ST-008 Appendix IX-C1: e-Compaction Reports

IOWADOT

E-Compaction Report

Project:	160th Street	Mapping Duration (hrs):	0.1	Operator:	Ingios Geotechnics inc
Map ID:	iadot_01-160th_cs56-fcs00210_2019_09_13_102231a	No. of Measurements:	13506	Machine ID:	Ingios_FCS00210
Date and Time:	9/13/2019 10:22:31 AM	Location:	Adair County	State Plane:	7 IOWA Carroll-Atlantic

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	99.7	120.58	1.57	8554	8046.81	14273.4	23528.17	2599.98	18.22	-507.19	5719.4	14974.17
k-value	Yes	3.4	15.72	0.2	150	20	95.1	190	33.54	35.26	-130	-54.9	40
Moisture Content	No												

Mapped Area

square feet	acres
13506	0.31

Pass Count

min.	avg.	max.
1	1	1

Elevation (ft)

min.	avg.	max.
1247.76	1252.59	1260.81

Velocity (fps)

min.	avg.	max.
4.5	5.21	6.25

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	13506	0.31	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.

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IOWADOT

E-Compaction Report

Project:	160th Street	Mapping Duration (hrs):	0.1	Operator:	Ingios Geotechnics inc
Map ID:	iadot_01-160th_cs56-fcs00210_2019_09_13_102231a	No. of Measurements:	13506	Machine ID:	Ingios_FCS00210
Date and Time:	9/13/2019 10:22:31 AM	Location:	Adair County	State Plane:	7 IOWA Carroll-Atlantic

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
120.58	CQI > = 95
99.7	80% of Resilient Modulus MVs >= 8554
18.22	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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IOWADOT

E-Compaction Report

Project:	160th Street	Mapping Duration (hrs):	0.1	Operator:	Ingios Geotechnics inc
Map ID:	iadot_01-160th_cs56-fcs00210_2019_09_13_102231a	No. of Measurements:	13506	Machine ID:	Ingios_FCS00210
Date and Time:	9/13/2019 10:22:31 AM	Location:	Adair County	State Plane:	7 IOWA Carroll-Atlantic

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
15.72	CQI > = 95
3.4	80% of k-Value MVs >= 150
35.26	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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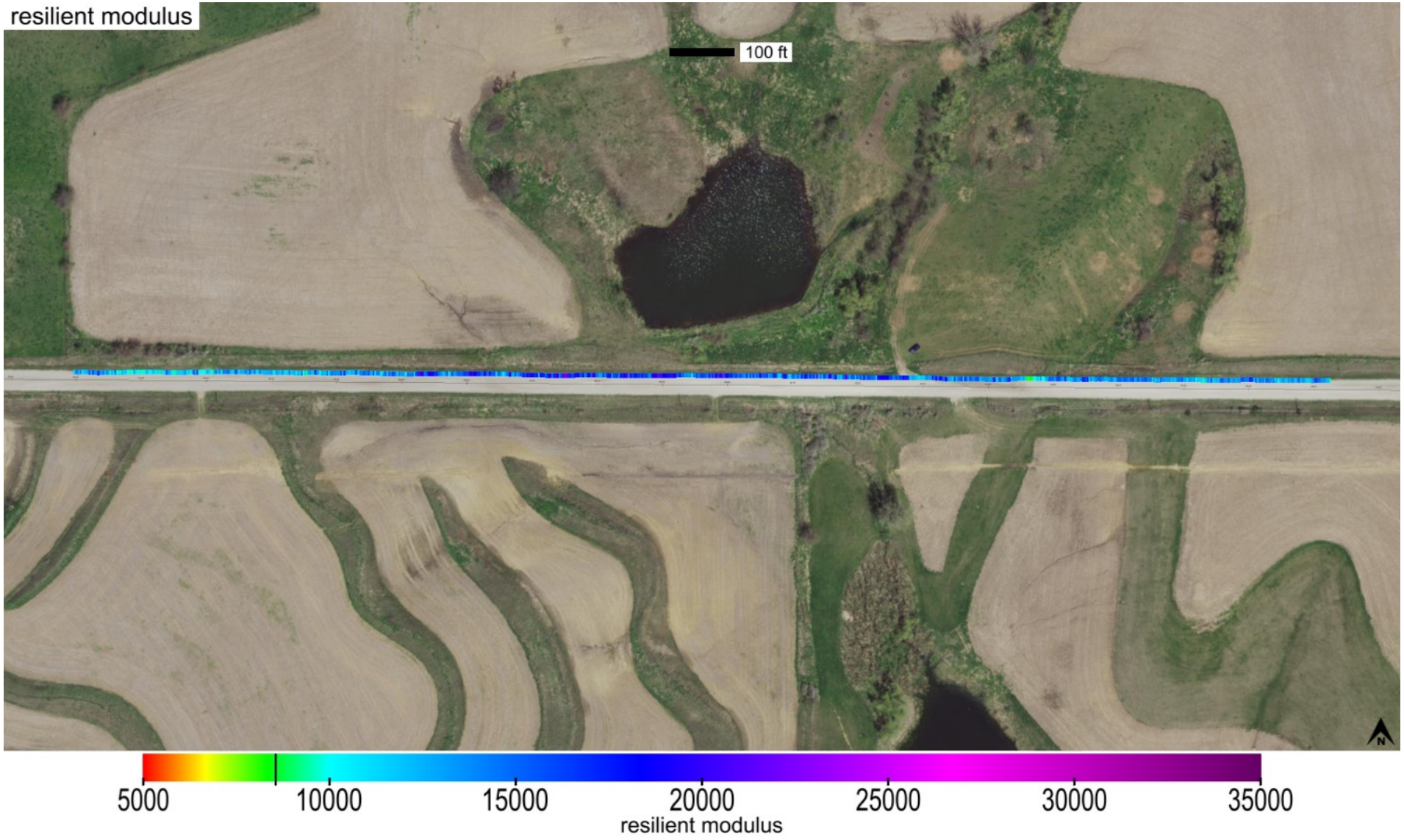
Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_102231a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.7	120.58	1.57	8554	8046.81	14273.4	23528.17	2599.98	18.22	-507.19	5719.4	14974.17



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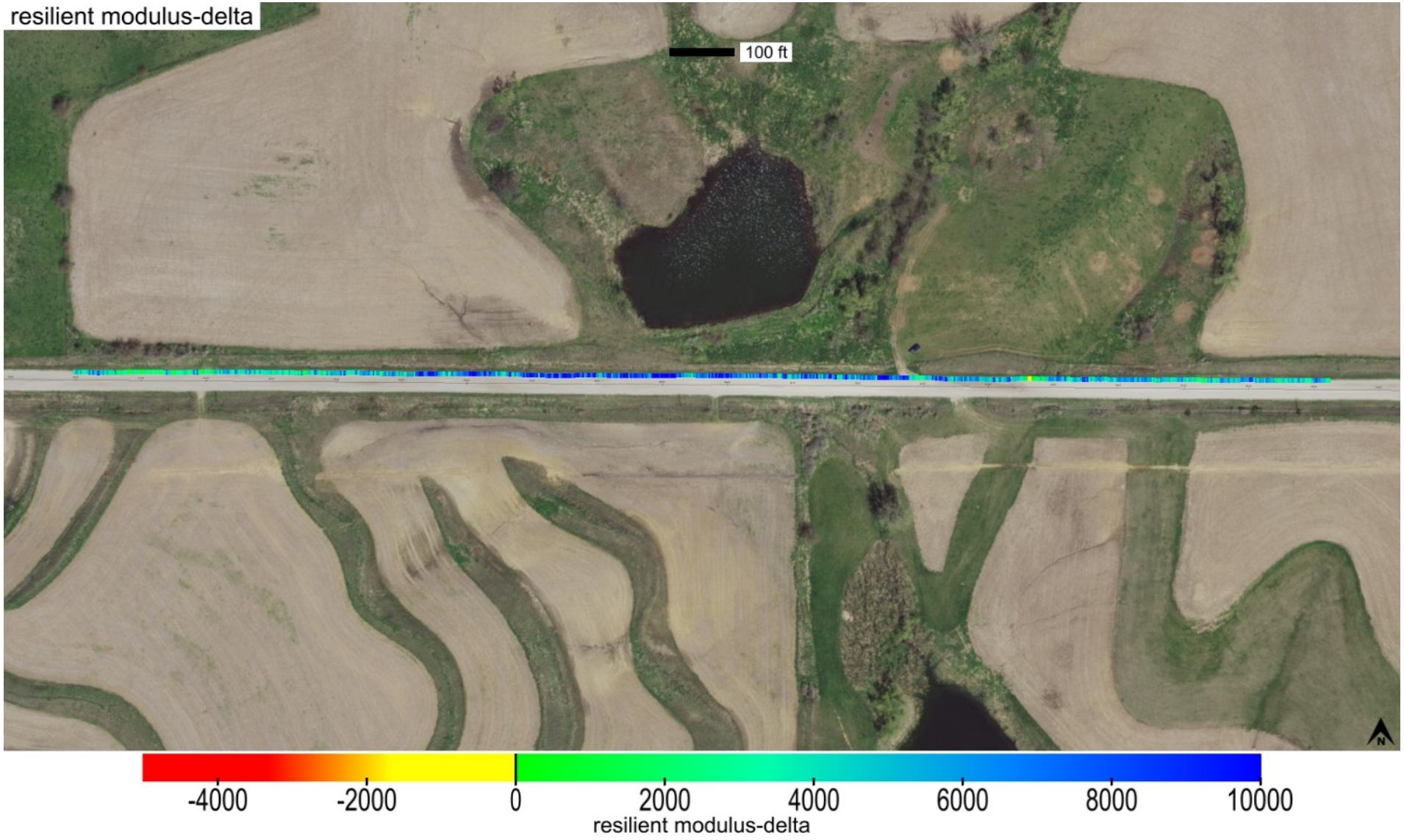
Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_102231a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.7	120.58	1.57	8554	8046.81	14273.4	23528.17	2599.98	18.22	-507.19	5719.4	14974.17



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_01-160th_cs56-fcs00210_2019_09_13_102231a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	99.7	8554	-507.19	5719.4	14974.17	751.52	5720.79	11087.55

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Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_102231a

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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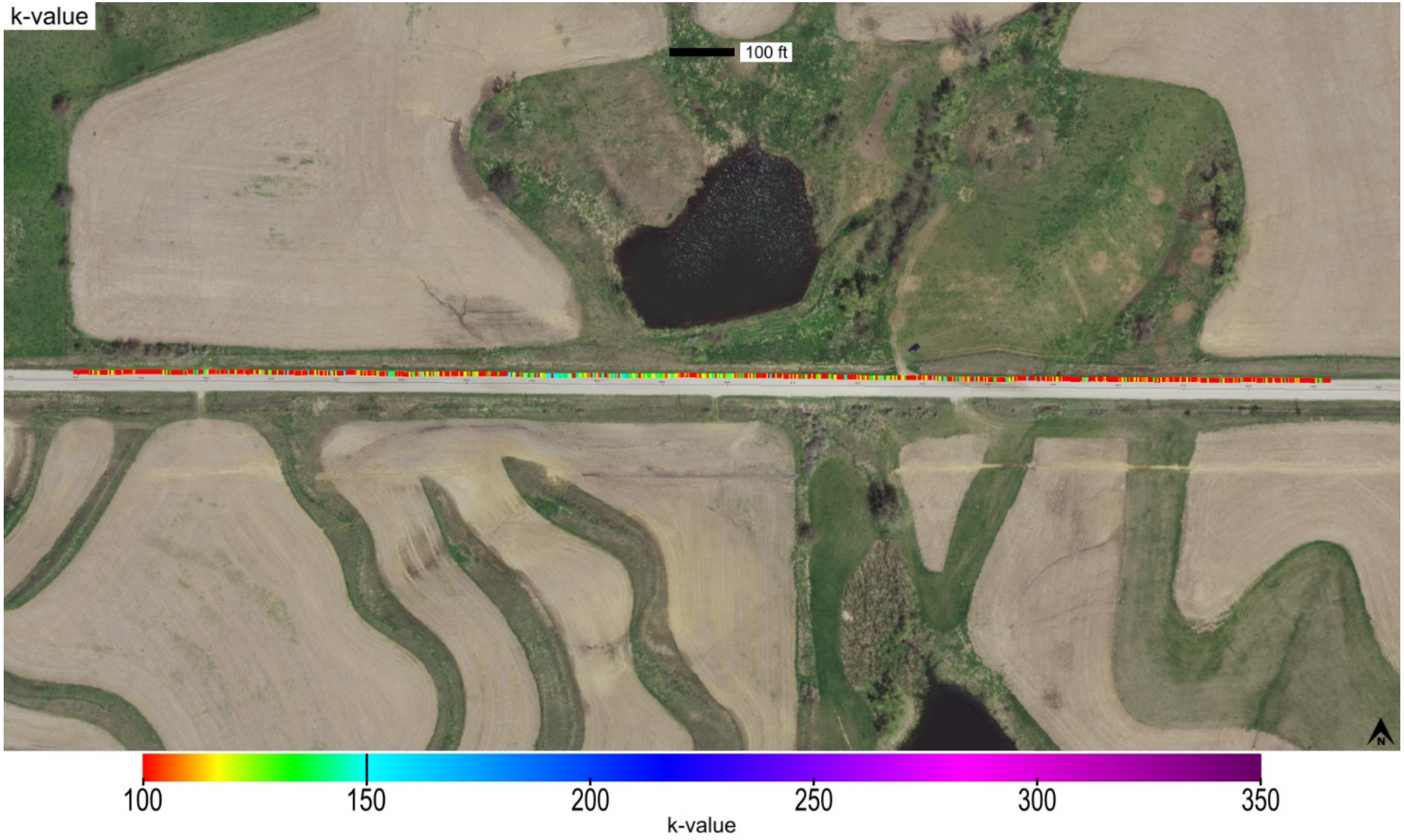
Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_102231a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	3.4	15.72	0.2	150	20	95.1	190	33.54	35.26	-130	-54.9	40



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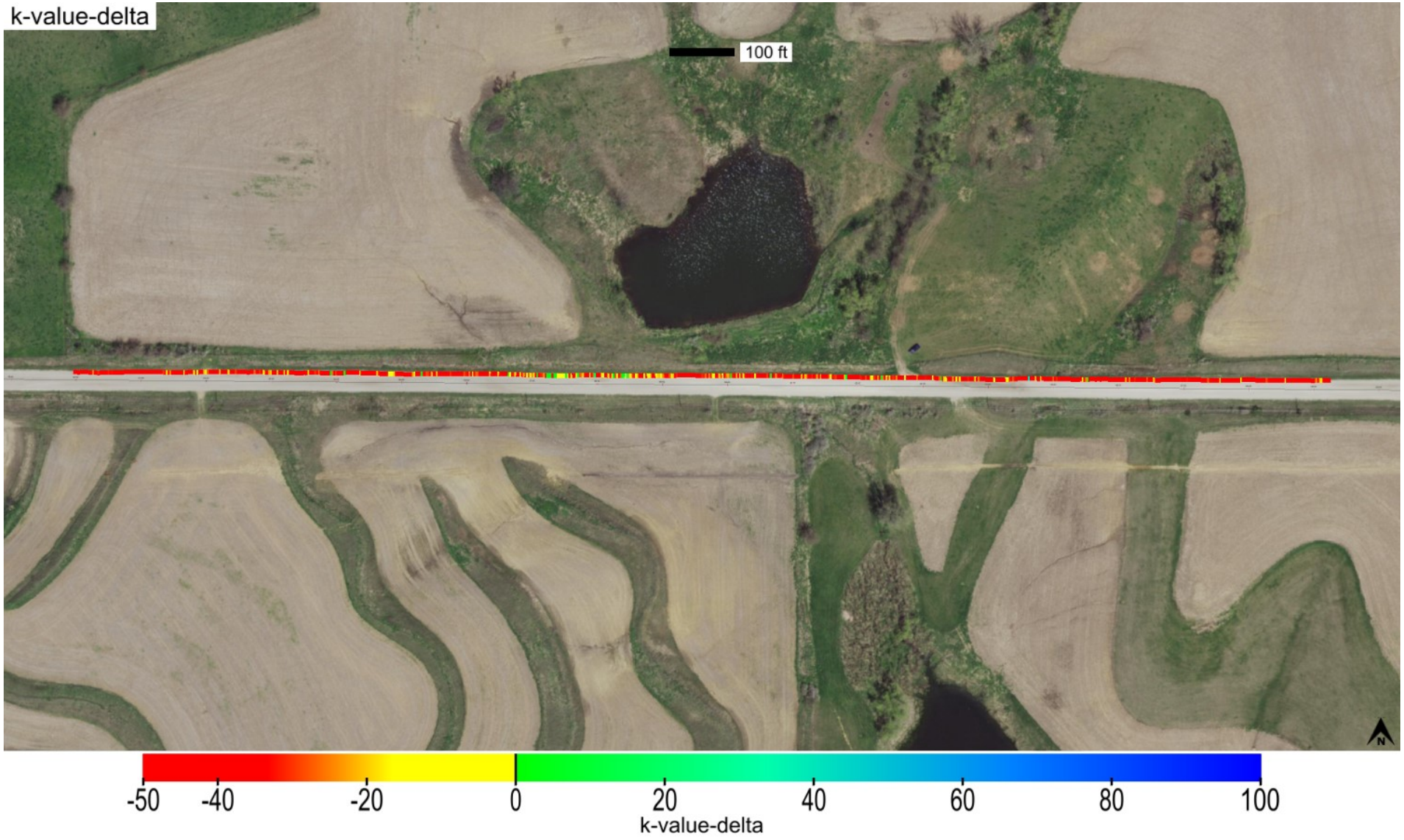
Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_102231a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	3.4	15.72	0.2	150	20	95.1	190	33.54	35.26	-130	-54.9	40



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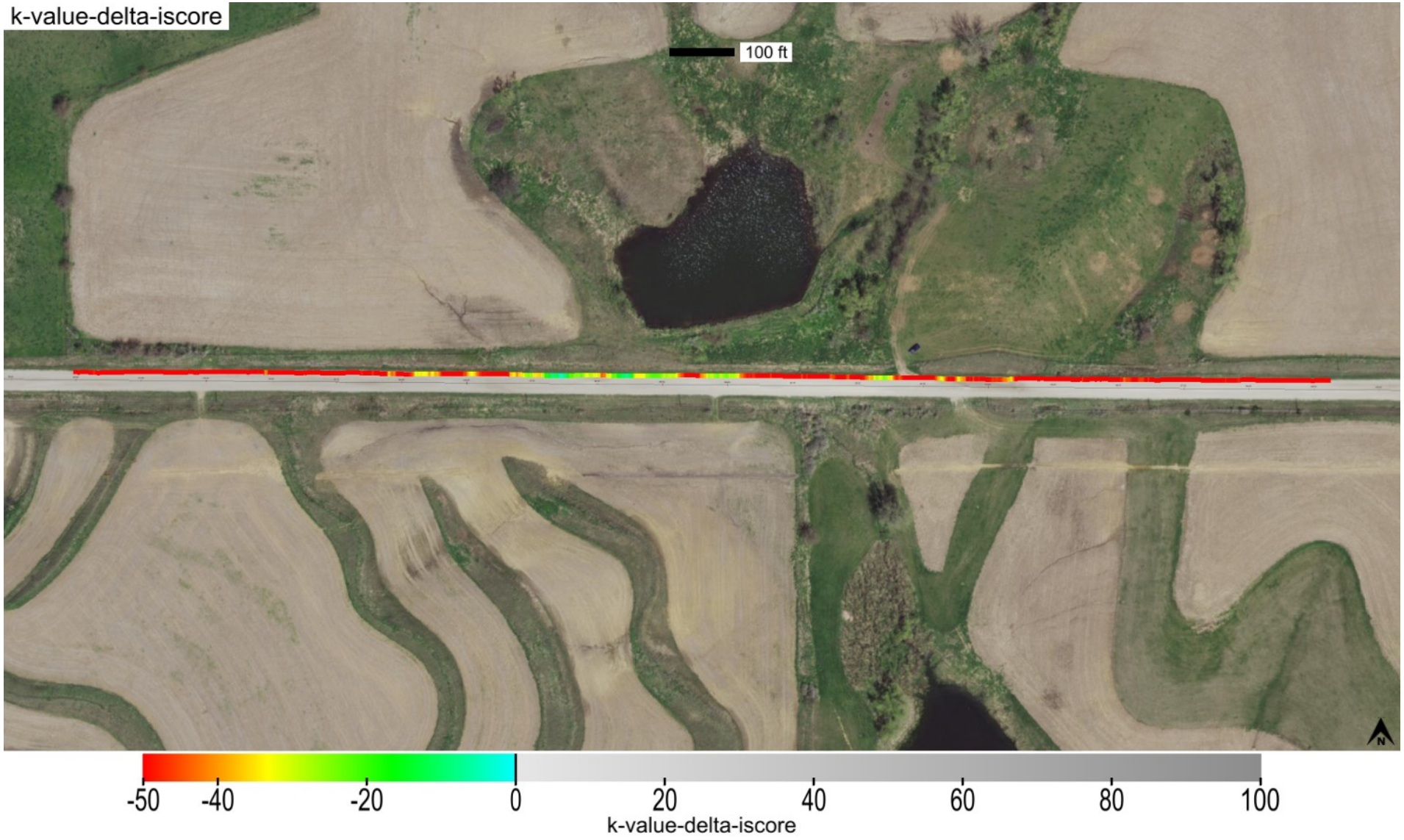
Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_102231a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	3.4	150	-130	-54.9	40	-125.64	-54.86	-3.62



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Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_102231a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	13506	100	none	0

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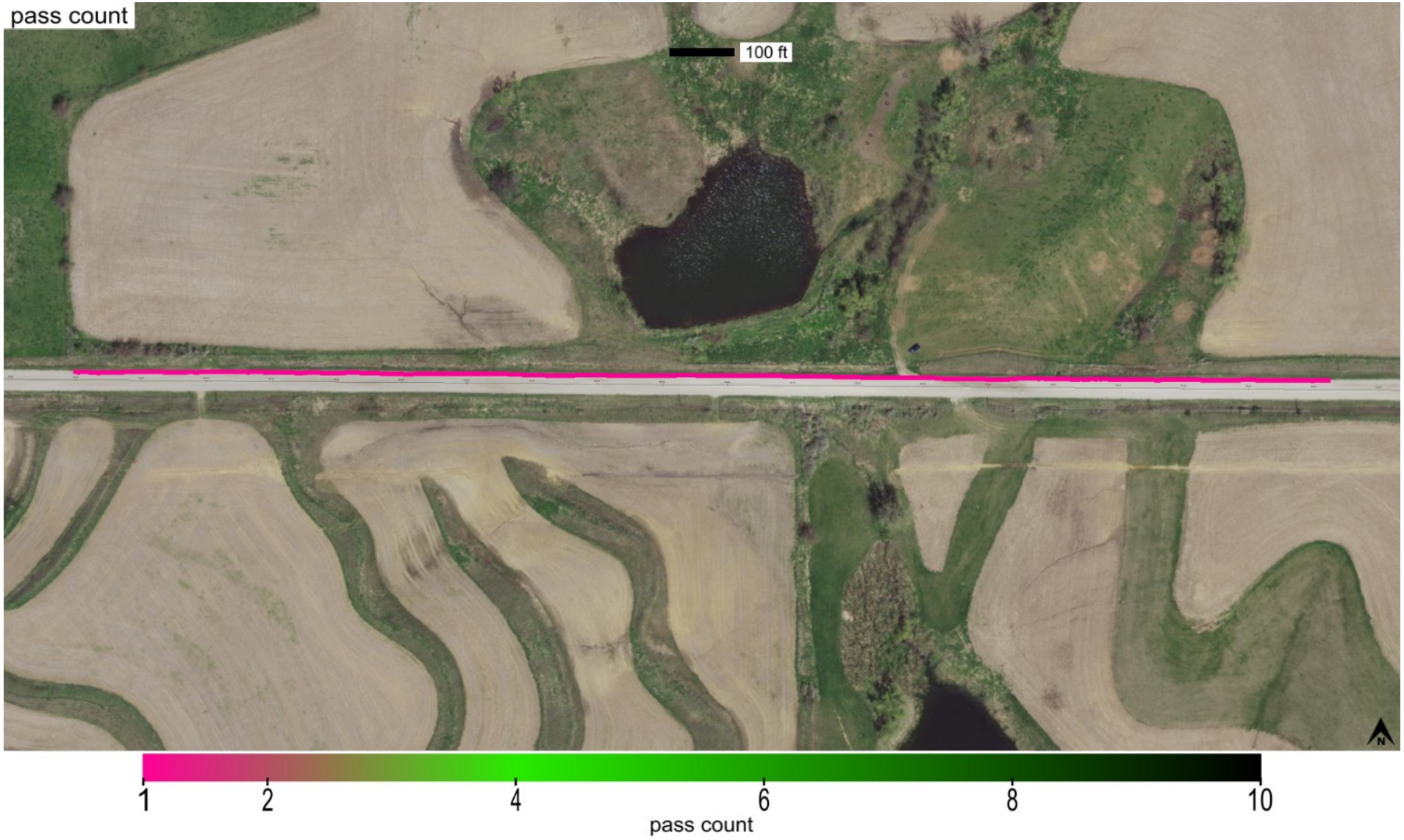
Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_102231a

minimum	average	maximum
1	1	1



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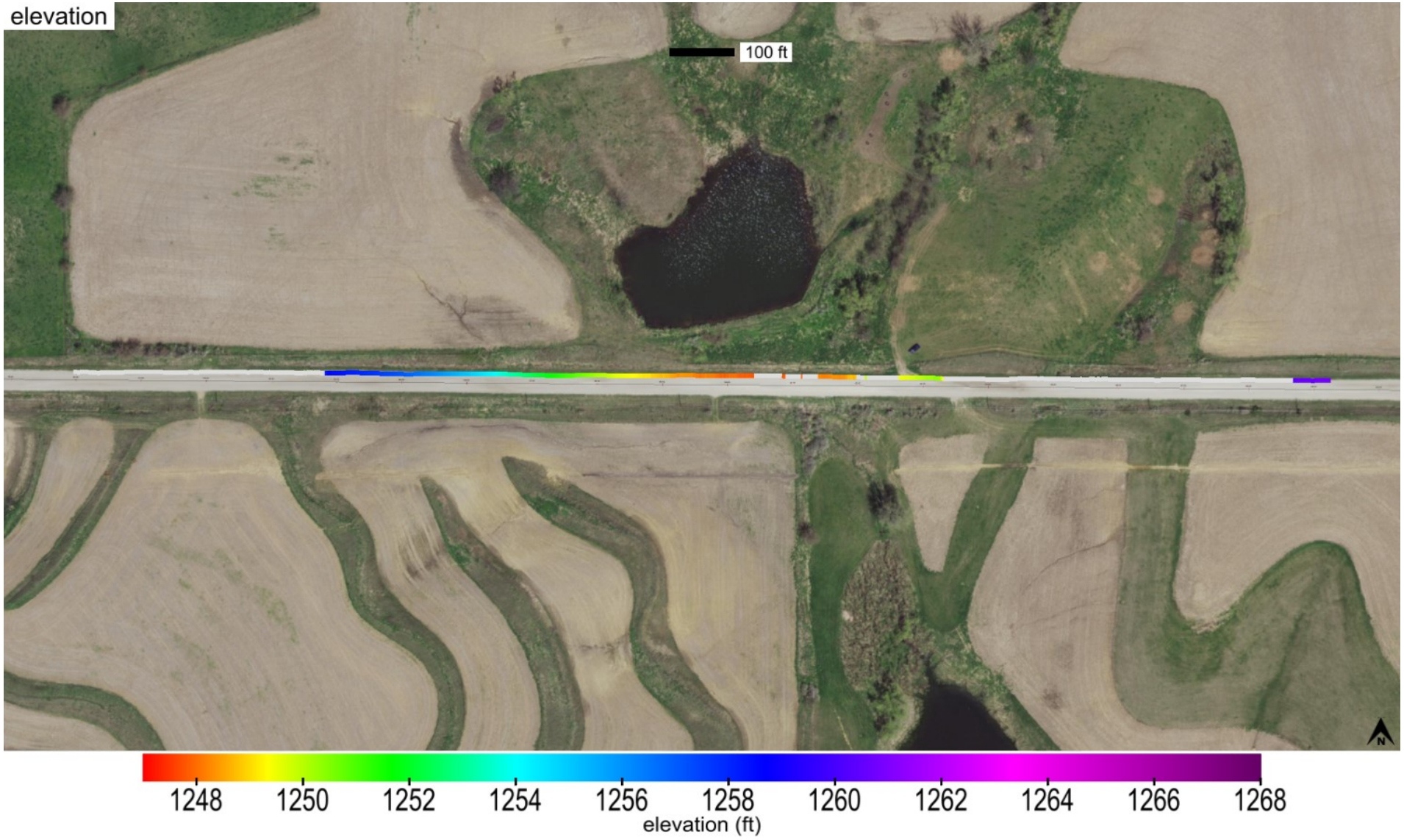
Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_102231a

minimum	average	maximum
1247.763	1252.59	1260.811



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Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_102231a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	13506	0.31	12	8554	150	40

Modified Subbase_IADOT (2115)

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Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_102231a

20190913_102202.jpg

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IOWADOT

E-Compaction Report

Project:	160th Street	Mapping Duration (hrs):	0.9	Operator:	Ingios Geotechnics inc
Map ID:	iadot_01-160th_cs56-fcs00210_2019_09_13_104411a	No. of Measurements:	59454	Machine ID:	Ingios_FCS00210
Date and Time:	9/13/2019 10:44:11 AM	Location:	Adair County	State Plane:	7 IOWA Carroll-Atlantic

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	99.7	112.22	0.85	8554	5500	18404.9	48514.29	6419.07	34.88	-3054	9850.9	39960.29
k-value	Yes	22.6	34.06	0.32	150	20	115.9	190	42.95	37.05	-130	-34.1	40
Moisture Content	No												

Mapped Area

square feet	acres
59454	1.36

Pass Count

min.	avg.	max.
1	1.72	7

Elevation (ft)

min.	avg.	max.
1156.69	1214.39	1255.93

Velocity (fps)

min.	avg.	max.
0.25	5.43	6.26

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	59454	1.365	12	8554	150	40

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IOWADOT

E-Compaction Report

Project:	160th Street	Mapping Duration (hrs):	0.9	Operator:	Ingios Geotechnics inc
Map ID:	iadot_01-160th_cs56-fcs00210_2019_09_13_104411a	No. of Measurements:	59454	Machine ID:	Ingios_FCS00210
Date and Time:	9/13/2019 10:44:11 AM	Location:	Adair County	State Plane:	7 IOWA Carroll-Atlantic

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
112.22	CQI > = 95
99.7	80% of Resilient Modulus MVs >= 8554
34.88	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:	160th Street	Mapping Duration (hrs):	0.9	Operator:	Ingios Geotechnics inc
Map ID:	iadot_01-160th_cs56-fcs00210_2019_09_13_104411a	No. of Measurements:	59454	Machine ID:	Ingios_FCS00210
Date and Time:	9/13/2019 10:44:11 AM	Location:	Adair County	State Plane:	7 IOWA Carroll-Atlantic

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
34.06	CQI > = 95
22.6	80% of k-Value MVs >= 150
37.05	COV <= 20
91.05	% 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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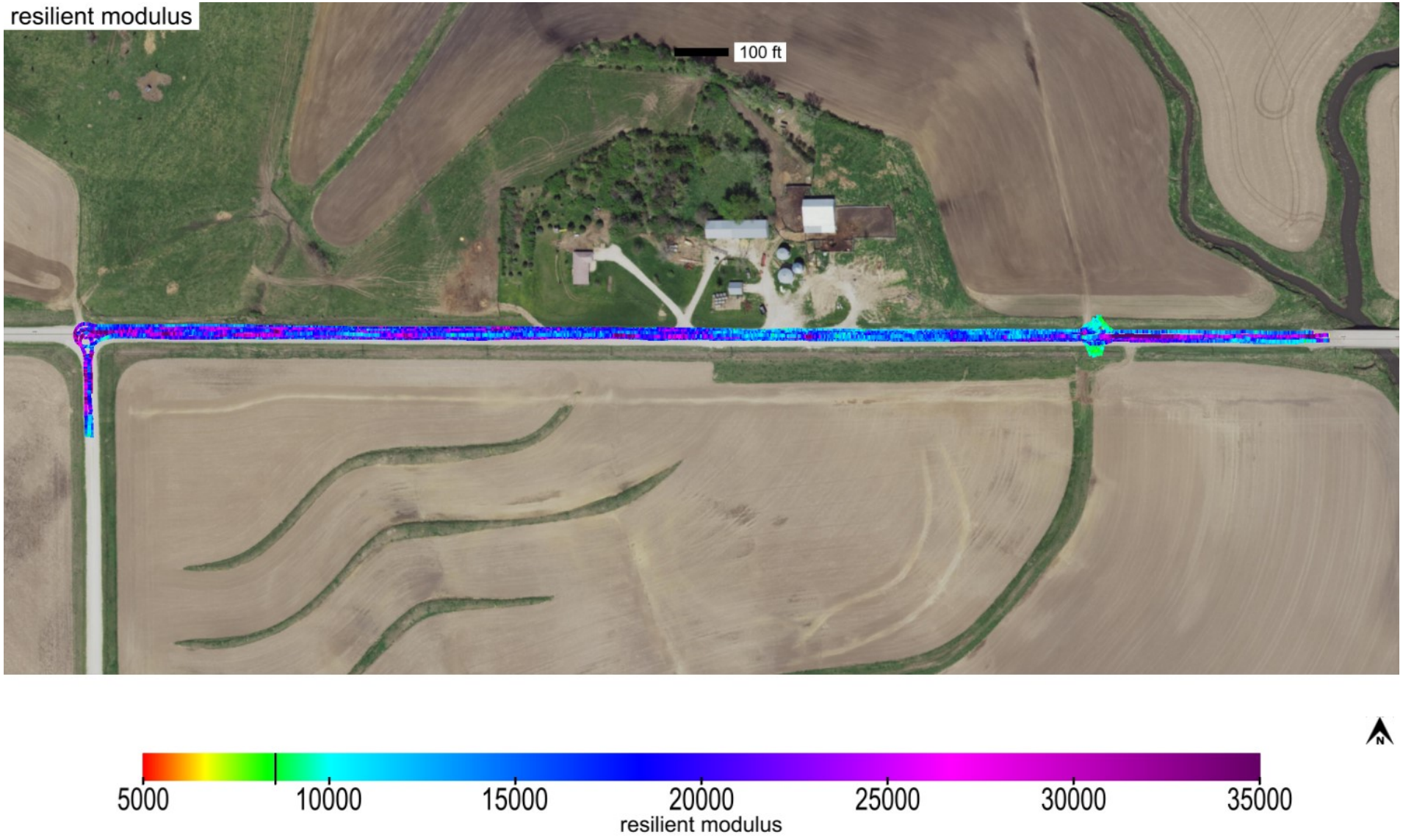
Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_104411a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.7	112.22	0.85	8554	5500	18404.9	48514.29	6419.07	34.88	-3054	9850.9	39960.29



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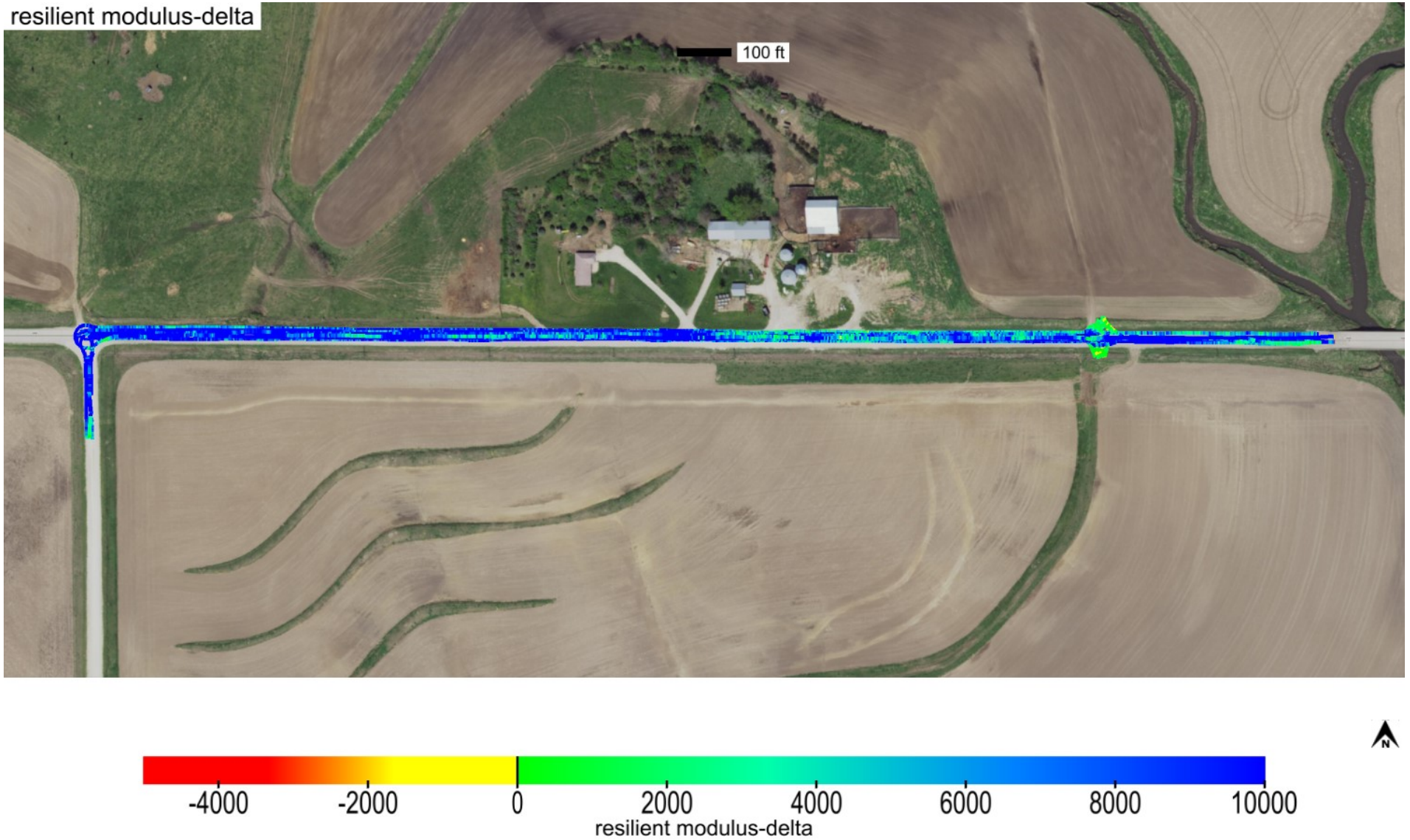
Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_104411a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.7	112.22	0.85	8554	5500	18404.9	48514.29	6419.07	34.88	-3054	9850.9	39960.29



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Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_104411a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	99.7	8554	-3054	9850.9	39960.29	360.76	10011.18	23898.04

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Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_104411a

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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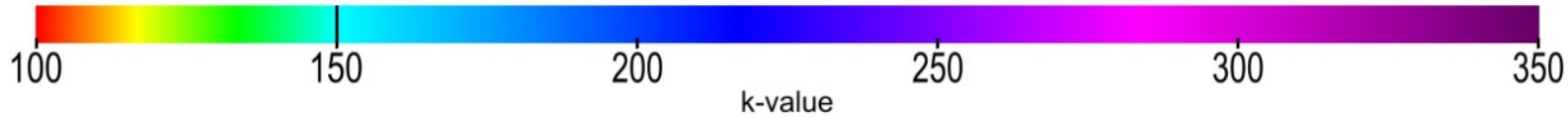
Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_104411a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	22.6	34.06	0.32	150	20	115.9	190	42.95	37.05	-130	-34.1	40



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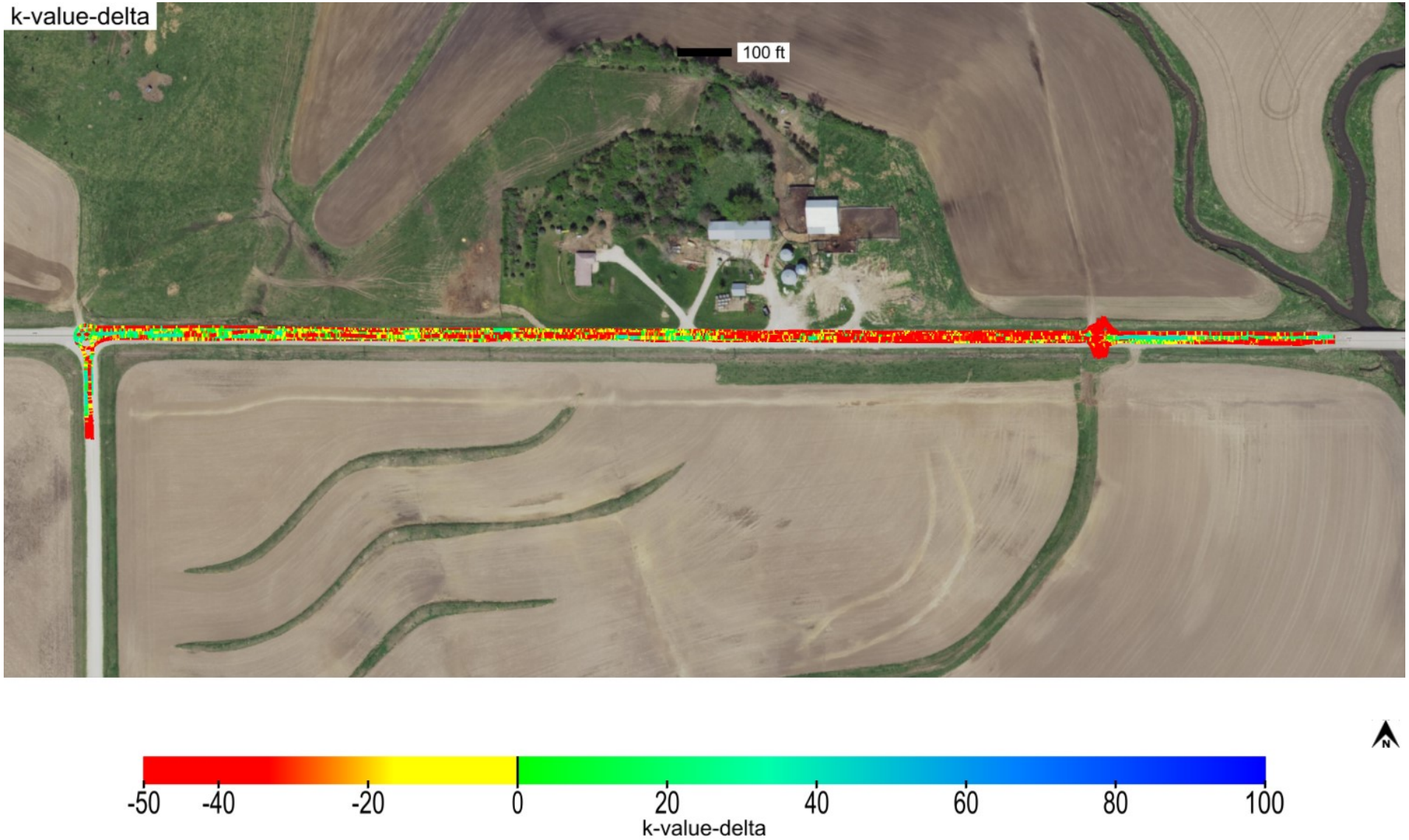
Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_104411a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	22.6	34.06	0.32	150	20	115.9	190	42.95	37.05	-130	-34.1	40



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Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_104411a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	22.6	150	-130	-34.1	40	-130	-33.16	23.32

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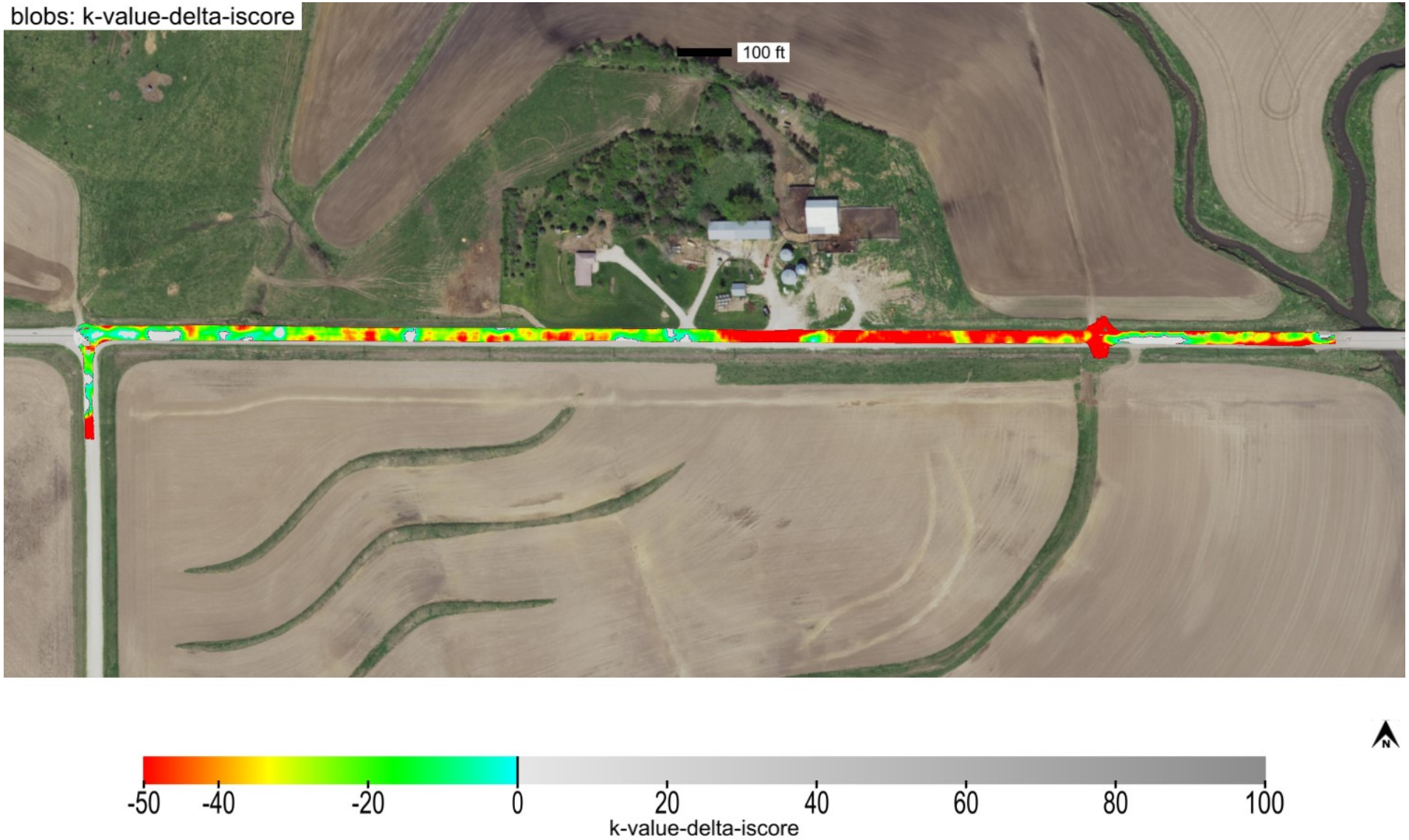
Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_104411a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	3	54135	91.05	none	0



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ingios GEOTECHNICS

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_104411a

minimum	average	maximum
1	1.72	7

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Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_104411a

minimum	average	maximum
1156.691	1214.394	1255.932

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ingios GEOTECHNICS

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_104411a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	59454	1.365	12	8554	150	40

Modified Subbase_IADOT (2115)

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Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_104411a

20190913_105428.jpg

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IOWADOT

E-Compaction Report

Project:	160th Street	Mapping Duration (hrs):	1.51	Operator:	Ingios Geotechnics inc
Map ID:	iadot_01-160th_cs56-fcs00210_2019_09_13_120959a	No. of Measurements:	113738	Machine ID:	Ingios_FCS00210
Date and Time:	9/13/2019 12:09:59 PM	Location:	Adair County	State Plane:	7 IOWA Carroll-Atlantic

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	111.79	0.84	8554	5500	17765.3	48142.84	6265.75	35.27	-3054	9211.3	39588.84
k-value	Yes	19.8	31.07	0.3	150	20	112.8	190	42.29	37.5	-130	-37.2	40
Moisture Content	No												

Mapped Area

square feet	acres
113738	2.61

Pass Count

min.	avg.	max.
1	1.74	7

Elevation (ft)

min.	avg.	max.
1157.74	1221.97	1256.12

Velocity (fps)

min.	avg.	max.
0.3	5.49	6.67

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	113738	2.611	12	8554	150	40

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	160th Street	Mapping Duration (hrs):	1.51	Operator:	Ingios Geotechnics inc
Map ID:	iadot_01-160th_cs56-fcs00210_2019_09_13_120959a	No. of Measurements:	113738	Machine ID:	Ingios_FCS00210
Date and Time:	9/13/2019 12:09:59 PM	Location:	Adair County	State Plane:	7 IOWA Carroll-Atlantic

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
111.79	CQI > = 95
99.4	80% of Resilient Modulus MVs >= 8554
35.27	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:	160th Street	Mapping Duration (hrs):	1.51	Operator:	Ingios Geotechnics inc
Map ID:	iadot_01-160th_cs56-fcs00210_2019_09_13_120959a	No. of Measurements:	113738	Machine ID:	Ingios_FCS00210
Date and Time:	9/13/2019 12:09:59 PM	Location:	Adair County	State Plane:	7 IOWA Carroll-Atlantic

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
31.07	CQI > = 95
19.8	80% of k-Value MVs >= 150
37.5	COV <= 20
94.8	% 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_01-160th_cs56-fcs00210_2019_09_13_120959a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.4	111.79	0.84	8554	5500	17765.3	48142.84	6265.75	35.27	-3054	9211.3	39588.84

resilient modulus

100 ft

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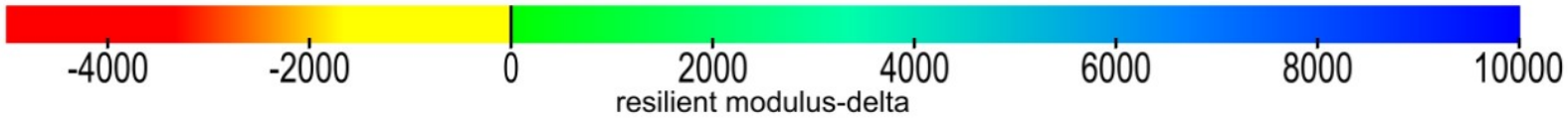
ingios GEOTECHNICS

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_120959a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.4	111.79	0.84	8554	5500	17765.3	48142.84	6265.75	35.27	-3054	9211.3	39588.84

resilient modulus-delta

100 ft



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ingios GEOTECHNICS

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_120959a

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	8554	-3054	9211.3	39588.84	-130.79	9477.88	33159.71

resilient modulus-delta-iscore

100 ft

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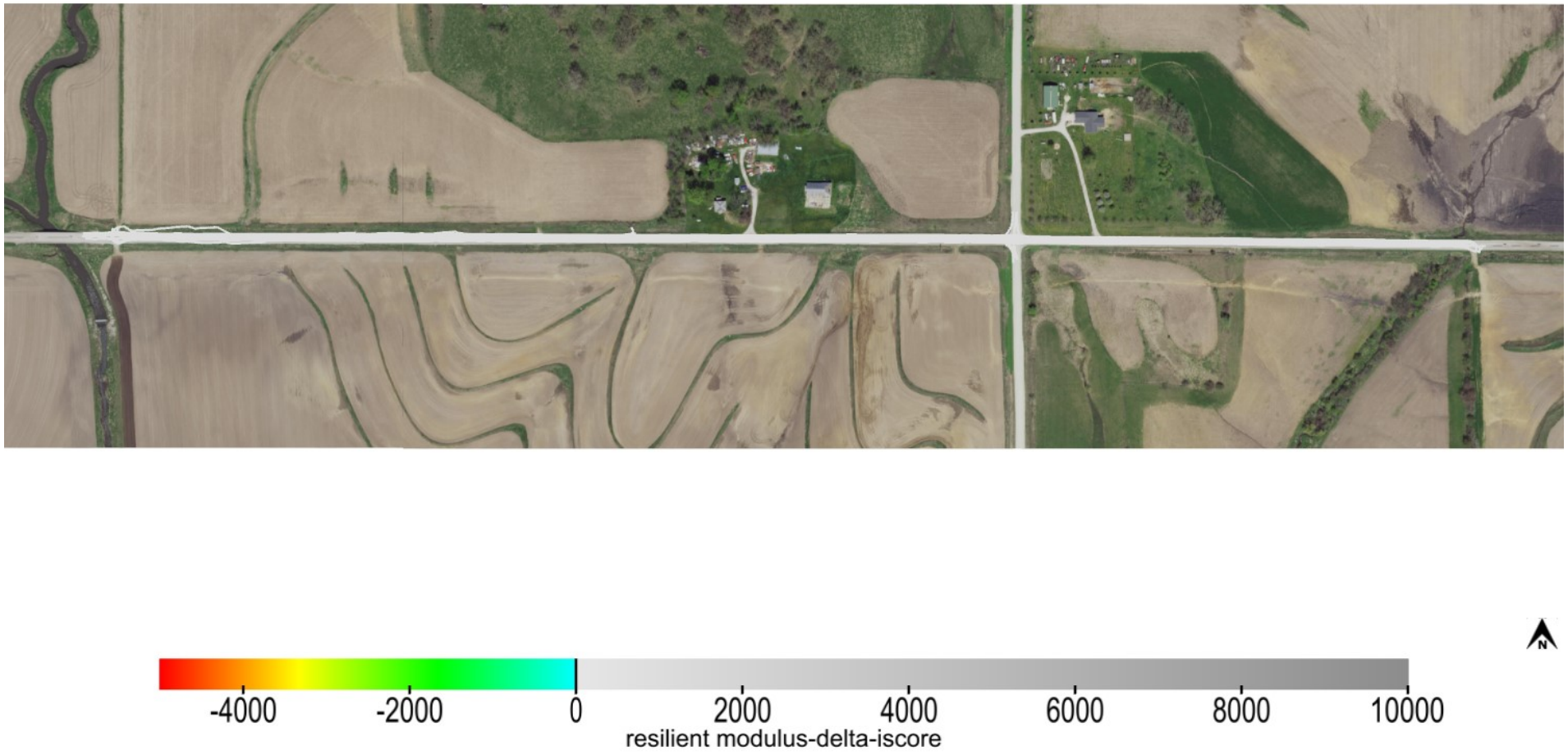
ingios GEOTECHNICS

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_120959a

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

blobs: resilient modulus-delta-iscore



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

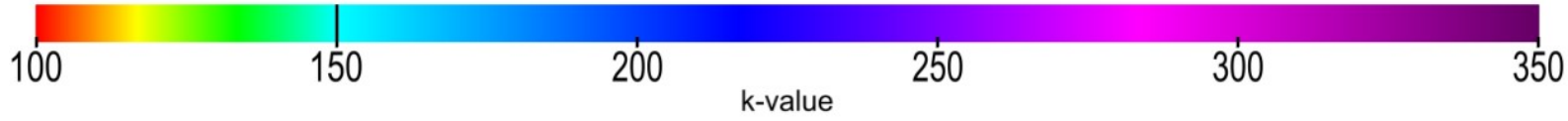
ingios GEOTECHNICS

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_120959a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	19.8	31.07	0.3	150	20	112.8	190	42.29	37.5	-130	-37.2	40

k-value

100 ft



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Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_120959a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	19.8	31.07	0.3	150	20	112.8	190	42.29	37.5	-130	-37.2	40

k-value-delta

100 ft

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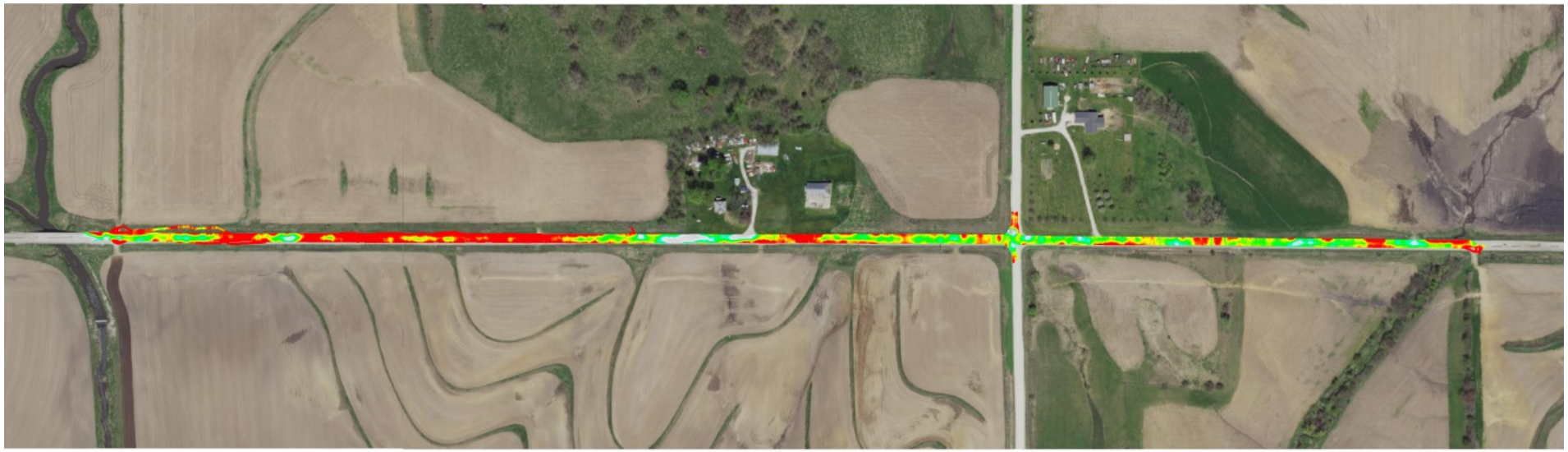
Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_120959a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	19.8	150	-130	-37.2	40	-130	-35.48	40

k-value-delta-iscore

100 ft



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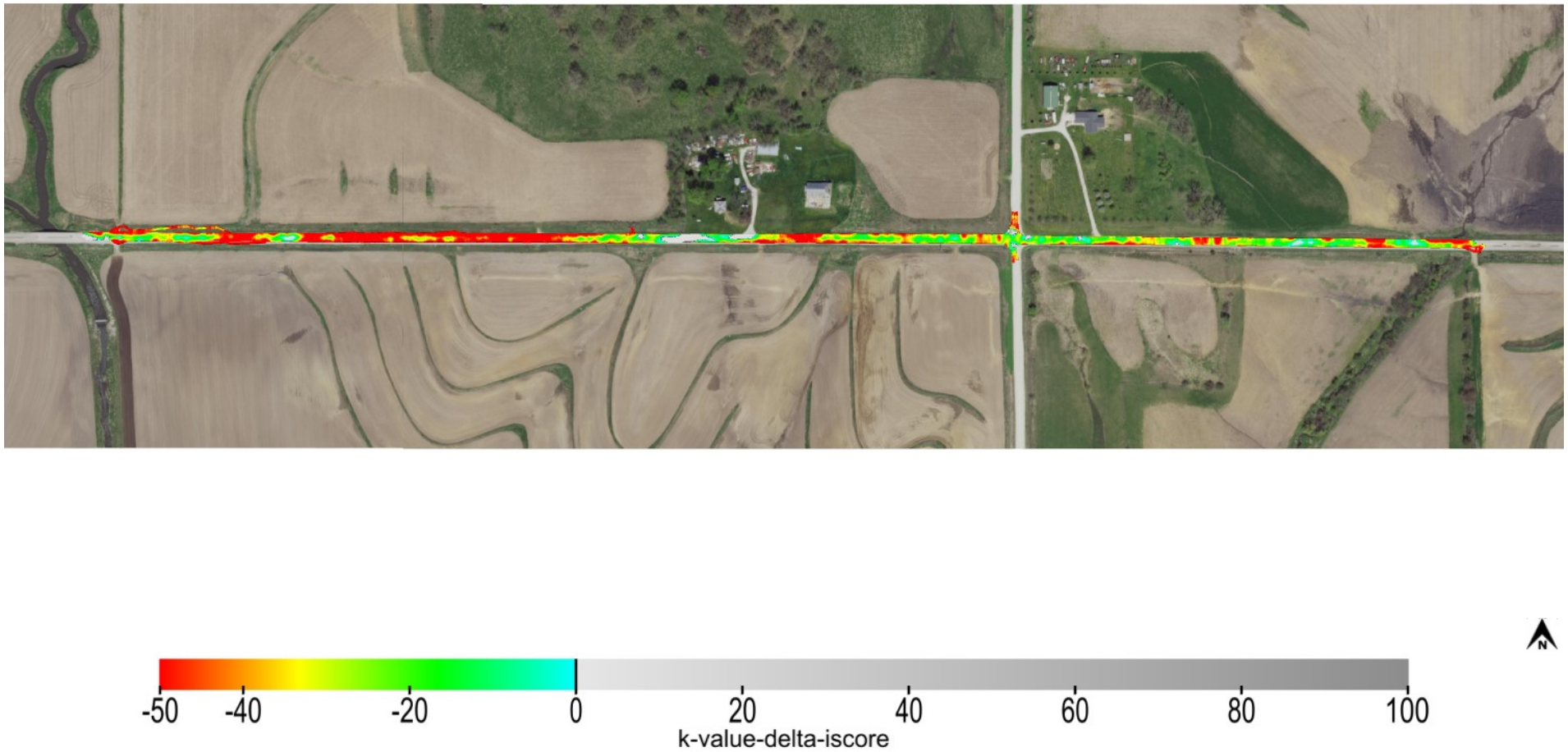
ingios GEOTECHNICS

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_120959a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	3	107826	94.8	none	0

blobs: k-value-delta-iscore



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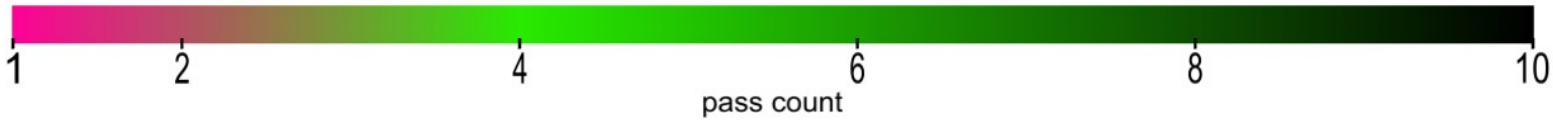
ingios GEOTECHNICS

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_120959a

minimum	average	maximum
1	1.74	7

pass count

100 ft



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ingios GEOTECHNICS

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_120959a

minimum	average	maximum
1157.74	1221.968	1256.123

elevation

100 ft

1160 1180 1200 1220 1240 1257

elevation (ft)

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ingios GEOTECHNICS

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_120959a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	113738	2.611	12	8554	150	40

materials

100 ft

Modified Subbase_IADOT (2115)

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ingios GEOTECHNICS

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_120959a

20190913_115713.jpg

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Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_120959a

20190913_125053.jpg

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	160th Street	Mapping Duration (hrs):	0.86	Operator:	Ingios Geotechnics inc
Map ID:	iadot_01-160th_cs56-fcs00210_2019_09_13_134253a	No. of Measurements:	80580	Machine ID:	Ingios_FCS00210
Date and Time:	9/13/2019 1:42:53 PM	Location:	Adair County	State Plane:	7 IOWA Carroll-Atlantic

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	113.15	0.91	8554	7391.67	20006.7	56000	6579.28	32.89	-1162.33	11452.7	47446
k-value	Yes	30	43.73	0.41	150	20	125.2	190	40.72	32.52	-130	-24.8	40
Moisture Content	No												

Mapped Area

square feet	acres
80580	1.85

Pass Count

min.	avg.	max.
1	1.42	4

Elevation (ft)

min.	avg.	max.
1213.84	1244.48	1259.56

Velocity (fps)

min.	avg.	max.
0.42	5.48	6.33

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	80580	1.85	12	8554	150	40

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	160th Street	Mapping Duration (hrs):	0.86	Operator:	Ingios Geotechnics inc
Map ID:	iadot_01-160th_cs56-fcs00210_2019_09_13_134253a	No. of Measurements:	80580	Machine ID:	Ingios_FCS00210
Date and Time:	9/13/2019 1:42:53 PM	Location:	Adair County	State Plane:	7 IOWA Carroll-Atlantic

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
113.15	CQI > = 95
99.6	80% of Resilient Modulus MVs >= 8554
32.89	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:	160th Street	Mapping Duration (hrs):	0.86	Operator:	Ingios Geotechnics inc
Map ID:	iadot_01-160th_cs56-fcs00210_2019_09_13_134253a	No. of Measurements:	80580	Machine ID:	Ingios_FCS00210
Date and Time:	9/13/2019 1:42:53 PM	Location:	Adair County	State Plane:	7 IOWA Carroll-Atlantic

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
43.73	CQI > = 95
30	80% of k-Value MVs >= 150
32.52	COV <= 20
87.66	% 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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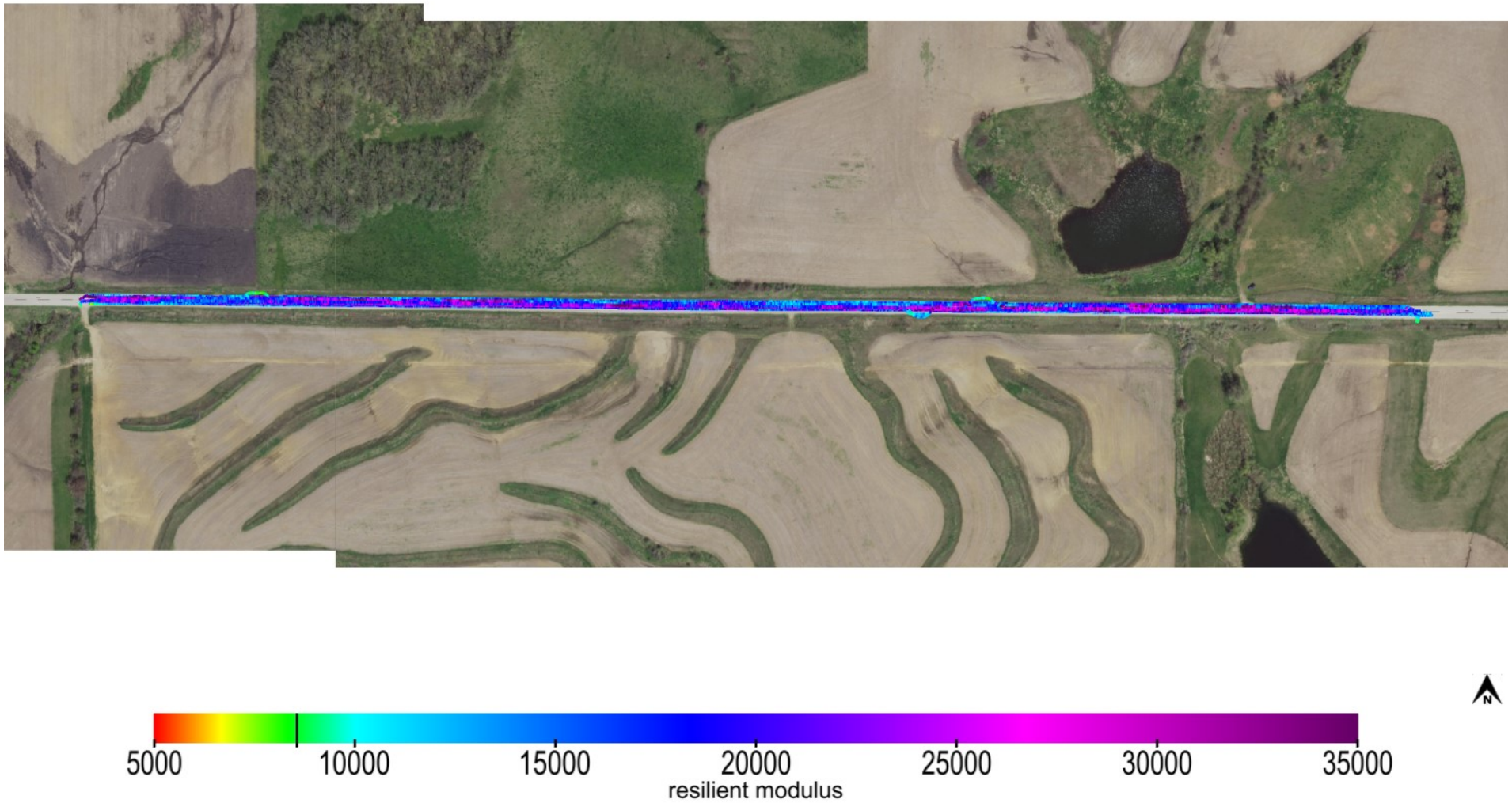
ingios GEOTECHNICS

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_134253a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.6	113.15	0.91	8554	7391.67	20006.7	56000	6579.28	32.89	-1162.33	11452.7	47446

resilient modulus



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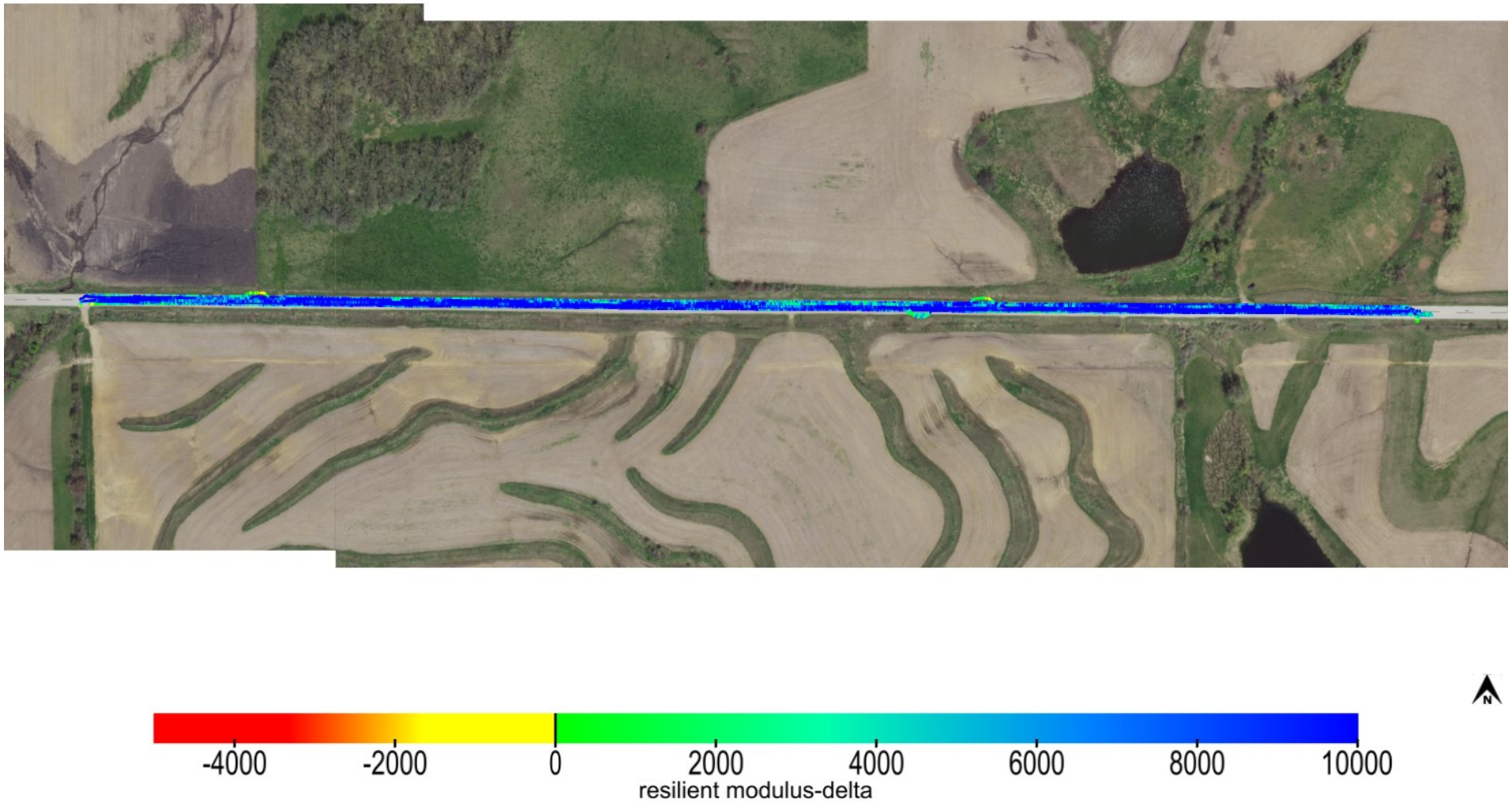
Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_134253a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.6	113.15	0.91	8554	7391.67	20006.7	56000	6579.28	32.89	-1162.33	11452.7	47446

resilient modulus-delta

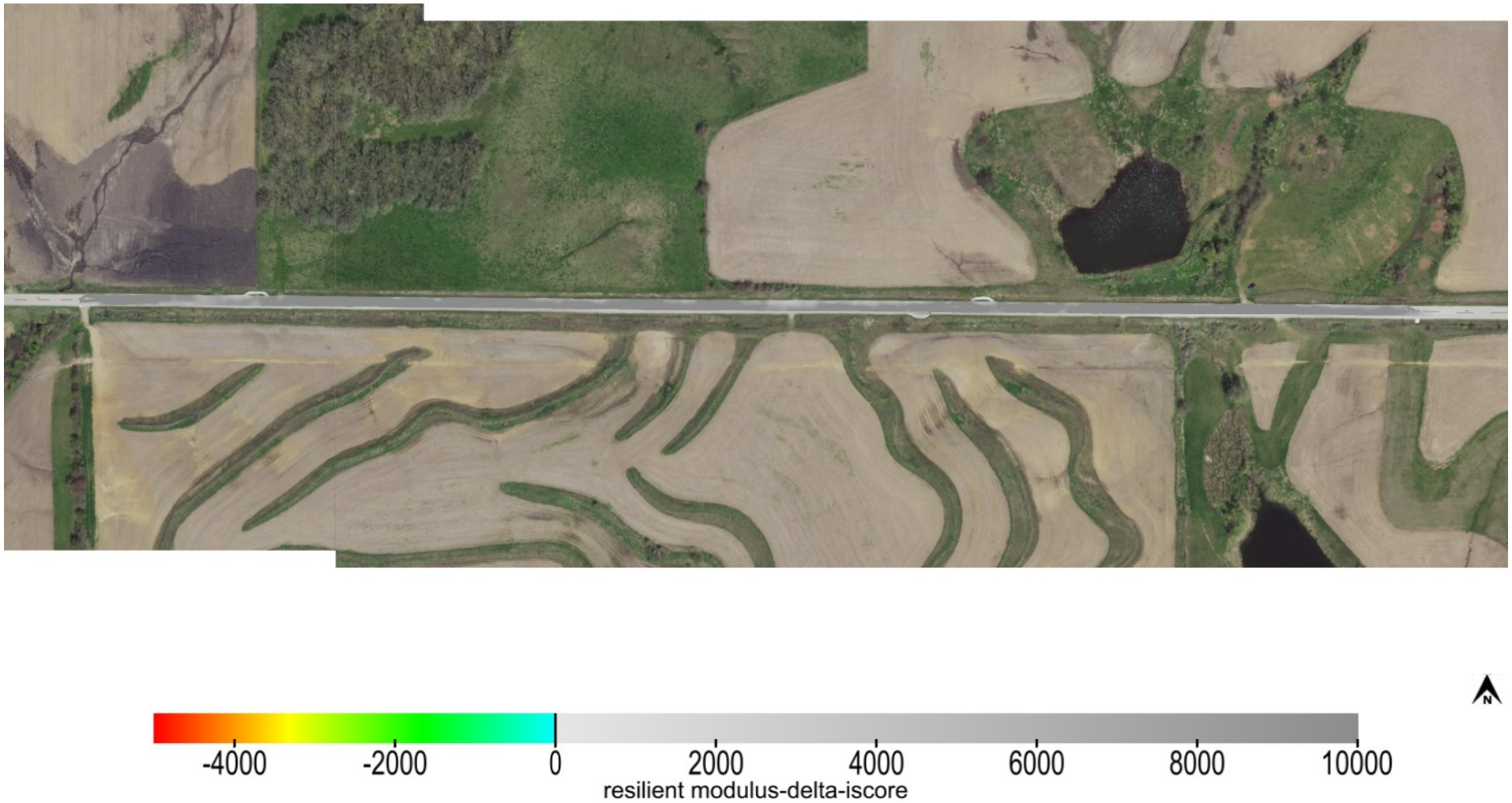


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_134253a

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	8554	-1162.33	11452.7	47446	-146.94	11773.55	23790.35

resilient modulus-delta-iscore



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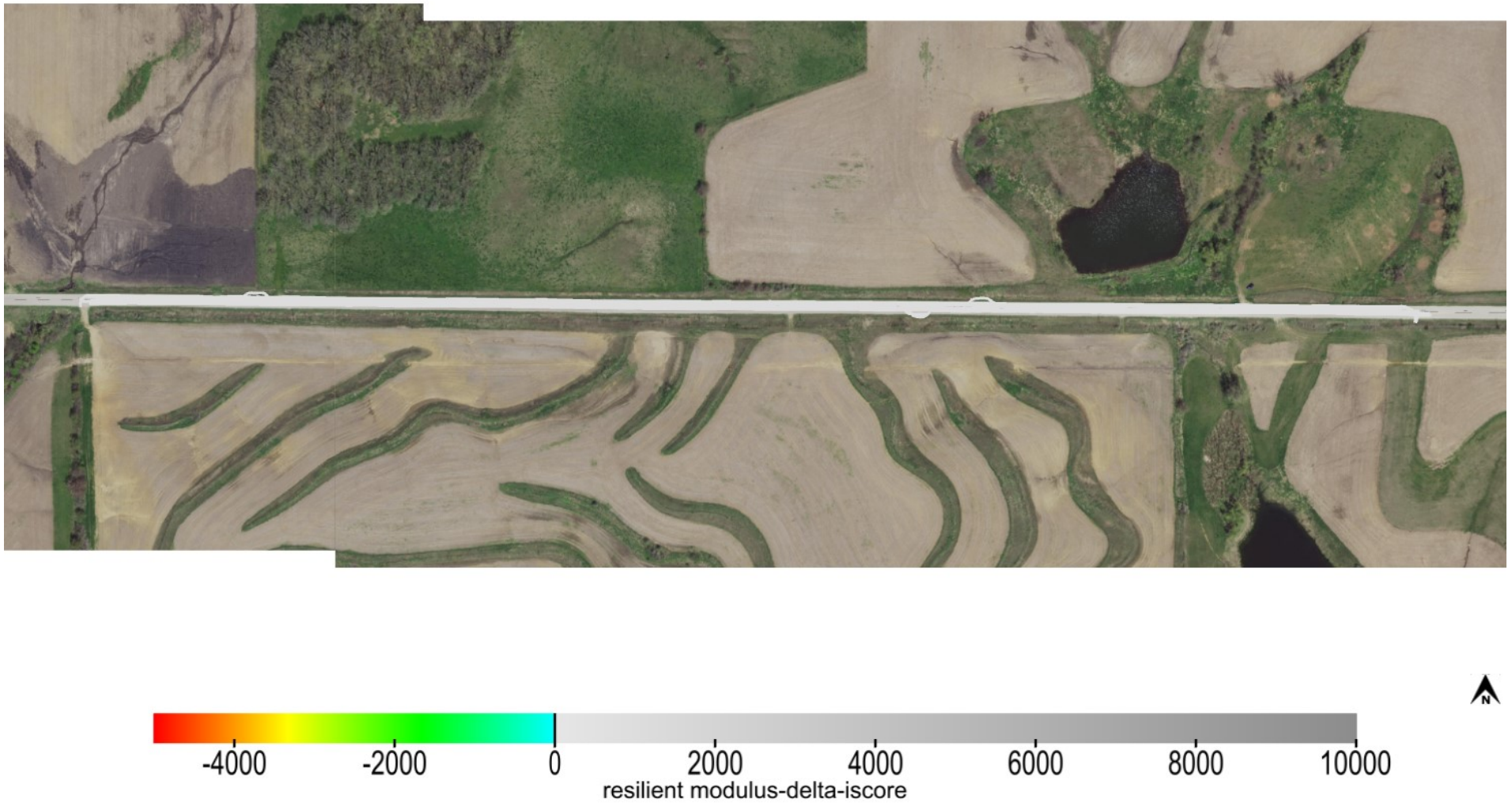
ingios GEOTECHNICS

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_134253a

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

blobs: resilient modulus-delta-iscore



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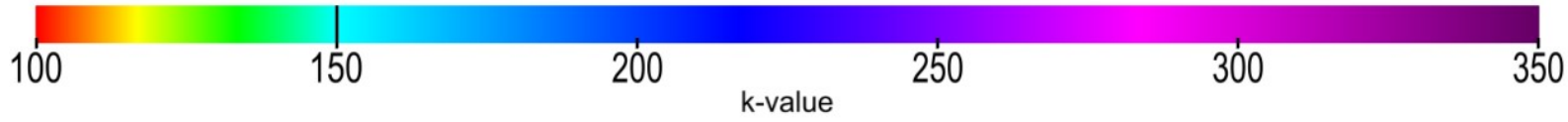
ingios GEOTECHNICS

