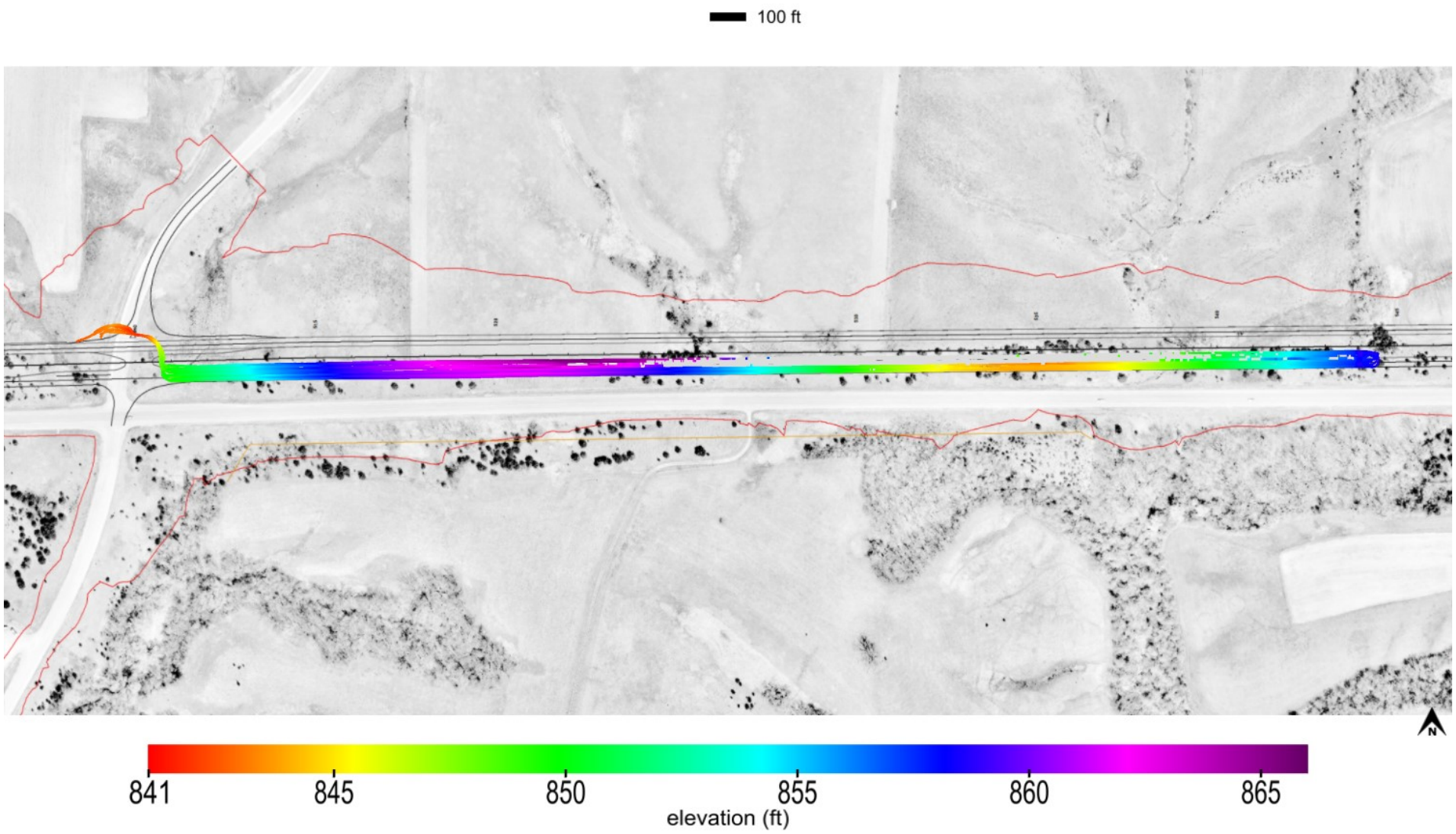
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_25_171353a

minimum	average	maximum
841.222	854.886	865.776

elevation



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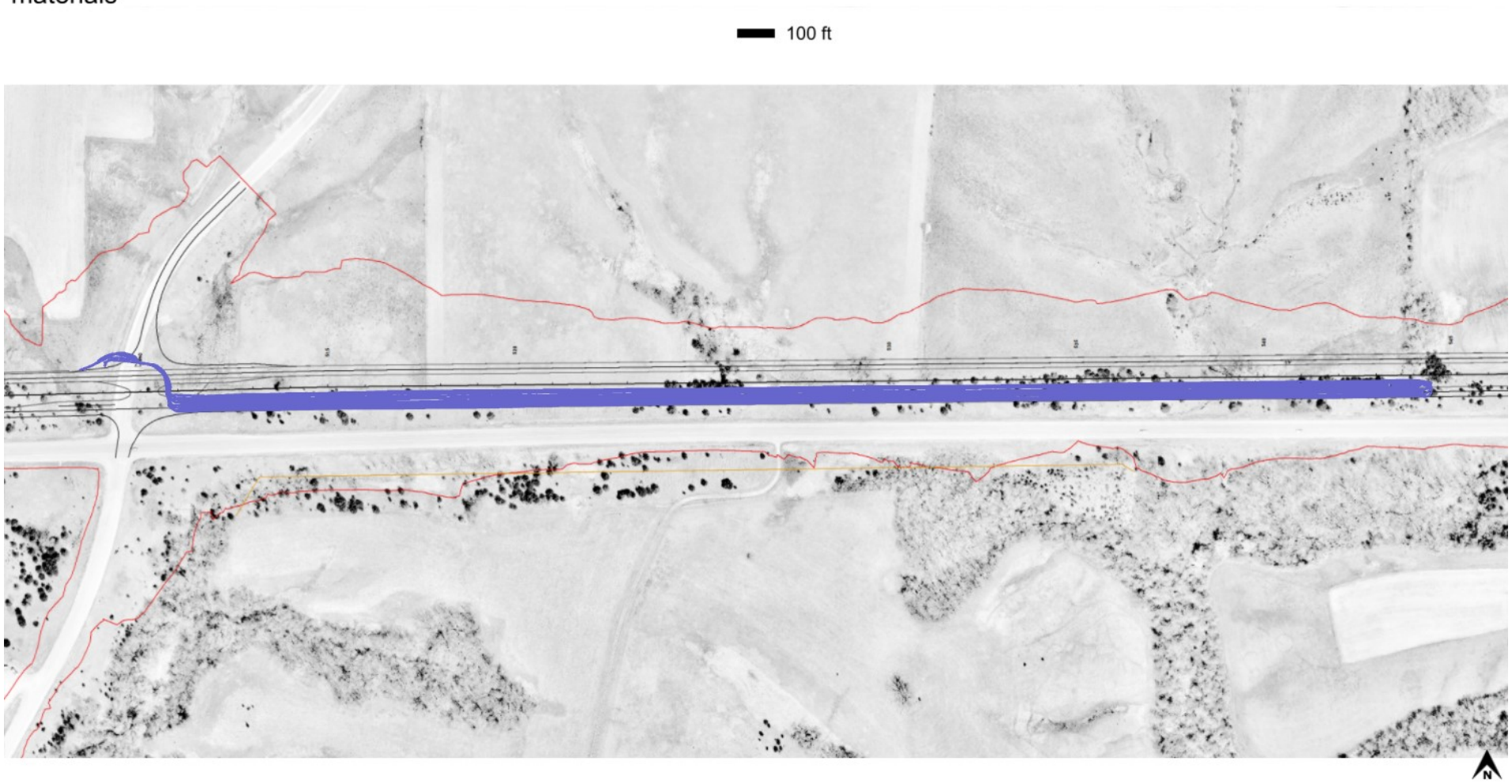
Map ID: iadot_86-us30_cs56-fcs00210_2020_06_25_171353a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	165411	3.797	12	3000	150	40

materials



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ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_25_171353a

20200625_170032.jpg

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US30 Tama County	Mapping Duration (hrs):	1.26	Operator:	Ingios Geotechnics inc
Map ID:	iadot_86-us30_cs56-fcs00210_2020_06_29_132047a	No. of Measurements:	129292	Machine ID:	Ingios_FCS00210
Date and Time:	6/29/2020 1:20:47 PM	Location:	Tama County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	18.5	-1.38	150	35	38.3	184.2	8.87	23.17	-115	-111.7	34.2
Moisture Content	No												

Mapped Area

square feet	acres
129292	2.97

Pass Count

min.	avg.	max.
1	1.13	3

Elevation (ft)

min.	avg.	max.
813.78	835.53	844.38

Velocity (fps)

min.	avg.	max.
3.8	5.55	7.13

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	129292	2.968	12	3000	150	40

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US30 Tama County	Mapping Duration (hrs):	1.26	Operator:	Ingios Geotechnics inc
Map ID:	iadot_86-us30_cs56-fcs00210_2020_06_29_132047a	No. of Measurements:	129292	Machine ID:	Ingios_FCS00210
Date and Time:	6/29/2020 1:20:47 PM	Location:	Tama County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
18.5	CQI > = 95
0.1	80% of k-Value MVs >= 150
23.17	COV <= 20
100	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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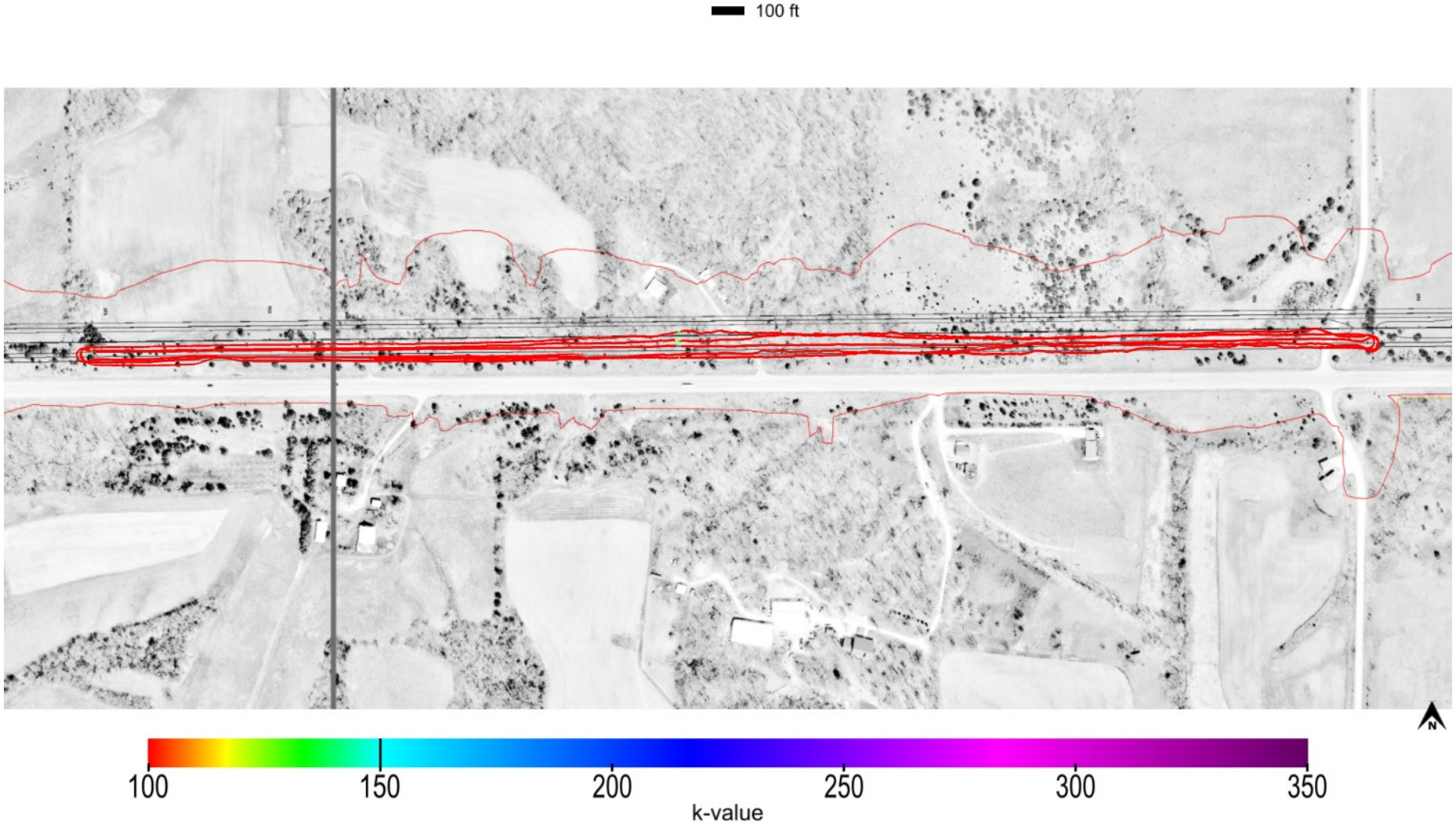
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_29_132047a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.1	18.5	-1.38	150	35	38.3	184.2	8.87	23.17	-115	-111.7	34.2

k-value



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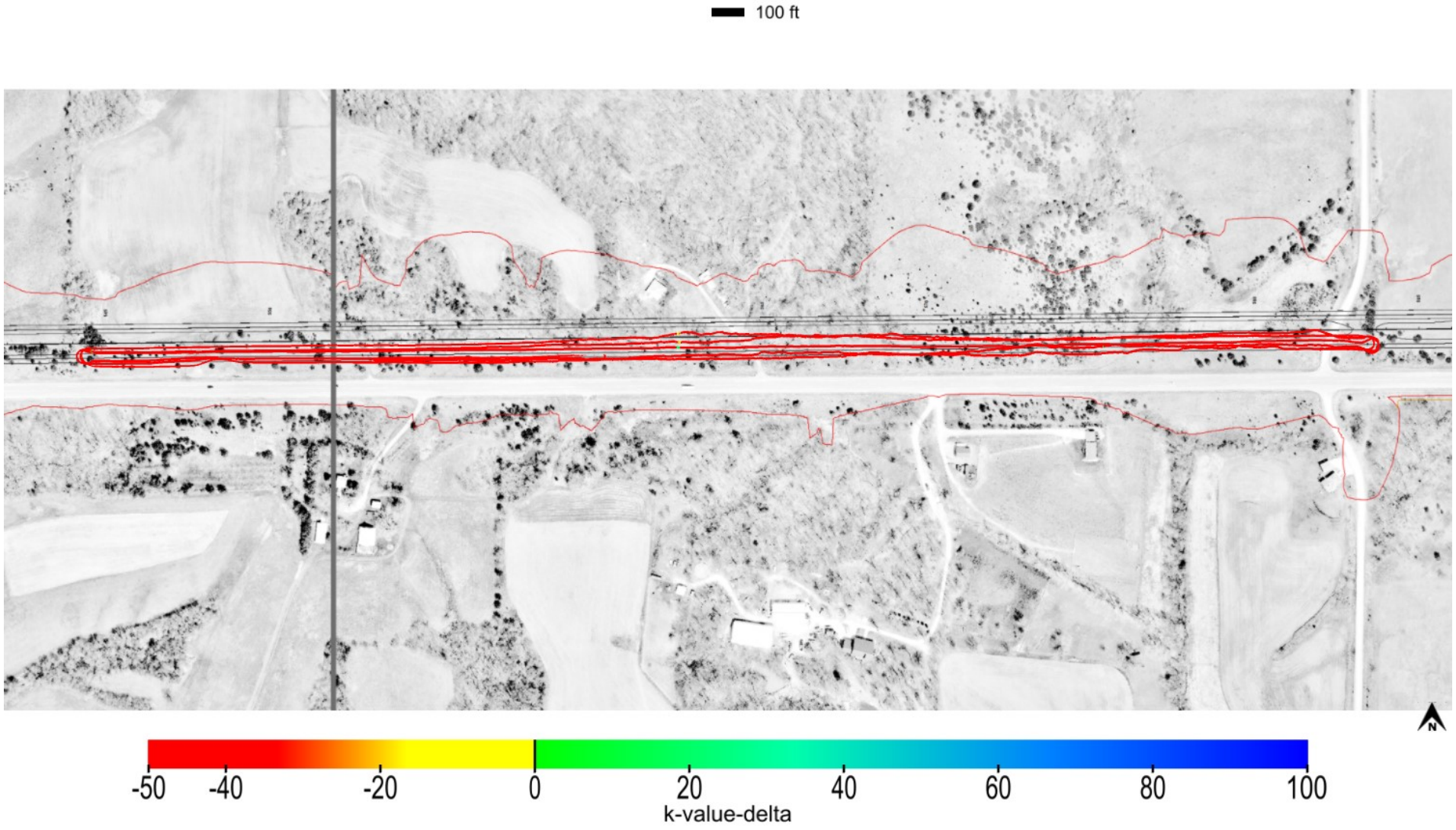
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_29_132047a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.1	18.5	-1.38	150	35	38.3	184.2	8.87	23.17	-115	-111.7	34.2

k-value-delta



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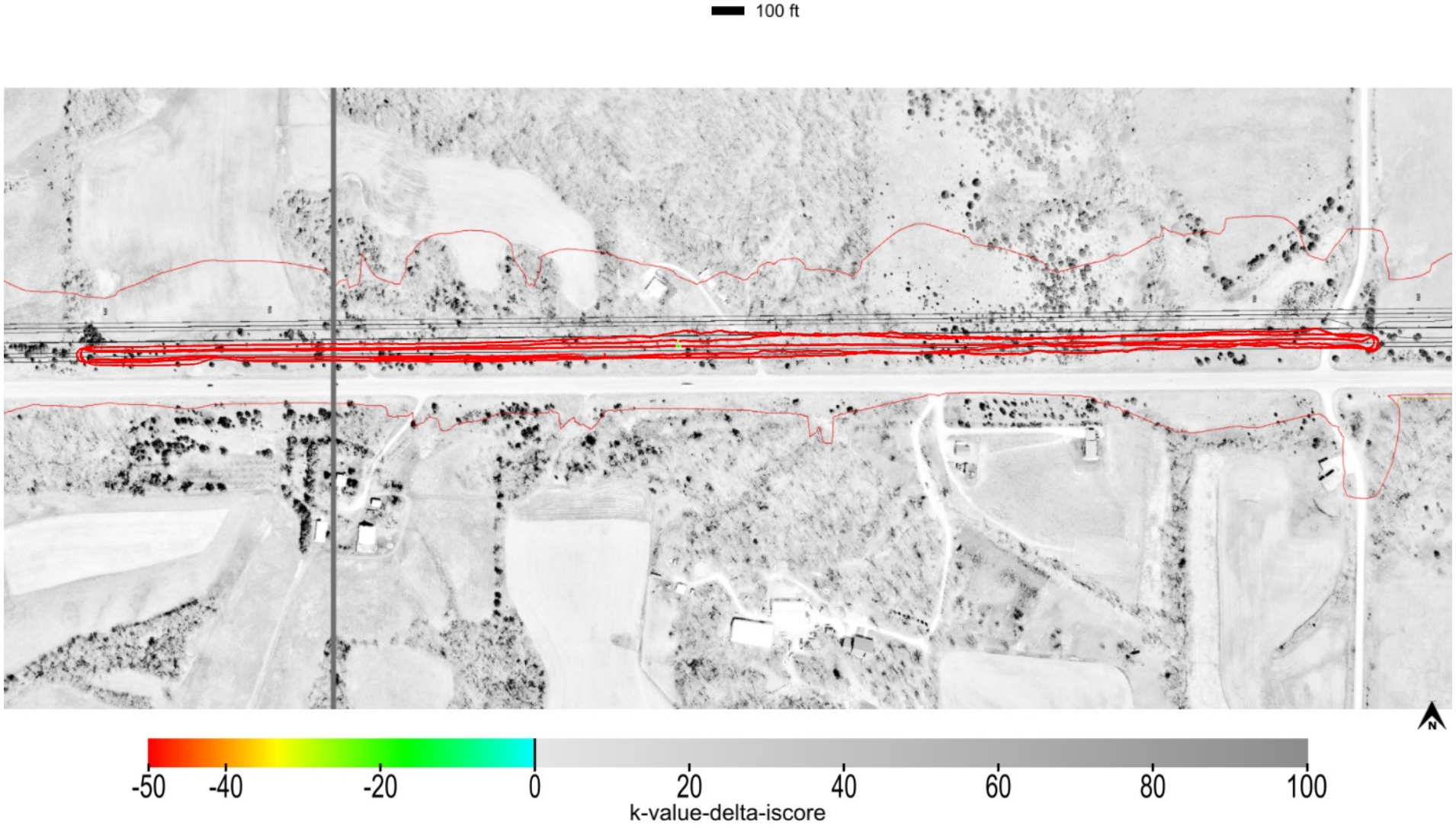
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_29_132047a

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	-115	-111.7	34.2	-115	-111.69	-16.19

k-value-delta-iscore



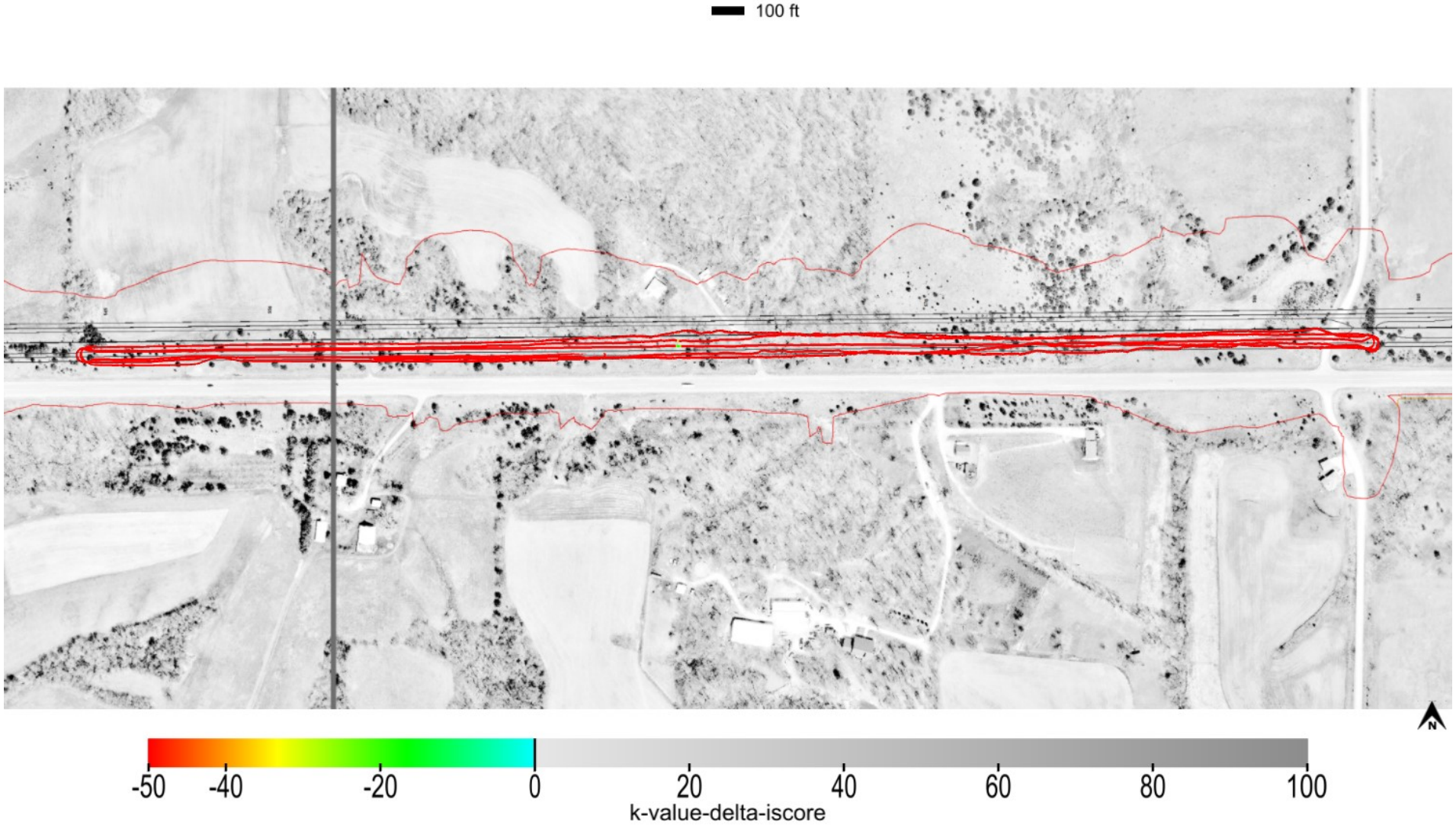
This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_29_132047a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	129292	100	none	0

blobs: k-value-delta-iscore



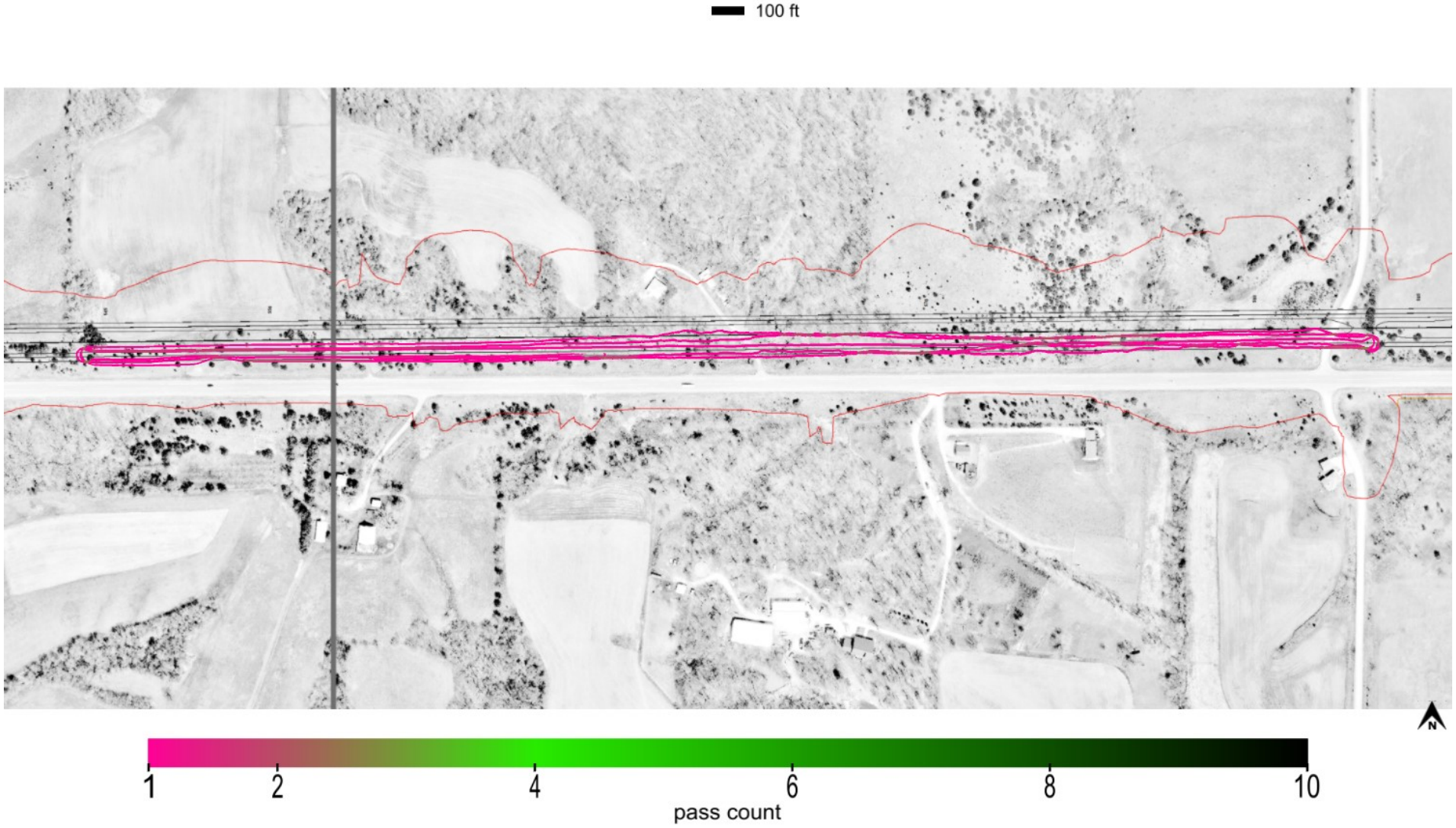
This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_29_132047a