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_134253a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	30	43.73	0.41	150	20	125.2	190	40.72	32.52	-130	-24.8	40

k-value

100 ft



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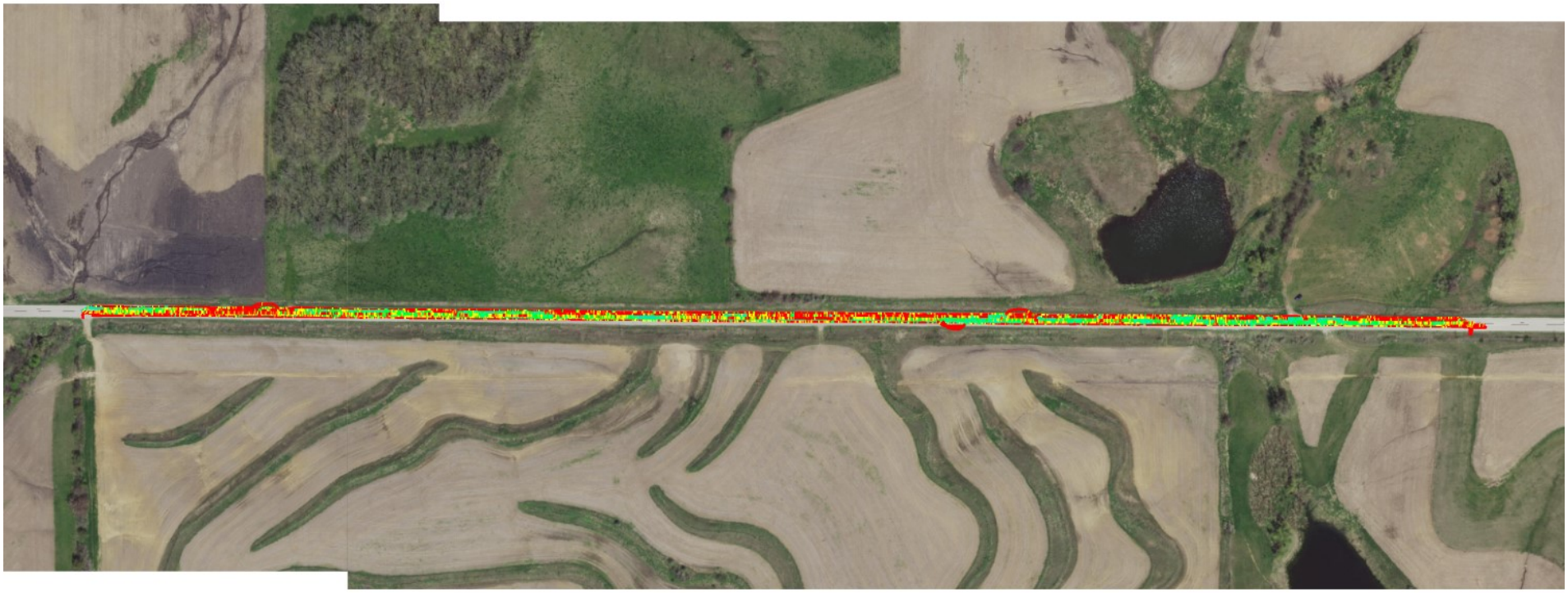
Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_134253a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	30	43.73	0.41	150	20	125.2	190	40.72	32.52	-130	-24.8	40

k-value-delta

100 ft



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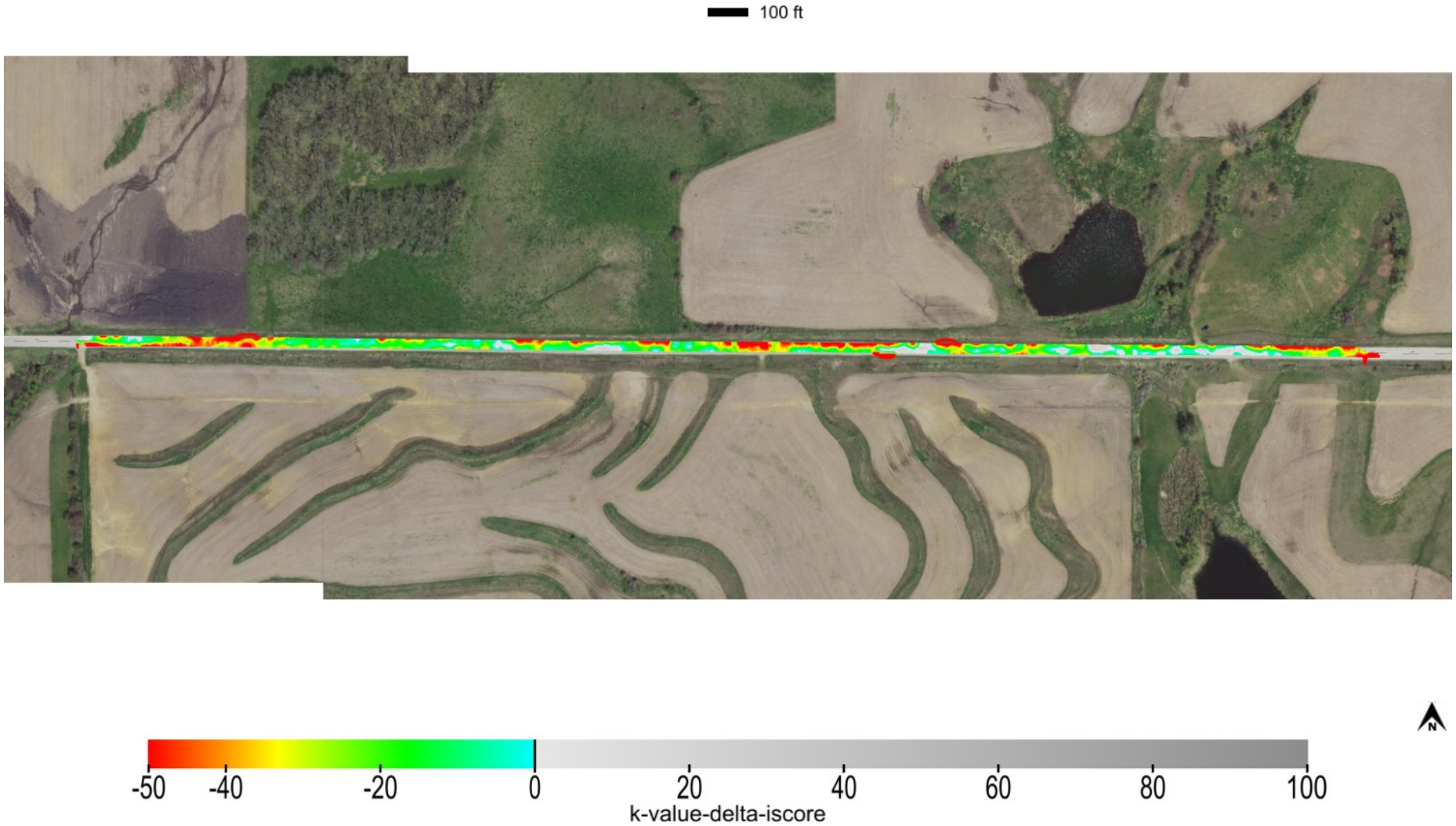
ingios GEOTECHNICS

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_134253a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	30	150	-130	-24.8	40	-130	-22.98	27.08

k-value-delta-iscore



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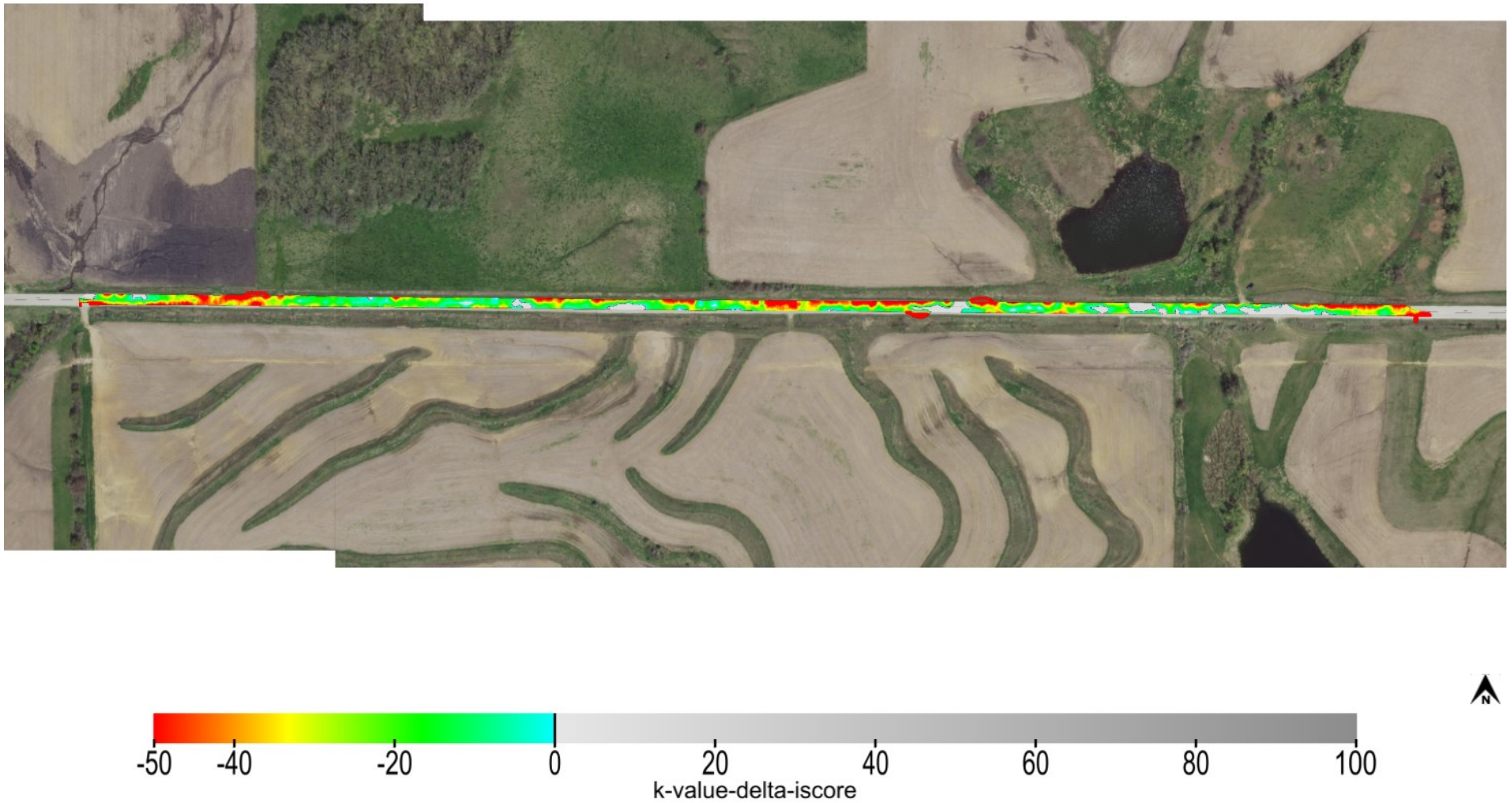
ingios GEOTECHNICS

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_134253a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	3	70639	87.66	none	0

blobs: k-value-delta-iscore



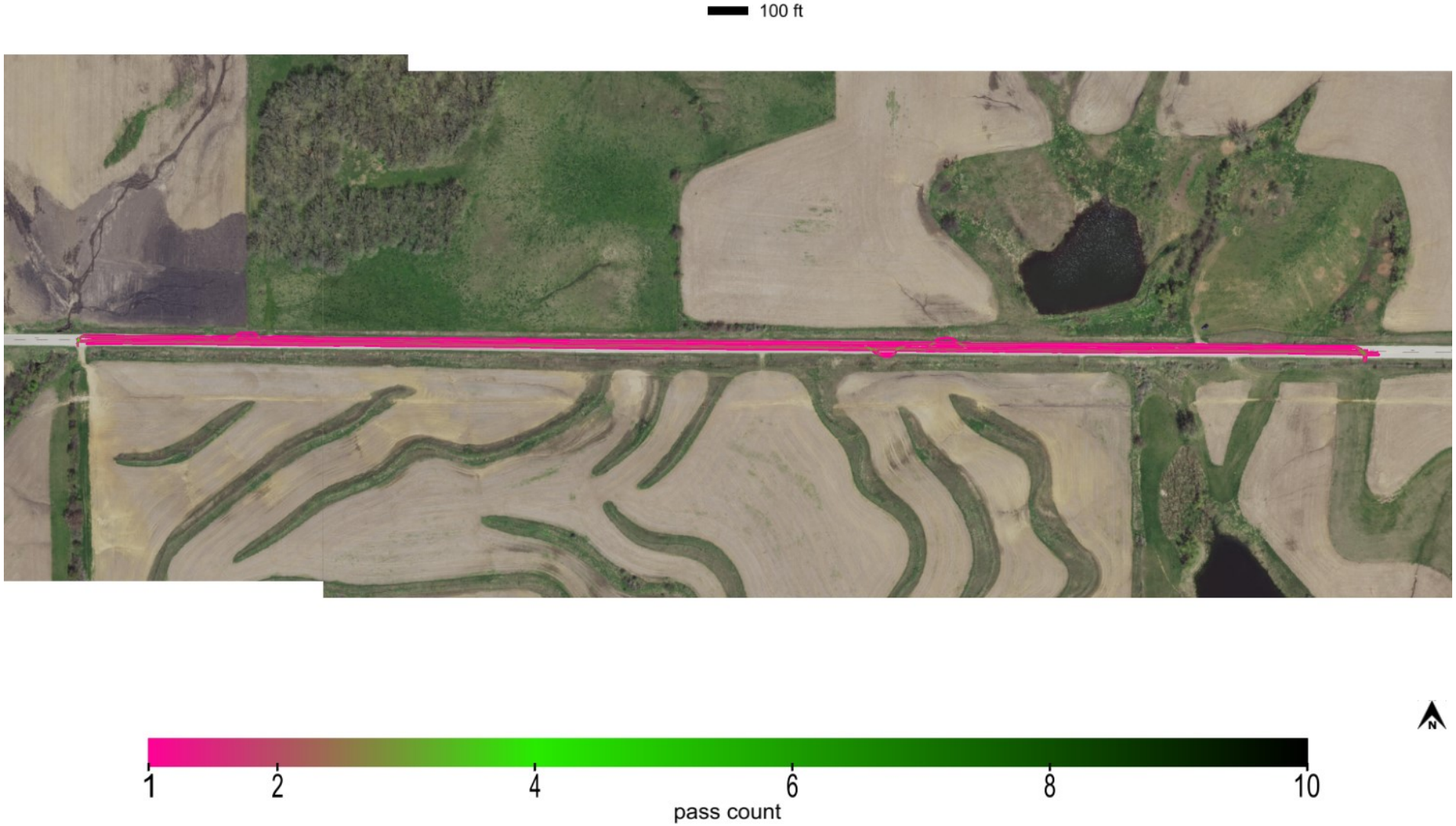
This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_134253a

minimum	average	maximum
1	1.42	4

pass count

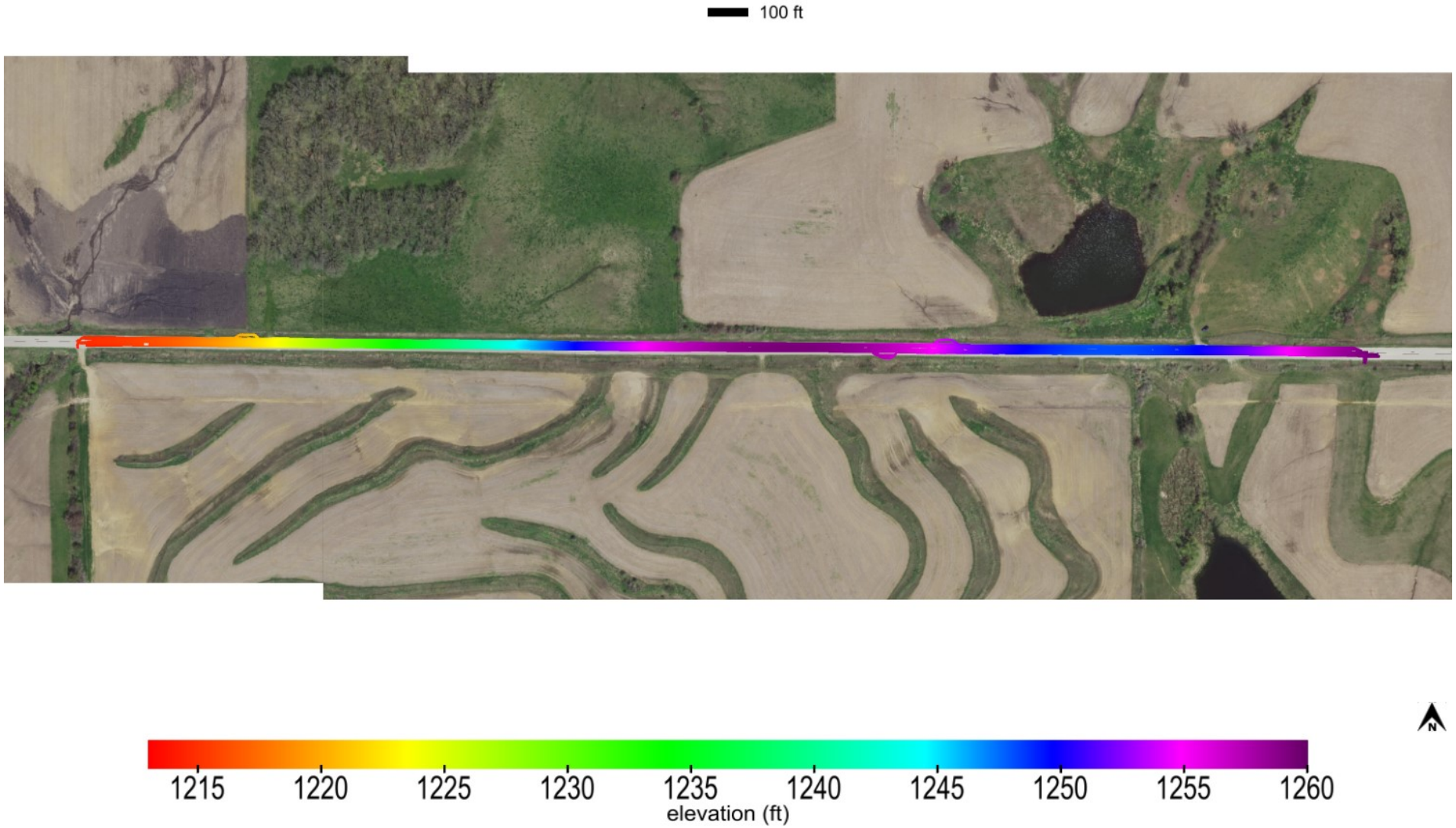


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_134253a

minimum	average	maximum
1213.836	1244.478	1259.555

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_01-160th_cs56-fcs00210_2019_09_13_134253a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	80580	1.85	12	8554	150	40

materials

100 ft

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:	160th Street	Mapping Duration (hrs):	1.24	Operator:	Ingios Geotechnics inc
Map ID:	iadot_01-160th_cs56-fcs00210_2019_09_13_143910a	No. of Measurements:	110056	Machine ID:	Ingios_FCS00210
Date and Time:	9/13/2019 2:39:10 PM	Location:	Adair County	State Plane:	7 IOWA Carroll-Atlantic

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	114.58	0.99	8554	7206.77	19610.3	51865	5957.63	30.38	-1347.23	11056.3	43311
k-value	Yes	26.3	40.77	0.43	150	20	124.3	190	38.48	30.97	-130	-25.7	40
Moisture Content	No												

Mapped Area

square feet	acres
110056	2.53

Pass Count

min.	avg.	max.
1	1.46	4

Elevation (ft)

min.	avg.	max.
1169.34	1220.56	1261.04

Velocity (fps)

min.	avg.	max.
0.21	5.48	6.16

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	110056	2.527	12	8554	150	40

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	160th Street	Mapping Duration (hrs):	1.24	Operator:	Ingios Geotechnics inc
Map ID:	iadot_01-160th_cs56-fcs00210_2019_09_13_143910a	No. of Measurements:	110056	Machine ID:	Ingios_FCS00210
Date and Time:	9/13/2019 2:39:10 PM	Location:	Adair County	State Plane:	7 IOWA Carroll-Atlantic

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
114.58	CQI > = 95
99.8	80% of Resilient Modulus MVs >= 8554
30.38	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:	160th Street	Mapping Duration (hrs):	1.24	Operator:	Ingios Geotechnics inc
Map ID:	iadot_01-160th_cs56-fcs00210_2019_09_13_143910a	No. of Measurements:	110056	Machine ID:	Ingios_FCS00210
Date and Time:	9/13/2019 2:39:10 PM	Location:	Adair County	State Plane:	7 IOWA Carroll-Atlantic

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
40.77	CQI > = 95
26.3	80% of k-Value MVs >= 150
30.97	COV <= 20
90.26	% 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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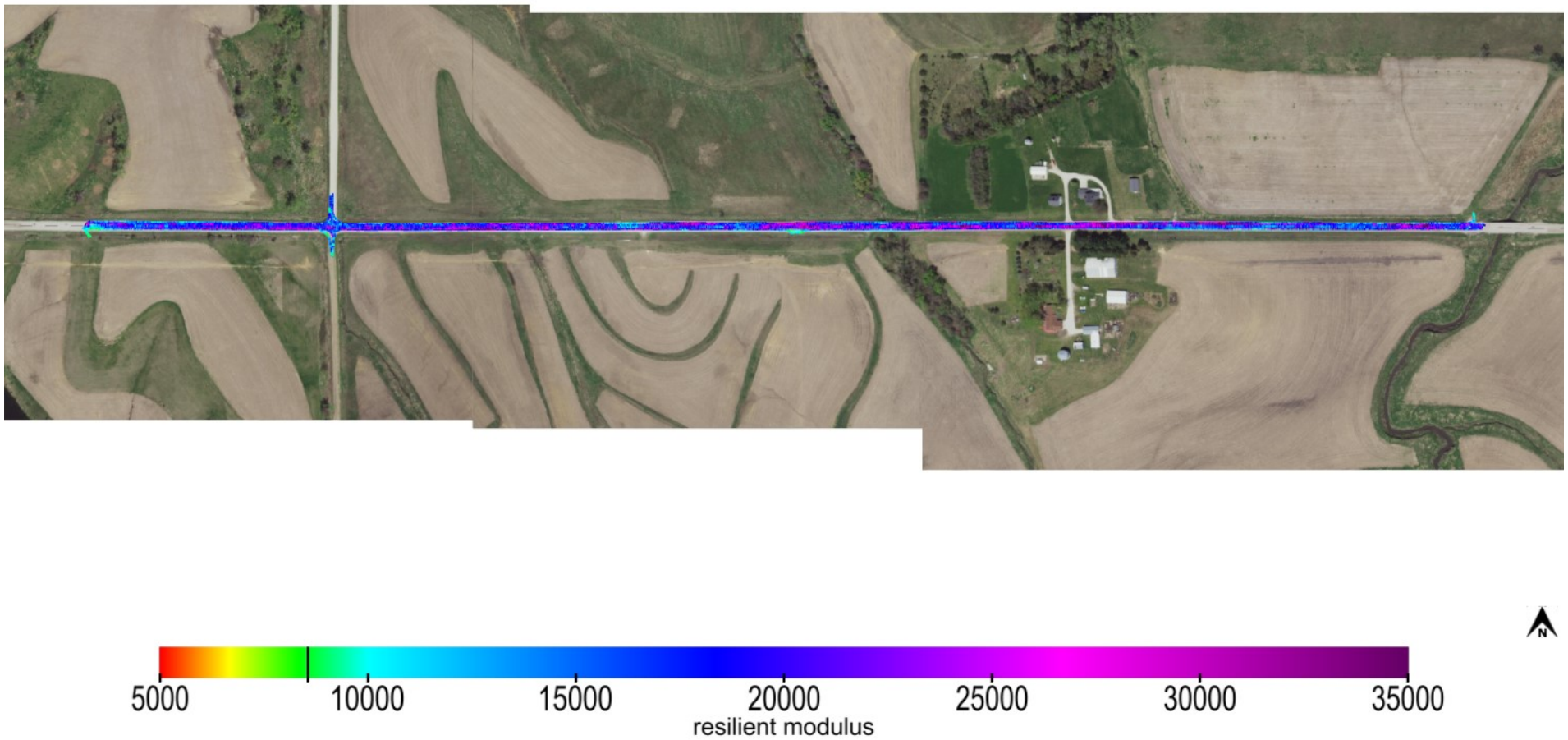
ingios GEOTECHNICS

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_143910a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.8	114.58	0.99	8554	7206.77	19610.3	51865	5957.63	30.38	-1347.23	11056.3	43311

resilient modulus



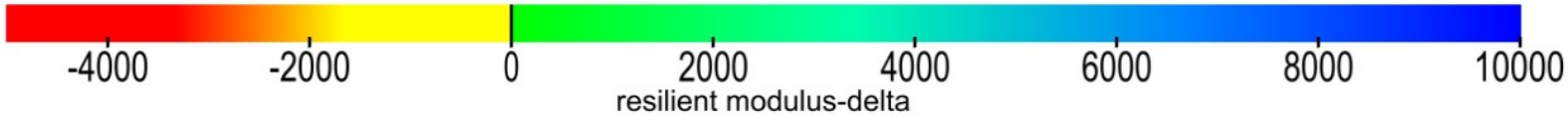
This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_143910a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.8	114.58	0.99	8554	7206.77	19610.3	51865	5957.63	30.38	-1347.23	11056.3	43311

resilient modulus-delta

100 ft



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ingios GEOTECHNICS

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_143910a

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	-1347.23	11056.3	43311	327.41	11250.05	24457.03

resilient modulus-delta-iscore

100 ft

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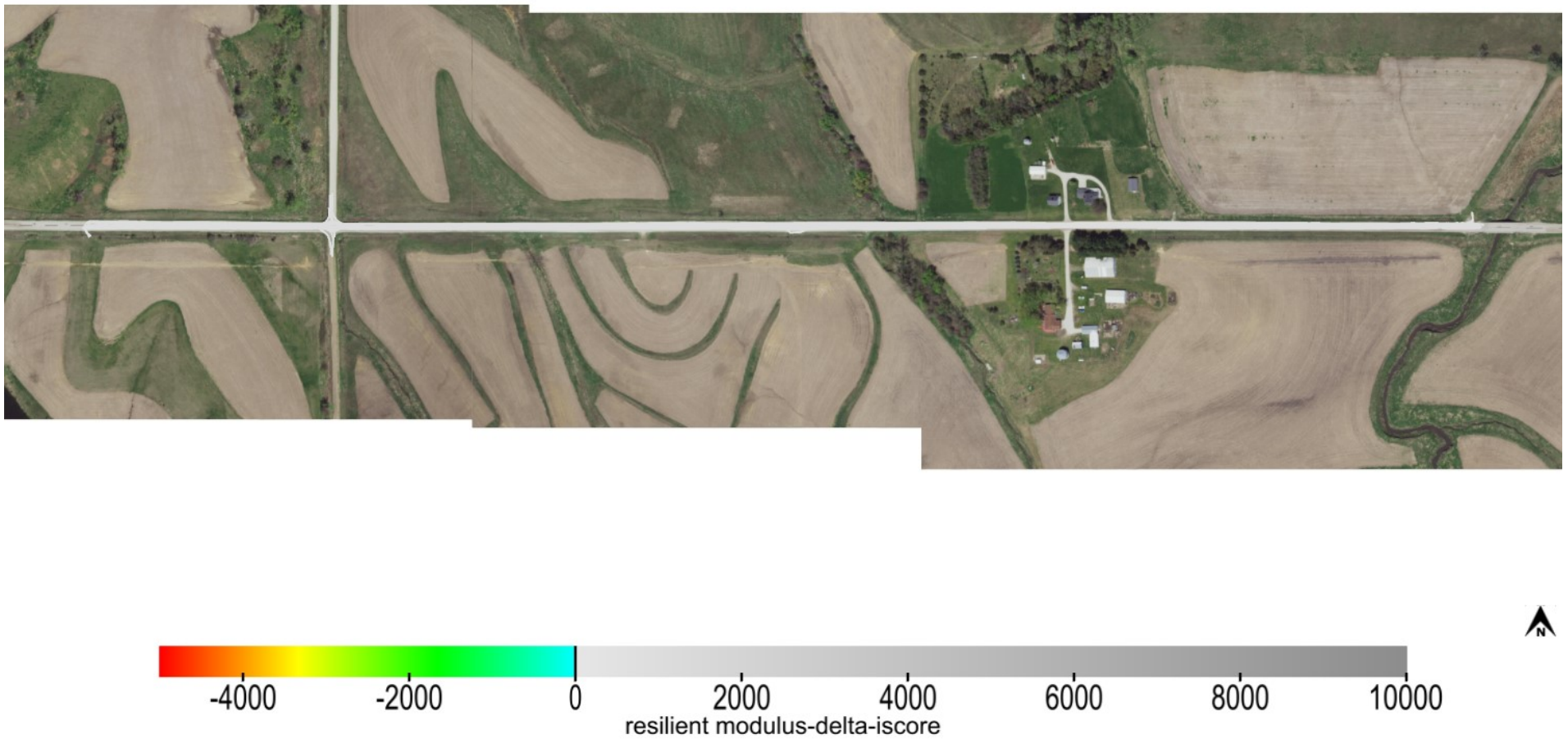
ingios GEOTECHNICS

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_143910a

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

blobs: resilient modulus-delta-iscore



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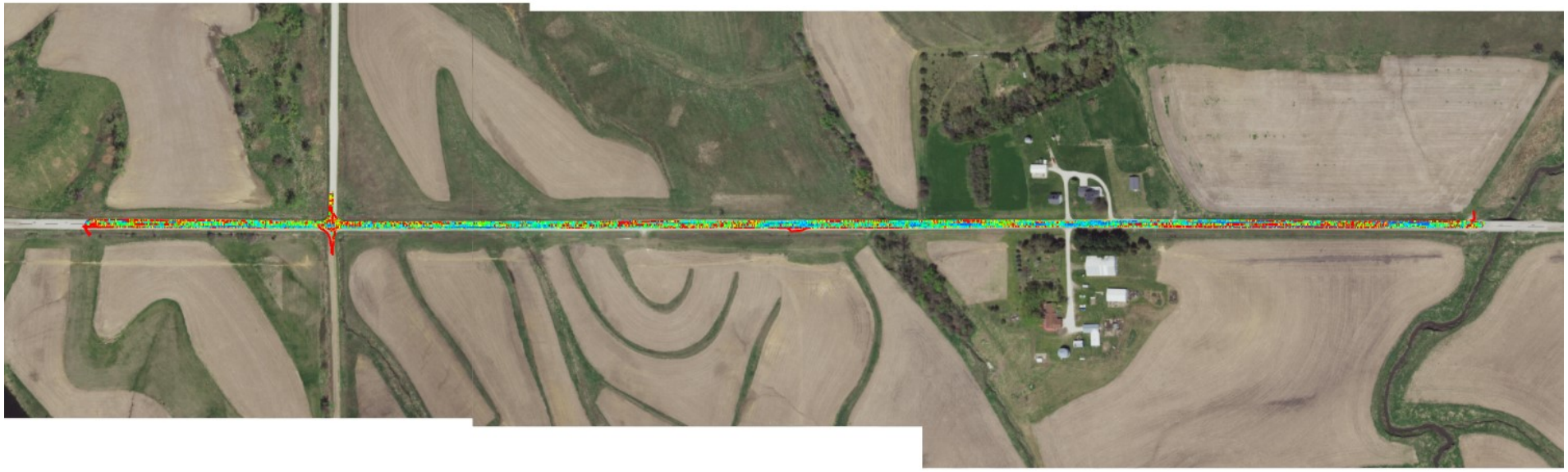
ingios GEOTECHNICS

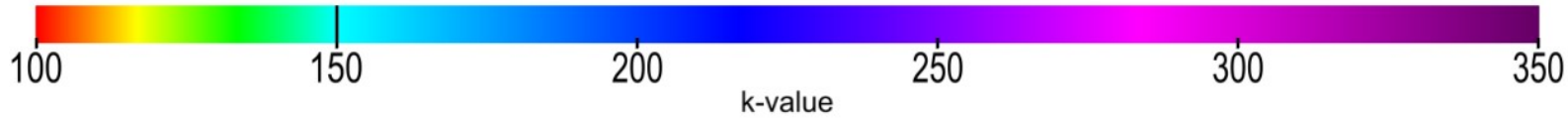
Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_143910a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	26.3	40.77	0.43	150	20	124.3	190	38.48	30.97	-130	-25.7	40

k-value

100 ft





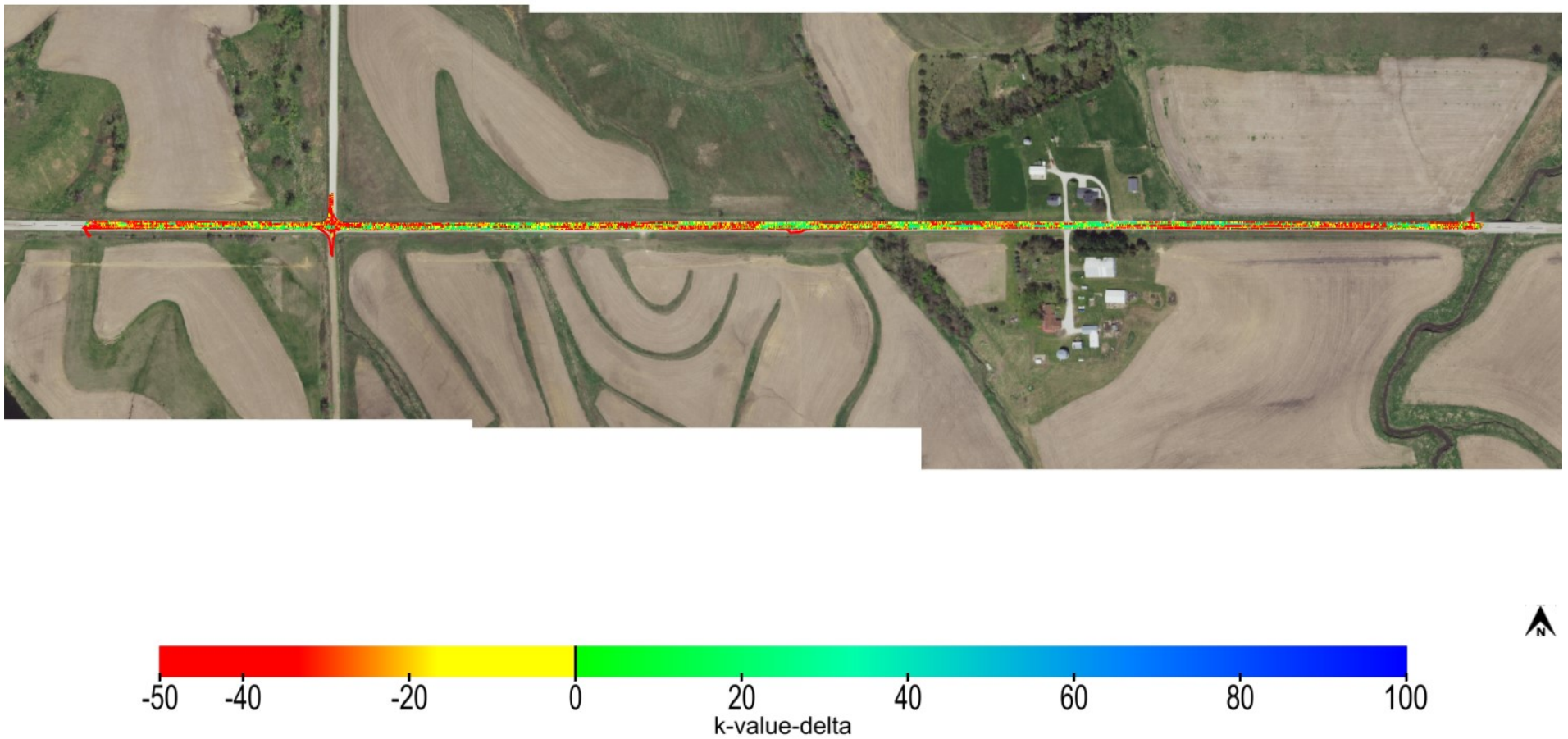
This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_143910a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	26.3	40.77	0.43	150	20	124.3	190	38.48	30.97	-130	-25.7	40

k-value-delta



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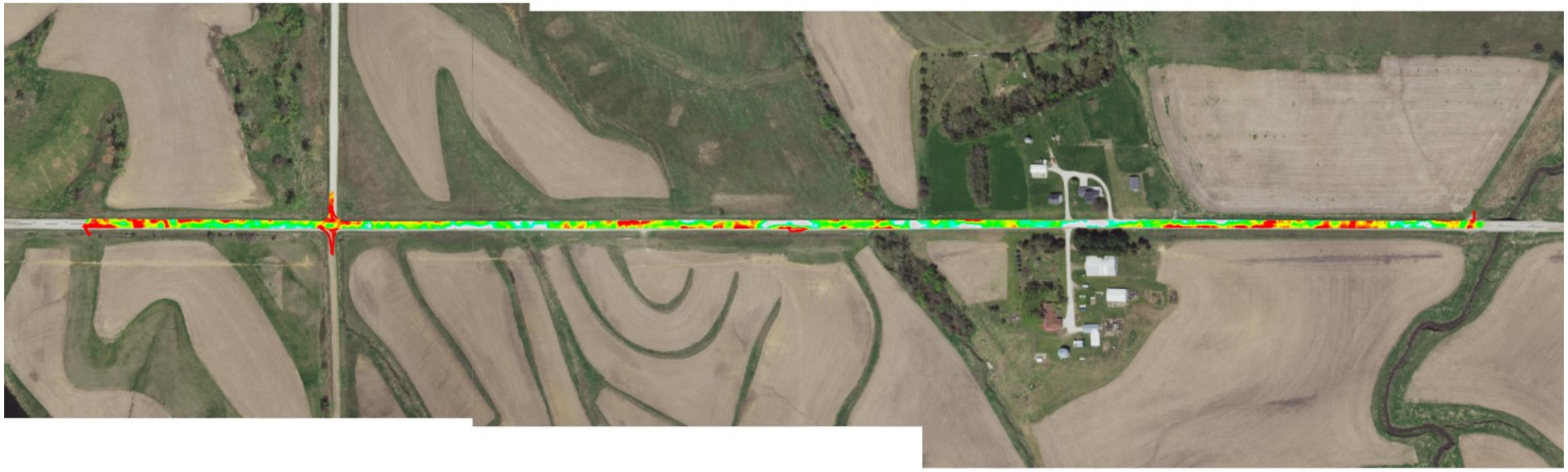
Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_143910a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	26.3	150	-130	-25.7	40	-130	-24.64	24.77

k-value-delta-iscore

100 ft



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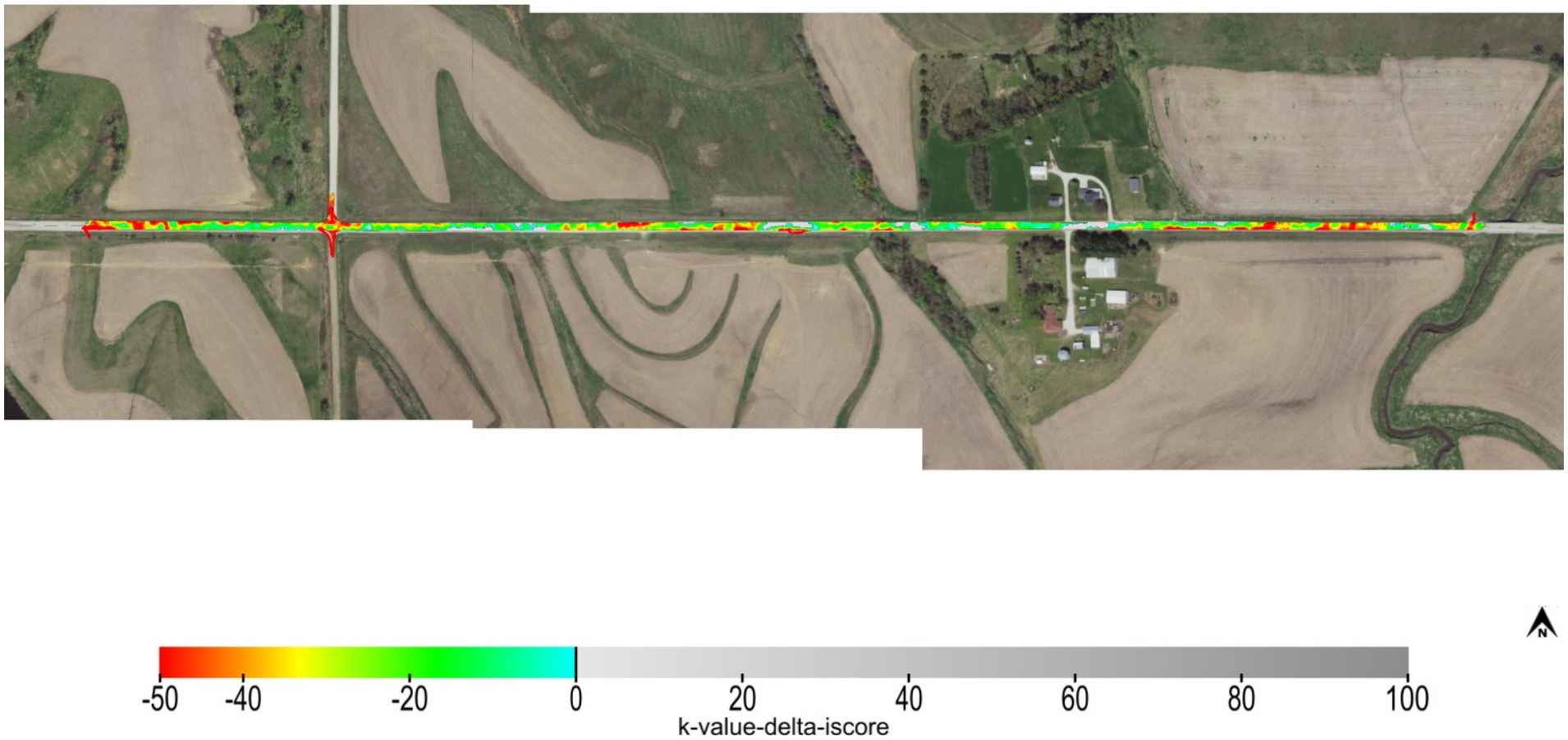
ingios GEOTECHNICS

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_143910a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	3	99333	90.26	none	0

blobs: k-value-delta-iscore



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ingios GEOTECHNICS

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_143910a

minimum	average	maximum
1	1.46	4

pass count

100 ft

1 2 4 6 8 10

pass count

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ingios GEOTECHNICS

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_143910a

minimum	average	maximum
1169.338	1220.559	1261.041

elevation

100 ft

1169 1180 1200 1220 1240 1260

elevation (ft)

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ingios GEOTECHNICS

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_143910a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	110056	2.527	12	8554	150	40

materials

100 ft

Modified Subbase_IADOT (2115)

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ingios GEOTECHNICS

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_143910a

20190913_144411.jpg

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ingios GEOTECHNICS

Map ID: iadot_01-160th_cs56-fcs00210_2019_09_13_143910a

20190913_151246.jpg

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US20 Blackhawk County	Mapping Duration (hrs):	0.42	Operator:	Ingios Geotechnics inc
Map ID:	iadot_07-us20_cs56-fcs00210_2019_08_27_113527a	No. of Measurements:	26687	Machine ID:	Ingios_FCS00210
Date and Time:	8/27/2019 11:35:27 AM	Location:	Black Hawk County	State Plane:	5 IOWA Waterloo

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	118	1.25	8554	6263.55	18646.5	41118.14	4423.84	23.72	-2290.45	10092.5	32564.14
k-value	Yes	43.8	59.7	0.49	150	60	127.1	160	35.77	28.14	-90	-22.9	10
Moisture Content	No												

Mapped Area

square feet	acres
26687	0.61

Pass Count

min.	avg.	max.
1	1.8	8

Elevation (ft)

min.	avg.	max.
763.94	767.13	768.72

Velocity (fps)

min.	avg.	max.
0.25	5.4	6.71

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	26687	0.613	12	8554	150	40

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US20 Blackhawk County	Mapping Duration (hrs):	0.42	Operator:	Ingios Geotechnics inc
Map ID:	iadot_07-us20_cs56-fcs00210_2019_08_27_113527a	No. of Measurements:	26687	Machine ID:	Ingios_FCS00210
Date and Time:	8/27/2019 11:35:27 AM	Location:	Black Hawk County	State Plane:	5 IOWA Waterloo

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
118	CQI > = 95
99.9	80% of Resilient Modulus MVs >= 8554
23.72	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:	US20 Blackhawk County	Mapping Duration (hrs):	0.42	Operator:	Ingios Geotechnics inc
Map ID:	iadot_07-us20_cs56-fcs00210_2019_08_27_113527a	No. of Measurements:	26687	Machine ID:	Ingios_FCS00210
Date and Time:	8/27/2019 11:35:27 AM	Location:	Black Hawk County	State Plane:	5 IOWA Waterloo

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
59.7	CQI > = 95
43.8	80% of k-Value MVs >= 150
28.14	COV <= 20
83.07	% 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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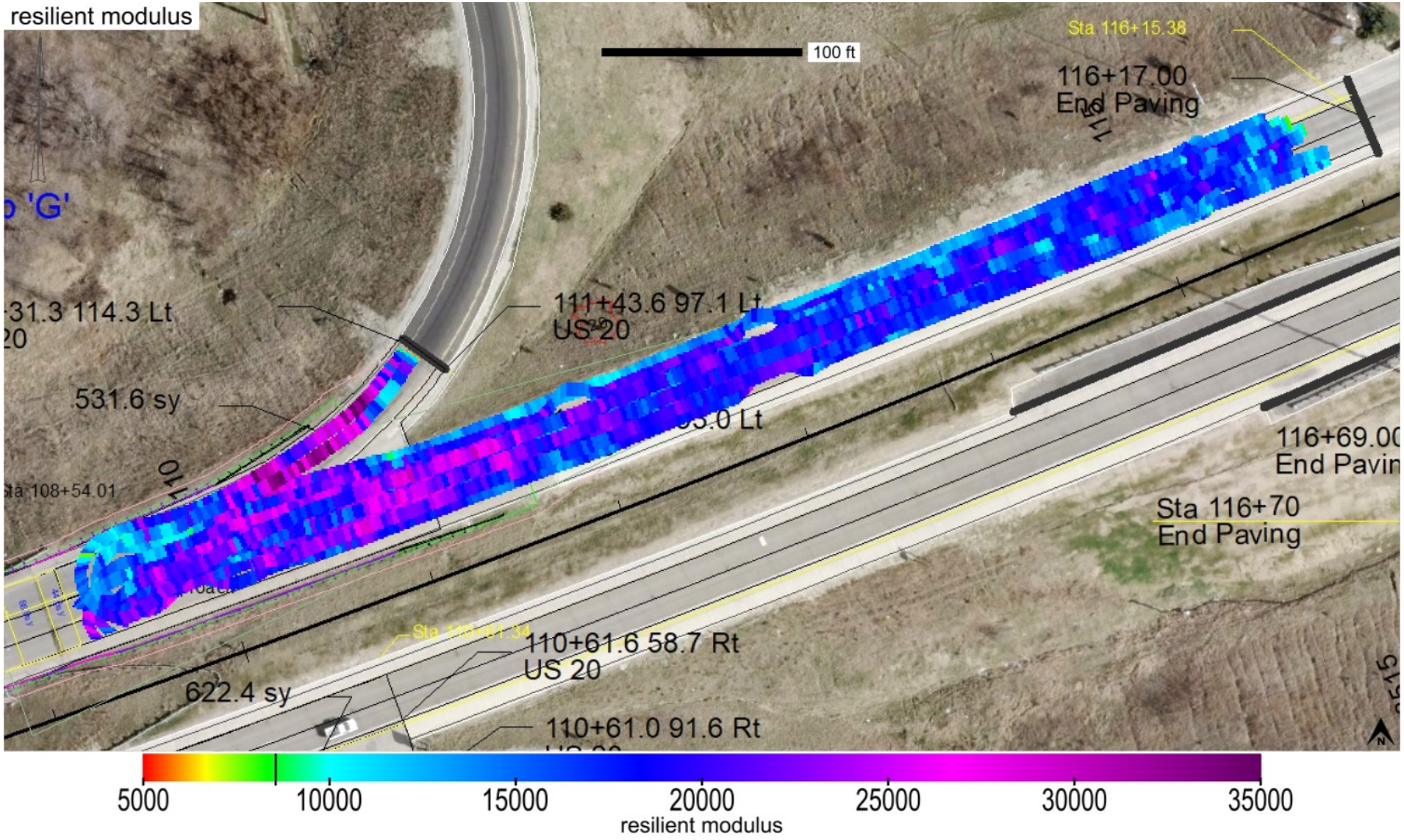
ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_27_113527a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.9	118	1.25	8554	6263.55	18646.5	41118.14	4423.84	23.72	-2290.45	10092.5	32564.14



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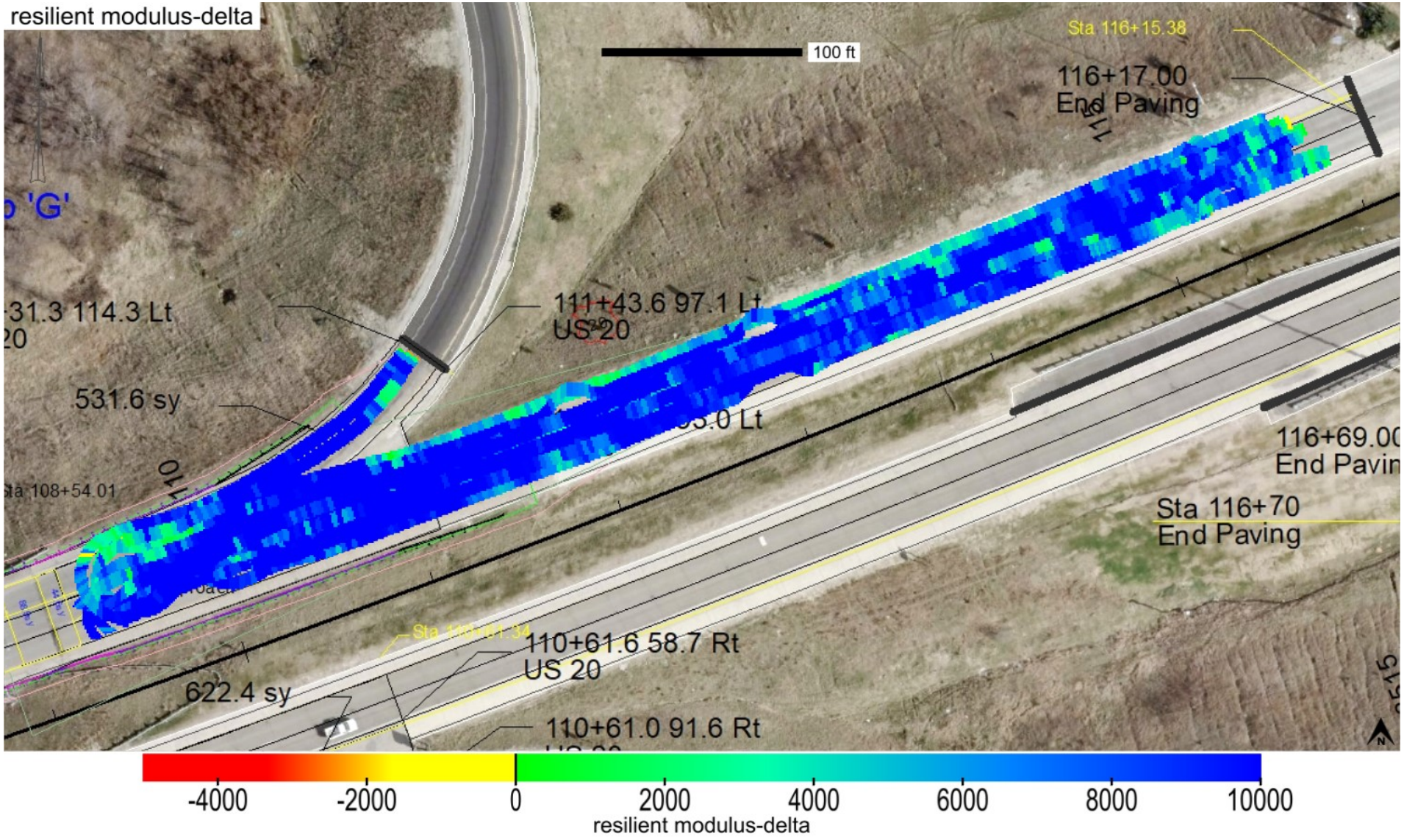
ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_27_113527a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.9	118	1.25	8554	6263.55	18646.5	41118.14	4423.84	23.72	-2290.45	10092.5	32564.14



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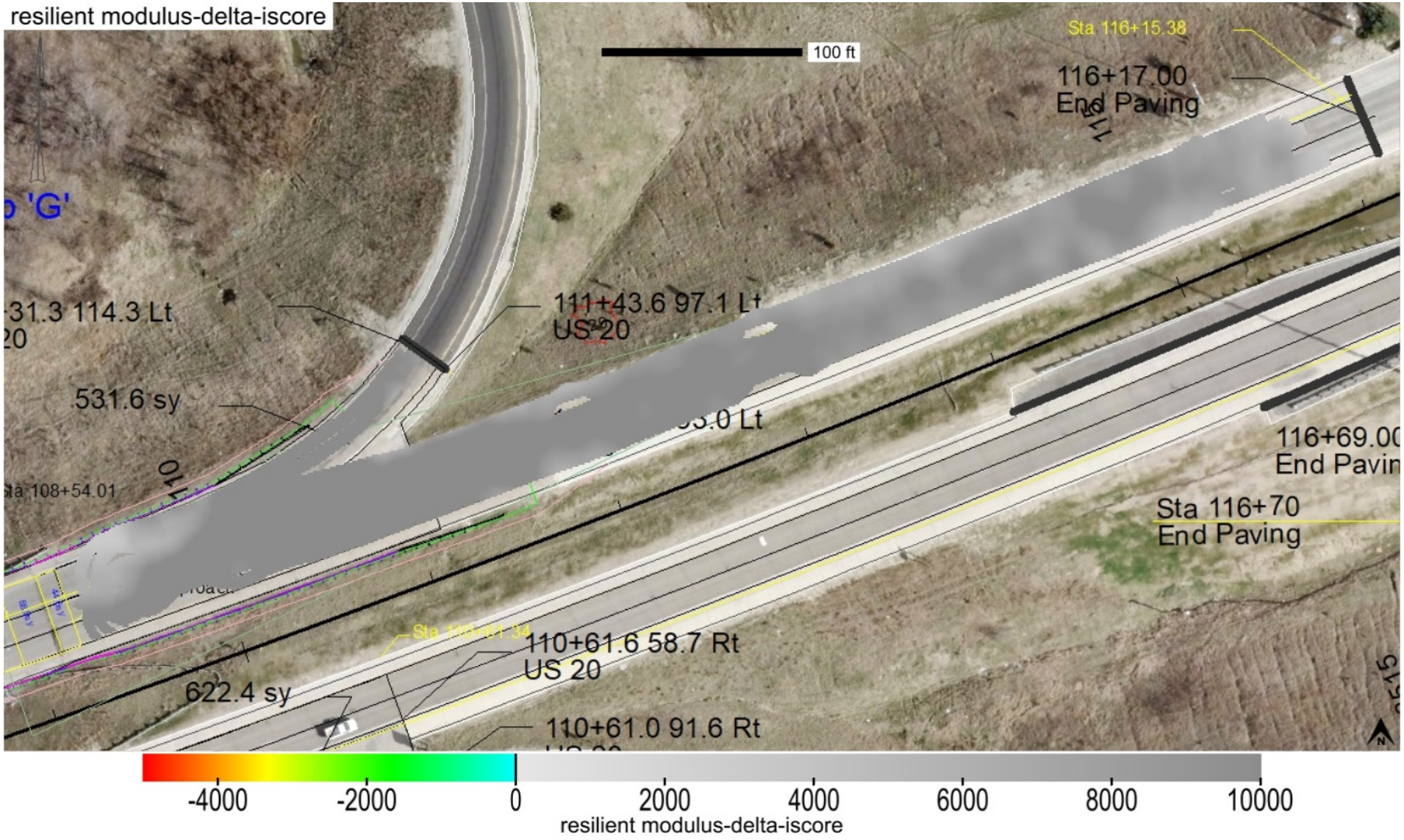
ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_27_113527a

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	8554	-2290.45	10092.5	32564.14	2839.68	10185.55	21982.81

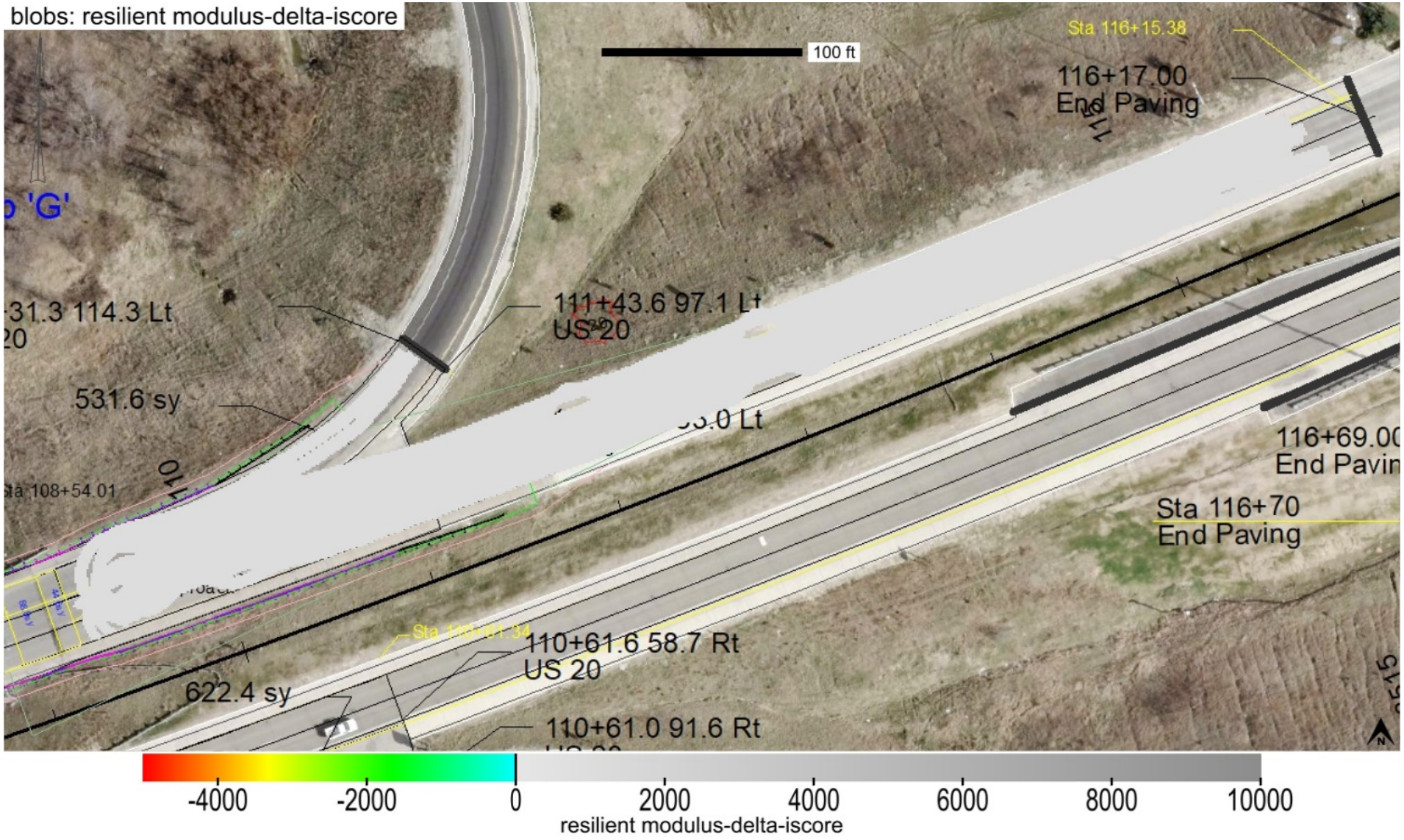


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_27_113527a

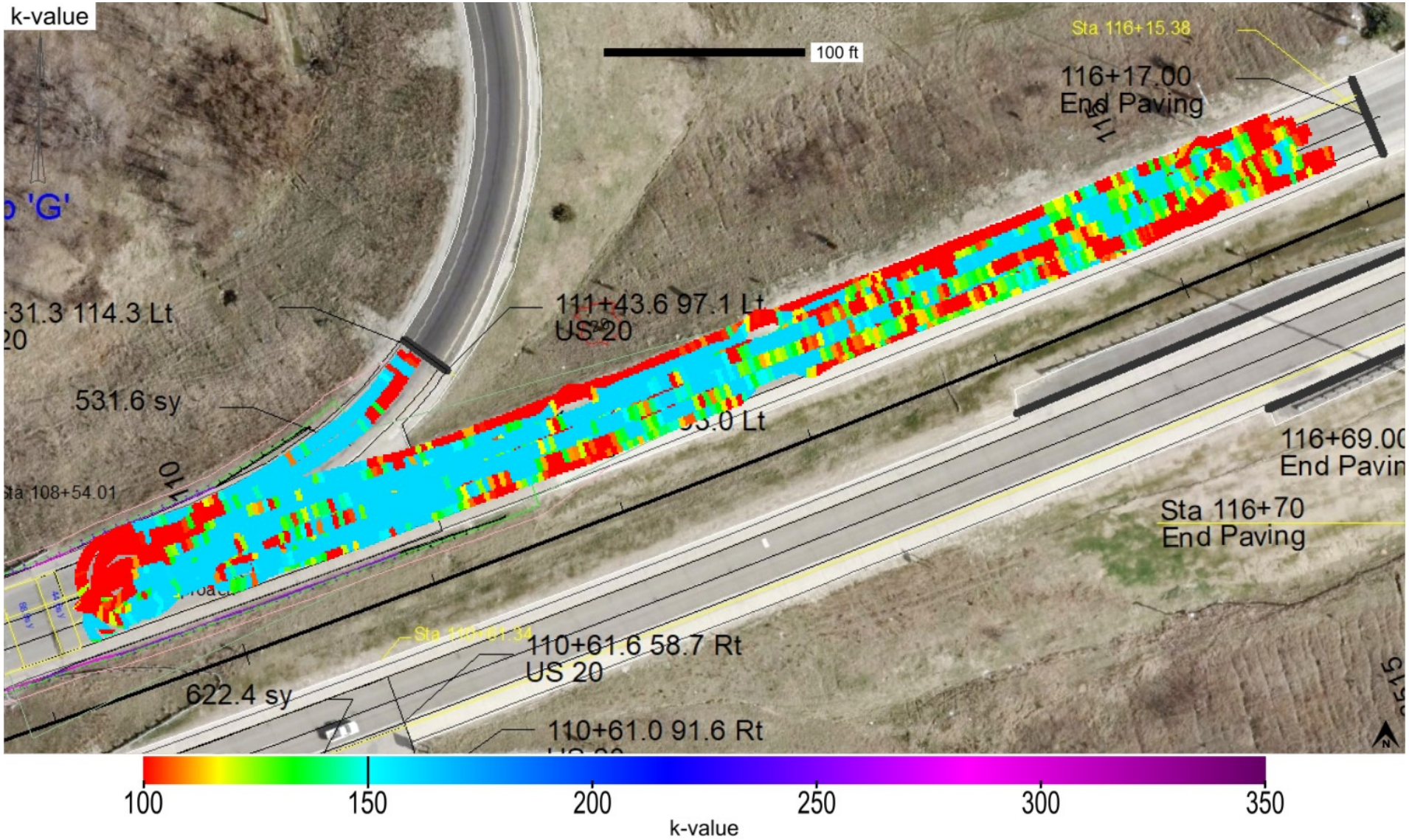
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0



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_07-us20_cs56-fcs00210_2019_08_27_113527a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	43.8	59.7	0.49	150	60	127.1	160	35.77	28.14	-90	-22.9	10

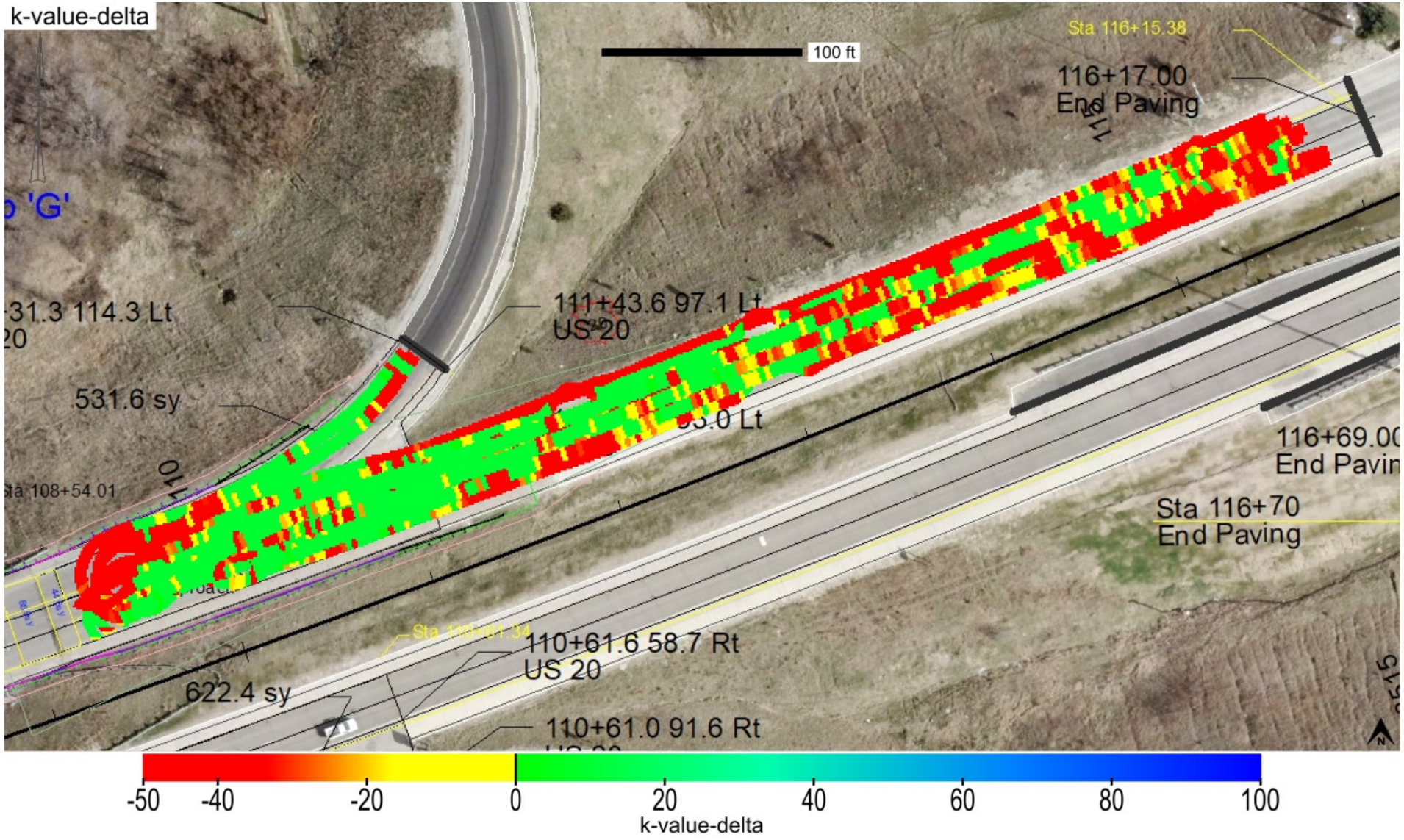


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_27_113527a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	43.8	59.7	0.49	150	60	127.1	160	35.77	28.14	-90	-22.9	10



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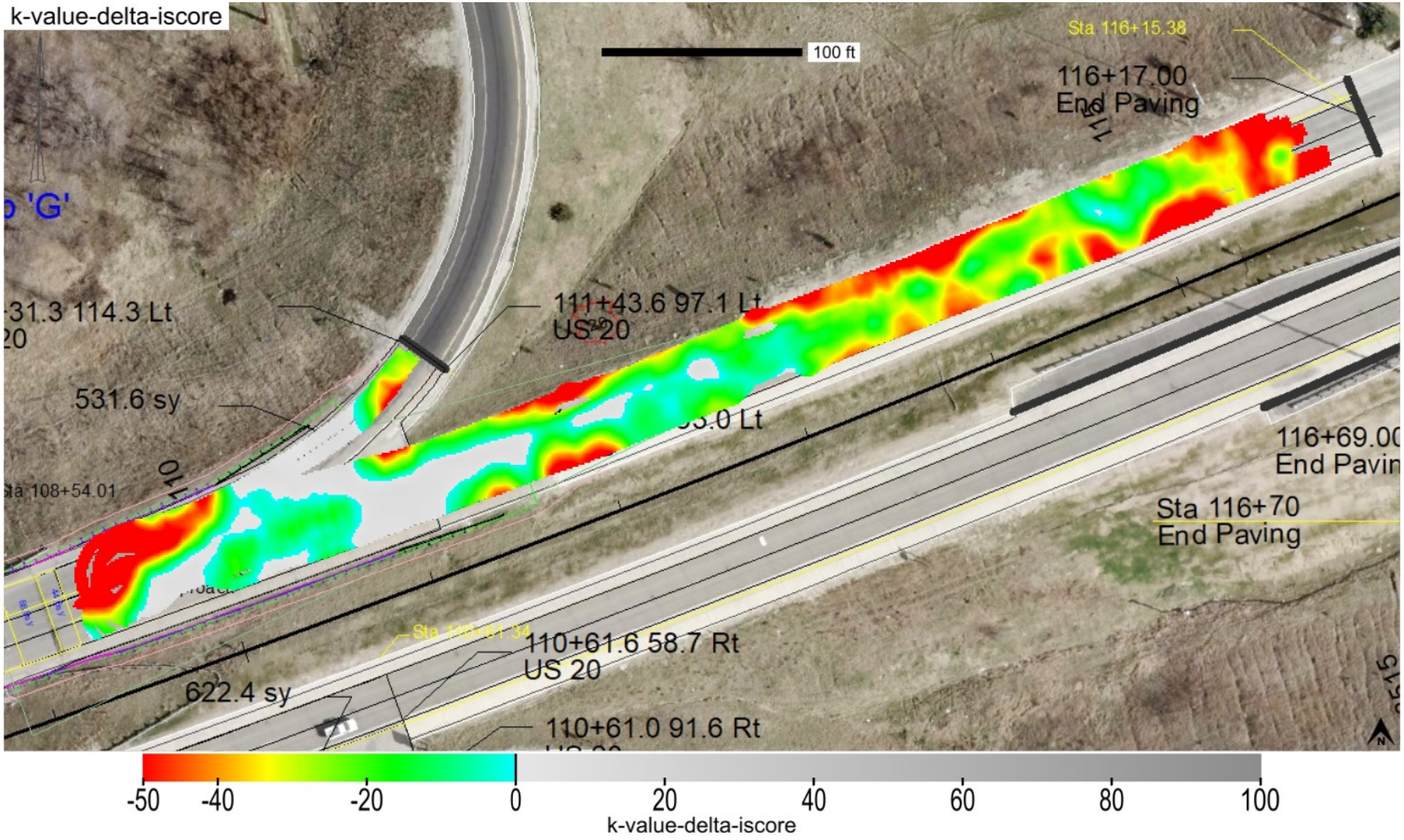
ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_27_113527a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	43.8	150	-90	-22.9	10	-89.96	-22.12	10



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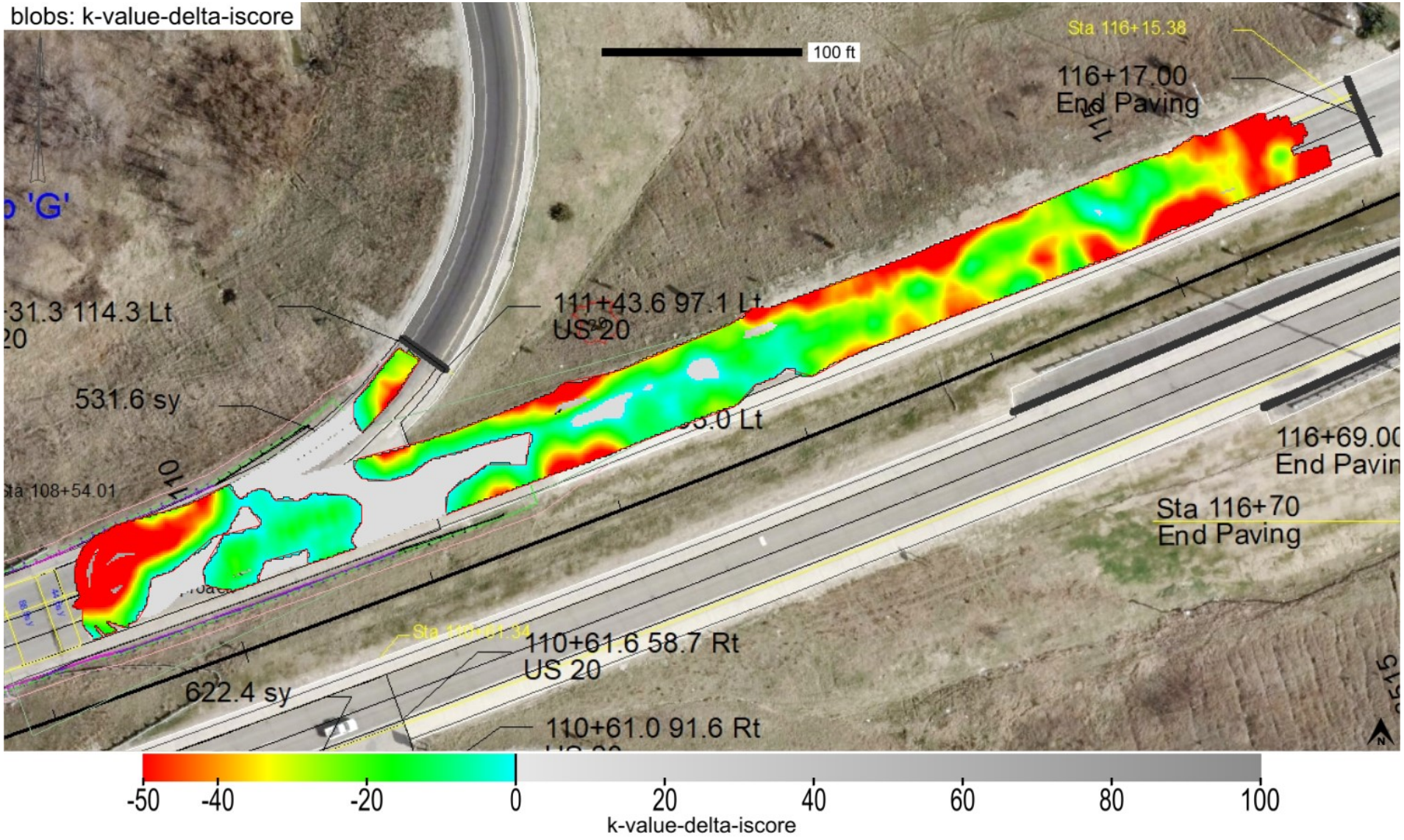
ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_27_113527a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	3	22170	83.07	none	0



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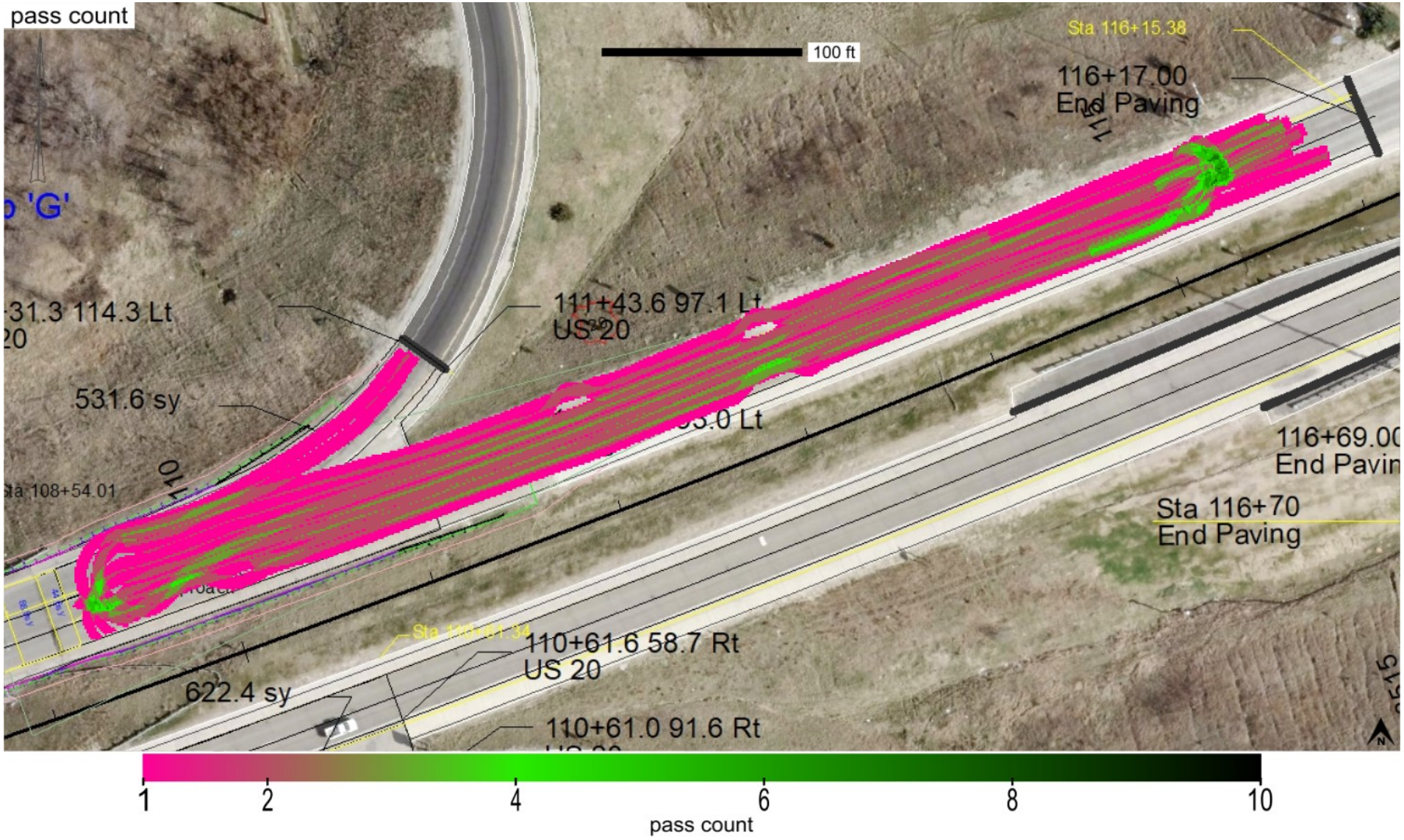
ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_27_113527a

minimum	average	maximum
1	1.8	8



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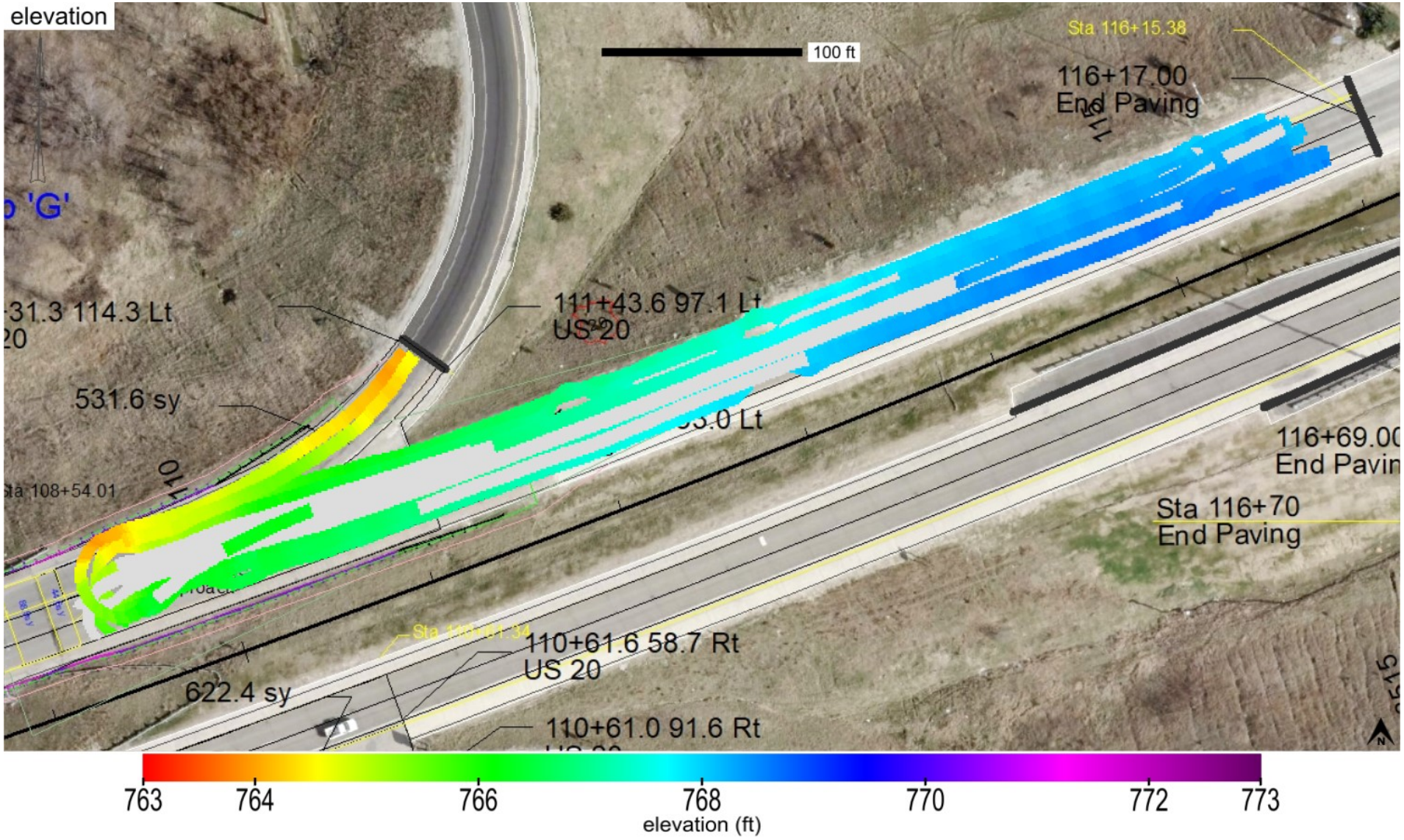
ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_27_113527a

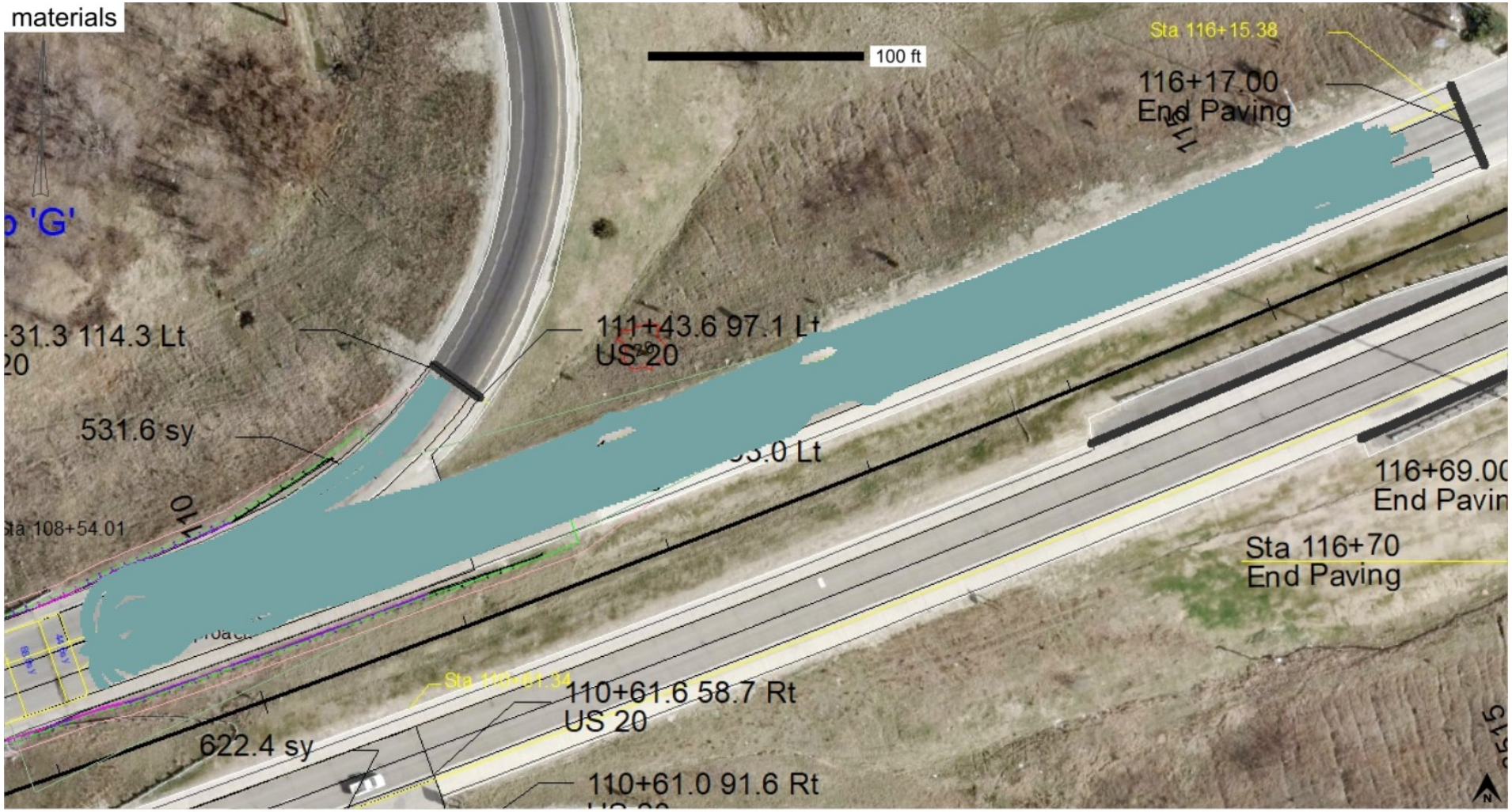
minimum	average	maximum
763.936	767.131	768.716



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_07-us20_cs56-fcs00210_2019_08_27_113527a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	26687	0.613	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_07-us20_cs56-fcs00210_2019_08_27_113527a

20190827_133847.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_07-us20_cs56-fcs00210_2019_08_27_113527a

20190827_152252.jpg

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US20 Blackhawk County	Mapping Duration (hrs):	0.63	Operator:	Ingios Geotechnics inc
Map ID:	iadot_07-us20_cs56-fcs00210_2019_08_27_190946a	No. of Measurements:	46550	Machine ID:	Ingios_FCS00210
Date and Time:	8/27/2019 7:09:46 PM	Location:	Black Hawk County	State Plane:	5 IOWA Waterloo

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	99.7	115.48	1.06	8554	5500	20566.4	47838.81	5847.65	28.43	-3054	12012.4	39284.81
k-value	Yes	54.8	71.96	0.57	150	60	133.7	160	34.41	25.73	-90	-16.3	10
Moisture Content	No												

Mapped Area

square feet	acres
46550	1.07

Pass Count

min.	avg.	max.
1	1.57	6

Elevation (ft)

min.	avg.	max.
759.66	761.64	764.09

Velocity (fps)

min.	avg.	max.
0.12	5.46	6.55

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	46550	1.069	12	8554	150	40

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US20 Blackhawk County	Mapping Duration (hrs):	0.63	Operator:	Ingios Geotechnics inc
Map ID:	iadot_07-us20_cs56-fcs00210_2019_08_27_190946a	No. of Measurements:	46550	Machine ID:	Ingios_FCS00210
Date and Time:	8/27/2019 7:09:46 PM	Location:	Black Hawk County	State Plane:	5 IOWA Waterloo

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
115.48	CQI > = 95
99.7	80% of Resilient Modulus MVs >= 8554
28.43	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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IOWADOT

E-Compaction Report

Project:	US20 Blackhawk County	Mapping Duration (hrs):	0.63	Operator:	Ingios Geotechnics inc
Map ID:	iadot_07-us20_cs56-fcs00210_2019_08_27_190946a	No. of Measurements:	46550	Machine ID:	Ingios_FCS00210
Date and Time:	8/27/2019 7:09:46 PM	Location:	Black Hawk County	State Plane:	5 IOWA Waterloo

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
71.96	CQI > = 95
54.8	80% of k-Value MVs >= 150
25.73	COV <= 20
69.99	% 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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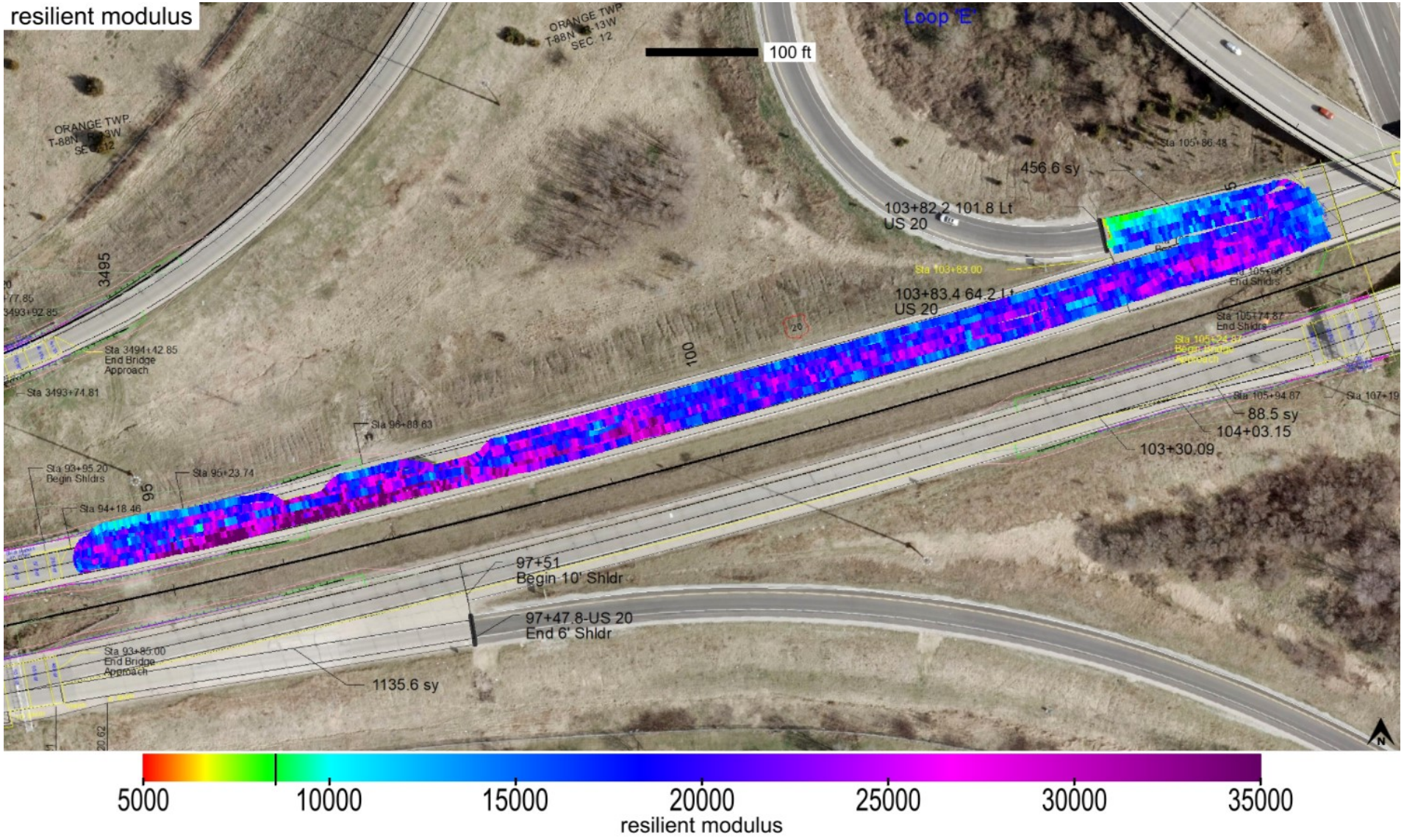
ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_27_190946a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.7	115.48	1.06	8554	5500	20566.4	47838.81	5847.65	28.43	-3054	12012.4	39284.81



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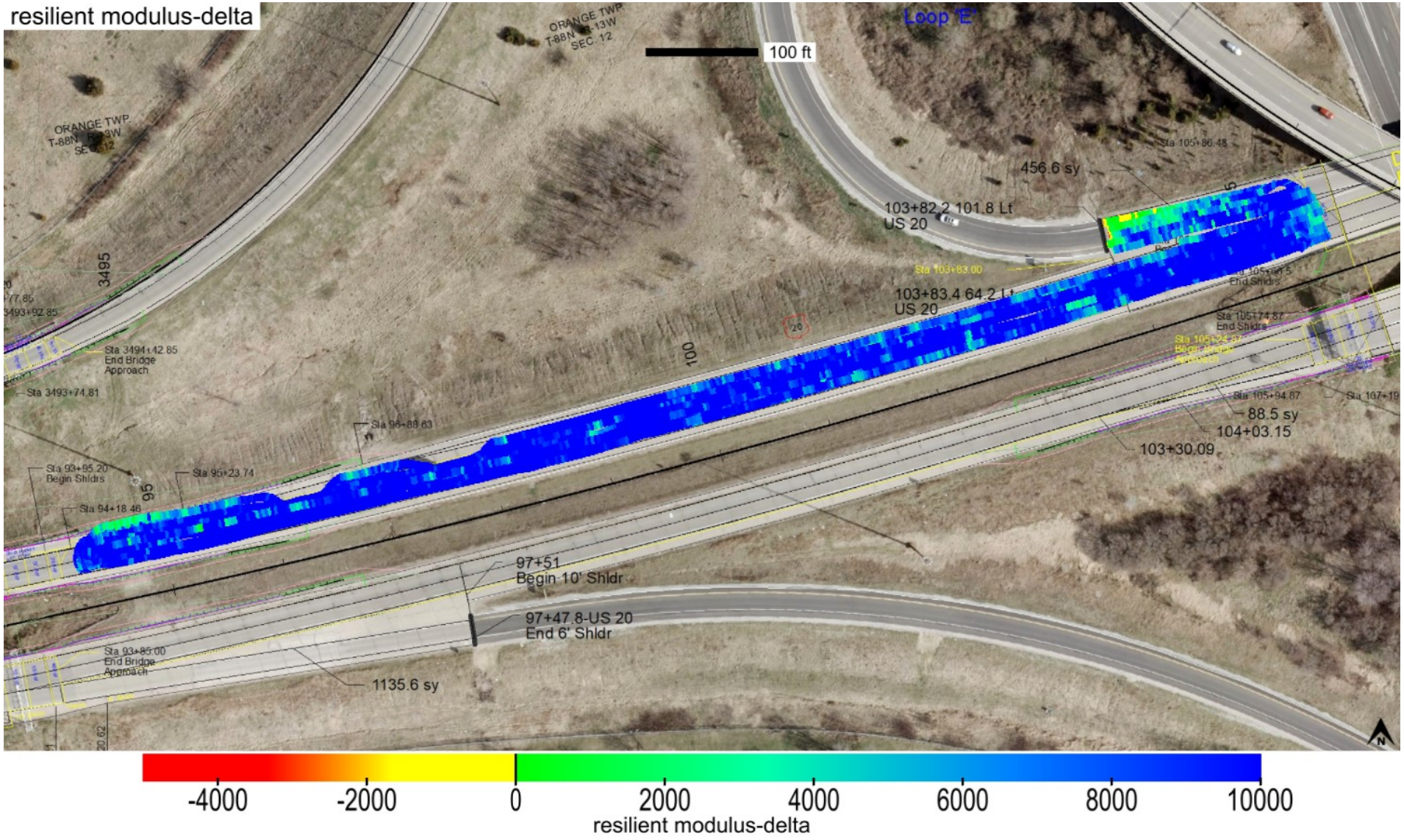
ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_27_190946a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.7	115.48	1.06	8554	5500	20566.4	47838.81	5847.65	28.43	-3054	12012.4	39284.81



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ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_27_190946a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	99.7	8554	-3054	12012.4	39284.81	-80.82	12054.03	29884.86

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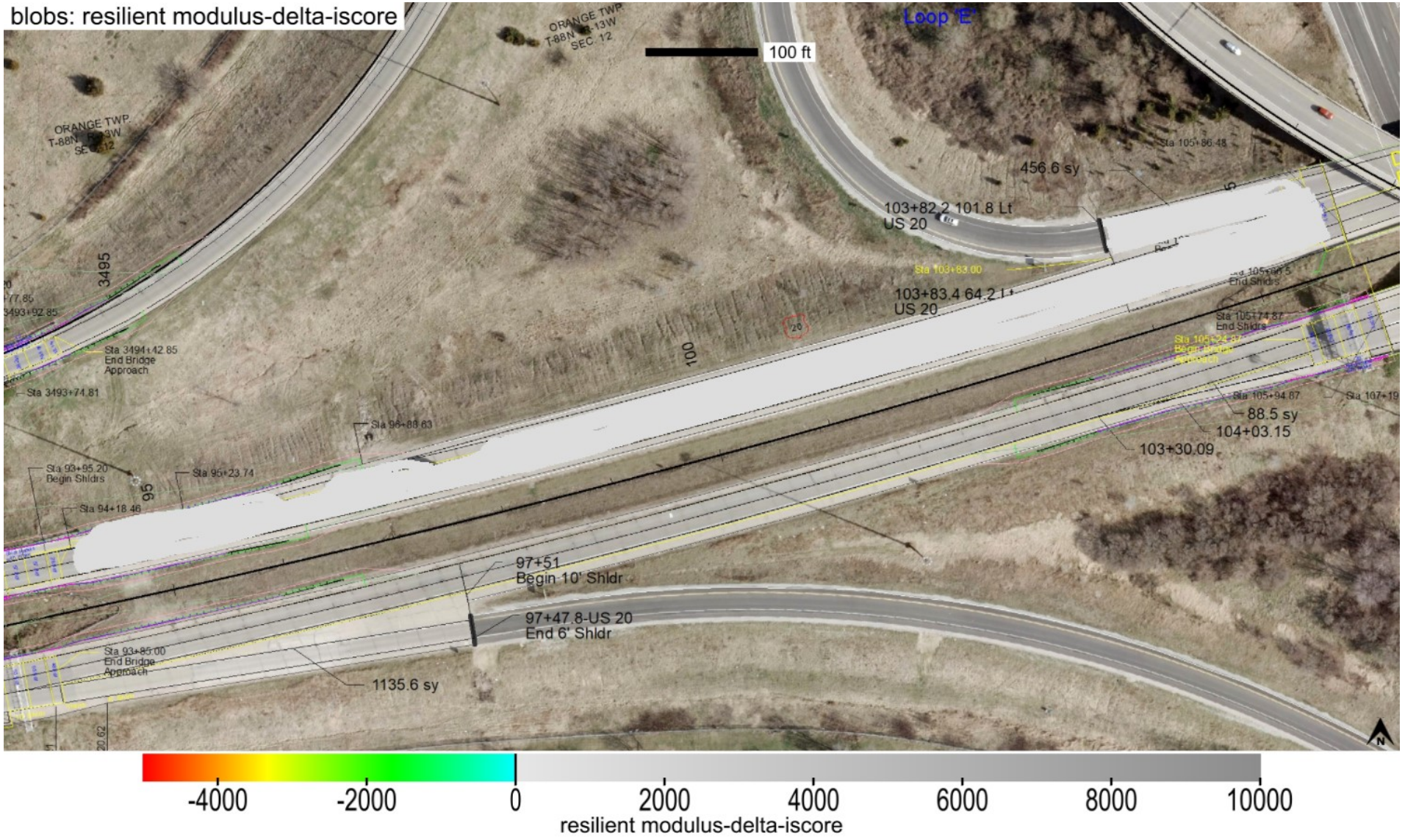
ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_27_190946a

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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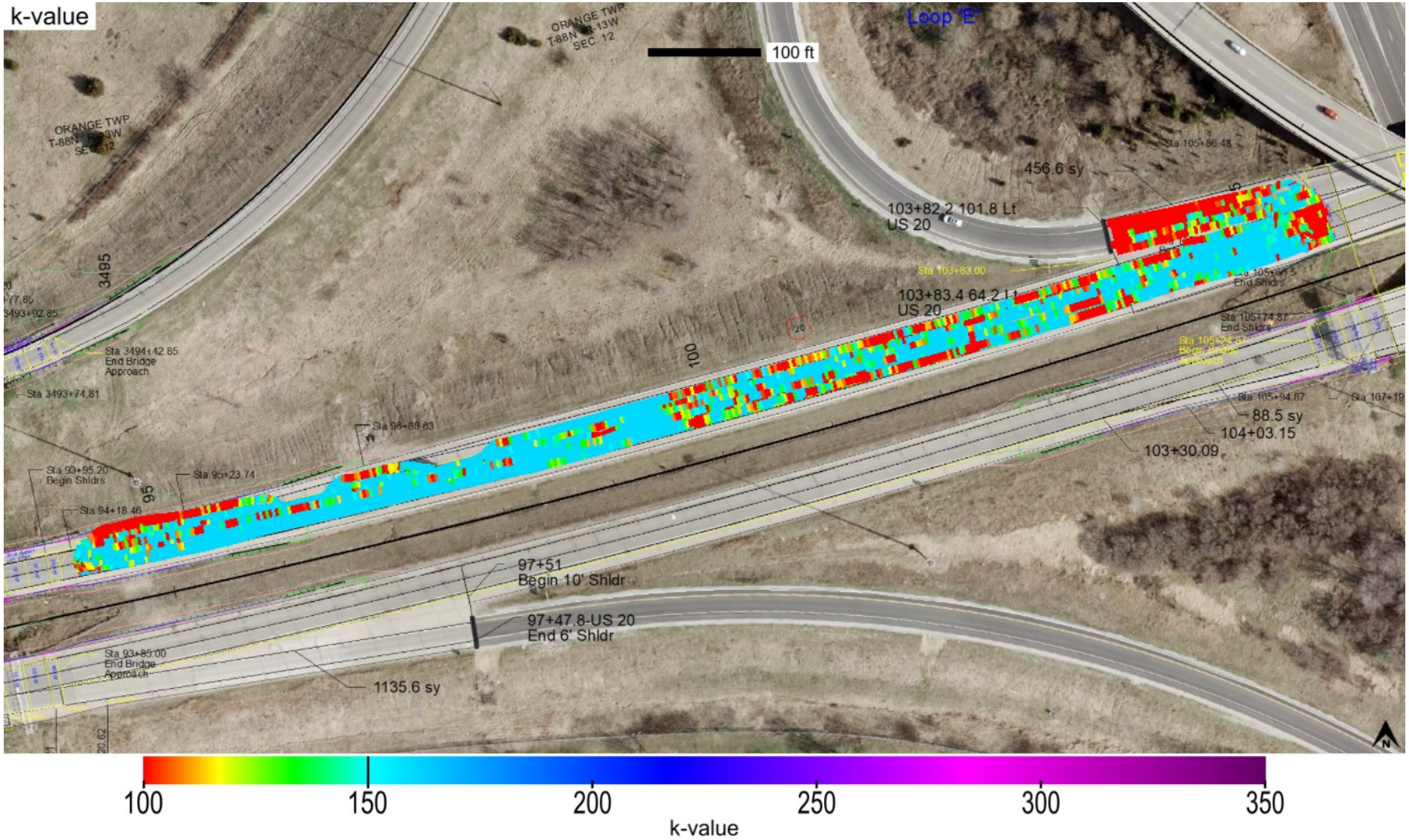
ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_27_190946a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	54.8	71.96	0.57	150	60	133.7	160	34.41	25.73	-90	-16.3	10



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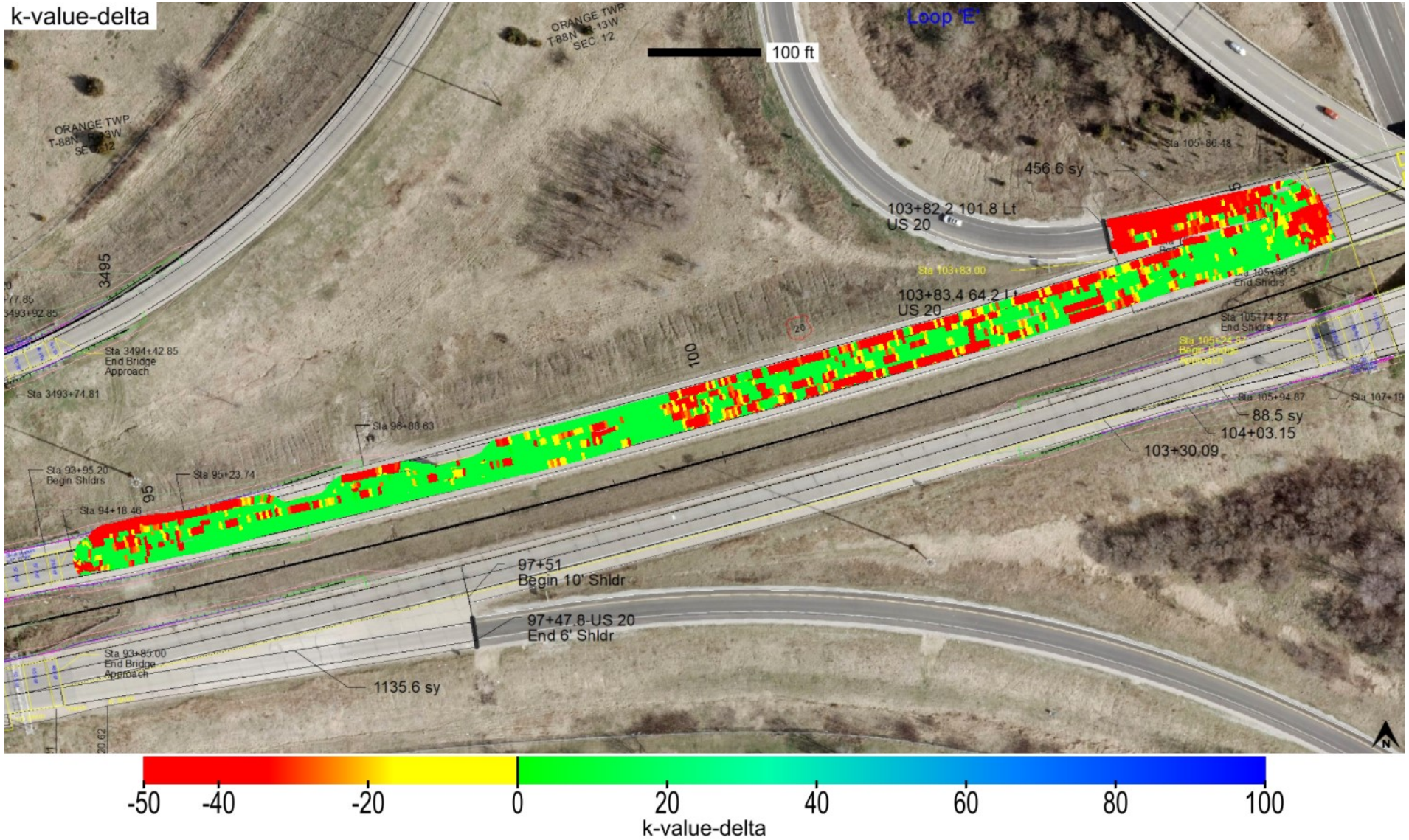
ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_27_190946a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	54.8	71.96	0.57	150	60	133.7	160	34.41	25.73	-90	-16.3	10



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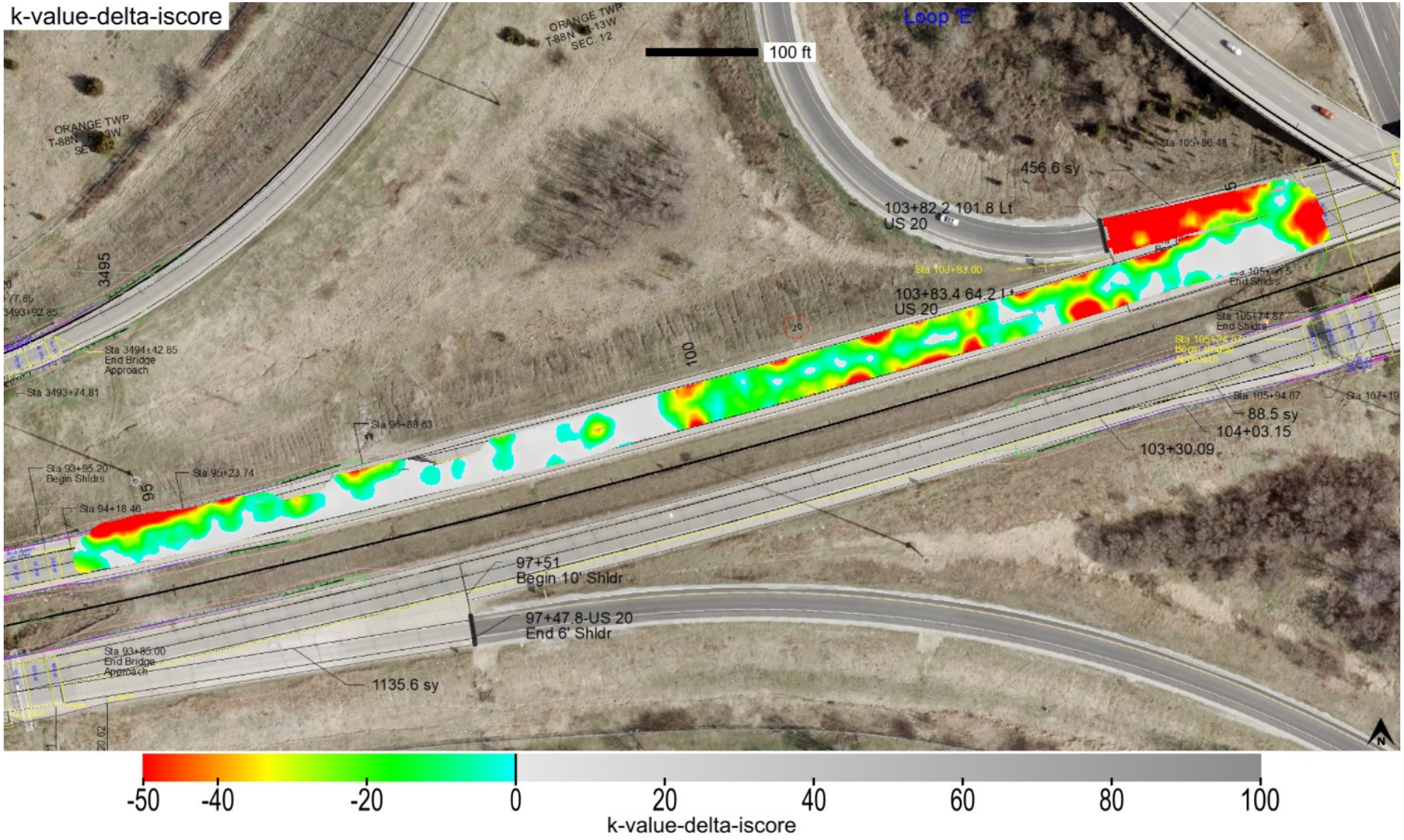
ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_27_190946a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	54.8	150	-90	-16.3	10	-90	-15.88	10



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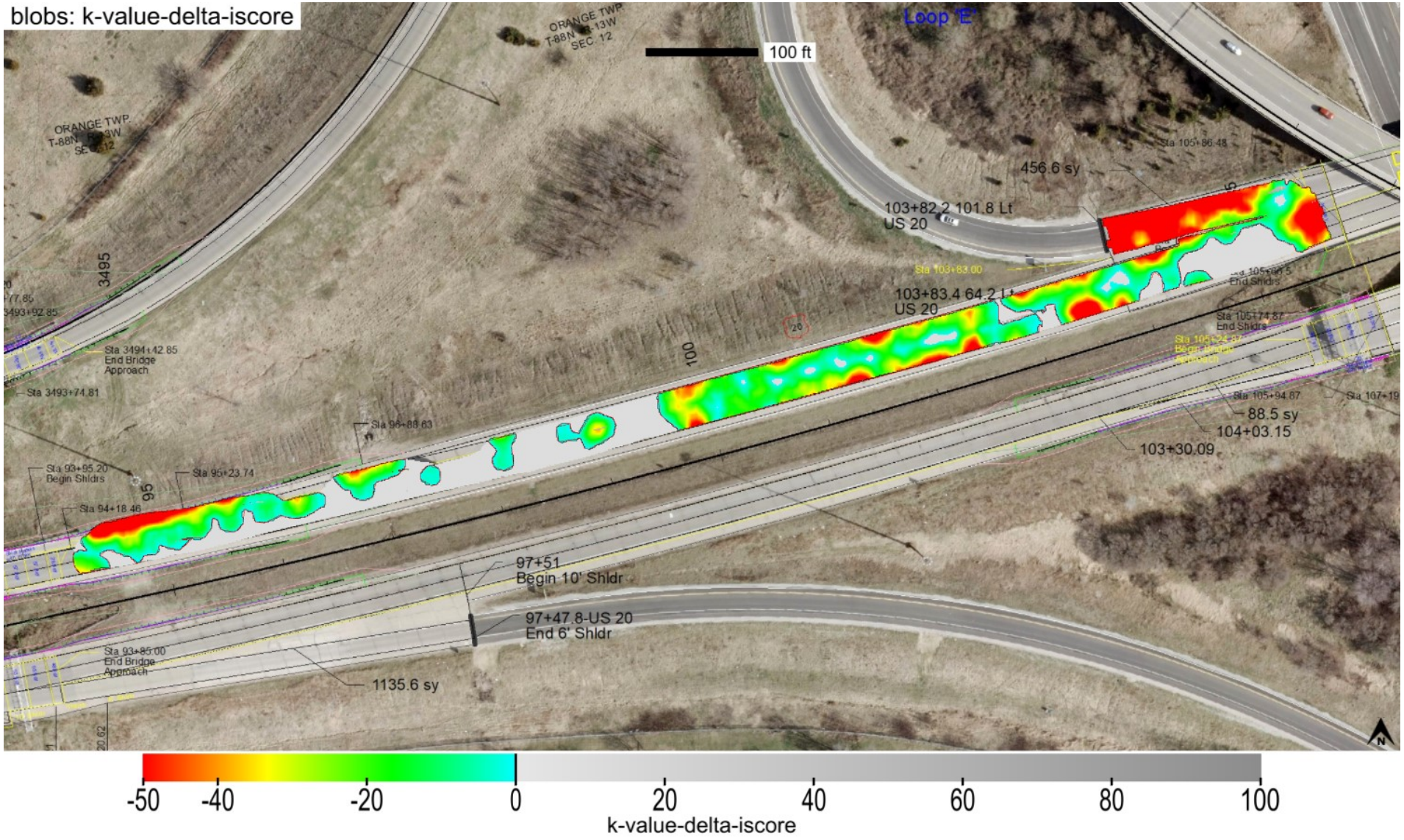
ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_27_190946a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	8	32581	69.99	none	0



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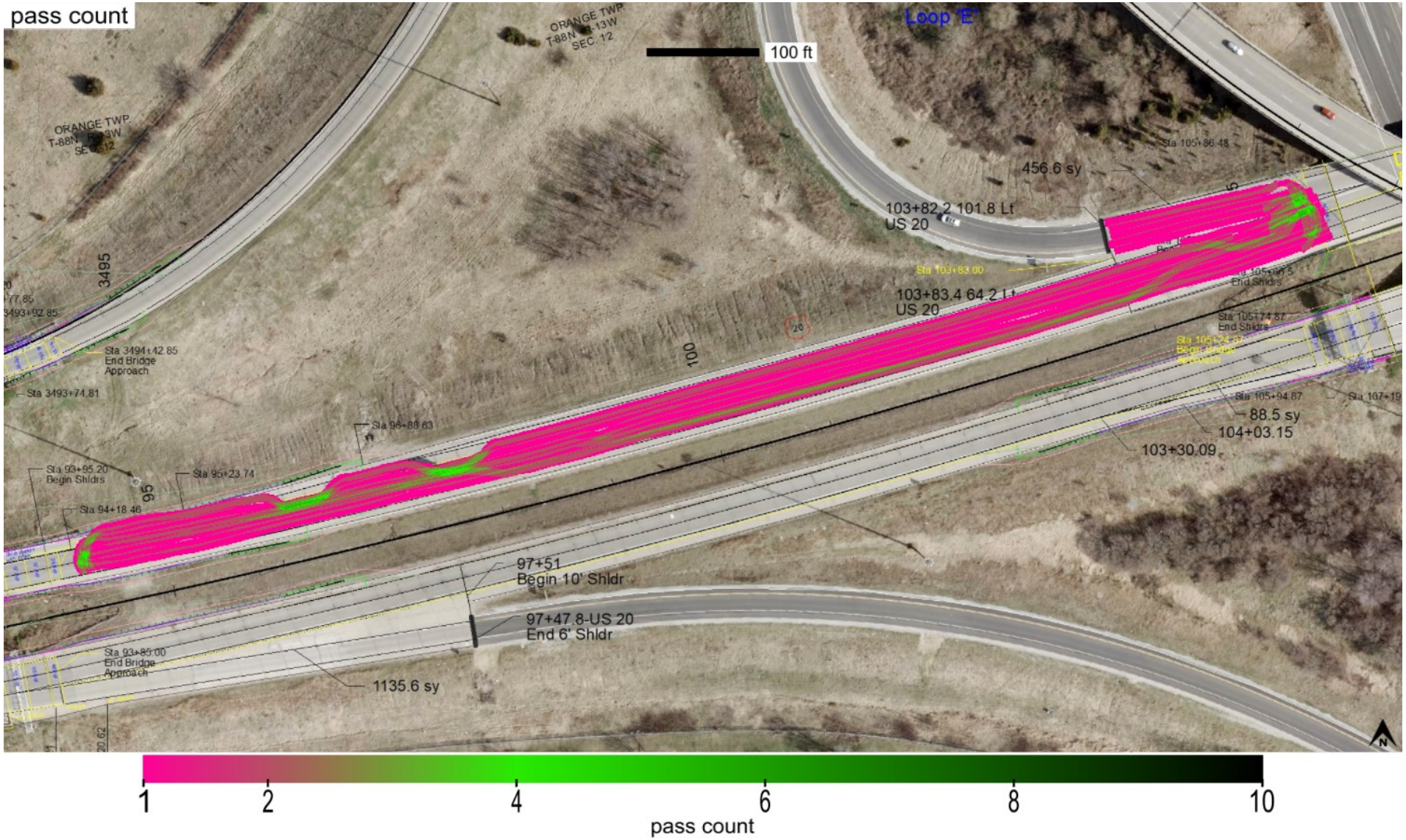
ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_27_190946a

minimum	average	maximum
1	1.57	6



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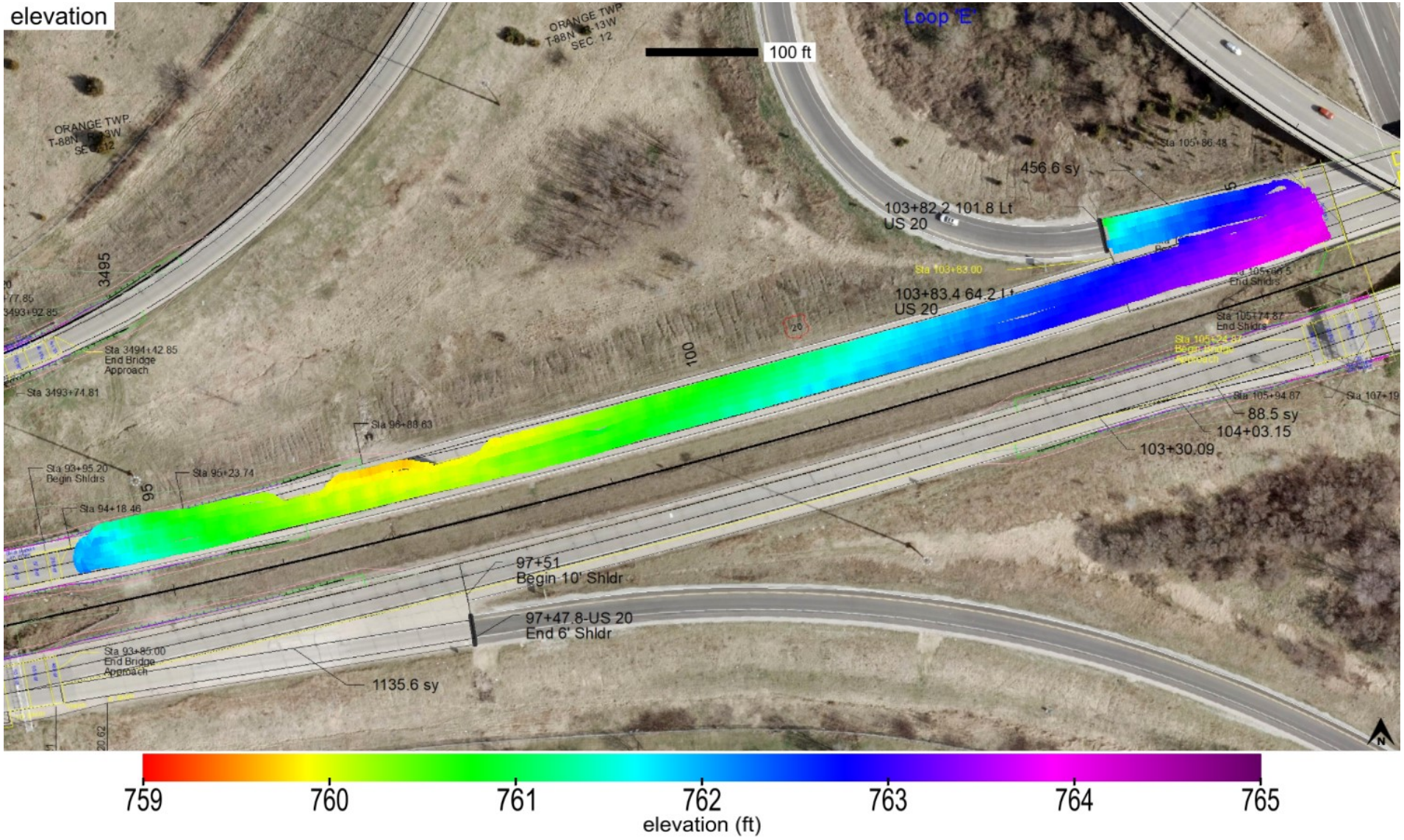
ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_27_190946a

minimum	average	maximum
759.661	761.641	764.093



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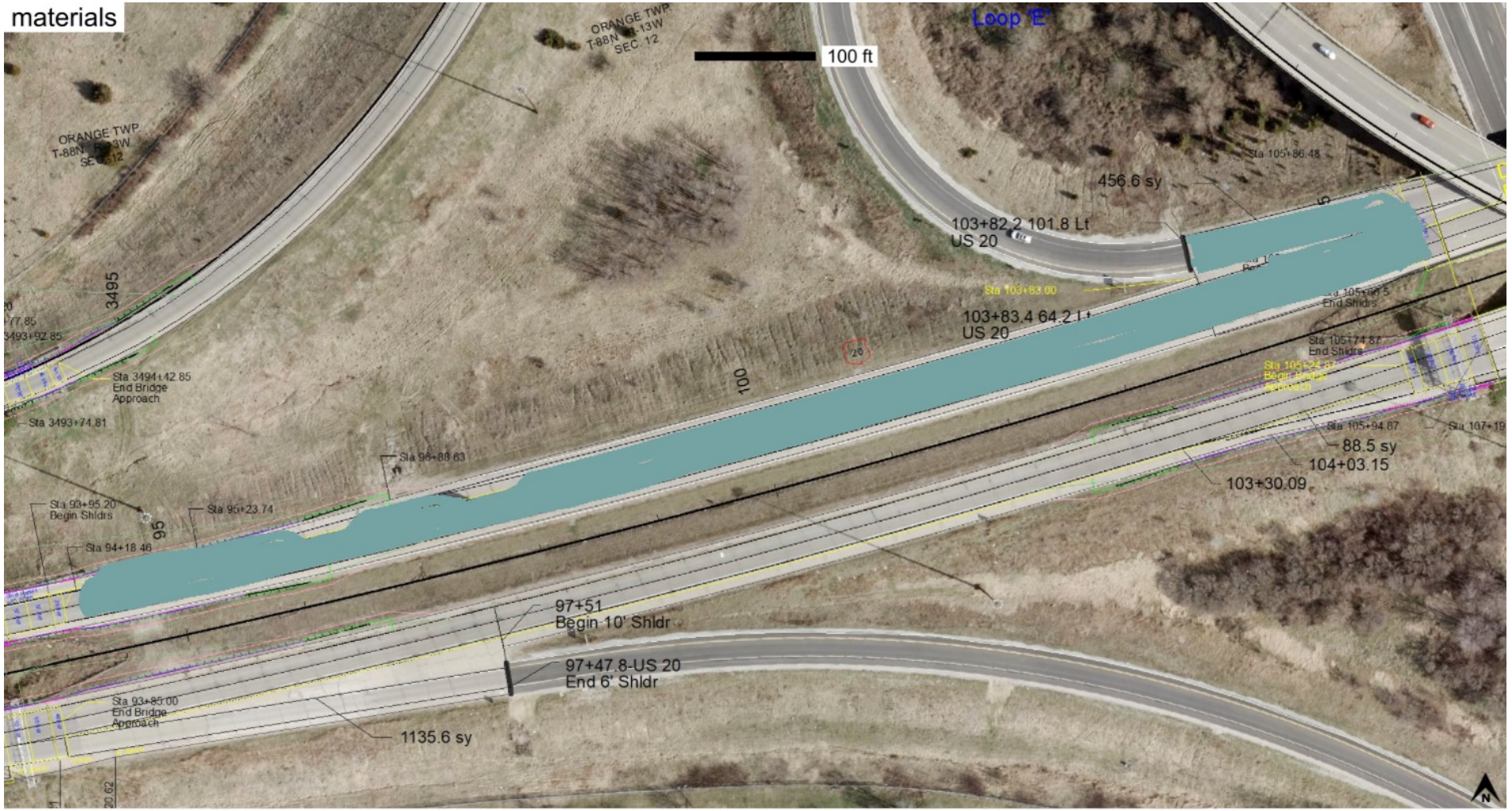
ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_27_190946a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	46550	1.069	12	8554	150	40



Granular Subbase_IADOT (2111)

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ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_27_190946a

20190827_192117.jpg

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Map ID: iadot_07-us20_cs56-fcs00210_2019_08_27_190946a

20190827_192315.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:	US20 Blackhawk County	Mapping Duration (hrs):	0.68	Operator:	Ingios Geotechnics inc
Map ID:	iadot_07-us20_cs56-fcs00210_2019_08_28_092321a	No. of Measurements:	52257	Machine ID:	Ingios_FCS00210
Date and Time:	8/28/2019 9:23:21 AM	Location:	Black Hawk County	State Plane:	5 IOWA Waterloo

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	117.11	1.17	3600	5694.69	20189.8	42254.25	5204.04	25.78	2094.69	16589.8	38654.25
k-value	Yes	30.2	48.11	0.59	150	20	131.3	190	31.82	24.23	-130	-18.7	40
Moisture Content	No												

Mapped Area

square feet	acres
52257	1.2

Pass Count

min.	avg.	max.
1	1.7	7

Elevation (ft)

min.	avg.	max.
770.28	783.96	797.04

Velocity (fps)

min.	avg.	max.
0.14	5.48	6.59

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Special Backfill	21010	100	52257	1.2	12	3600	150	40

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US20 Blackhawk County	Mapping Duration (hrs):	0.68	Operator:	Ingios Geotechnics inc
Map ID:	iadot_07-us20_cs56-fcs00210_2019_08_28_092321a	No. of Measurements:	52257	Machine ID:	Ingios_FCS00210
Date and Time:	8/28/2019 9:23:21 AM	Location:	Black Hawk County	State Plane:	5 IOWA Waterloo

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
117.11	CQI > = 95
100	80% of Resilient Modulus MVs >= 3600
25.78	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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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US20 Blackhawk County	Mapping Duration (hrs):	0.68	Operator:	Ingios Geotechnics inc
Map ID:	iadot_07-us20_cs56-fcs00210_2019_08_28_092321a	No. of Measurements:	52257	Machine ID:	Ingios_FCS00210
Date and Time:	8/28/2019 9:23:21 AM	Location:	Black Hawk County	State Plane:	5 IOWA Waterloo

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
48.11	CQI > = 95
30.2	80% of k-Value MVs >= 150
24.23	COV <= 20
89.65	% 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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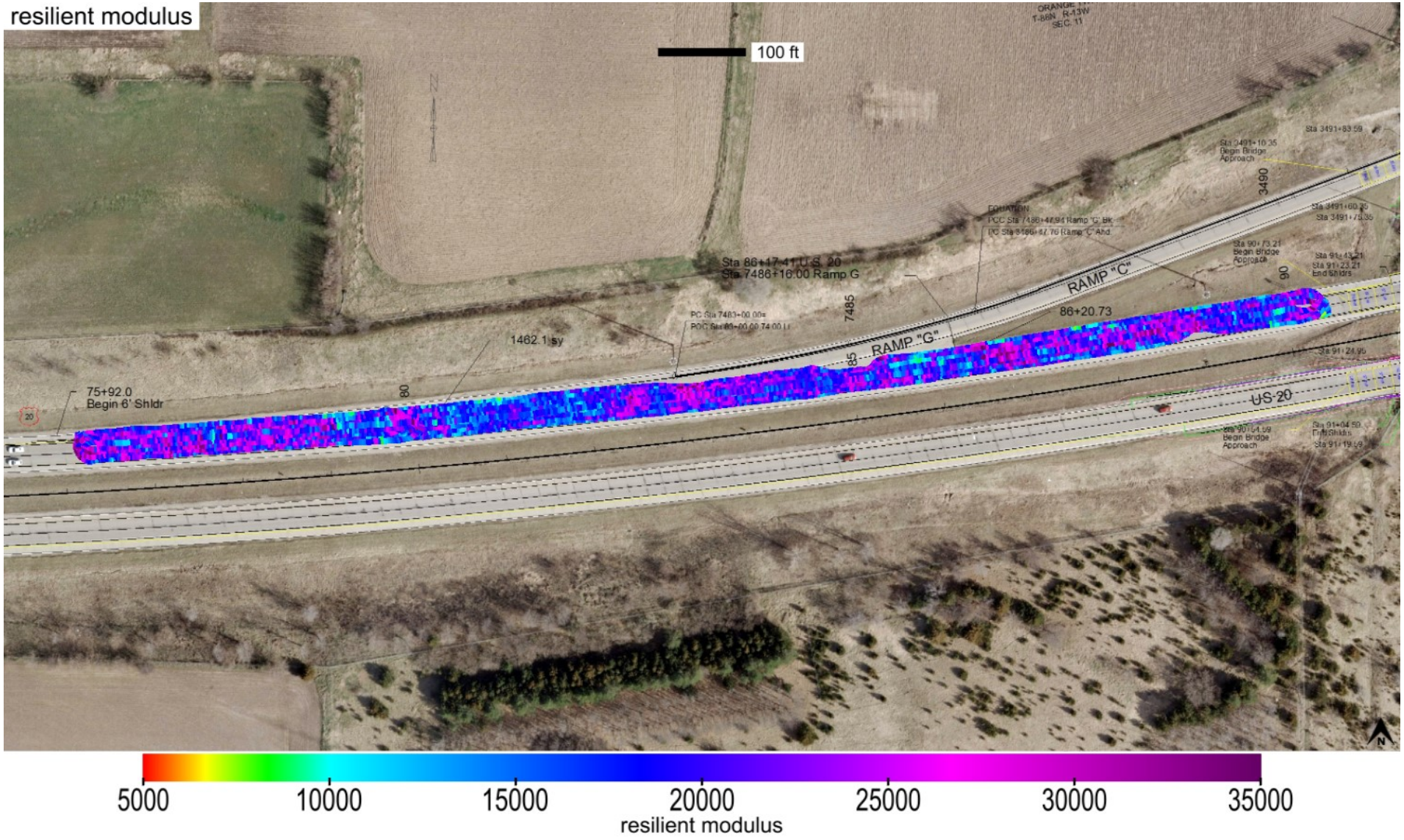
ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_28_092321a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	117.11	1.17	3600	5694.69	20189.8	42254.25	5204.04	25.78	2094.69	16589.8	38654.25



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_07-us20_cs56-fcs00210_2019_08_28_092321a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	117.11	1.17	3600	5694.69	20189.8	42254.25	5204.04	25.78	2094.69	16589.8	38654.25

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_07-us20_cs56-fcs00210_2019_08_28_092321a

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	2094.69	16589.8	38654.25	8162.53	16695.2	25699.68

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ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_28_092321a

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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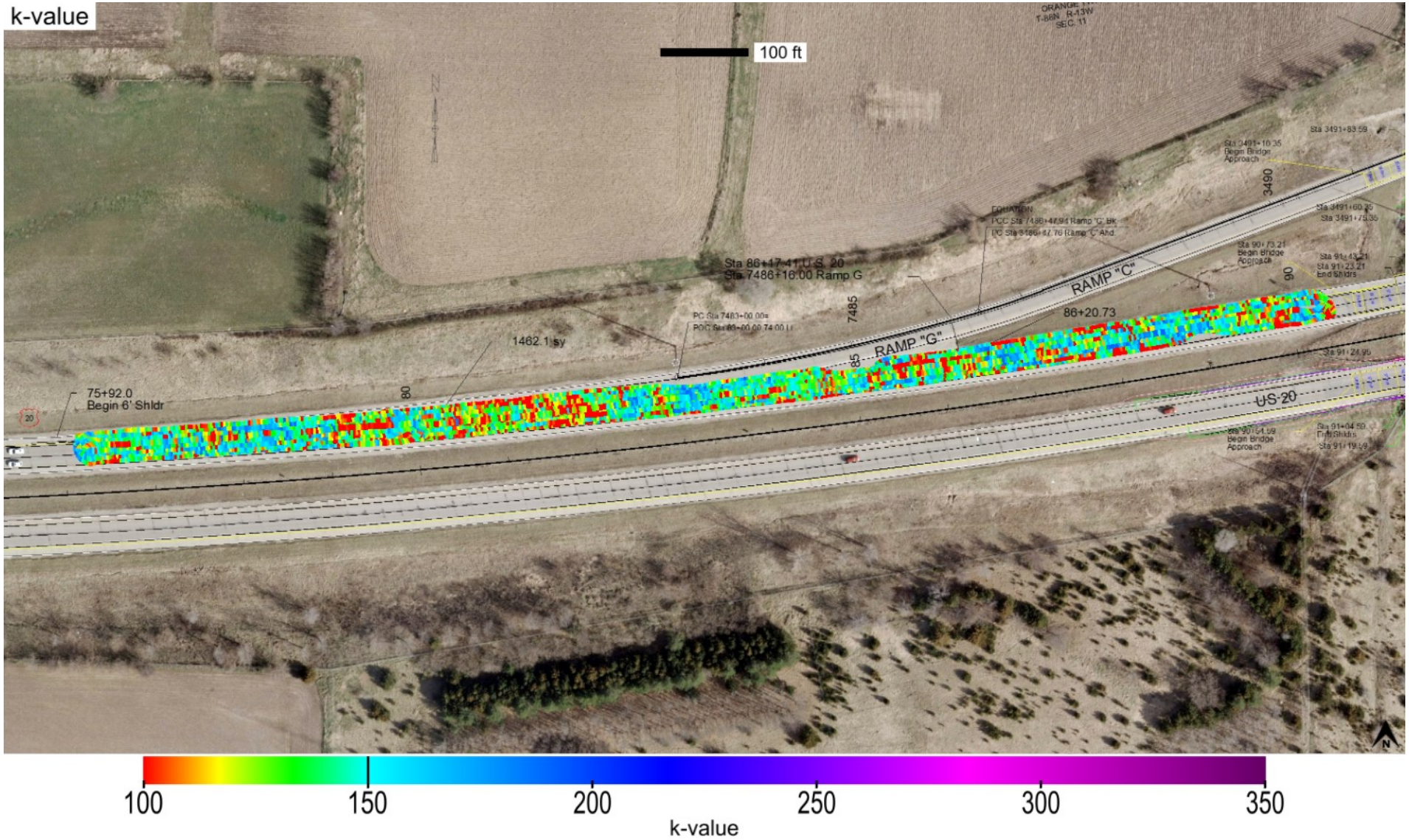
ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_28_092321a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	30.2	48.11	0.59	150	20	131.3	190	31.82	24.23	-130	-18.7	40



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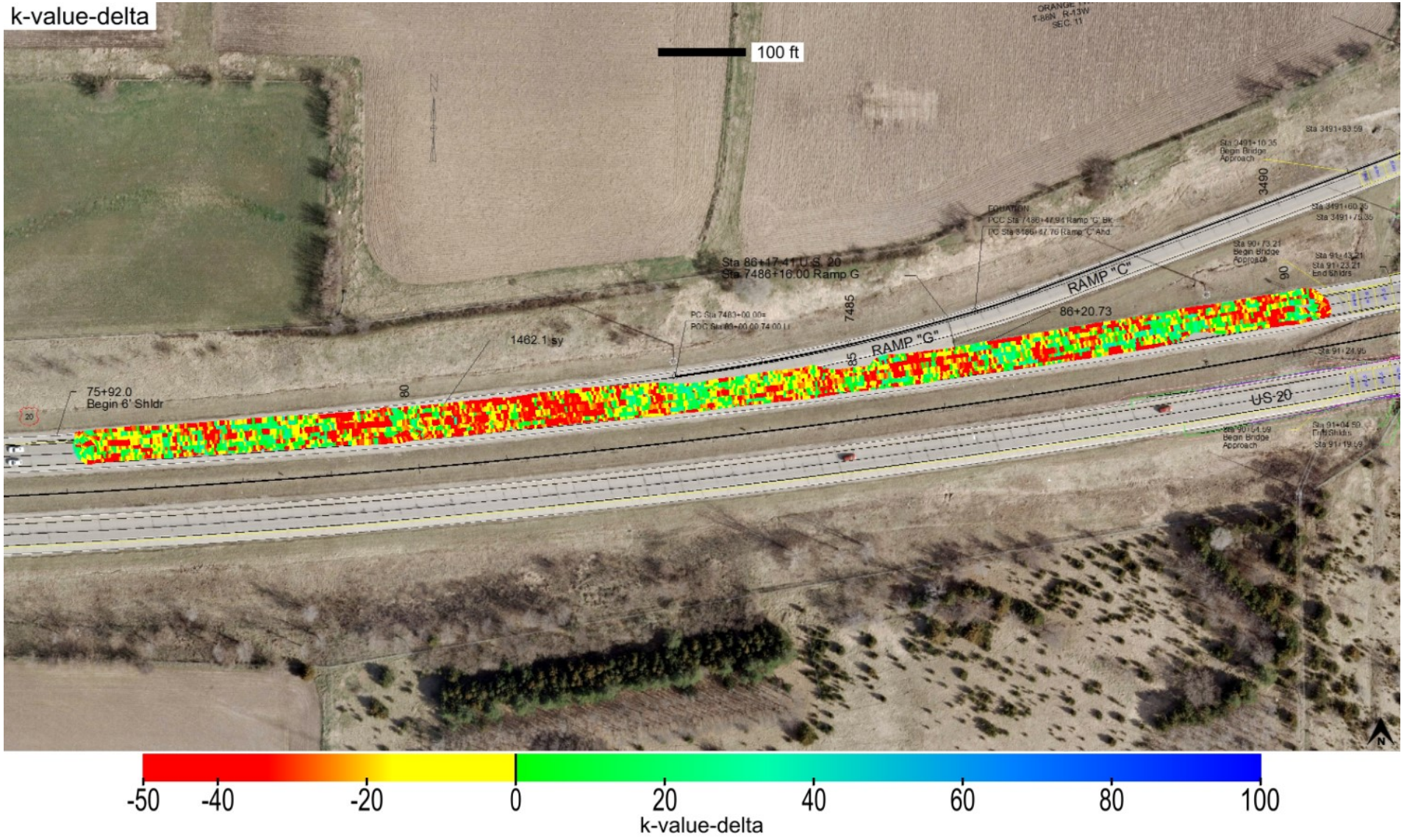
ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_28_092321a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	30.2	48.11	0.59	150	20	131.3	190	31.82	24.23	-130	-18.7	40

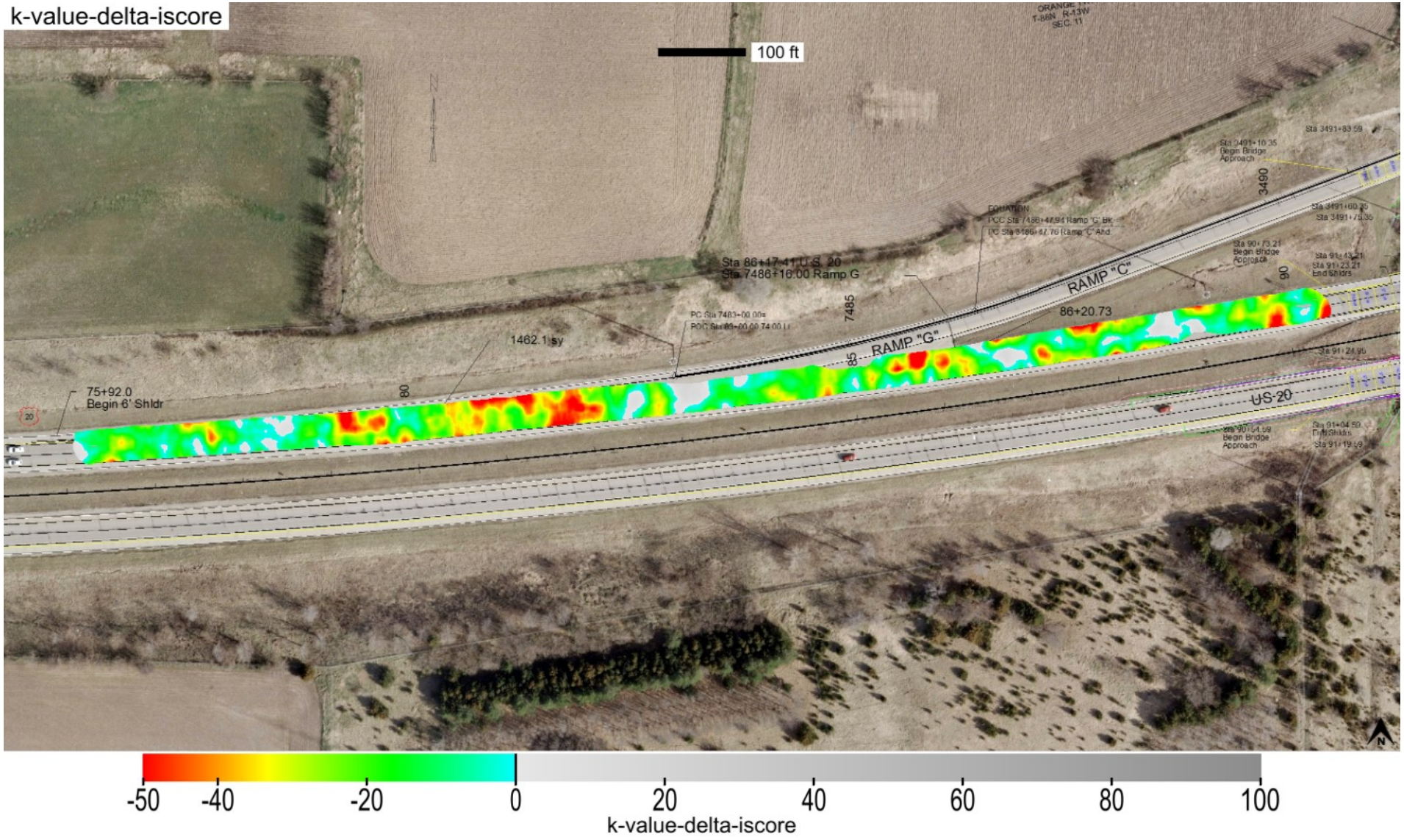


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_28_092321a

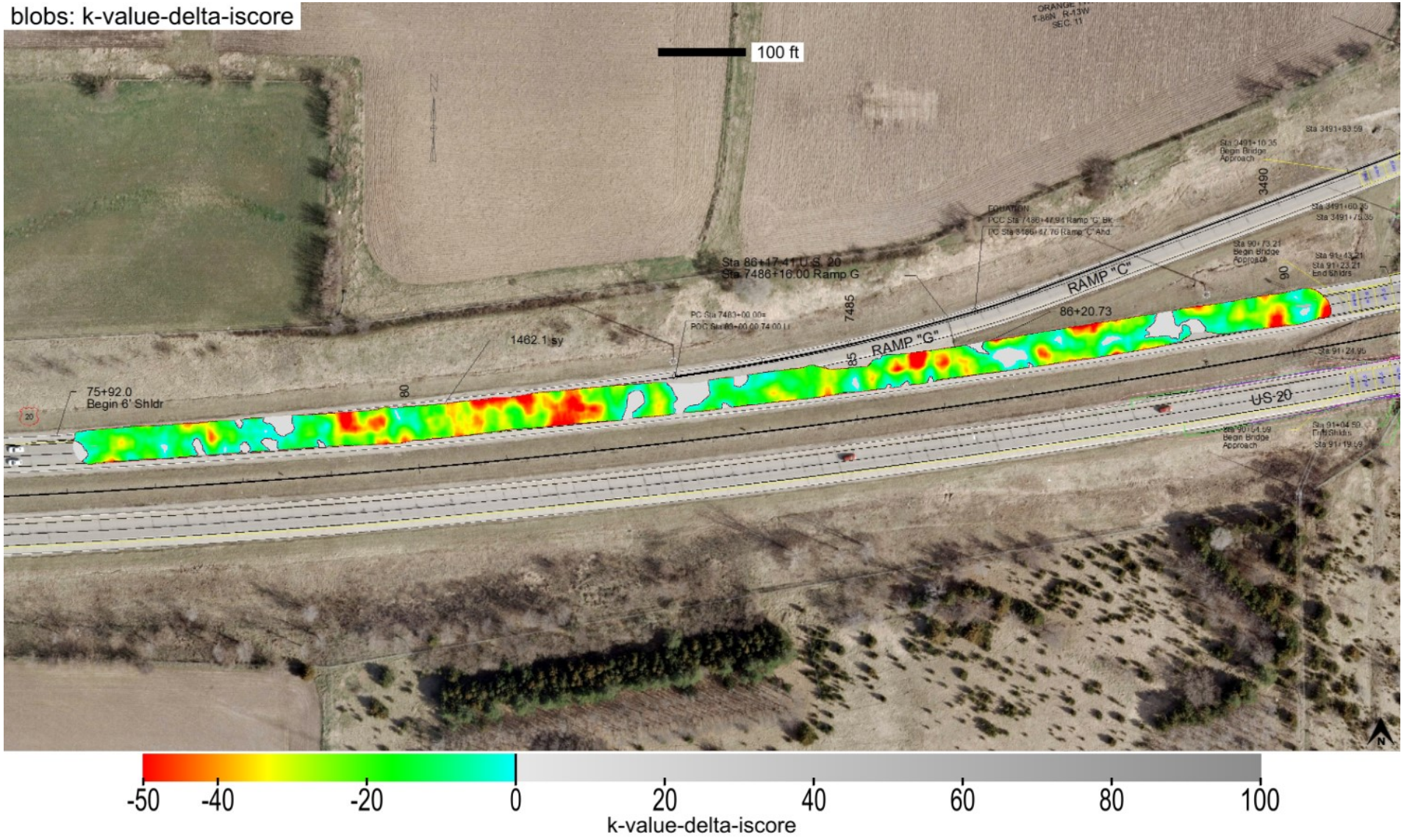
Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	30.2	150	-130	-18.7	40	-69.81	-18.15	19.43



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_07-us20_cs56-fcs00210_2019_08_28_092321a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	3	46850	89.65	none	0



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ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_28_092321a

minimum	average	maximum
1	1.7	7

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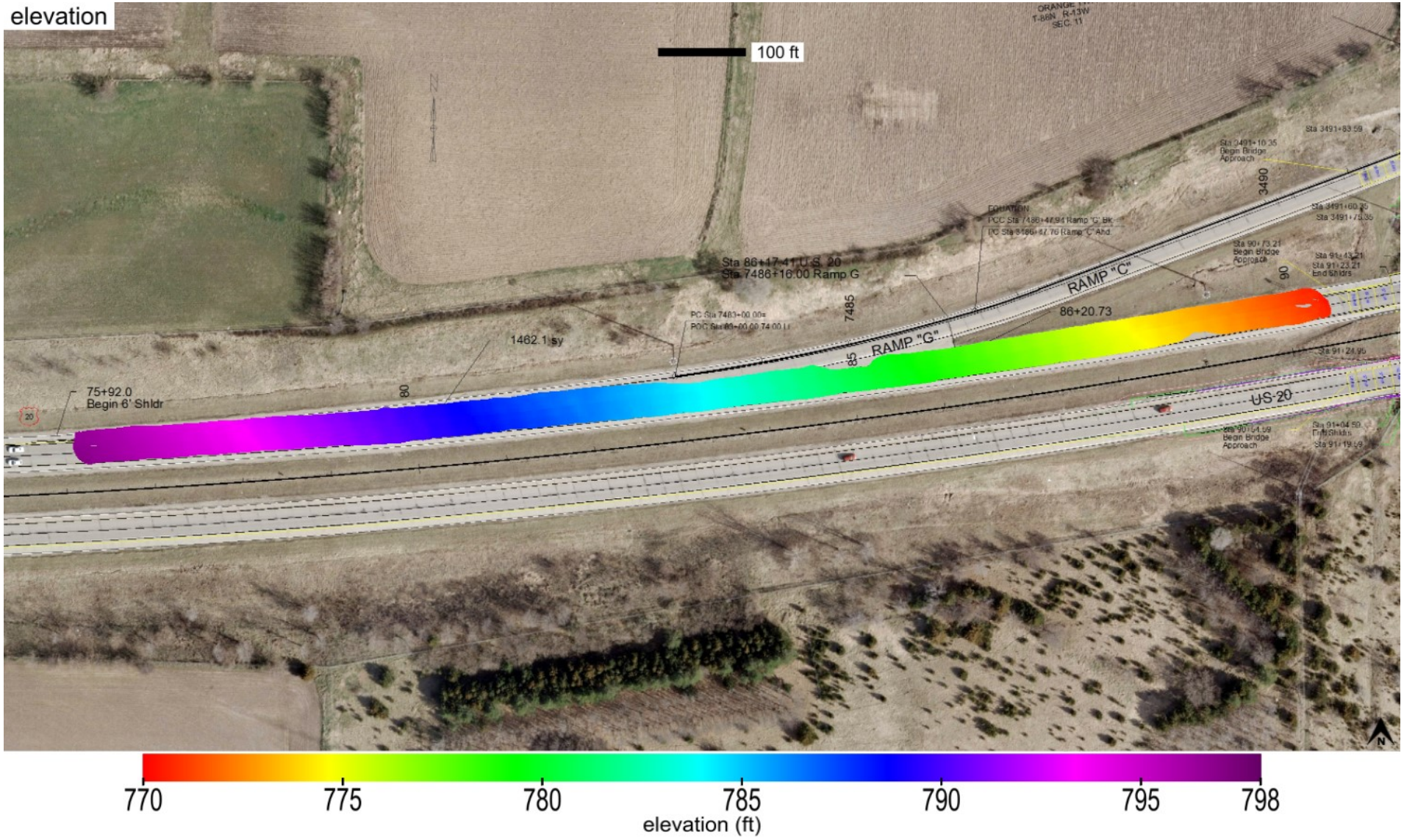
ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_28_092321a

minimum	average	maximum
770.281	783.958	797.036



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_07-us20_cs56-fcs00210_2019_08_28_092321a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Special Backfill	21010	100	52257	1.2	12	3600	150	40

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.

ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_28_092321a

20190828_100303.jpg

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ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_08_28_092321a

20190828_102002.jpg

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US20 Blackhawk County	Mapping Duration (hrs):	3.03	Operator:	Ingios Geotechnics inc
Map ID:	iadot_07-us20_cs56-fcs00210_2019_09_05_083512a	No. of Measurements:	246546	Machine ID:	Ingios_FCS00210
Date and Time:	9/5/2019 8:35:12 AM	Location:	Black Hawk County	State Plane:	5 IOWA Waterloo

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	118.29	1.27	8554	5500	17685.8	41611.61	4113.77	23.26	-3054	9131.8	33057.61
k-value	Yes	32.2	46.7	0.4	150	60	118.8	160	36.78	30.95	-90	-31.2	10
Moisture Content	No												

Mapped Area

square feet	acres
246546	5.66

Pass Count

min.	avg.	max.
1	1.56	8

Elevation (ft)

min.	avg.	max.
789.53	805.05	826.47

Velocity (fps)

min.	avg.	max.
0.13	5.48	6.66

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	246546	5.66	12	8554	150	40

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US20 Blackhawk County	Mapping Duration (hrs):	3.03	Operator:	Ingios Geotechnics inc
Map ID:	iadot_07-us20_cs56-fcs00210_2019_09_05_083512a	No. of Measurements:	246546	Machine ID:	Ingios_FCS00210
Date and Time:	9/5/2019 8:35:12 AM	Location:	Black Hawk County	State Plane:	5 IOWA Waterloo

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
118.29	CQI > = 95
99.9	80% of Resilient Modulus MVs >= 8554
23.26	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:	US20 Blackhawk County	Mapping Duration (hrs):	3.03	Operator:	Ingios Geotechnics inc
Map ID:	iadot_07-us20_cs56-fcs00210_2019_09_05_083512a	No. of Measurements:	246546	Machine ID:	Ingios_FCS00210
Date and Time:	9/5/2019 8:35:12 AM	Location:	Black Hawk County	State Plane:	5 IOWA Waterloo

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
46.7	CQI > = 95
32.2	80% of k-Value MVs >= 150
30.95	COV <= 20
90.87	% 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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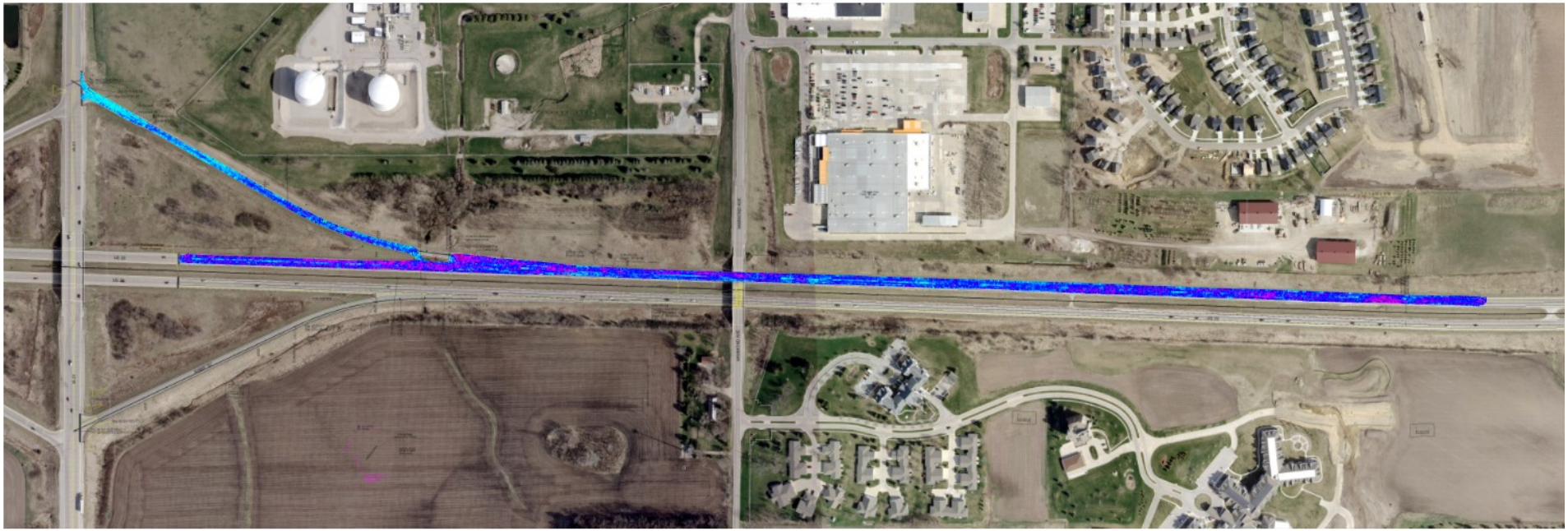
ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_09_05_083512a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.9	118.29	1.27	8554	5500	17685.8	41611.61	4113.77	23.26	-3054	9131.8	33057.61

resilient modulus

100 ft



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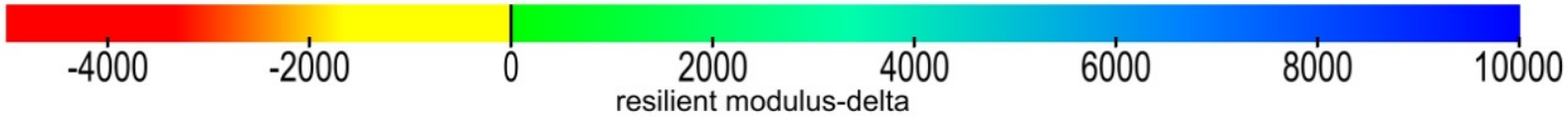
ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_09_05_083512a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.9	118.29	1.27	8554	5500	17685.8	41611.61	4113.77	23.26	-3054	9131.8	33057.61

resilient modulus-delta

100 ft



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ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_09_05_083512a

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	8554	-3054	9131.8	33057.61	1704.24	9182.53	21870.29

resilient modulus-delta-iscore

100 ft

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ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_09_05_083512a

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

blobs: resilient modulus-delta-iscore

100 ft

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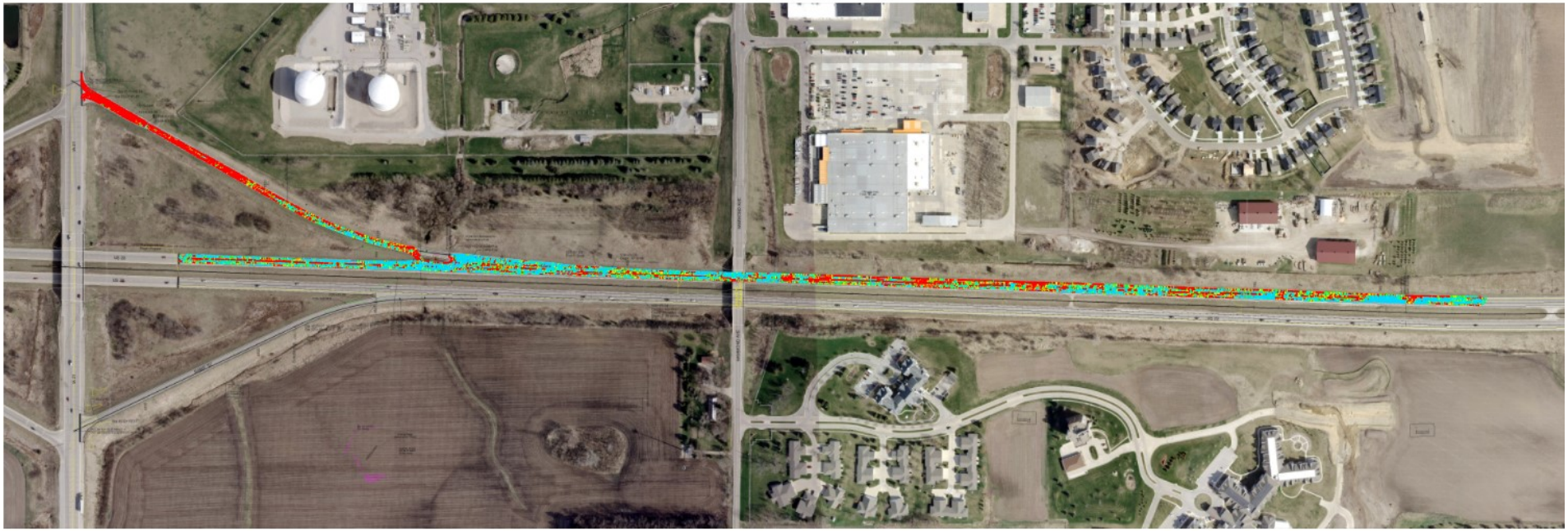
ingios GEOTECHNICS

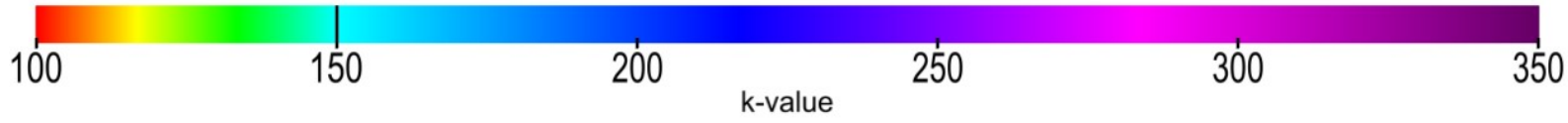
Map ID: iadot_07-us20_cs56-fcs00210_2019_09_05_083512a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	32.2	46.7	0.4	150	60	118.8	160	36.78	30.95	-90	-31.2	10

k-value

100 ft





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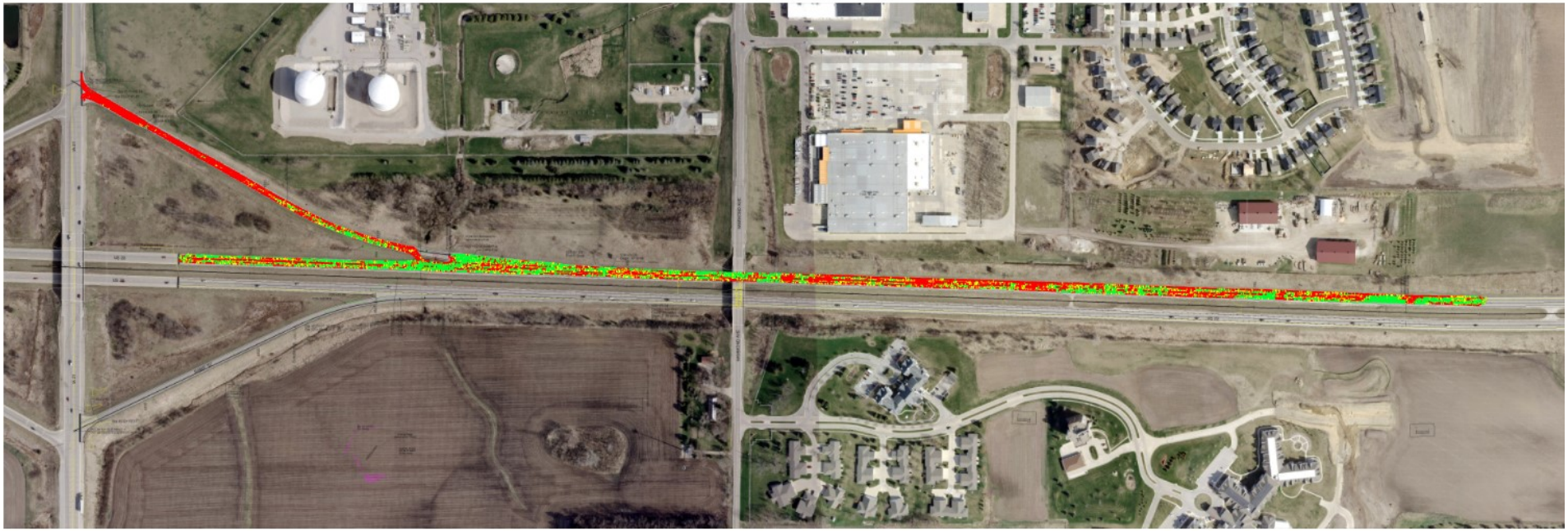
ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_09_05_083512a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	32.2	46.7	0.4	150	60	118.8	160	36.78	30.95	-90	-31.2	10

k-value-delta

100 ft



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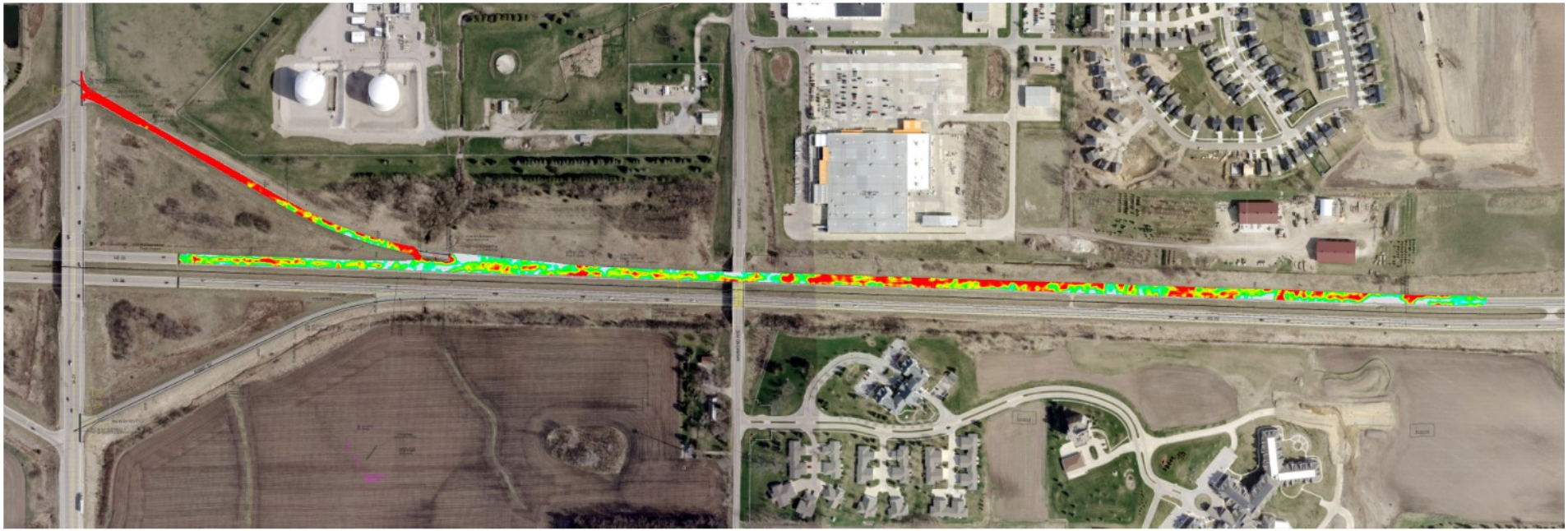
ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_09_05_083512a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	32.2	150	-90	-31.2	10	-90	-30.82	10

k-value-delta-iscore

100 ft



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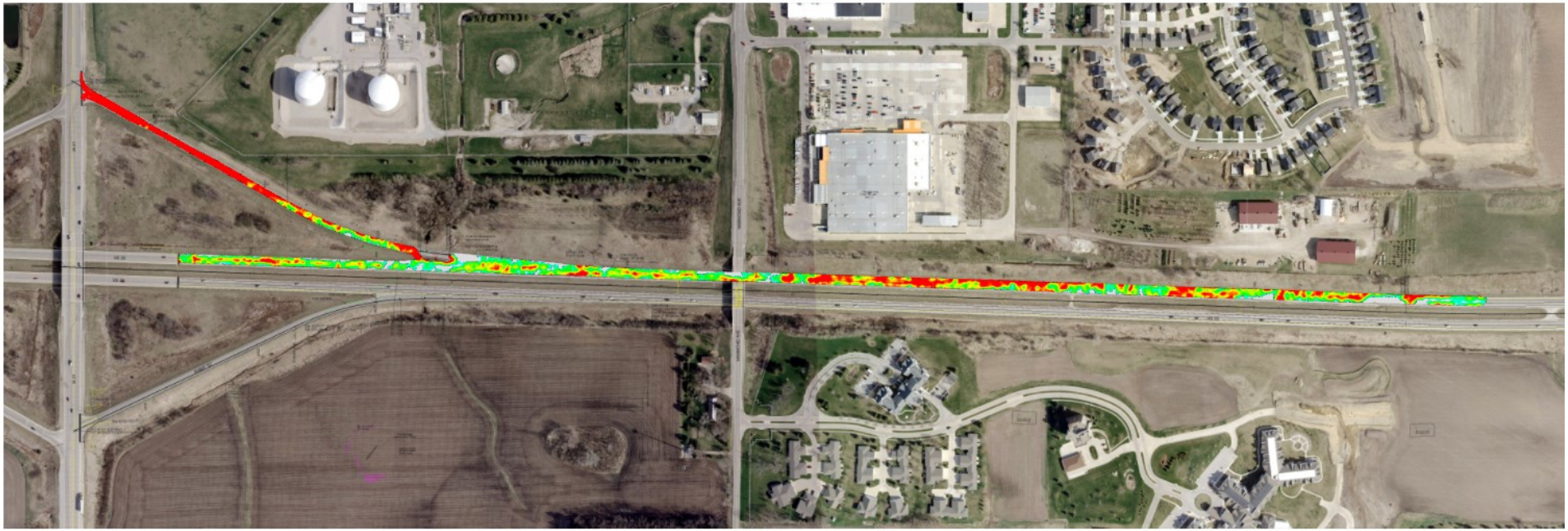
ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_09_05_083512a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	4	224033	90.87	none	0

blobs: k-value-delta-iscore

100 ft



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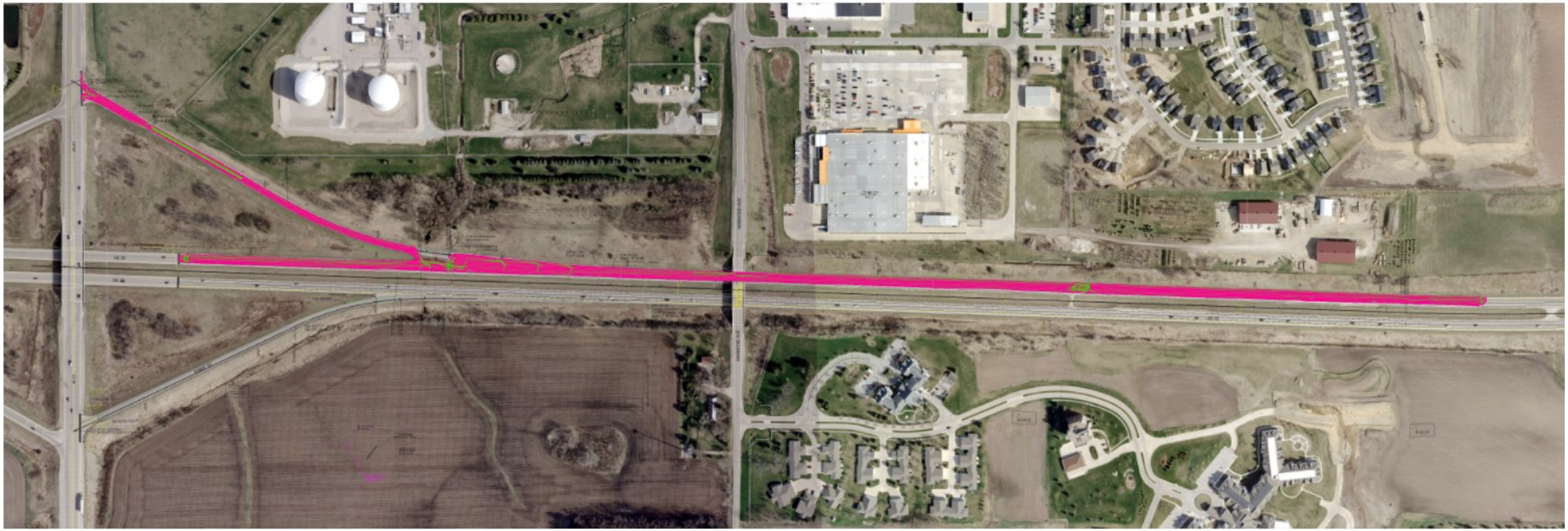
ingios GEOTECHNICS

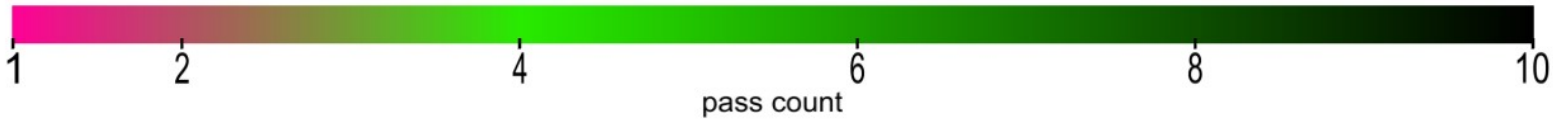
Map ID: iadot_07-us20_cs56-fcs00210_2019_09_05_083512a

minimum	average	maximum
1	1.56	8

pass count

100 ft





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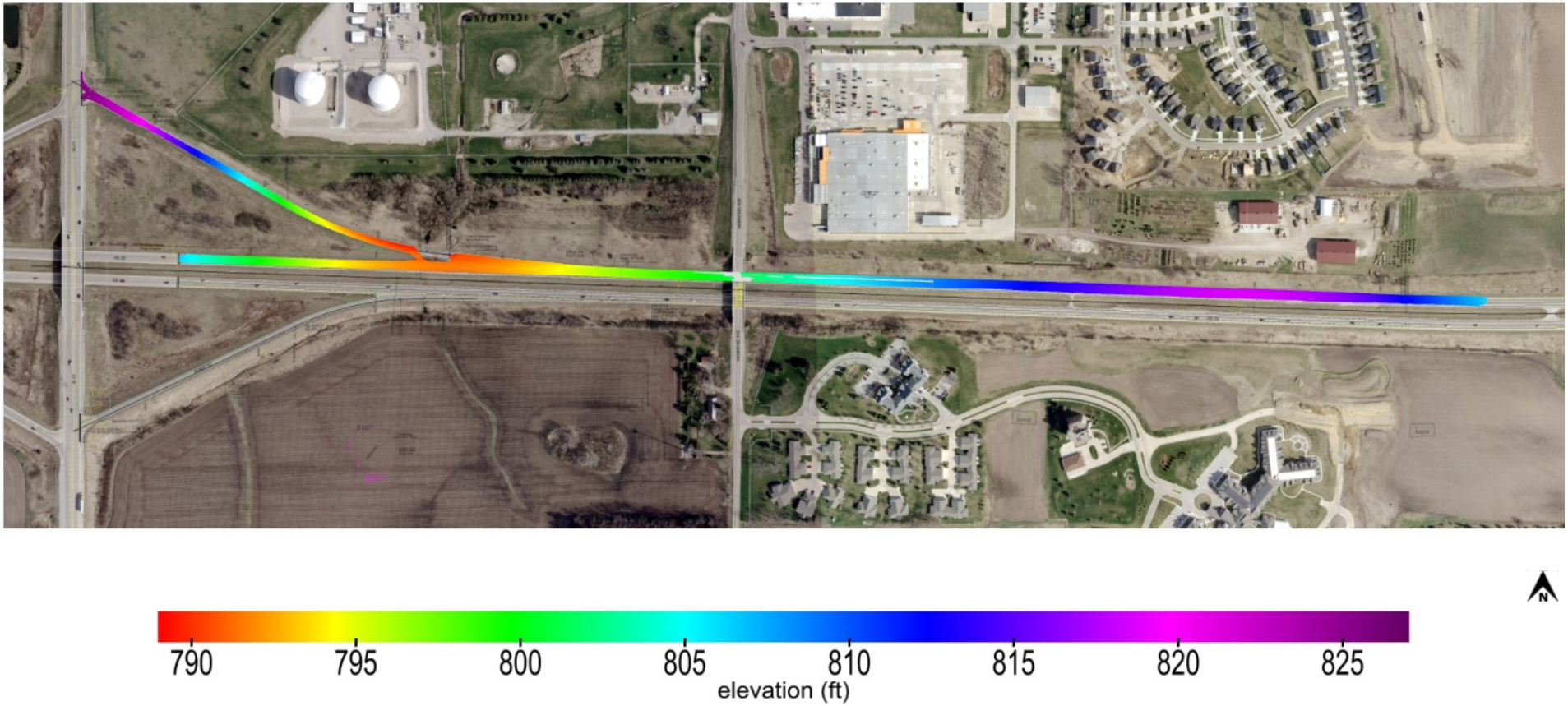
ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_09_05_083512a

minimum	average	maximum
789.529	805.046	826.468

elevation

100 ft



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ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_09_05_083512a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	246546	5.66	12	8554	150	40

materials

100 ft

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_07-us20_cs56-fcs00210_2019_09_05_083512a

20190905_104140.jpg

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ingios GEOTECHNICS

Map ID: iadot_07-us20_cs56-fcs00210_2019_09_05_083512a

20190905_110308.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_07-us20_cs56-fcs00210_2019_09_05_083512a

20190905_111220.jpg

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	IA City Rd Des Moines County	Mapping Duration (hrs):	1.21	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-iacityrd_cs56-fcs00210_2019_10_22_134816	No. of Measurements:	115572	Machine ID:	Ingios_FCS00210
Date and Time:	10/22/2019 1:48:16 PM	Location:	Des Moines 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	119.92	0.94	9037	14557.54	38258.9	56000	7714.33	20.16	5520.54	29221.9	46963
k-value	Yes	90.1	113.72	1.55	150	55	182.4	202	23.15	12.69	-95	32.4	52
Moisture Content	No												

Mapped Area

square feet	acres
115572	2.65

Pass Count

min.	avg.	max.
1	1.38	3

Elevation (ft)

min.	avg.	max.
647.52	652.48	657.81

Velocity (fps)

min.	avg.	max.
1.23	5.27	6.06

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Surfacing	41008	100	115572	2.653	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:	IA City Rd Des Moines County	Mapping Duration (hrs):	1.21	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-iacityrd_cs56-fcs00210_2019_10_22_134816	No. of Measurements:	115572	Machine ID:	Ingios_FCS00210
Date and Time:	10/22/2019 1:48:16 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
119.92	CQI > = 95
100	80% of Resilient Modulus MVs >= 9037
20.16	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.