minimum	average	maximum
1	1.13	3

pass count



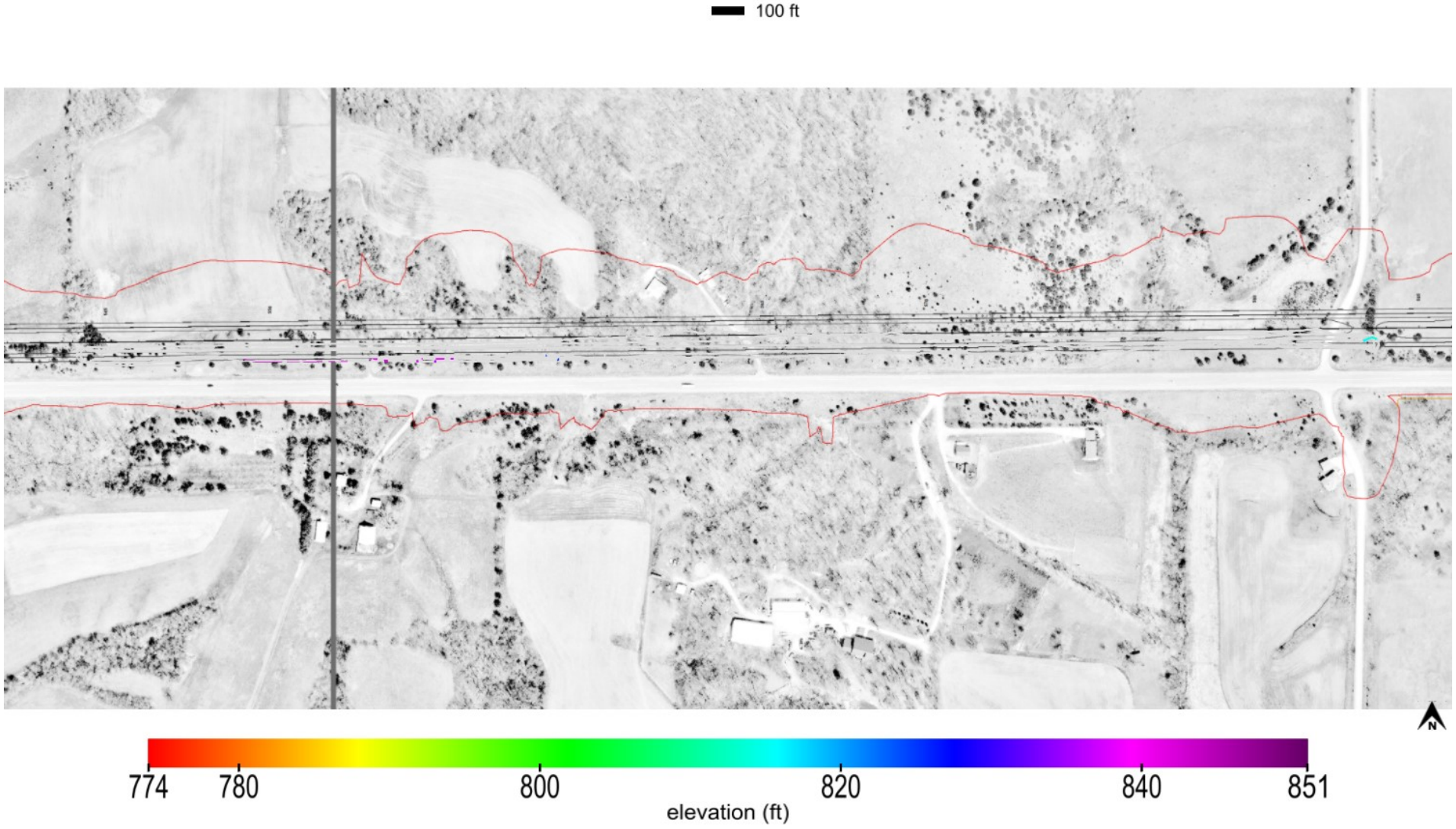
This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_29_132047a

minimum	average	maximum
813.775	835.533	844.382

elevation



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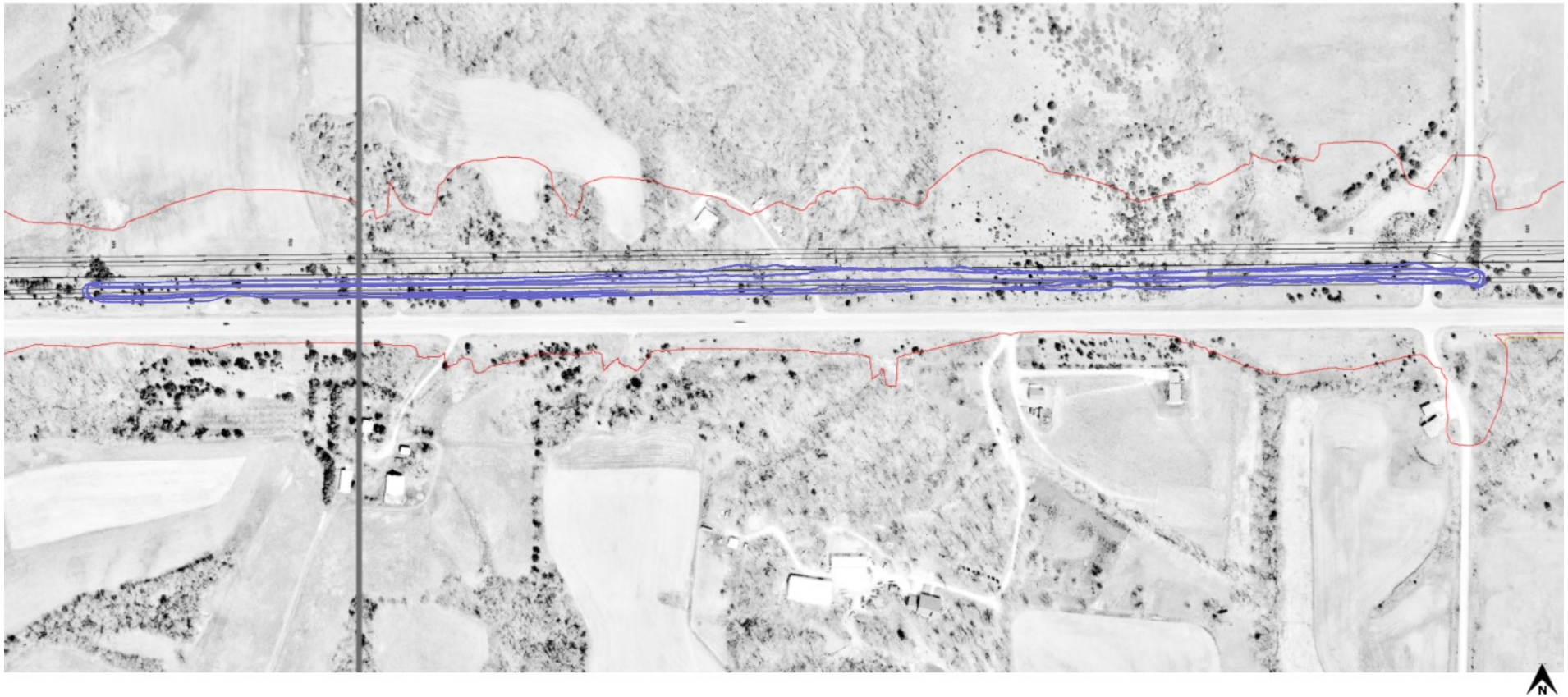
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_29_132047a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	129292	2.968	12	3000	150	40

materials

100 ft



Subgrade_Treatment Select Cohesive_IADOT (2102.02D)

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

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US30 Tama County	Mapping Duration (hrs):	1.12	Operator:	Ingios Geotechnics inc
Map ID:	iadot_86-us30_cs56-fcs00210_2020_06_29_145858a	No. of Measurements:	95571	Machine ID:	Ingios_FCS00210
Date and Time:	6/29/2020 2:58:58 PM	Location:	Tama County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	0.2	11.18	-0.61	150	35	44.1	206.71	16.78	38.04	-115	-105.9	56.71
Moisture Content	No												

Mapped Area

square feet	acres
95571	2.19

Pass Count

min.	avg.	max.
1	1.14	3

Elevation (ft)

min.	avg.	max.
811.61	838.48	845.31

Velocity (fps)

min.	avg.	max.
0.06	5.56	7.83

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	95571	2.194	12	3000	150	40

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

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US30 Tama County	Mapping Duration (hrs):	1.12	Operator:	Ingios Geotechnics inc
Map ID:	iadot_86-us30_cs56-fcs00210_2020_06_29_145858a	No. of Measurements:	95571	Machine ID:	Ingios_FCS00210
Date and Time:	6/29/2020 2:58:58 PM	Location:	Tama County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
11.18	CQI > = 95
0.2	80% of k-Value MVs >= 150
38.04	COV <= 20
100	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

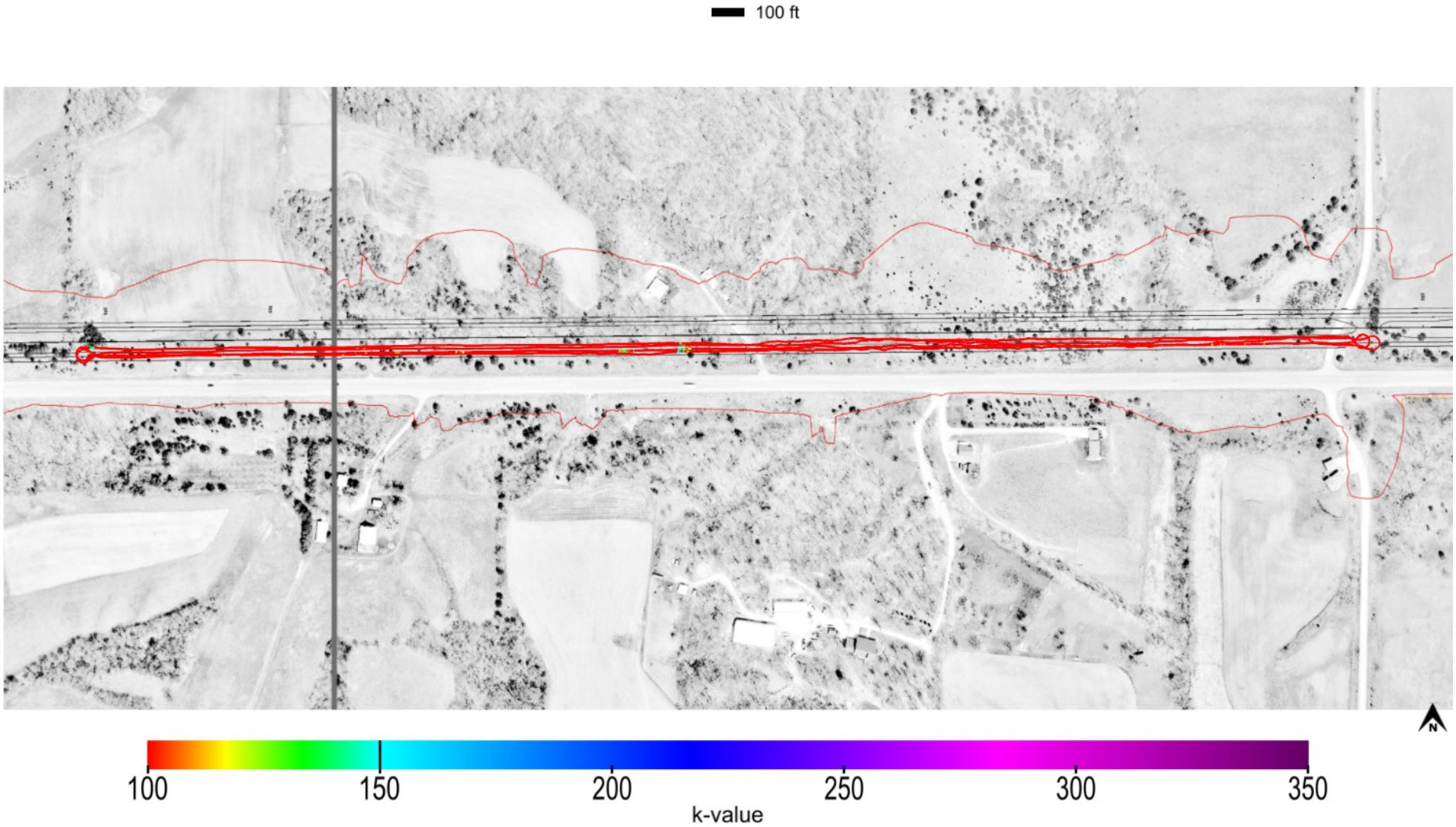
This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_29_145858a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.2	11.18	-0.61	150	35	44.1	206.71	16.78	38.04	-115	-105.9	56.71

k-value



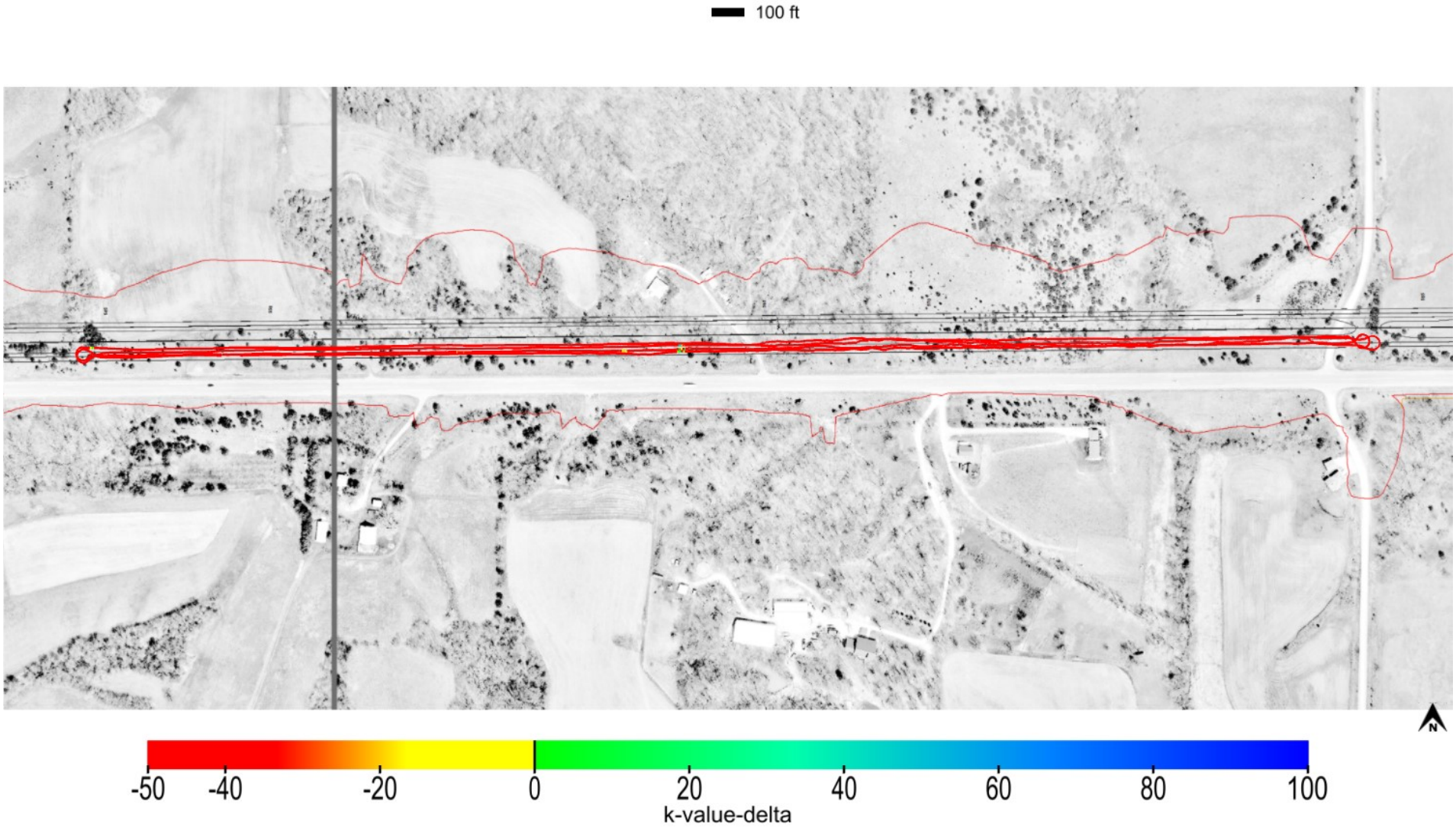
This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_29_145858a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.2	11.18	-0.61	150	35	44.1	206.71	16.78	38.04	-115	-105.9	56.71

k-value-delta



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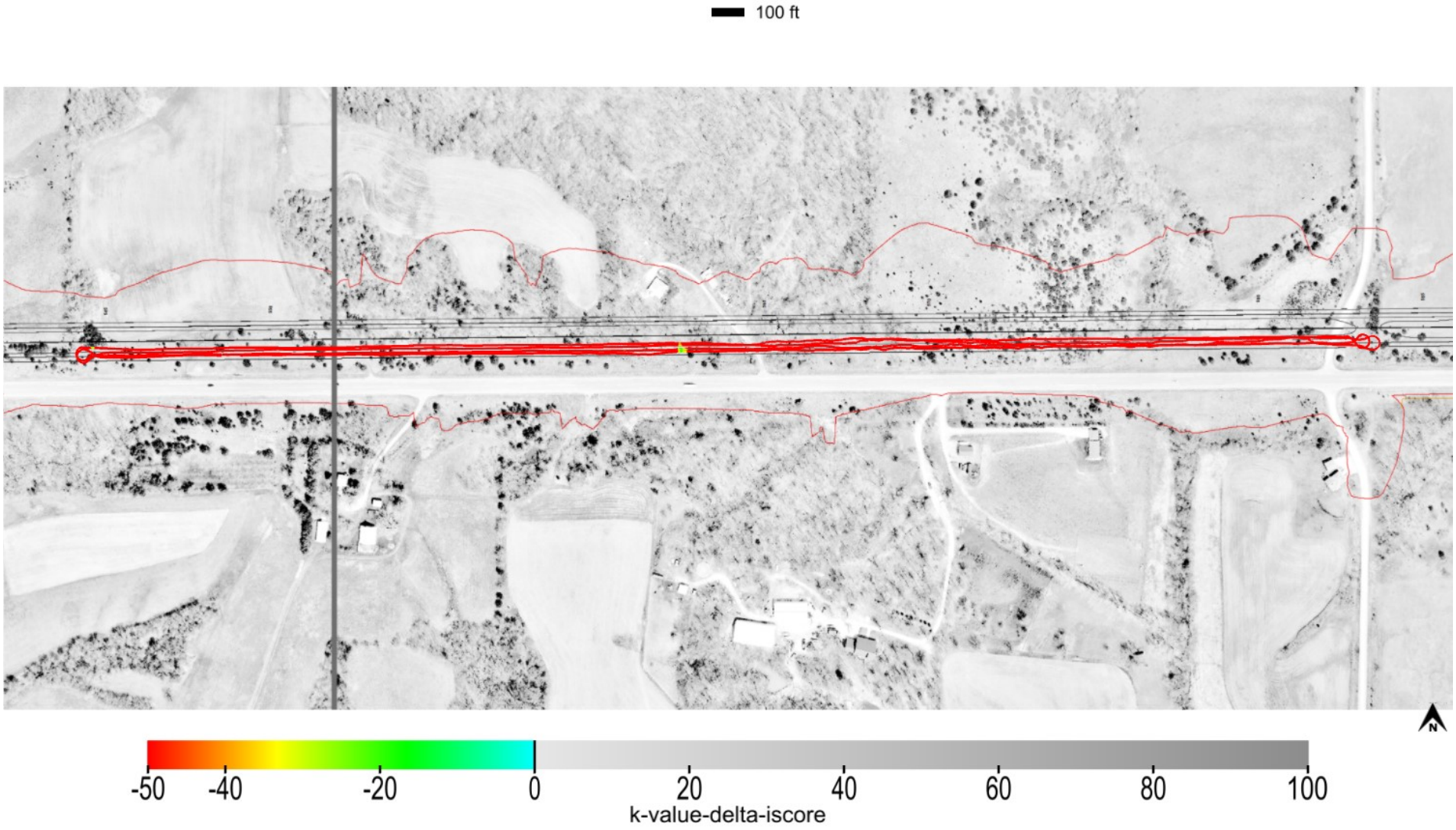
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_29_145858a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	0.2	150	-115	-105.9	56.71	-115	-105.78	-15.2

k-value-delta-iscore



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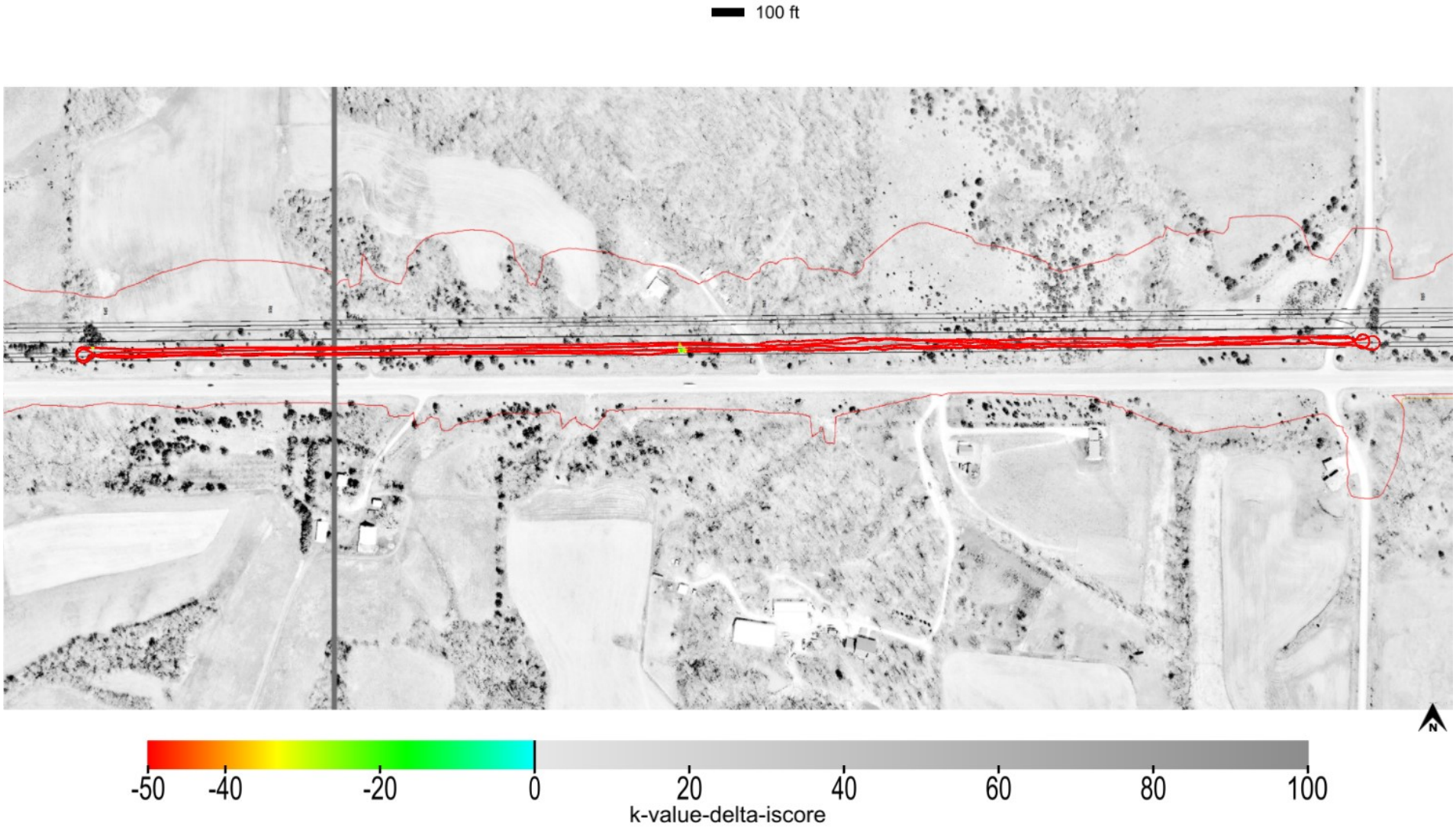
Map ID: iadot_86-us30_cs56-fcs00210_2020_06_29_145858a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	95571	100	none	0