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:	IA City Rd Des Moines County	Mapping Duration (hrs):	1.21	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-iacityrd_cs56-fcs00210_2019_10_22_134816	No. of Measurements:	115572	Machine ID:	Ingios_FCS00210
Date and Time:	10/22/2019 1:48:16 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
113.72	CQI > = 95
90.1	80% of k-Value MVs >= 150
12.69	COV <= 20
2.59	% 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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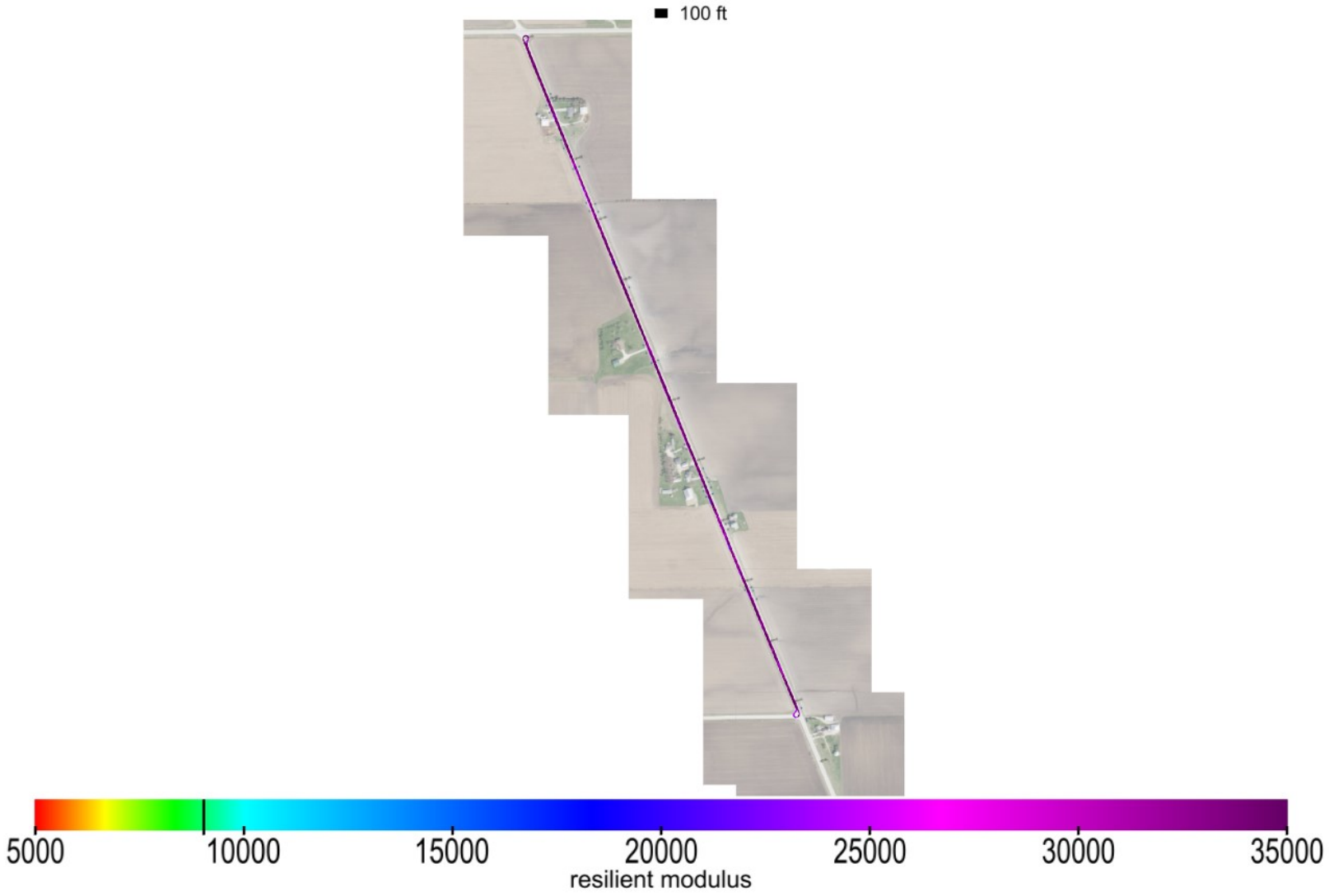
Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_134816

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	119.92	0.94	9037	14557.54	38258.9	56000	7714.33	20.16	5520.54	29221.9	46963

resilient modulus

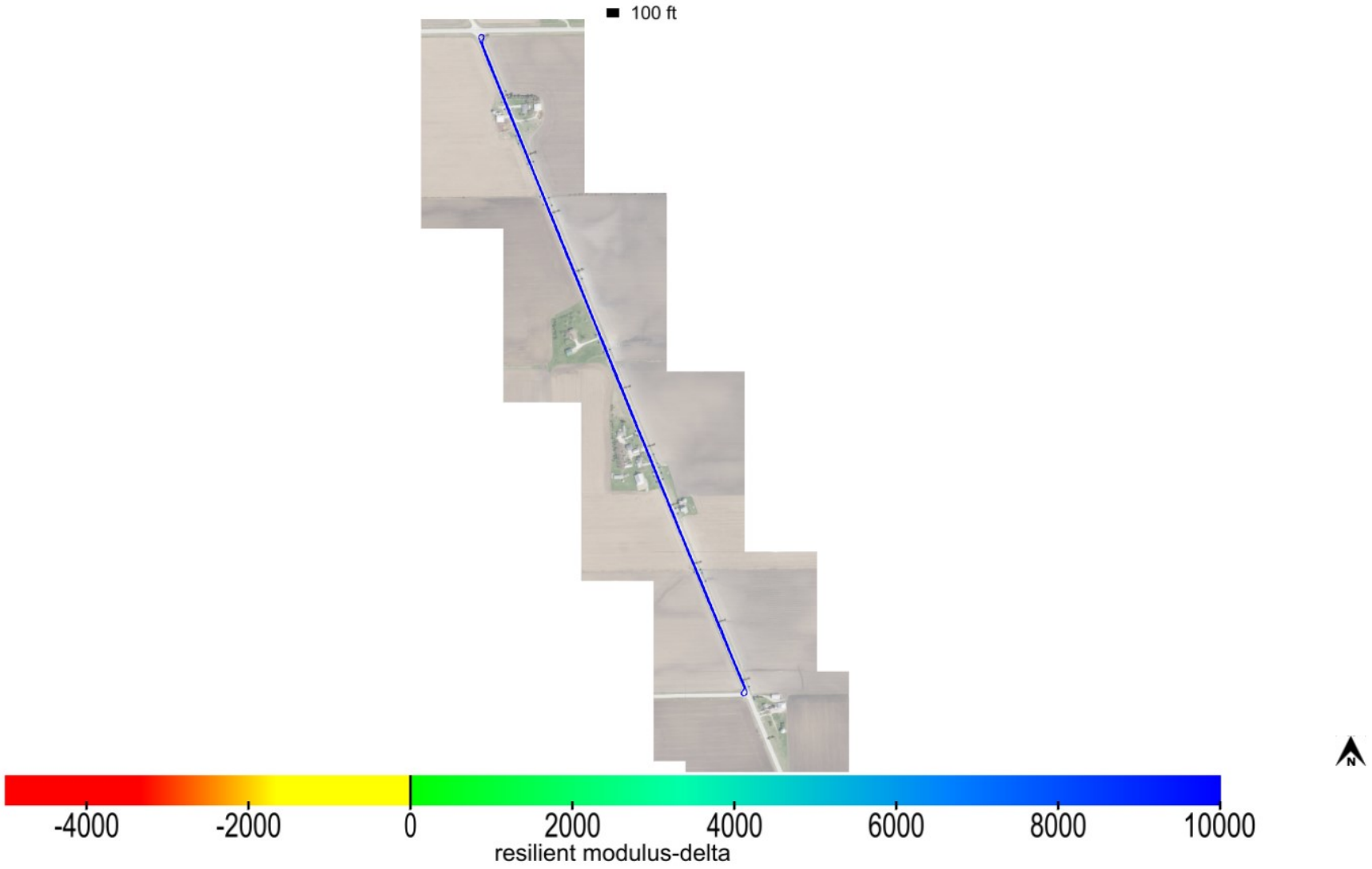


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_134816

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	119.92	0.94	9037	14557.54	38258.9	56000	7714.33	20.16	5520.54	29221.9	46963

resilient modulus-delta

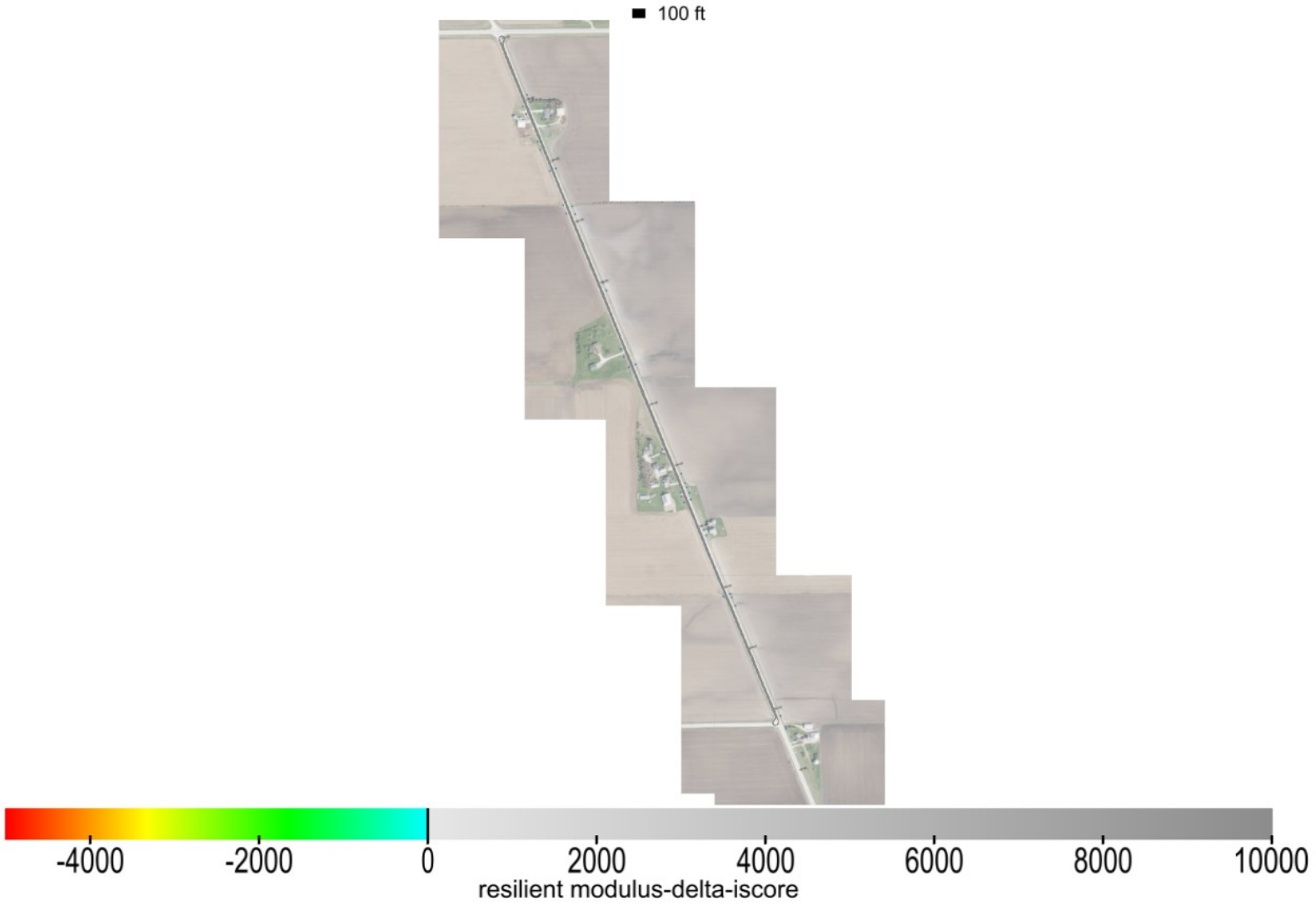


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_134816

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	5520.54	29221.9	46963	13490.77	29429.21	42714.03

resilient modulus-delta-iscore

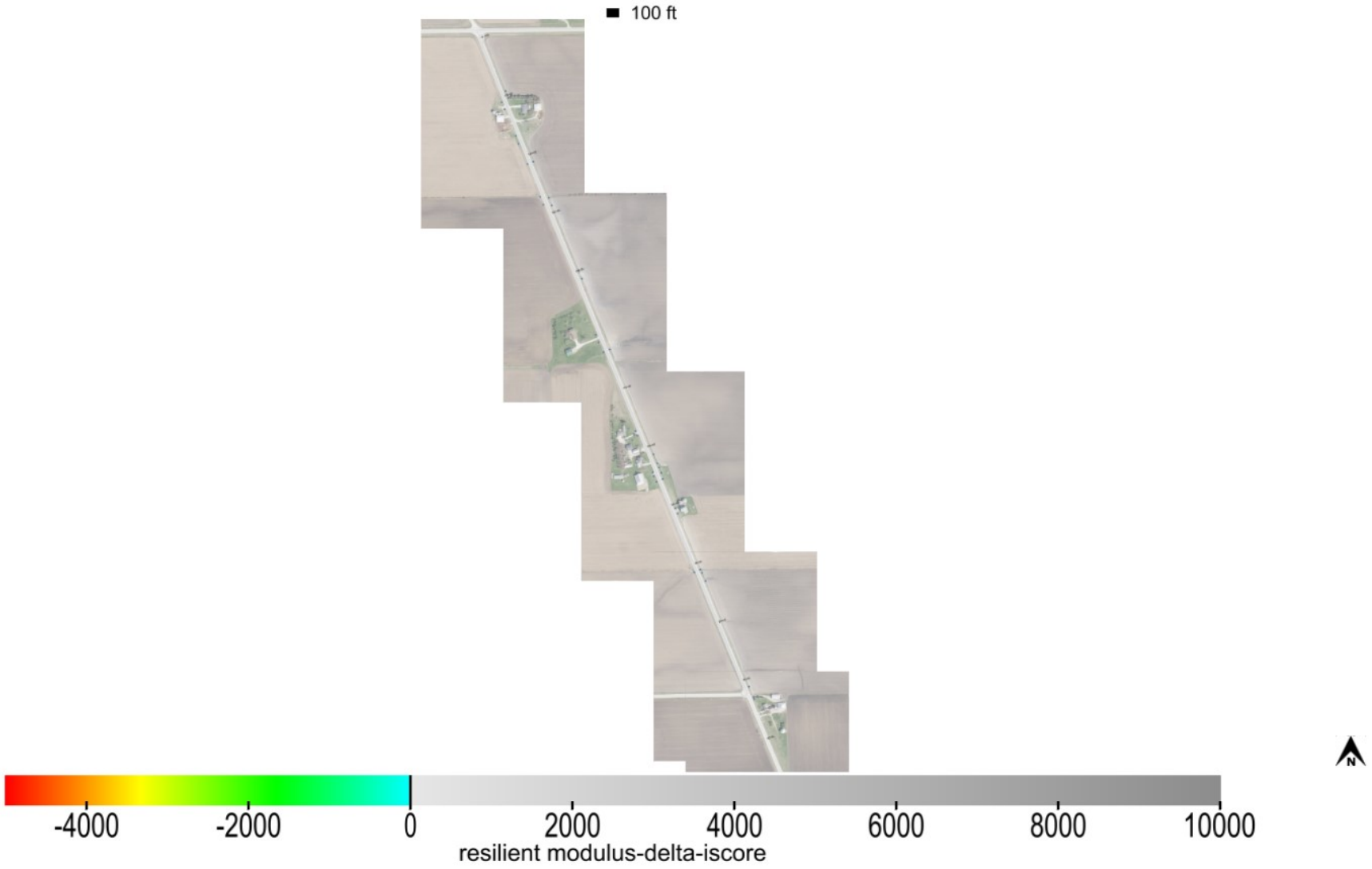


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_134816

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

blobs: resilient modulus-delta-iscore

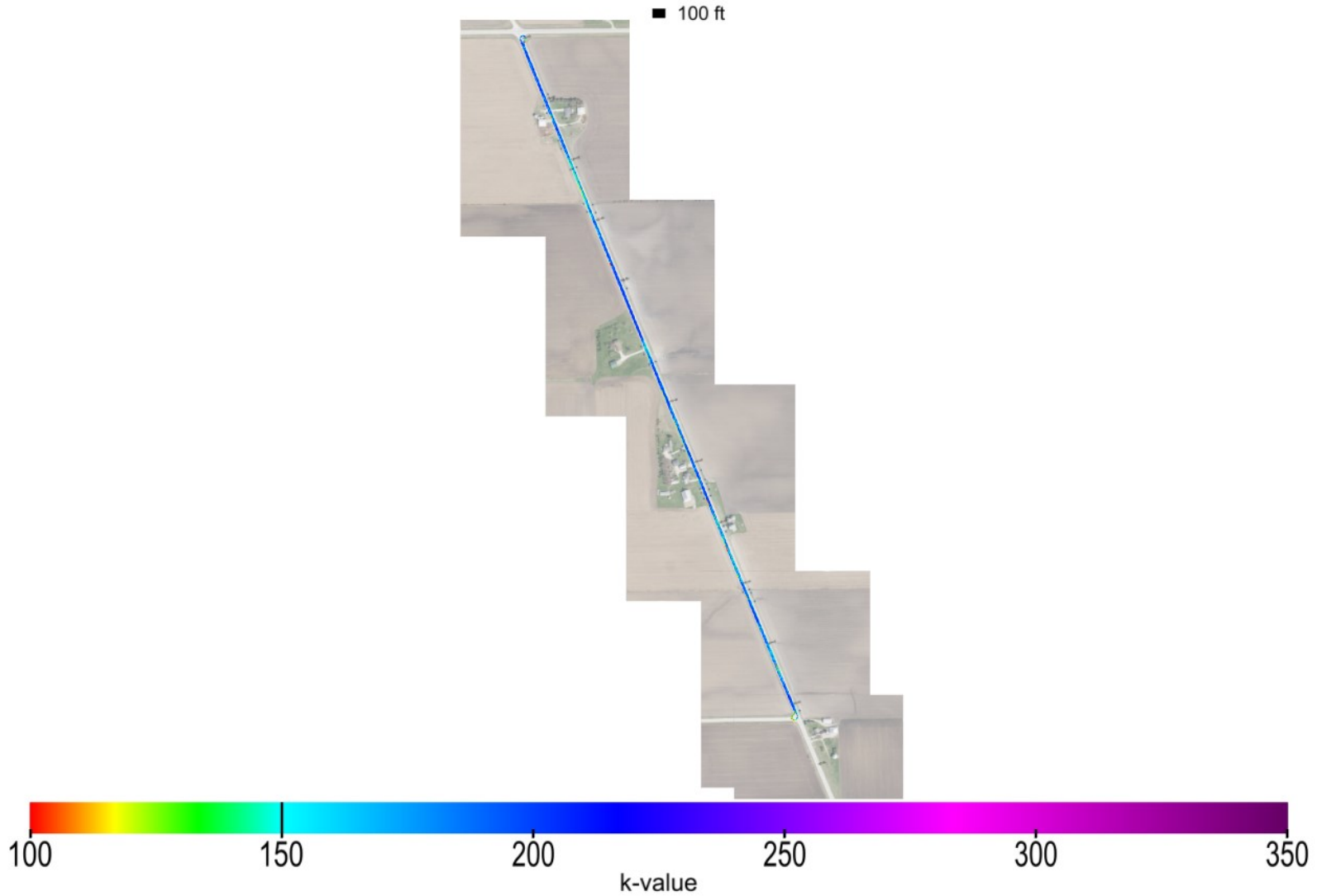


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_134816

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	90.1	113.72	1.55	150	55	182.4	202	23.15	12.69	-95	32.4	52

k-value

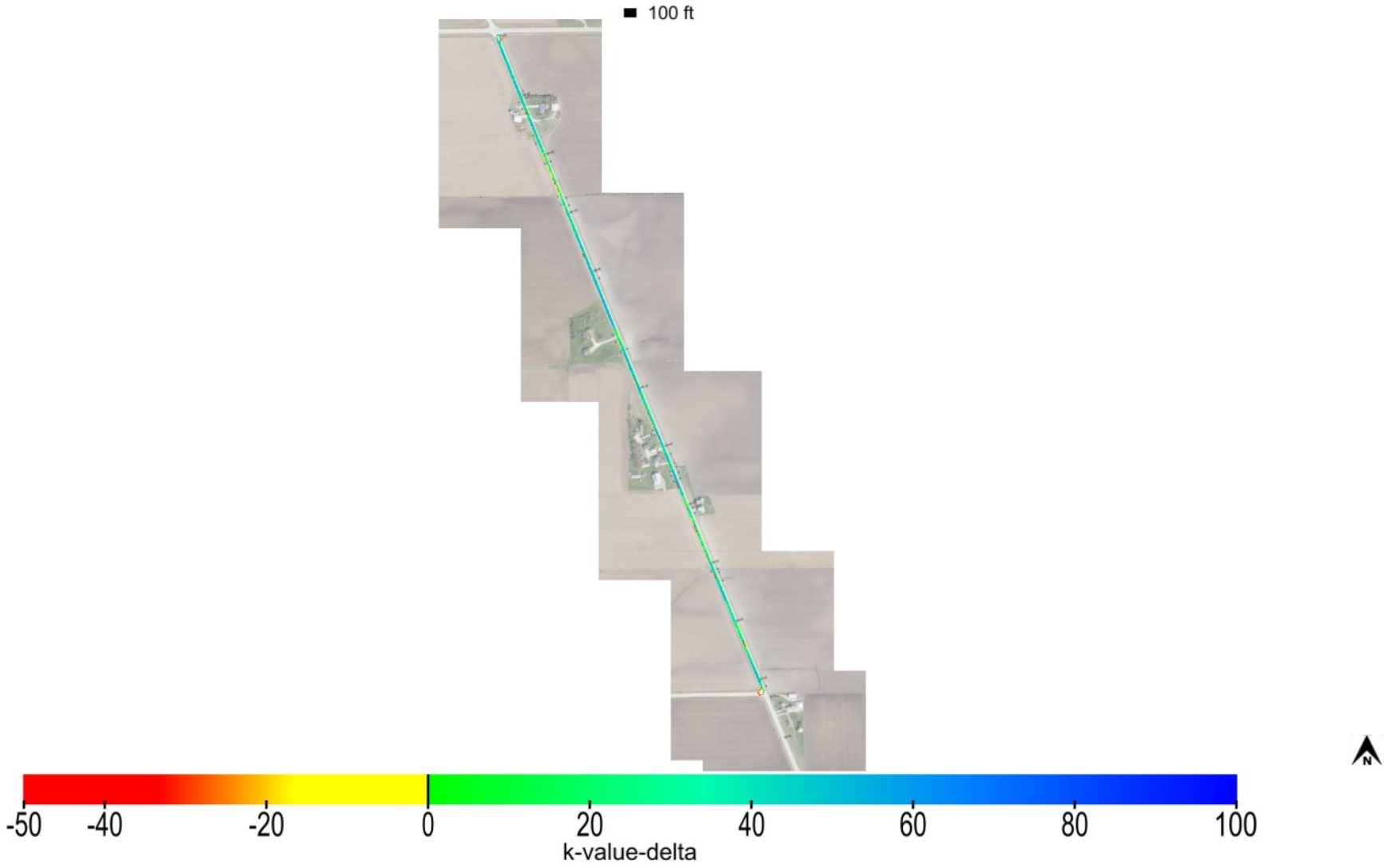


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_134816

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	90.1	113.72	1.55	150	55	182.4	202	23.15	12.69	-95	32.4	52

k-value-delta

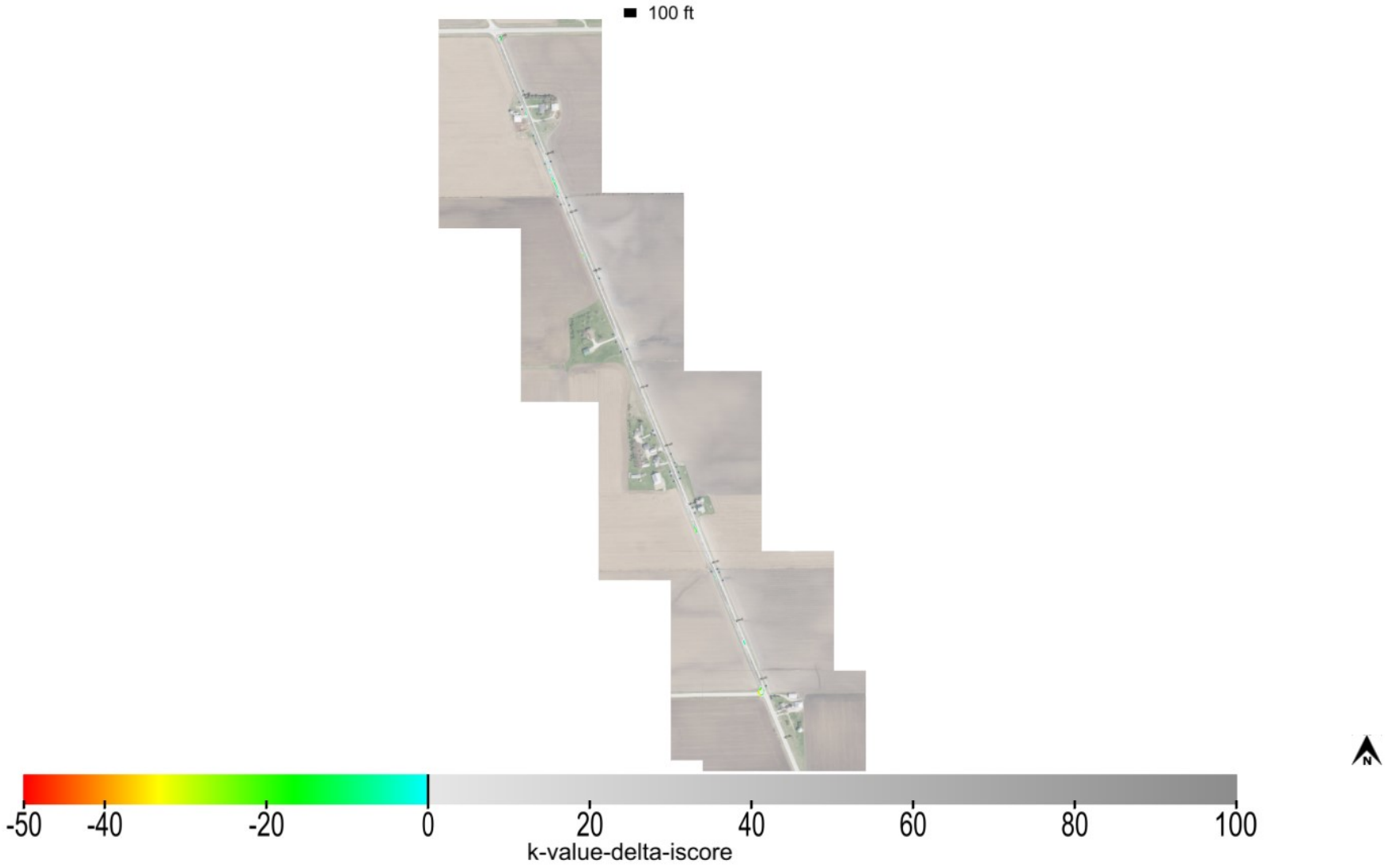


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_134816

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	90.1	150	-95	32.4	52	-37.52	32.68	52

k-value-delta-iscore

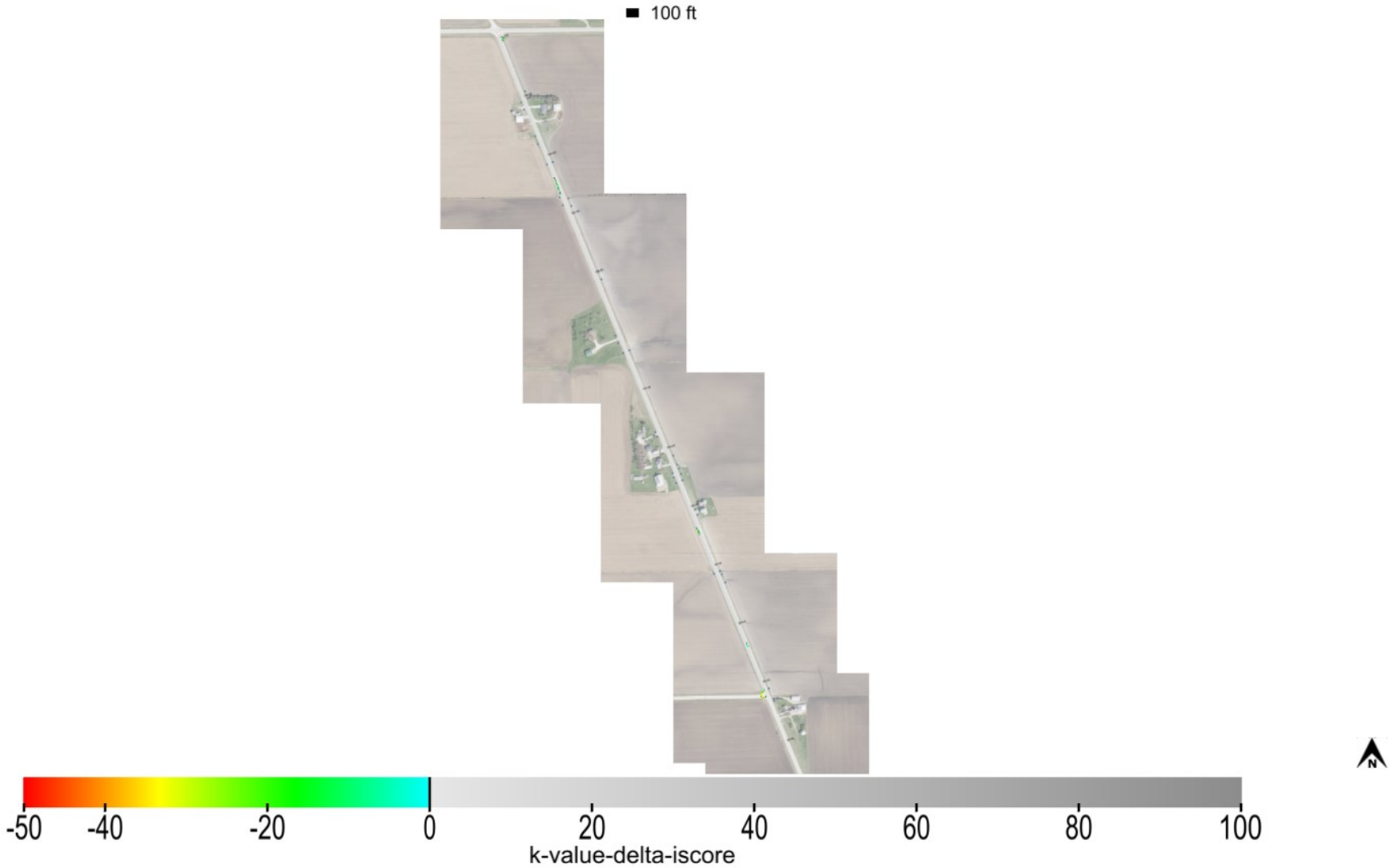


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_134816

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	5	2992	2.59	none	0

blobs: k-value-delta-iscore

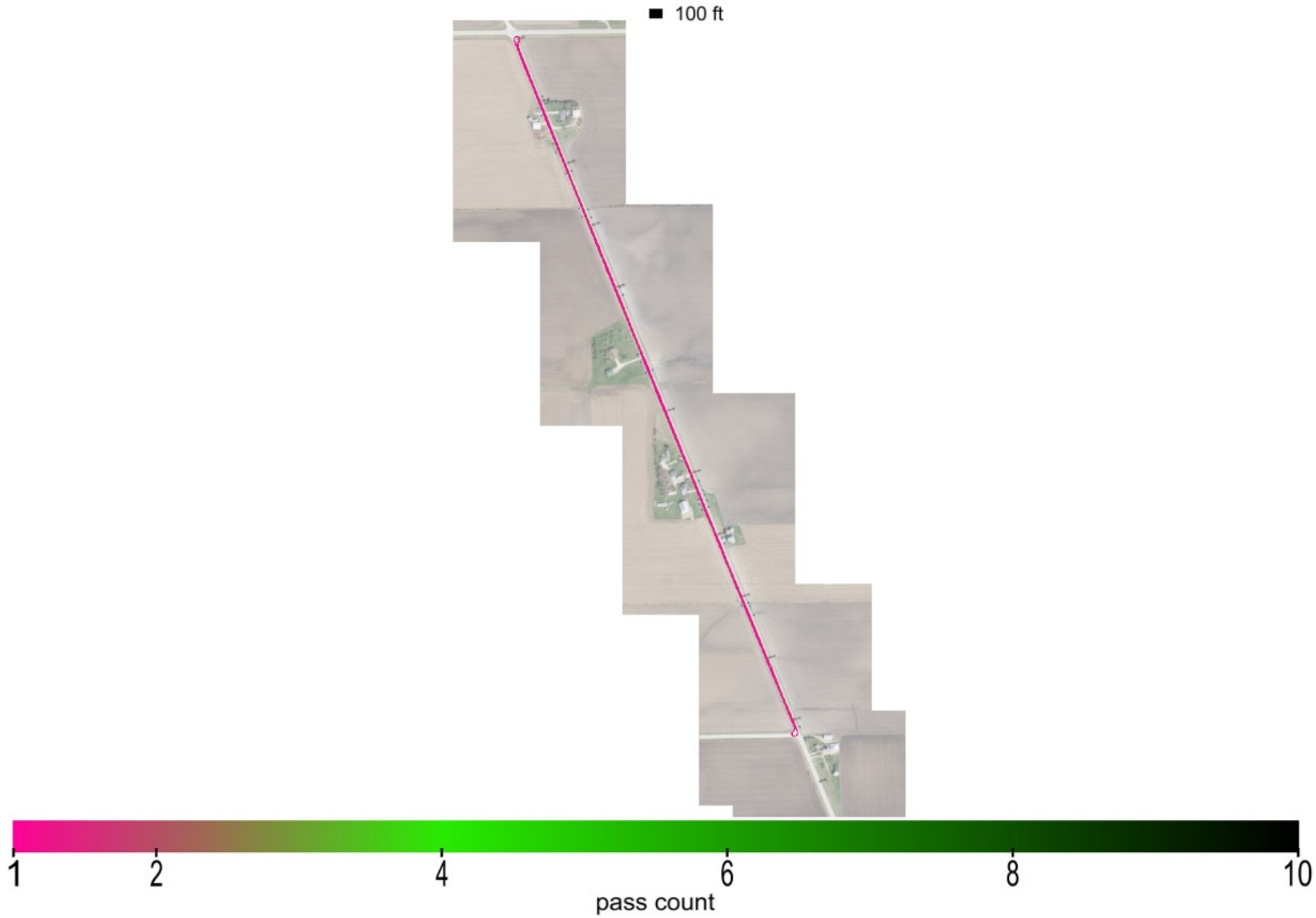


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_134816

minimum	average	maximum
1	1.38	3

pass count

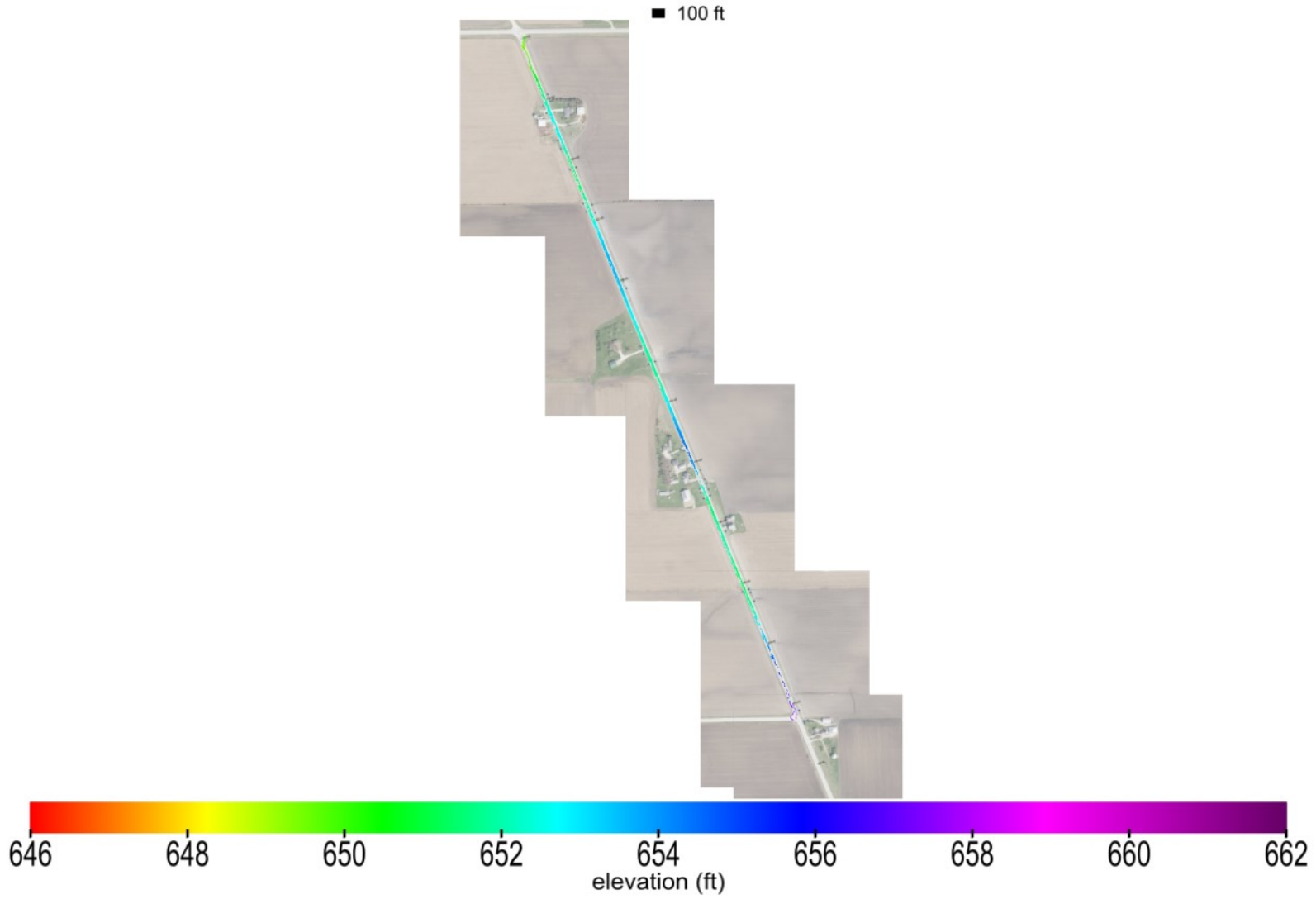


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_134816

minimum	average	maximum
647.518	652.482	657.81

elevation

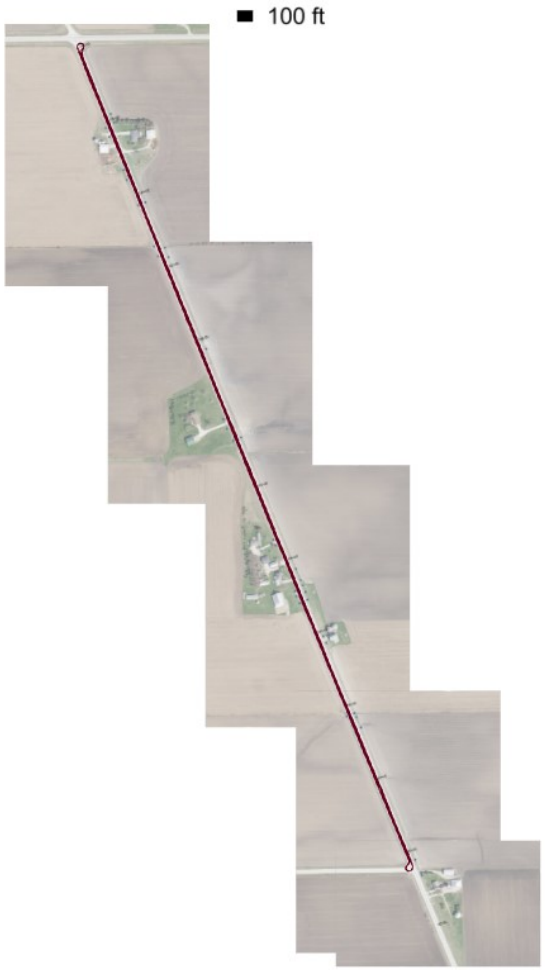


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_134816

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Surfacing	41008	100	115572	2.653	12	9037	150	40

materials



Granular Surfacing Class A Crushed Stone_IADOT (2312)

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_29-iacityrd_cs56-fcs00210_2019_10_22_134816

20191022_135611.jpg

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Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_134816

20191022_141008.jpg

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	IA City Rd Des Moines County	Mapping Duration (hrs):	0.57	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-iacityrd_cs56-fcs00210_2019_10_22_152135	No. of Measurements:	55056	Machine ID:	Ingios_FCS00210
Date and Time:	10/22/2019 3:21:35 PM	Location:	Des Moines 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	119.02	1.1	9037	13463.83	34771.2	56000	7640.69	21.97	4426.83	25734.2	46963
k-value	Yes	76.1	98.64	1.23	150	55	166.3	202	24.77	14.9	-95	16.3	52
Moisture Content	No												

Mapped Area

square feet	acres
55056	1.26

Pass Count

min.	avg.	max.
1	1.35	3

Elevation (ft)

min.	avg.	max.
654.43	656.38	658.61

Velocity (fps)

min.	avg.	max.
0.54	5.22	5.92

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Surfacing	41008	100	55056	1.264	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:	IA City Rd Des Moines County	Mapping Duration (hrs):	0.57	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-iacityrd_cs56-fcs00210_2019_10_22_152135	No. of Measurements:	55056	Machine ID:	Ingios_FCS00210
Date and Time:	10/22/2019 3:21:35 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
98.64	CQI > = 95
76.1	80% of k-Value MVs >= 150
14.9	COV <= 20
17.28	% 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.

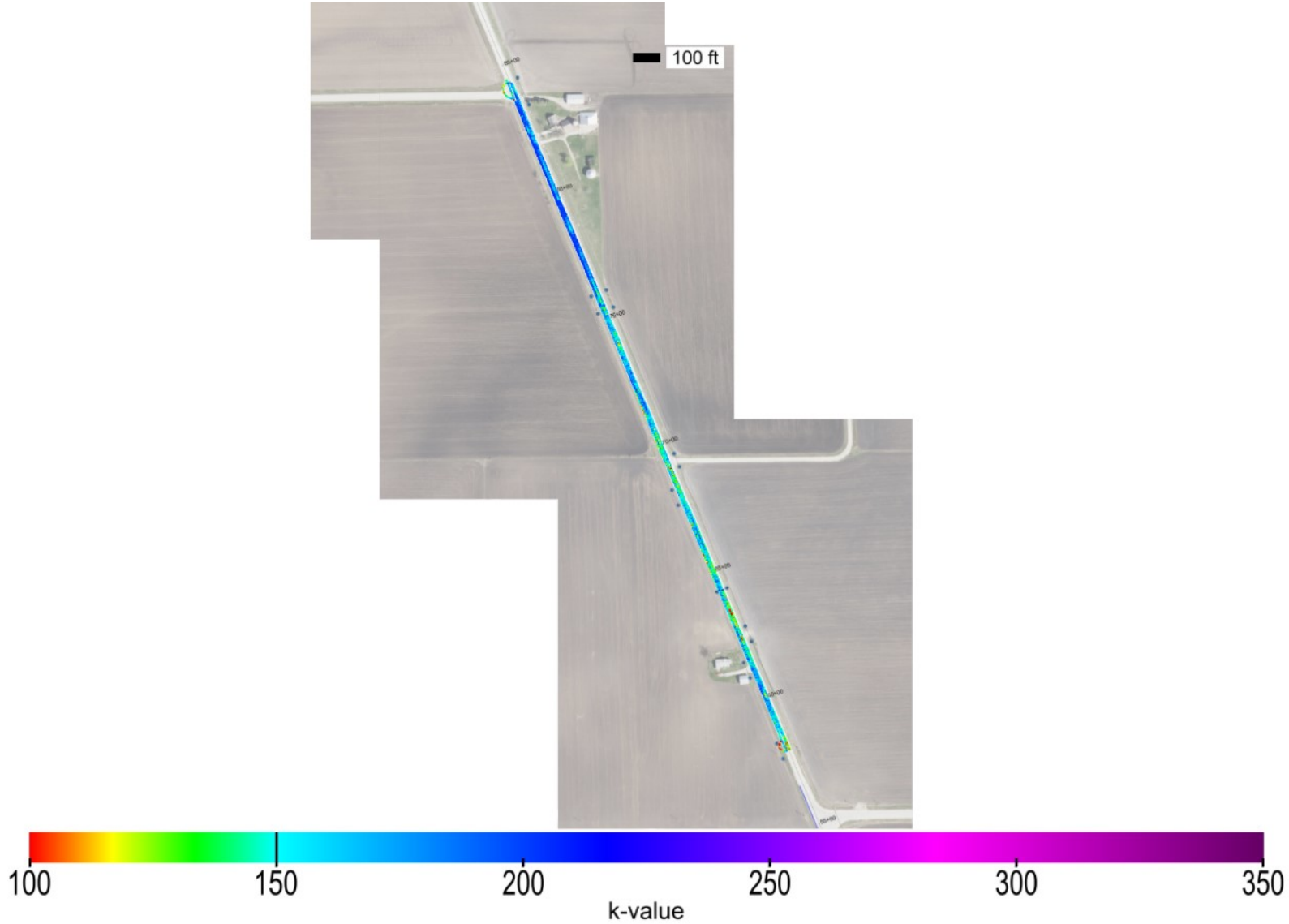
This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_152135

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	76.1	98.64	1.23	150	55	166.3	202	24.77	14.9	-95	16.3	52

k-value



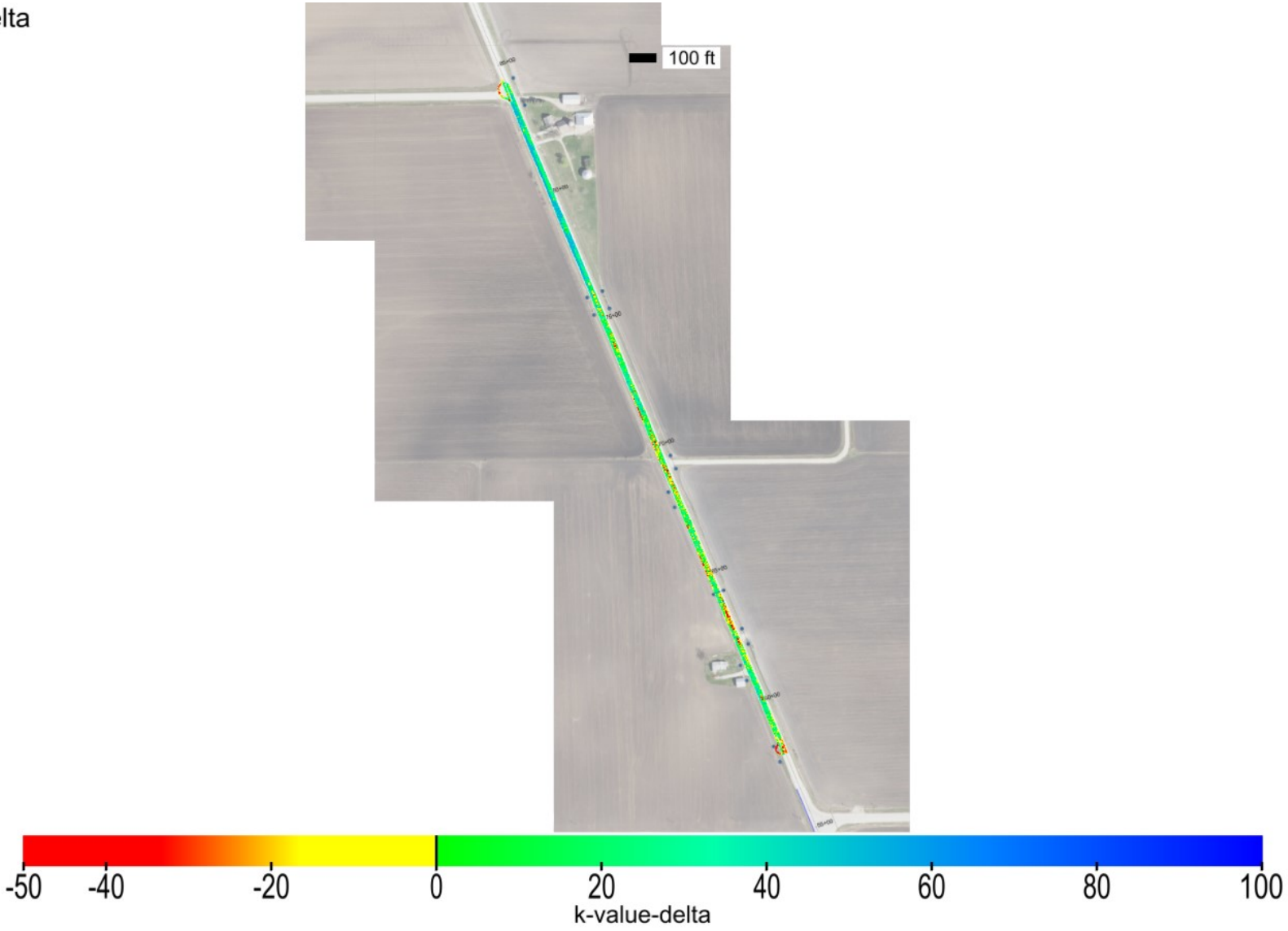
This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_152135

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	76.1	98.64	1.23	150	55	166.3	202	24.77	14.9	-95	16.3	52

k-value-delta

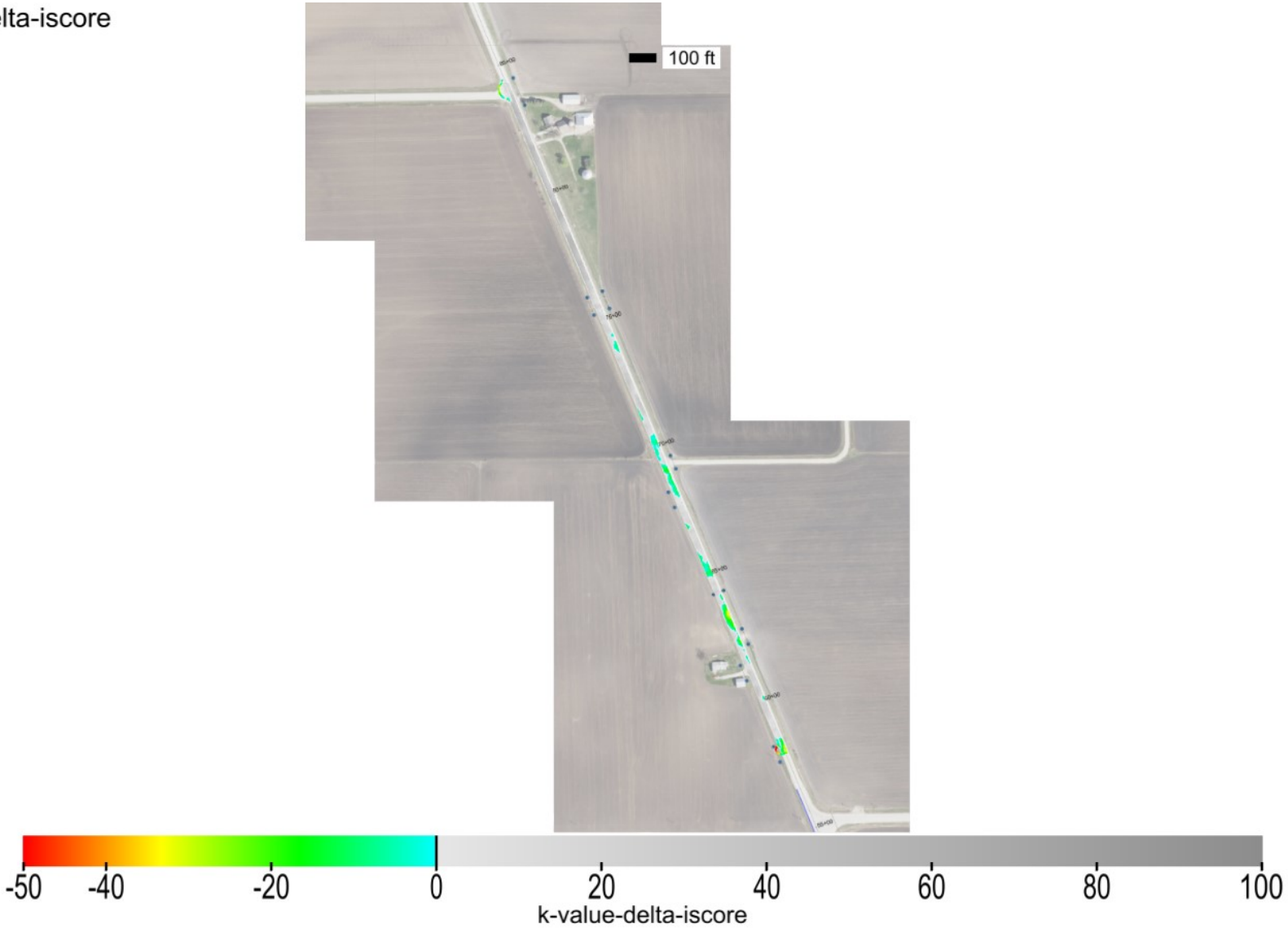


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_152135

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	76.1	150	-95	16.3	52	-69.64	16.29	52

k-value-delta-iscore

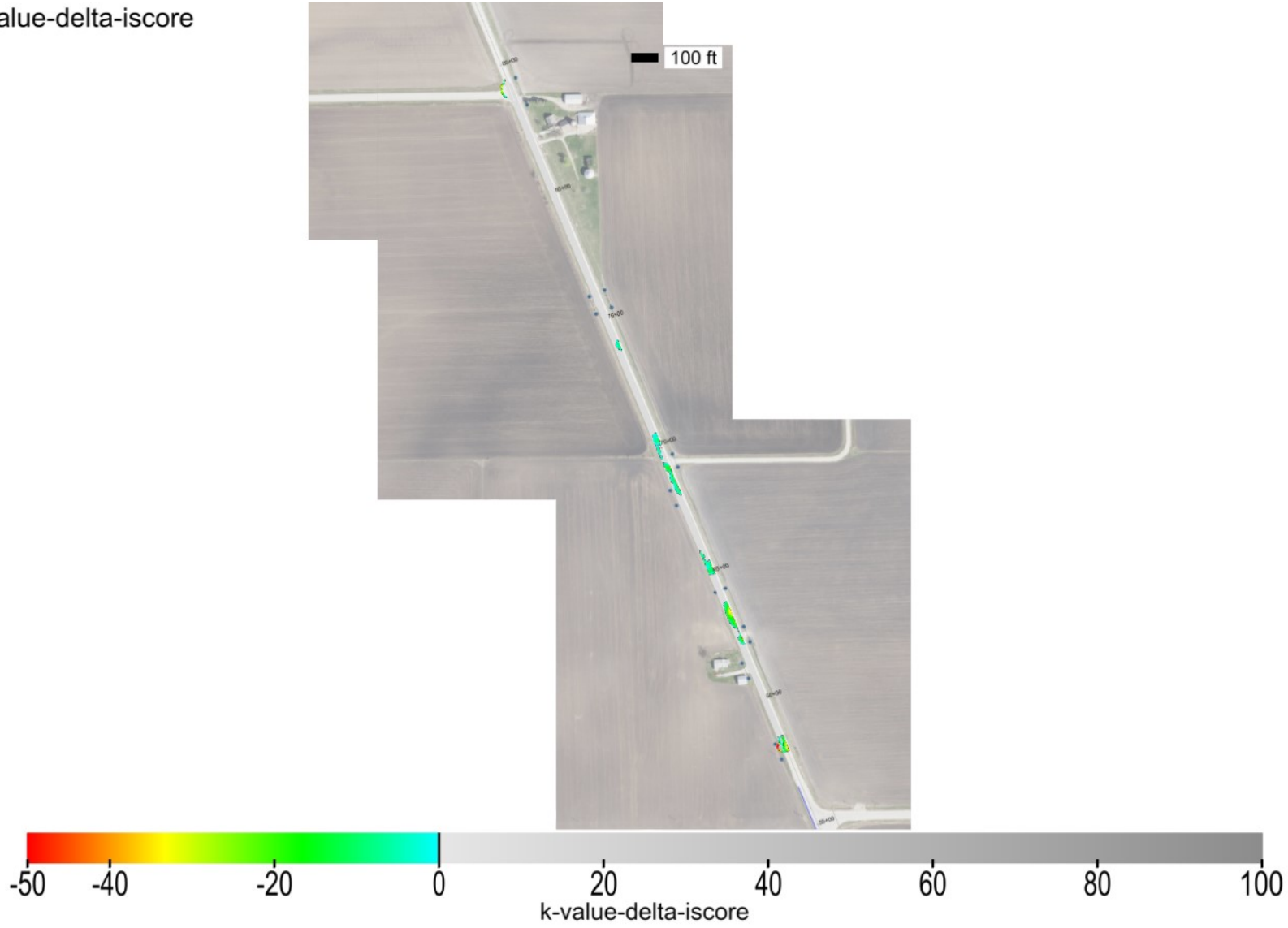


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_152135

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	8	9513	17.28	none	0

blobs: k-value-delta-iscore

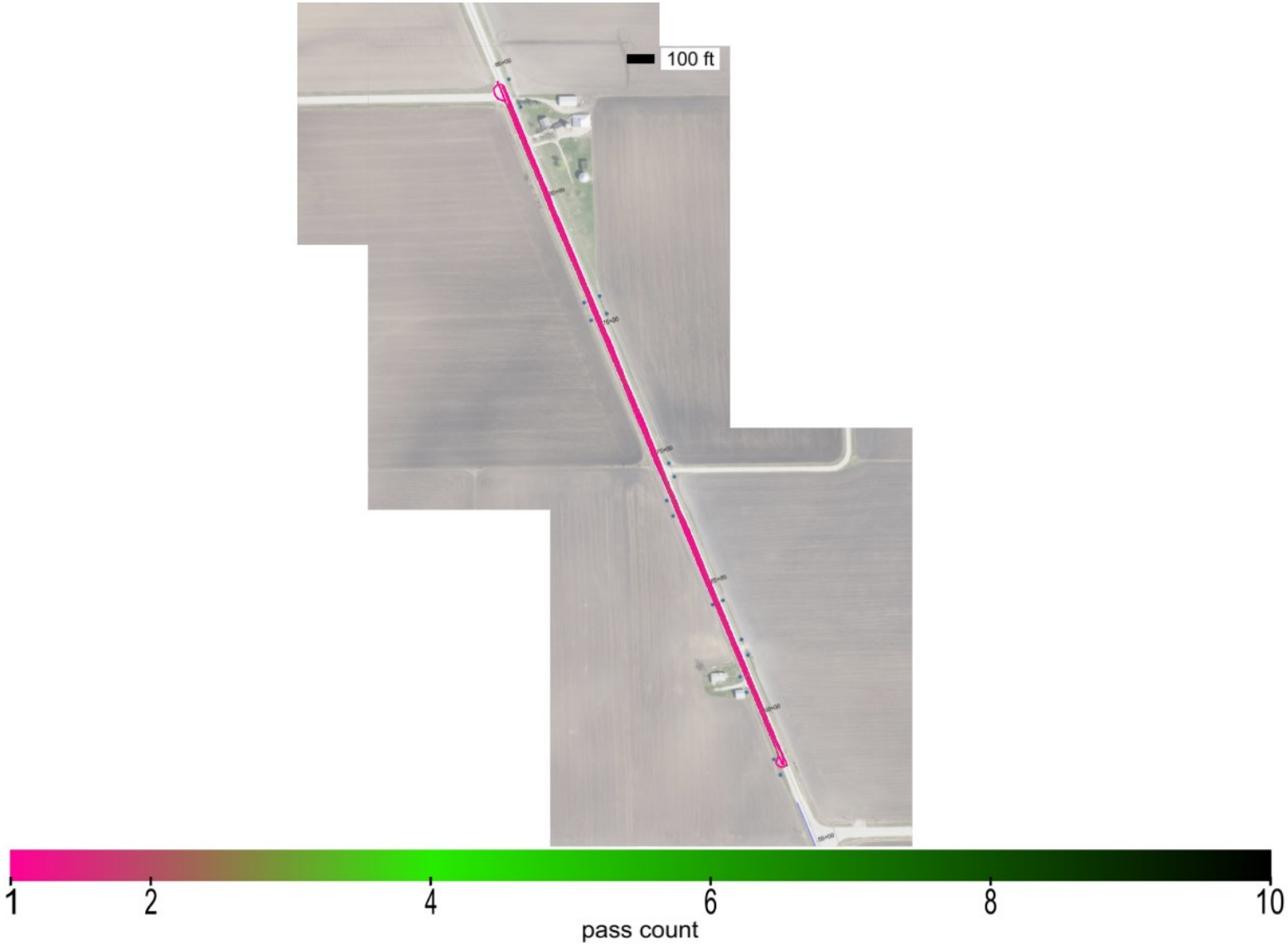


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_152135

minimum	average	maximum
1	1.35	3

pass count

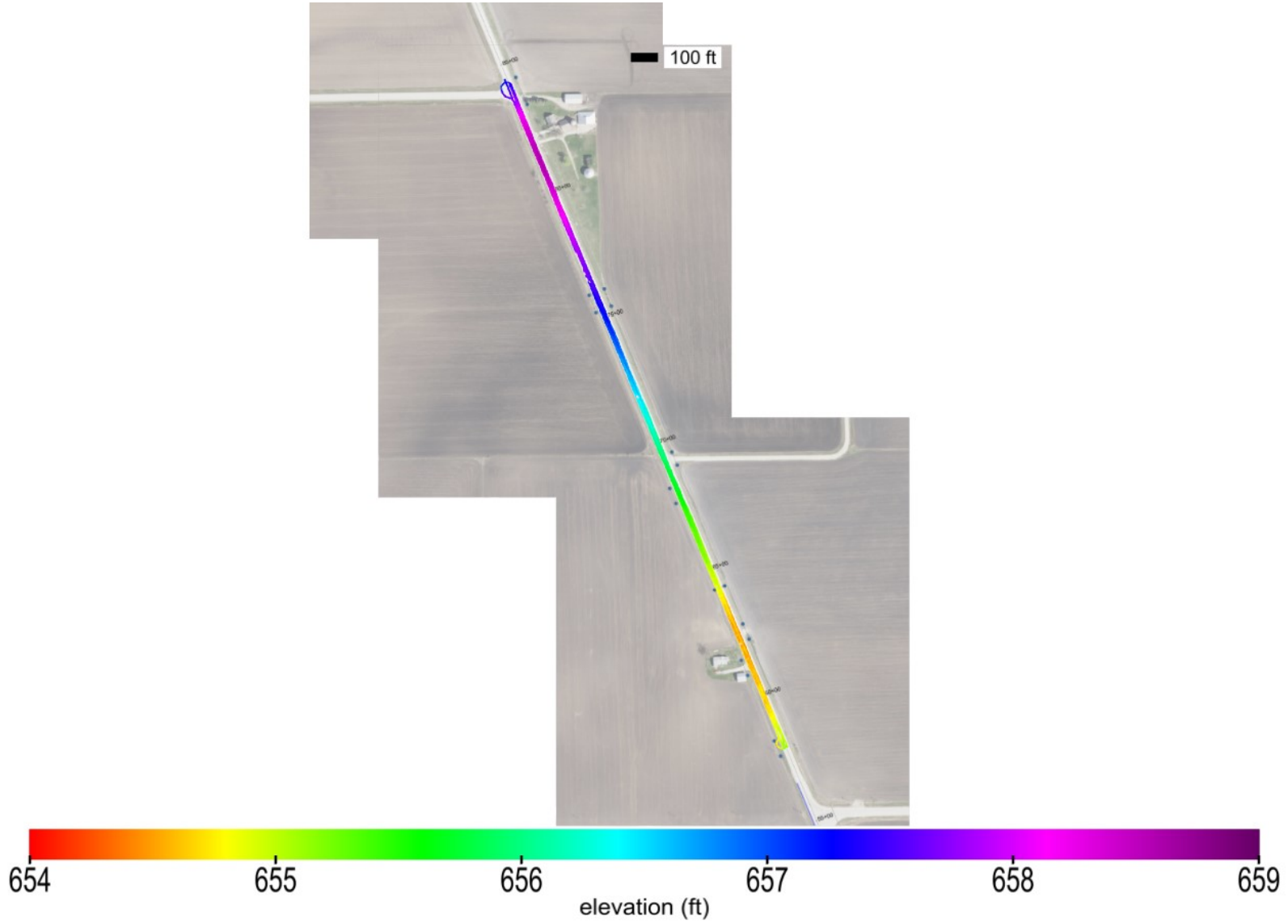


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_152135

minimum	average	maximum
654.428	656.384	658.611

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_29-iacityrd_cs56-fcs00210_2019_10_22_152135

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Surfacing	41008	100	55056	1.264	12	9037	150	40

materials

Granular Surfacing Class A Crushed Stone_IADOT (2312)

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_29-iacityrd_cs56-fcs00210_2019_10_22_152135

20191022_150050.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:	IA City Rd Des Moines County	Mapping Duration (hrs):	0.21	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-iacityrd_cs56-fcs00210_2019_10_22_155654	No. of Measurements:	7761	Machine ID:	Ingios_FCS00210
Date and Time:	10/22/2019 3:56:54 PM	Location:	Des Moines 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	99.8	109.03	0.74	9037	7864.52	26128.9	56000	10863.42	41.58	-1172.48	17091.9	46963
k-value	Yes	33.7	44.27	0.33	150	55	122.7	202	47.67	38.85	-95	-27.3	52
Moisture Content	No												

Mapped Area

square feet	acres
7761	0.18

Pass Count

min.	avg.	max.
1	1.57	4

Elevation (ft)

min.	avg.	max.
656.55	657.3	657.96

Velocity (fps)

min.	avg.	max.
0.09	5.08	5.63

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Surfacing	41008	100	7761	0.178	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:	IA City Rd Des Moines County	Mapping Duration (hrs):	0.21	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-iacityrd_cs56-fcs00210_2019_10_22_155654	No. of Measurements:	7761	Machine ID:	Ingios_FCS00210
Date and Time:	10/22/2019 3:56:54 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
44.27	CQI > = 95
33.7	80% of k-Value MVs >= 150
38.85	COV <= 20
64.99	% 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.