blobs: k-value-delta-iscore



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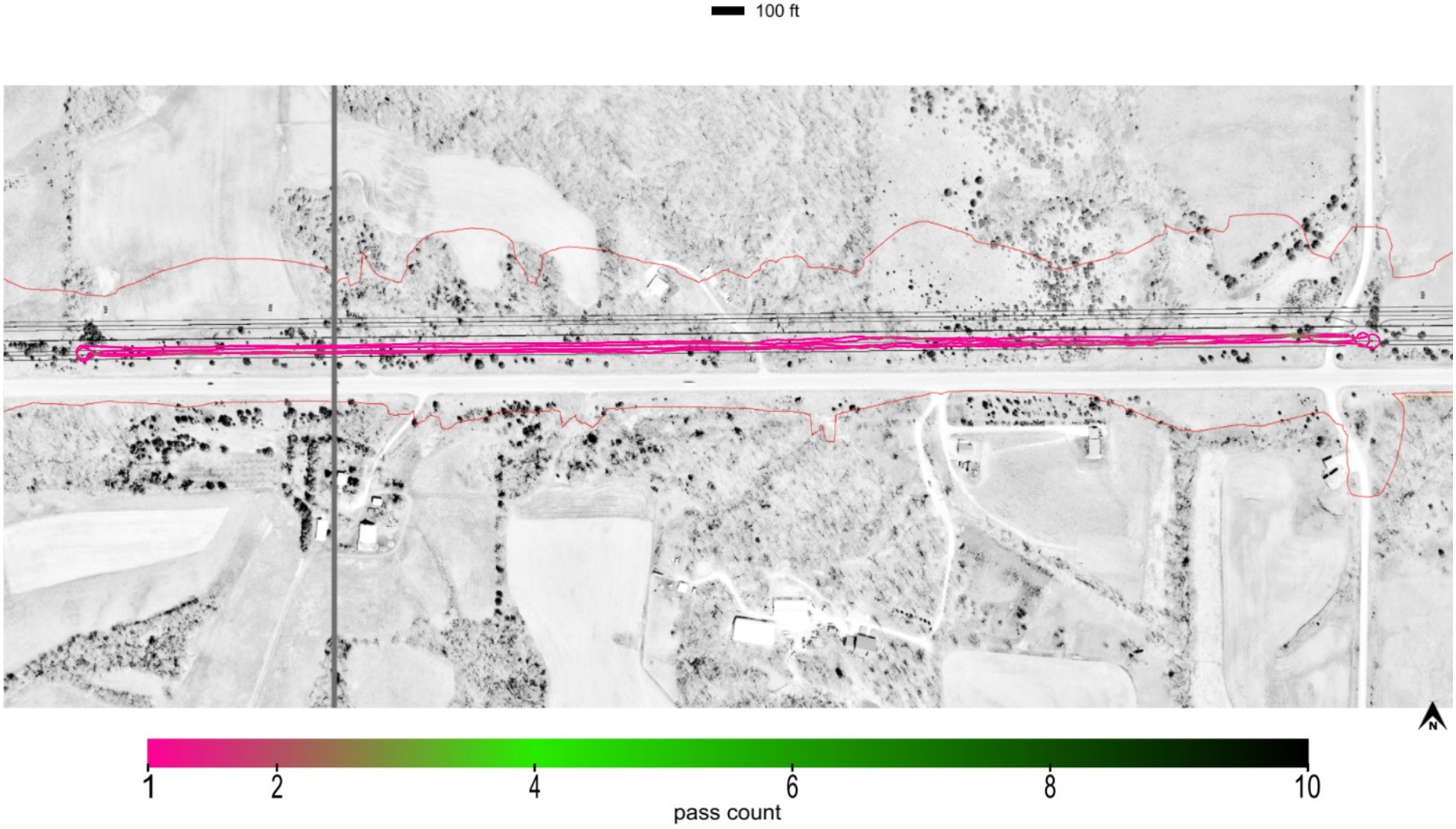
Map ID: iadot_86-us30_cs56-fcs00210_2020_06_29_145858a

minimum	average	maximum
1	1.14	3

pass count



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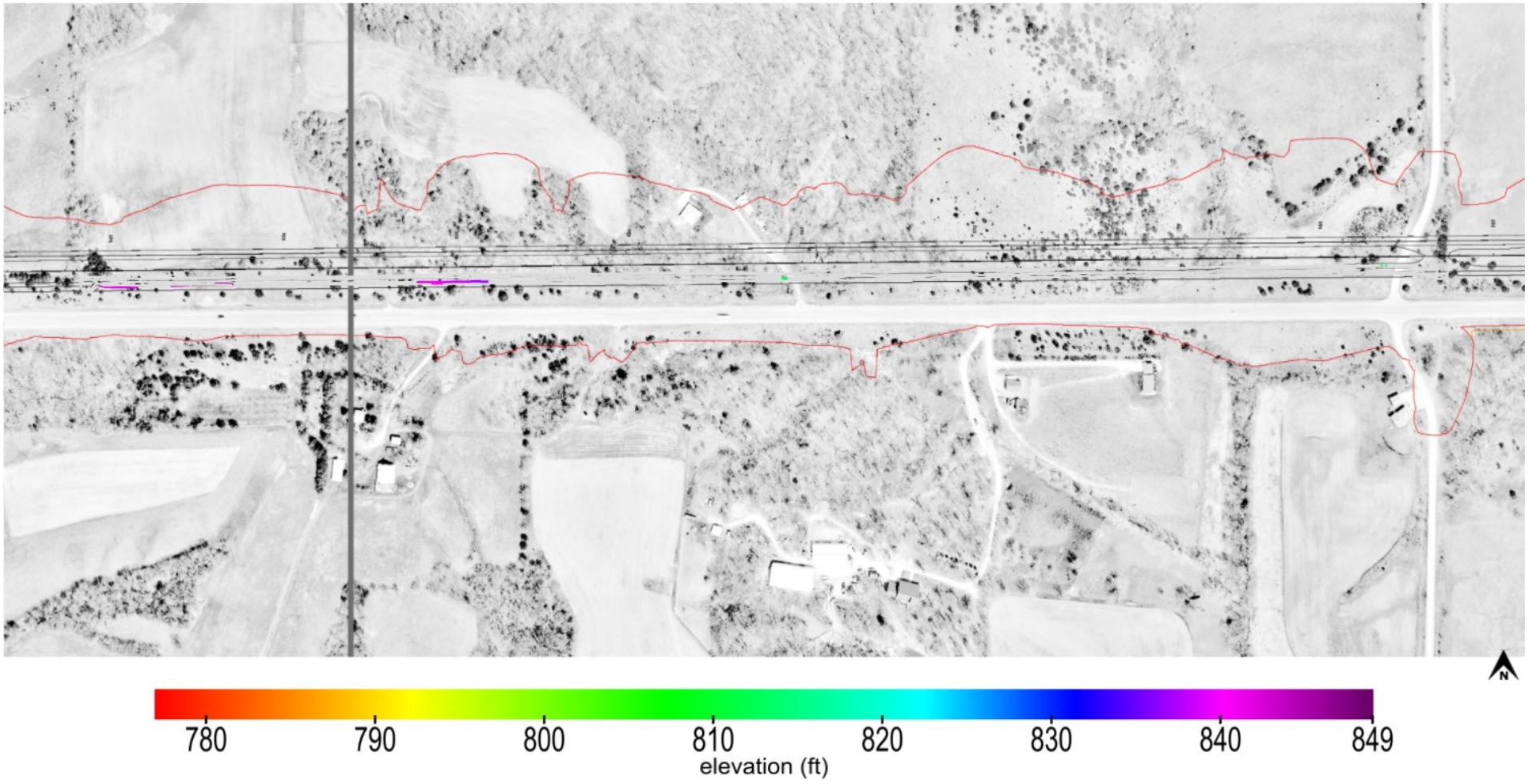
Map ID: iadot_86-us30_cs56-fcs00210_2020_06_29_145858a

minimum	average	maximum
811.612	838.476	845.31

elevation



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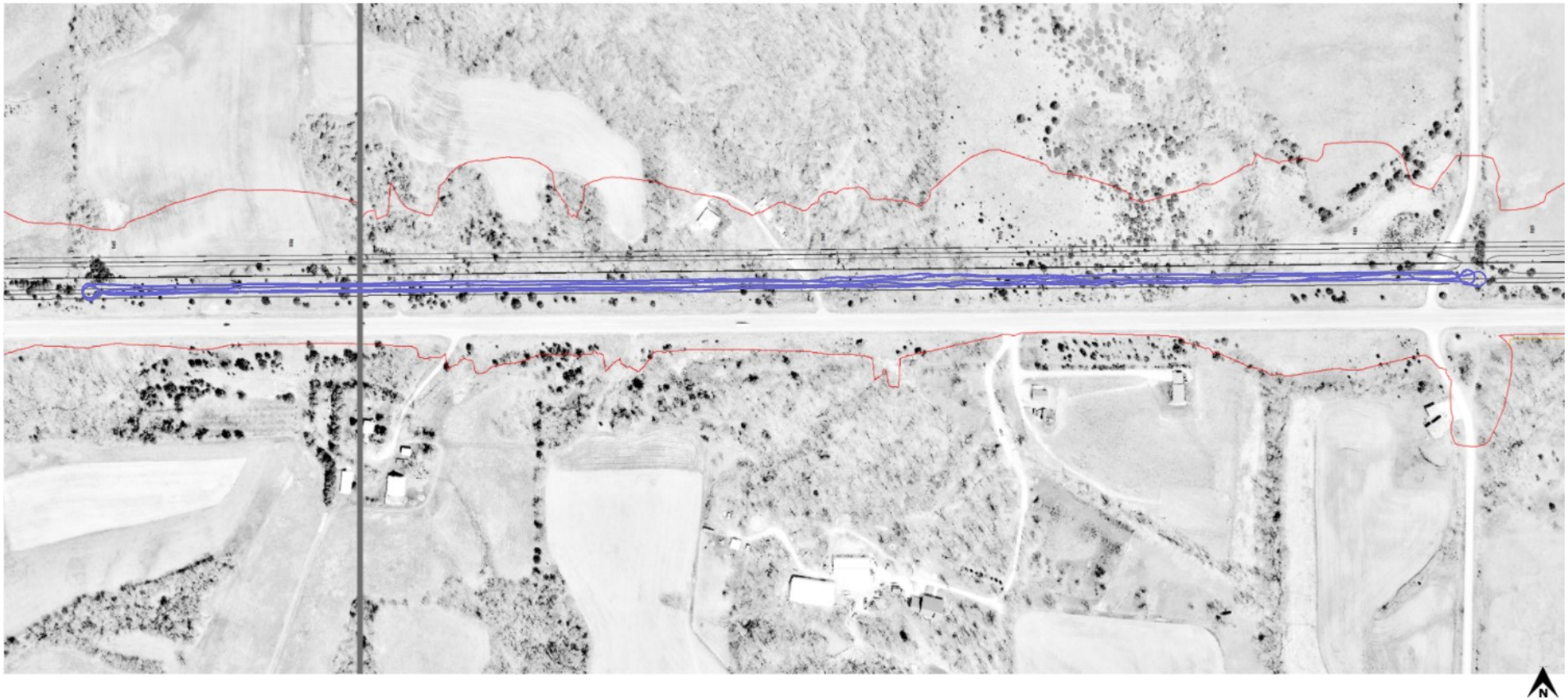
Map ID: iadot_86-us30_cs56-fcs00210_2020_06_29_145858a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	95571	2.194	12	3000	150	40

materials

100 ft



Subgrade_Treatment Select Cohesive_IADOT (2102.02D)

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

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US30 Tama County	Mapping Duration (hrs):	0.37	Operator:	Ingios Geotechnics inc
Map ID:	iadot_86-us30_cs56-fcs00210_2020_06_30_091435a	No. of Measurements:	27009	Machine ID:	Ingios_FCS00210
Date and Time:	6/30/2020 9:14:35 AM	Location:	Tama County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	7.72	-0.58	150	35	41.8	184.54	19.15	45.81	-115	-108.2	34.54
Moisture Content	No												

Mapped Area

square feet	acres
27009	0.62

Pass Count

min.	avg.	max.
1	1.4	5

Elevation (ft)

min.	avg.	max.
0	0	0

Velocity (fps)

min.	avg.	max.
0.03	5.48	5.94

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	27009	0.62	12	3000	150	40

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IOWADOT

E-Compaction Report

Project:	US30 Tama County	Mapping Duration (hrs):	0.37	Operator:	Ingios Geotechnics inc
Map ID:	iadot_86-us30_cs56-fcs00210_2020_06_30_091435a	No. of Measurements:	27009	Machine ID:	Ingios_FCS00210
Date and Time:	6/30/2020 9:14:35 AM	Location:	Tama County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
7.72	CQI > = 95
0.6	80% of k-Value MVs >= 150
45.81	COV <= 20
100	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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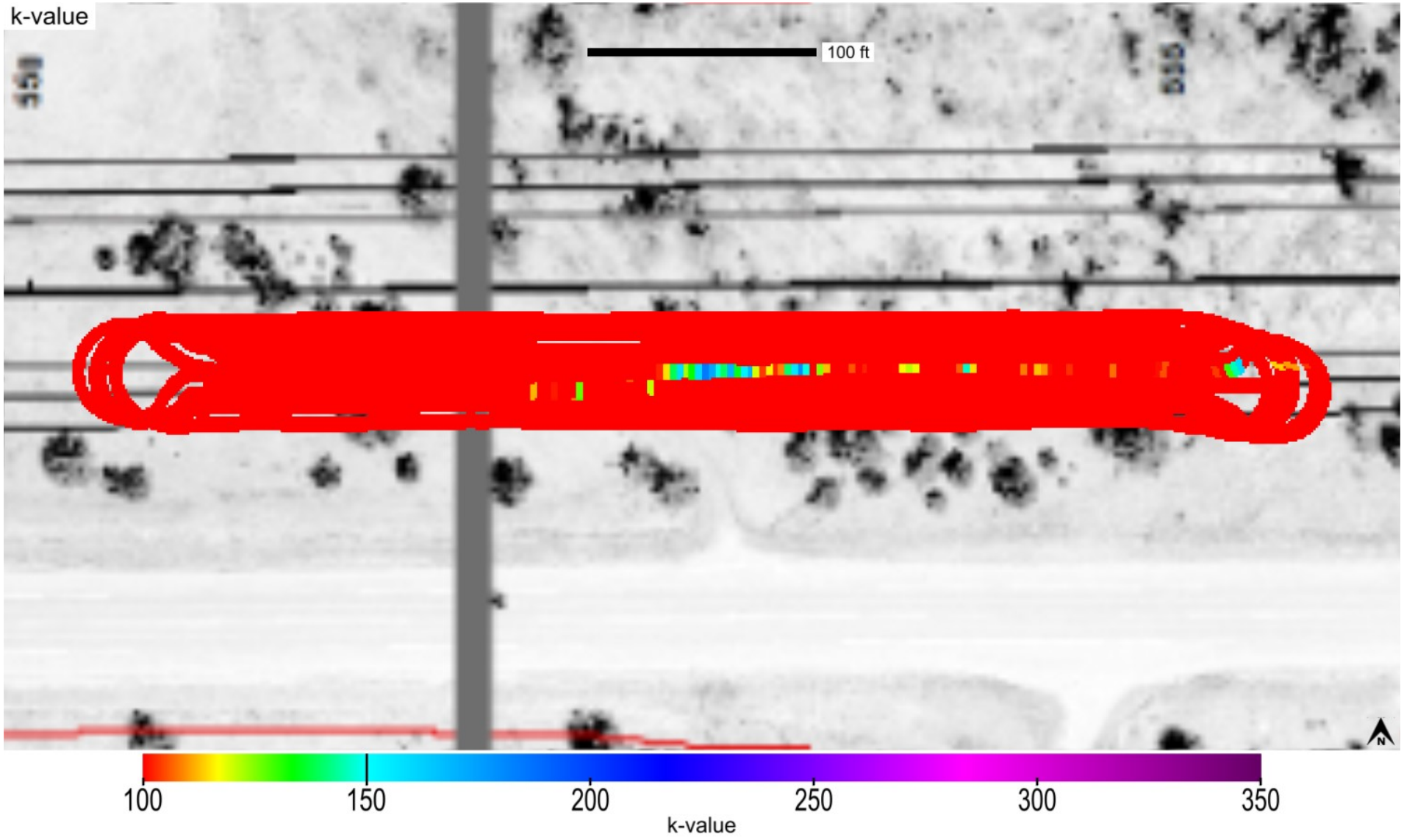
Map ID: iadot_86-us30_cs56-fcs00210_2020_06_30_091435a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.6	7.72	-0.58	150	35	41.8	184.54	19.15	45.81	-115	-108.2	34.54



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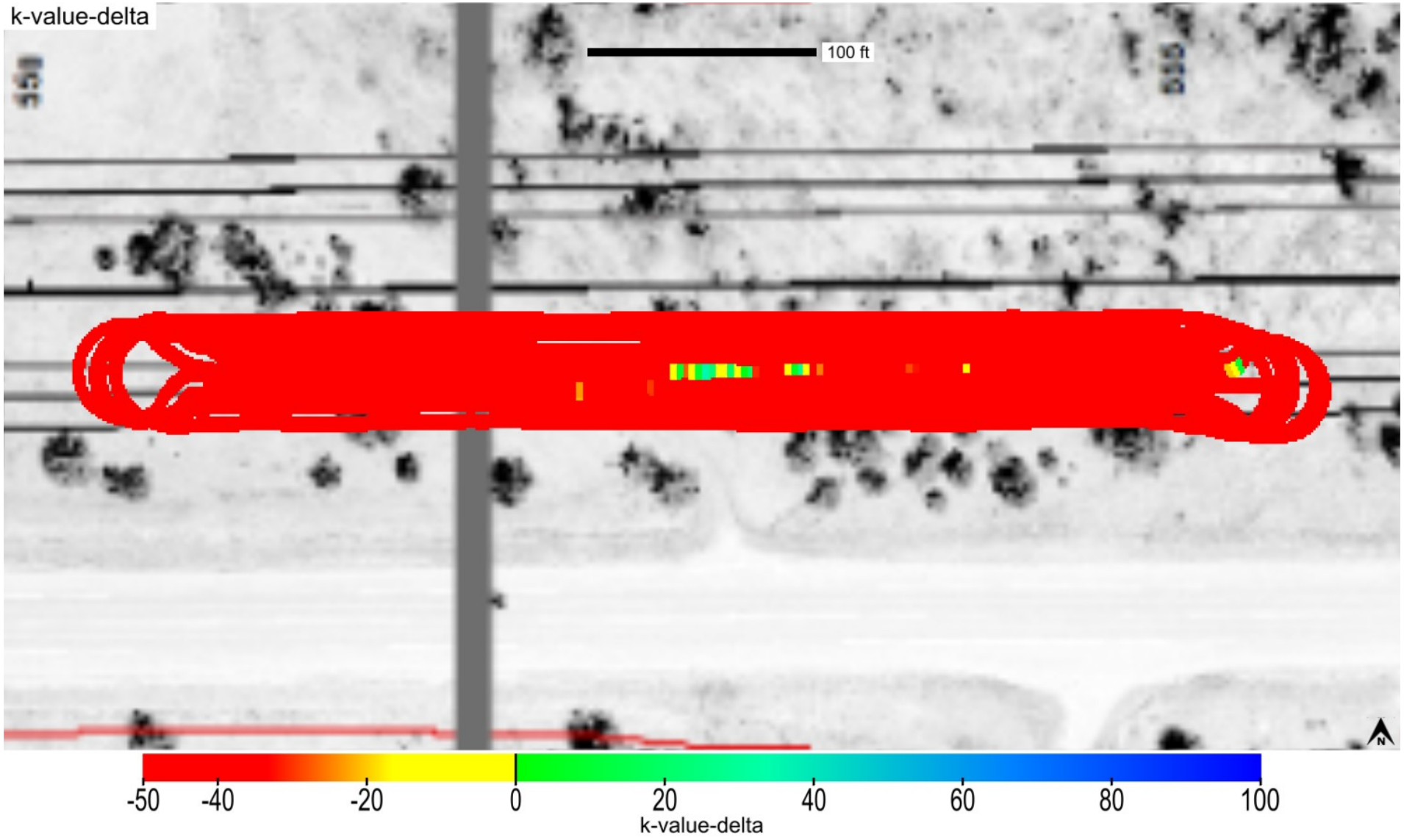
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_30_091435a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.6	7.72	-0.58	150	35	41.8	184.54	19.15	45.81	-115	-108.2	34.54



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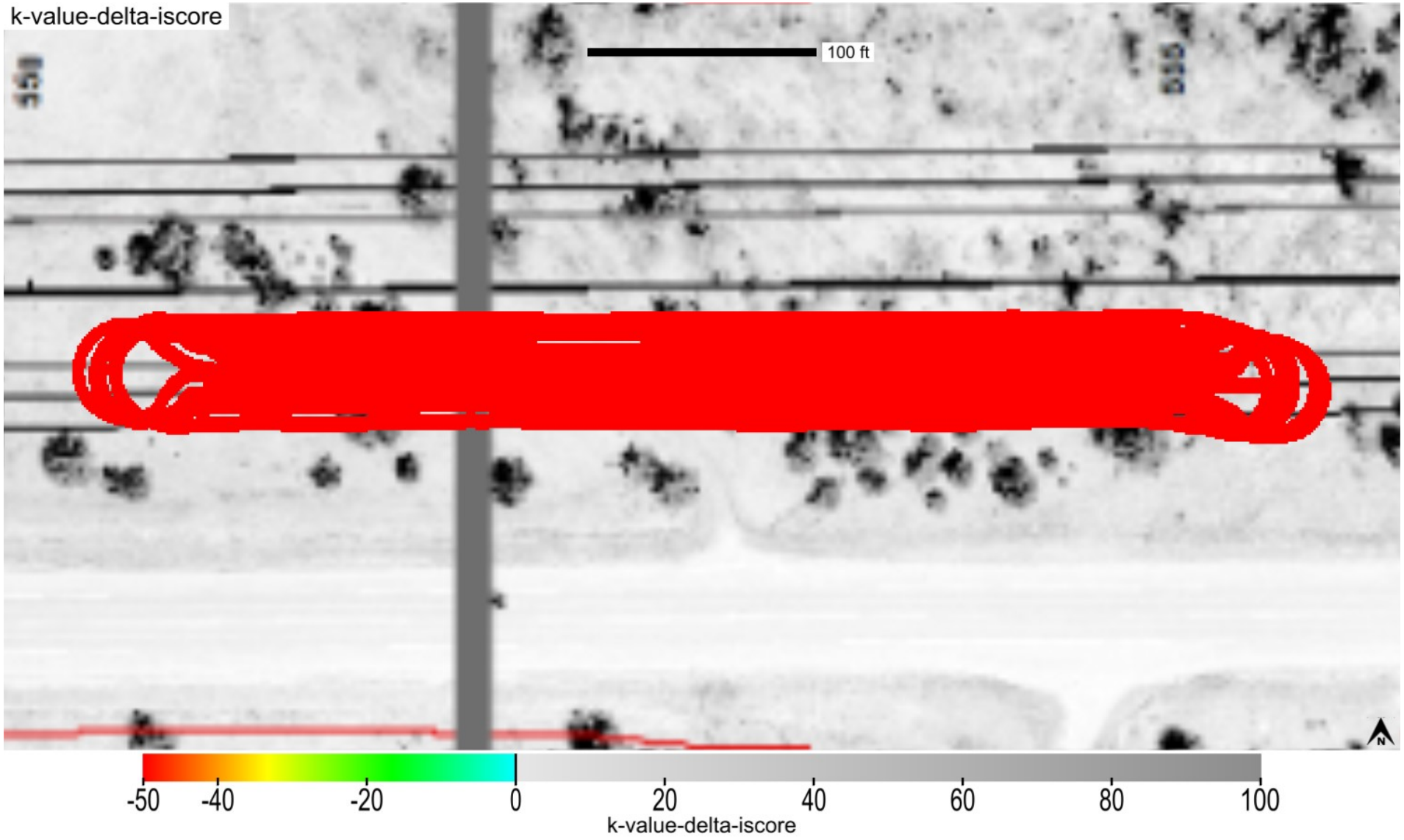
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_30_091435a

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	-115	-108.2	34.54	-115	-108.12	-50.41



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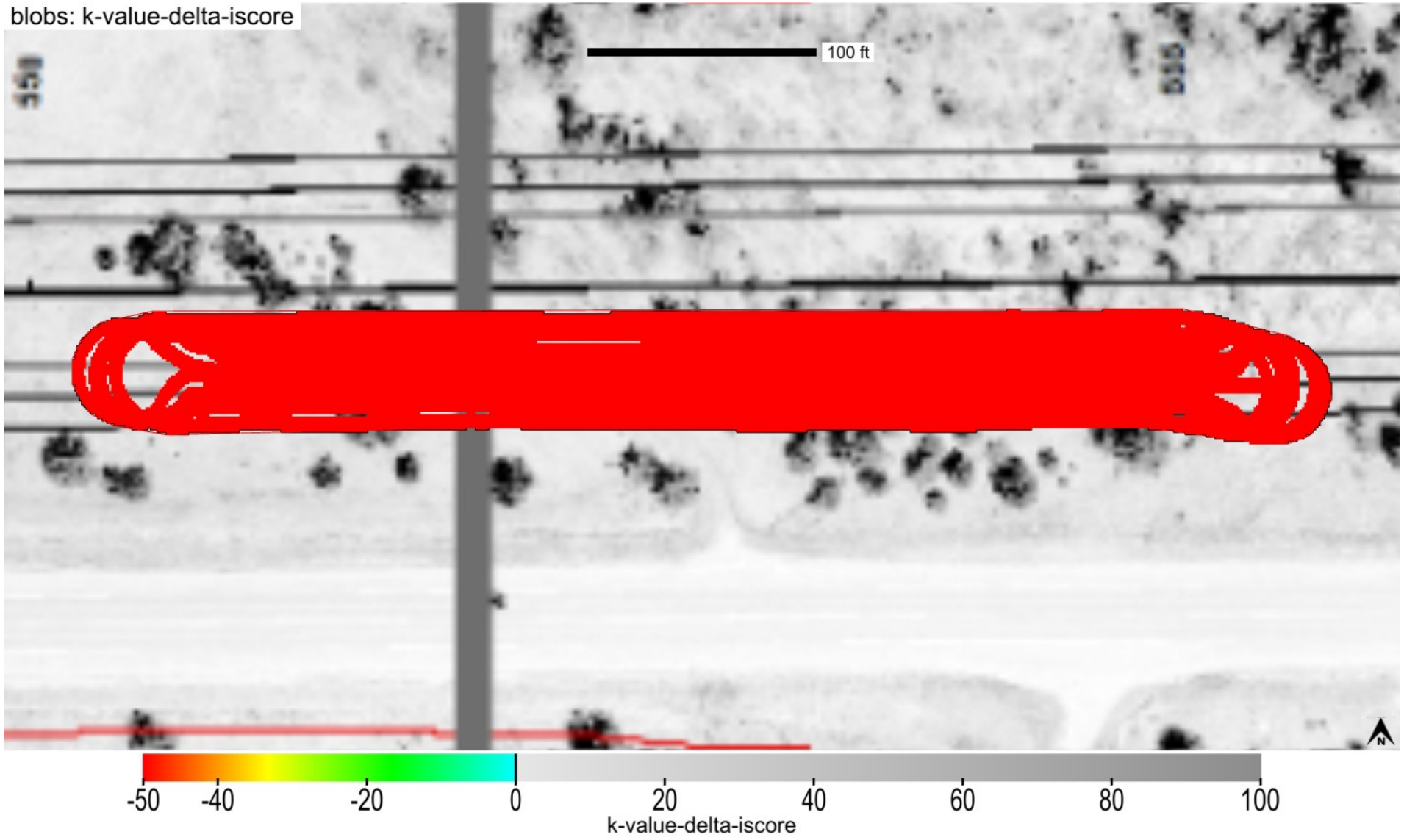
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_30_091435a

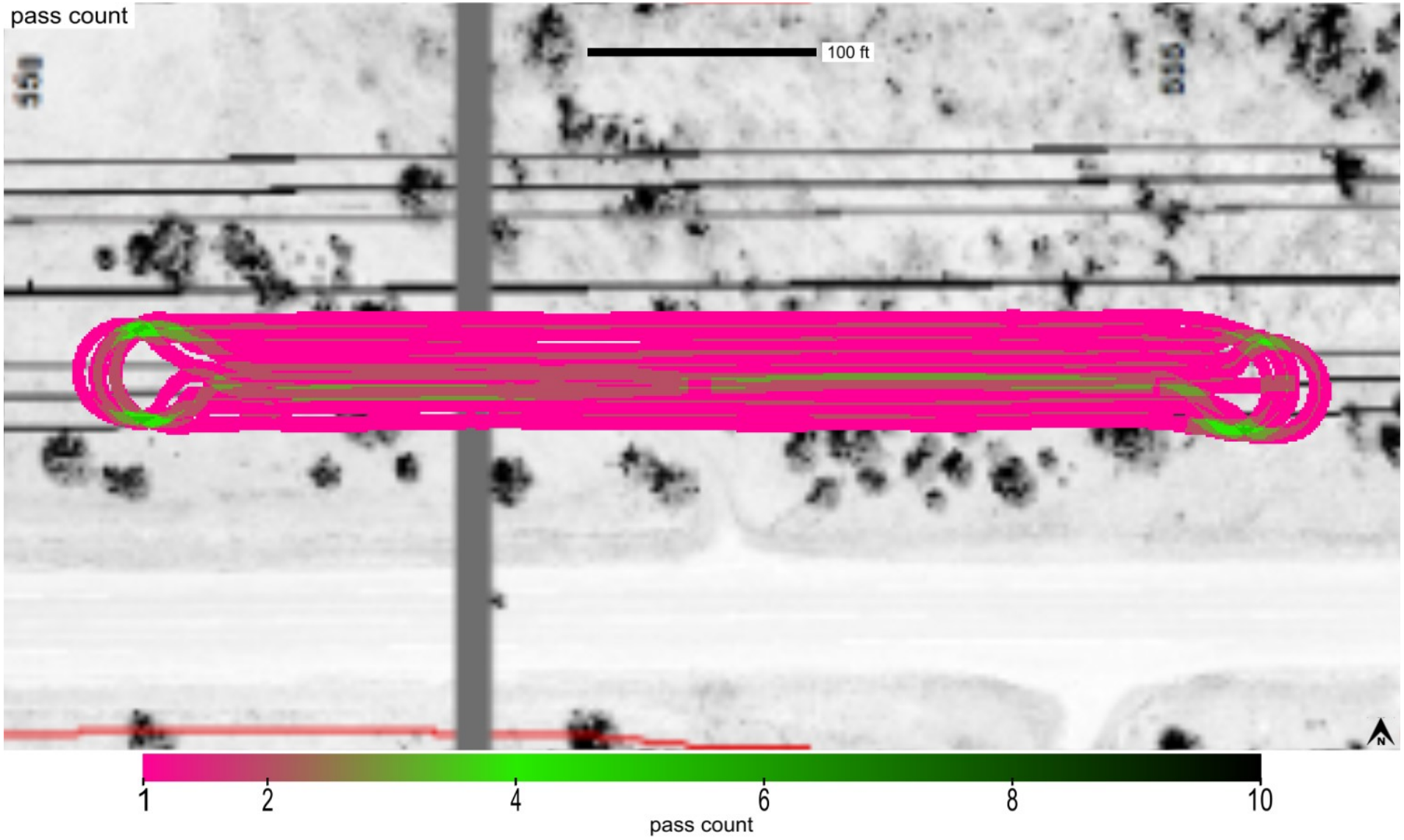
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	27009	100	none	0



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

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_30_091435a

minimum	average	maximum
1	1.4	5



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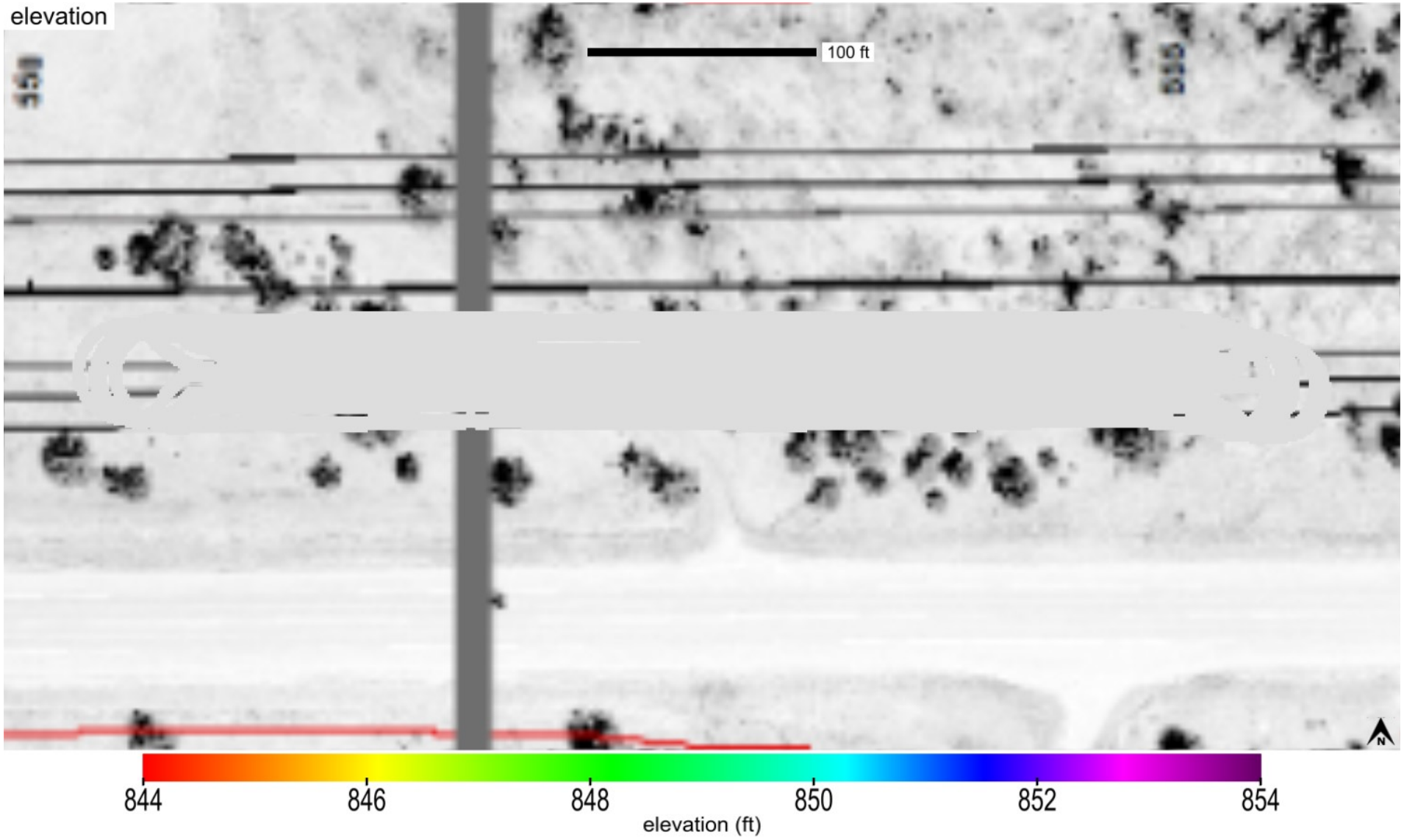
Map ID: iadot_86-us30_cs56-fcs00210_2020_06_30_091435a

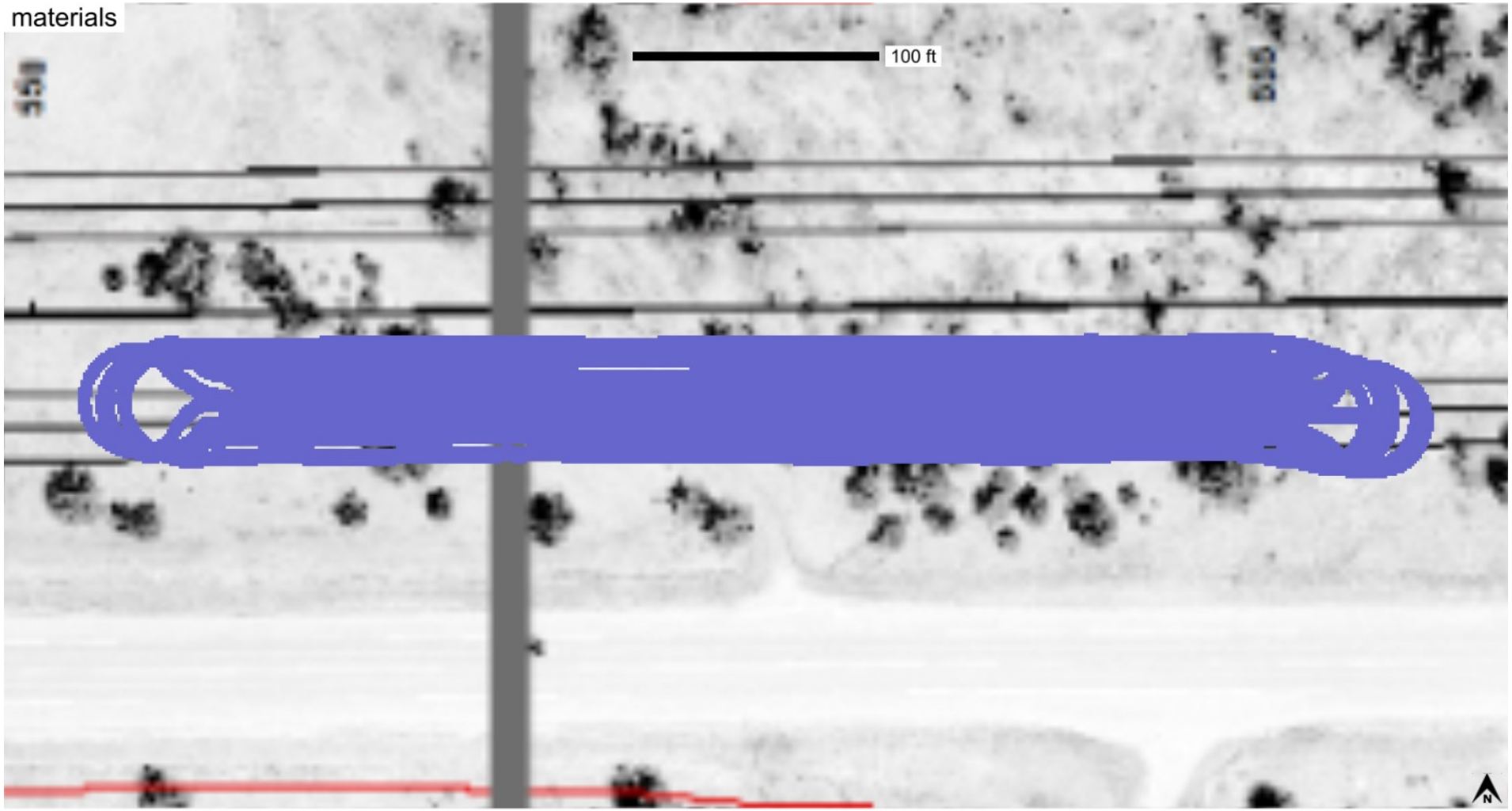
minimum	average	maximum
0	0	0



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

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_30_091435a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	27009	0.62	12	3000	150	40



Subgrade_Treatment Select Cohesive_IADOT (2102.02D)

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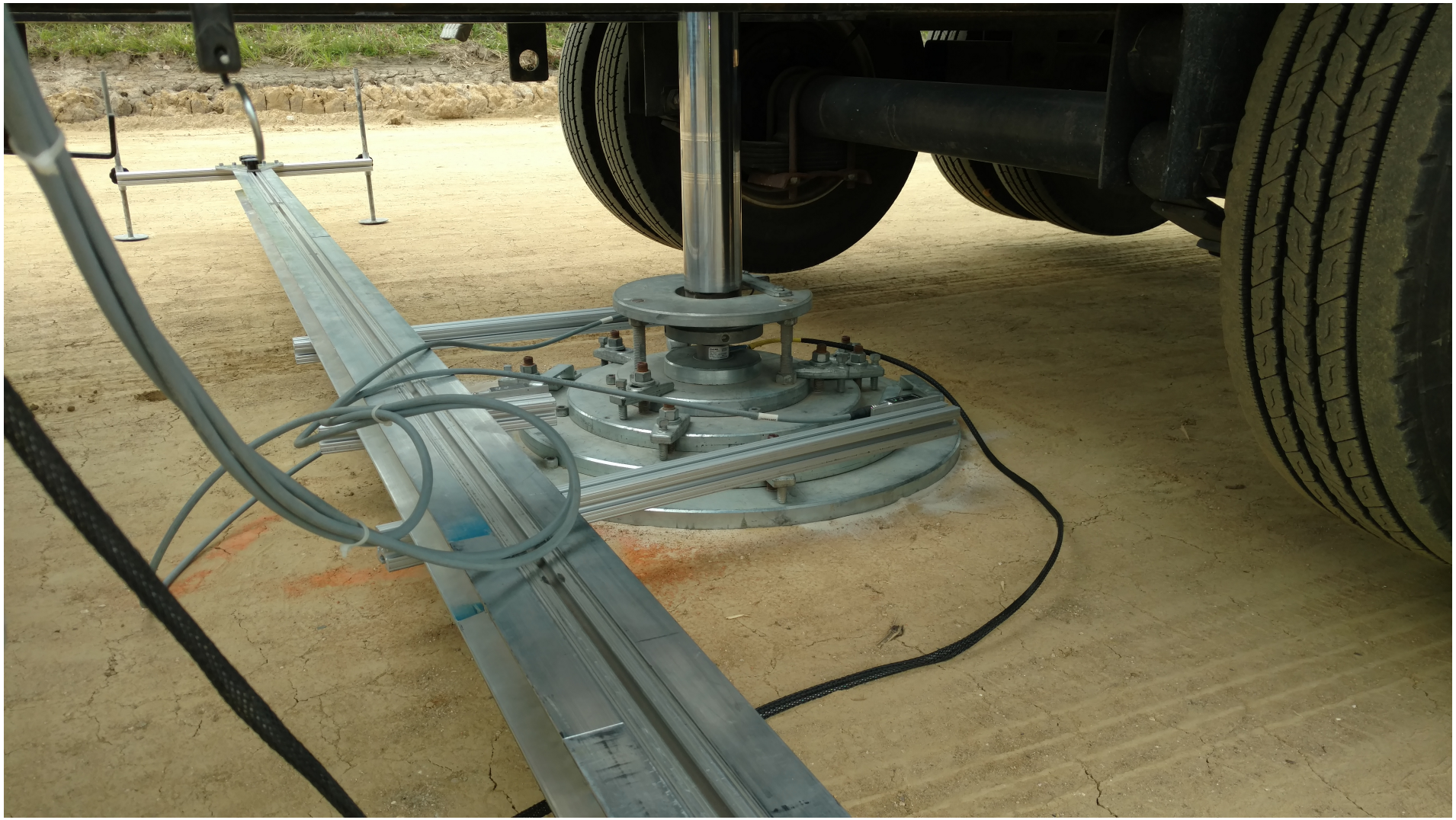
Map ID: iadot_86-us30_cs56-fcs00210_2020_06_30_091435a

IMG_20200630_103545187.jpg



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IOWADOT

E-Compaction Report

Project:	US30 Tama County	Mapping Duration (hrs):	0.63	Operator:	Ingios Geotechnics inc
Map ID:	iadot_86-us30_cs56-fcs00210_2020_06_30_112616a	No. of Measurements:	69691	Machine ID:	Ingios_FCS00210
Date and Time:	6/30/2020 11:26:16 AM	Location:	Tama County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	20.98	-1.76	150	35	38.4	102.07	6.93	18.04	-115	-111.6	-47.93
Moisture Content	No												

Mapped Area

square feet	acres
69691	1.6

Pass Count

min.	avg.	max.
1	1.26	4

Elevation (ft)

min.	avg.	max.
0	0	0

Velocity (fps)

min.	avg.	max.
3.09	5.53	6.83

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	69691	1.6	12	3000	150	40

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IOWADOT

E-Compaction Report

Project:	US30 Tama County	Mapping Duration (hrs):	0.63	Operator:	Ingios Geotechnics inc
Map ID:	iadot_86-us30_cs56-fcs00210_2020_06_30_112616a	No. of Measurements:	69691	Machine ID:	Ingios_FCS00210
Date and Time:	6/30/2020 11:26:16 AM	Location:	Tama County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
20.98	CQI > = 95
0	80% of k-Value MVs >= 150
18.04	COV <= 20
100	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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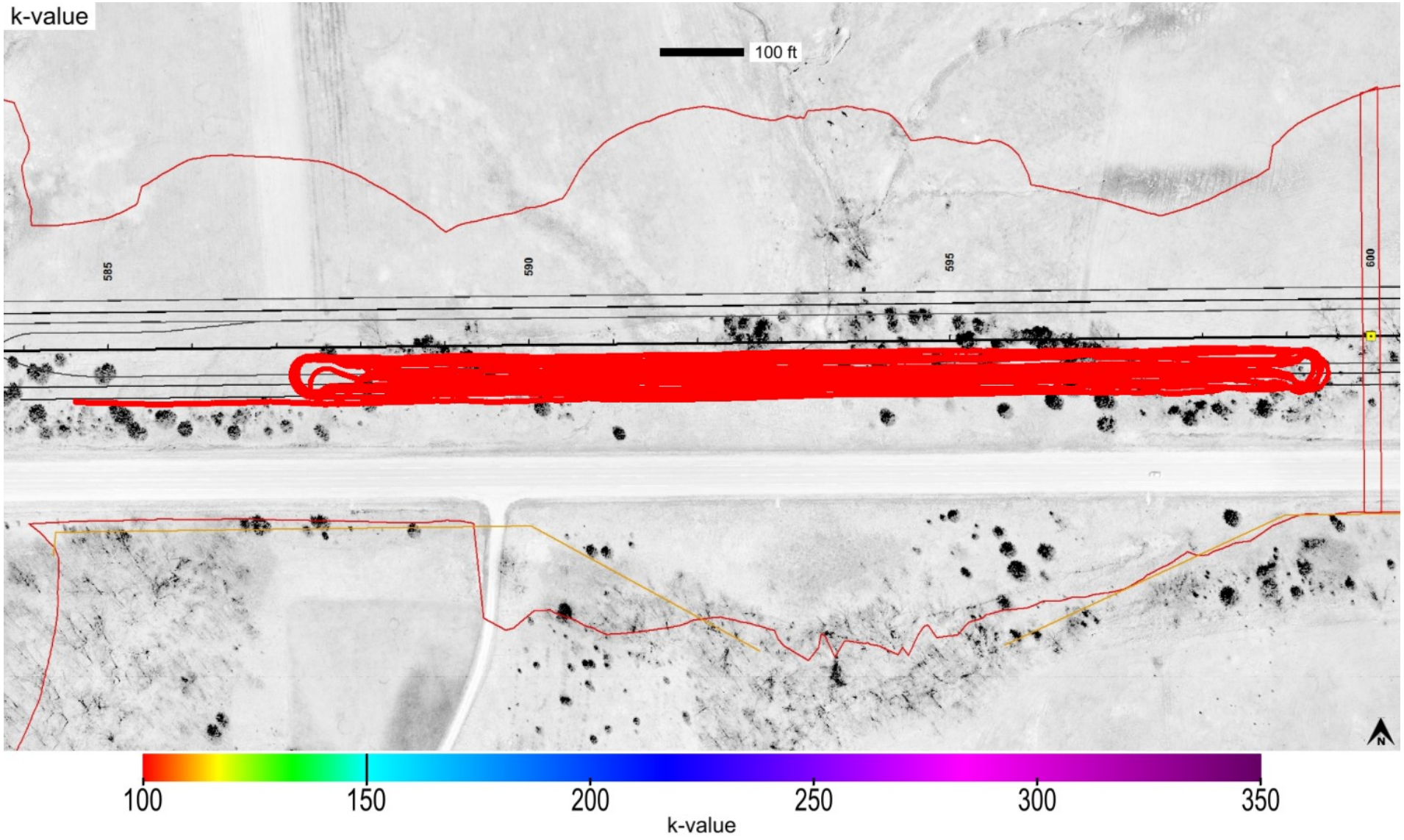
Map ID: iadot_86-us30_cs56-fcs00210_2020_06_30_112616a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0	20.98	-1.76	150	35	38.4	102.07	6.93	18.04	-115	-111.6	-47.93



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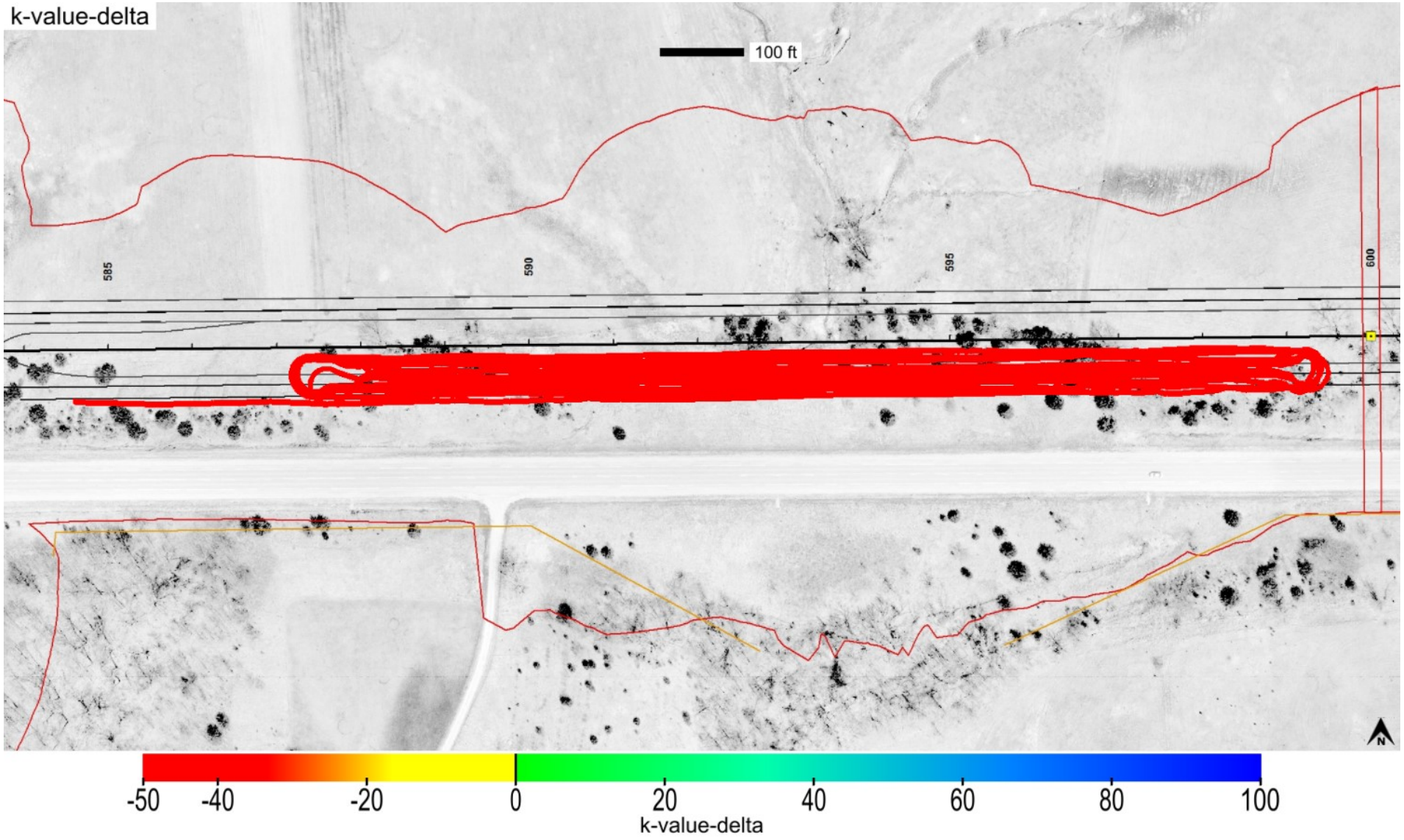
Map ID: iadot_86-us30_cs56-fcs00210_2020_06_30_112616a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0	20.98	-1.76	150	35	38.4	102.07	6.93	18.04	-115	-111.6	-47.93



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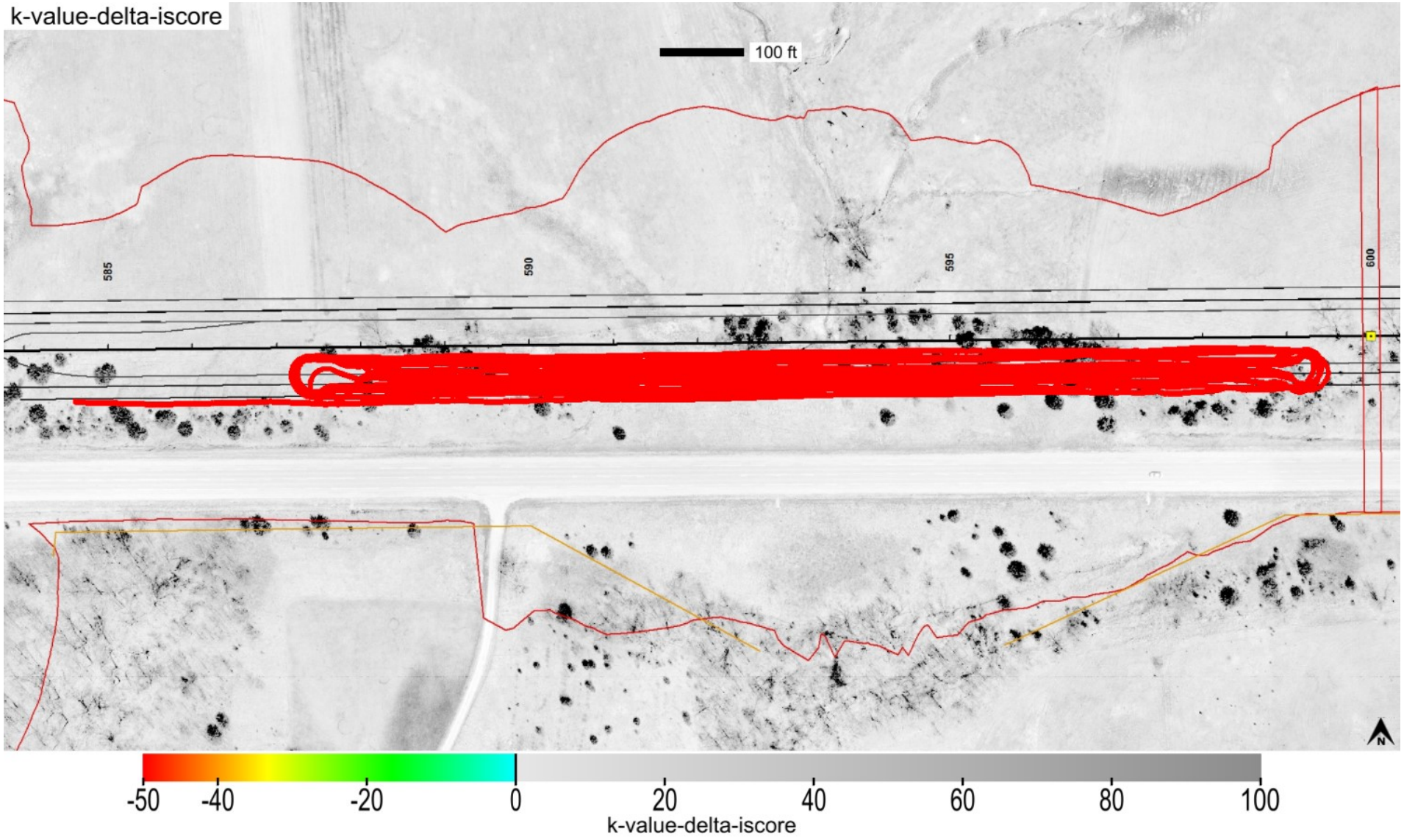
Map ID: iadot_86-us30_cs56-fcs00210_2020_06_30_112616a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	0	150	-115	-111.6	-47.93	-115	-111.58	-96.26