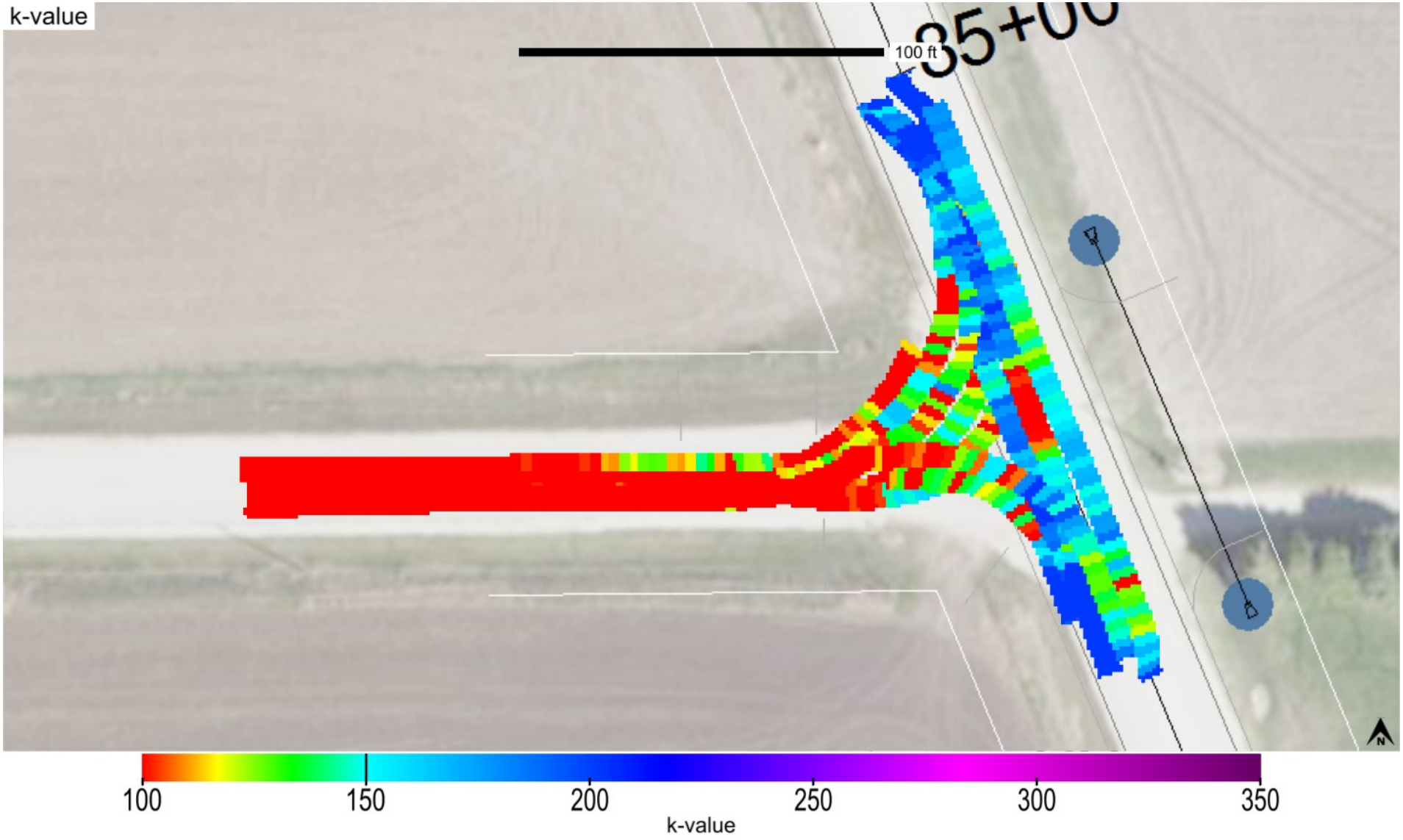
i-Score Blob (%): Represents the percentage of the area within the map area that has been identified from i-Score Blob Analysis as a prioritized contiguous area that is > = 200 sq. ft, with MVs < target values. Description of i-Score Blob: 0% = No rework needed; 0 to 20% = Some rework needed; 20 to 30% = 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_29-iacityrd_cs56-fcs00210_2019_10_22_155654

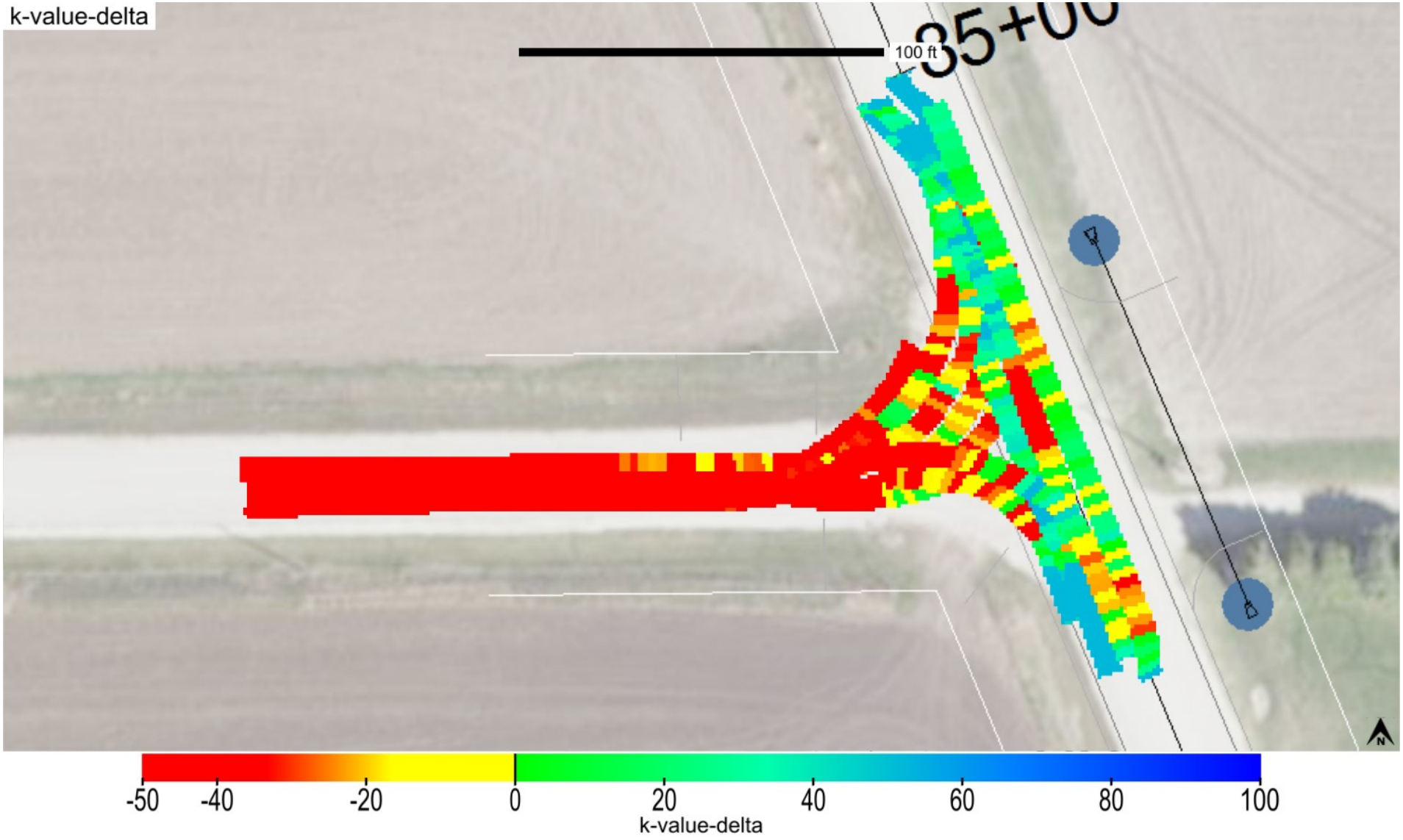
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	33.7	44.27	0.33	150	55	122.7	202	47.67	38.85	-95	-27.3	52



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_29-iacityrd_cs56-fcs00210_2019_10_22_155654

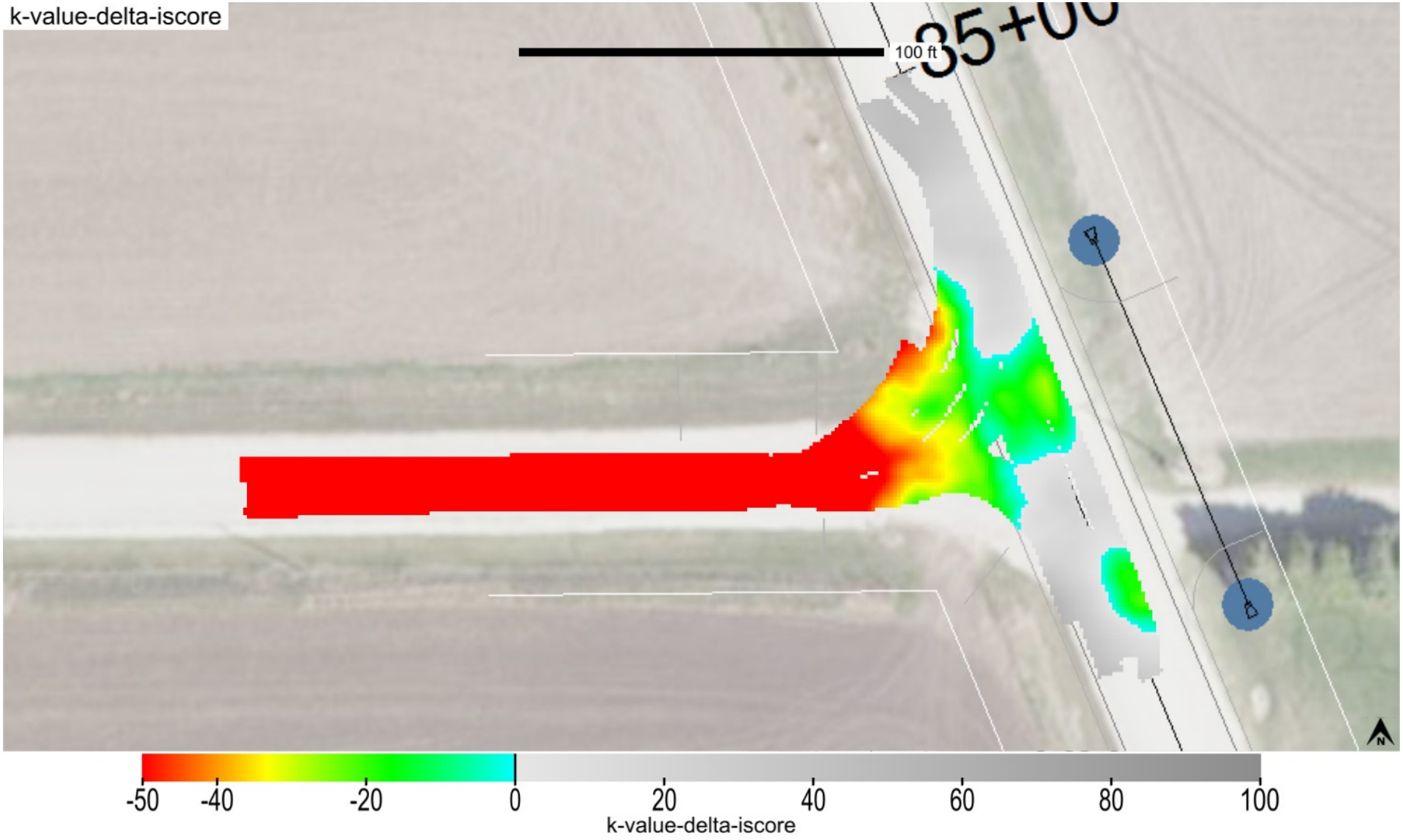
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	33.7	44.27	0.33	150	55	122.7	202	47.67	38.85	-95	-27.3	52



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_29-iacityrd_cs56-fcs00210_2019_10_22_155654

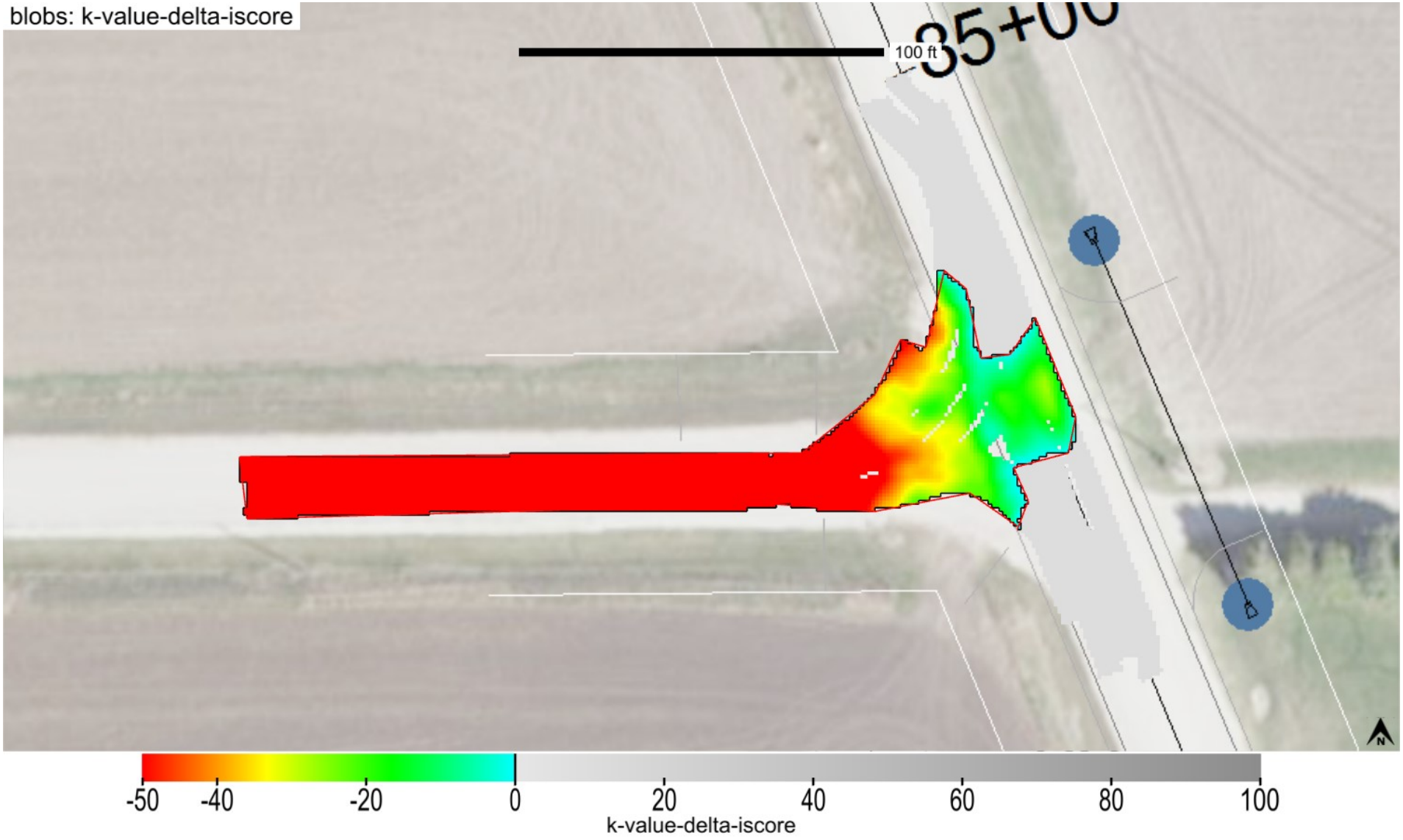
Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	33.7	150	-95	-27.3	52	-93.89	-27.63	51.82



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_29-iacityrd_cs56-fcs00210_2019_10_22_155654

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	5044	64.99	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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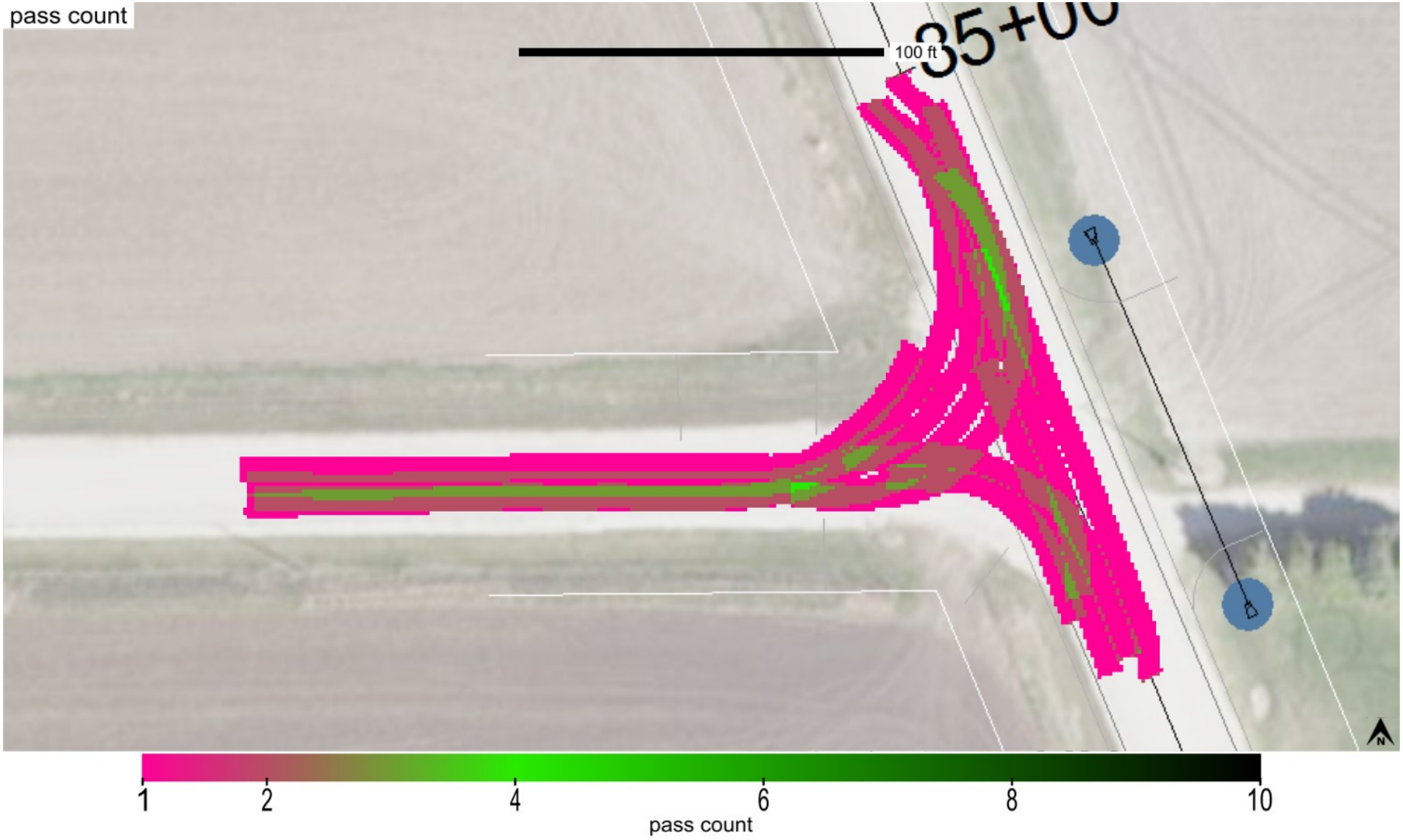
Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_155654

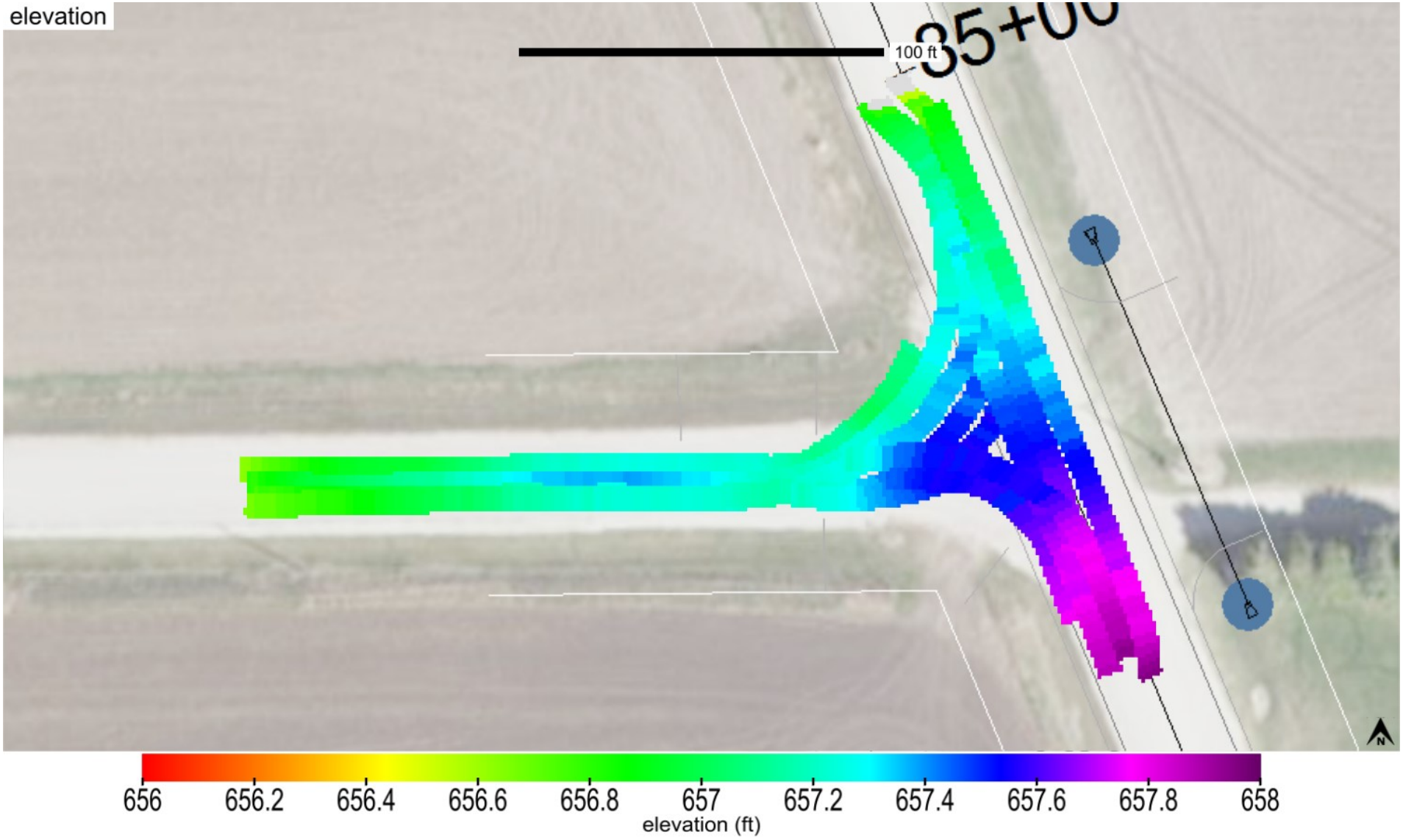
minimum	average	maximum
1	1.57	4



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_29-iacityrd_cs56-fcs00210_2019_10_22_155654

minimum	average	maximum
656.547	657.301	657.955



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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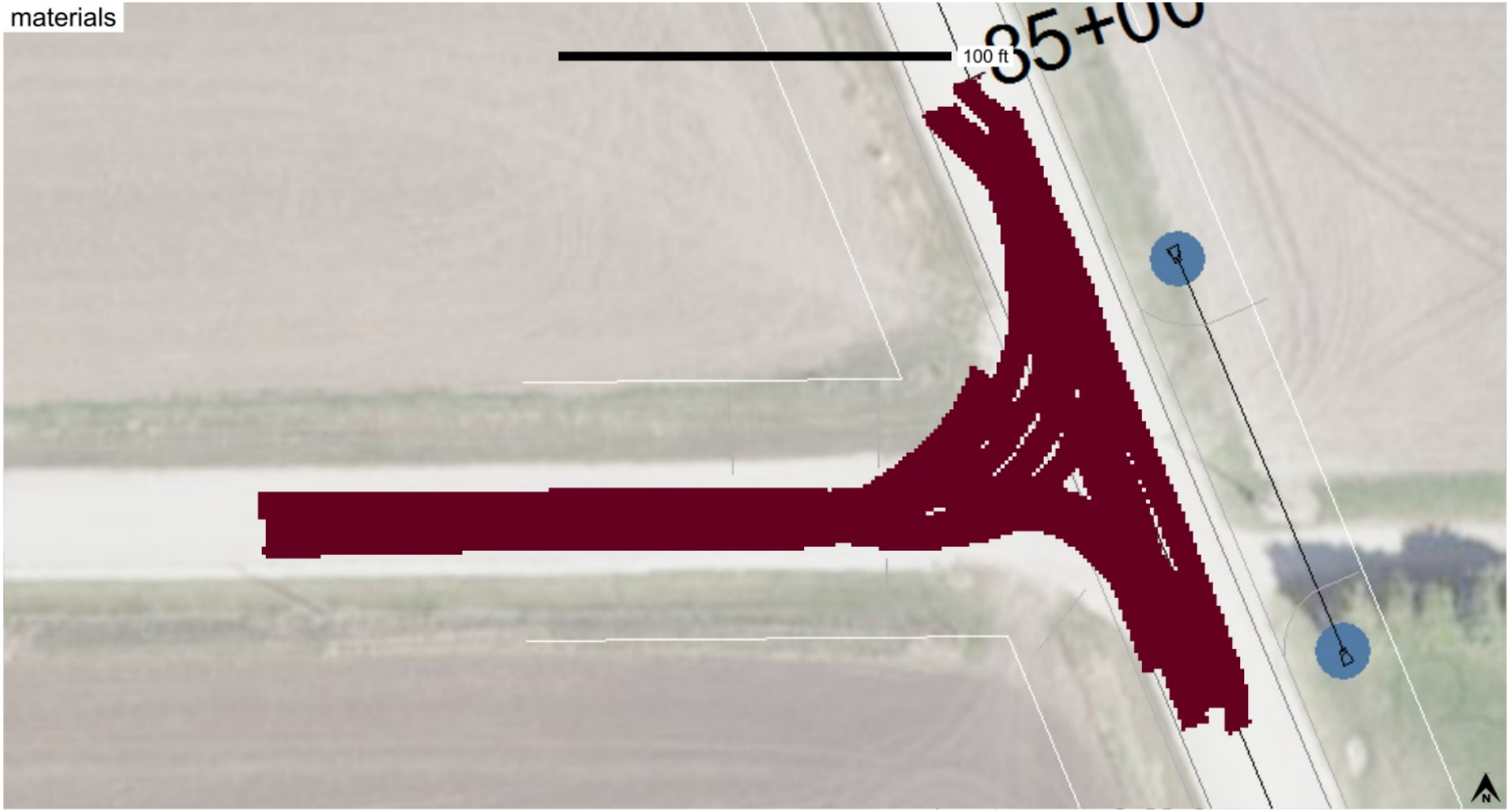
Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_155654

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Surfacing	41008	100	7761	0.178	12	9037	150	40



Granular Surfacing Class A Crushed Stone_IADOT (2312)

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_29-iacityrd_cs56-fcs00210_2019_10_22_155654

20191022_162215.jpg

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IOWADOT

E-Compaction Report

Project:	IA City Rd Des Moines County	Mapping Duration (hrs):	0.27	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-iacityrd_cs56-fcs00210_2019_10_22_161815	No. of Measurements:	36754	Machine ID:	Ingios_FCS00210
Date and Time:	10/22/2019 4:18:15 PM	Location:	Des Moines 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	123.02	1.1	9037	23463.8	41008.9	56000	5729.92	13.97	14426.8	31971.9	46963
k-value	Yes	99.8	127.04	3.61	150	135.63	190.8	202	10.68	5.6	-14.37	40.8	52
Moisture Content	No												

Mapped Area

square feet	acres
36754	0.84

Pass Count

min.	avg.	max.
1	1	2

Elevation (ft)

min.	avg.	max.
640.23	648.45	655.41

Velocity (fps)

min.	avg.	max.
4.94	5.44	6.04

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Surfacing	41008	100	36754	0.844	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:	IA City Rd Des Moines County	Mapping Duration (hrs):	0.27	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-iacityrd_cs56-fcs00210_2019_10_22_161815	No. of Measurements:	36754	Machine ID:	Ingios_FCS00210
Date and Time:	10/22/2019 4:18:15 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
123.02	CQI > = 95
100	80% of Resilient Modulus MVs >= 9037
13.97	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:	IA City Rd Des Moines County	Mapping Duration (hrs):	0.27	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-iacityrd_cs56-fcs00210_2019_10_22_161815	No. of Measurements:	36754	Machine ID:	Ingios_FCS00210
Date and Time:	10/22/2019 4:18:15 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
127.04	CQI > = 95
99.8	80% of k-Value MVs >= 150
5.6	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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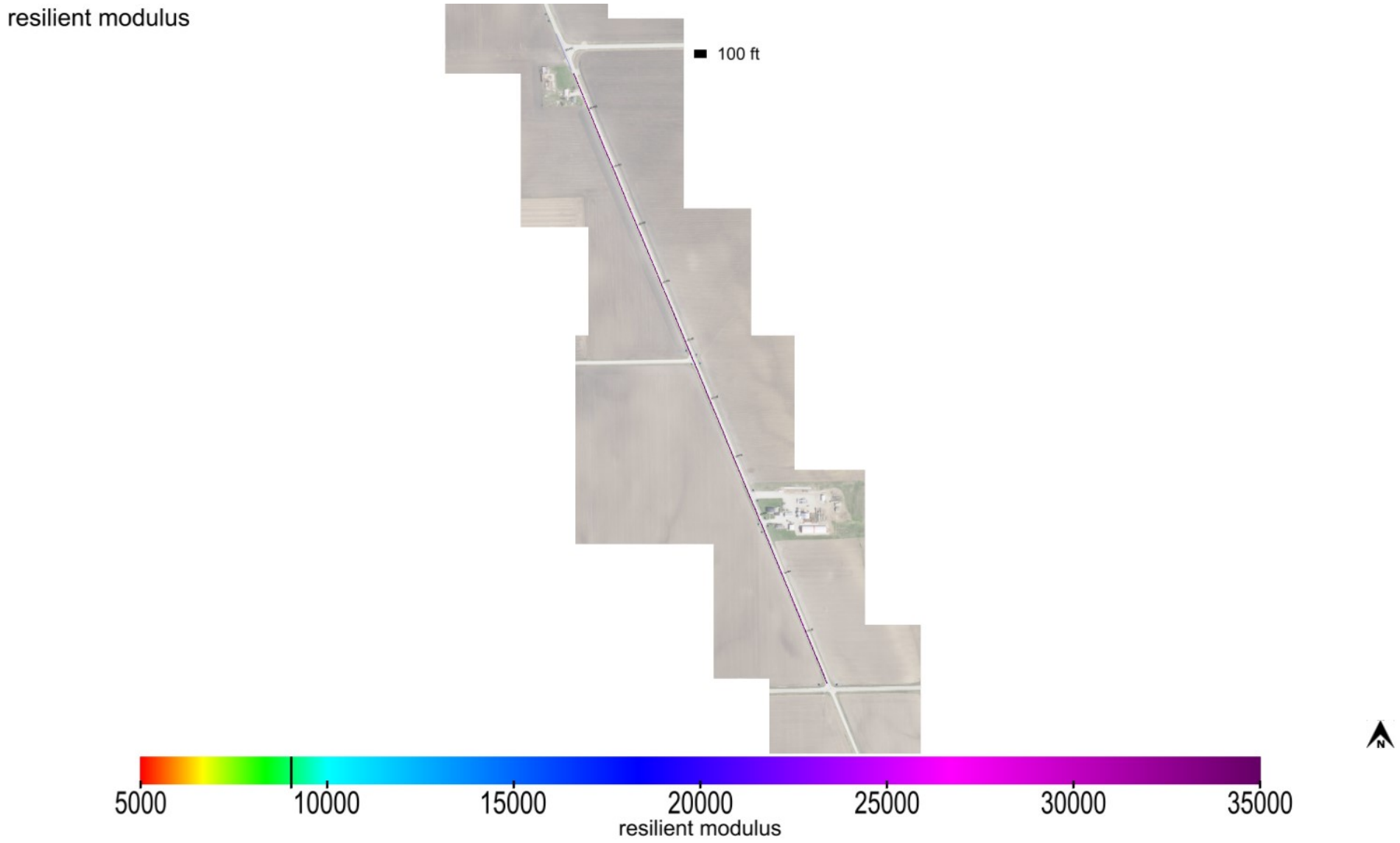
Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_161815

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	123.02	1.1	9037	23463.8	41008.9	56000	5729.92	13.97	14426.8	31971.9	46963



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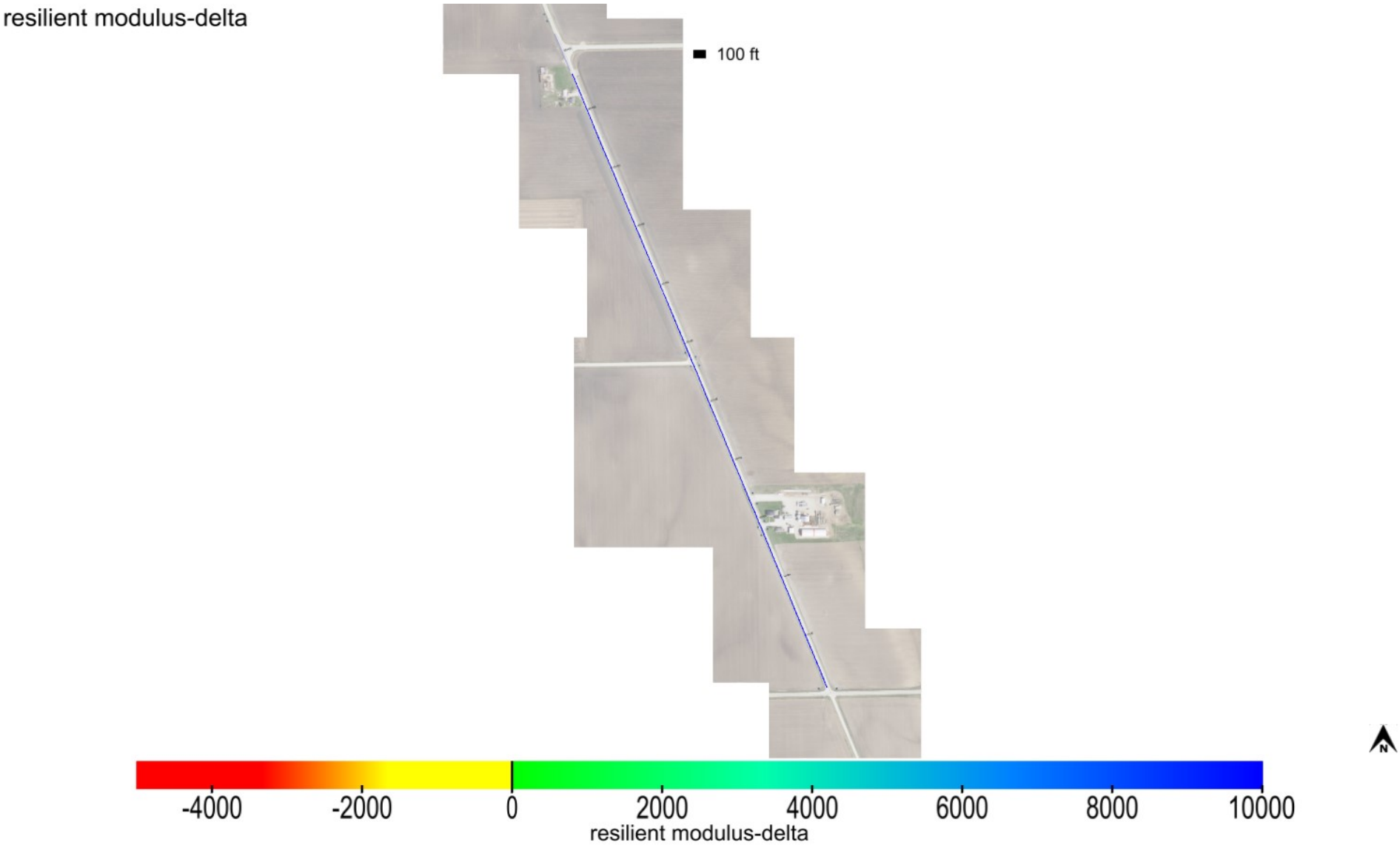
Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_161815

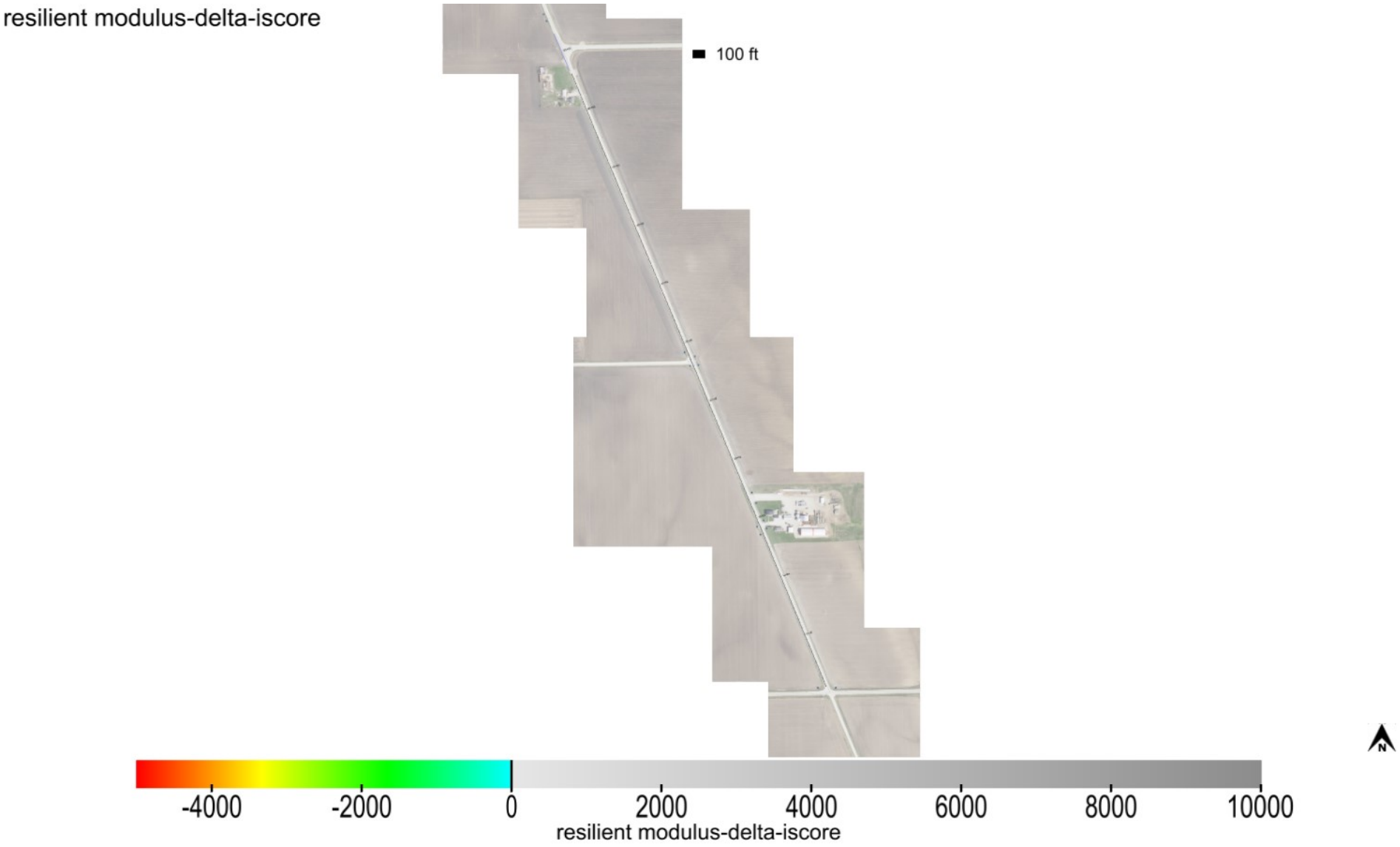
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	123.02	1.1	9037	23463.8	41008.9	56000	5729.92	13.97	14426.8	31971.9	46963



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_29-iacityrd_cs56-fcs00210_2019_10_22_161815

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	14426.8	31971.9	46963	20415.51	31971.77	41598.91

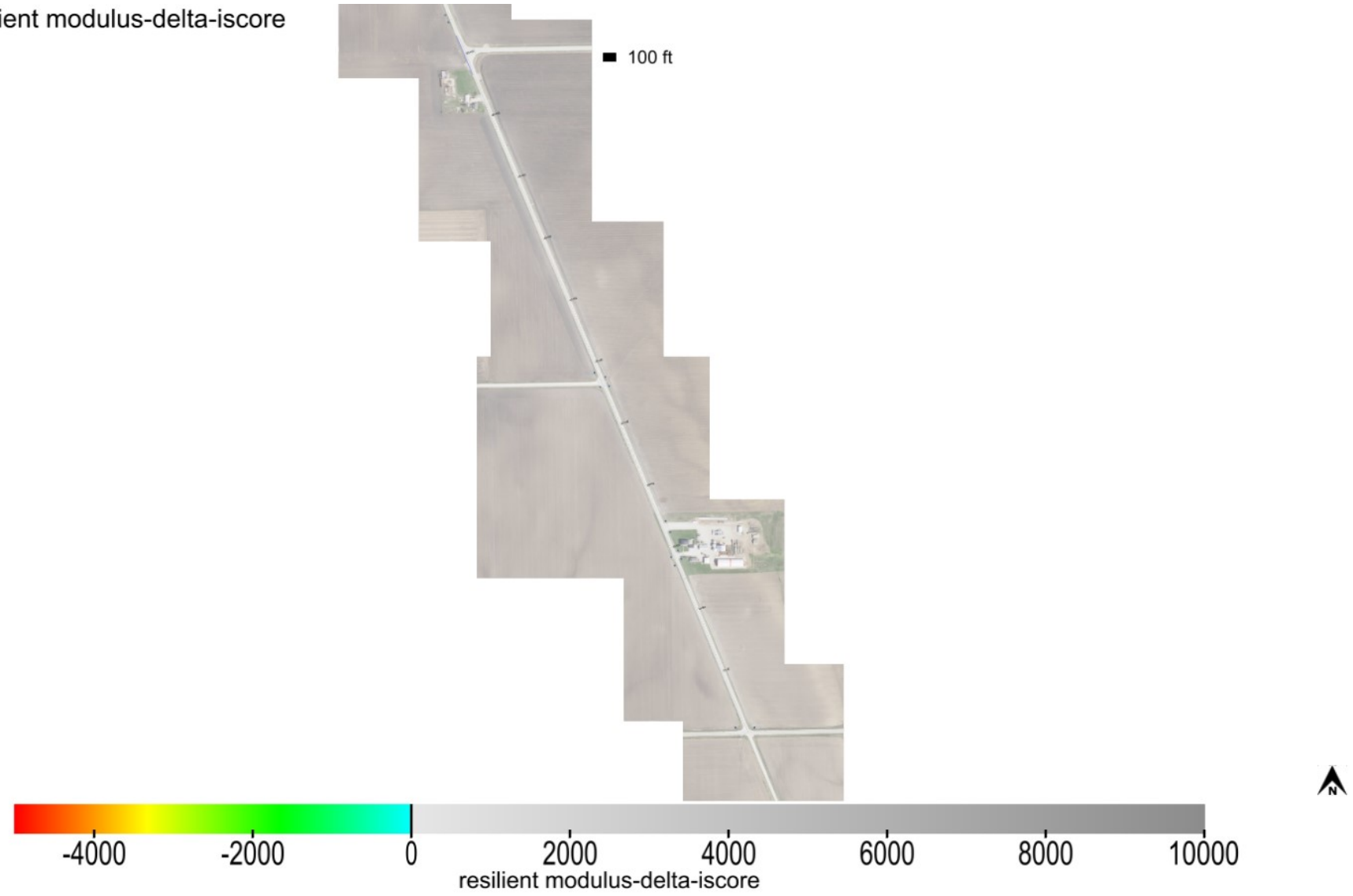


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_161815

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

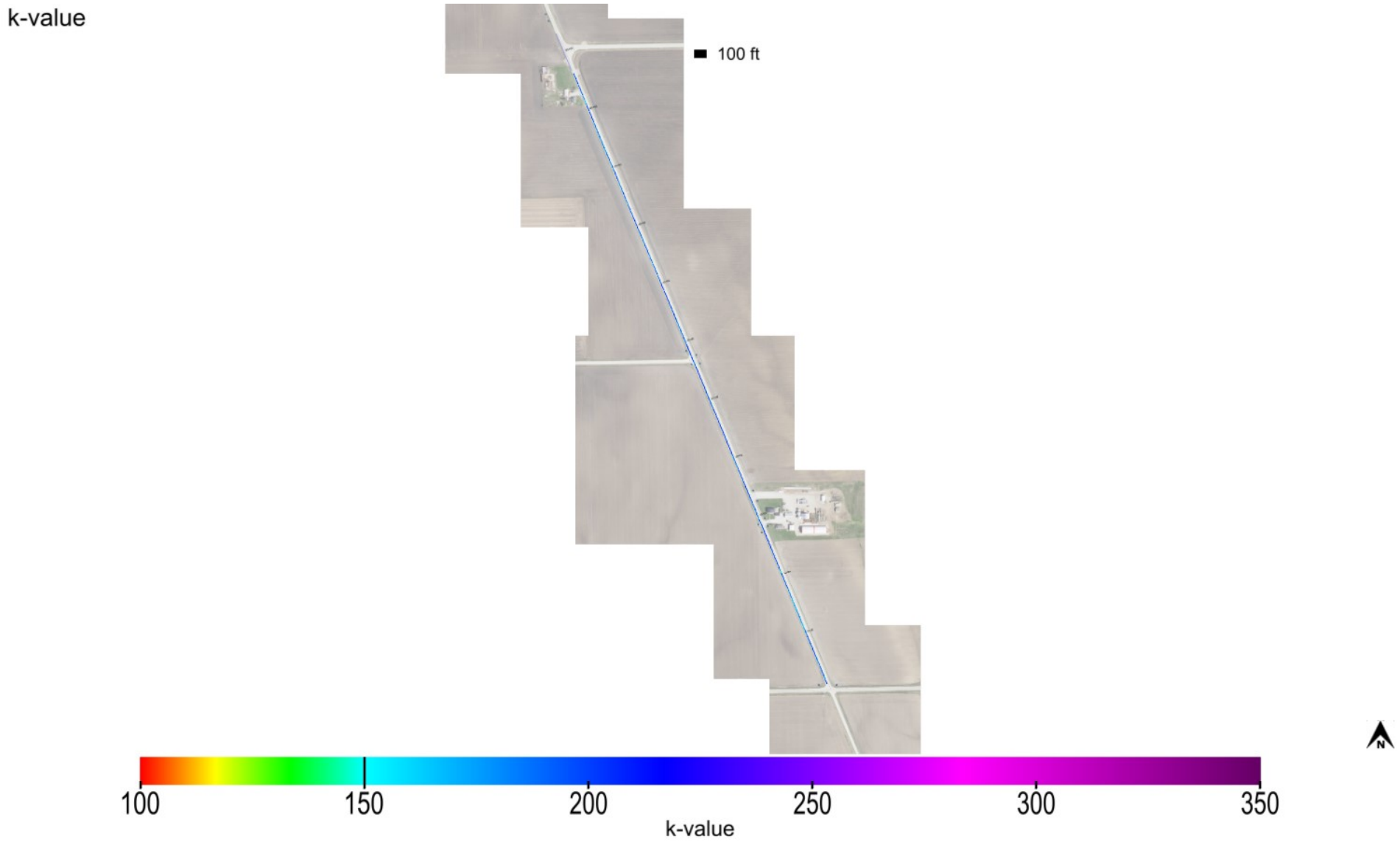
blobs: resilient modulus-delta-iscore



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_29-iacityrd_cs56-fcs00210_2019_10_22_161815

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	99.8	127.04	3.61	150	135.63	190.8	202	10.68	5.6	-14.37	40.8	52



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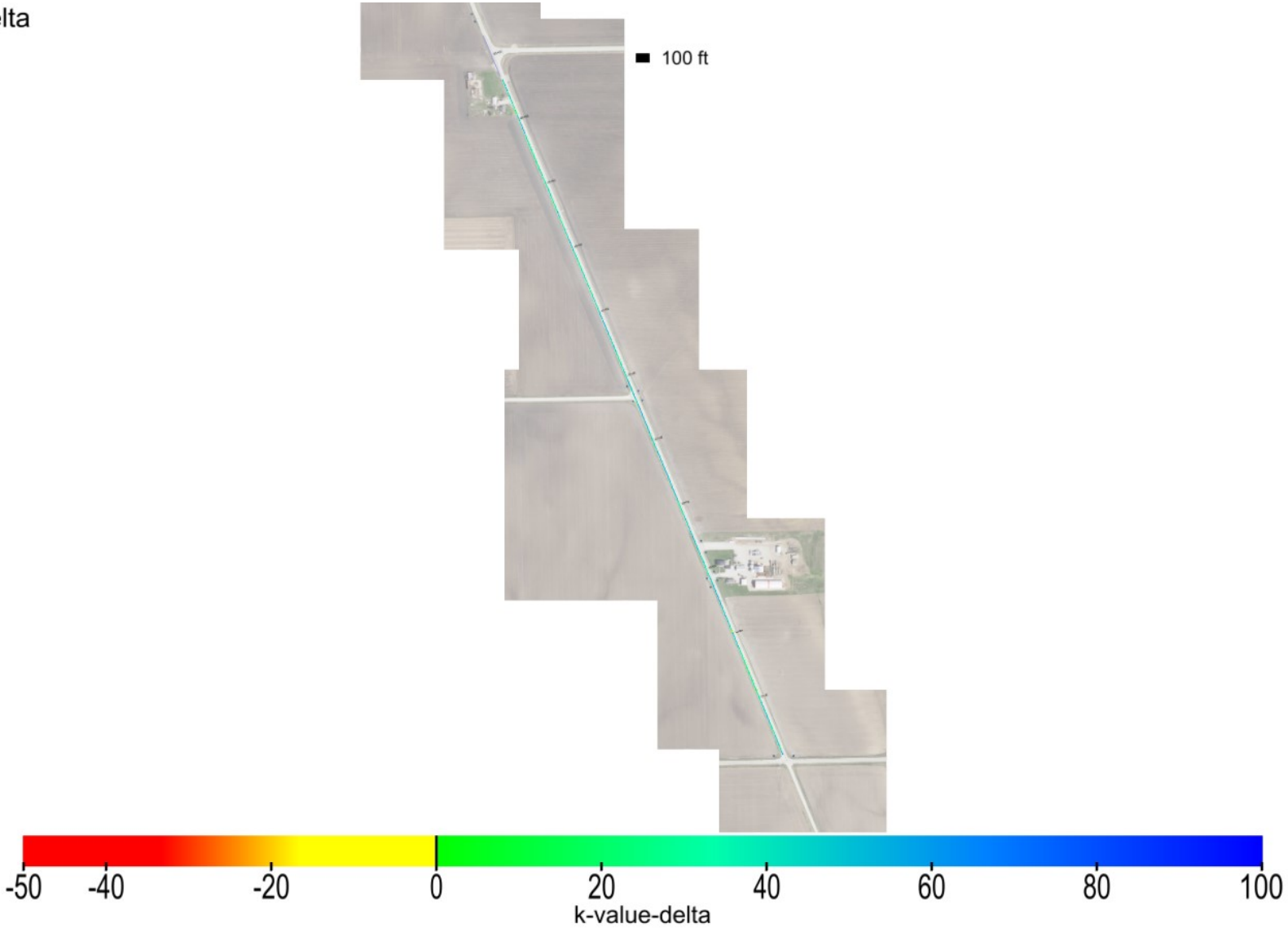
Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_161815

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	99.8	127.04	3.61	150	135.63	190.8	202	10.68	5.6	-14.37	40.8	52

k-value-delta

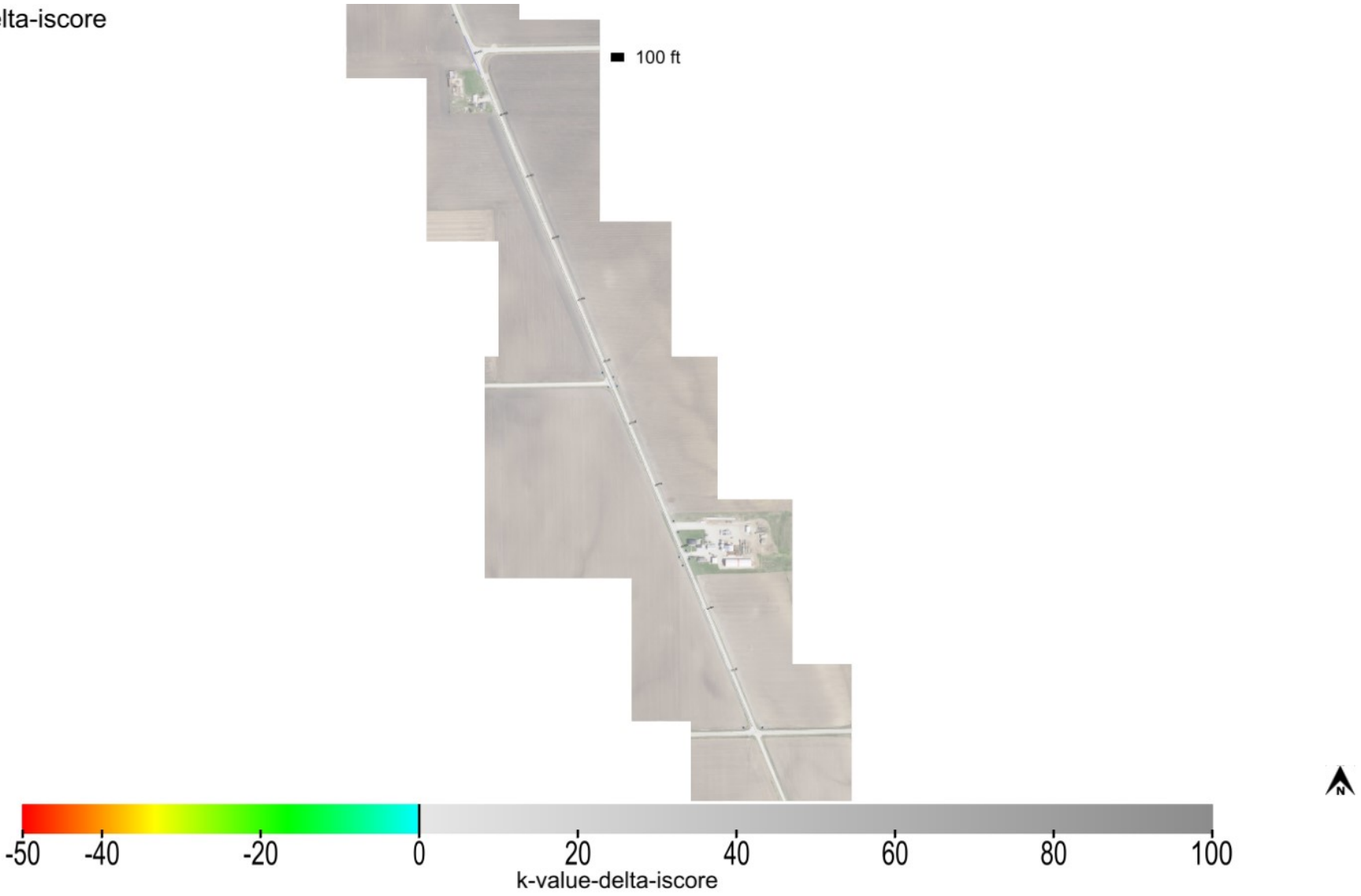


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_161815

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	99.8	150	-14.37	40.8	52	1.28	40.81	52

k-value-delta-iscore

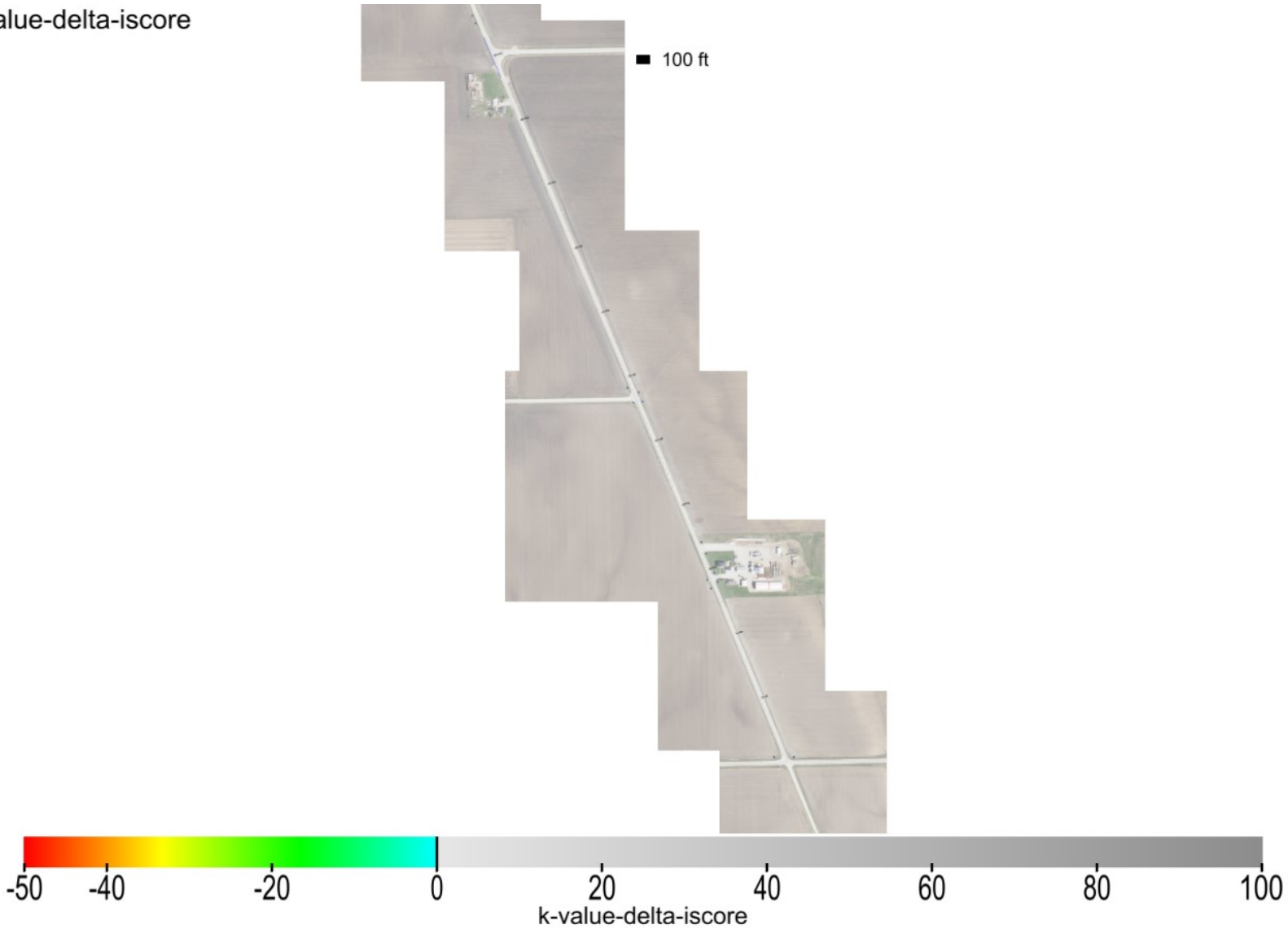


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_161815

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

blobs: k-value-delta-iscore



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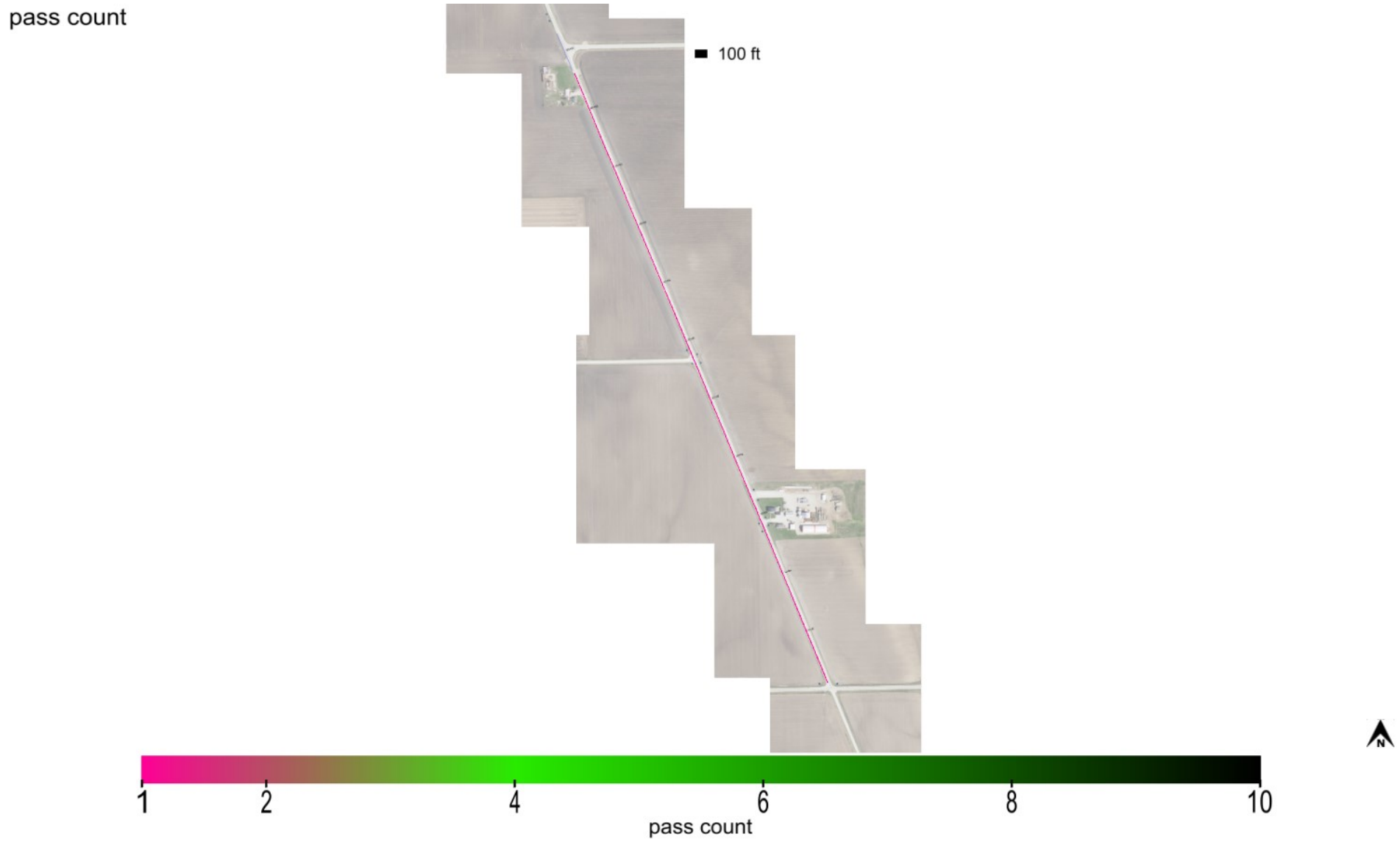
Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_161815

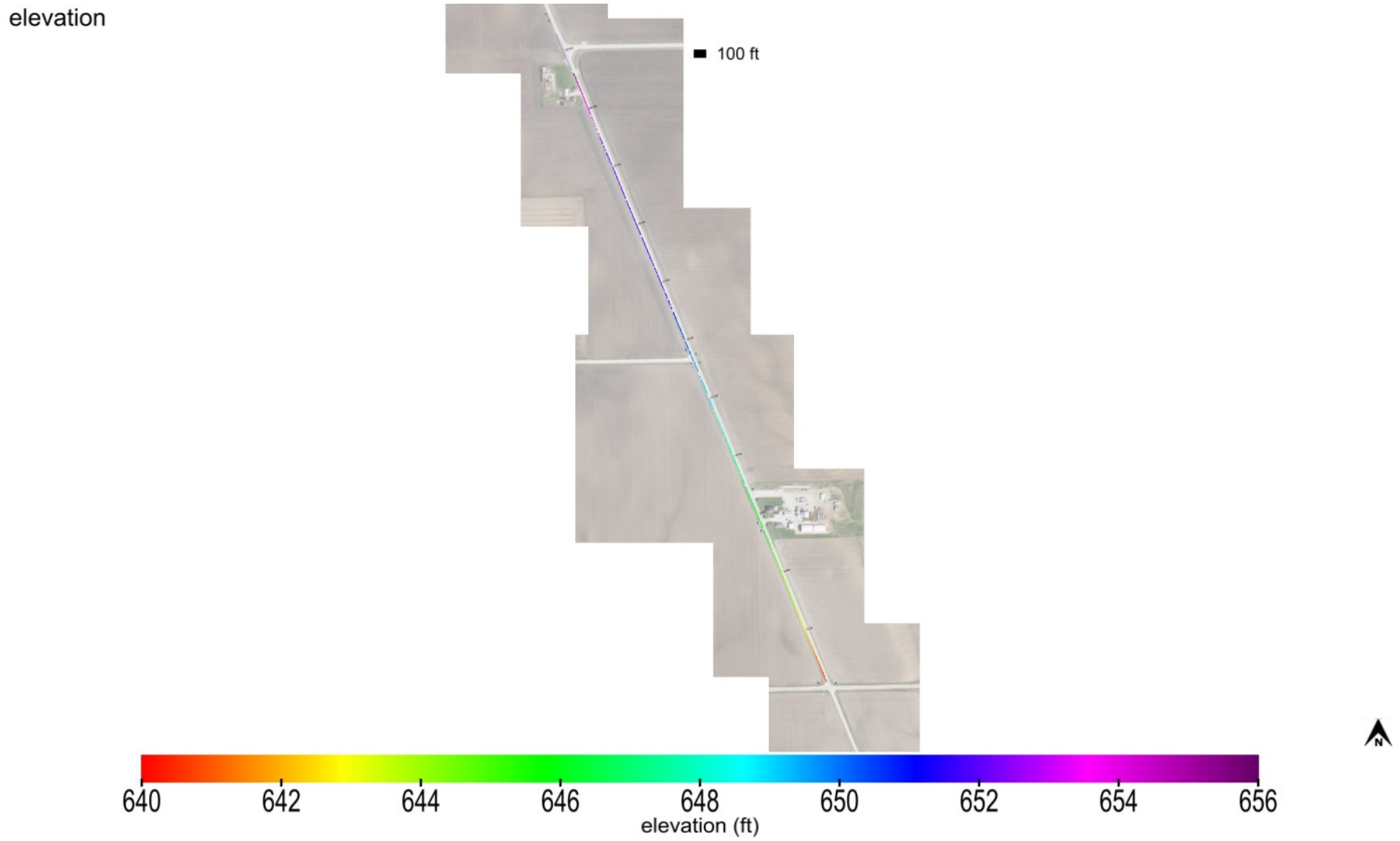
minimum	average	maximum
1	1	2



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_29-iacityrd_cs56-fcs00210_2019_10_22_161815

minimum	average	maximum
640.228	648.45	655.409



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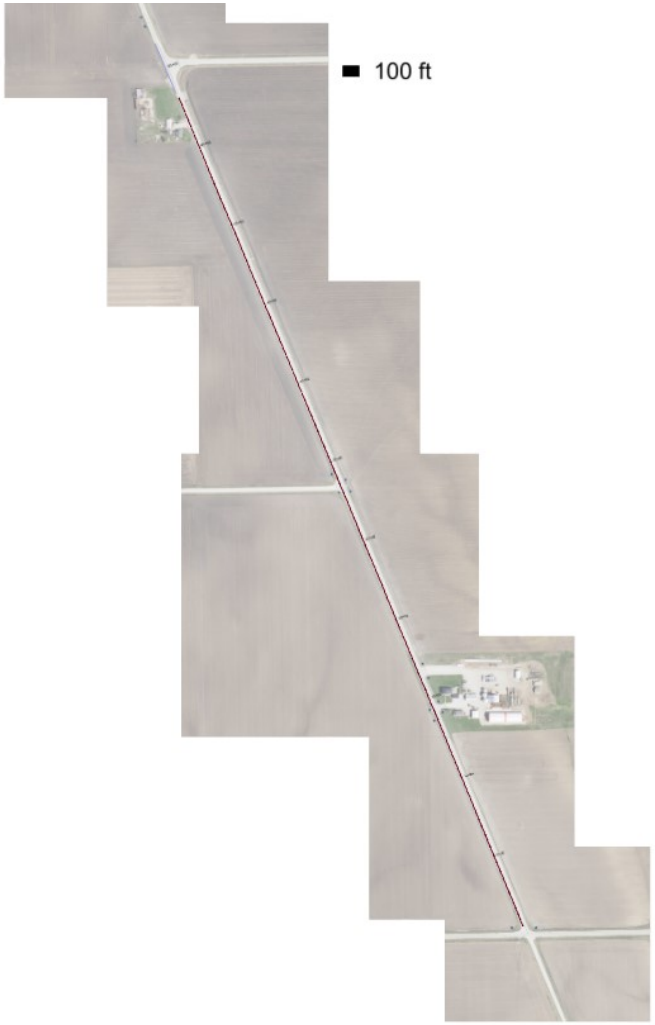
Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_161815

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Surfacing	41008	100	36754	0.844	12	9037	150	40

materials



Granular Surfacing Class A Crushed Stone_IADOT (2312)

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_29-iacityrd_cs56-fcs00210_2019_10_22_161815

20191022_163212.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:	IA City Rd Des Moines County	Mapping Duration (hrs):	0.11	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-iacityrd_cs56-fcs00210_2019_10_22_163829	No. of Measurements:	15846	Machine ID:	Ingios_FCS00210
Date and Time:	10/22/2019 4:38:29 PM	Location:	Des Moines 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	29.1	35.77	0.25	150	35	116.1	234.01	54.13	46.63	-115	-33.9	84.01
Moisture Content	No												

Mapped Area

square feet	acres
15846	0.36

Pass Count

min.	avg.	max.
1	1	1

Elevation (ft)

min.	avg.	max.
611.9	631.19	640.3

Velocity (fps)

min.	avg.	max.
2.68	5.53	6.46

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Class 10 Subgrade	24005	100	15846	0.364	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:	IA City Rd Des Moines County	Mapping Duration (hrs):	0.11	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-iacityrd_cs56-fcs00210_2019_10_22_163829	No. of Measurements:	15846	Machine ID:	Ingios_FCS00210
Date and Time:	10/22/2019 4:38:29 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
35.77	CQI > = 95
29.1	80% of k-Value MVs >= 150
46.63	COV <= 20
73.31	% 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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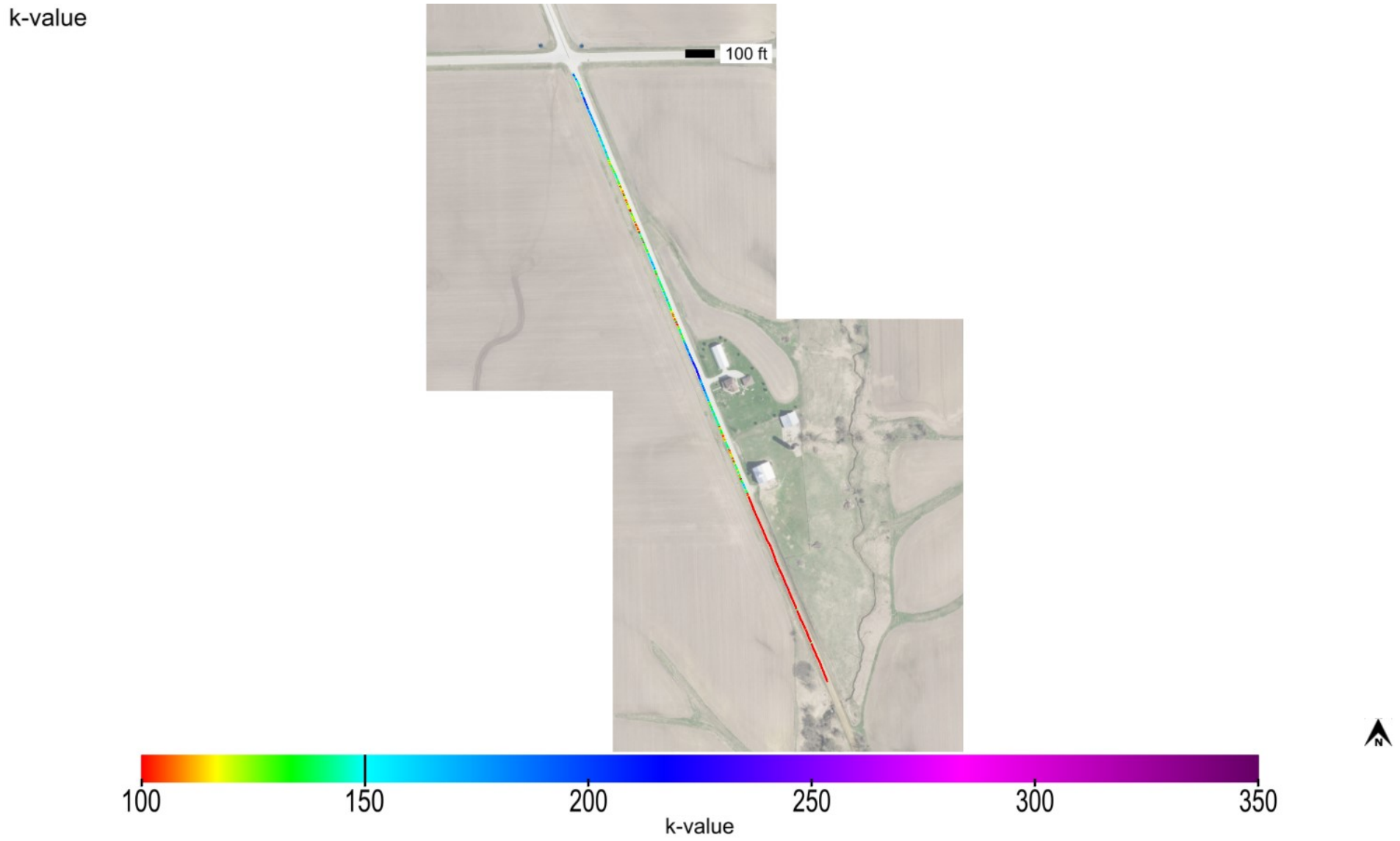
ingios GEOTECHNICS

Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_163829

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	29.1	35.77	0.25	150	35	116.1	234.01	54.13	46.63	-115	-33.9	84.01

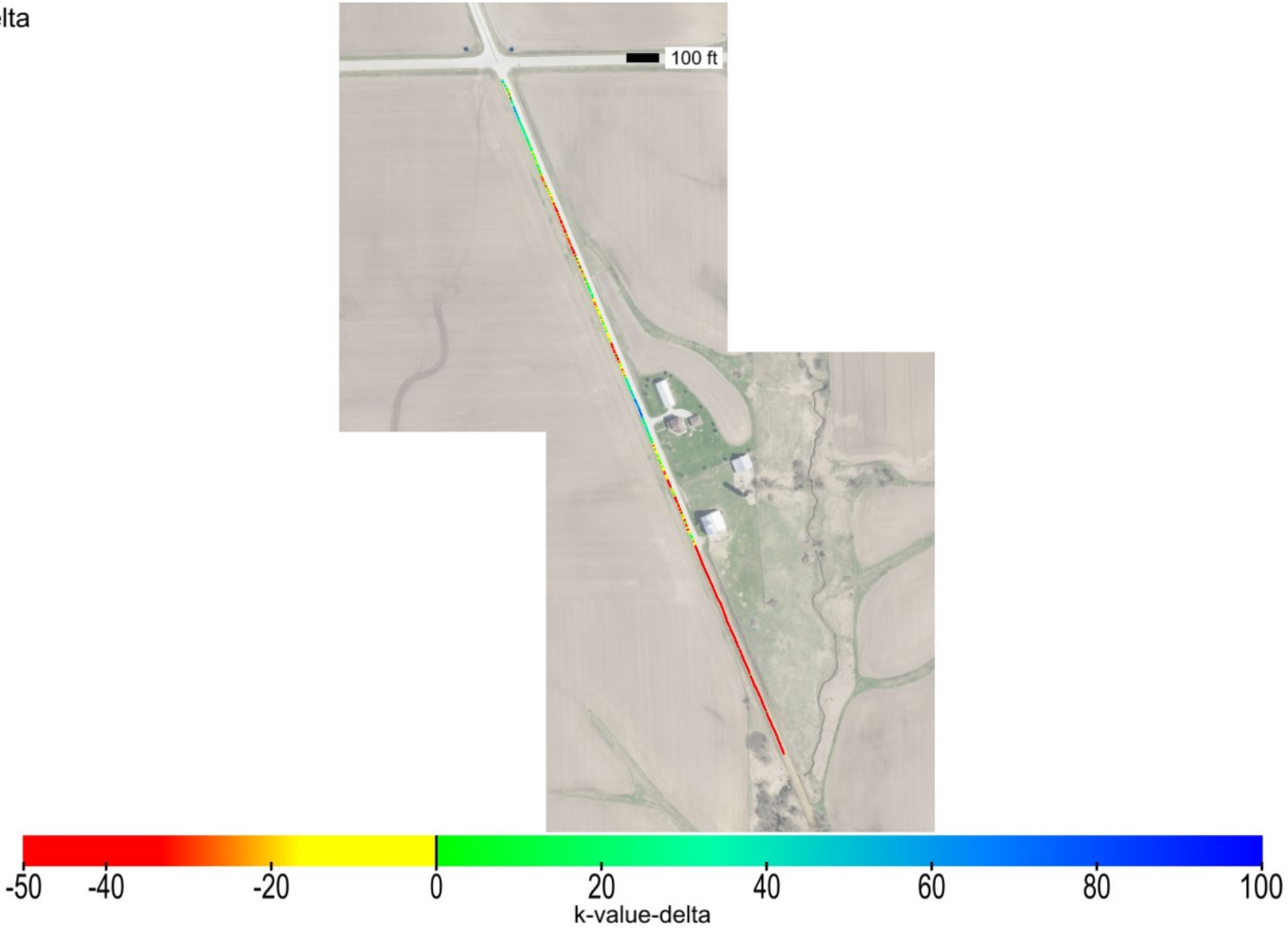


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_163829

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	29.1	35.77	0.25	150	35	116.1	234.01	54.13	46.63	-115	-33.9	84.01

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_29-iacityrd_cs56-fcs00210_2019_10_22_163829

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	29.1	150	-115	-33.9	84.01	-115	-33.92	73.2

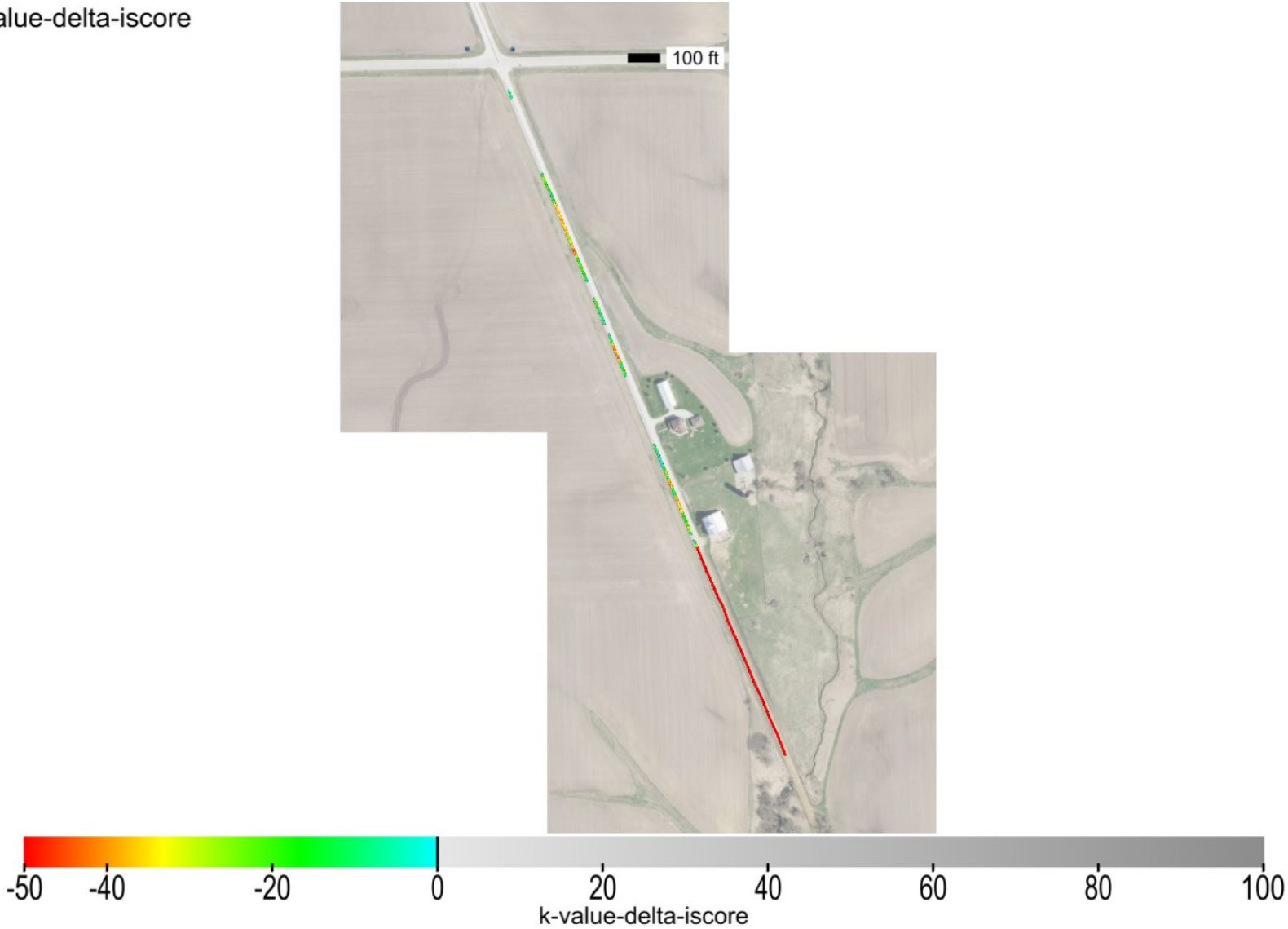
k-value-delta-iscore

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_29-iacityrd_cs56-fcs00210_2019_10_22_163829

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	6	11617	73.31	none	0

blobs: k-value-delta-iscore

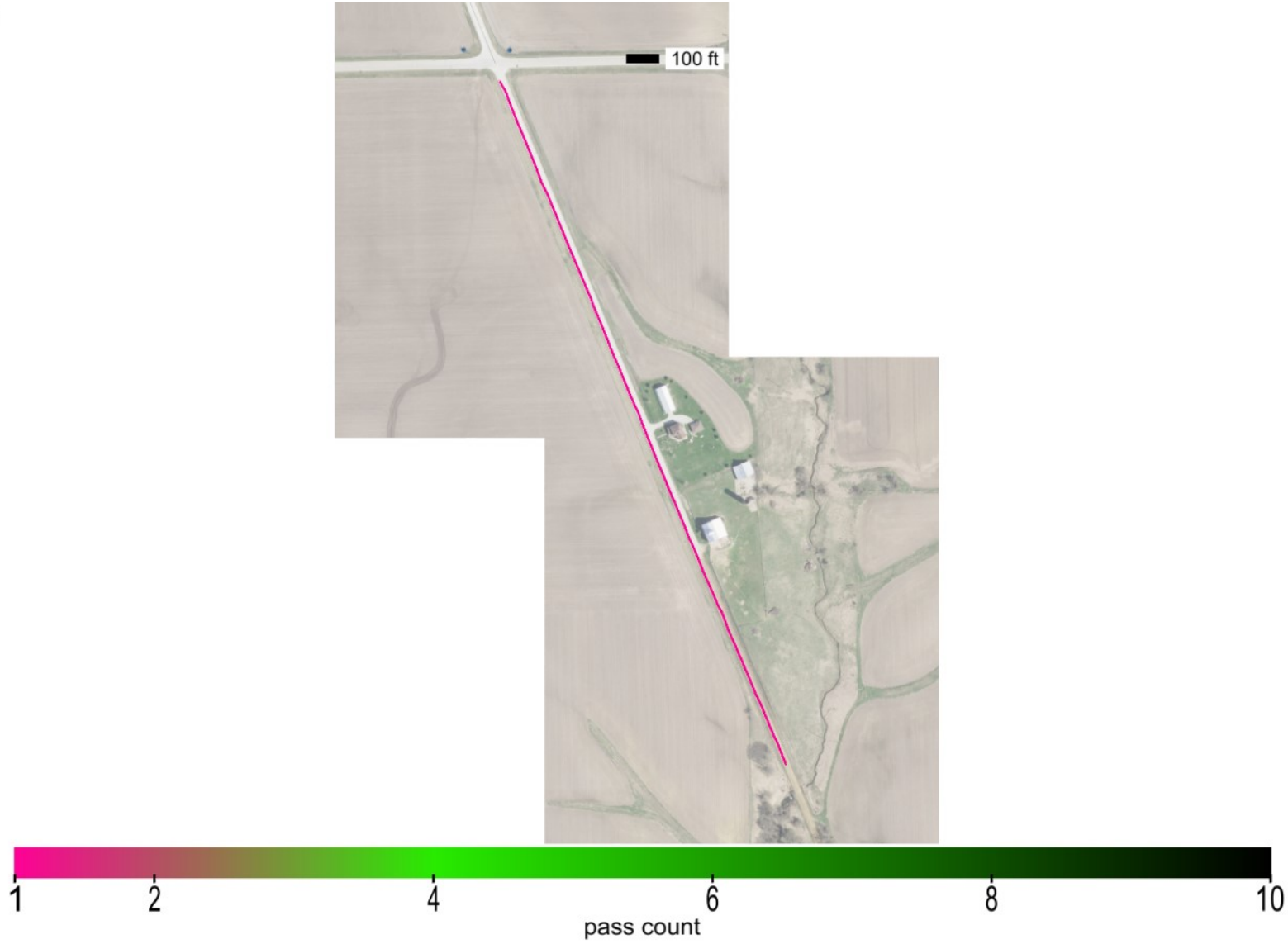


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_163829

minimum	average	maximum
1	1	1

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_29-iacityrd_cs56-fcs00210_2019_10_22_163829

minimum	average	maximum
611.898	631.19	640.297

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_29-iacityrd_cs56-fcs00210_2019_10_22_163829

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Class 10 Subgrade	24005	100	15846	0.364	12	3000	150	40

materials

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.

Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_163829

20191022_164030.jpg

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IOWADOT

E-Compaction Report

Project:	IA City Rd Des Moines County	Mapping Duration (hrs):	0.07	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-iacityrd_cs56-fcs00210_2019_10_22_164954	No. of Measurements:	9217	Machine ID:	Ingios_FCS00210
Date and Time:	10/22/2019 4:49:54 PM	Location:	Des Moines 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	0.4	7.81	-0.44	150	35	46.8	159.64	21.2	45.25	-115	-103.2	9.64
Moisture Content	No												

Mapped Area

square feet	acres
9217	0.21

Pass Count

min.	avg.	max.
1	1	1

Elevation (ft)

min.	avg.	max.
629.93	632.78	633.52

Velocity (fps)

min.	avg.	max.
5.11	5.52	5.89

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Class 10 Subgrade	24005	100	9217	0.212	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:	IA City Rd Des Moines County	Mapping Duration (hrs):	0.07	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-iacityrd_cs56-fcs00210_2019_10_22_164954	No. of Measurements:	9217	Machine ID:	Ingios_FCS00210
Date and Time:	10/22/2019 4:49:54 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
7.81	CQI > = 95
0.4	80% of k-Value MVs >= 150
45.25	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.