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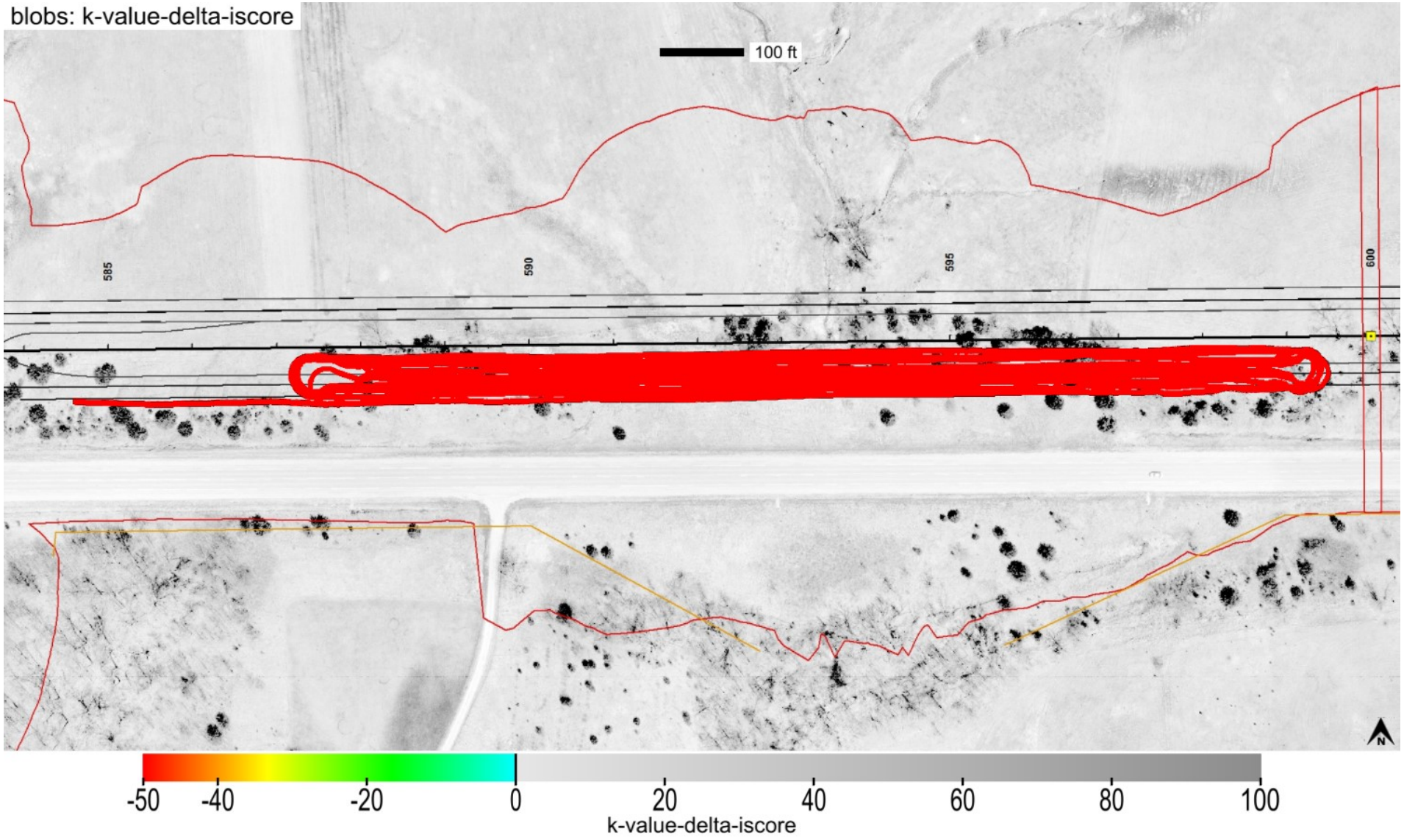
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_30_112616a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	69691	100	none	0



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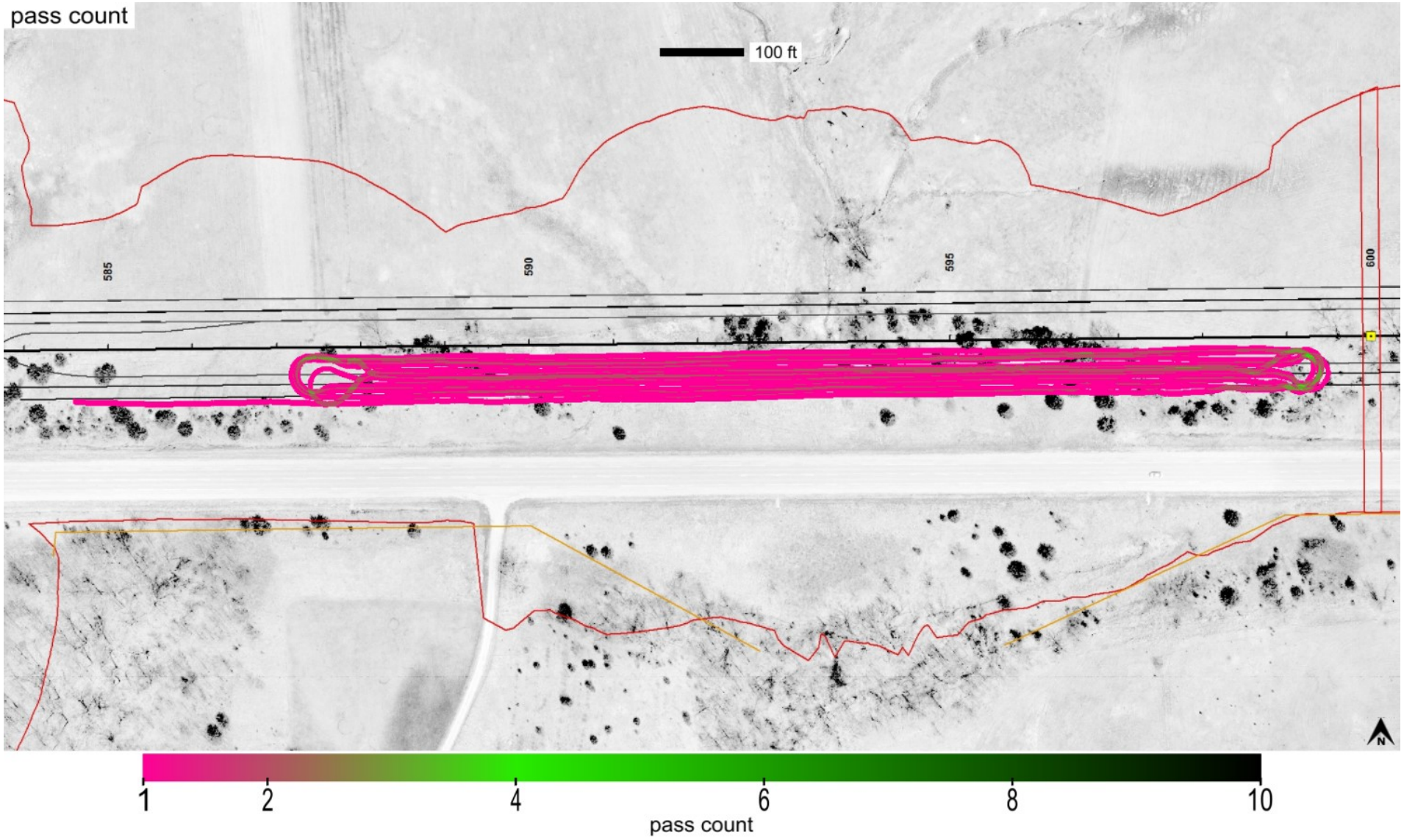
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_30_112616a

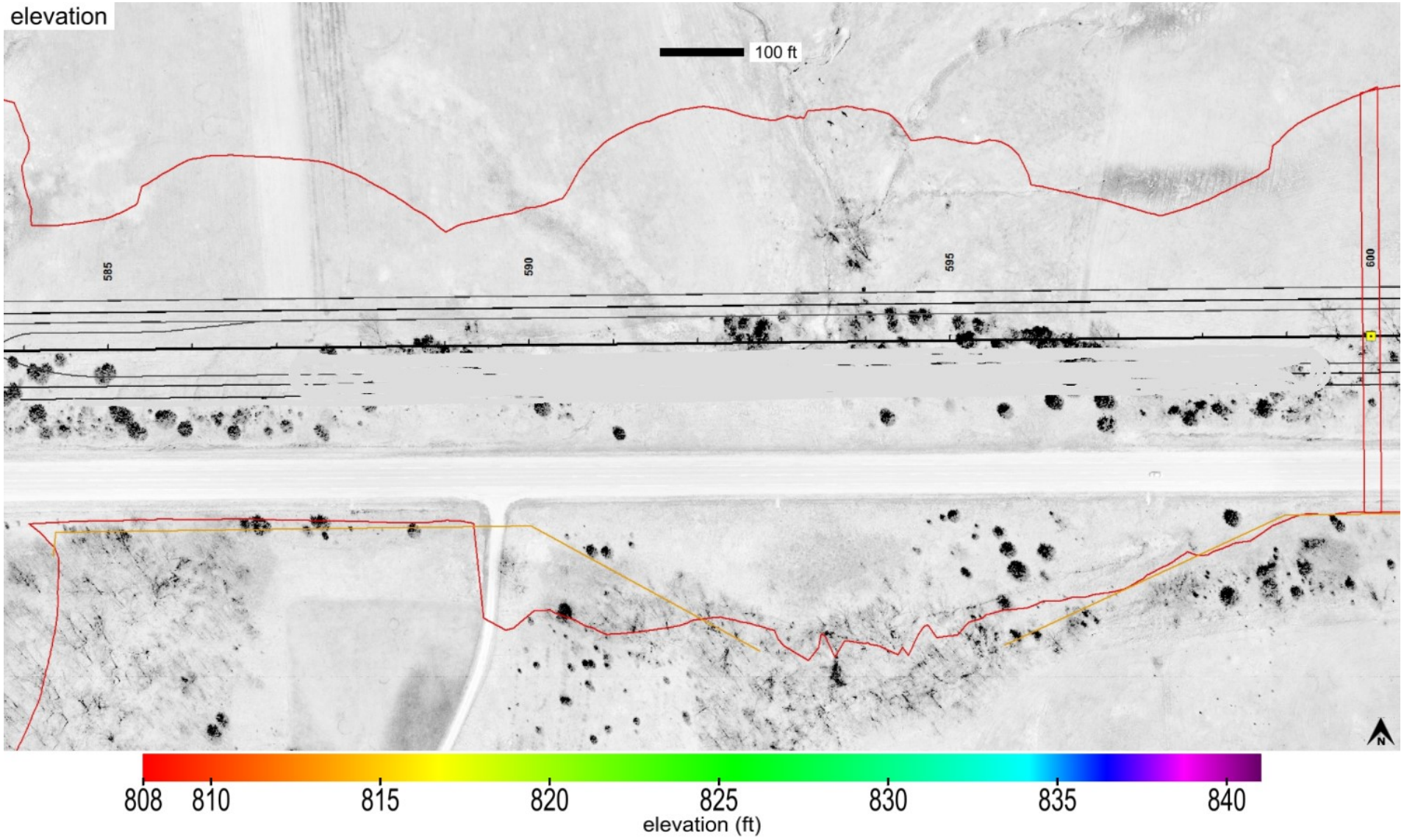
minimum	average	maximum
1	1.26	4



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

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_30_112616a

minimum	average	maximum
0	0	0



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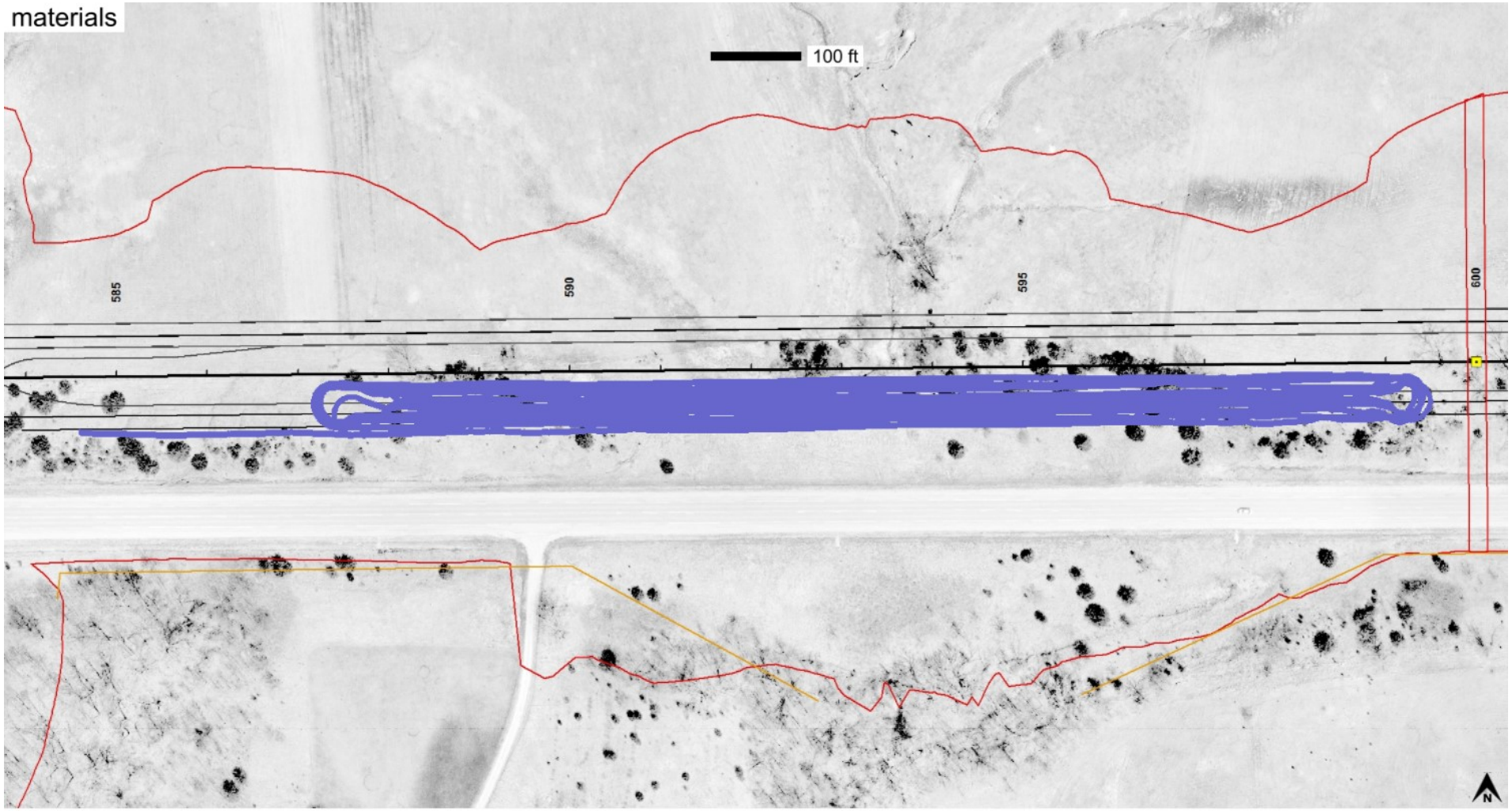
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_30_112616a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	69691	1.6	12	3000	150	40



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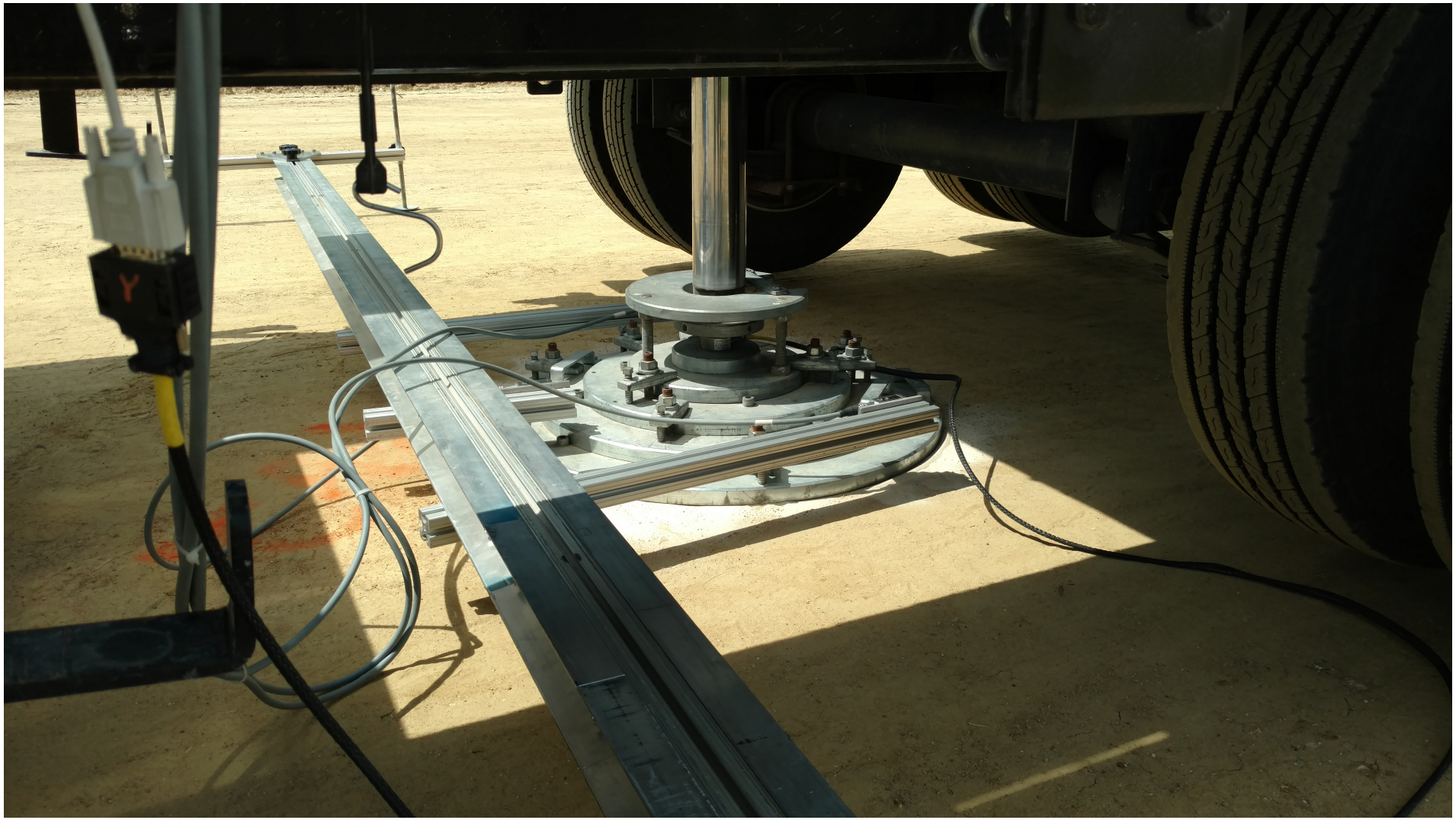
ingios GEOTECHNICS

Map ID: iadot_86-us30_cs56-fcs00210_2020_06_30_112616a

IMG_20200630_111613365.jpg



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

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US30 Tama County	Mapping Duration (hrs):	0.7	Operator:	Ingios Geotechnics inc
Map ID:	iadot_86-us30_cs56-fcs00210_2020_07_07_090829a	No. of Measurements:	68736	Machine ID:	Ingios_FCS00210
Date and Time:	7/7/2020 9:08:29 AM	Location:	Tama County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	Yes	98.5	115.89	1.15	8554	6977.55	14598.6	30386.84	3666.58	25.12	-1576.45	6044.6	21832.84
k-value	Yes	3.5	17.6	0.18	150	60	90.3	160	28.75	31.85	-90	-59.7	10
Moisture Content	No												

Mapped Area

square feet	acres
68736	1.58

Pass Count

min.	avg.	max.
1	1.38	5

Elevation (ft)

min.	avg.	max.
0	0	0

Velocity (fps)

min.	avg.	max.
0.3	5.49	7.56

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	68736	1.578	12	8554	150	40

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E-Compaction Report

Project:	US30 Tama County	Mapping Duration (hrs):	0.7	Operator:	Ingios Geotechnics inc
Map ID:	iadot_86-us30_cs56-fcs00210_2020_07_07_090829a	No. of Measurements:	68736	Machine ID:	Ingios_FCS00210
Date and Time:	7/7/2020 9:08:29 AM	Location:	Tama County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
115.89	CQI > = 95
98.5	80% of Resilient Modulus MVs >= 8554
25.12	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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E-Compaction Report

Project:	US30 Tama County	Mapping Duration (hrs):	0.7	Operator:	Ingios Geotechnics inc
Map ID:	iadot_86-us30_cs56-fcs00210_2020_07_07_090829a	No. of Measurements:	68736	Machine ID:	Ingios_FCS00210
Date and Time:	7/7/2020 9:08:29 AM	Location:	Tama County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
17.6	CQI > = 95
3.5	80% of k-Value MVs >= 150
31.85	COV <= 20
99.7	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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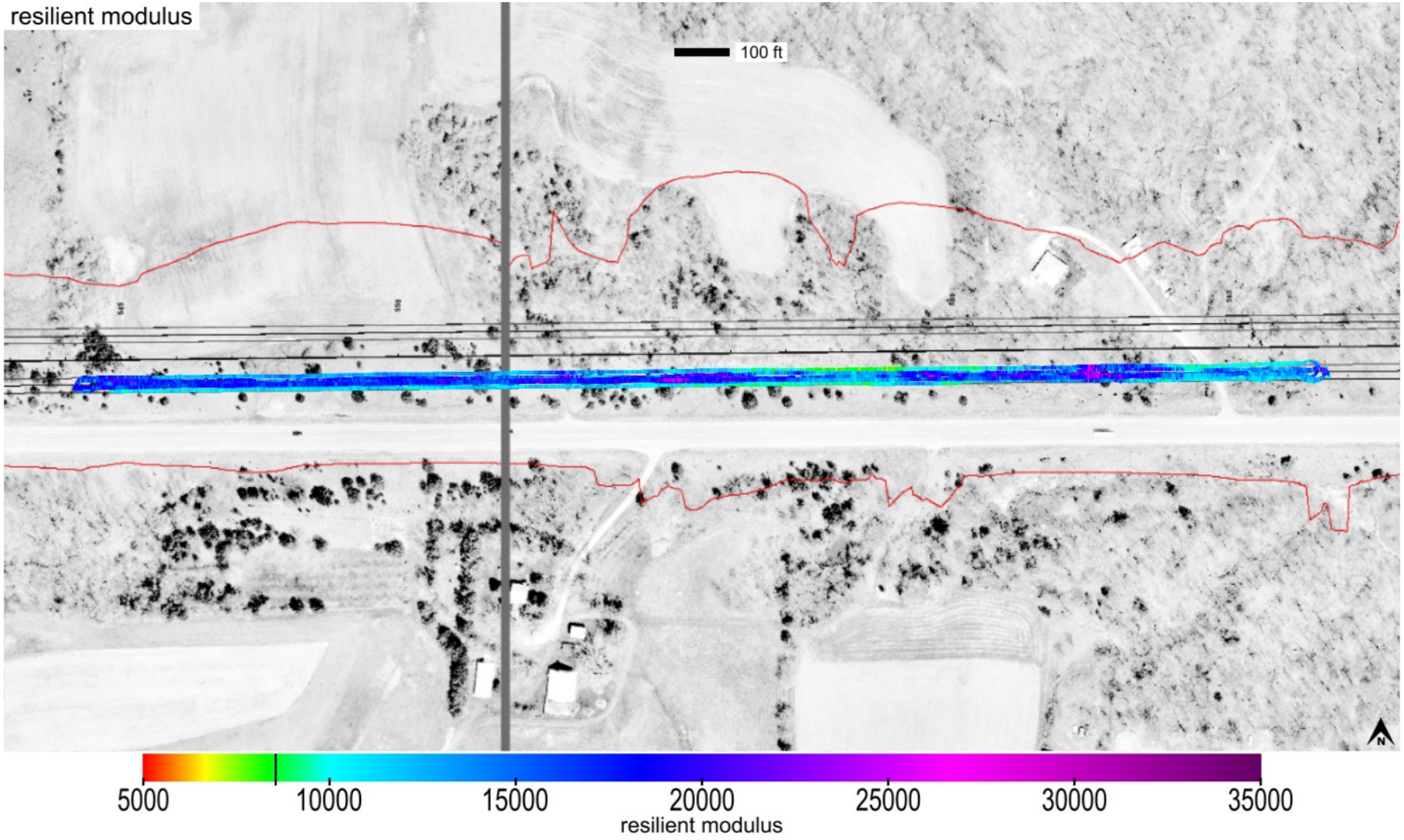
Map ID: iadot_86-us30_cs56-fcs00210_2020_07_07_090829a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	98.5	115.89	1.15	8554	6977.55	14598.6	30386.84	3666.58	25.12	-1576.45	6044.6	21832.84



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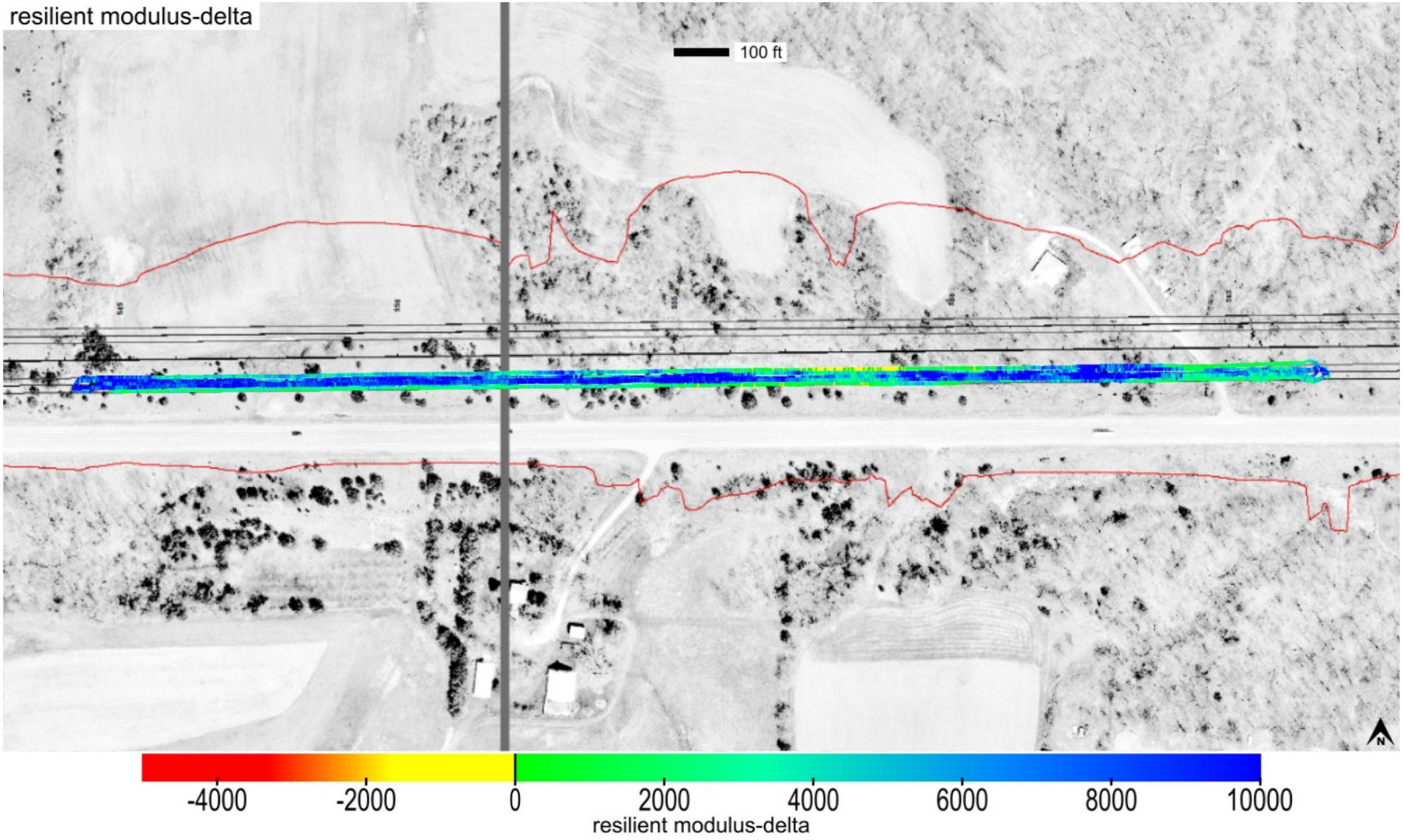
Map ID: iadot_86-us30_cs56-fcs00210_2020_07_07_090829a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	98.5	115.89	1.15	8554	6977.55	14598.6	30386.84	3666.58	25.12	-1576.45	6044.6	21832.84