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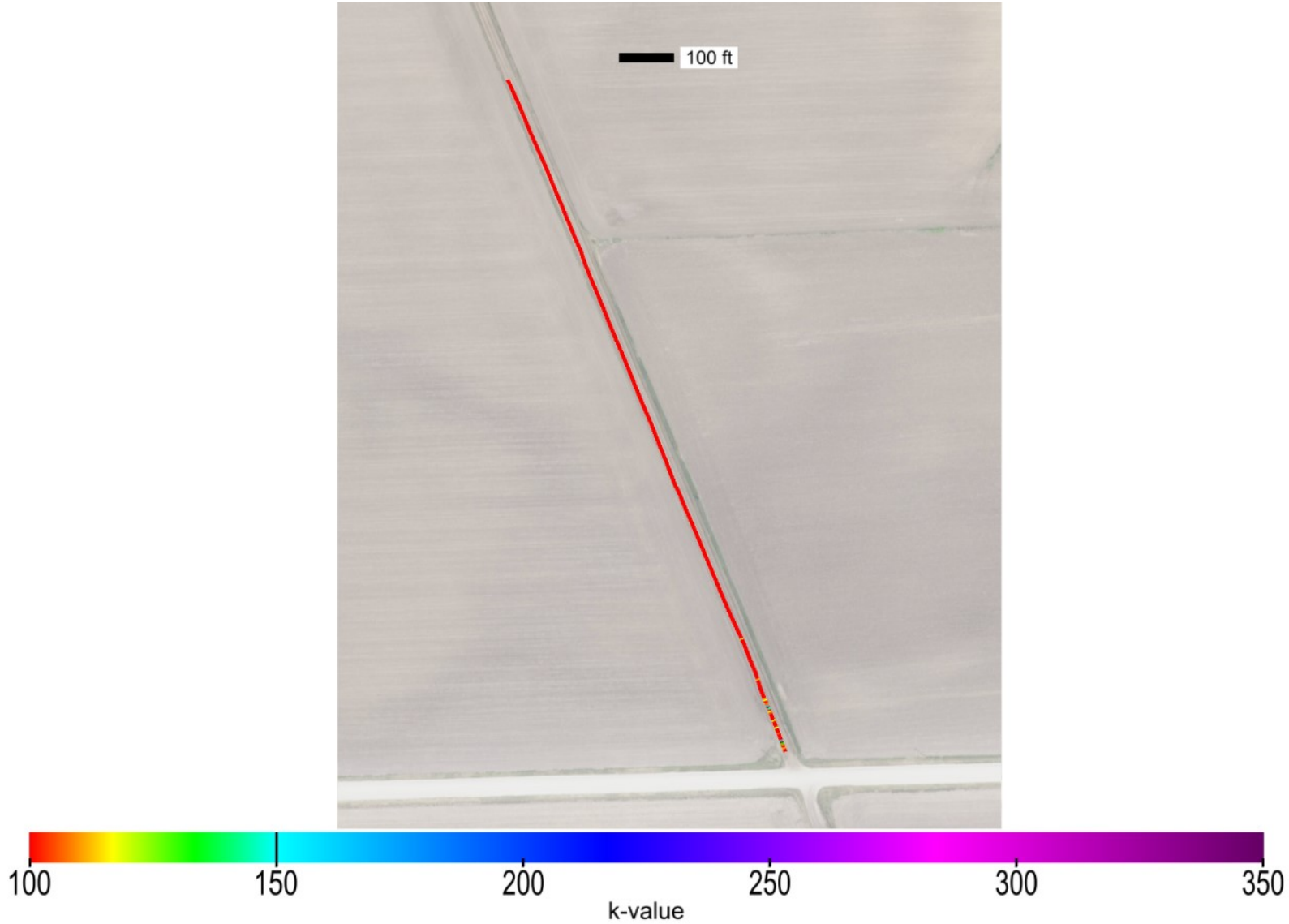
Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_164954

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.4	7.81	-0.44	150	35	46.8	159.64	21.2	45.25	-115	-103.2	9.64

k-value



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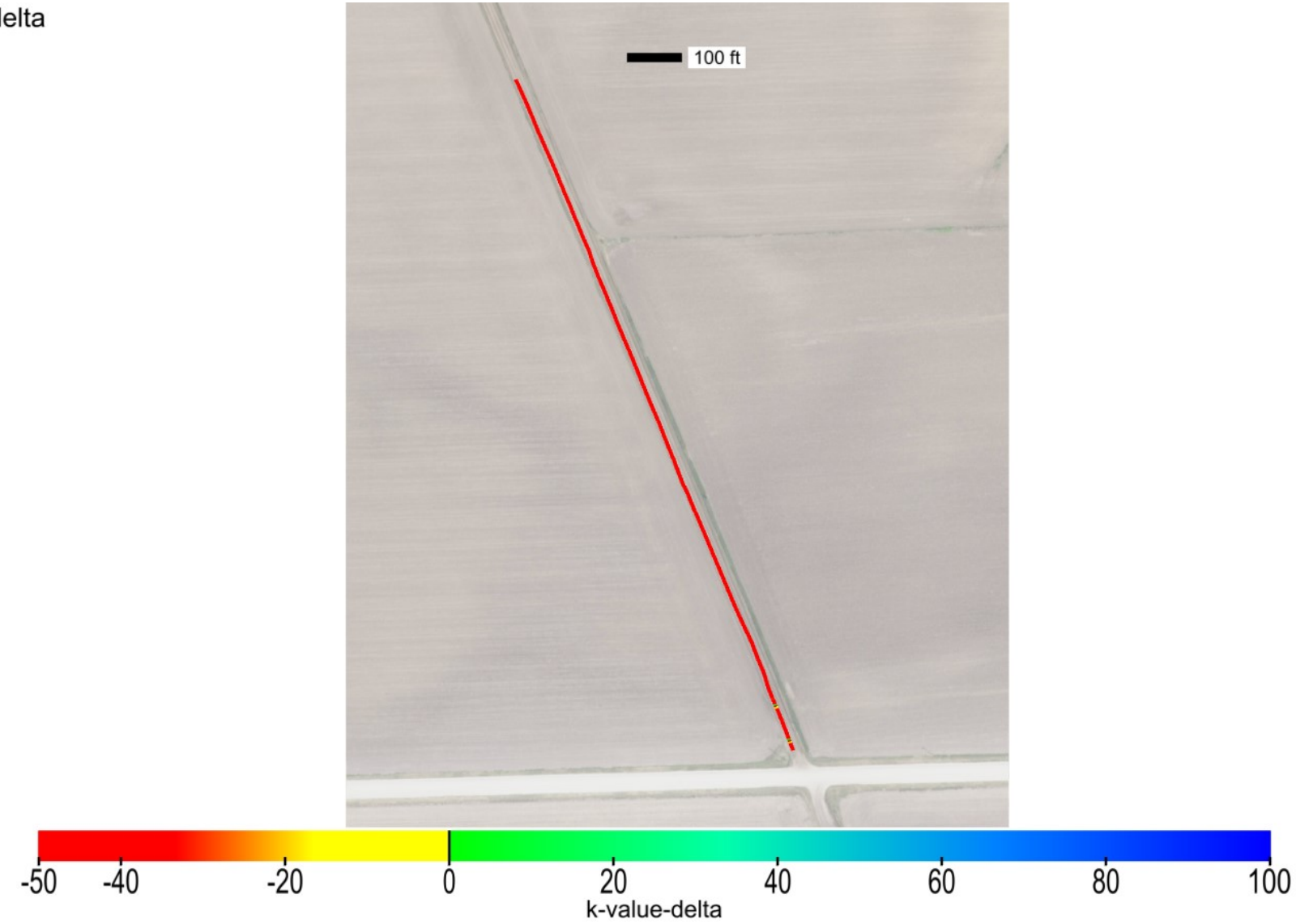
Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_164954

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.4	7.81	-0.44	150	35	46.8	159.64	21.2	45.25	-115	-103.2	9.64

k-value-delta

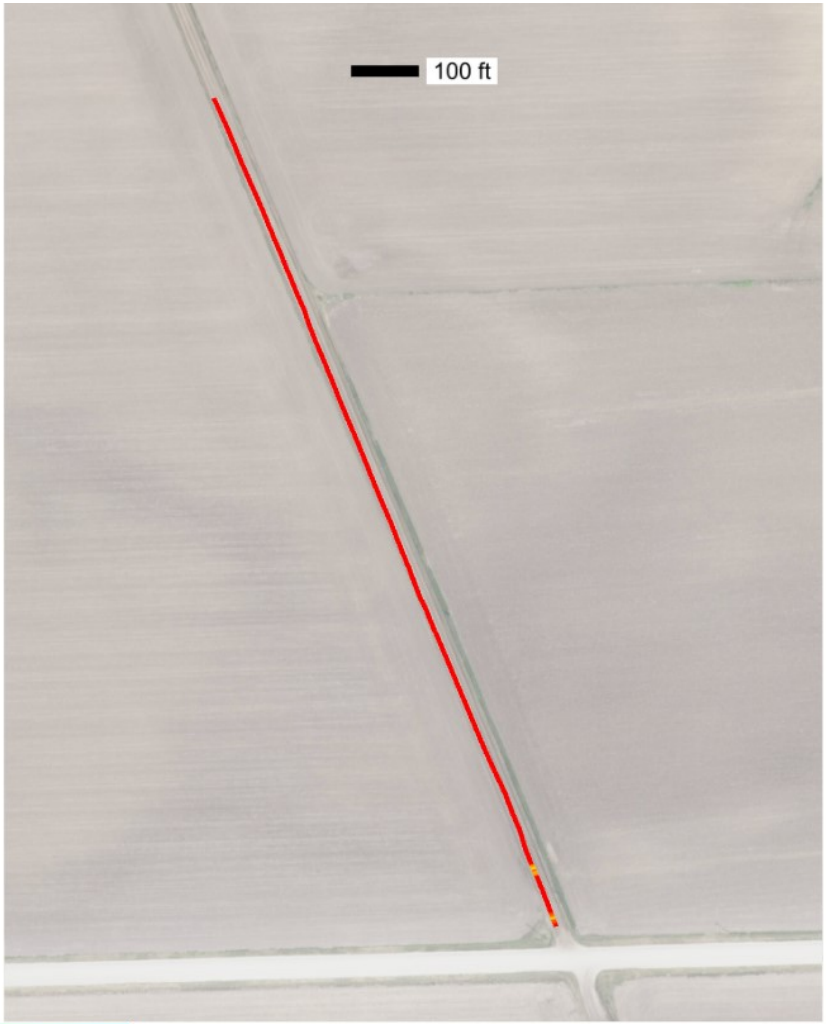


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_164954

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	0.4	150	-115	-103.2	9.64	-115	-103.15	-34.6

k-value-delta-iscore

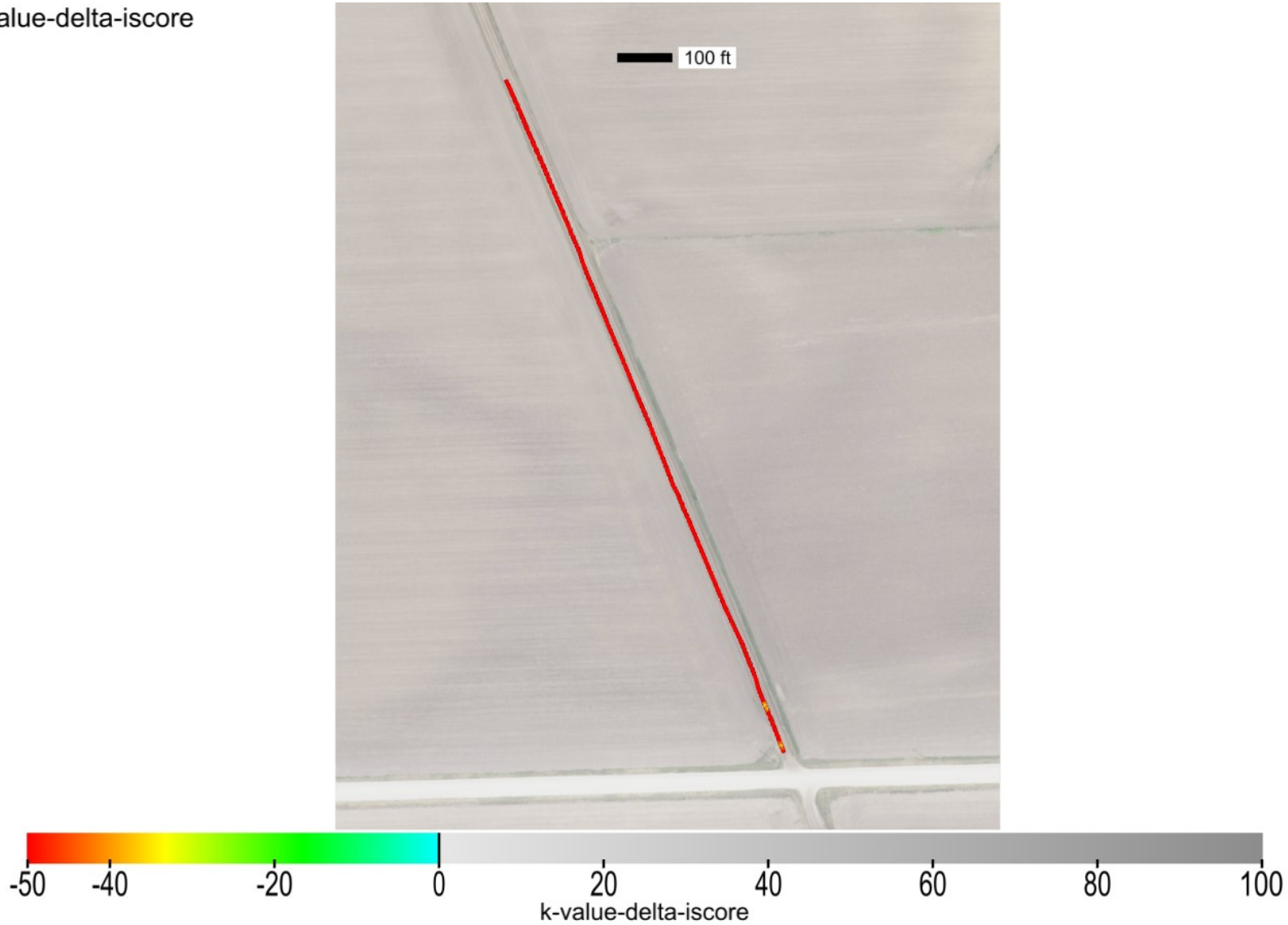


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_164954

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	9217	100	none	0

blobs: k-value-delta-iscore



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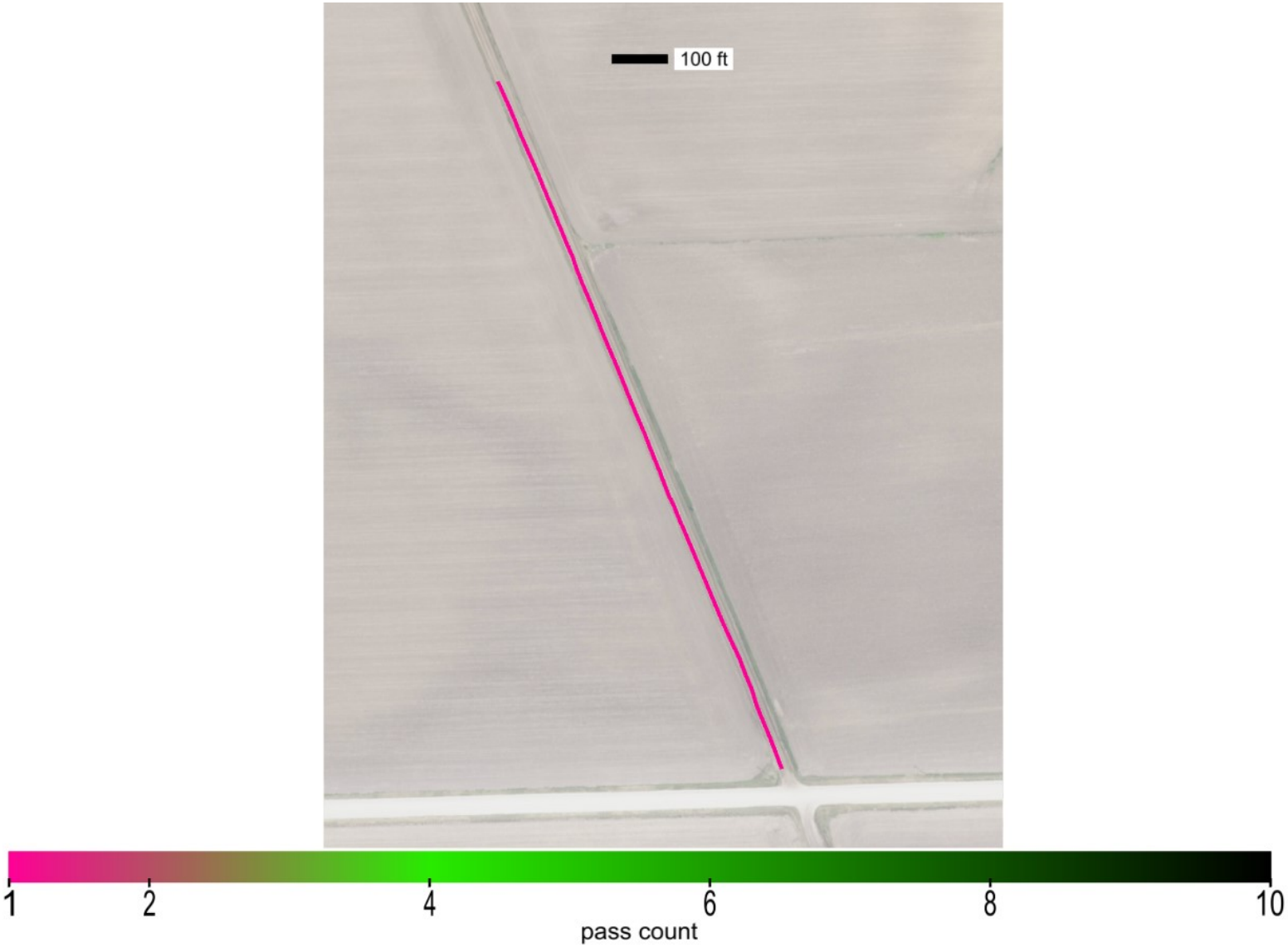
Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_164954

minimum	average	maximum
1	1	1

pass count

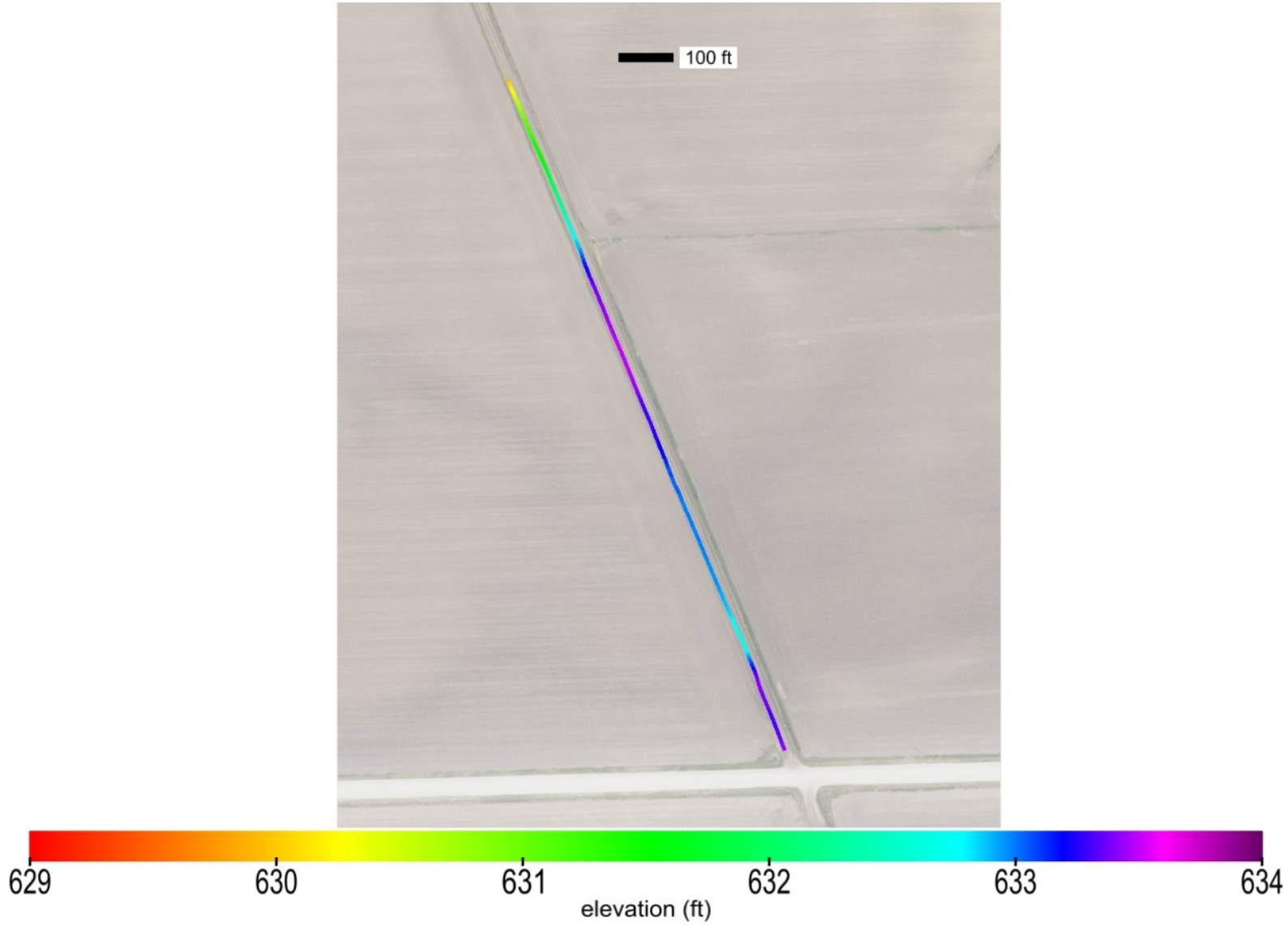


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-iacityrd_cs56-fcs00210_2019_10_22_164954

minimum	average	maximum
629.927	632.782	633.519

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_29-iacityrd_cs56-fcs00210_2019_10_22_164954

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Class 10 Subgrade	24005	100	9217	0.212	12	3000	150	40

materials

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_29-iacityrd_cs56-fcs00210_2019_10_22_164954

20191022_164940.jpg

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IOWADOT

E-Compaction Report

Project:	US61 Des Moines County	Mapping Duration (hrs):	0.47	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2019_10_22_172537a	No. of Measurements:	46971	Machine ID:	Ingios_FCS00210
Date and Time:	10/22/2019 5:25:37 PM	Location:	Des Moines 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	1.7	5.65	-0.09	150	35	66	242.59	34.31	52	-115	-84	92.59
Moisture Content	No												

Mapped Area

square feet	acres
46971	1.08

Pass Count

min.	avg.	max.
1	1.32	6

Elevation (ft)

min.	avg.	max.
597.29	601.53	604.28

Velocity (fps)

min.	avg.	max.
0.72	5.48	6.18

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	46971	1.078	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:	US61 Des Moines County	Mapping Duration (hrs):	0.47	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2019_10_22_172537a	No. of Measurements:	46971	Machine ID:	Ingios_FCS00210
Date and Time:	10/22/2019 5:25:37 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
114.77	CQI > = 95
100	80% of Resilient Modulus MVs >= 3000
30.46	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:	US61 Des Moines County	Mapping Duration (hrs):	0.47	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2019_10_22_172537a	No. of Measurements:	46971	Machine ID:	Ingios_FCS00210
Date and Time:	10/22/2019 5:25:37 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
5.65	CQI > = 95
1.7	80% of k-Value MVs >= 150
52	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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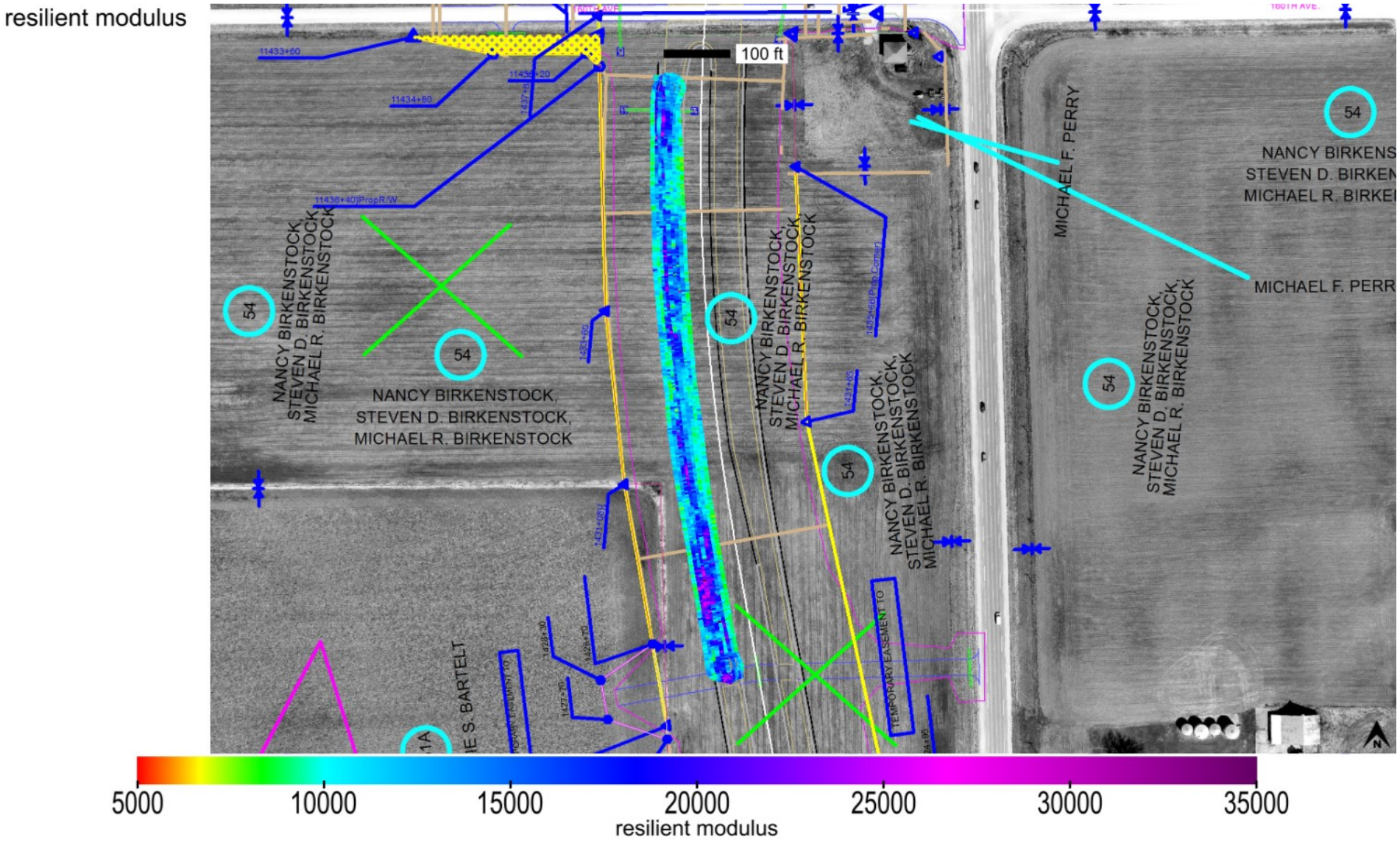
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_22_172537a

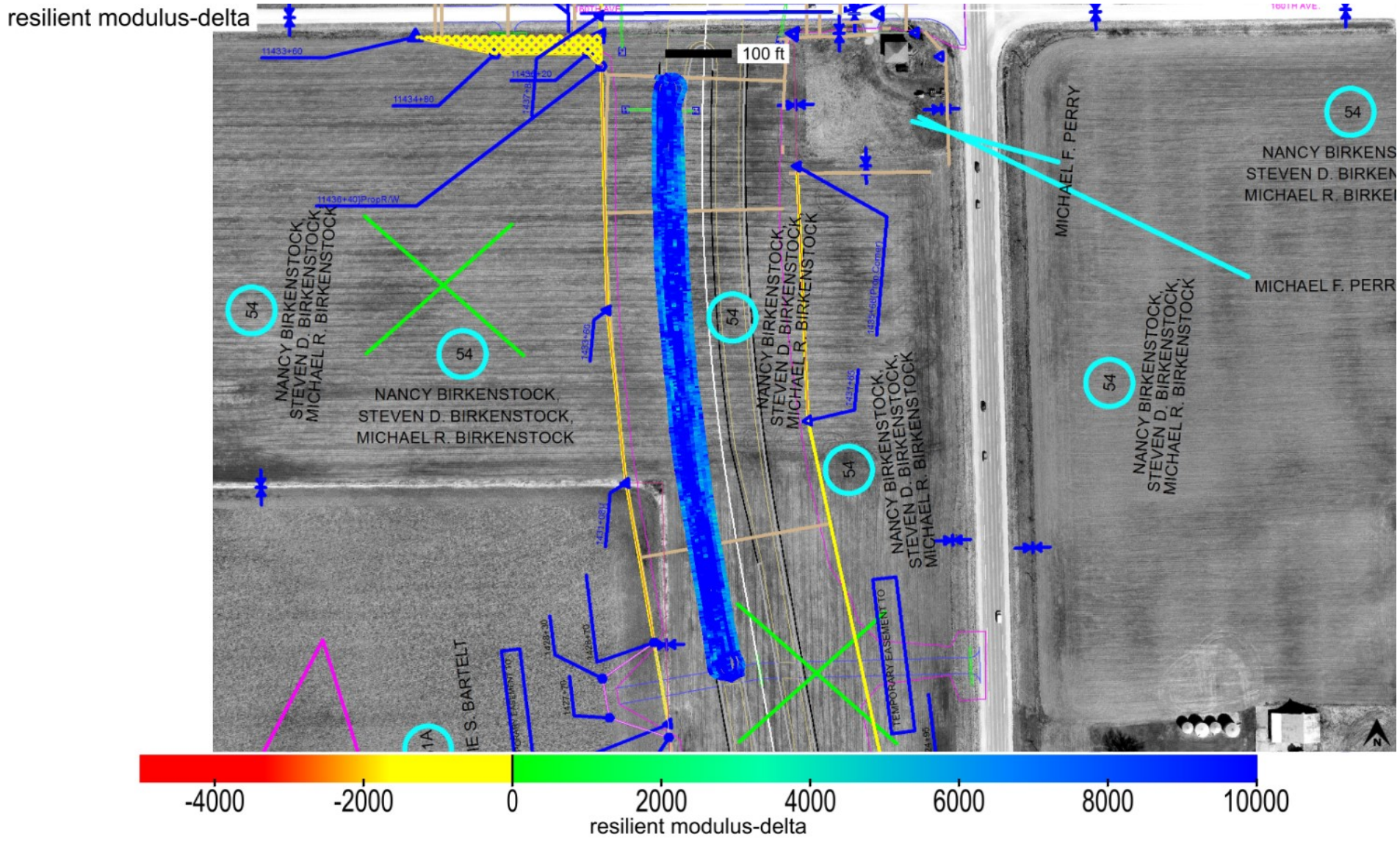
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	No	100	114.77	0.93	3000	7281.42	13178	51755.9	4014.06	30.46	4281.42	10178	48755.9



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_29-us61_cs56-fcs00210_2019_10_22_172537a

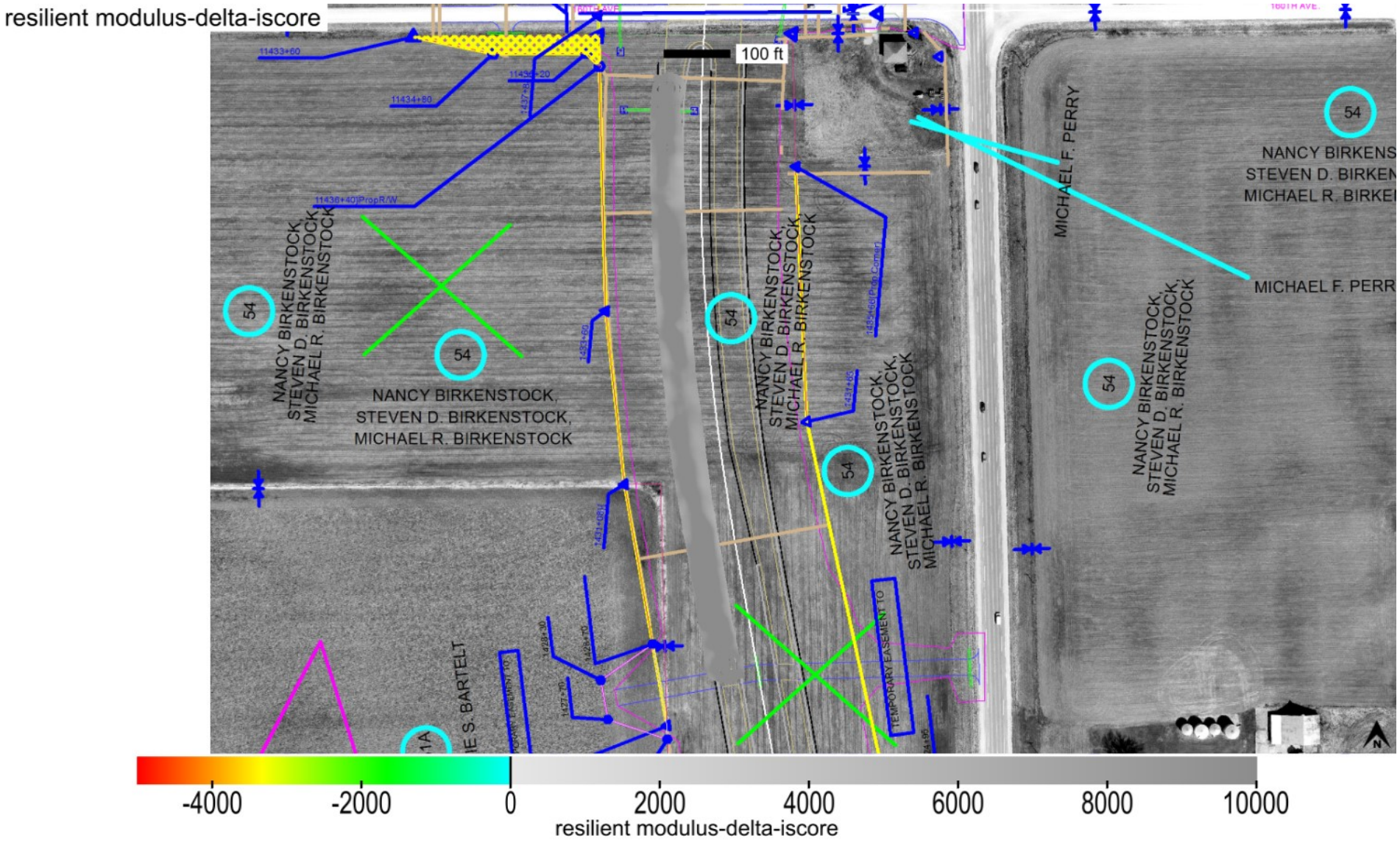
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	No	100	114.77	0.93	3000	7281.42	13178	51755.9	4014.06	30.46	4281.42	10178	48755.9



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_29-us61_cs56-fcs00210_2019_10_22_172537a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	No	100	3000	4281.42	10178	48755.9	5379.32	10245.7	20749.14



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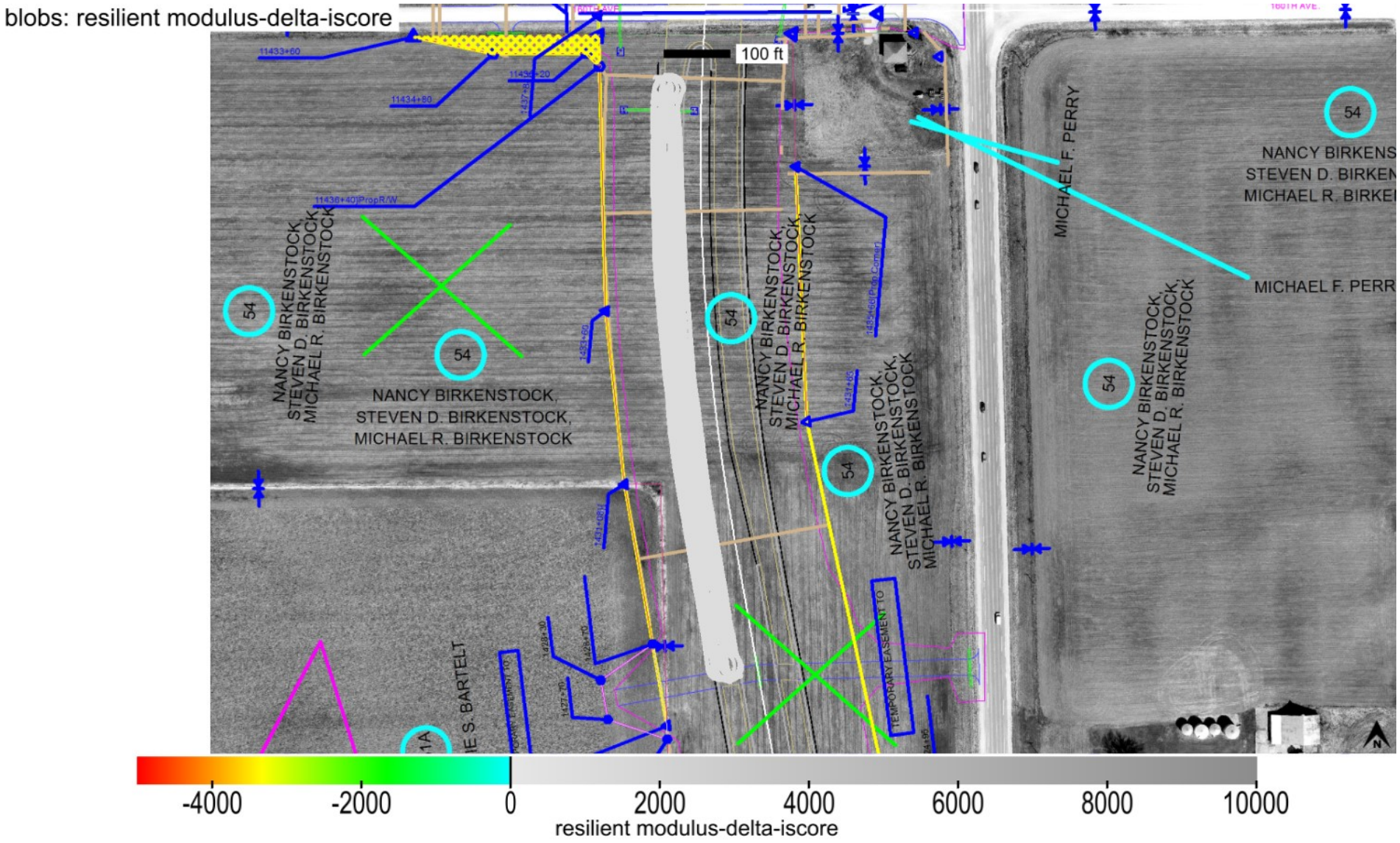
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_22_172537a

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.

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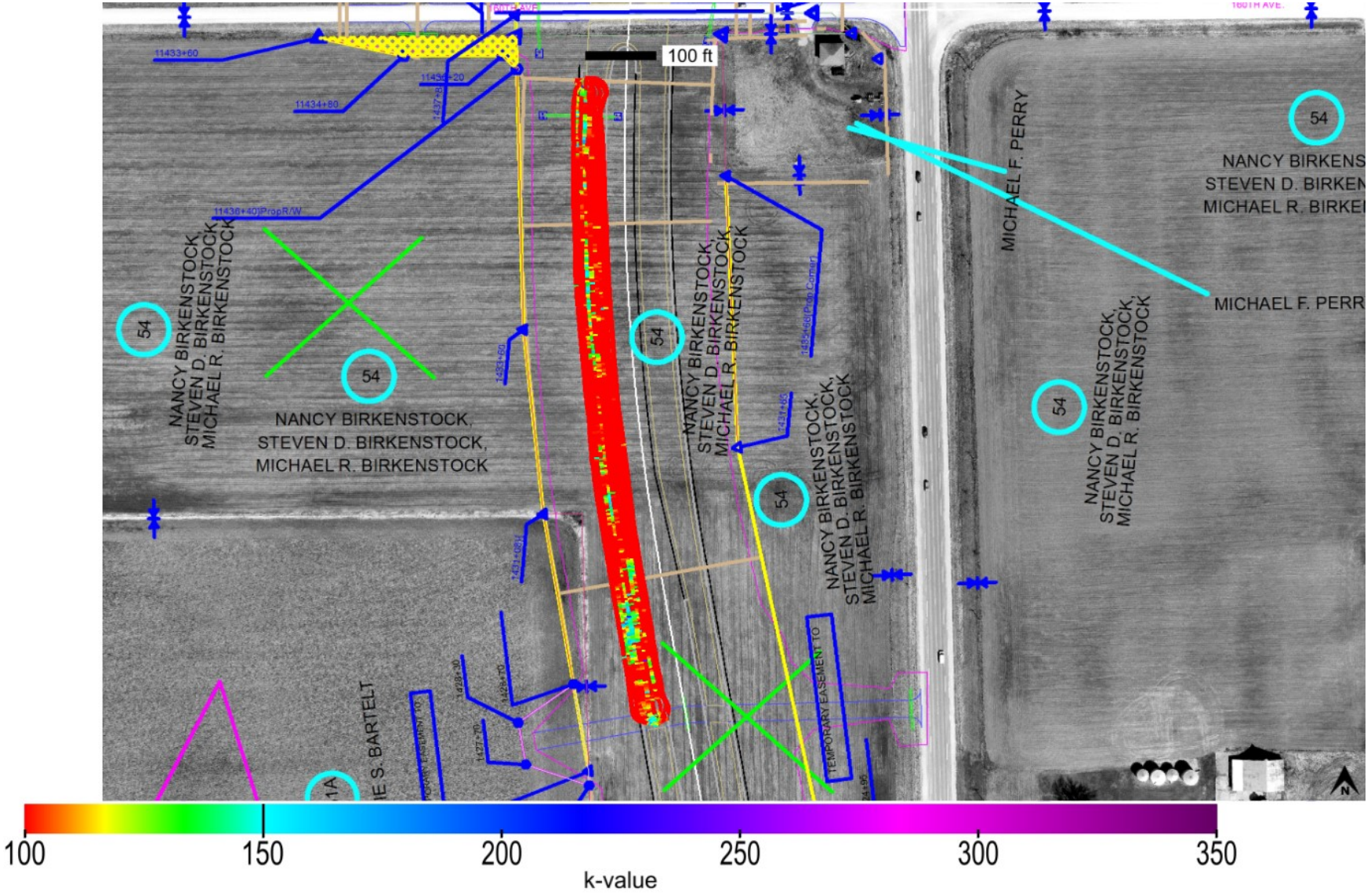
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_22_172537a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	1.7	5.65	-0.09	150	35	66	242.59	34.31	52	-115	-84	92.59

k-value

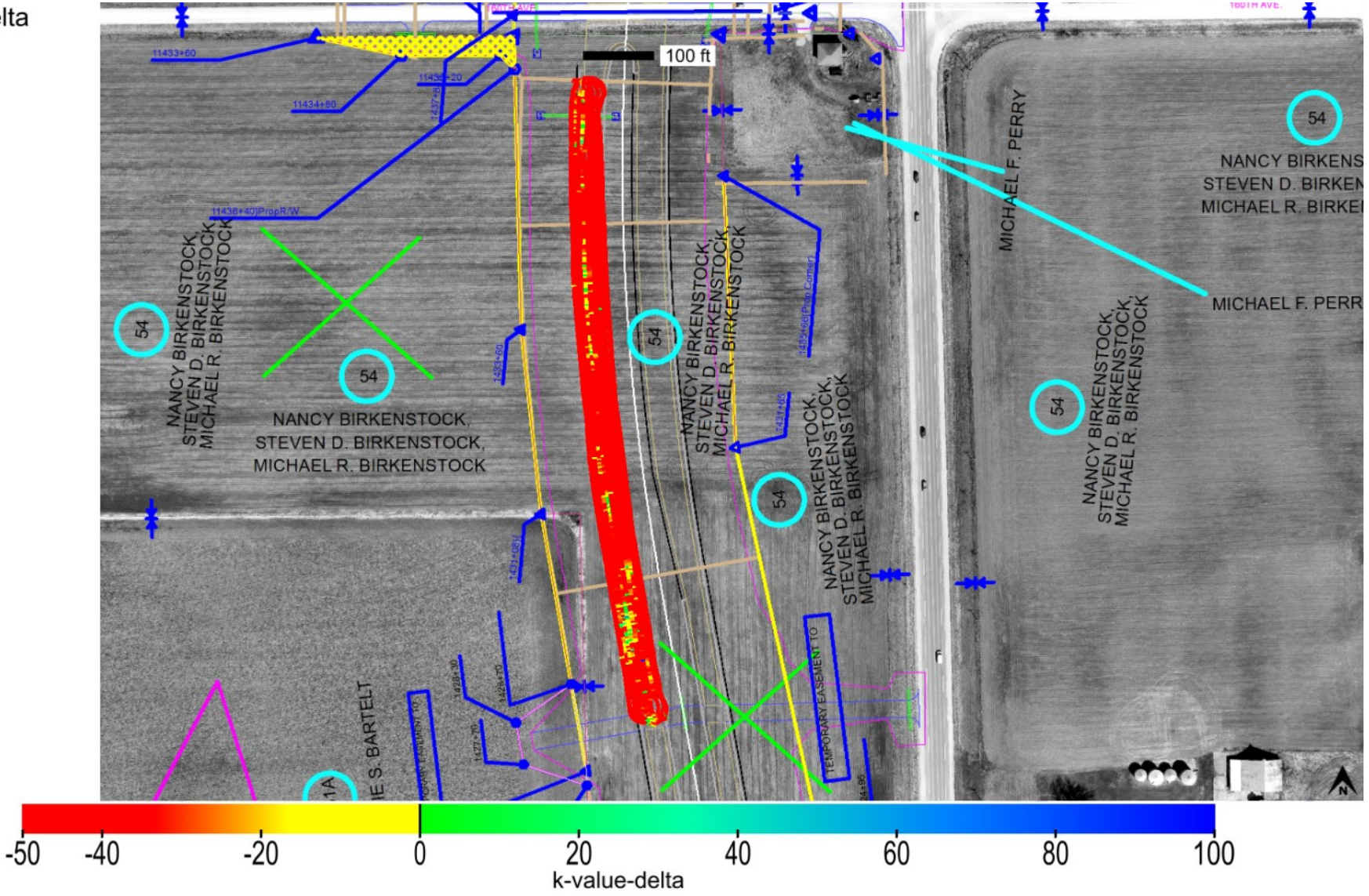


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-us61_cs56-fcs00210_2019_10_22_172537a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	1.7	5.65	-0.09	150	35	66	242.59	34.31	52	-115	-84	92.59

k-value-delta



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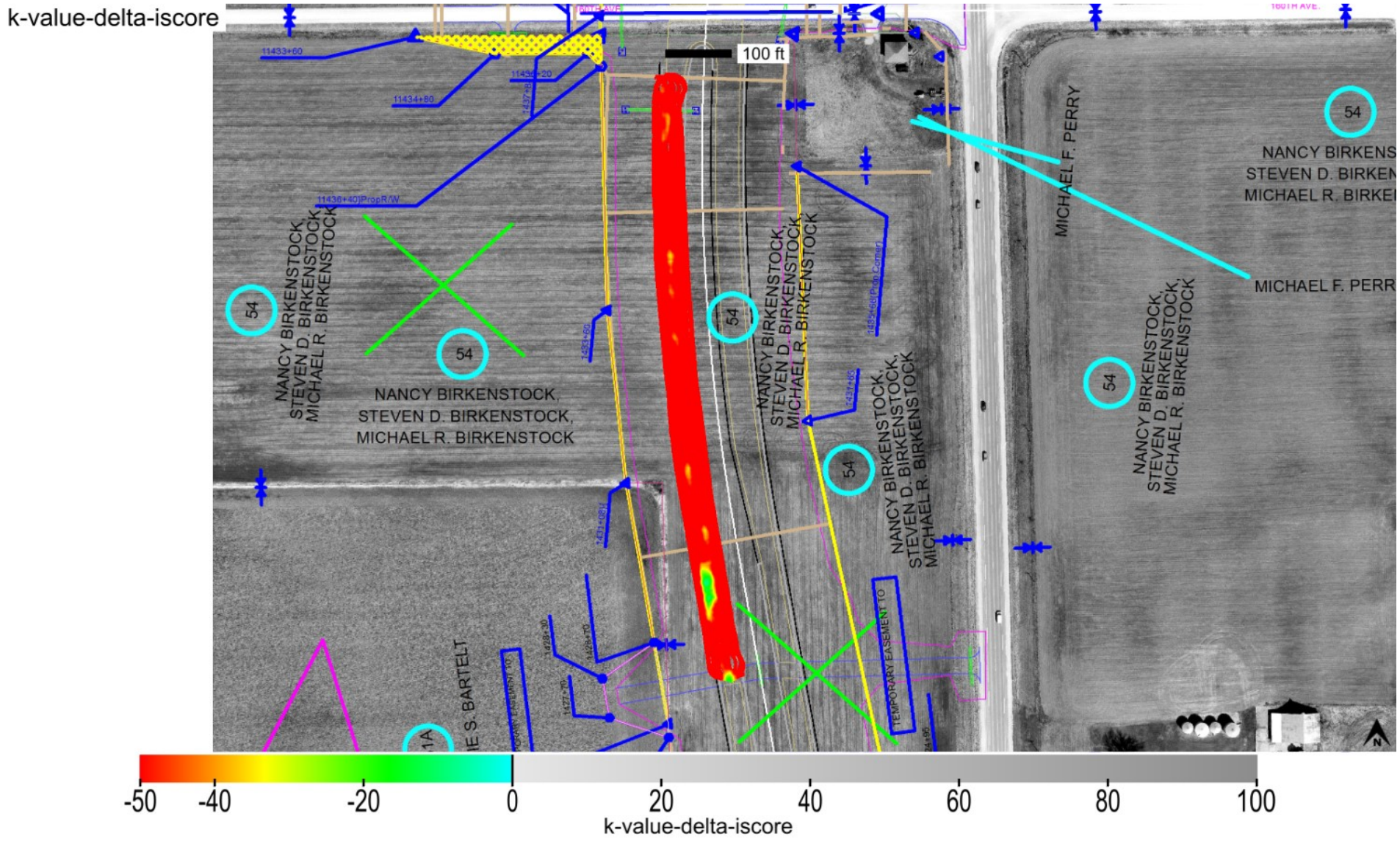
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_22_172537a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	1.7	150	-115	-84	92.59	-115	-83.47	-8.52



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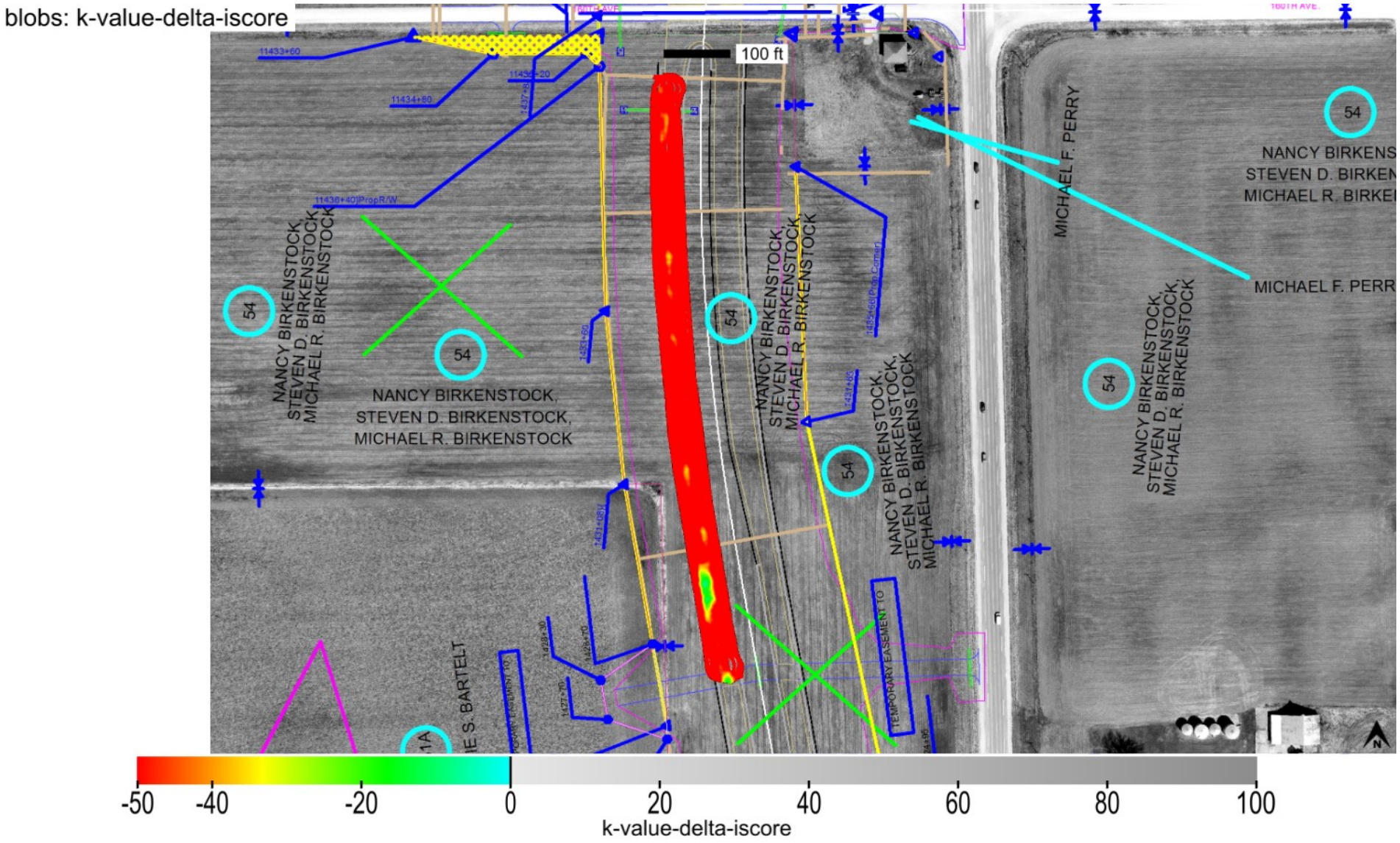
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_22_172537a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	46971	100	none	0



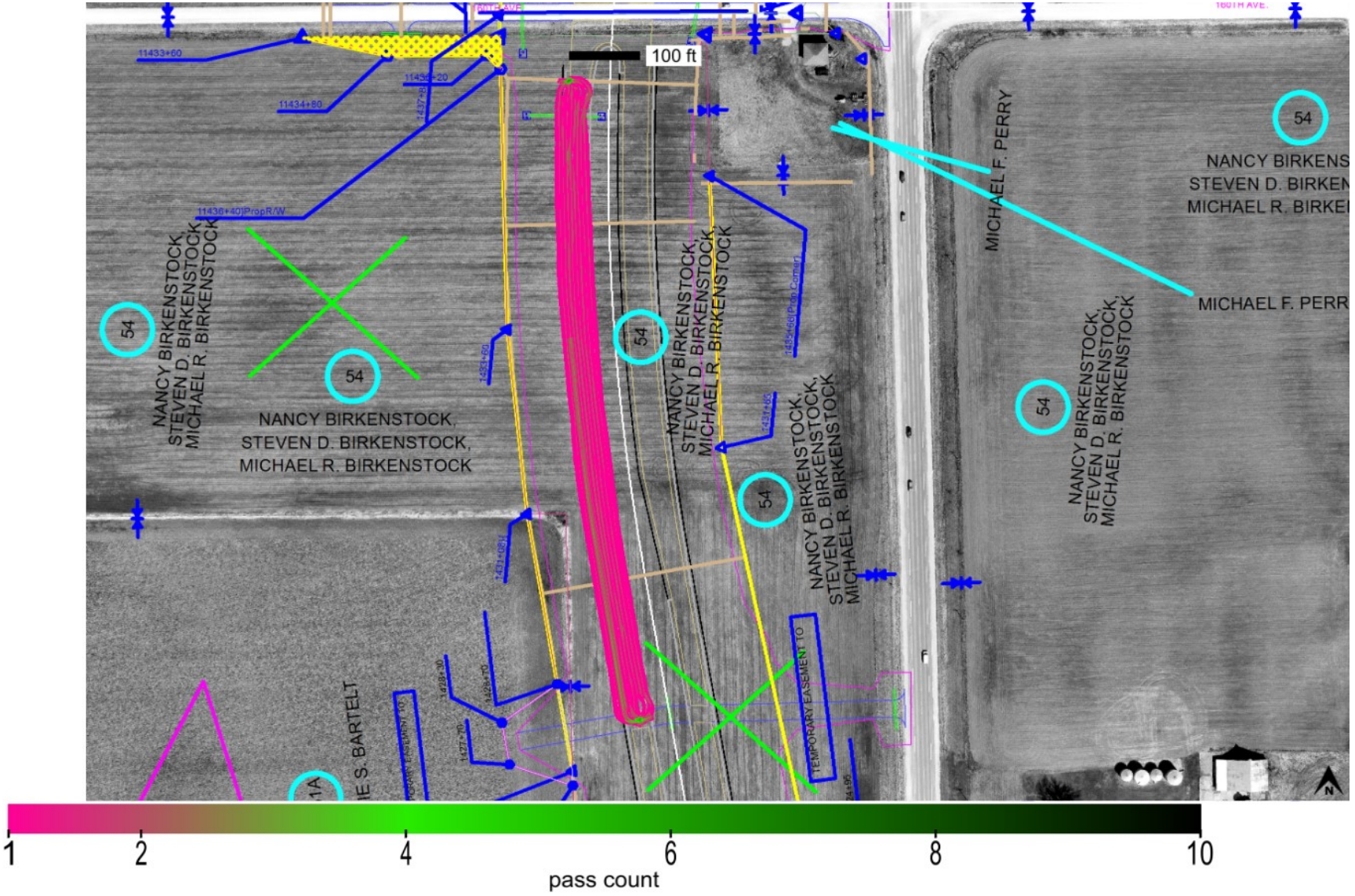
This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_29-us61_cs56-fcs00210_2019_10_22_172537a

minimum	average	maximum
1	1.32	6

pass count



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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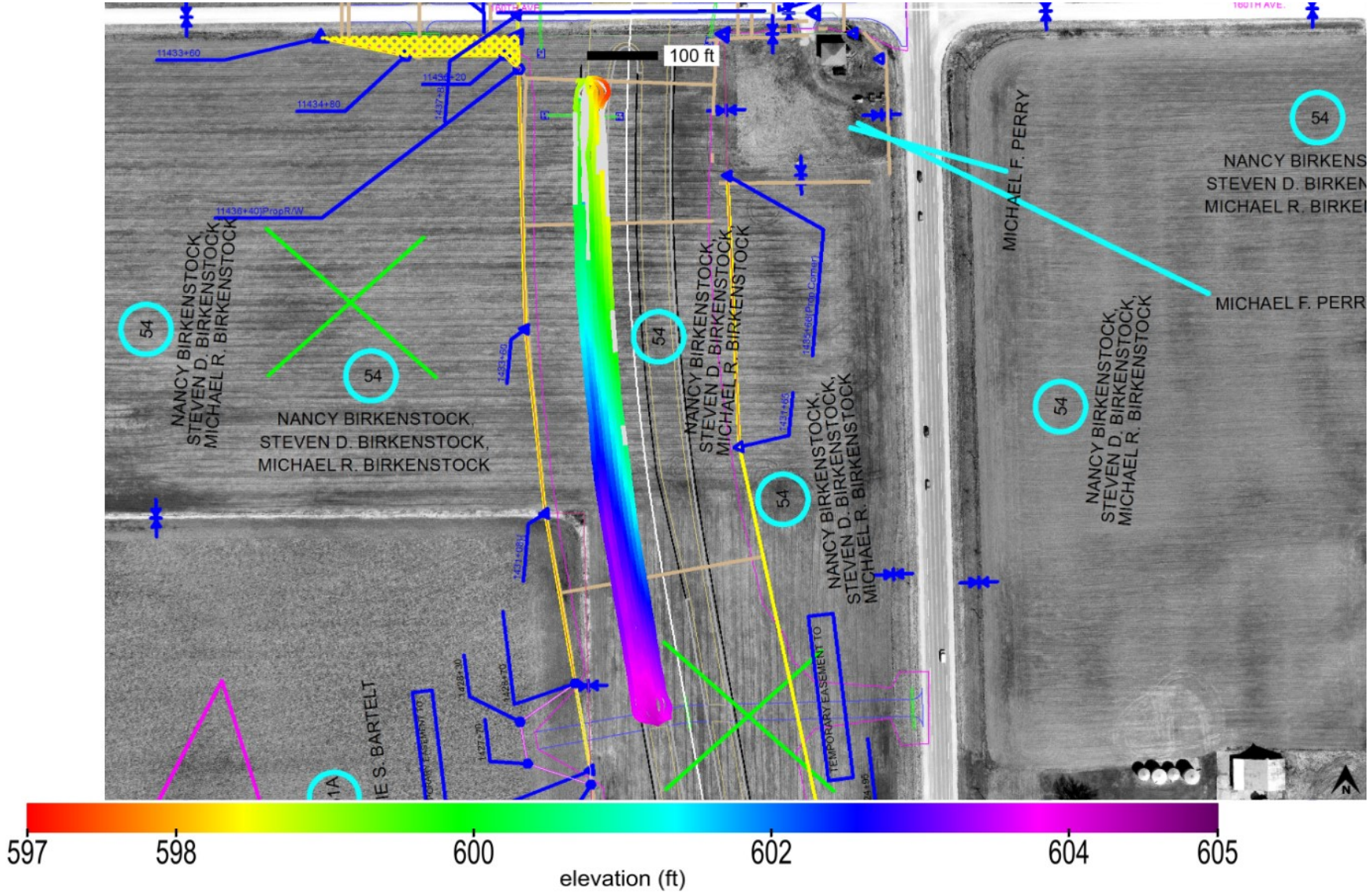
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_22_172537a

minimum	average	maximum
597.286	601.534	604.28

elevation



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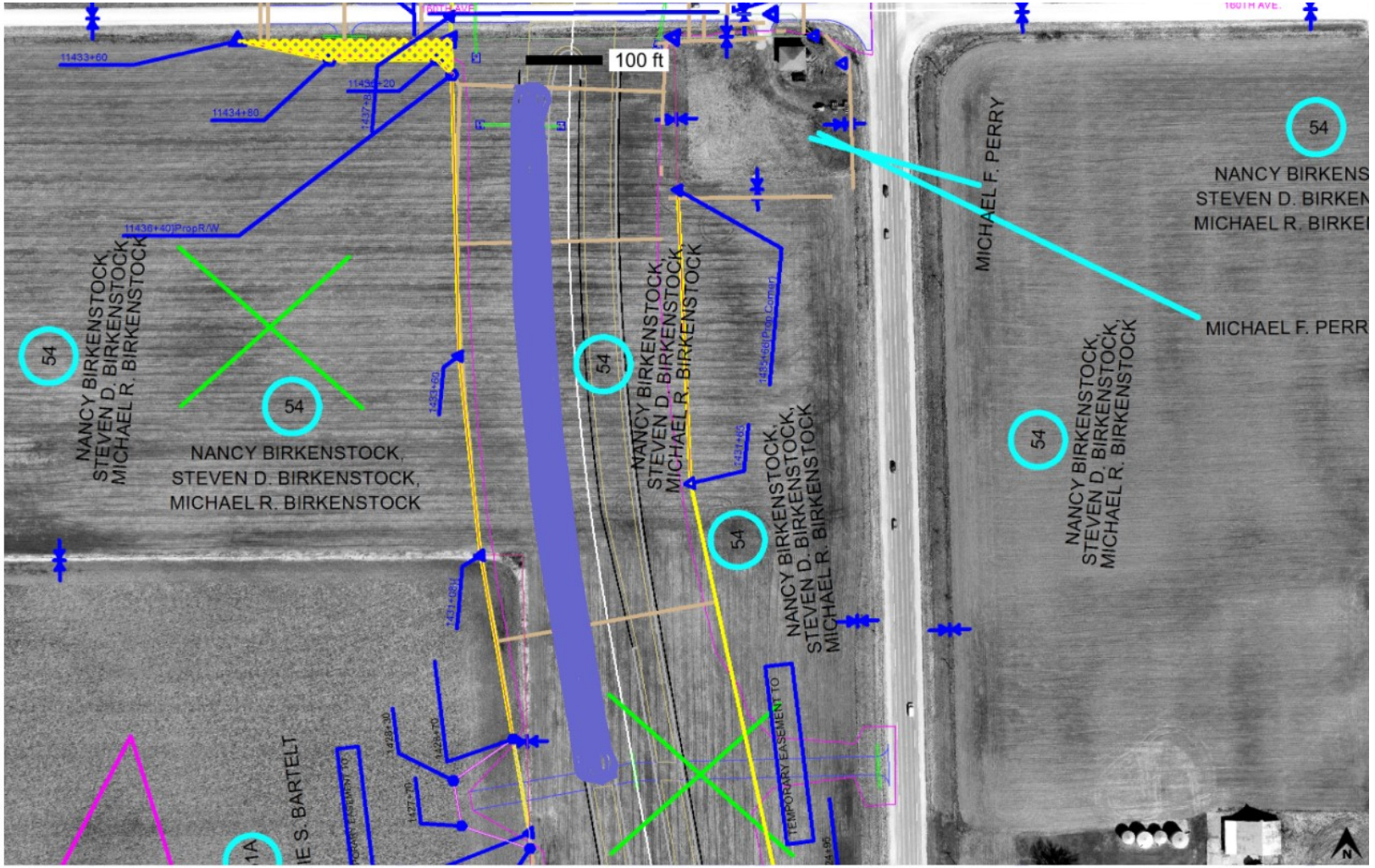
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_22_172537a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	46971	1.078	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.

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Map ID: iadot_29-us61_cs56-fcs00210_2019_10_22_172537a

20191022_172843.jpg

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IOWADOT

E-Compaction Report

Project:	US61 Des Moines County	Mapping Duration (hrs):	0.52	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2019_10_22_175418a	No. of Measurements:	60289	Machine ID:	Ingios_FCS00210
Date and Time:	10/22/2019 5:54:18 PM	Location:	Des Moines 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	4.8	11.99	0.05	150	35	80.5	225.3	36.69	45.56	-115	-69.5	75.3
Moisture Content	No												

Mapped Area

square feet	acres
60289	1.38

Pass Count

min.	avg.	max.
1	1.18	4

Elevation (ft)

min.	avg.	max.
600.27	604.29	608.92

Velocity (fps)

min.	avg.	max.
4.31	5.47	6.41

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	60289	1.384	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:	US61 Des Moines County	Mapping Duration (hrs):	0.52	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2019_10_22_175418a	No. of Measurements:	60289	Machine ID:	Ingios_FCS00210
Date and Time:	10/22/2019 5:54:18 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
114.68	CQI > = 95
100	80% of Resilient Modulus MVs >= 3000
30.65	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:	US61 Des Moines County	Mapping Duration (hrs):	0.52	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2019_10_22_175418a	No. of Measurements:	60289	Machine ID:	Ingios_FCS00210
Date and Time:	10/22/2019 5:54:18 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
11.99	CQI > = 95
4.8	80% of k-Value MVs >= 150
45.56	COV <= 20
98.29	% 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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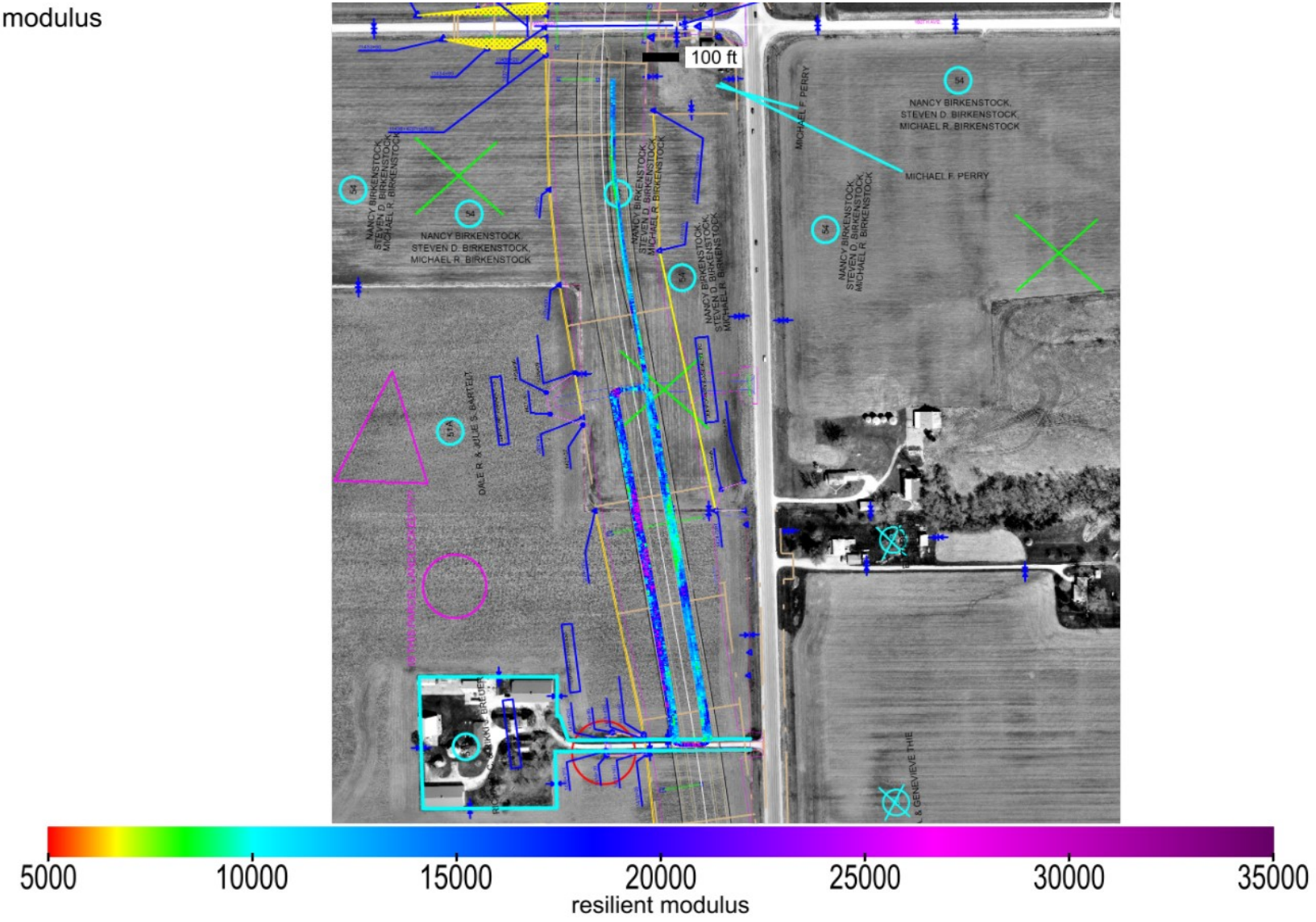
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_22_175418a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	No	100	114.68	0.94	3000	7275.41	14657.2	38555.43	4493.01	30.65	4275.41	11657.2	35555.43

resilient modulus



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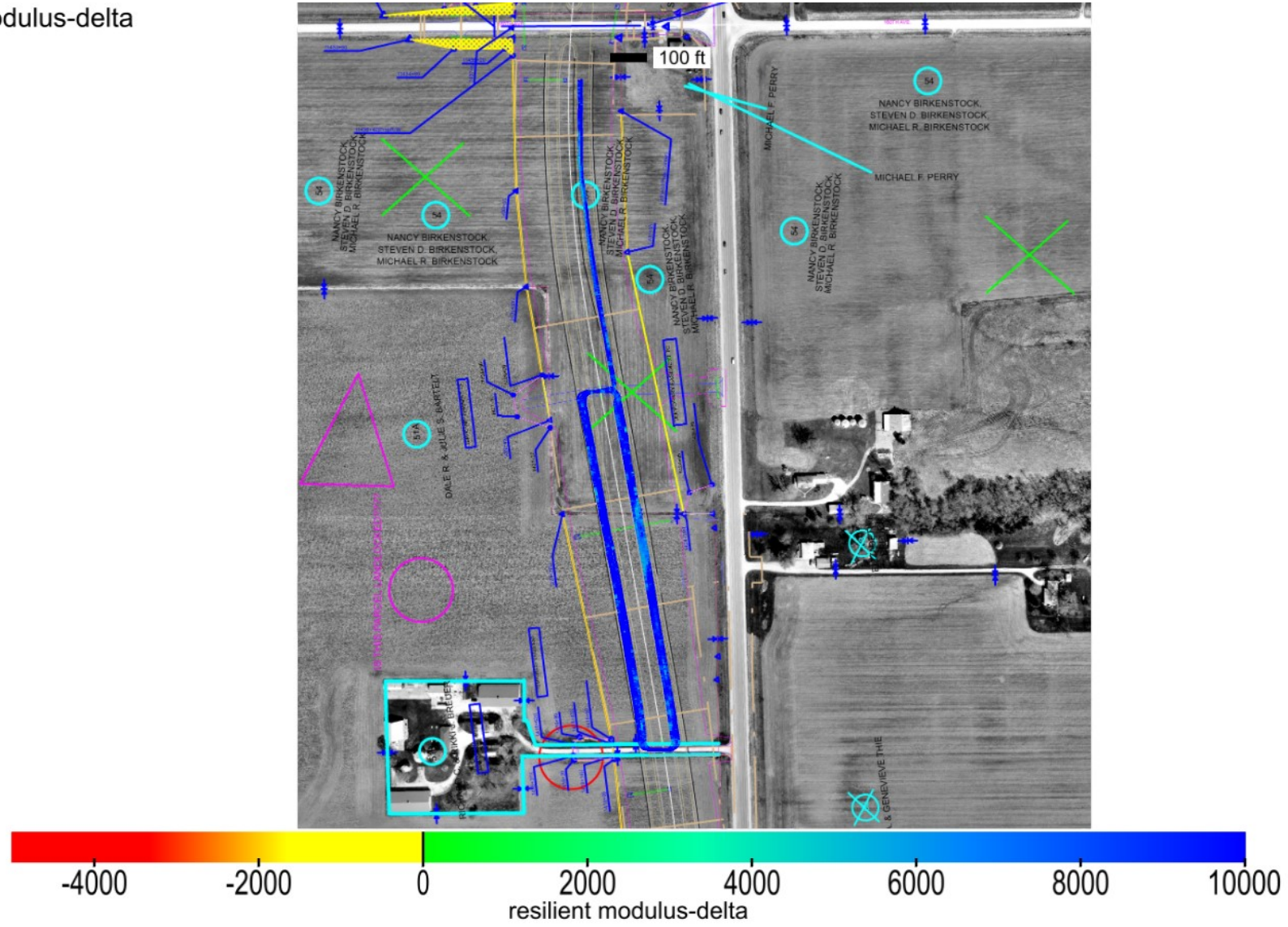
ingios GEOTECHNICS

Map ID: iadot_29-us61_cs56-fcs00210_2019_10_22_175418a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	No	100	114.68	0.94	3000	7275.41	14657.2	38555.43	4493.01	30.65	4275.41	11657.2	35555.43

resilient modulus-delta

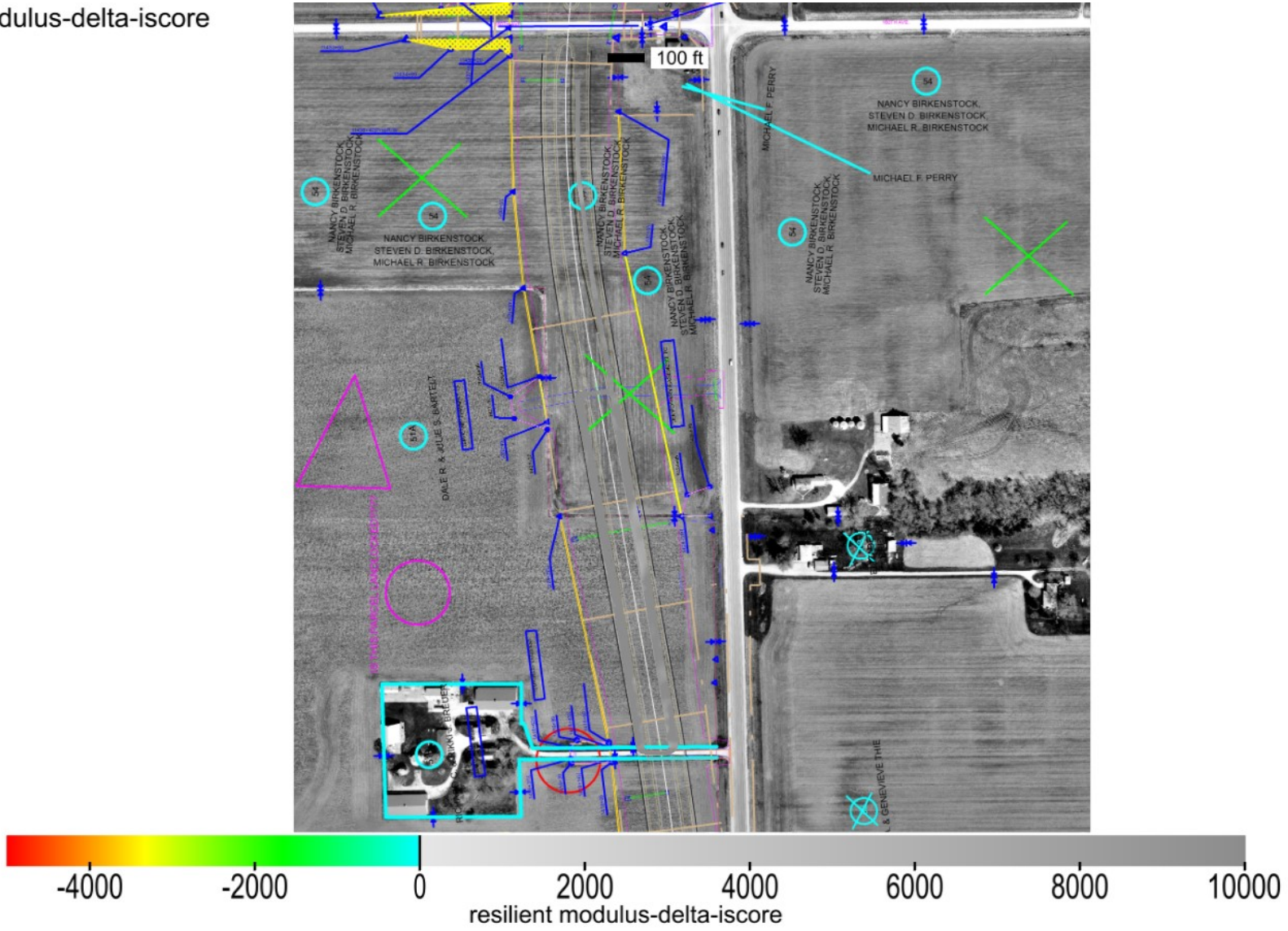


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-us61_cs56-fcs00210_2019_10_22_175418a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	No	100	3000	4275.41	11657.2	35555.43	5649.44	11678.9	26791.83

resilient modulus-delta-iscore



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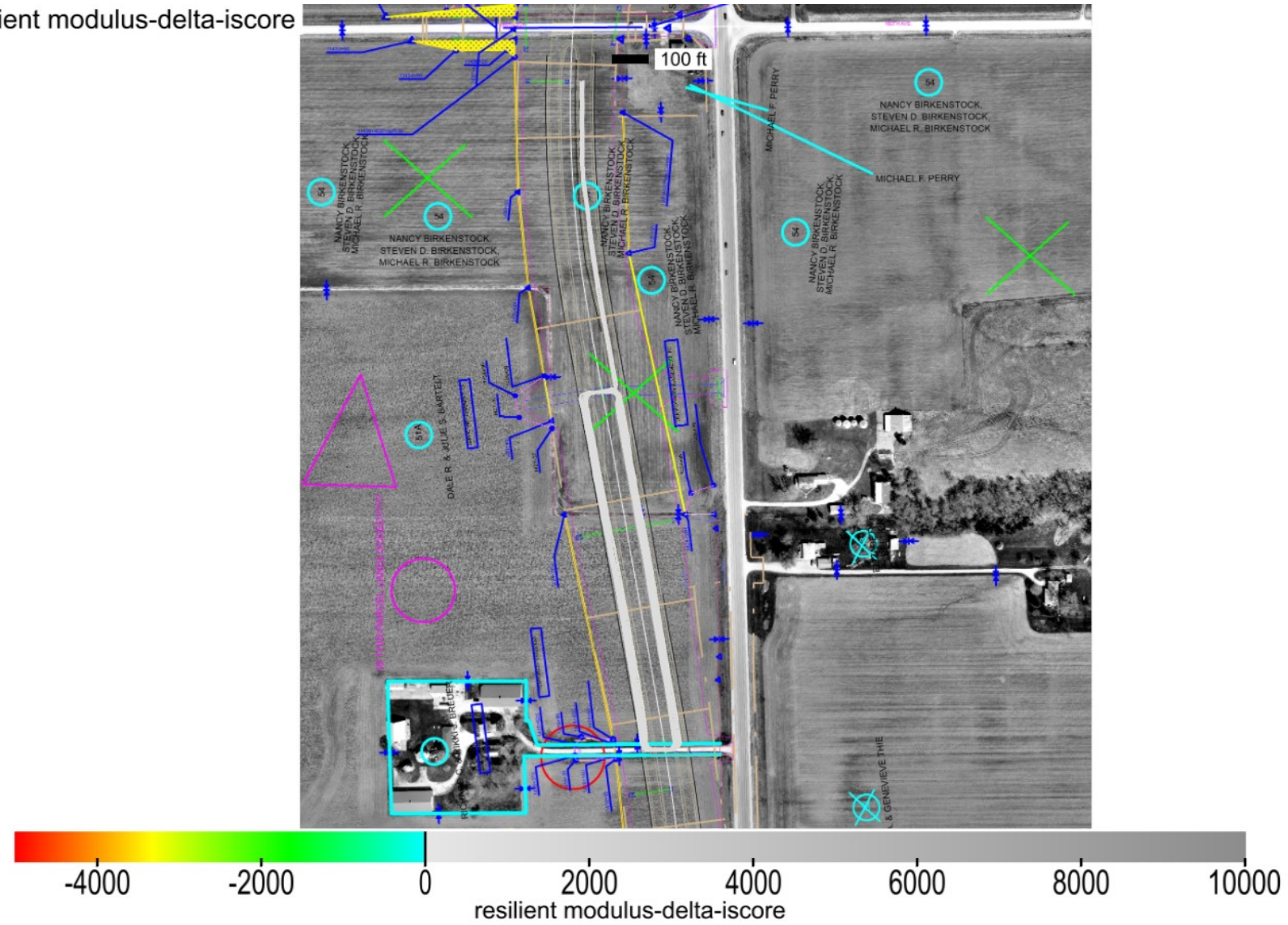
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_22_175418a