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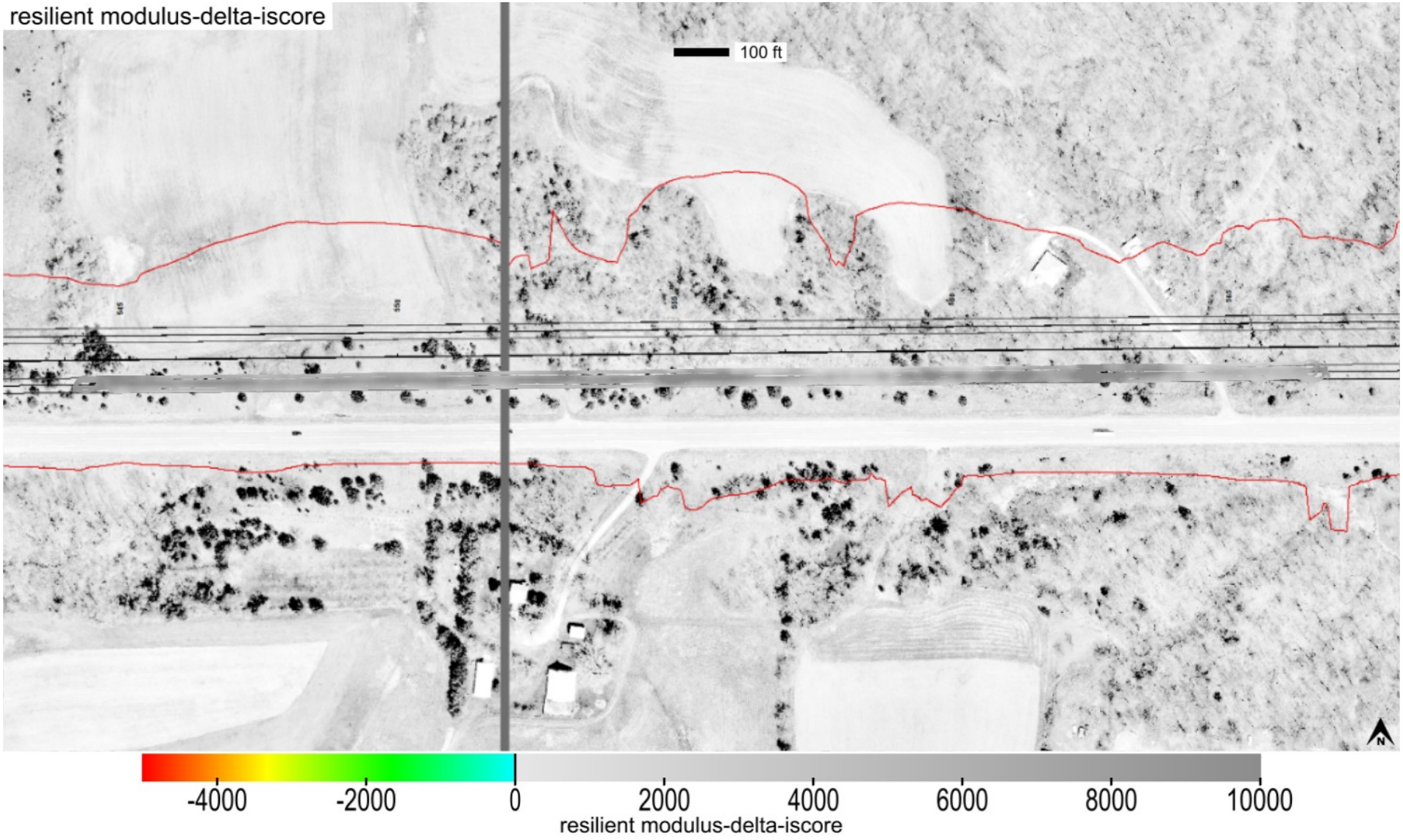
Map ID: iadot_86-us30_cs56-fcs00210_2020_07_07_090829a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	98.5	8554	-1576.45	6044.6	21832.84	14.86	6229.75	15476.65



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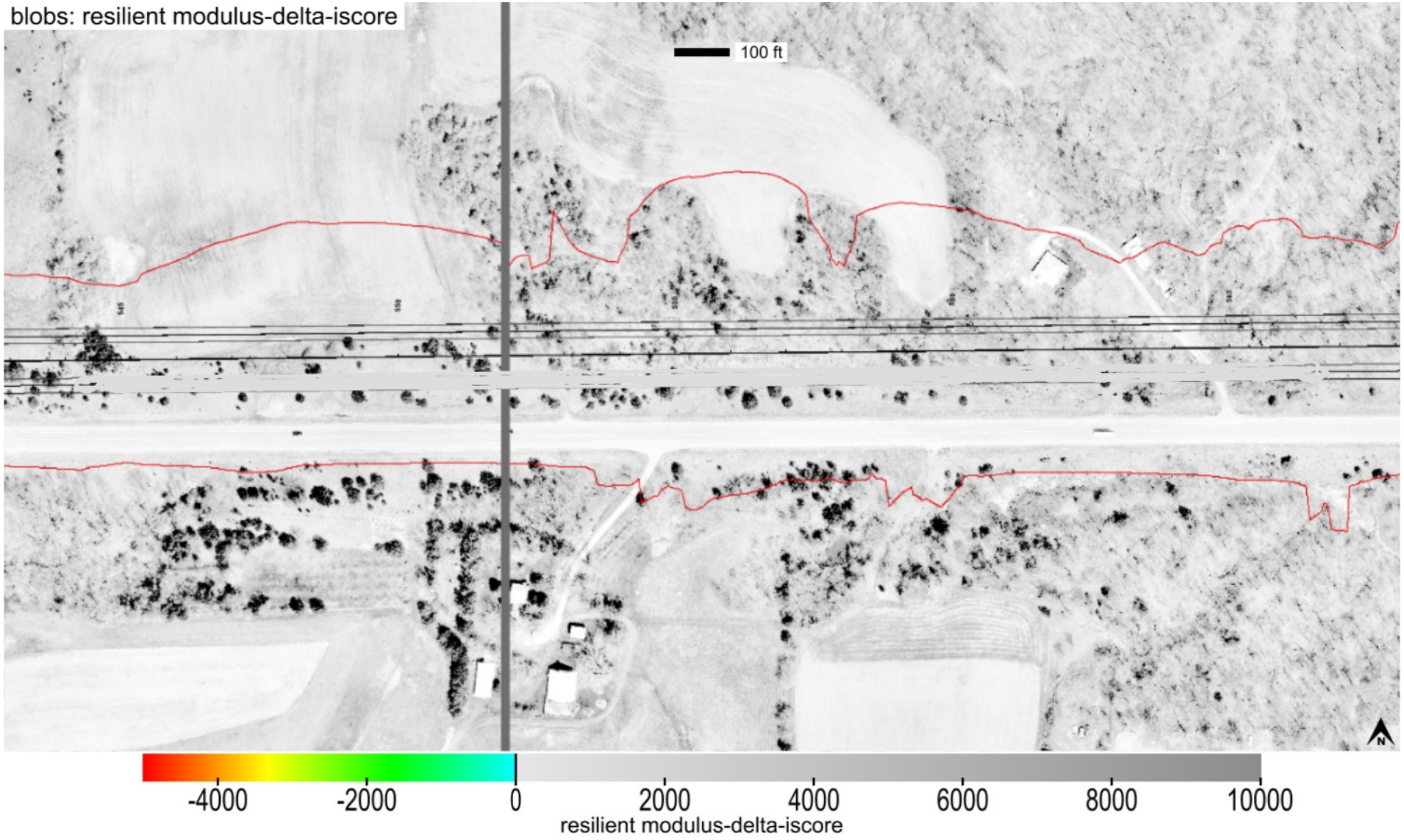
Map ID: iadot_86-us30_cs56-fcs00210_2020_07_07_090829a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0



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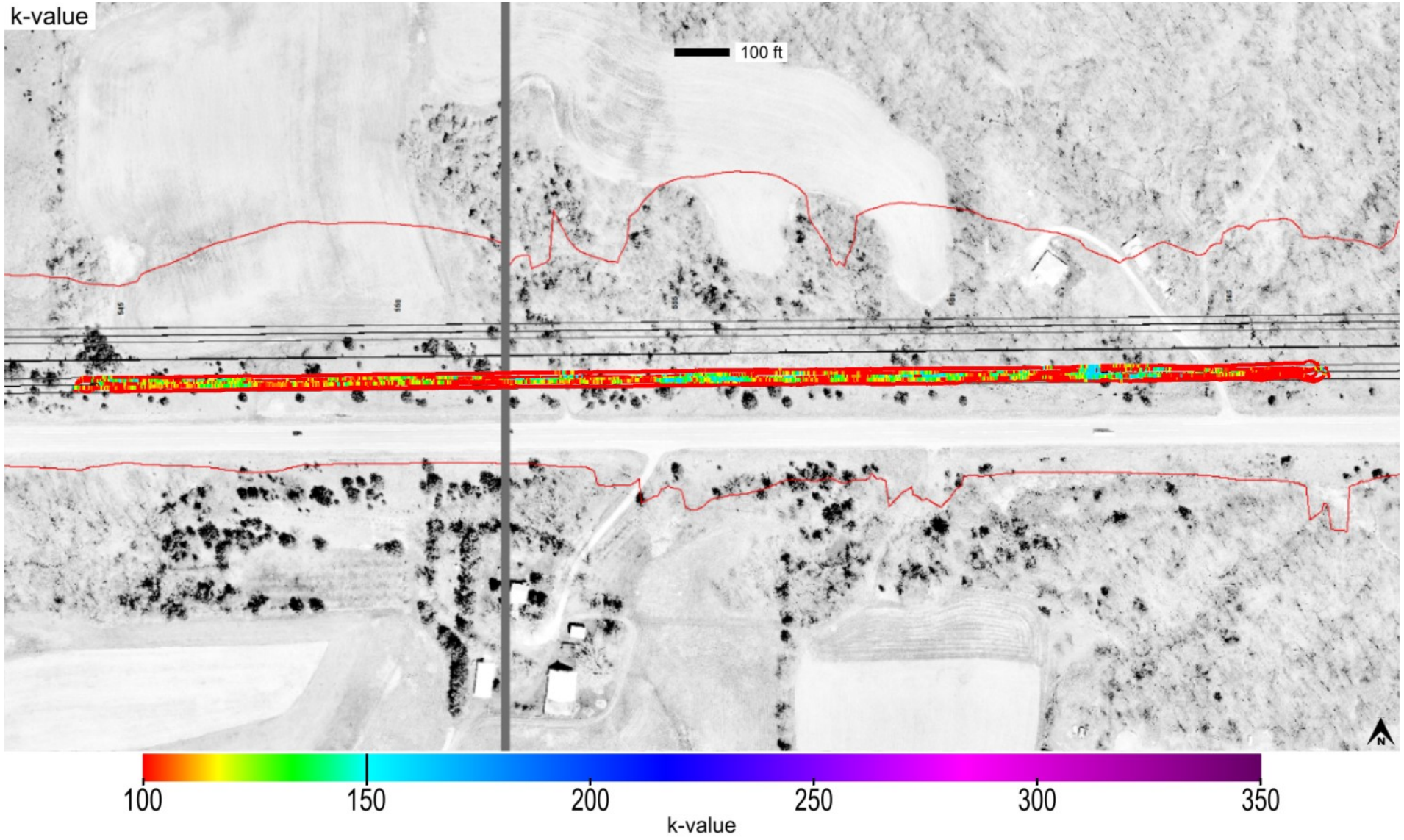
Map ID: iadot_86-us30_cs56-fcs00210_2020_07_07_090829a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	3.5	17.6	0.18	150	60	90.3	160	28.75	31.85	-90	-59.7	10



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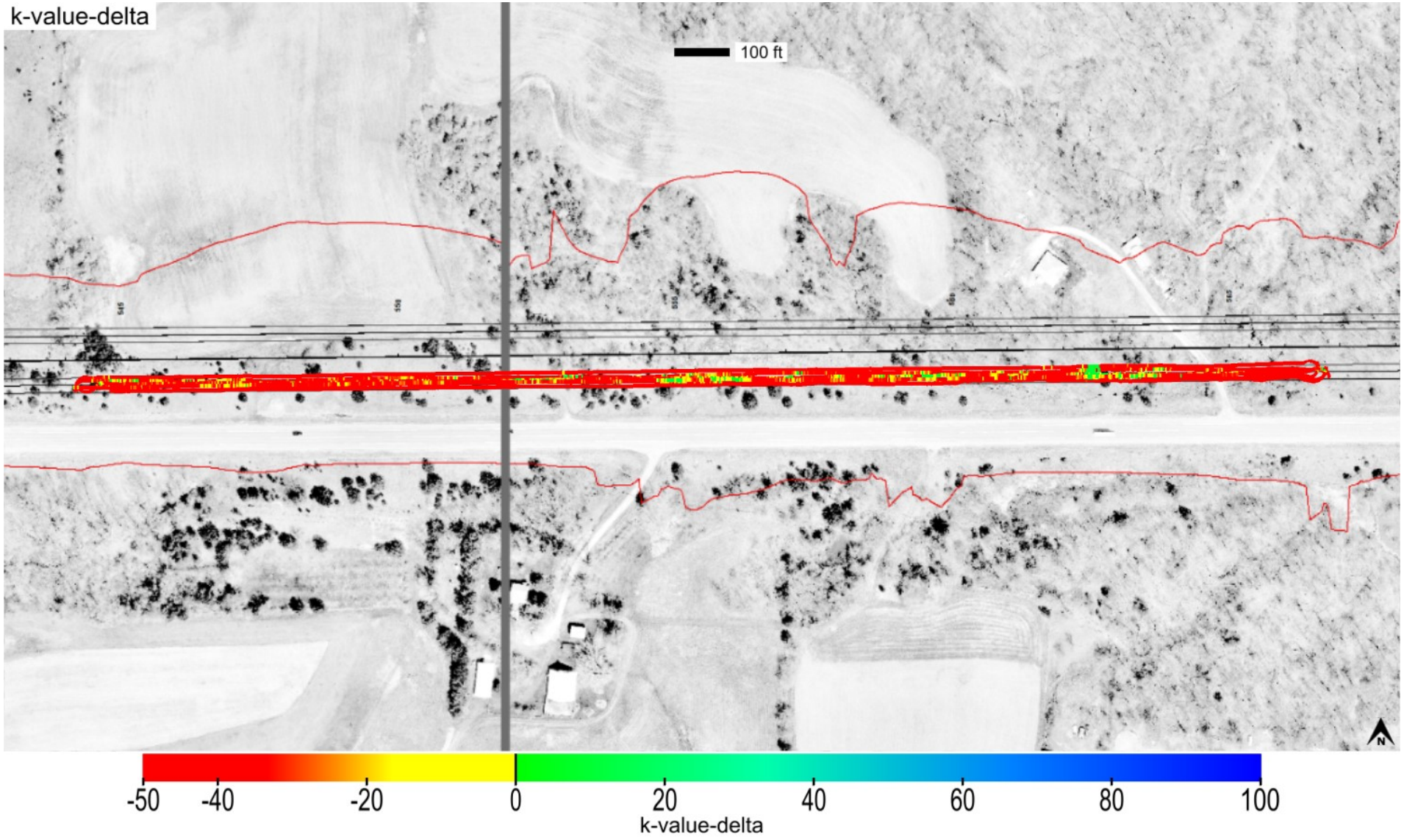
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	3.5	17.6	0.18	150	60	90.3	160	28.75	31.85	-90	-59.7	10



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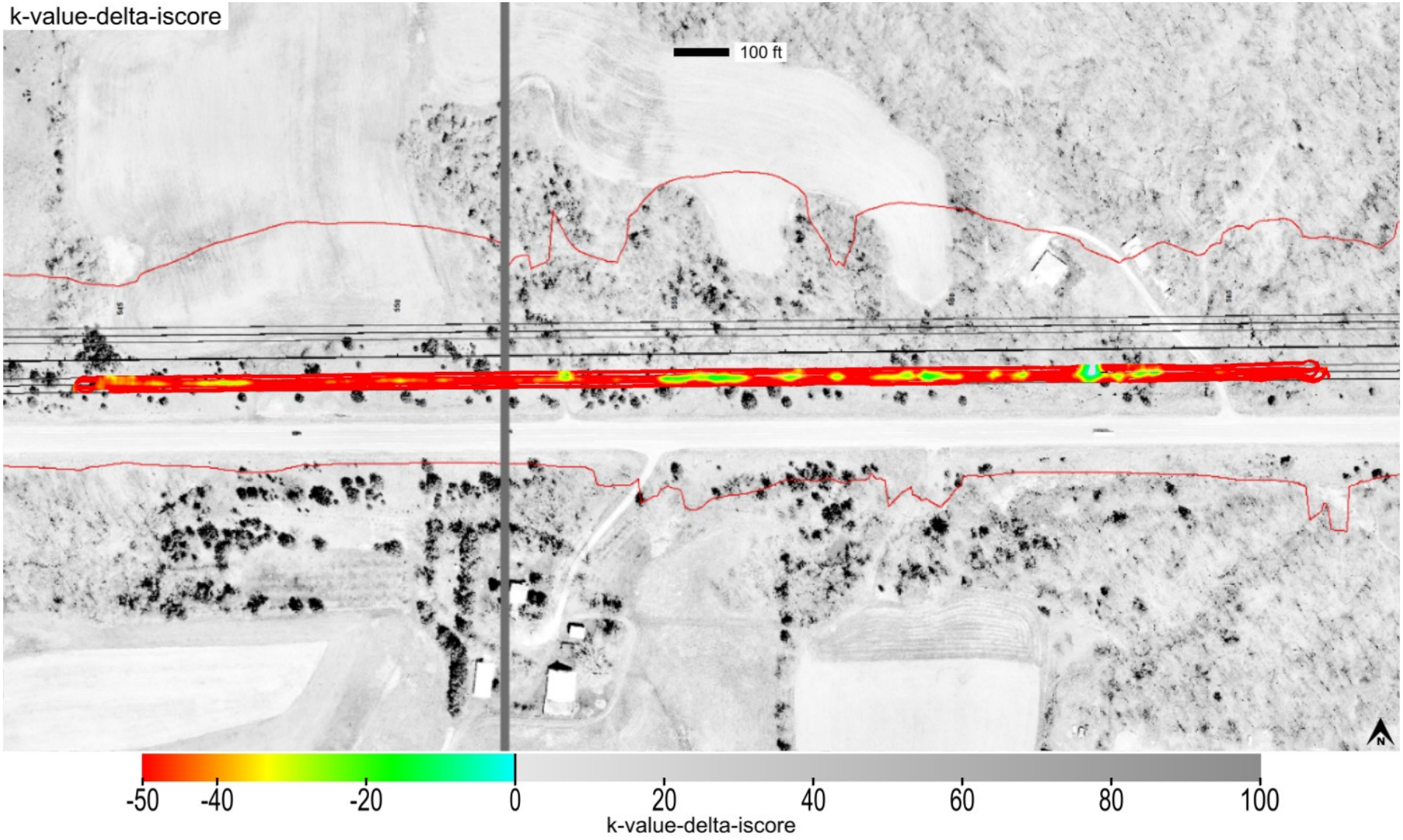
Map ID: iadot_86-us30_cs56-fcs00210_2020_07_07_090829a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	3.5	150	-90	-59.7	10	-90	-58.27	6.56



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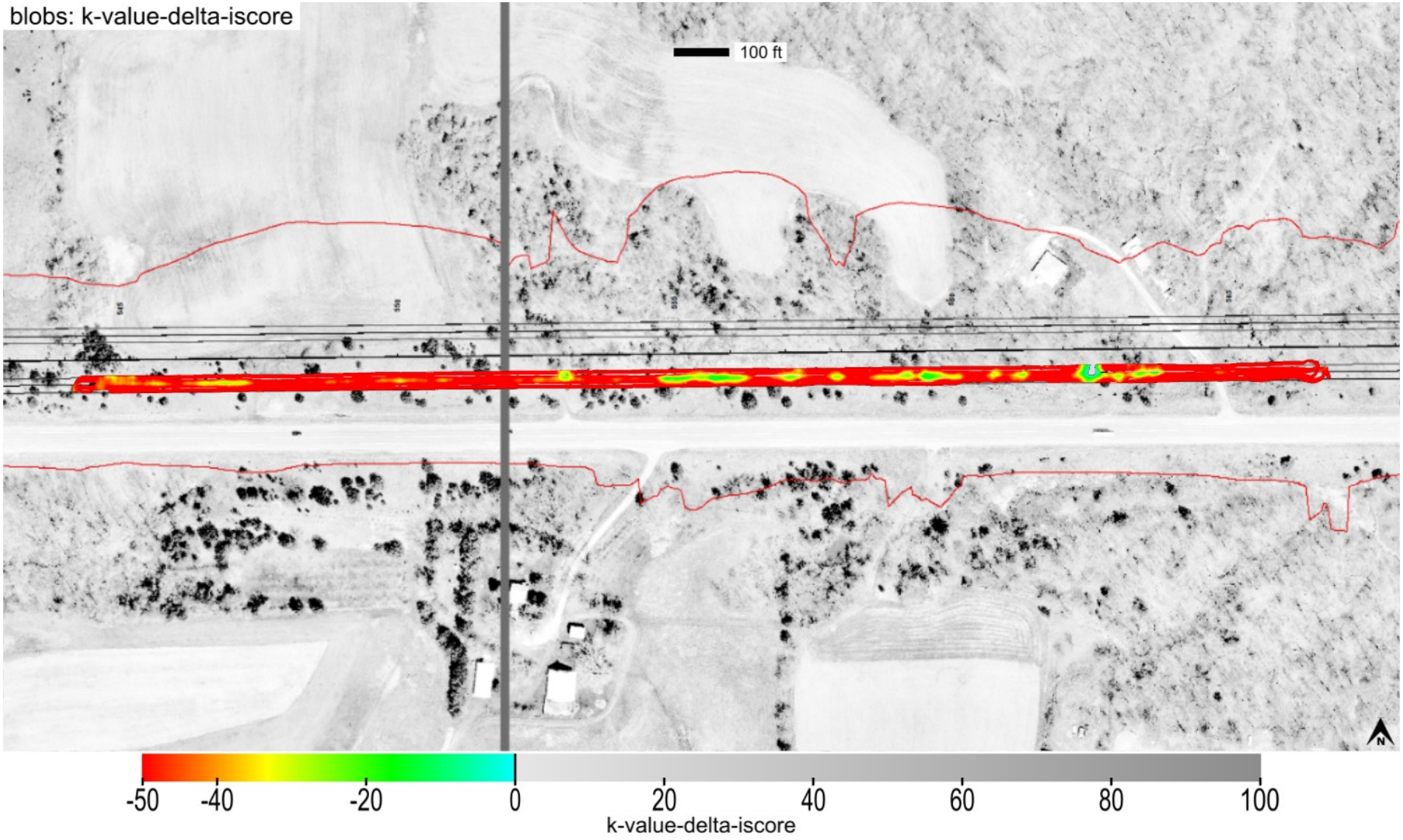
Map ID: iadot_86-us30_cs56-fcs00210_2020_07_07_090829a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	68527	99.7	none	0



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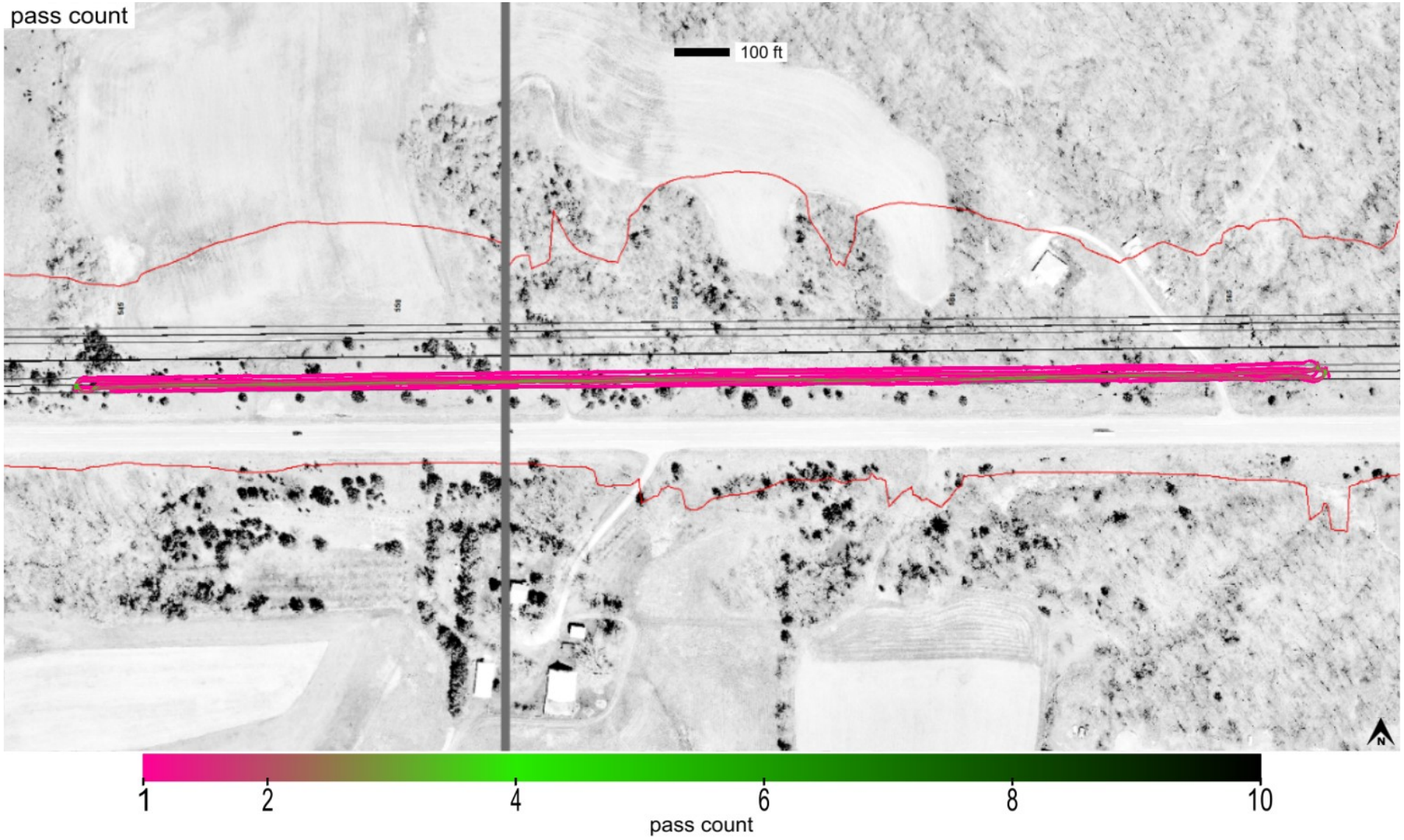
Map ID: iadot_86-us30_cs56-fcs00210_2020_07_07_090829a

minimum	average	maximum
1	1.38	5



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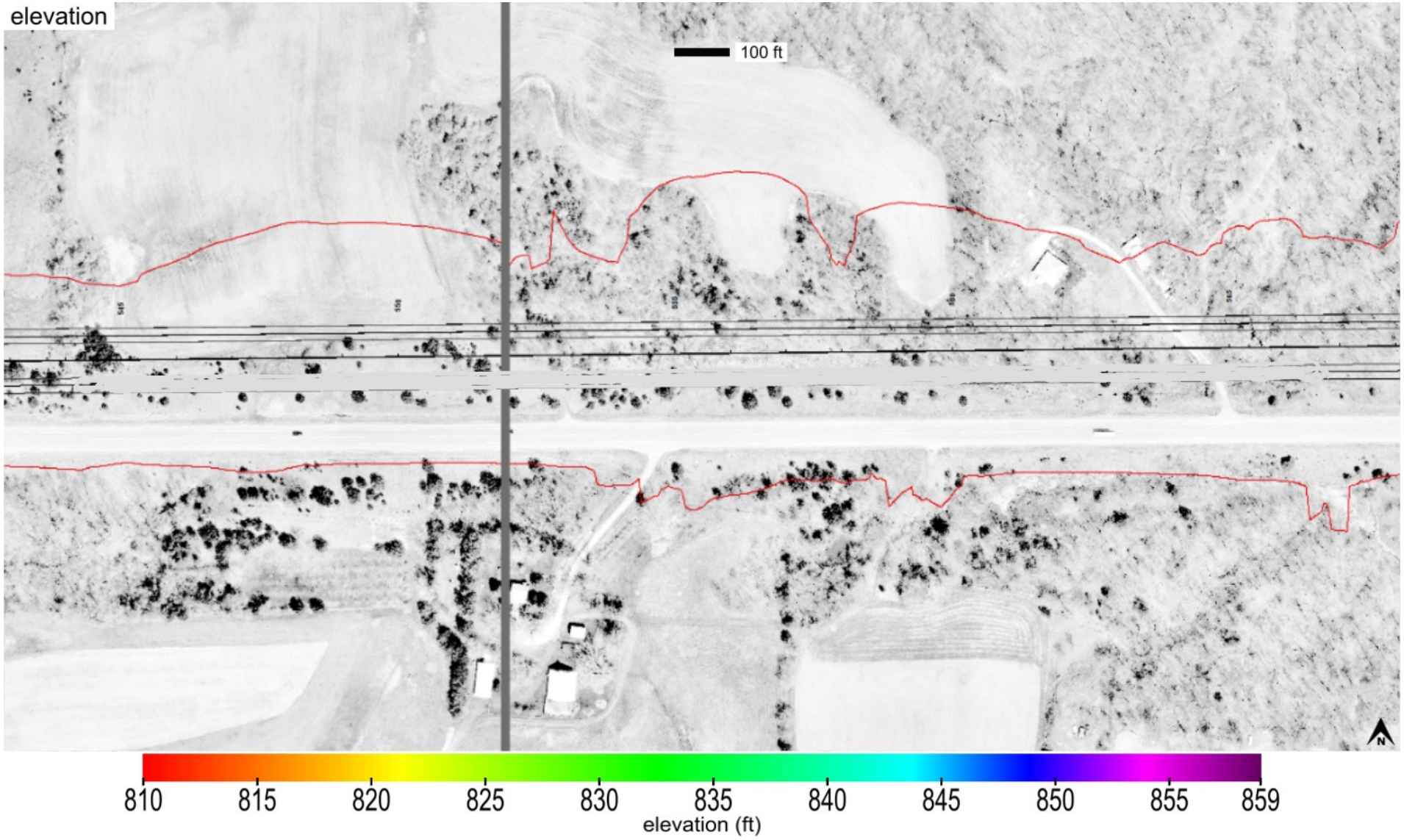
Map ID: iadot_86-us30_cs56-fcs00210_2020_07_07_090829a

minimum	average	maximum
0	0	0



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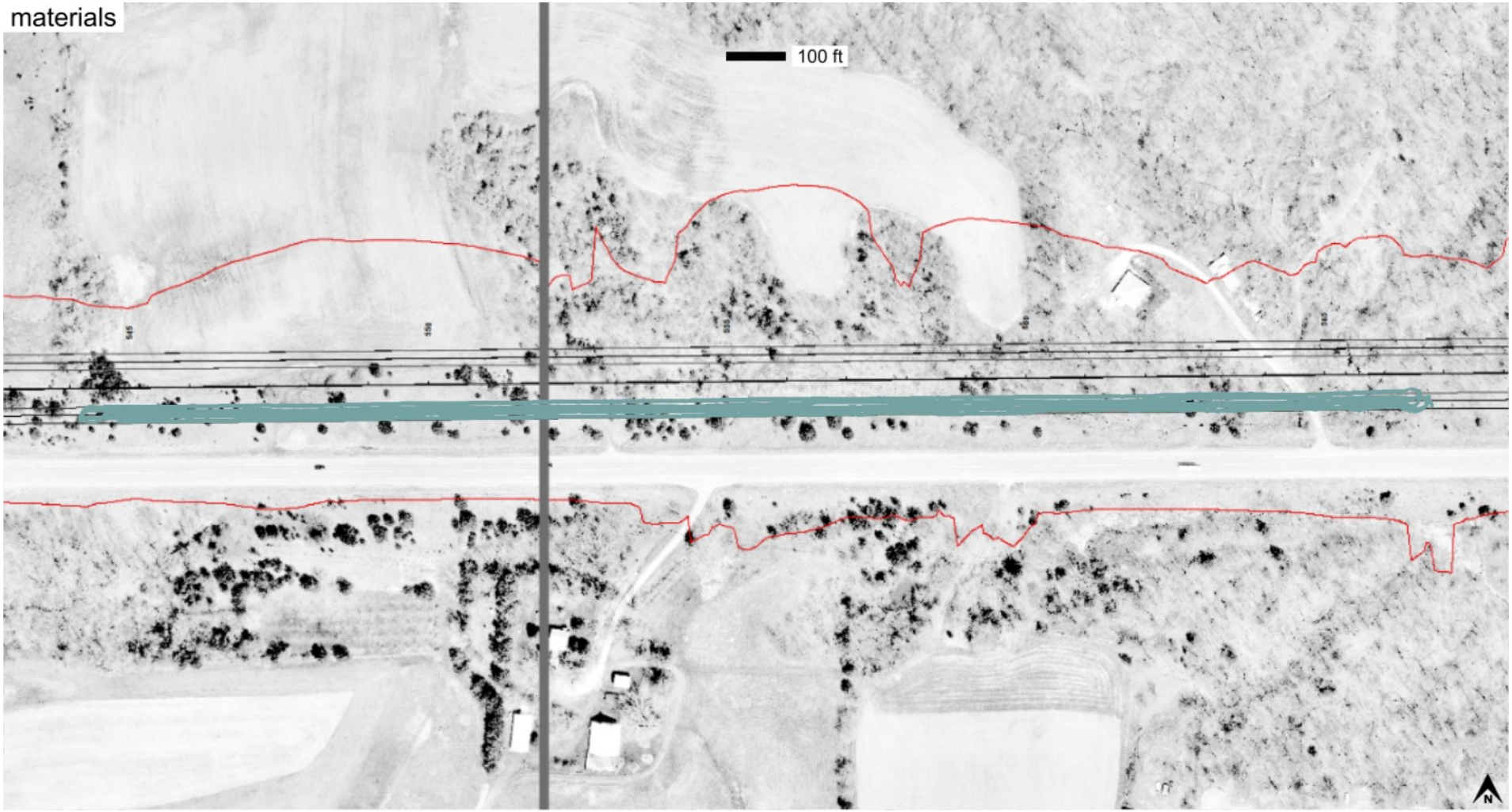
Map ID: iadot_86-us30_cs56-fcs00210_2020_07_07_090829a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	68736	1.578	12	8554	150	40



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Map ID: iadot_86-us30_cs56-fcs00210_2020_07_07_090829a

20200707_135656.jpg

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Map ID: iadot_86-us30_cs56-fcs00210_2020_07_07_090829a

IMG_20200709_111601077.jpg

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IOWADOT

E-Compaction Report

Project:	US30 Tama County	Mapping Duration (hrs):	1.89	Operator:	Ingios Geotechnics inc
Map ID:	iadot_86-us30_cs56-fcs00210_2020_07_08_065115a	No. of Measurements:	38396	Machine ID:	Ingios_FCS00210
Date and Time:	7/8/2020 6:51:15 AM	Location:	Tama County	State Plane:	1401 IOWA NORTH

Review Status: Review Required

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	Yes	99.8	122.5	1.92	8554	7302.16	12275.5	21327.77	1786.03	14.55	-1251.84	3721.5	12773.77
k-value	Yes	0.6	17.71	0.03	150	60	76.7	160	19.83	25.86	-90	-73.3	10
Moisture Content	No												

Mapped Area

square feet	acres
38396	0.88

Pass Count

min.	avg.	max.
1	6.16	17

Elevation (ft)

min.	avg.	max.
0	0	0

Velocity (fps)

min.	avg.	max.
0.25	5.46	6.72

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	38396	0.881	12	8554	150	40

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IOWADOT

E-Compaction Report

Project:	US30 Tama County	Mapping Duration (hrs):	1.89	Operator:	Ingios Geotechnics inc
Map ID:	iadot_86-us30_cs56-fcs00210_2020_07_08_065115a	No. of Measurements:	38396	Machine ID:	Ingios_FCS00210
Date and Time:	7/8/2020 6:51:15 AM	Location:	Tama County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
122.5	CQI > = 95
99.8	80% of Resilient Modulus MVs >= 8554
14.55	COV <= 20
0	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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IOWADOT

E-Compaction Report

Project:	US30 Tama County	Mapping Duration (hrs):	1.89	Operator:	Ingios Geotechnics inc
Map ID:	iadot_86-us30_cs56-fcs00210_2020_07_08_065115a	No. of Measurements:	38396	Machine ID:	Ingios_FCS00210
Date and Time:	7/8/2020 6:51:15 AM	Location:	Tama County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
17.71	CQI > = 95
0.6	80% of k-Value MVs >= 150
25.86	COV <= 20
100	% i-Score Blob Area >= 200 ft^2
	80% of w% >= w% tv

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 for the selected material.The default target % _Passing TV 80%.

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

i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = Moderate rework needed; > 30% = Signficant rework needed.

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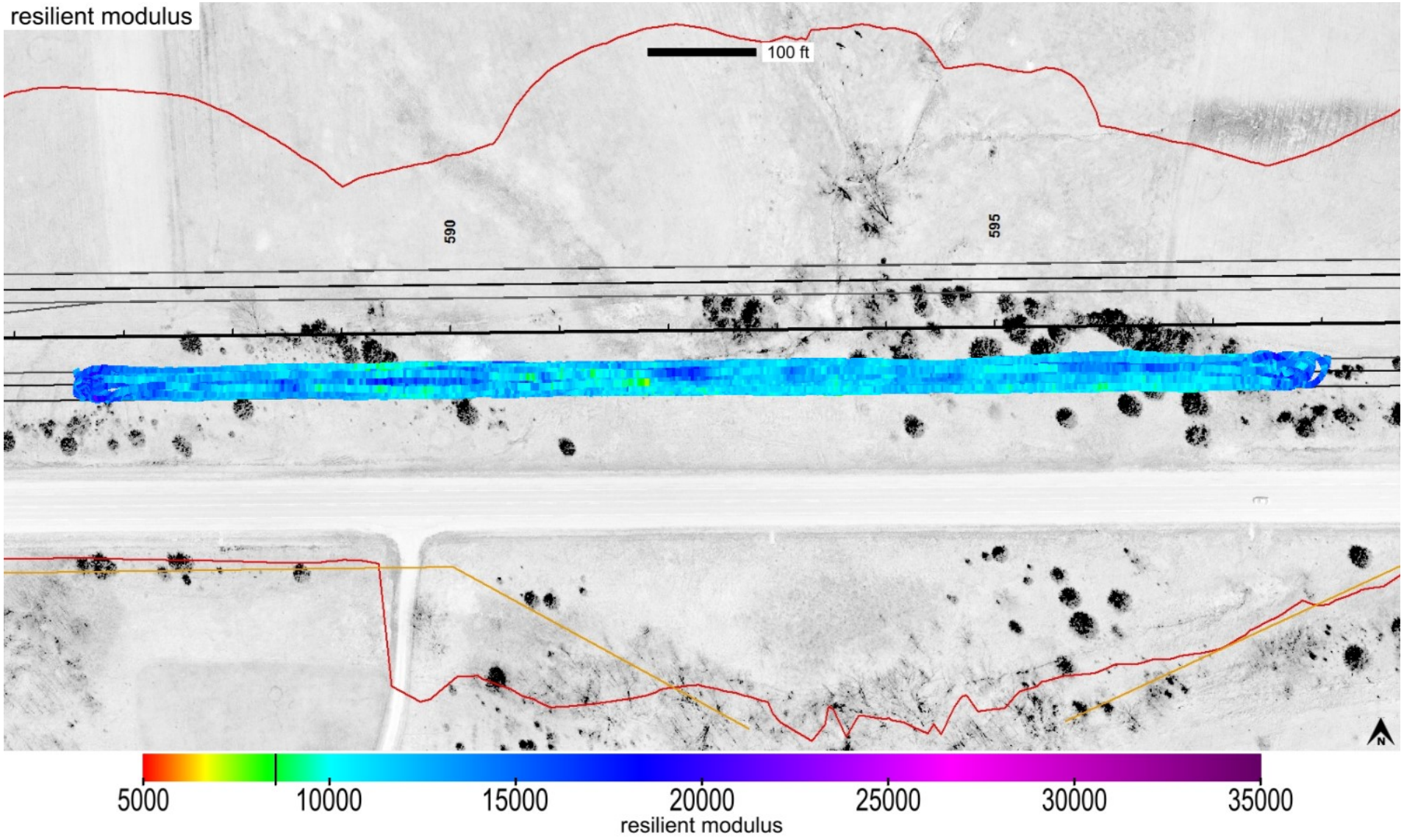
Map ID: iadot_86-us30_cs56-fcs00210_2020_07_08_065115a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.8	122.5	1.92	8554	7302.16	12275.5	21327.77	1786.03	14.55	-1251.84	3721.5	12773.77



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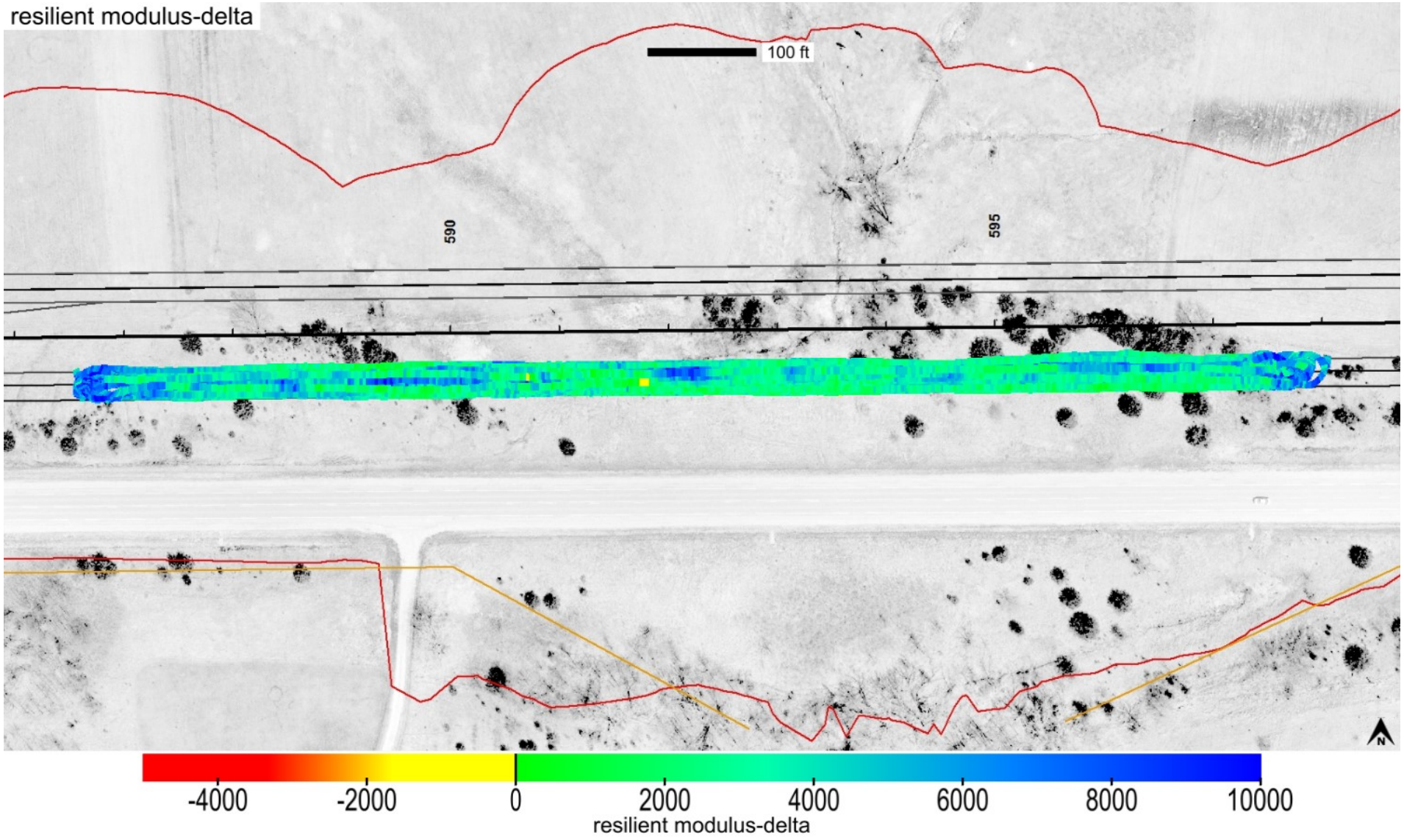
Map ID: iadot_86-us30_cs56-fcs00210_2020_07_08_065115a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.8	122.5	1.92	8554	7302.16	12275.5	21327.77	1786.03	14.55	-1251.84	3721.5	12773.77



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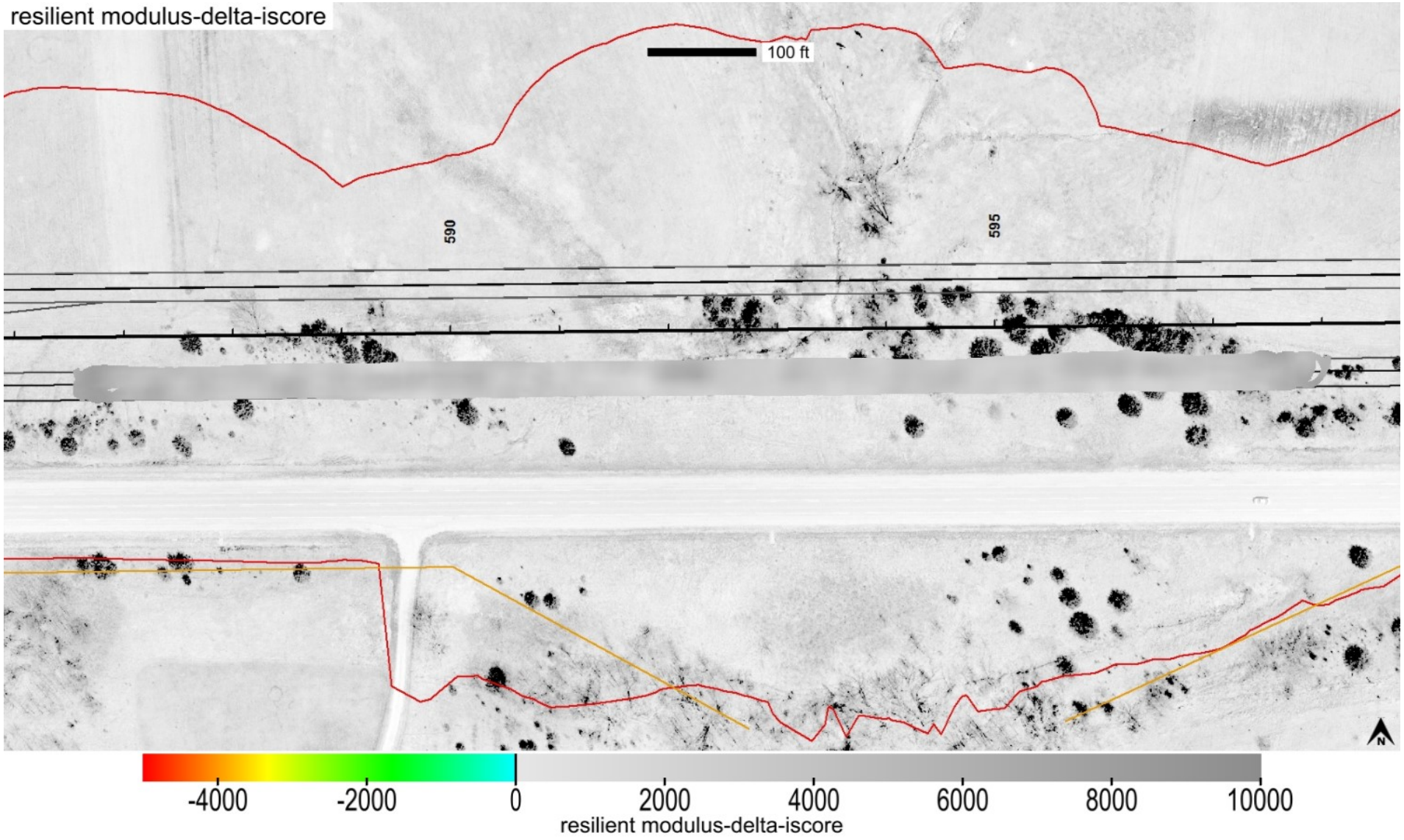
Map ID: iadot_86-us30_cs56-fcs00210_2020_07_08_065115a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	99.8	8554	-1251.84	3721.5	12773.77	1207.36	3732.66	8337.17



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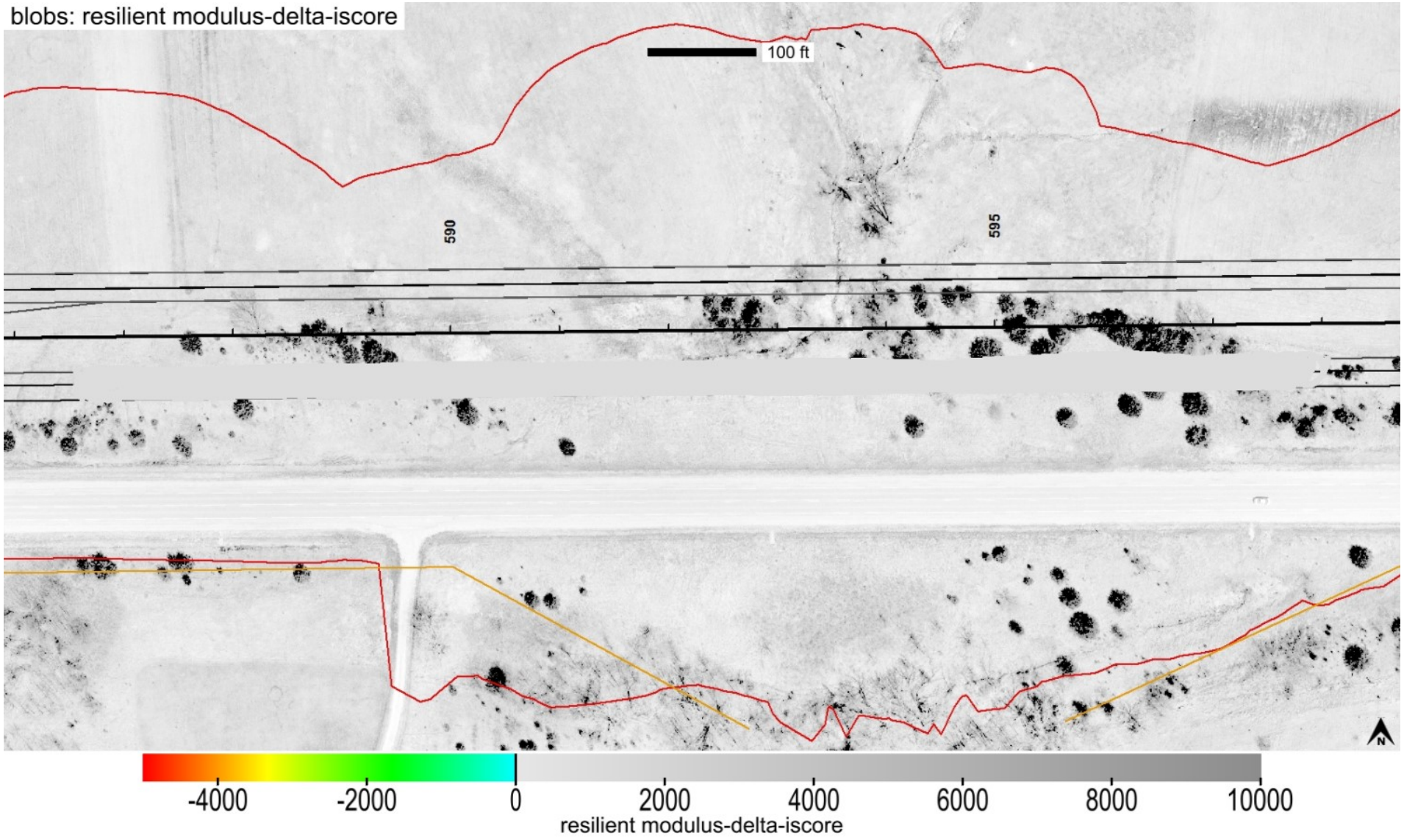
Map ID: iadot_86-us30_cs56-fcs00210_2020_07_08_065115a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0



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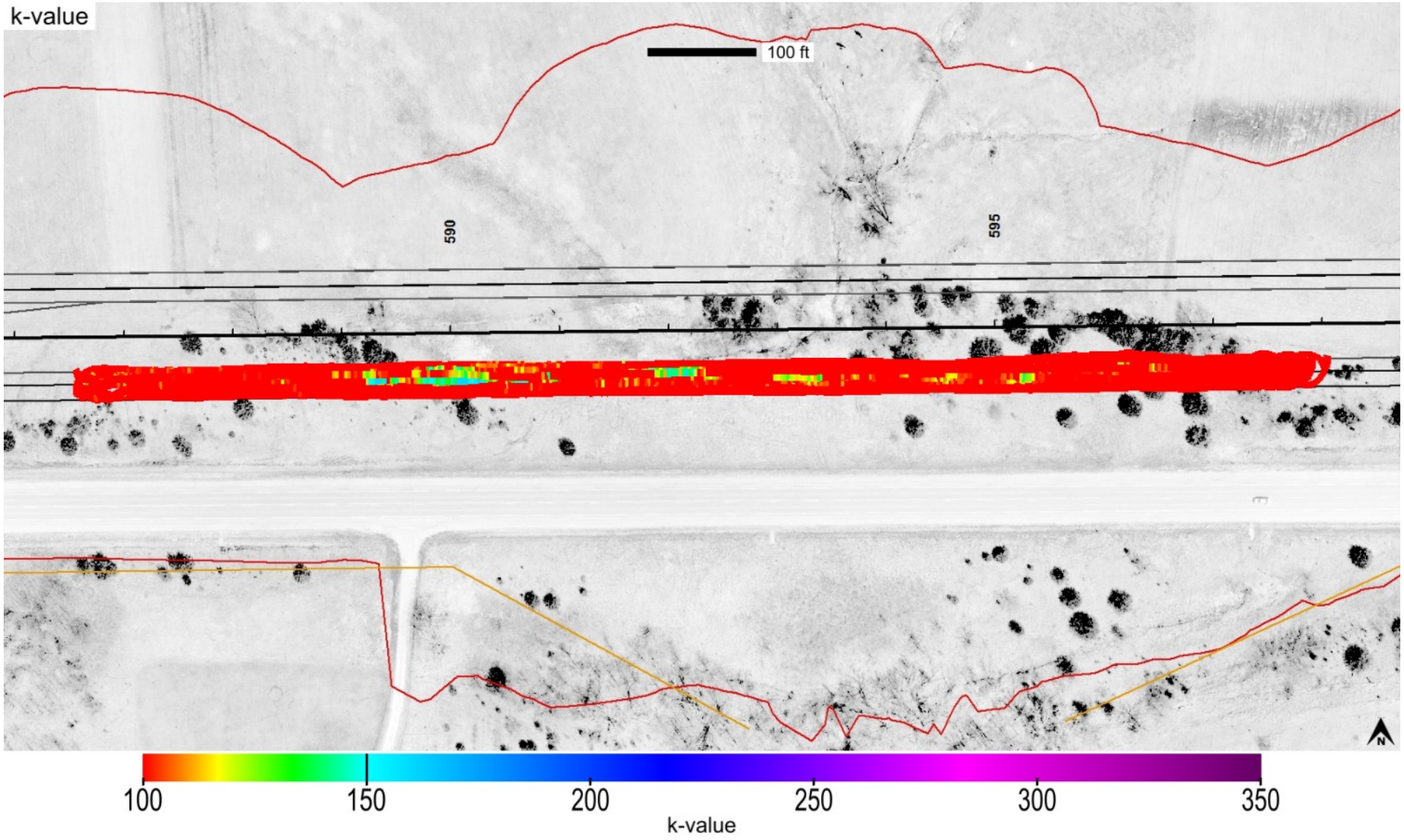
Map ID: iadot_86-us30_cs56-fcs00210_2020_07_08_065115a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.6	17.71	0.03	150	60	76.7	160	19.83	25.86	-90	-73.3	10



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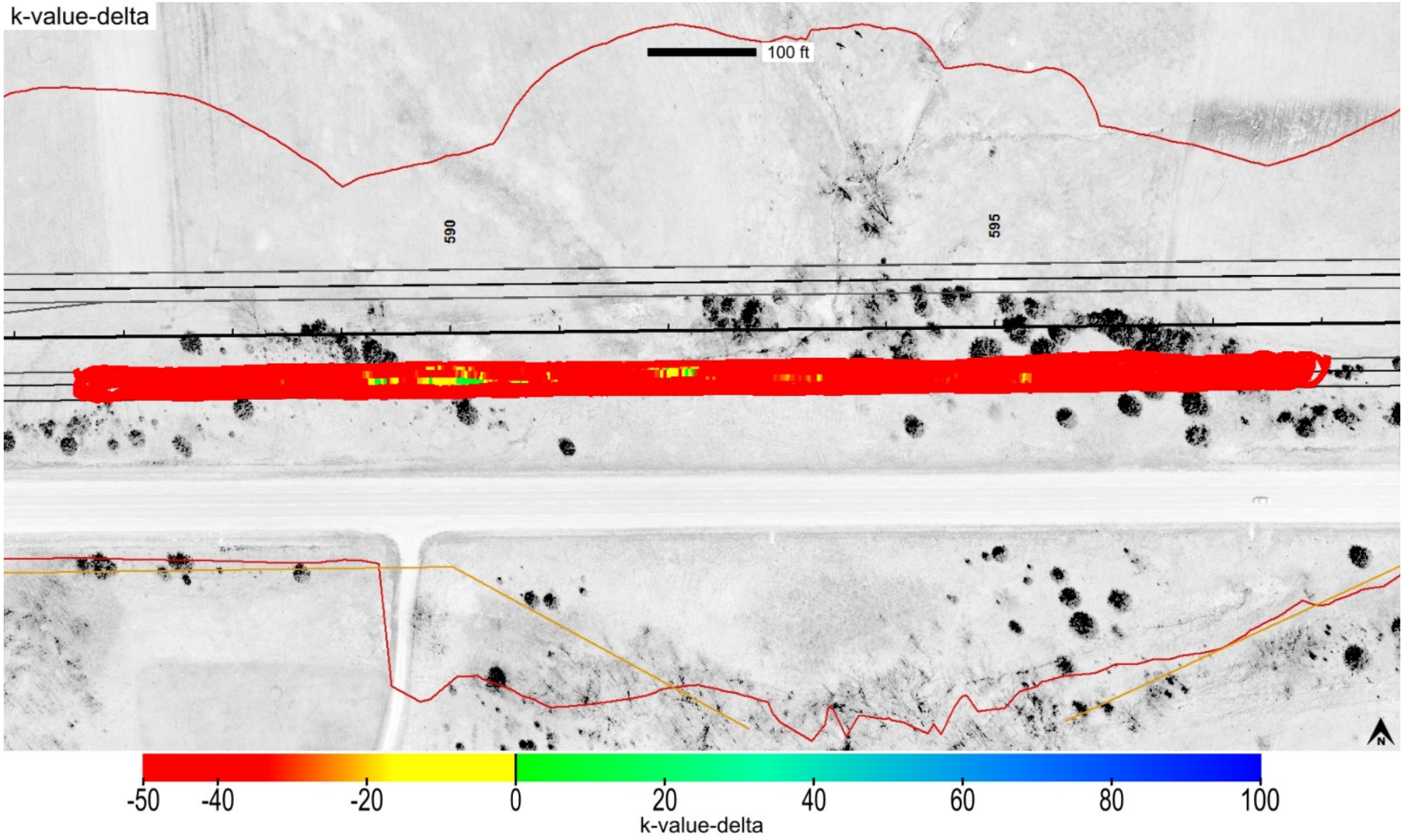
Map ID: iadot_86-us30_cs56-fcs00210_2020_07_08_065115a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.6	17.71	0.03	150	60	76.7	160	19.83	25.86	-90	-73.3	10



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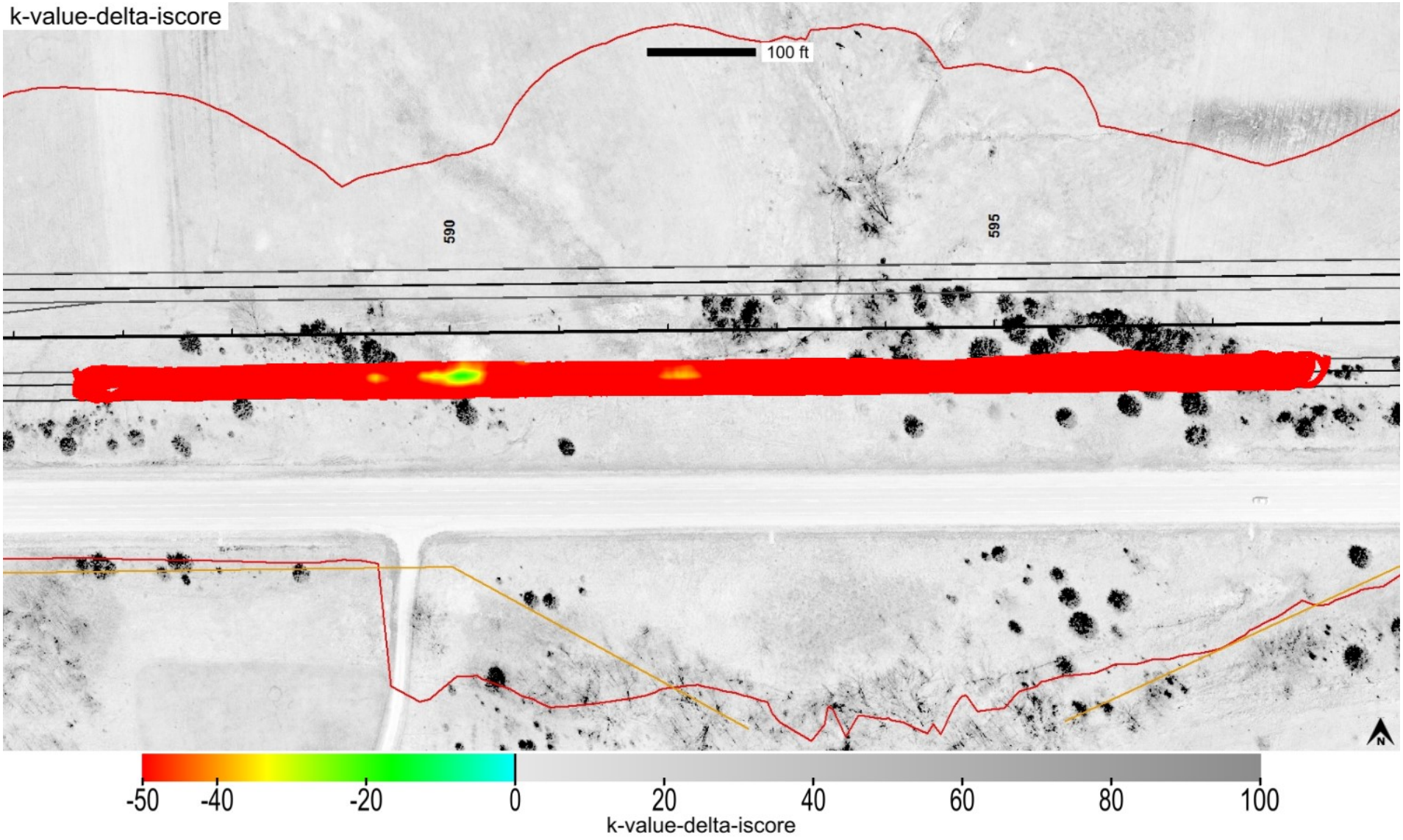
Map ID: iadot_86-us30_cs56-fcs00210_2020_07_08_065115a

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	-90	-73.3	10	-90	-72.99	-18.2



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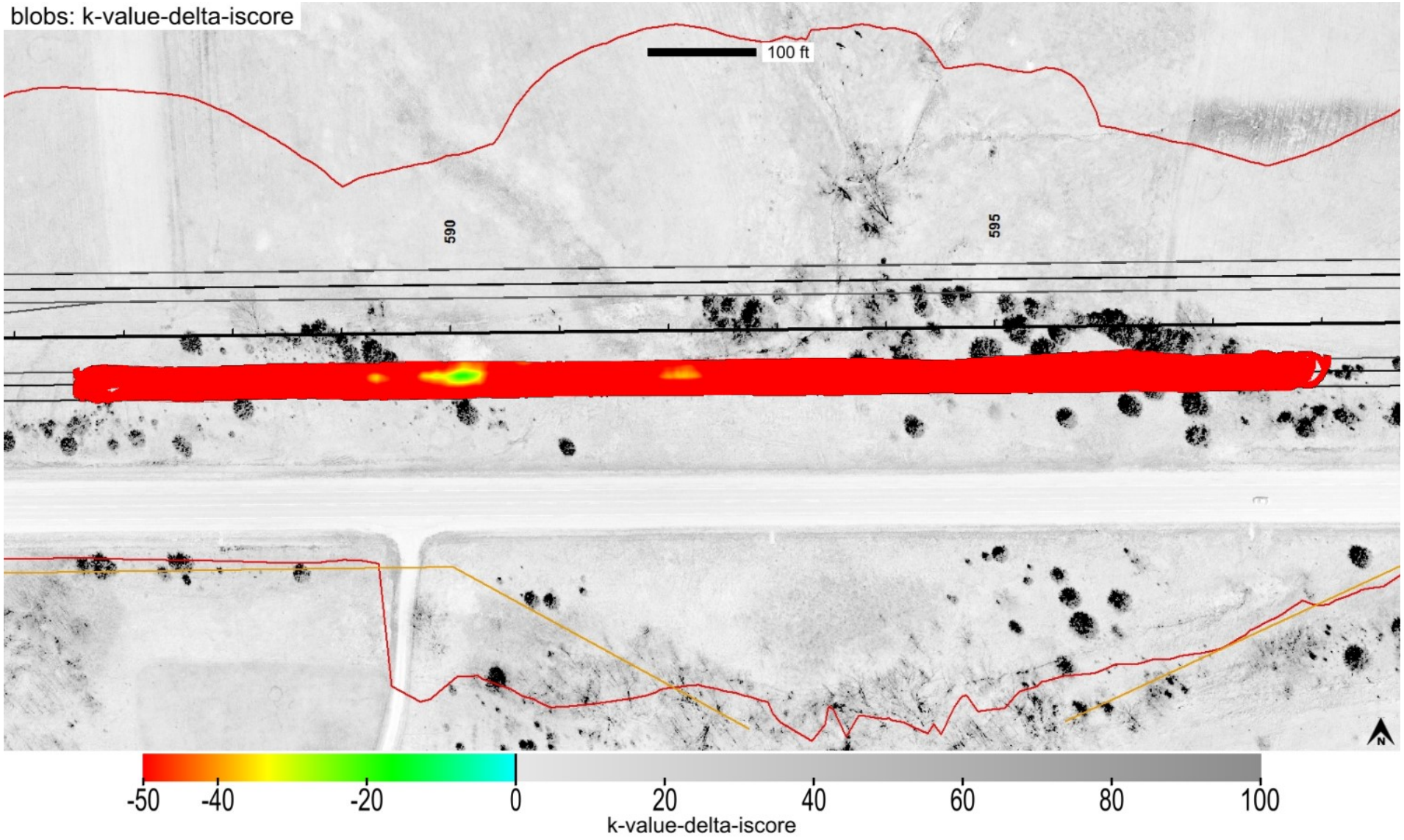
Map ID: iadot_86-us30_cs56-fcs00210_2020_07_08_065115a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	38396	100	none	0



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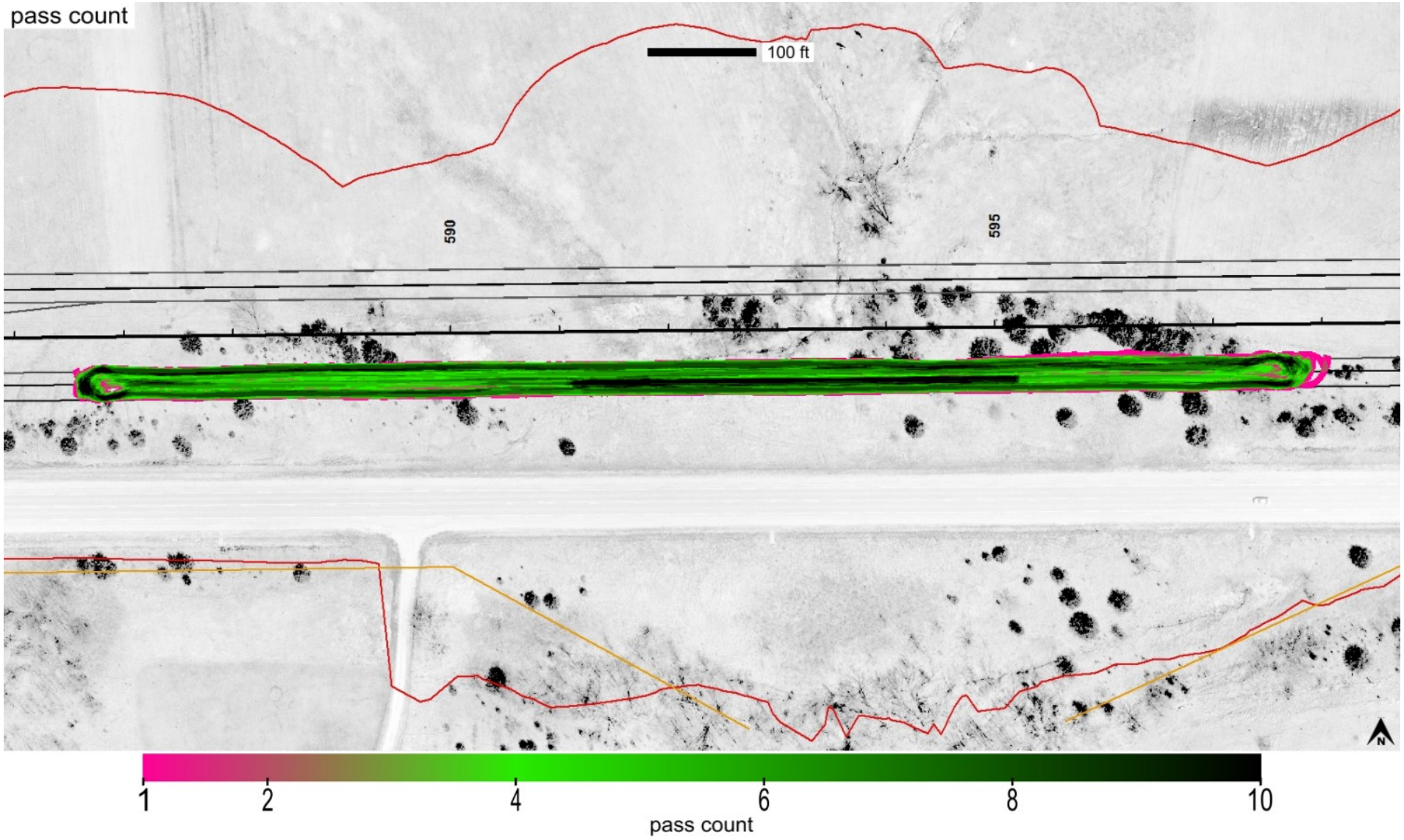
Map ID: iadot_86-us30_cs56-fcs00210_2020_07_08_065115a

minimum	average	maximum
1	6.16	17



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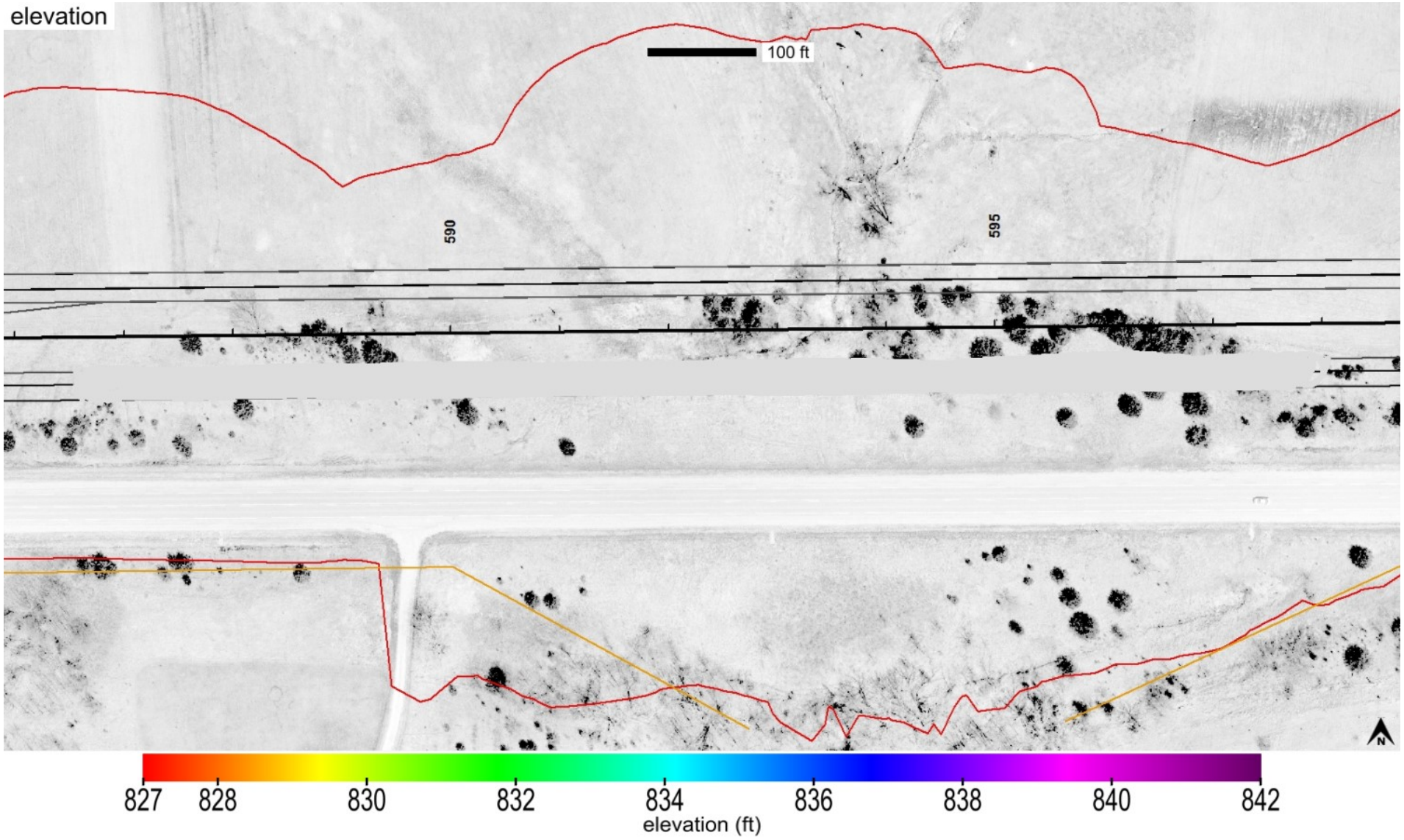
Map ID: iadot_86-us30_cs56-fcs00210_2020_07_08_065115a

minimum	average	maximum
0	0	0



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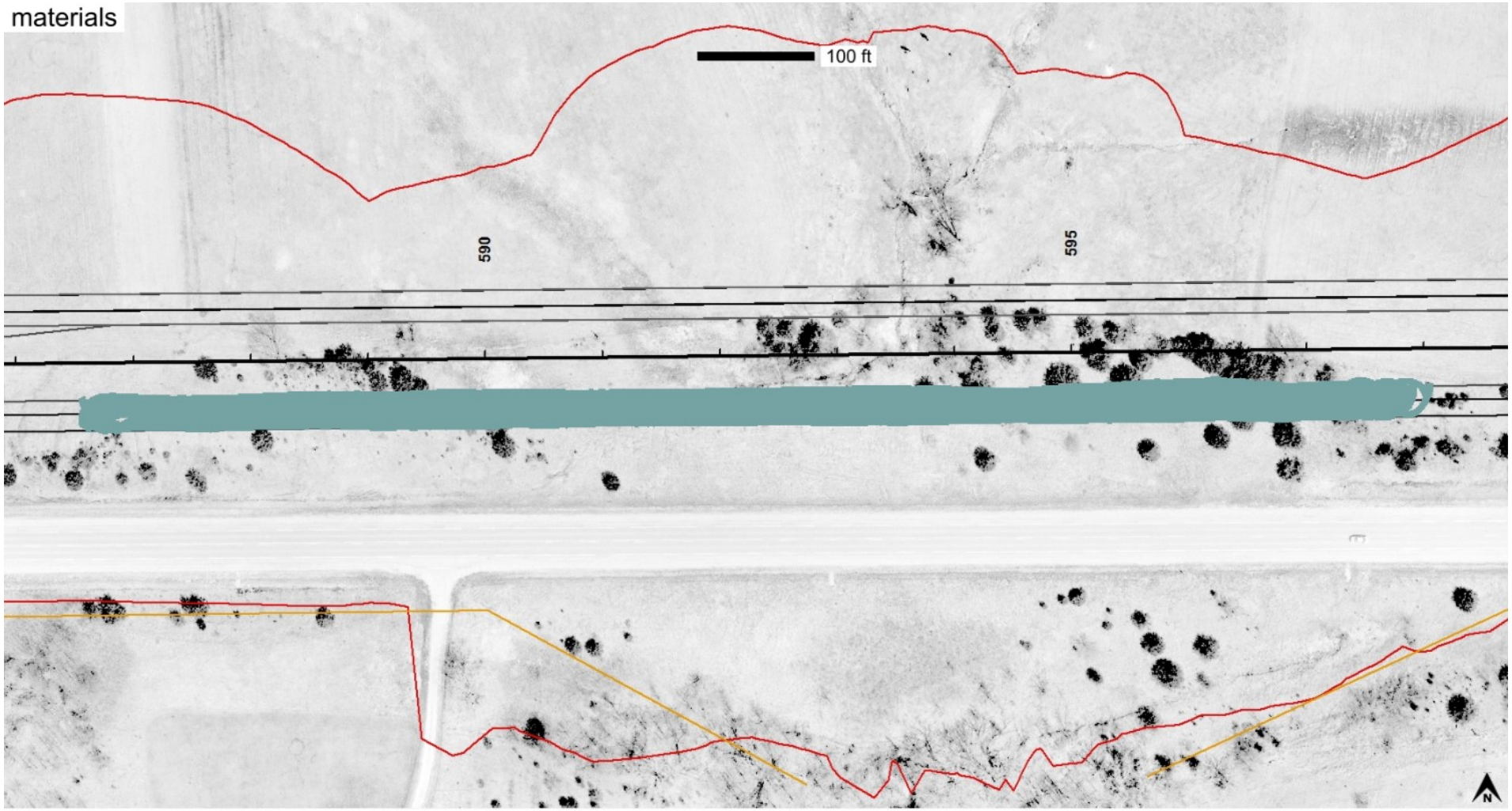
Map ID: iadot_86-us30_cs56-fcs00210_2020_07_08_065115a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	38396	0.881	12	8554	150	40



Granular Subbase_IADOT (2111)

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Map ID: iadot_86-us30_cs56-fcs00210_2020_07_08_065115a

20200708_094721.jpg

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