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

blobs: resilient modulus-delta-iscore

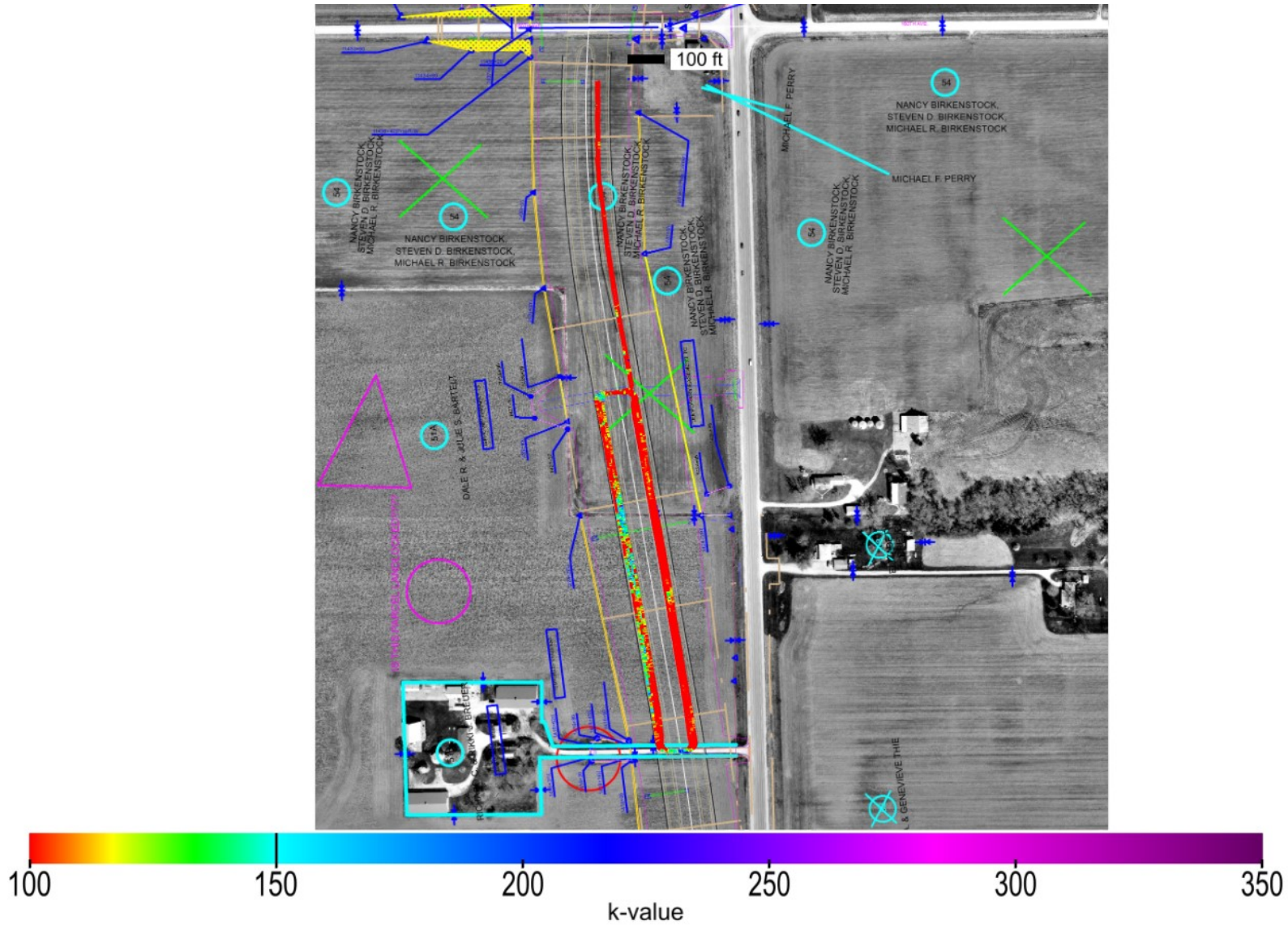


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-us61_cs56-fcs00210_2019_10_22_175418a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	4.8	11.99	0.05	150	35	80.5	225.3	36.69	45.56	-115	-69.5	75.3

k-value

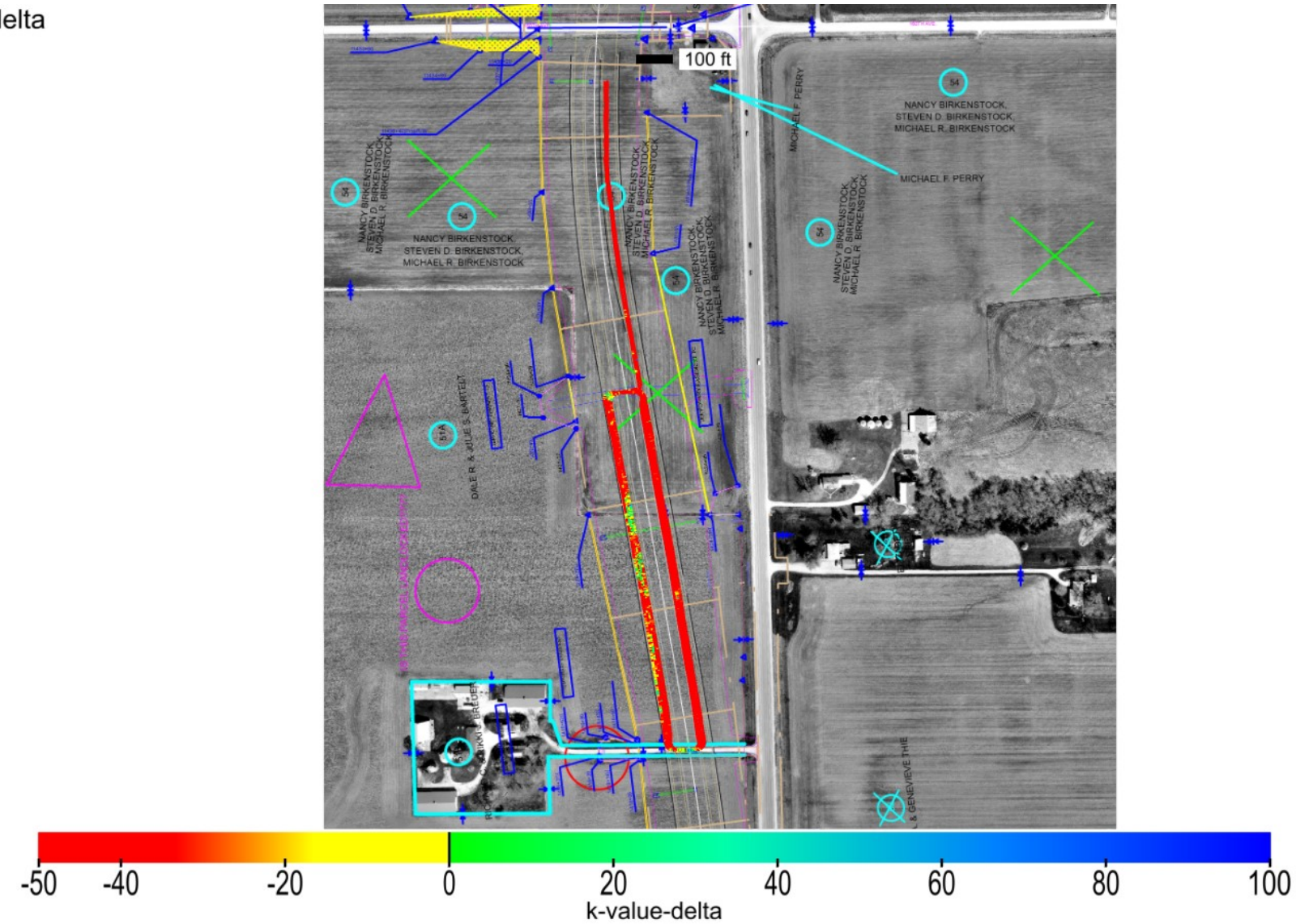


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-us61_cs56-fcs00210_2019_10_22_175418a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	4.8	11.99	0.05	150	35	80.5	225.3	36.69	45.56	-115	-69.5	75.3

k-value-delta

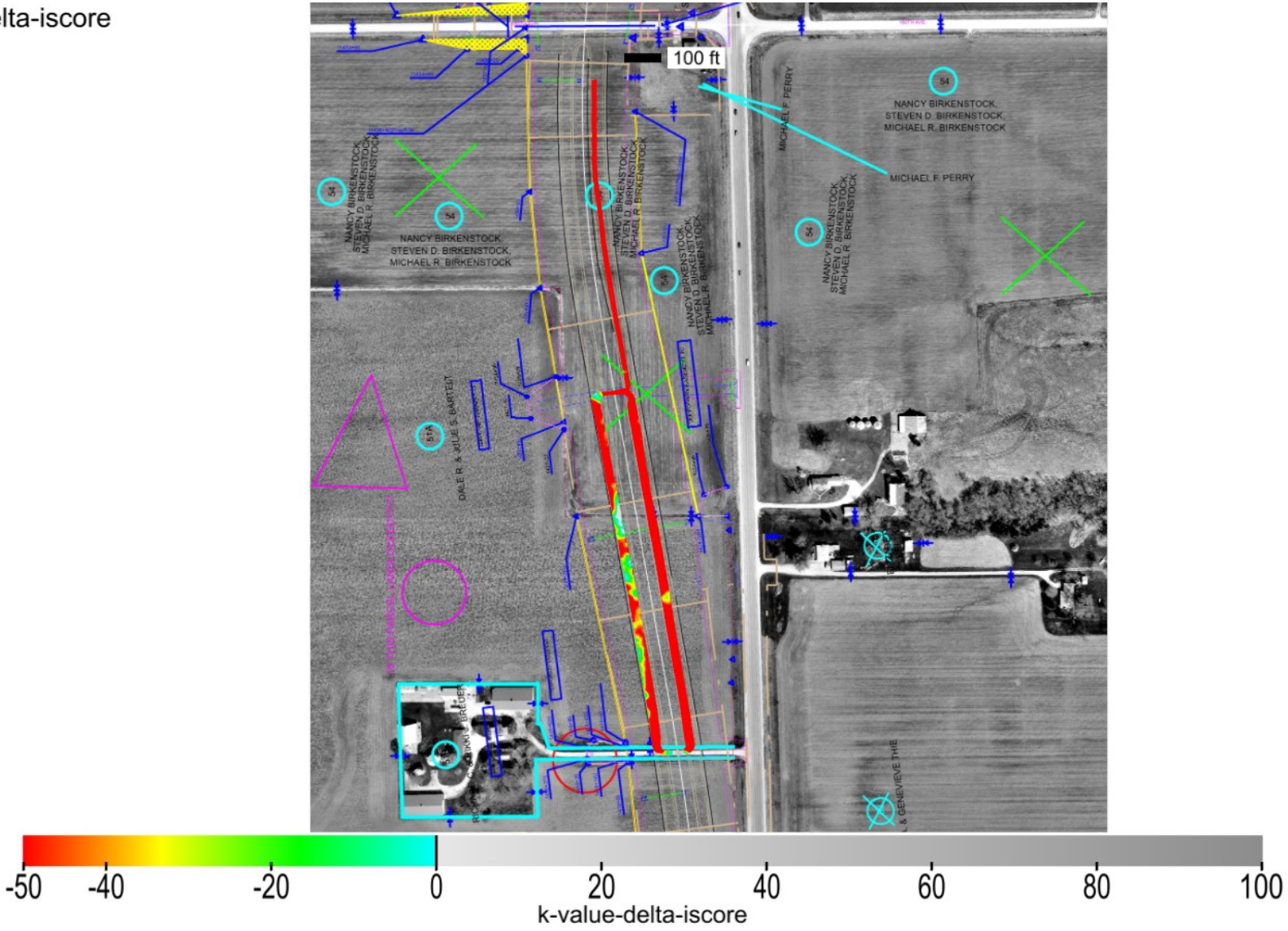


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-us61_cs56-fcs00210_2019_10_22_175418a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	4.8	150	-115	-69.5	75.3	-115	-69.25	45.14

k-value-delta-iscore

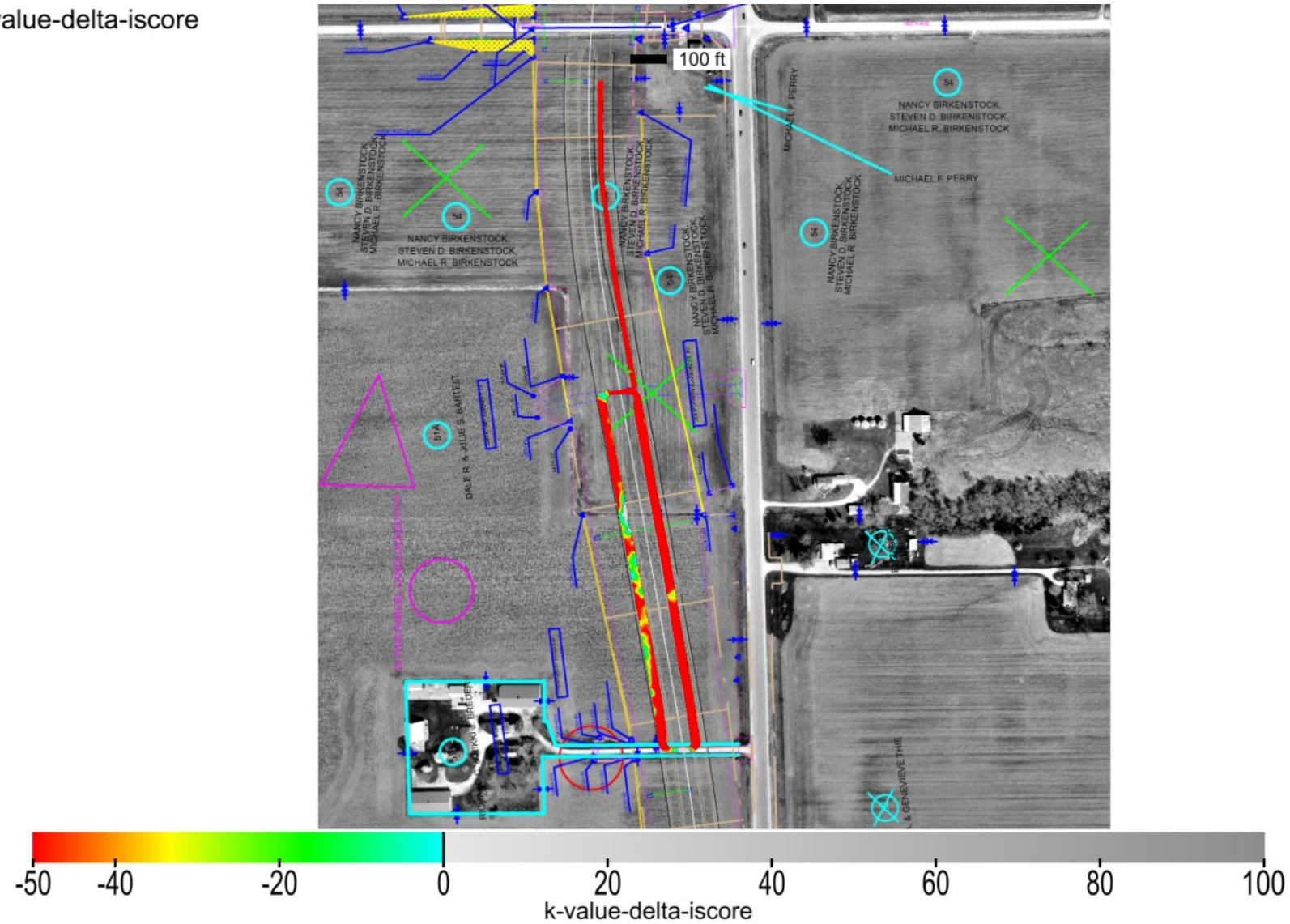


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-us61_cs56-fcs00210_2019_10_22_175418a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	59261	98.29	none	0

blobs: k-value-delta-iscore



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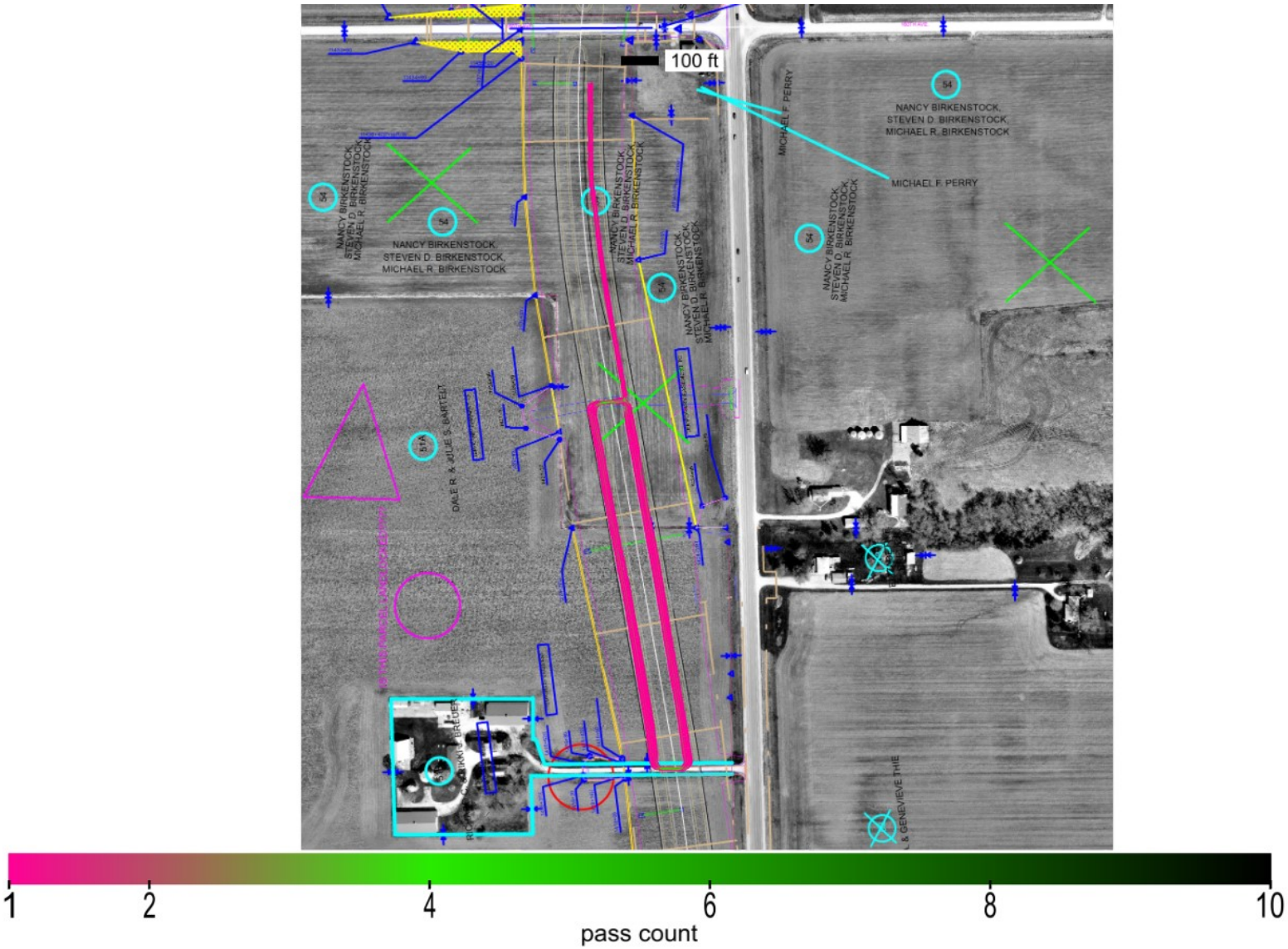
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_22_175418a

minimum	average	maximum
1	1.18	4

pass count

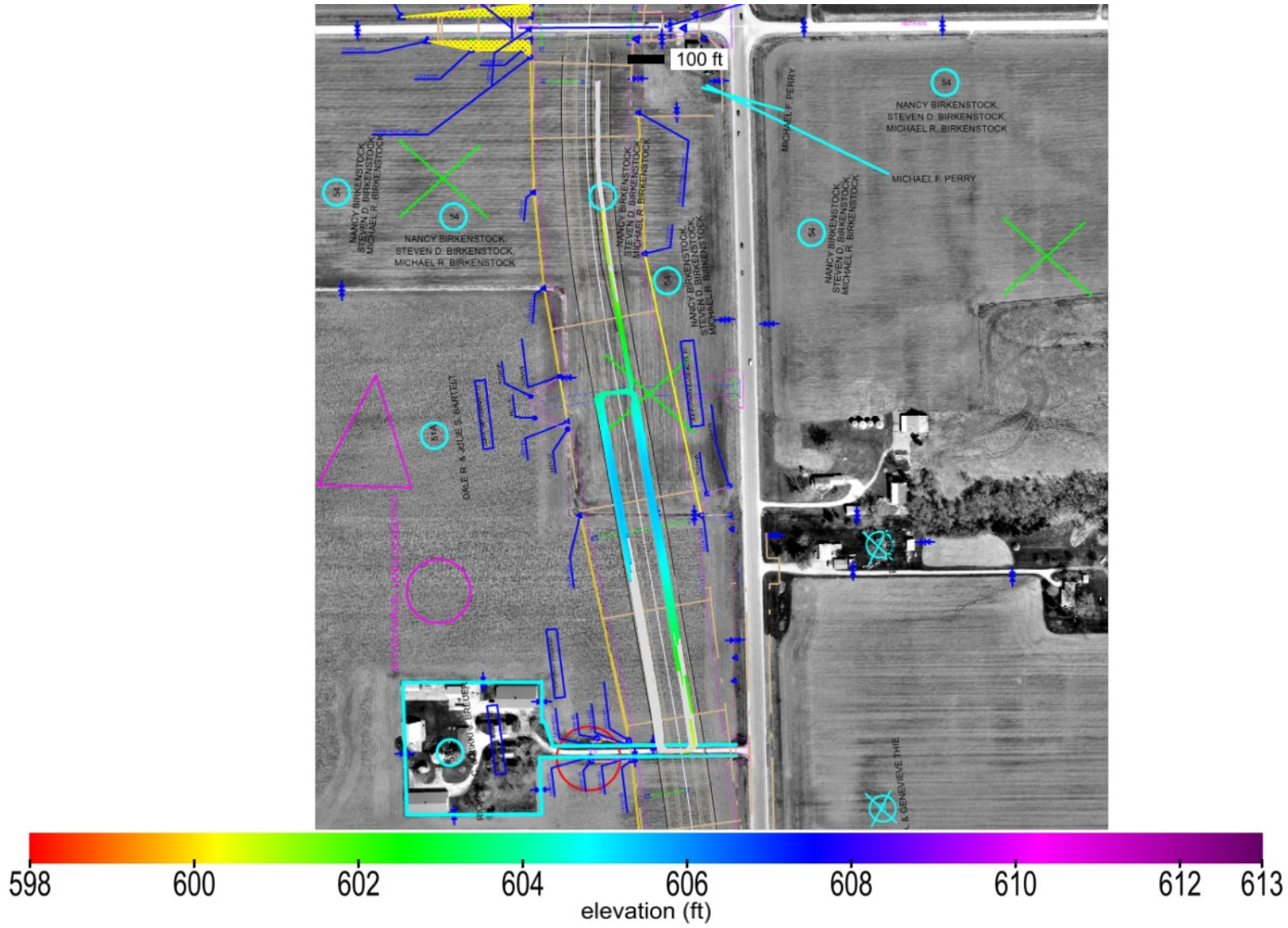


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-us61_cs56-fcs00210_2019_10_22_175418a

minimum	average	maximum
600.271	604.29	608.916

elevation



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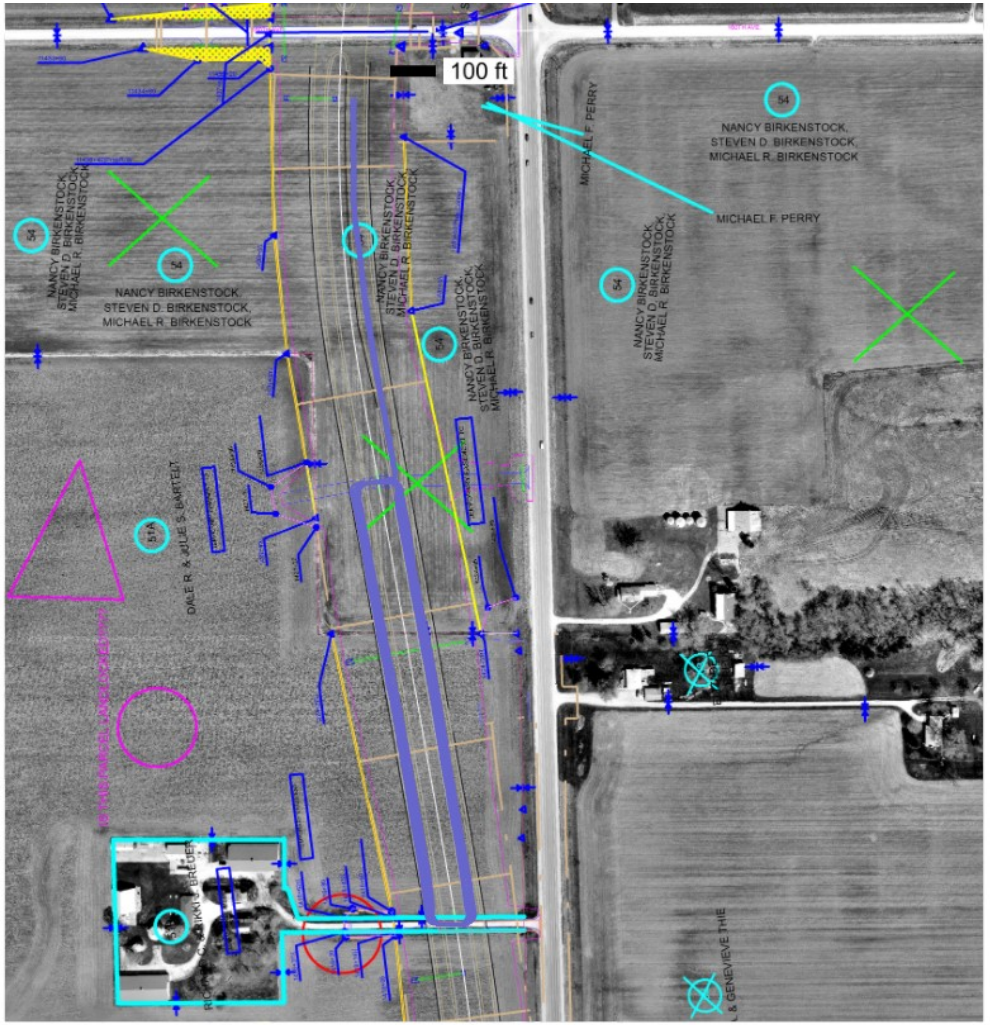
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_22_175418a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	60289	1.384	12	3000	150	40

materials



Subgrade_Treatment Select Cohesive_IADOT (2102.02D)

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Map ID: iadot_29-us61_cs56-fcs00210_2019_10_22_175418a

20191022_175314.jpg

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Map ID: iadot_29-us61_cs56-fcs00210_2019_10_22_175418a

20191023_094917.jpg

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Map ID: iadot_29-us61_cs56-fcs00210_2019_10_22_175418a

20191023_094934.jpg

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IOWADOT

E-Compaction Report

Project:	US61 Des Moines County	Mapping Duration (hrs):	0.23	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2019_10_23_095035a	No. of Measurements:	2900	Machine ID:	Ingios_FCS00210
Date and Time:	10/23/2019 9:50:35 AM	Location:	Des Moines 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	5.8	20.32	0.26	150	35	99	179.23	30.58	30.88	-115	-51	29.23
Moisture Content	No												

Mapped Area

square feet	acres
2900	0.07

Pass Count

min.	avg.	max.
1	5.15	6

Elevation (ft)

min.	avg.	max.
604.75	606.32	607.92

Velocity (fps)

min.	avg.	max.
0.64	5.3	5.54

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	2900	0.067	12	3000	150	40

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IOWADOT

E-Compaction Report

Project:	US61 Des Moines County	Mapping Duration (hrs):	0.23	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2019_10_23_095035a	No. of Measurements:	2900	Machine ID:	Ingios_FCS00210
Date and Time:	10/23/2019 9:50:35 AM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
116.72	CQI > = 95
100	80% of Resilient Modulus MVs >= 3000
26.57	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:	US61 Des Moines County	Mapping Duration (hrs):	0.23	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2019_10_23_095035a	No. of Measurements:	2900	Machine ID:	Ingios_FCS00210
Date and Time:	10/23/2019 9:50:35 AM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
20.32	CQI > = 95
5.8	80% of k-Value MVs >= 150
30.88	COV <= 20
98.86	% 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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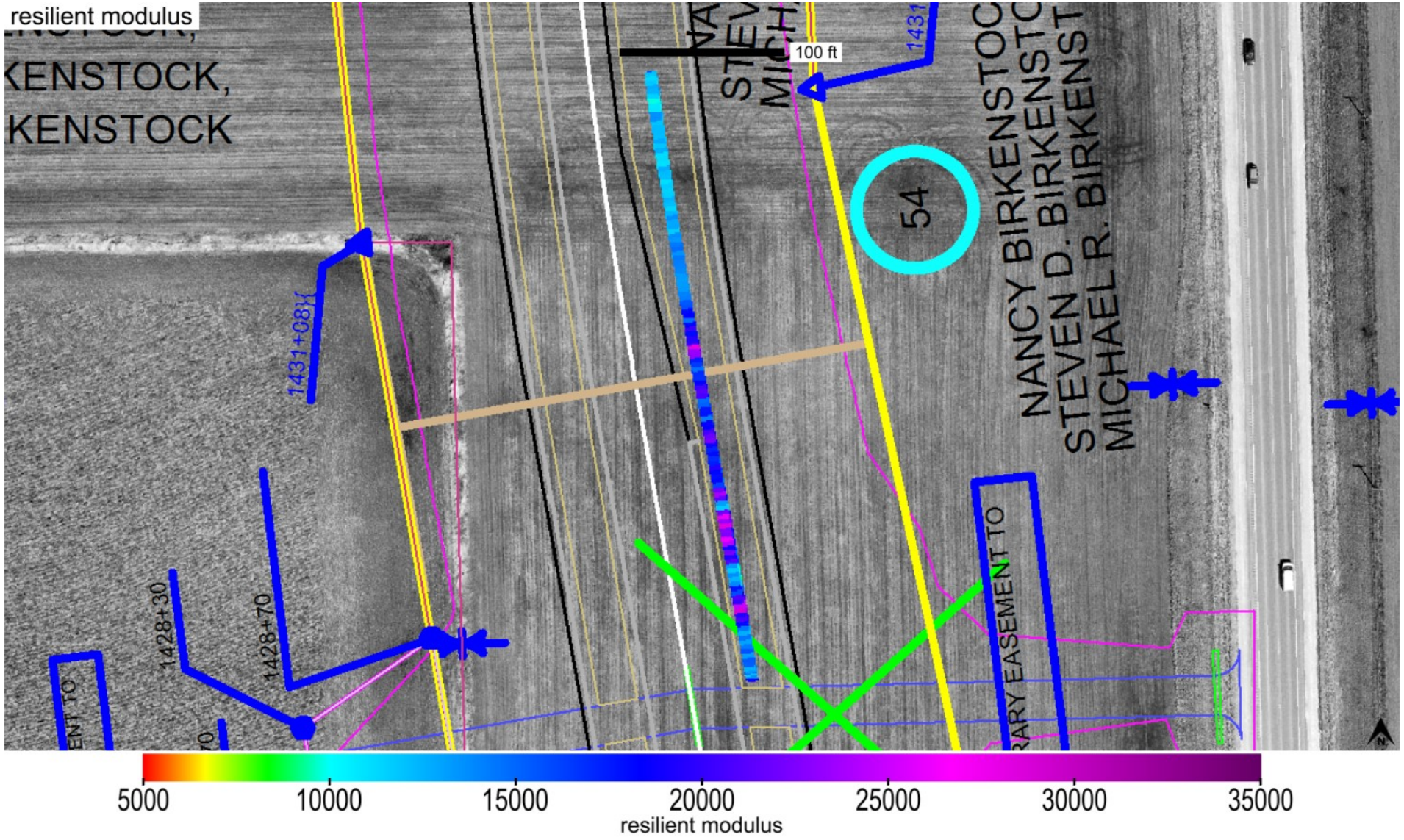
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_095035a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	No	100	116.72	1.1	3000	8758.31	16141.8	28893.89	4289.52	26.57	5758.31	13141.8	25893.89



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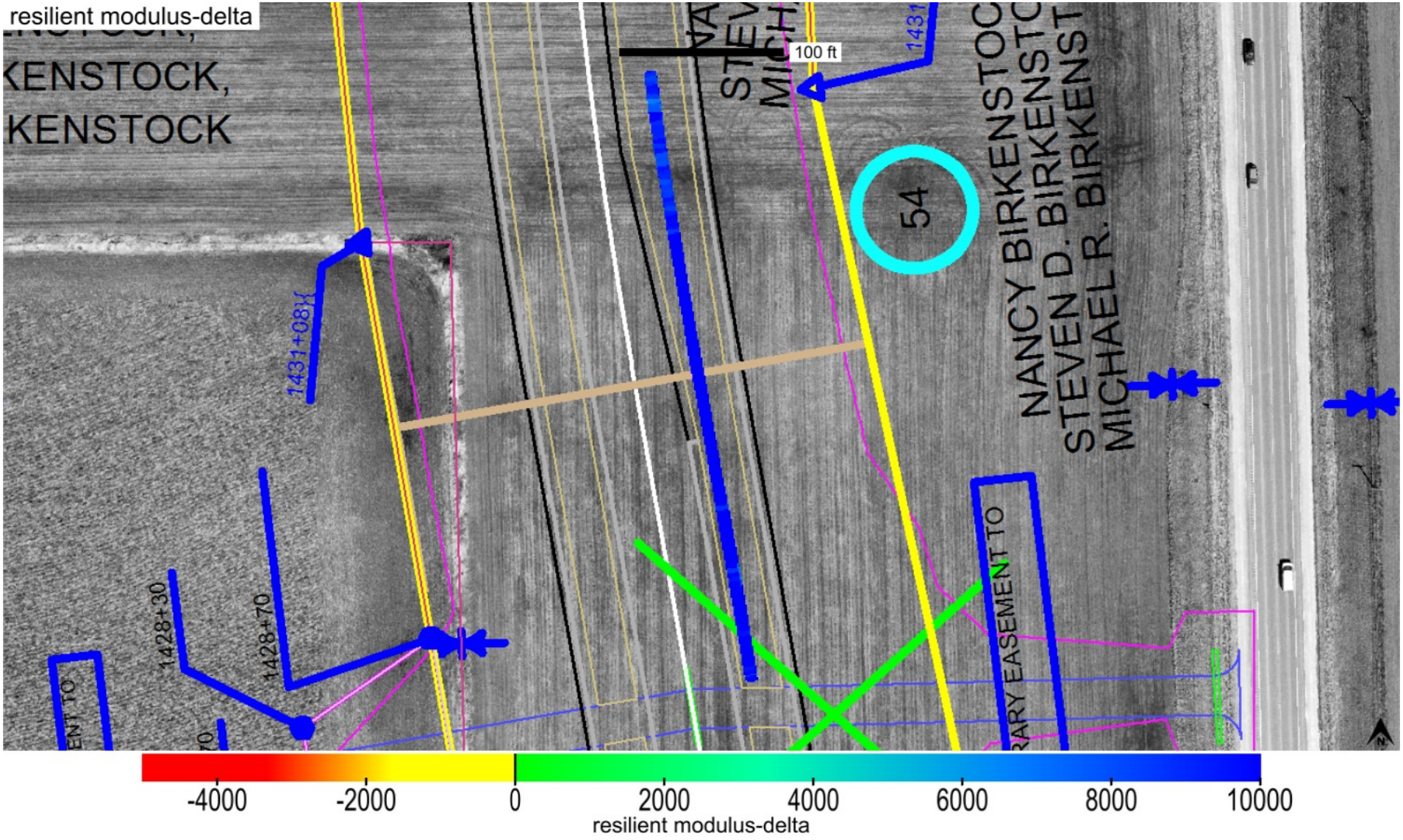
ingios GEOTECHNICS

Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_095035a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	No	100	116.72	1.1	3000	8758.31	16141.8	28893.89	4289.52	26.57	5758.31	13141.8	25893.89



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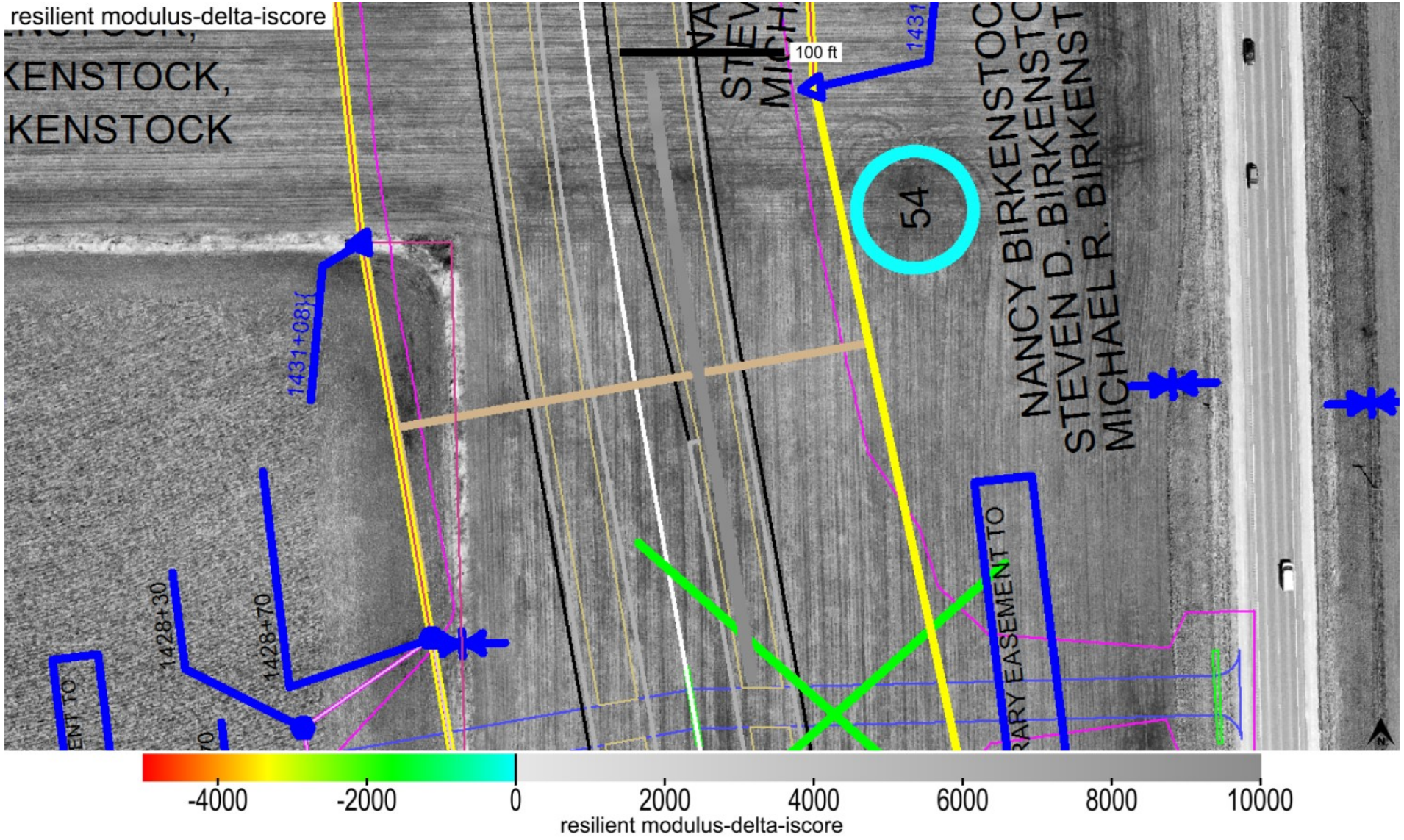
ingios GEOTECHNICS

Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_095035a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	No	100	3000	5758.31	13141.8	25893.89	8421.16	13143.29	21414.04



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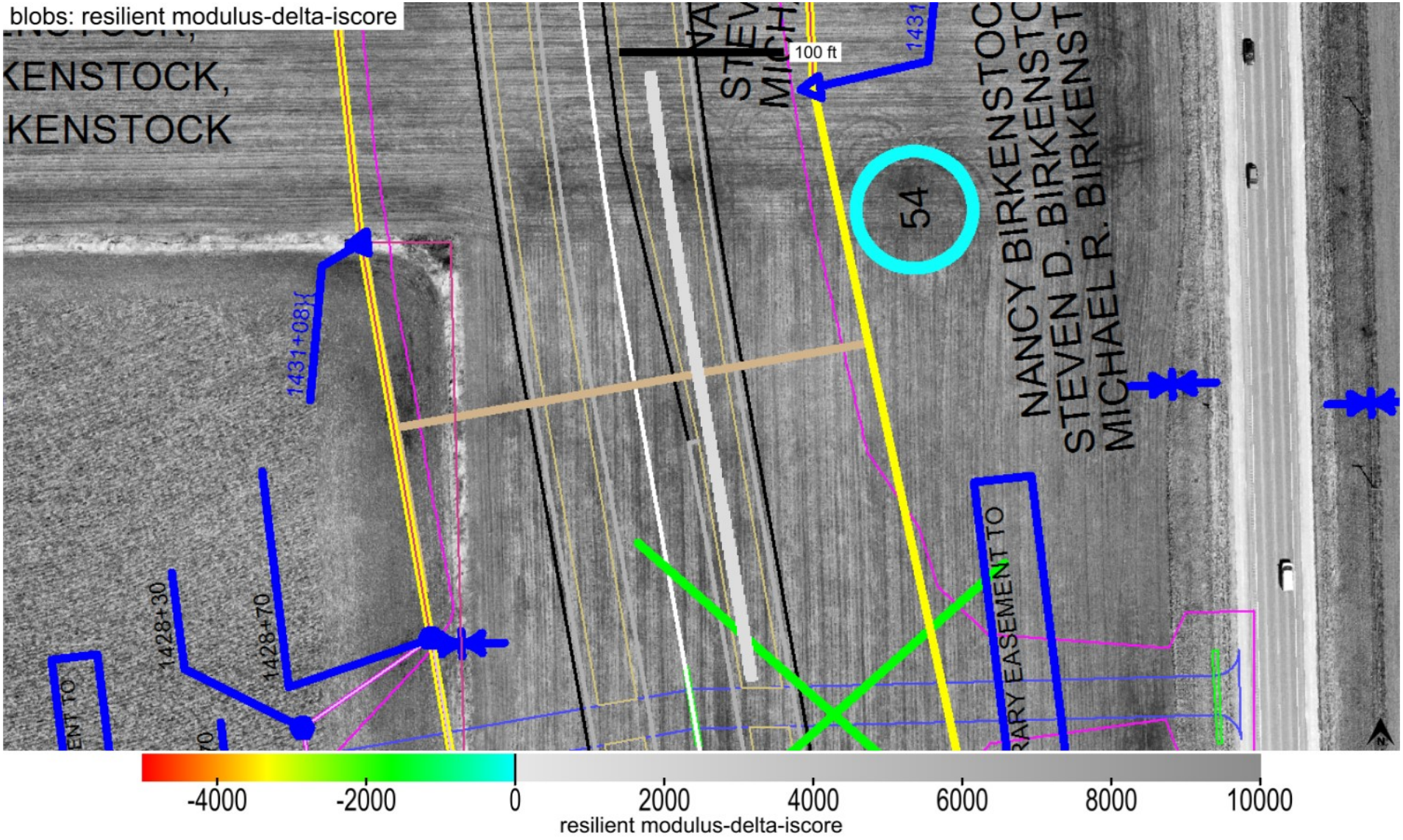
ingios GEOTECHNICS

Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_095035a

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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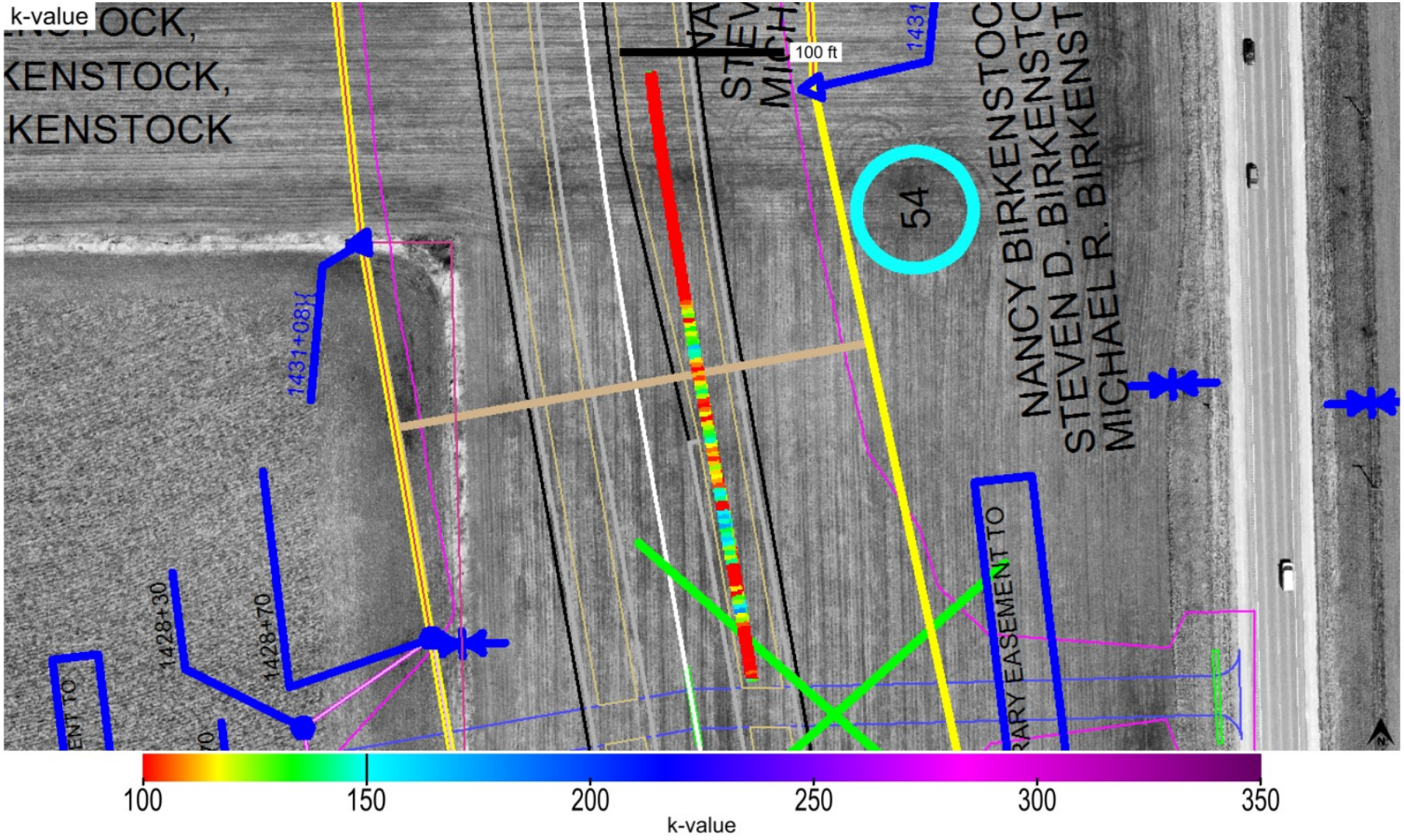
ingios GEOTECHNICS

Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_095035a

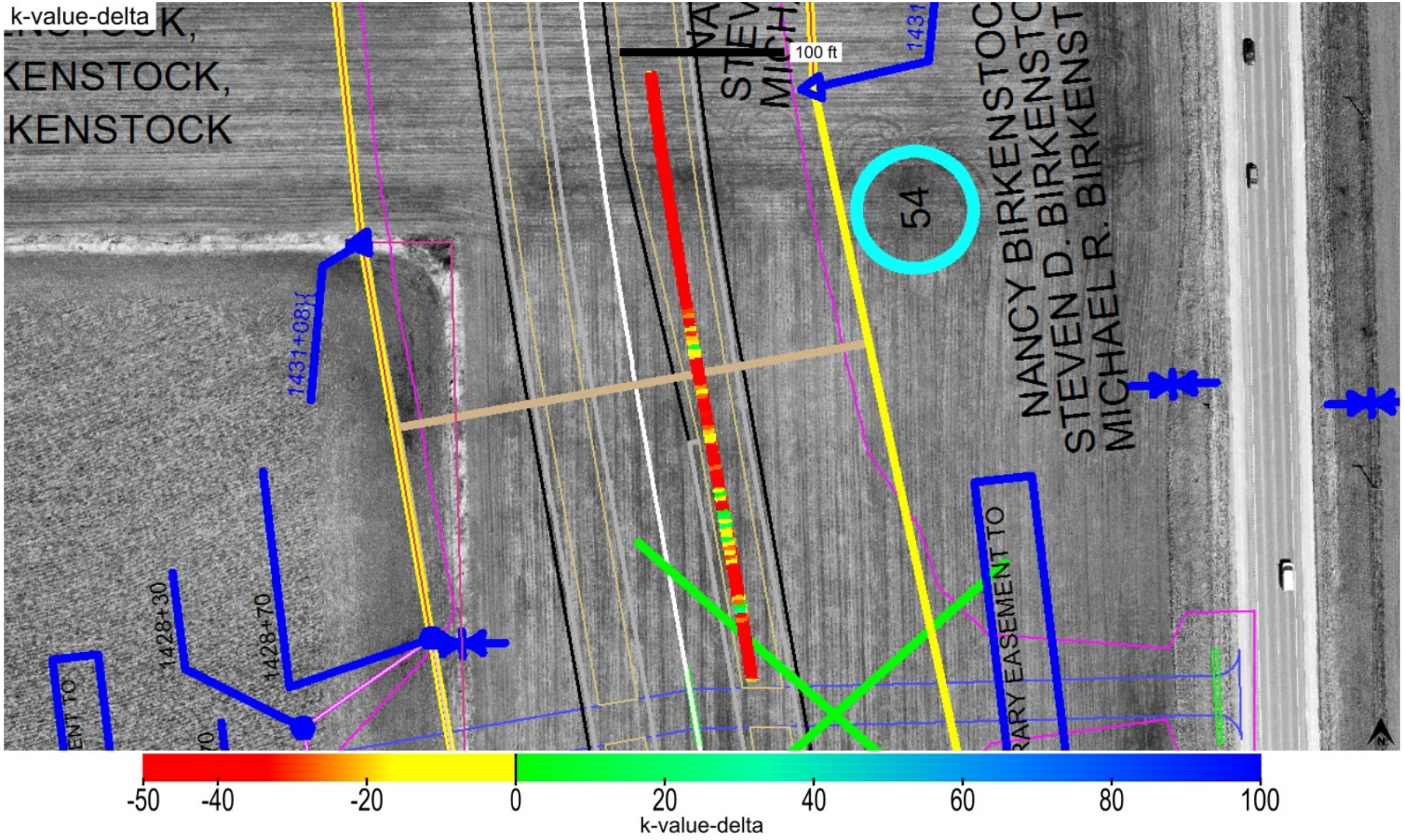
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	5.8	20.32	0.26	150	35	99	179.23	30.58	30.88	-115	-51	29.23



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_29-us61_cs56-fcs00210_2019_10_23_095035a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	5.8	20.32	0.26	150	35	99	179.23	30.58	30.88	-115	-51	29.23



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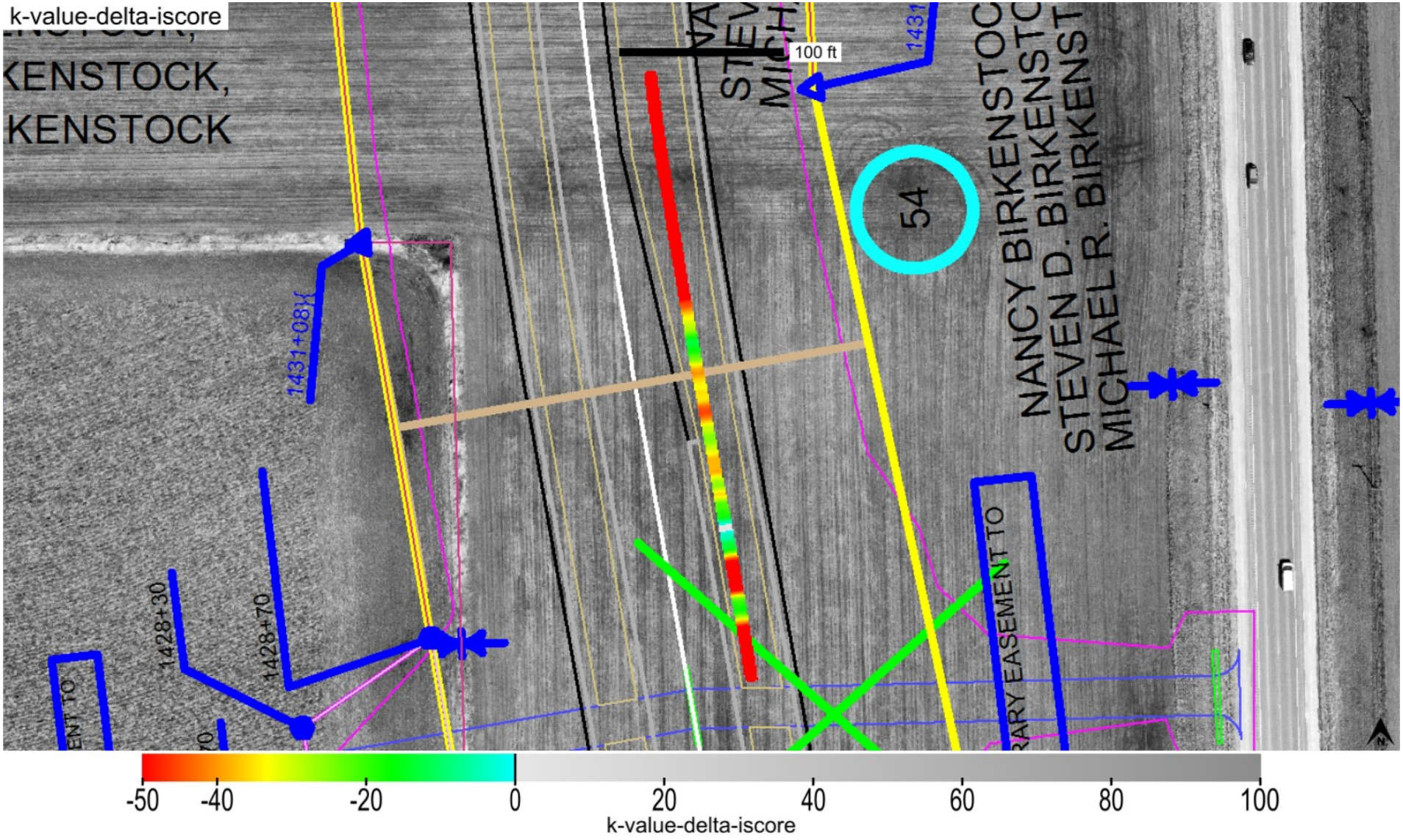
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_095035a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	5.8	150	-115	-51	29.23	-88.05	-51.02	2.19



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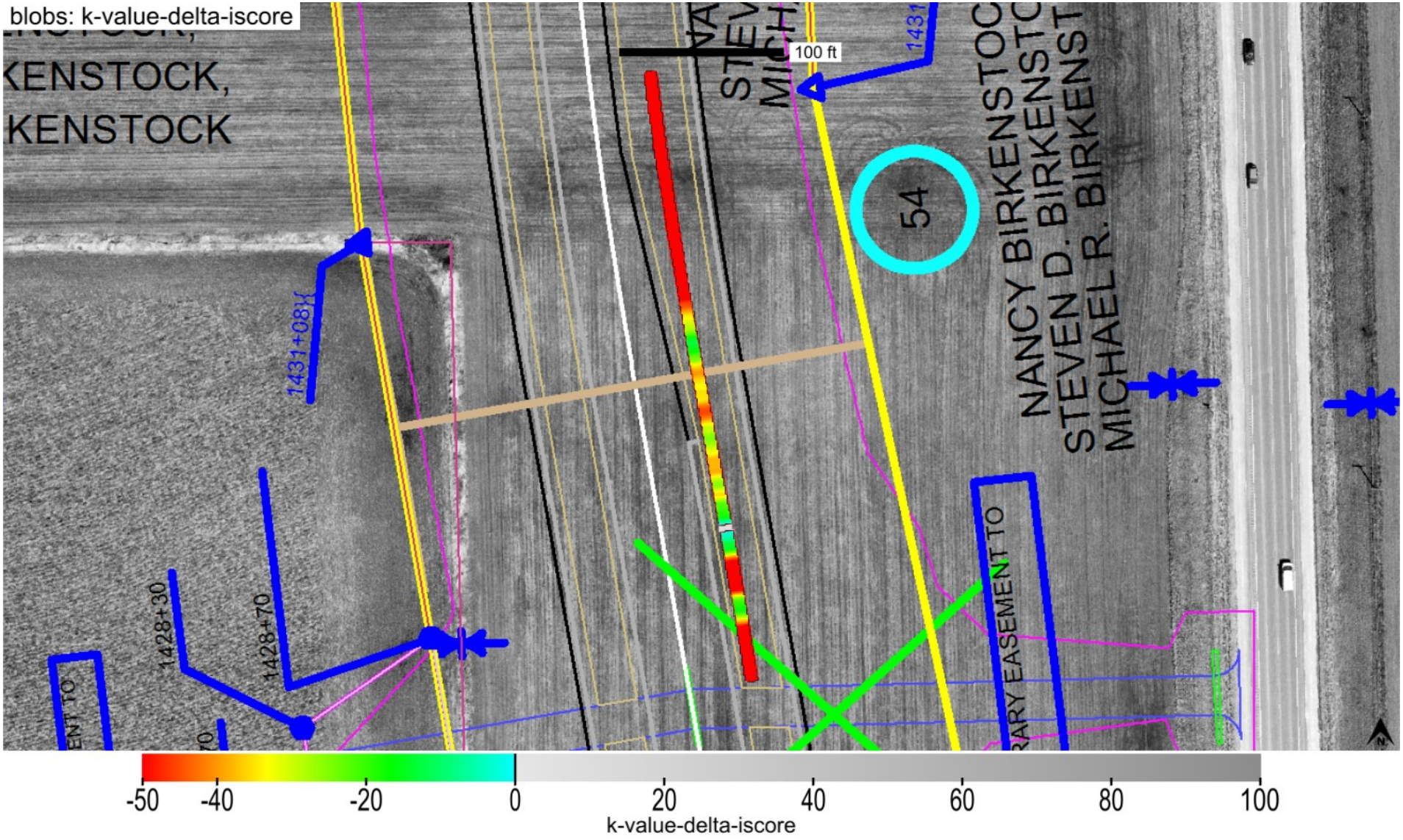
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_095035a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	2	2867	98.86	none	0



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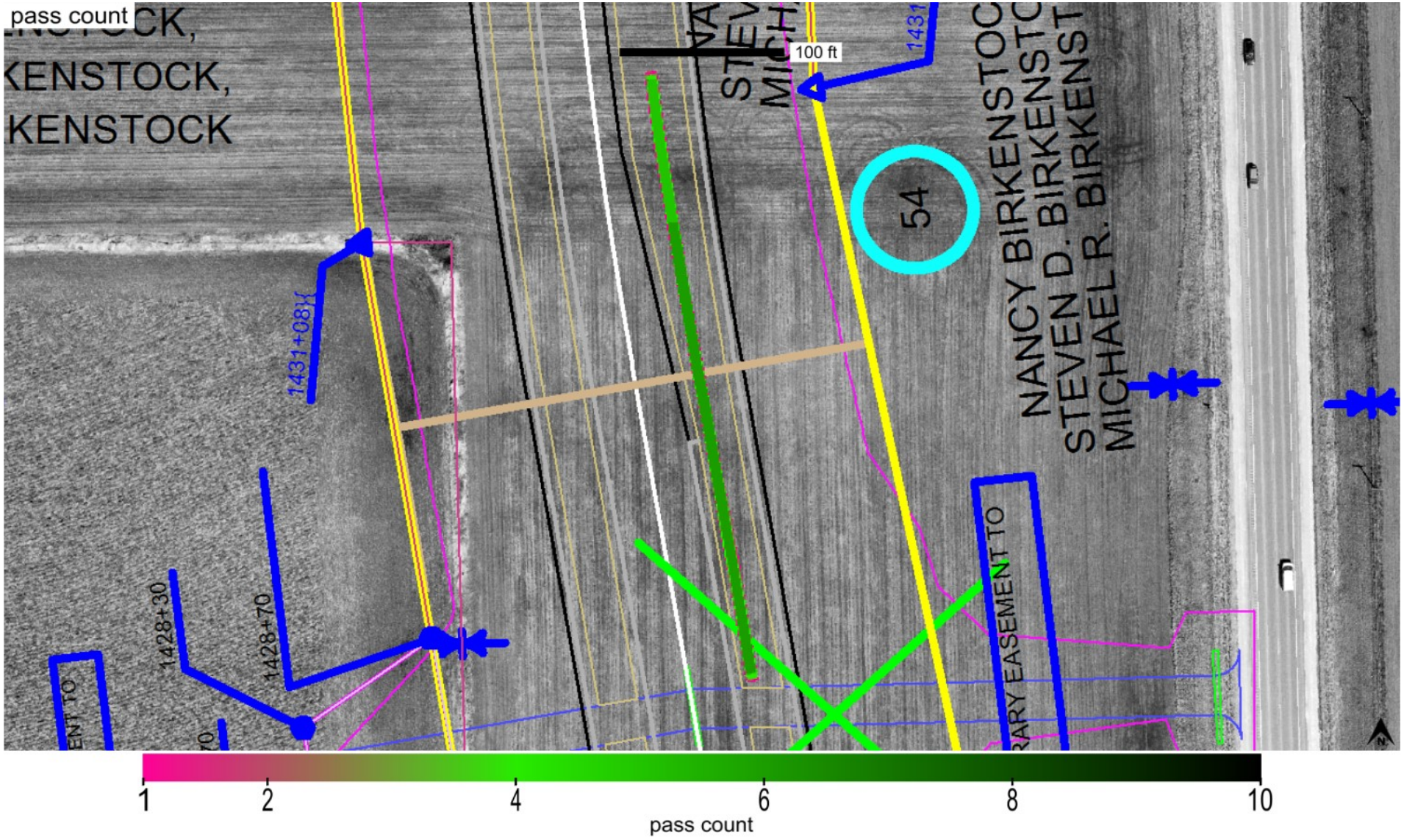
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_095035a

minimum	average	maximum
1	5.15	6



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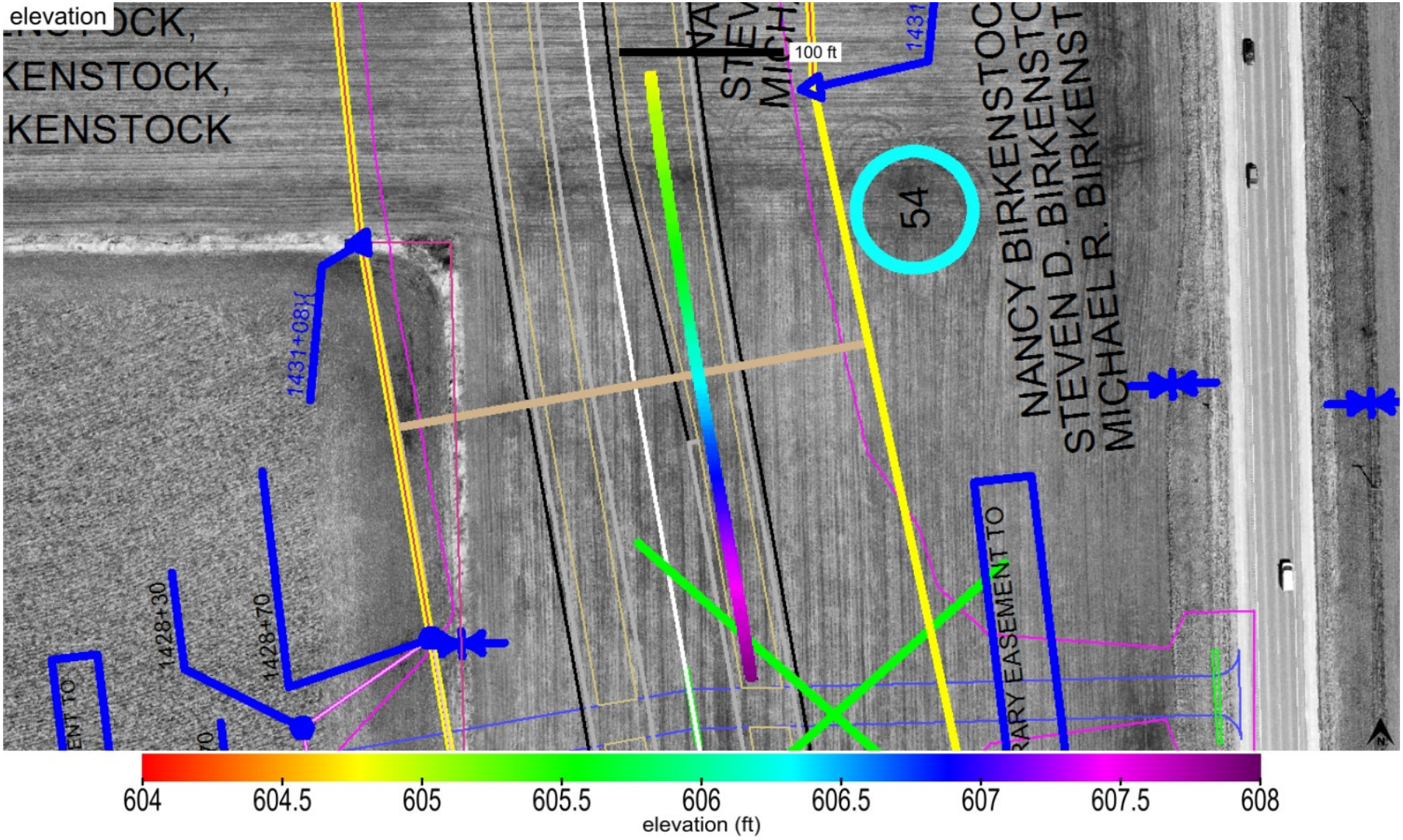
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_095035a

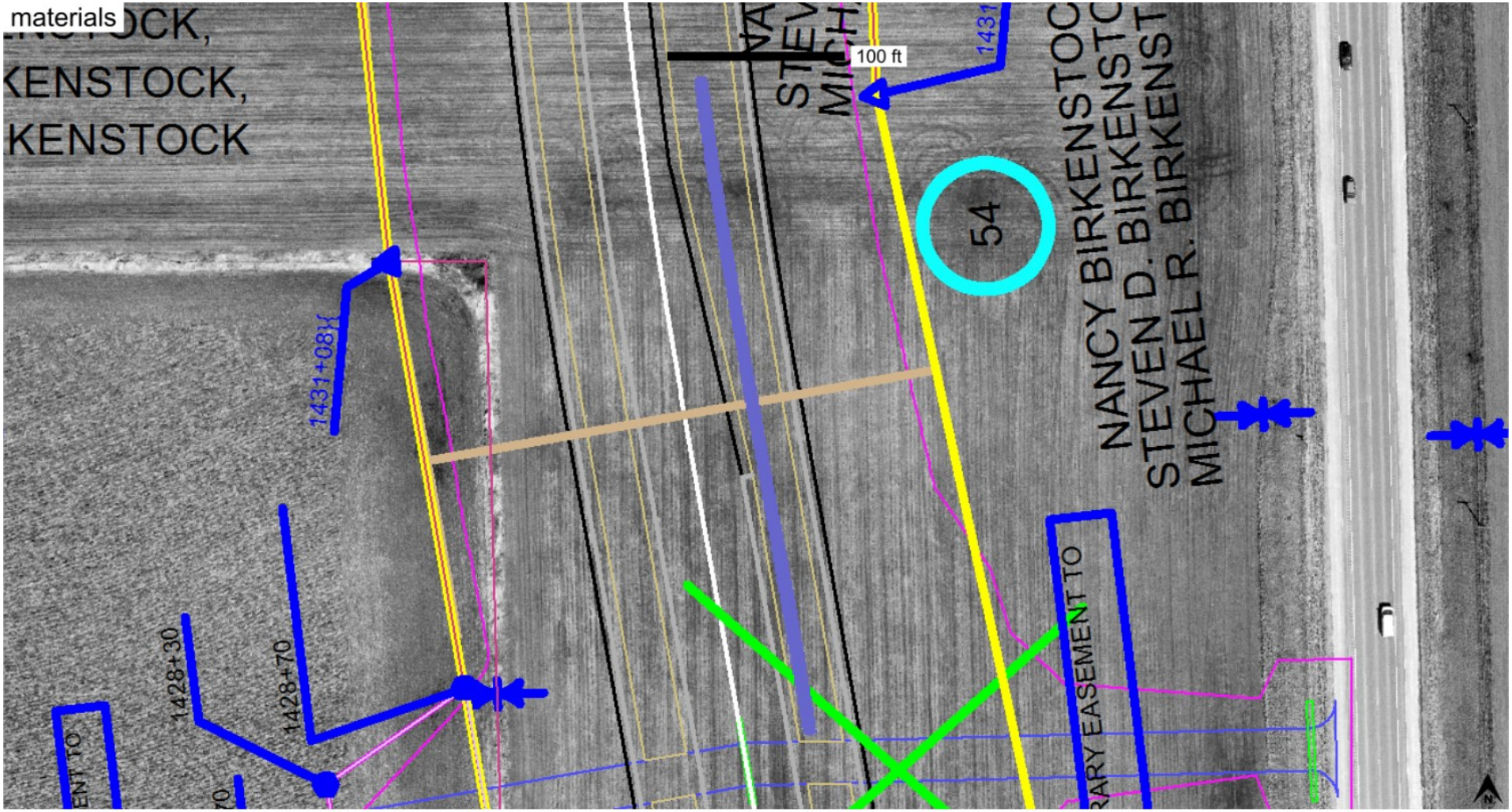
minimum	average	maximum
604.749	606.315	607.922



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_29-us61_cs56-fcs00210_2019_10_23_095035a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	2900	0.067	12	3000	150	40



Subgrade_Treatment Select Cohesive_IADOT (2102.02D)

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ingios GEOTECHNICS

Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_095035a

20191023_100531.jpg

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IOWADOT

E-Compaction Report

Project:	US61 Des Moines County	Mapping Duration (hrs):	1.69	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2019_10_23_102320a	No. of Measurements:	169572	Machine ID:	Ingios_FCS00210
Date and Time:	10/23/2019 10:23:20 AM	Location:	Des Moines 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	0.7	7.41	-0.2	150	35	58.5	280.79	27.21	46.55	-115	-91.5	130.79
Moisture Content	No												

Mapped Area

square feet	acres
169572	3.89

Pass Count

min.	avg.	max.
1	1.36	5

Elevation (ft)

min.	avg.	max.
589.58	598.37	609.4

Velocity (fps)

min.	avg.	max.
0.56	5.46	7.11

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	169572	3.893	12	3000	150	40

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US61 Des Moines County	Mapping Duration (hrs):	1.69	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2019_10_23_102320a	No. of Measurements:	169572	Machine ID:	Ingios_FCS00210
Date and Time:	10/23/2019 10:23:20 AM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
116.9	CQI > = 95
100	80% of Resilient Modulus MVs >= 3000
26.19	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:	US61 Des Moines County	Mapping Duration (hrs):	1.69	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2019_10_23_102320a	No. of Measurements:	169572	Machine ID:	Ingios_FCS00210
Date and Time:	10/23/2019 10:23:20 AM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
7.41	CQI > = 95
0.7	80% of k-Value MVs >= 150
46.55	COV <= 20
99.72	% 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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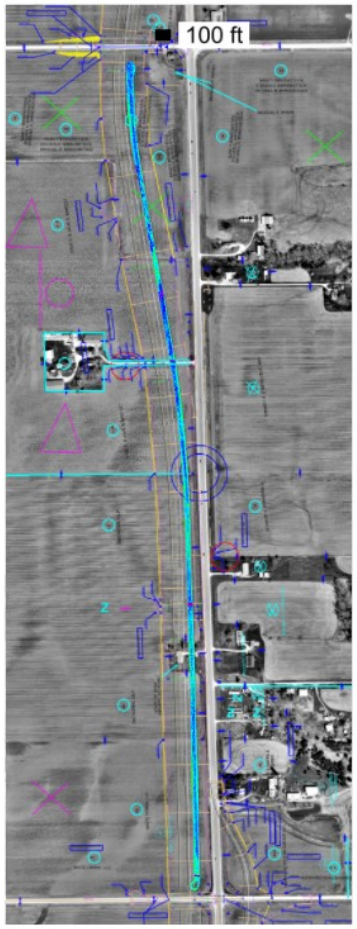
ingios GEOTECHNICS

Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_102320a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	No	100	116.9	1.07	3000	5500	12347.6	56000	3233.72	26.19	2500	9347.6	53000

resilient modulus



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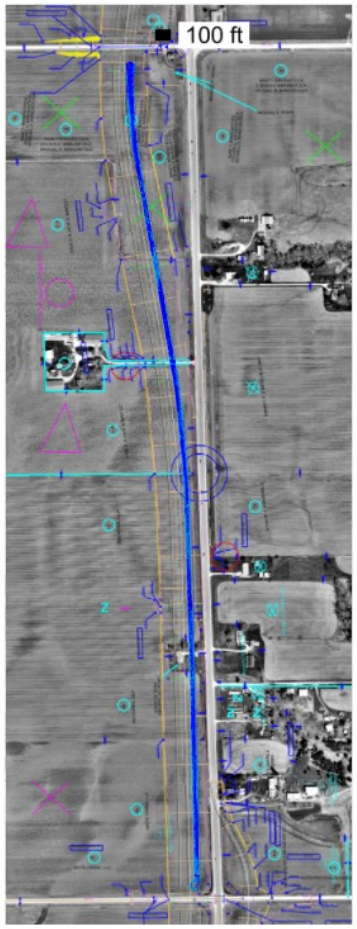
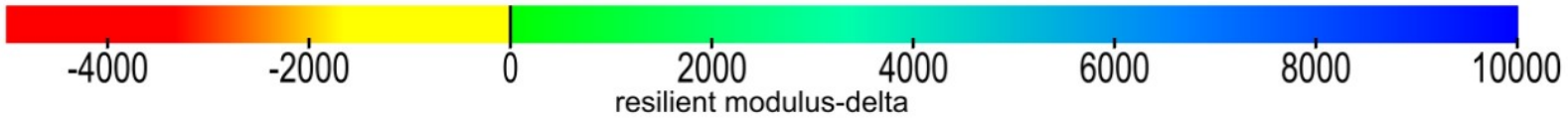
ingios GEOTECHNICS

Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_102320a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	No	100	116.9	1.07	3000	5500	12347.6	56000	3233.72	26.19	2500	9347.6	53000

resilient modulus-delta





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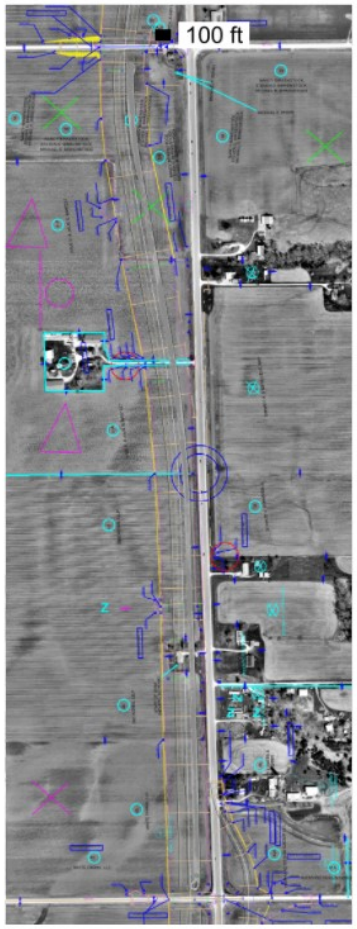
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_102320a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	No	100	3000	2500	9347.6	53000	5373.03	9420.77	27381.68

resilient modulus-delta-iscore



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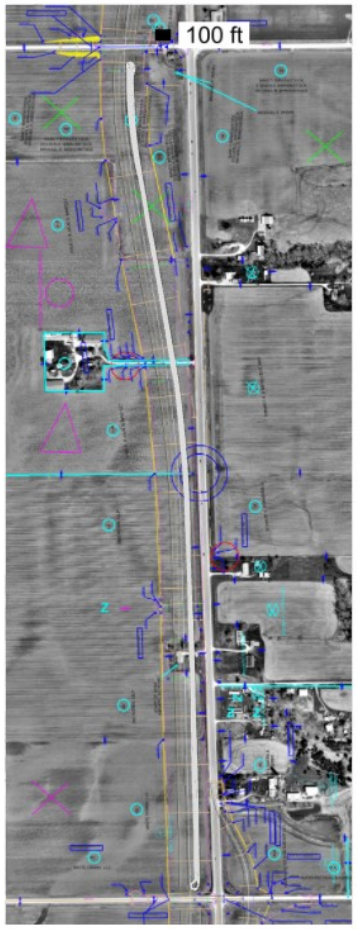
ingios GEOTECHNICS

Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_102320a

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

blobs: resilient modulus-delta-iscore



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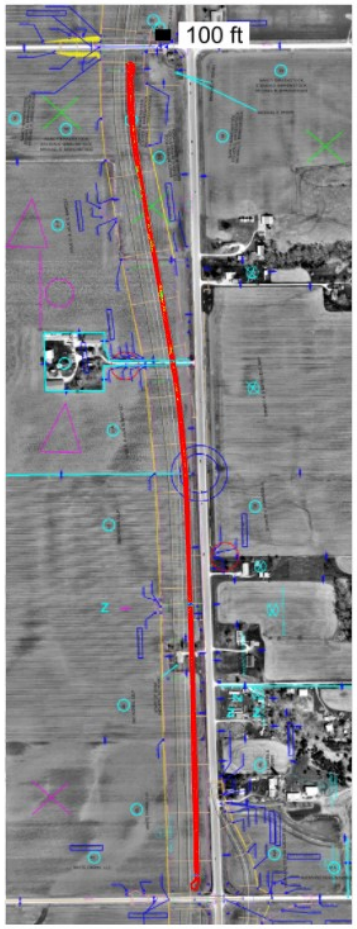
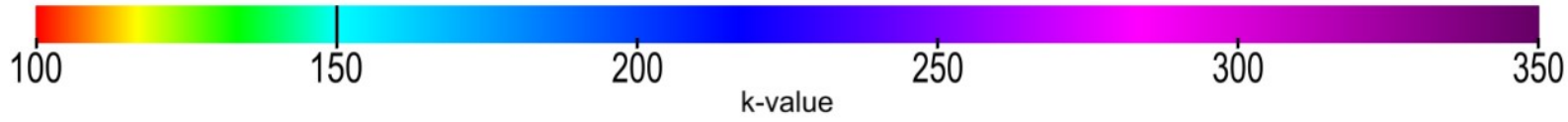
ingios GEOTECHNICS

Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_102320a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.7	7.41	-0.2	150	35	58.5	280.79	27.21	46.55	-115	-91.5	130.79

k-value





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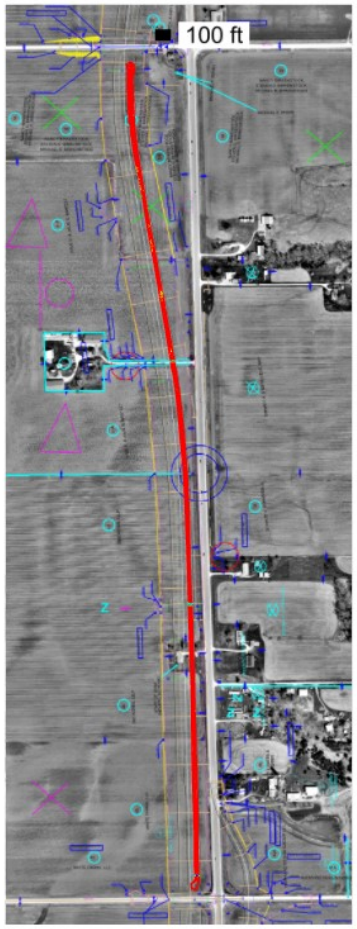
ingios GEOTECHNICS

Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_102320a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.7	7.41	-0.2	150	35	58.5	280.79	27.21	46.55	-115	-91.5	130.79

k-value-delta



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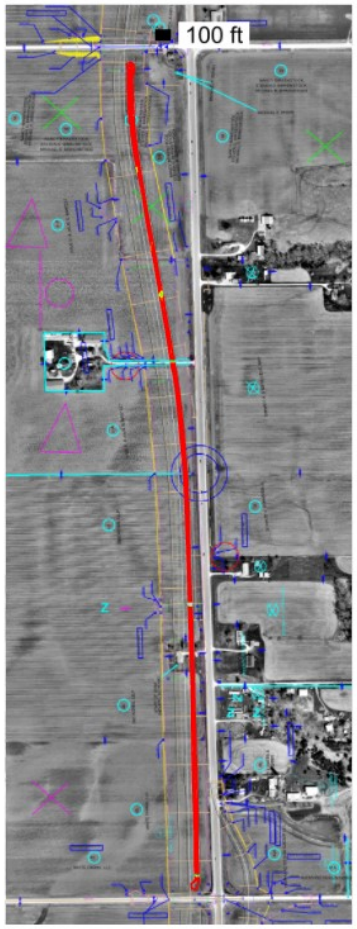
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_102320a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	0.7	150	-115	-91.5	130.79	-115	-90.91	36.57

k-value-delta-iscore



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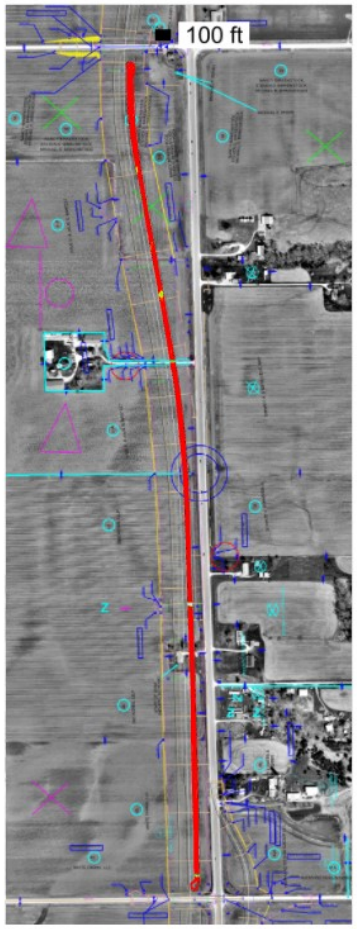
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_102320a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	2	169096	99.72	none	0

blobs: k-value-delta-iscore



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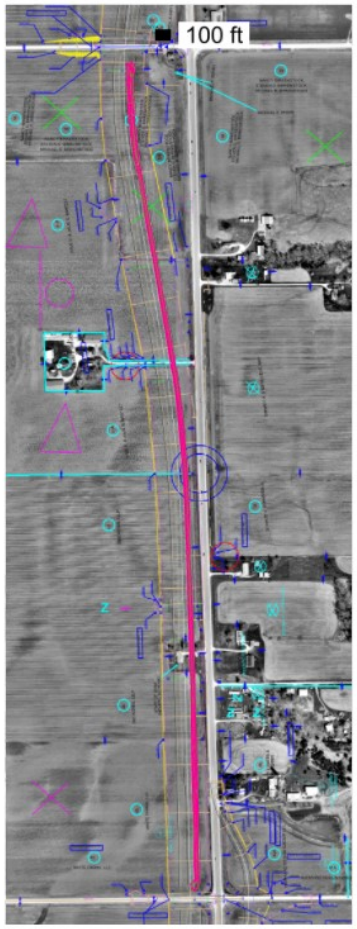
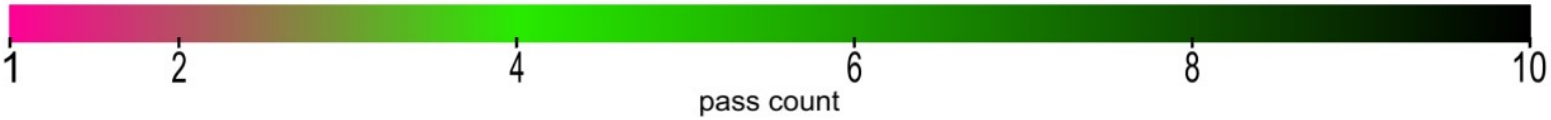
ingios GEOTECHNICS

Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_102320a

minimum	average	maximum
1	1.36	5

pass count





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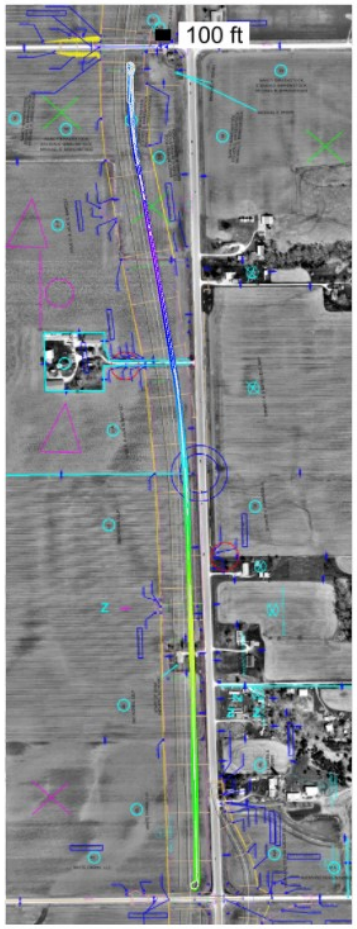
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_102320a

minimum	average	maximum
589.576	598.368	609.395

elevation



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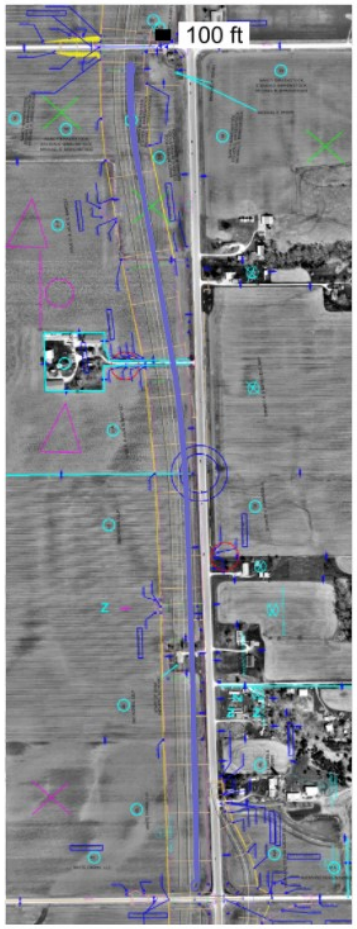
ingios GEOTECHNICS

Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_102320a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	169572	3.893	12	3000	150	40

materials



Subgrade_Treatment Select Cohesive_IADOT (2102.02D)

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US61 Des Moines County	Mapping Duration (hrs):	1.04	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2019_10_23_130838a	No. of Measurements:	118379	Machine ID:	Ingios_FCS00210
Date and Time:	10/23/2019 1:08:38 PM	Location:	Des Moines 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	4.5	10.12	0.02	150	35	77.4	240.06	37.68	48.66	-115	-72.6	90.06
Moisture Content	No												

Mapped Area

square feet	acres
118379	2.72

Pass Count

min.	avg.	max.
1	1.21	4

Elevation (ft)

min.	avg.	max.
589.99	598.17	609.4

Velocity (fps)

min.	avg.	max.
3.97	5.48	6.56

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	118379	2.718	12	3000	150	40

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IOWADOT

E-Compaction Report

Project:	US61 Des Moines County	Mapping Duration (hrs):	1.04	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2019_10_23_130838a	No. of Measurements:	118379	Machine ID:	Ingios_FCS00210
Date and Time:	10/23/2019 1:08:38 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
113.99	CQI > = 95
100	80% of Resilient Modulus MVs >= 3000
32.02	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:	US61 Des Moines County	Mapping Duration (hrs):	1.04	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2019_10_23_130838a	No. of Measurements:	118379	Machine ID:	Ingios_FCS00210
Date and Time:	10/23/2019 1:08:38 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
10.12	CQI > = 95
4.5	80% of k-Value MVs >= 150
48.66	COV <= 20
98.4	% 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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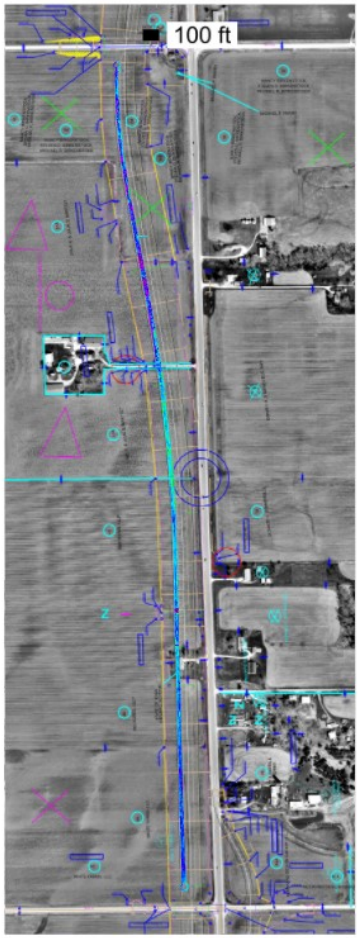
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_130838a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	No	100	113.99	0.9	3000	5500	14905.9	53561.21	4772.29	32.02	2500	11905.9	50561.21

resilient modulus



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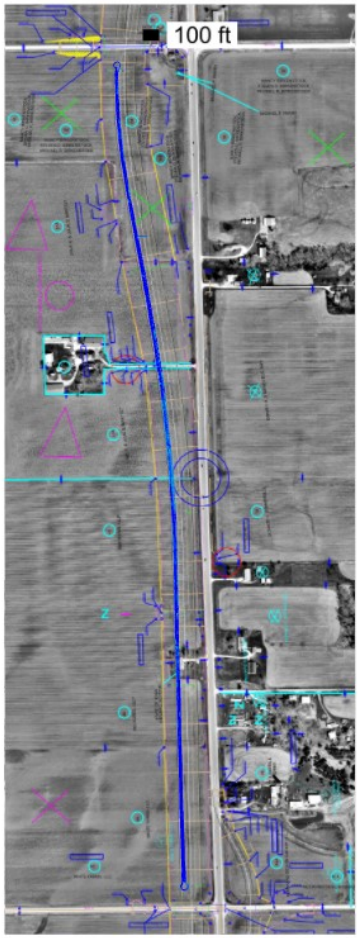
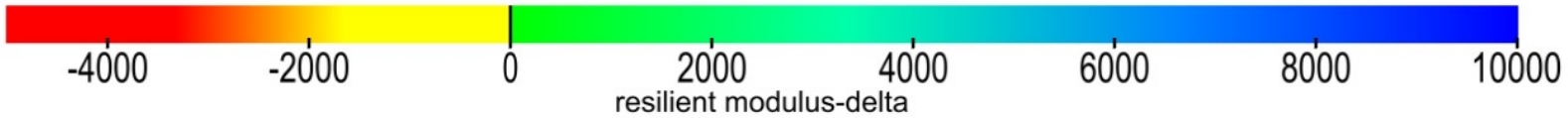
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_130838a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	No	100	113.99	0.9	3000	5500	14905.9	53561.21	4772.29	32.02	2500	11905.9	50561.21

resilient modulus-delta





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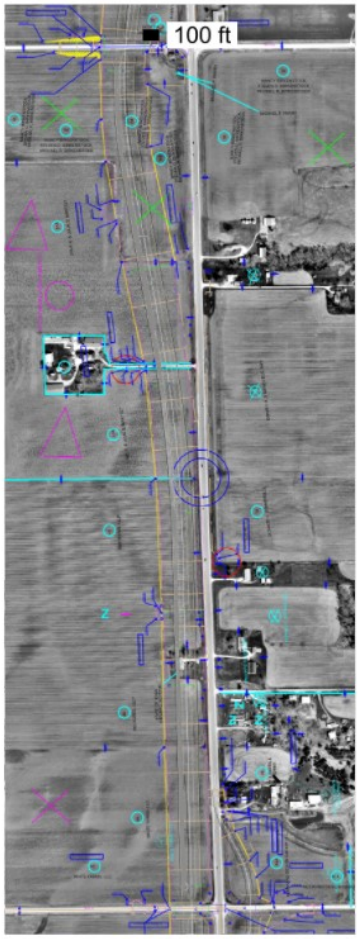
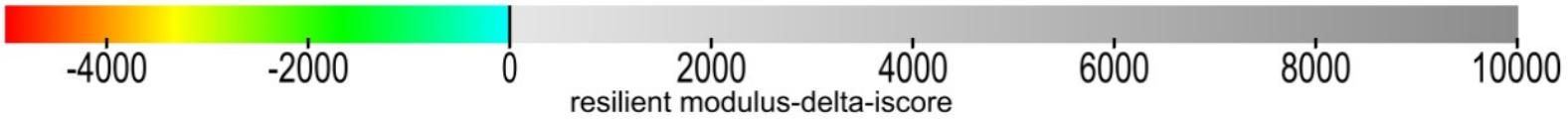
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_130838a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	No	100	3000	2500	11905.9	50561.21	5351.31	11948.77	31861.6

resilient modulus-delta-iscore





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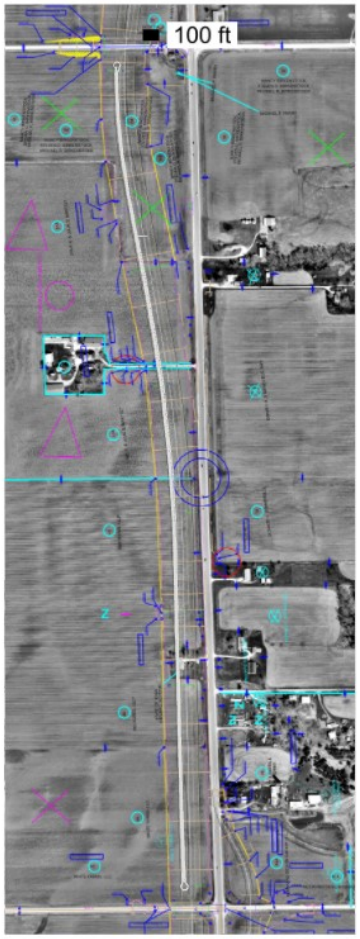
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_130838a

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

blobs: resilient modulus-delta-iscore



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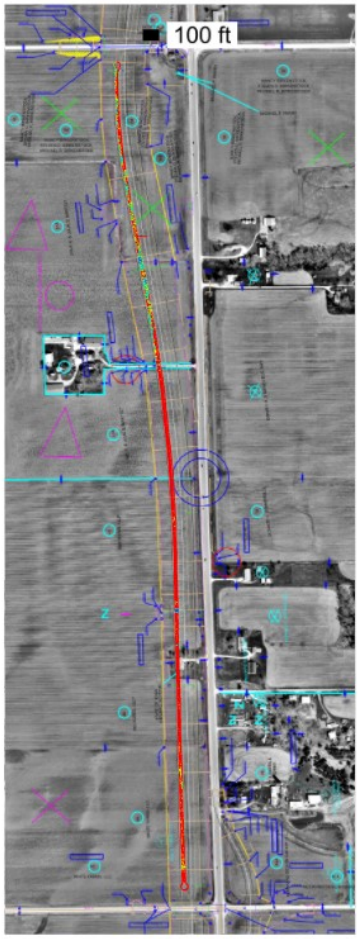
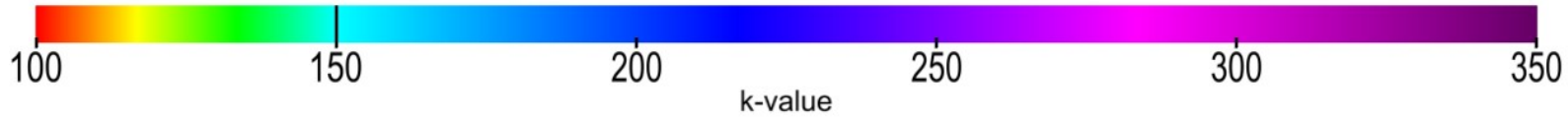
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_130838a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	4.5	10.12	0.02	150	35	77.4	240.06	37.68	48.66	-115	-72.6	90.06

k-value





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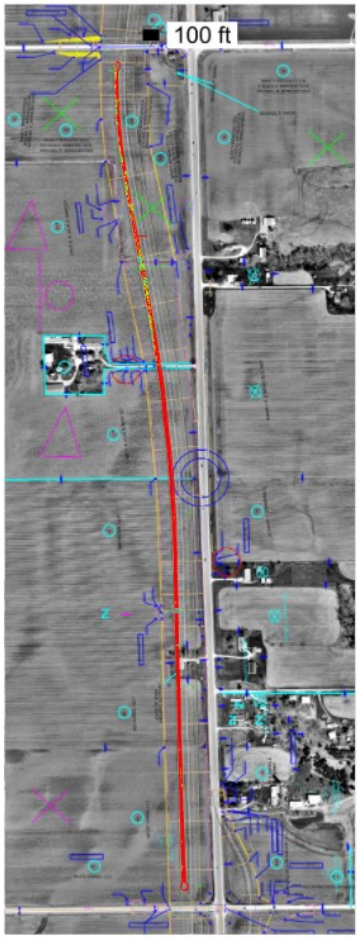
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_130838a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	4.5	10.12	0.02	150	35	77.4	240.06	37.68	48.66	-115	-72.6	90.06

k-value-delta



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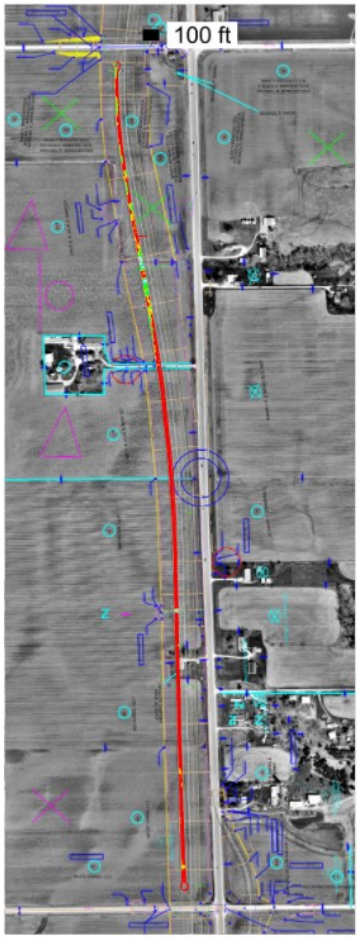
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_130838a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	4.5	150	-115	-72.6	90.06	-115	-72.22	54.77

k-value-delta-iscore



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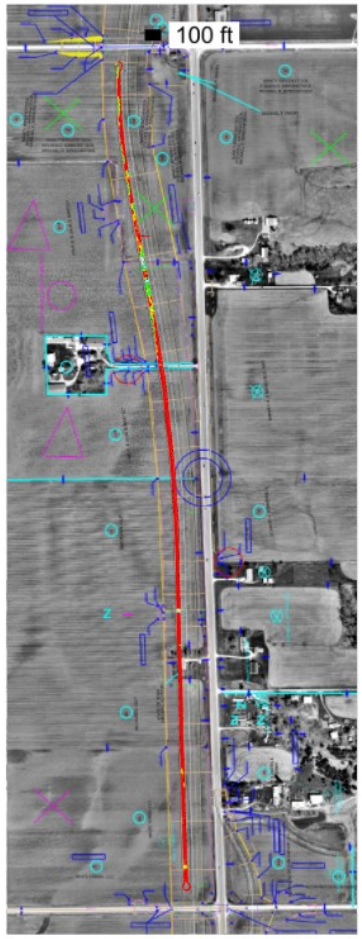
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_130838a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	3	116487	98.4	none	0

blobs: k-value-delta-iscore



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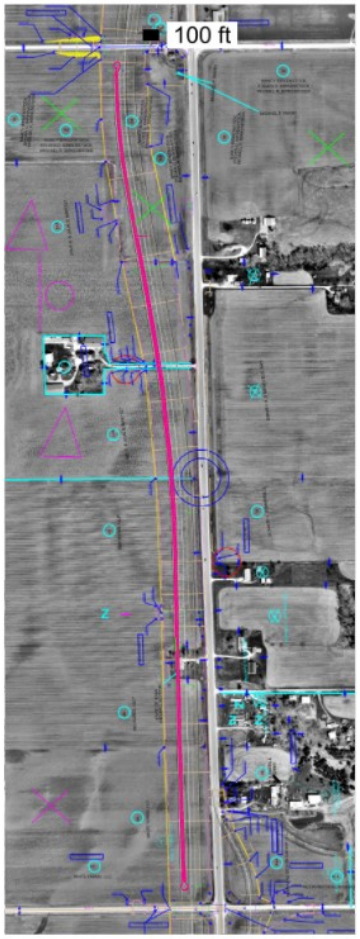
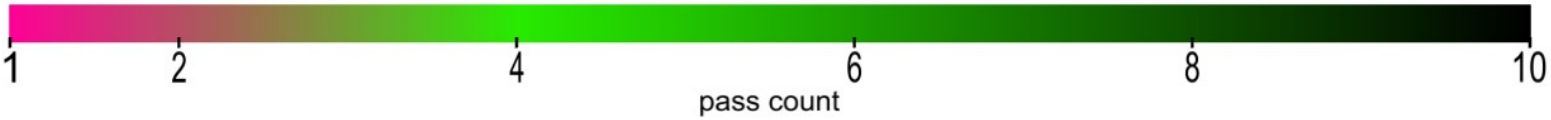
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_130838a

minimum	average	maximum
1	1.21	4

pass count





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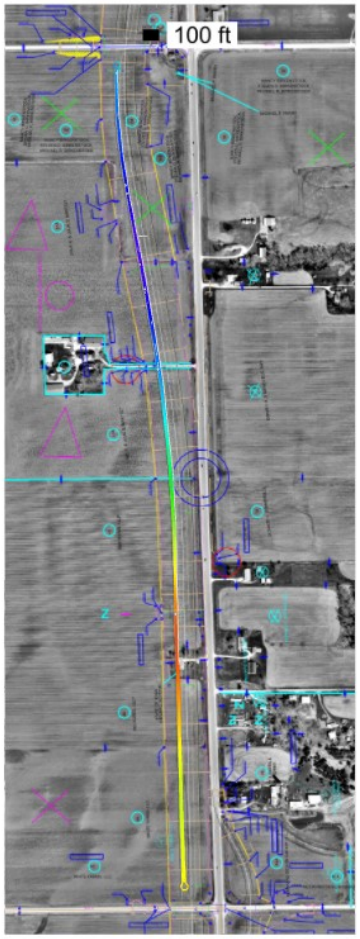
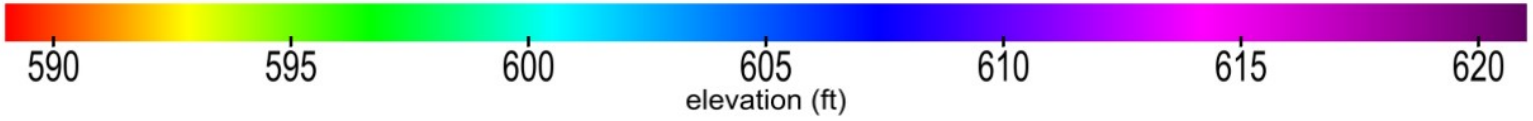
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_130838a

minimum	average	maximum
589.989	598.171	609.405

elevation





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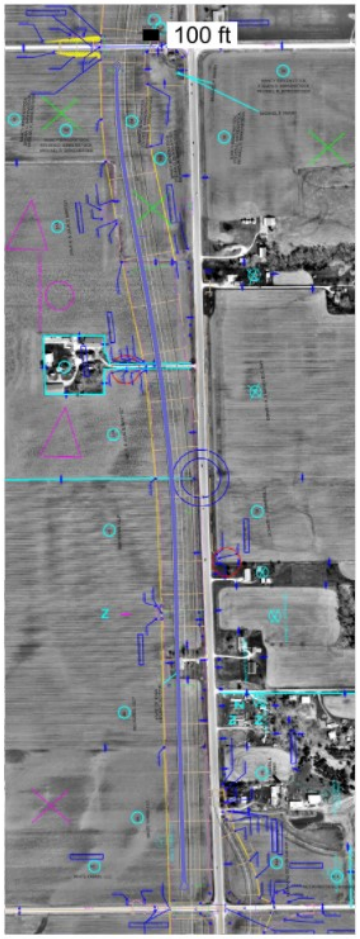
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_130838a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	118379	2.718	12	3000	150	40

materials



Subgrade_Treatment Select Cohesive_IADOT (2102.02D)

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Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_130838a

20191023_135015.jpg

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IOWADOT

E-Compaction Report

Project:	US61 Des Moines County	Mapping Duration (hrs):	1.34	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2019_10_23_142038a	No. of Measurements:	143836	Machine ID:	Ingios_FCS00210
Date and Time:	10/23/2019 2:20:38 PM	Location:	Des Moines 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	4.4	9.94	0.02	150	35	77.4	244.94	37.87	48.92	-115	-72.6	94.94
Moisture Content	No												

Mapped Area

square feet	acres
143836	3.3

Pass Count

min.	avg.	max.
1	1.26	4

Elevation (ft)

min.	avg.	max.
589.93	598.78	609.4

Velocity (fps)

min.	avg.	max.
0.41	5.45	6.05

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	143836	3.302	12	3000	150	40

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IOWADOT

E-Compaction Report

Project:	US61 Des Moines County	Mapping Duration (hrs):	1.34	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2019_10_23_142038a	No. of Measurements:	143836	Machine ID:	Ingios_FCS00210
Date and Time:	10/23/2019 2:20:38 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
113.74	CQI > = 95
100	80% of Resilient Modulus MVs >= 3000
32.53	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:	US61 Des Moines County	Mapping Duration (hrs):	1.34	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2019_10_23_142038a	No. of Measurements:	143836	Machine ID:	Ingios_FCS00210
Date and Time:	10/23/2019 2:20:38 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
9.94	CQI > = 95
4.4	80% of k-Value MVs >= 150
48.92	COV <= 20
98.29	% 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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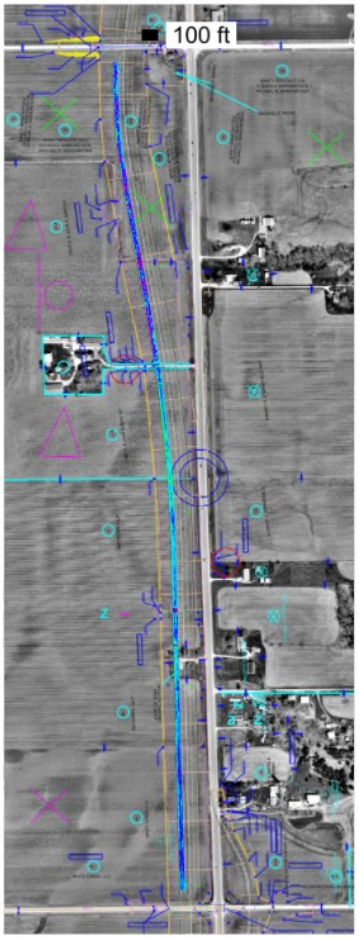
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_142038a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	No	100	113.74	0.89	3000	5500	14787.7	46132.35	4810.58	32.53	2500	11787.7	43132.35

resilient modulus



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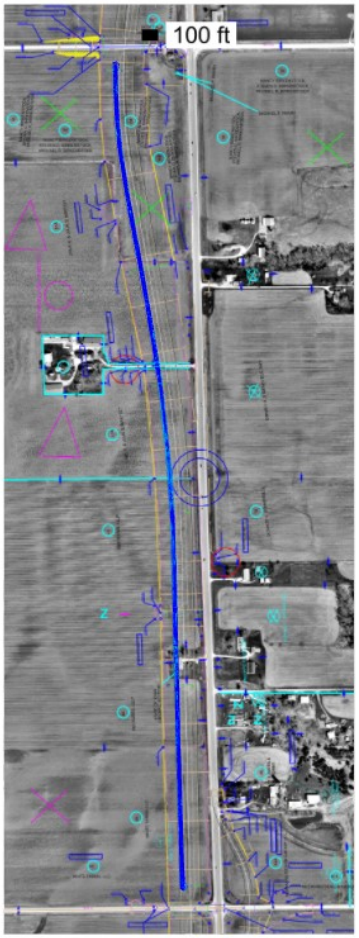
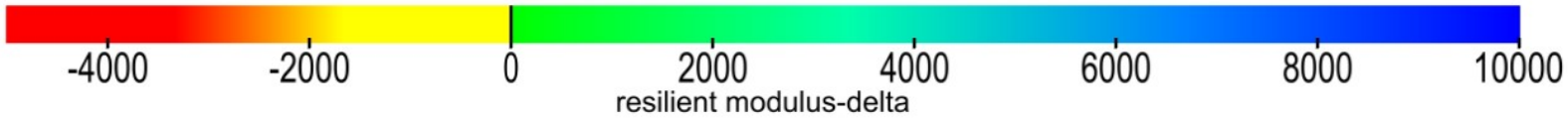
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_142038a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	No	100	113.74	0.89	3000	5500	14787.7	46132.35	4810.58	32.53	2500	11787.7	43132.35

resilient modulus-delta





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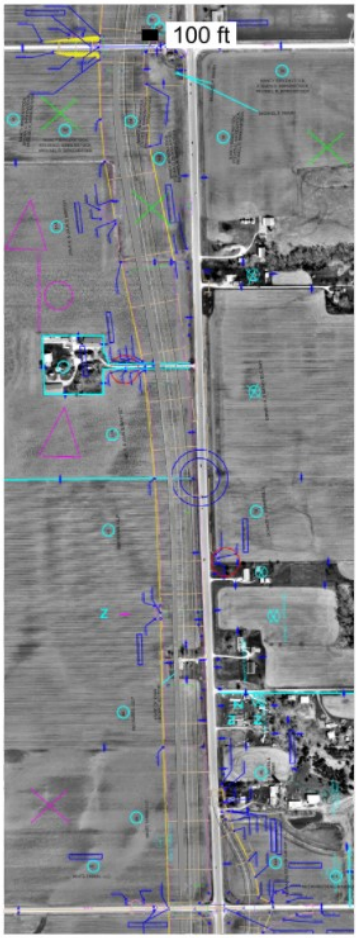
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_142038a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	No	100	3000	2500	11787.7	43132.35	5256.86	11867.79	35690.68

resilient modulus-delta-iscore



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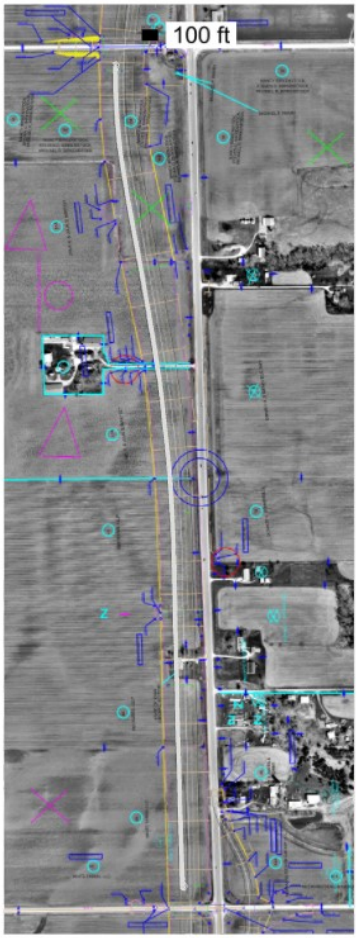
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_142038a

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

blobs: resilient modulus-delta-iscore



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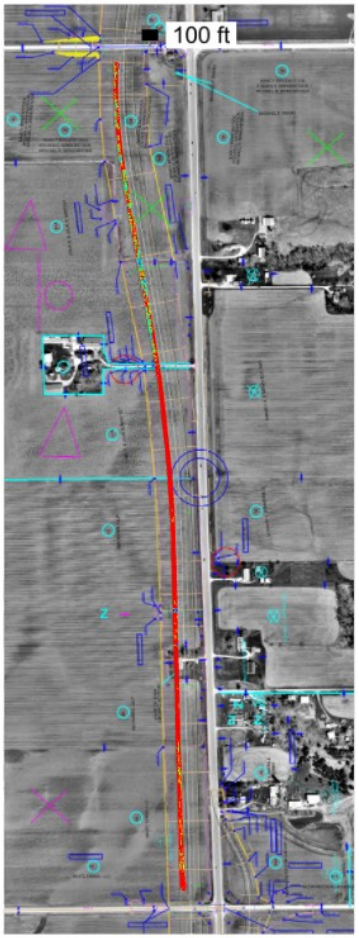
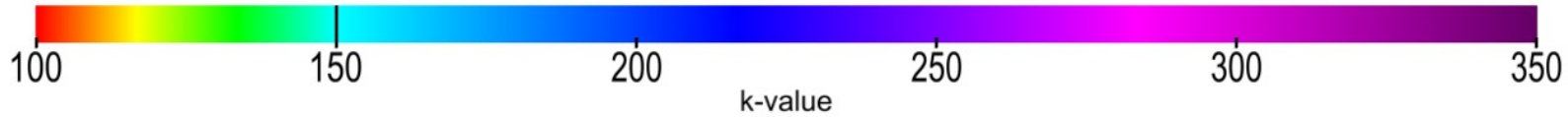
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_142038a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	4.4	9.94	0.02	150	35	77.4	244.94	37.87	48.92	-115	-72.6	94.94

k-value



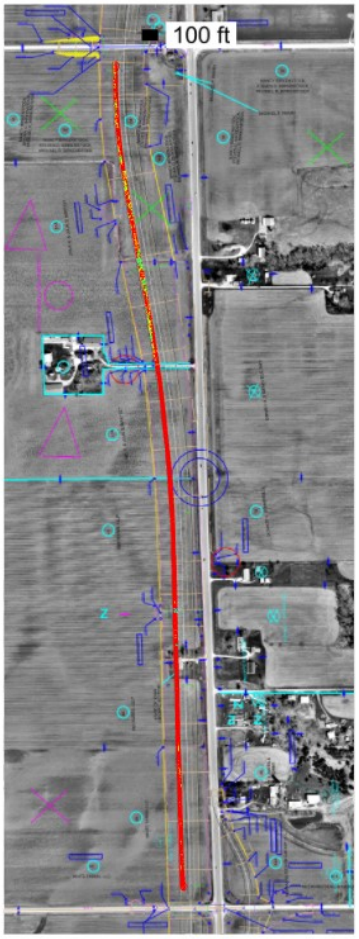


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_142038a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	4.4	9.94	0.02	150	35	77.4	244.94	37.87	48.92	-115	-72.6	94.94

k-value-delta

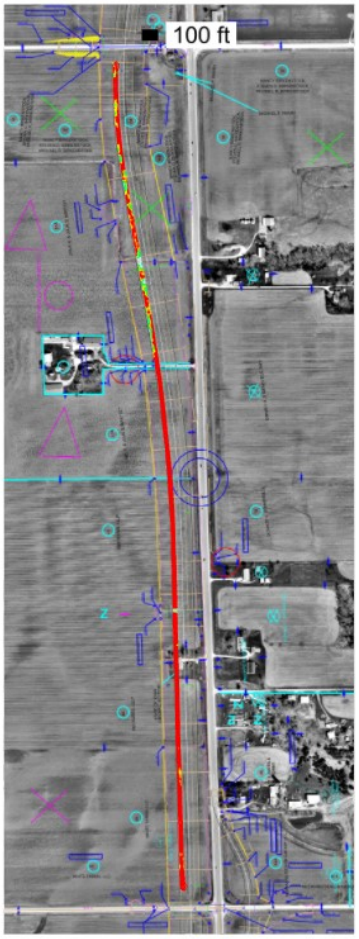


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_142038a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	4.4	150	-115	-72.6	94.94	-115	-71.96	62.51

k-value-delta-iscore



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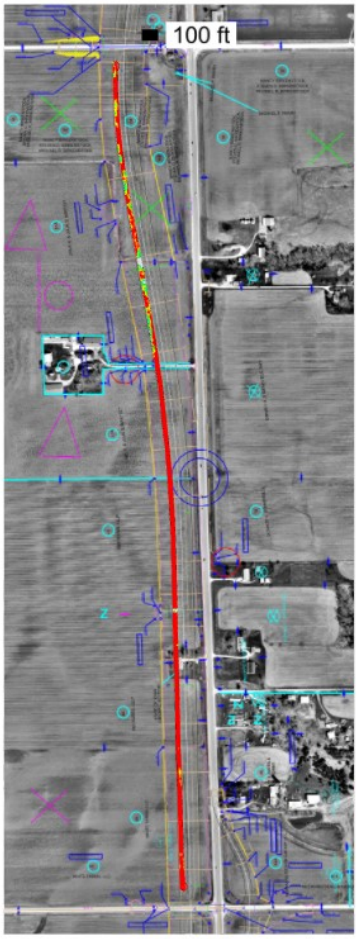
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_142038a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	3	141383	98.29	none	0

blobs: k-value-delta-iscore



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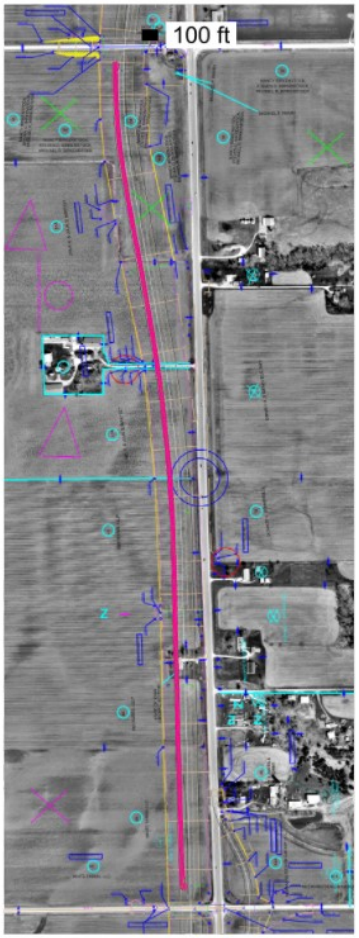
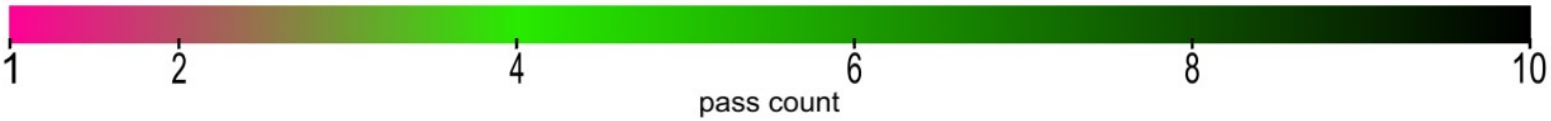
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_142038a

minimum	average	maximum
1	1.26	4

pass count





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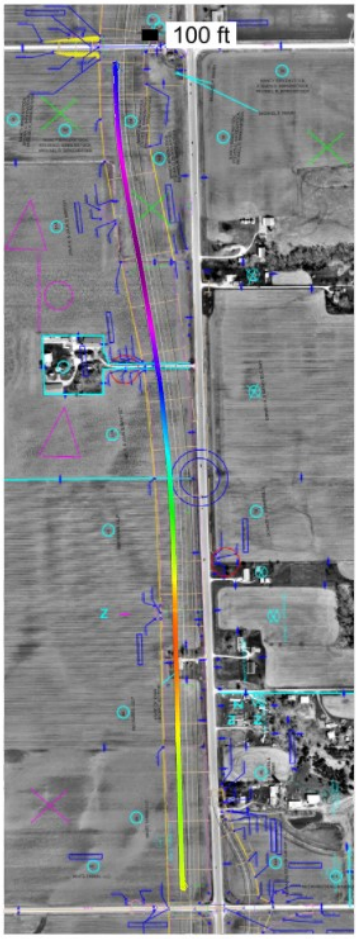
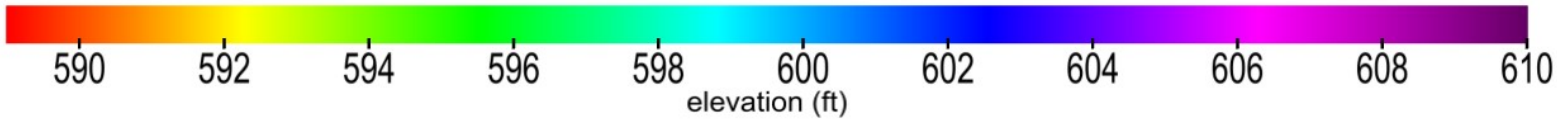
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_142038a

minimum	average	maximum
589.93	598.775	609.405

elevation





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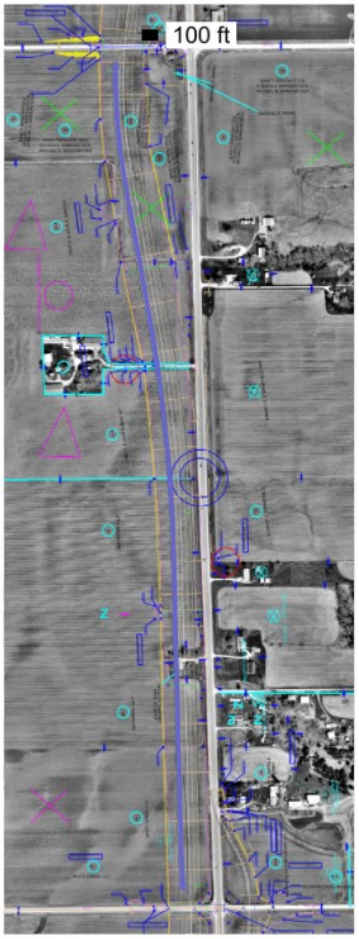
Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_142038a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	143836	3.302	12	3000	150	40

materials



Subgrade_Treatment Select Cohesive_IADOT (2102.02D)

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Map ID: iadot_29-us61_cs56-fcs00210_2019_10_23_142038a

20191023_150957.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_29-us61_cs56-fcs00210_2019_10_23_142038a

20191023_152655.jpg

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IOWADOT

E-Compaction Report

Project:	US61 Des Moines County	Mapping Duration (hrs):	0.73	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2020_05_11_142147a	No. of Measurements:	78619	Machine ID:	Ingios_FCS00210
Date and Time:	5/11/2020 2:21:47 PM	Location:	Des Moines 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	0.3	14.75	-1.1	150	35	37	299.75	11.47	31	-115	-113	149.75
Moisture Content	No												

Mapped Area

square feet	acres
78619	1.8

Pass Count

min.	avg.	max.
1	1.21	6

Elevation (ft)

min.	avg.	max.
585.58	587.59	589.77

Velocity (fps)

min.	avg.	max.
1.12	5.51	10.26

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	78619	1.805	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:	US61 Des Moines County	Mapping Duration (hrs):	0.73	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2020_05_11_142147a	No. of Measurements:	78619	Machine ID:	Ingios_FCS00210
Date and Time:	5/11/2020 2:21:47 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
120.27	CQI > = 95
100	80% of Resilient Modulus MVs >= 3000
19.46	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:	US61 Des Moines County	Mapping Duration (hrs):	0.73	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2020_05_11_142147a	No. of Measurements:	78619	Machine ID:	Ingios_FCS00210
Date and Time:	5/11/2020 2:21:47 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
14.75	CQI > = 95
0.3	80% of k-Value MVs >= 150
31	COV <= 20
99.99	% 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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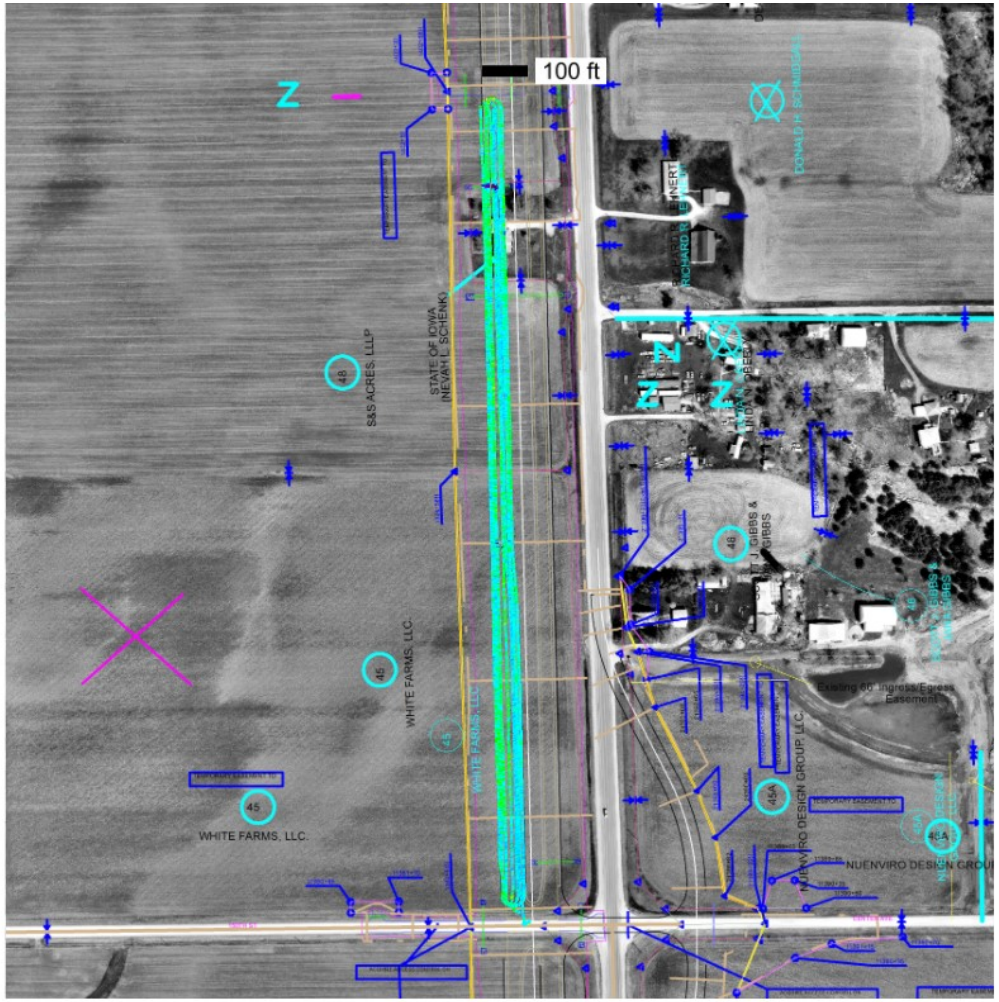
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_142147a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	No	100	120.27	1.37	3000	5500	9926.8	56000	1931.97	19.46	2500	6926.8	53000

resilient modulus

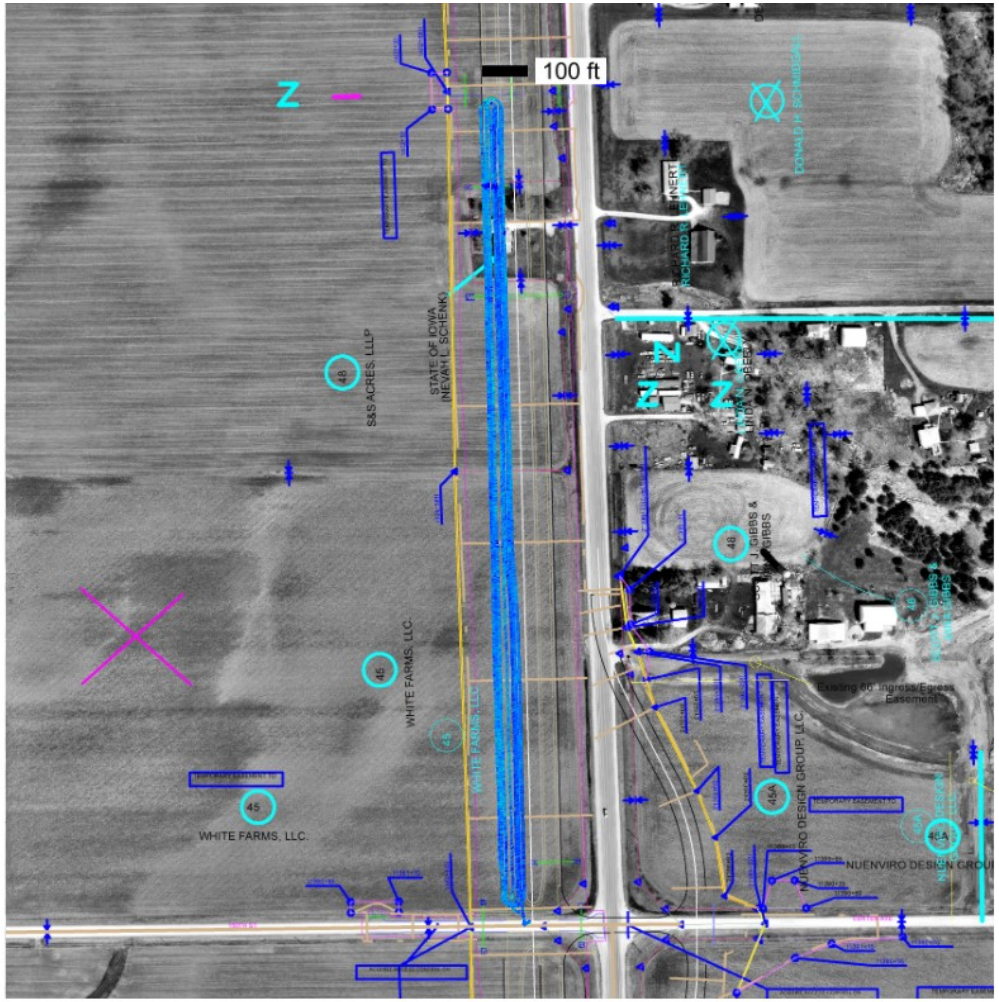


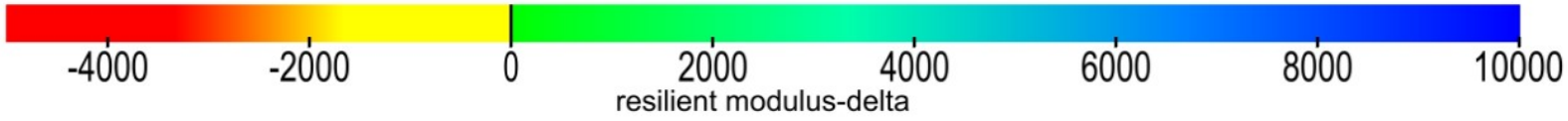
This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_142147a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	No	100	120.27	1.37	3000	5500	9926.8	56000	1931.97	19.46	2500	6926.8	53000

resilient modulus-delta



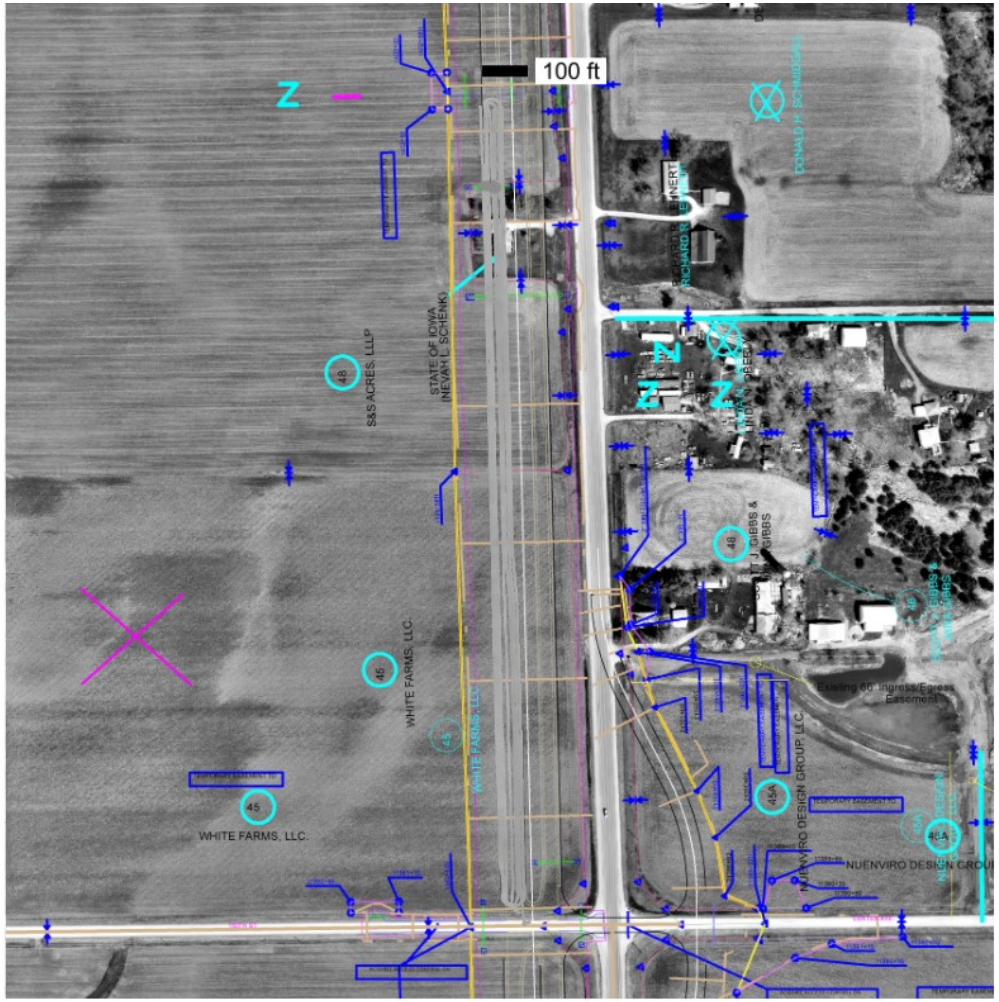


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_142147a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	No	100	3000	2500	6926.8	53000	4952.27	6941.46	25761.77

resilient modulus-delta-iscore



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ingios GEOTECHNICS

Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_142147a

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

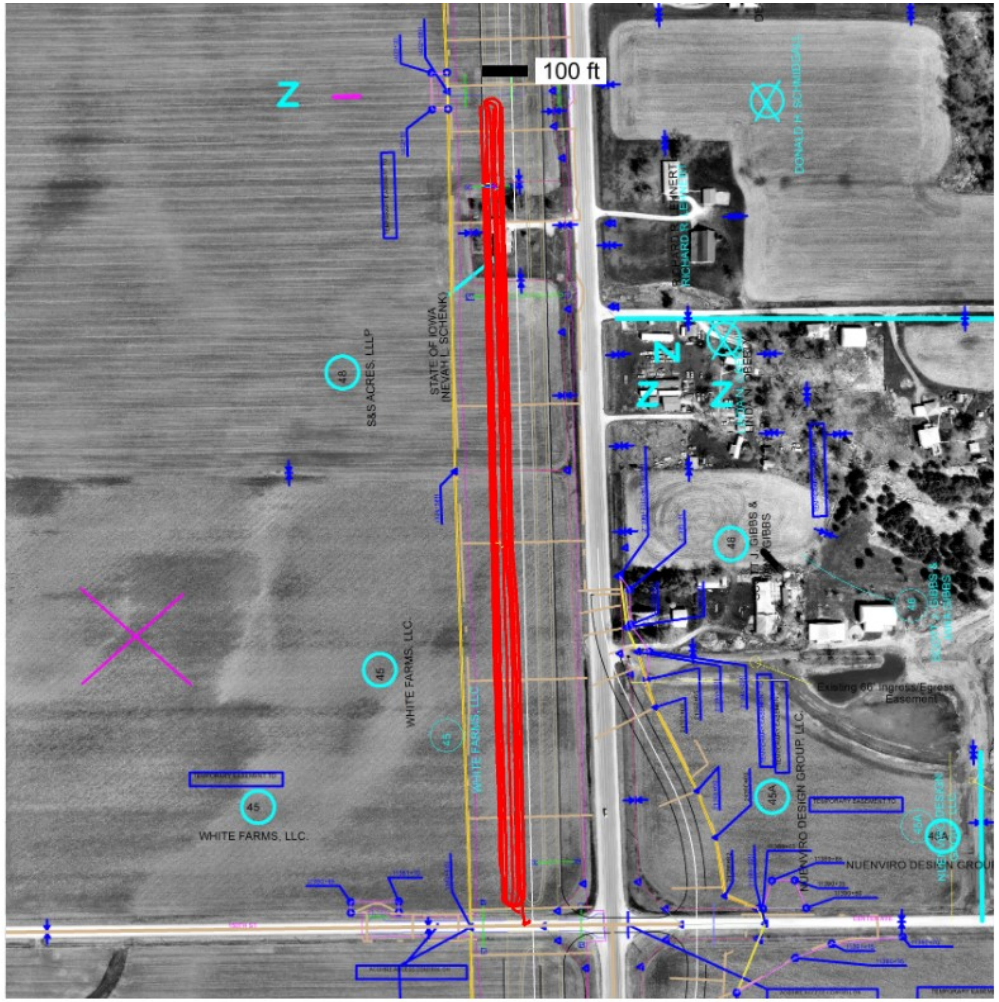
blobs: resilient modulus-delta-iscore

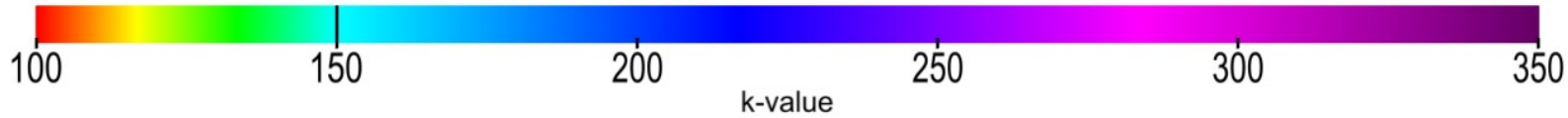
This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_142147a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.3	14.75	-1.1	150	35	37	299.75	11.47	31	-115	-113	149.75

k-value





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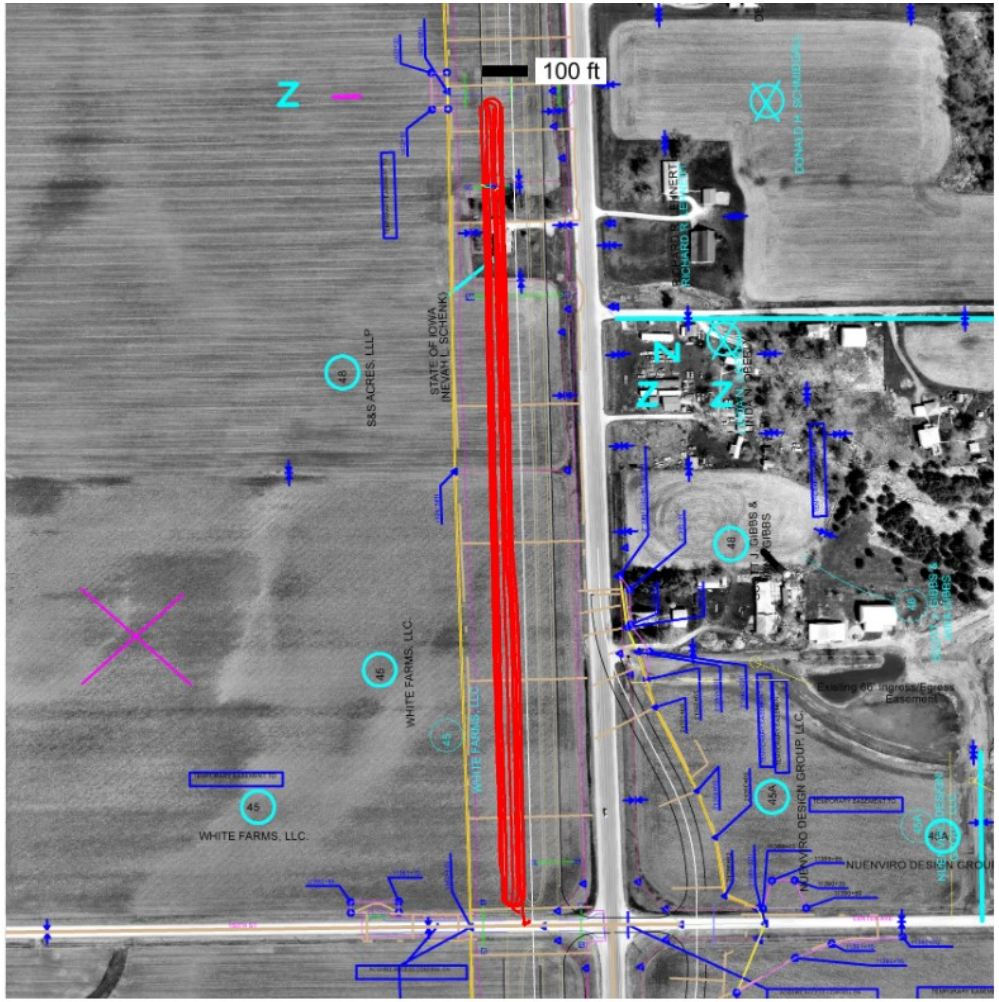
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_142147a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.3	14.75	-1.1	150	35	37	299.75	11.47	31	-115	-113	149.75

k-value-delta



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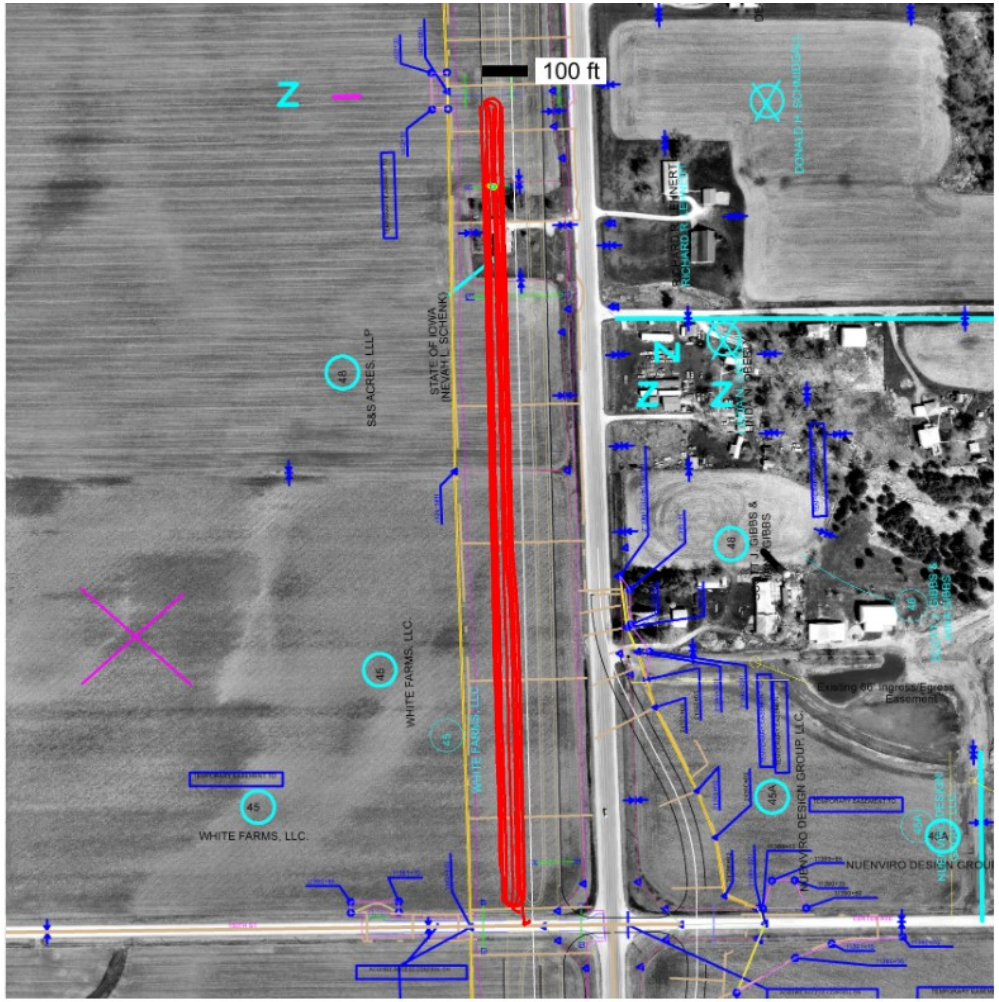
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_142147a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	0.3	150	-115	-113	149.75	-115	-113.04	2.31

k-value-delta-iscore



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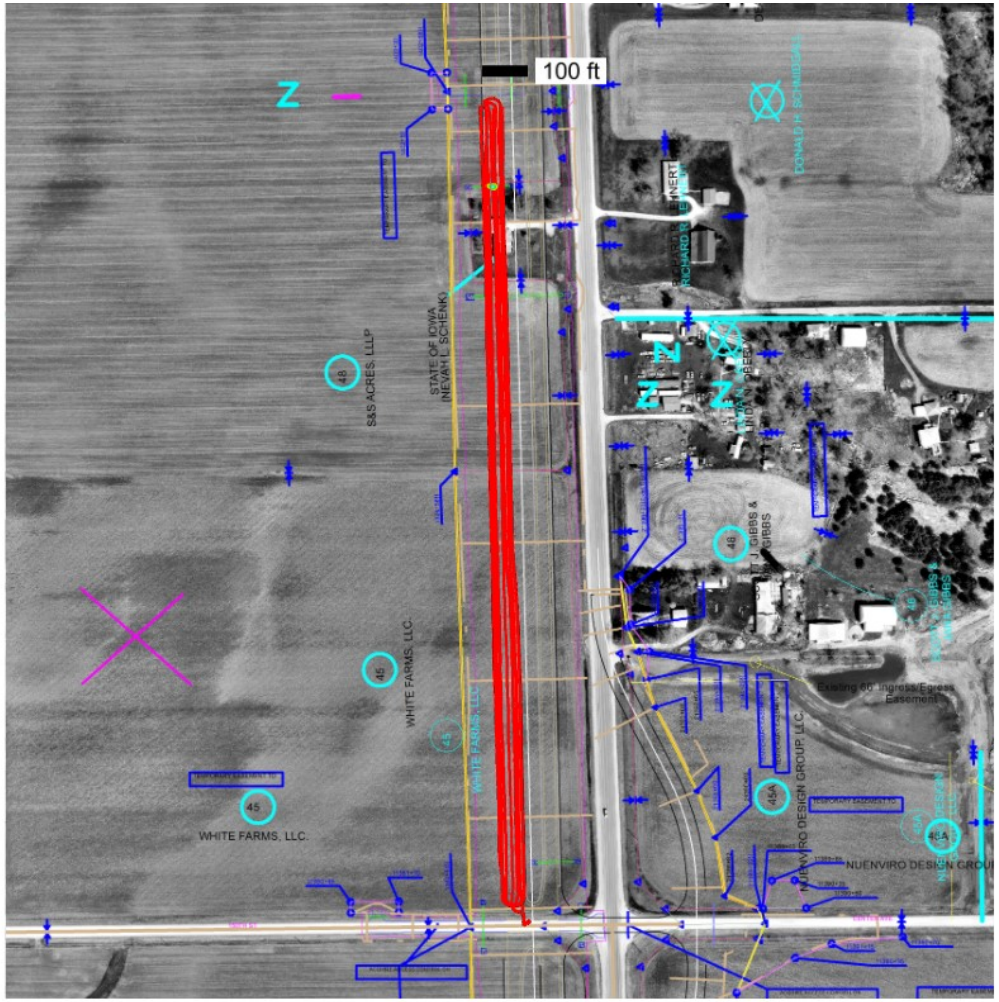
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_142147a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	78611	99.99	none	0

blobs: k-value-delta-iscore



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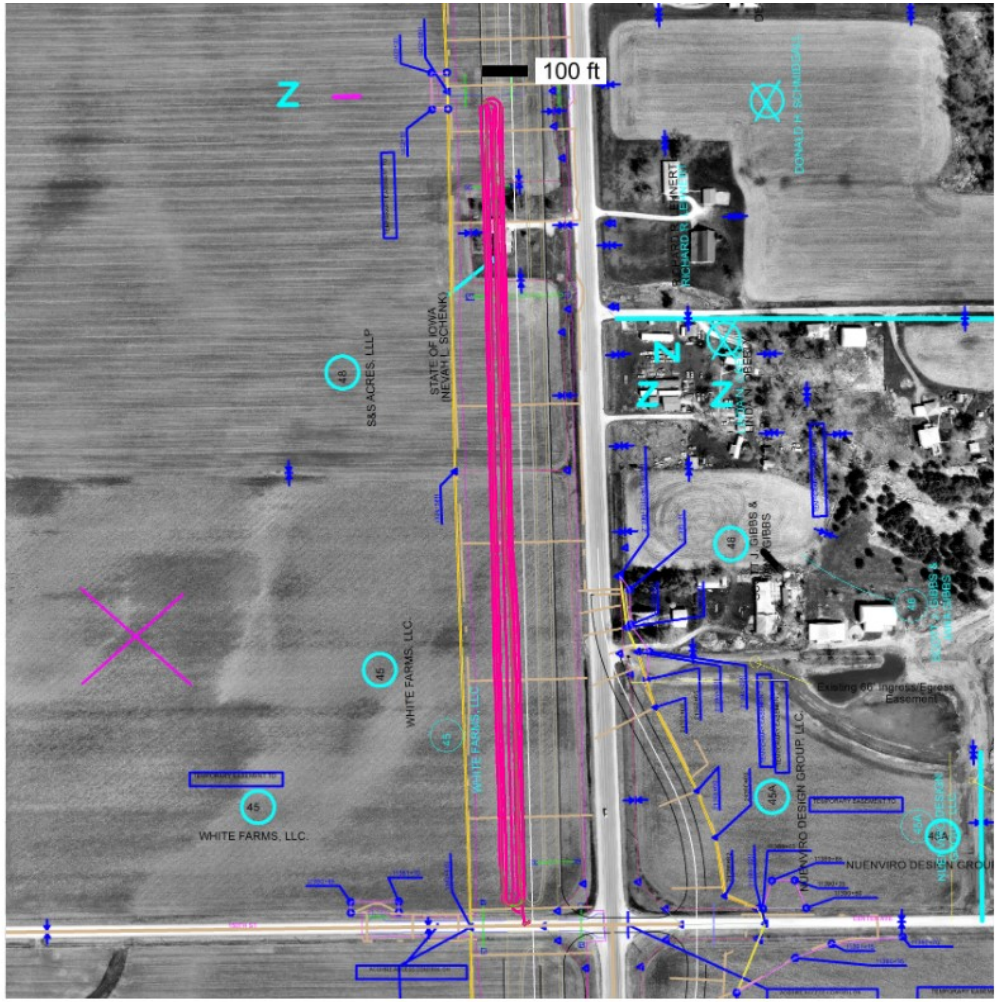
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_142147a

minimum	average	maximum
1	1.21	6

pass count

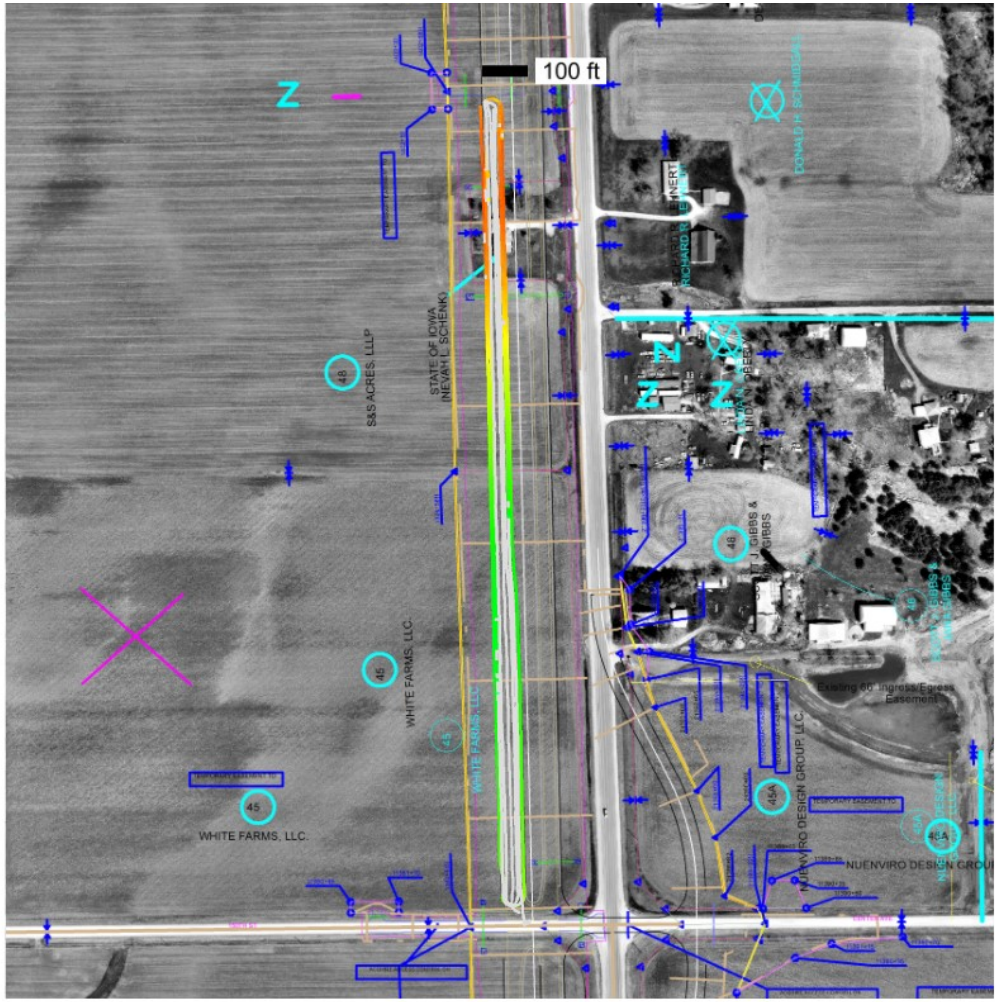


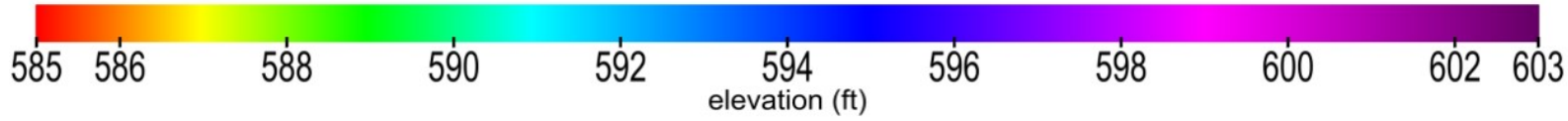
This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_142147a

minimum	average	maximum
585.58	587.588	589.766

elevation



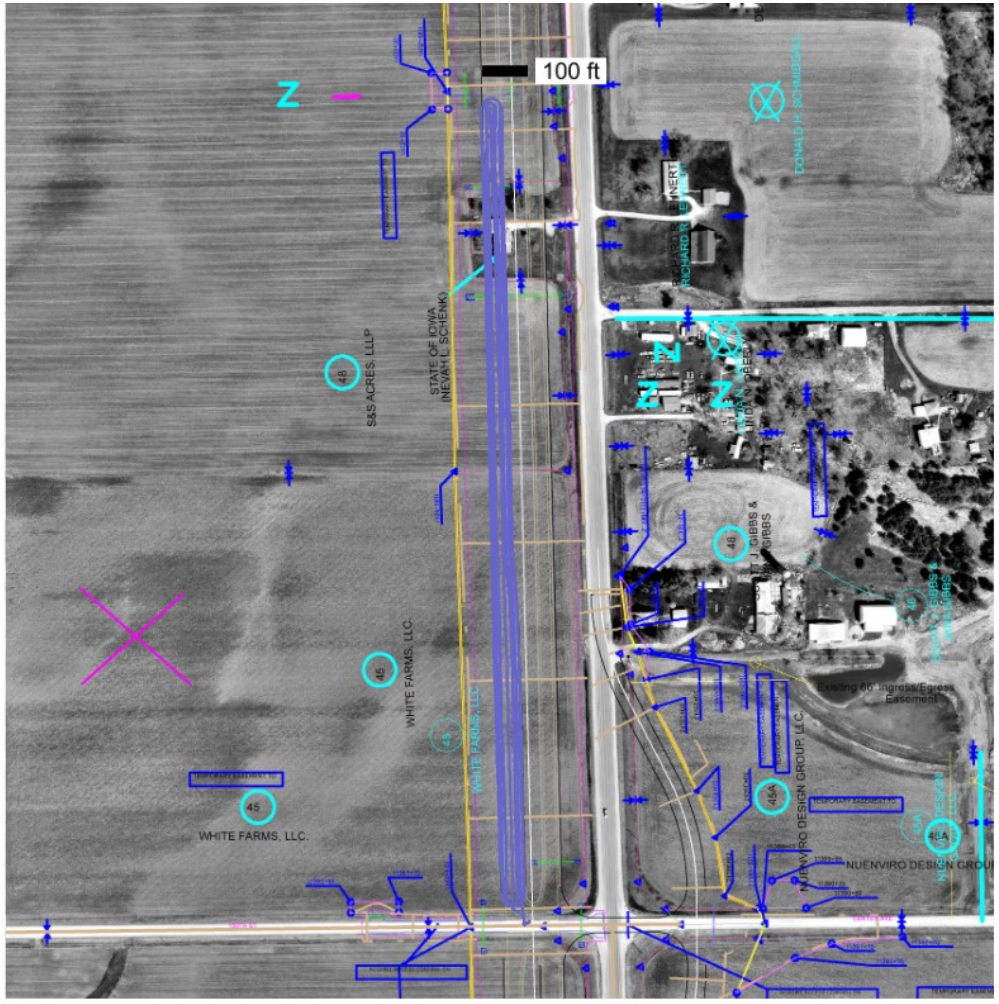


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_142147a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	78619	1.805	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.

Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_142147a

20200511_142317.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_29-us61_cs56-fcs00210_2020_05_11_142147a

20200511_142320.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:	US61 Des Moines County	Mapping Duration (hrs):	0.44	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2020_05_11_151341a	No. of Measurements:	58668	Machine ID:	Ingios_FCS00210
Date and Time:	5/11/2020 3:13:41 PM	Location:	Des Moines 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	0.3	14.6	-0.95	150	35	39.6	208.64	12.44	31.44	-115	-110.4	58.64
Moisture Content	No												

Mapped Area

square feet	acres
58668	1.35

Pass Count

min.	avg.	max.
1	1.01	2

Elevation (ft)

min.	avg.	max.
589.32	600.03	606.05

Velocity (fps)

min.	avg.	max.
2.94	5.48	7.65

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	58668	1.347	12	3000	150	40

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IOWADOT

E-Compaction Report

Project:	US61 Des Moines County	Mapping Duration (hrs):	0.44	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2020_05_11_151341a	No. of Measurements:	58668	Machine ID:	Ingios_FCS00210
Date and Time:	5/11/2020 3:13:41 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
124.16	CQI > = 95
100	80% of Resilient Modulus MVs >= 3000
11.68	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:	US61 Des Moines County	Mapping Duration (hrs):	0.44	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2020_05_11_151341a	No. of Measurements:	58668	Machine ID:	Ingios_FCS00210
Date and Time:	5/11/2020 3:13:41 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
14.6	CQI > = 95
0.3	80% of k-Value MVs >= 150
31.44	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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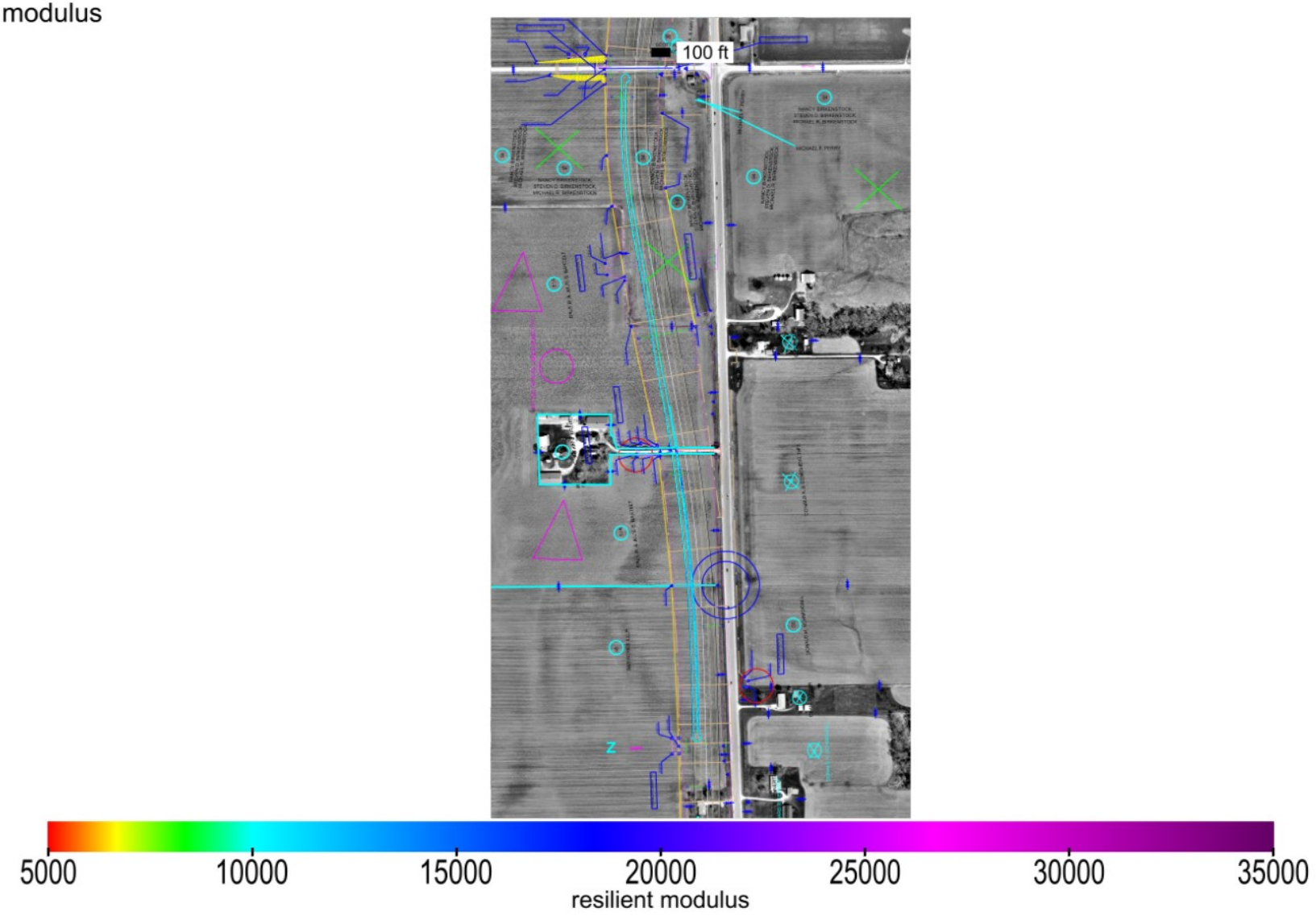
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_151341a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	No	100	124.16	2.34	3000	8464.5	11013.2	34191.83	1285.86	11.68	5464.5	8013.2	31191.83

resilient modulus

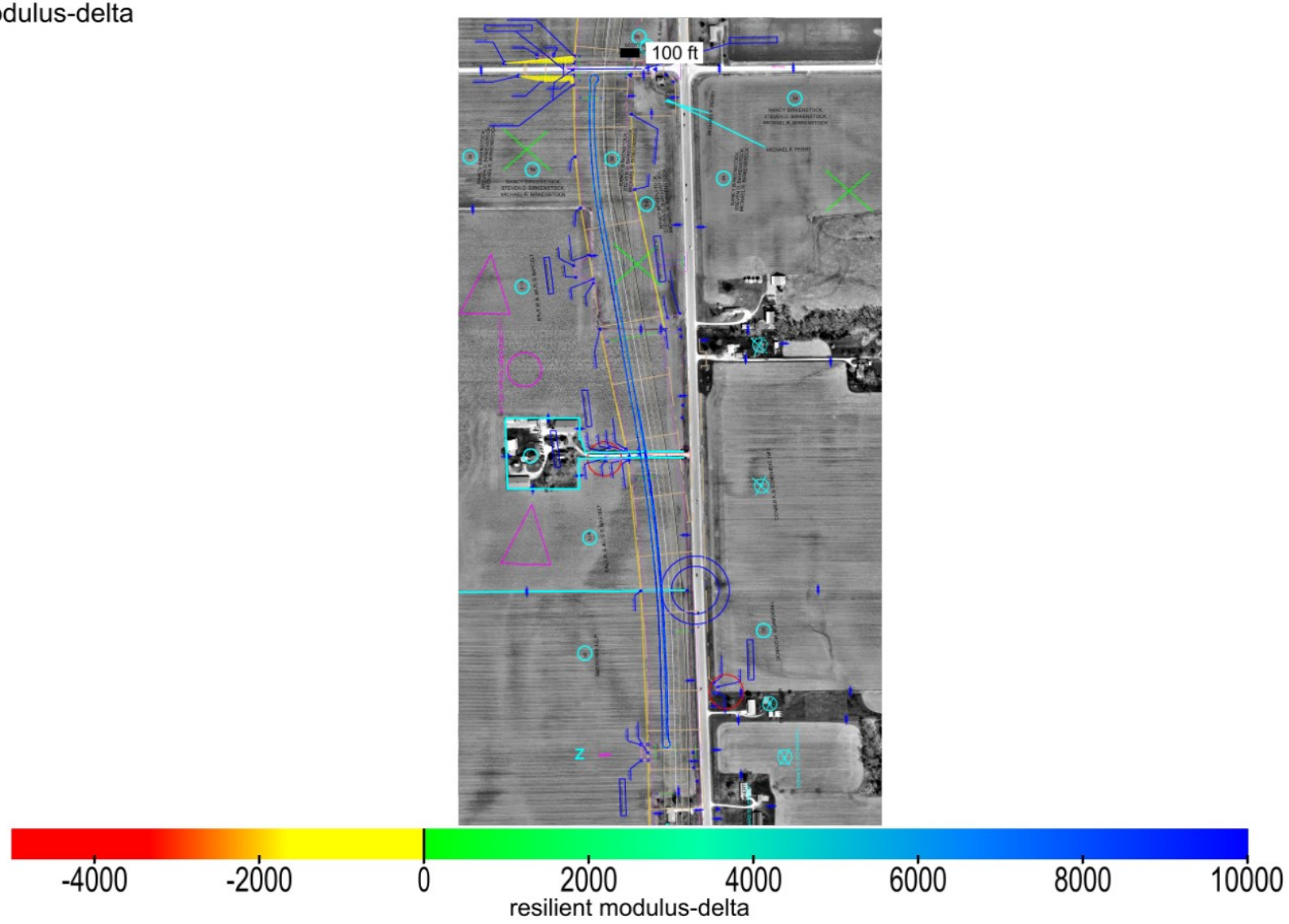


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_151341a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	No	100	124.16	2.34	3000	8464.5	11013.2	34191.83	1285.86	11.68	5464.5	8013.2	31191.83

resilient modulus-delta

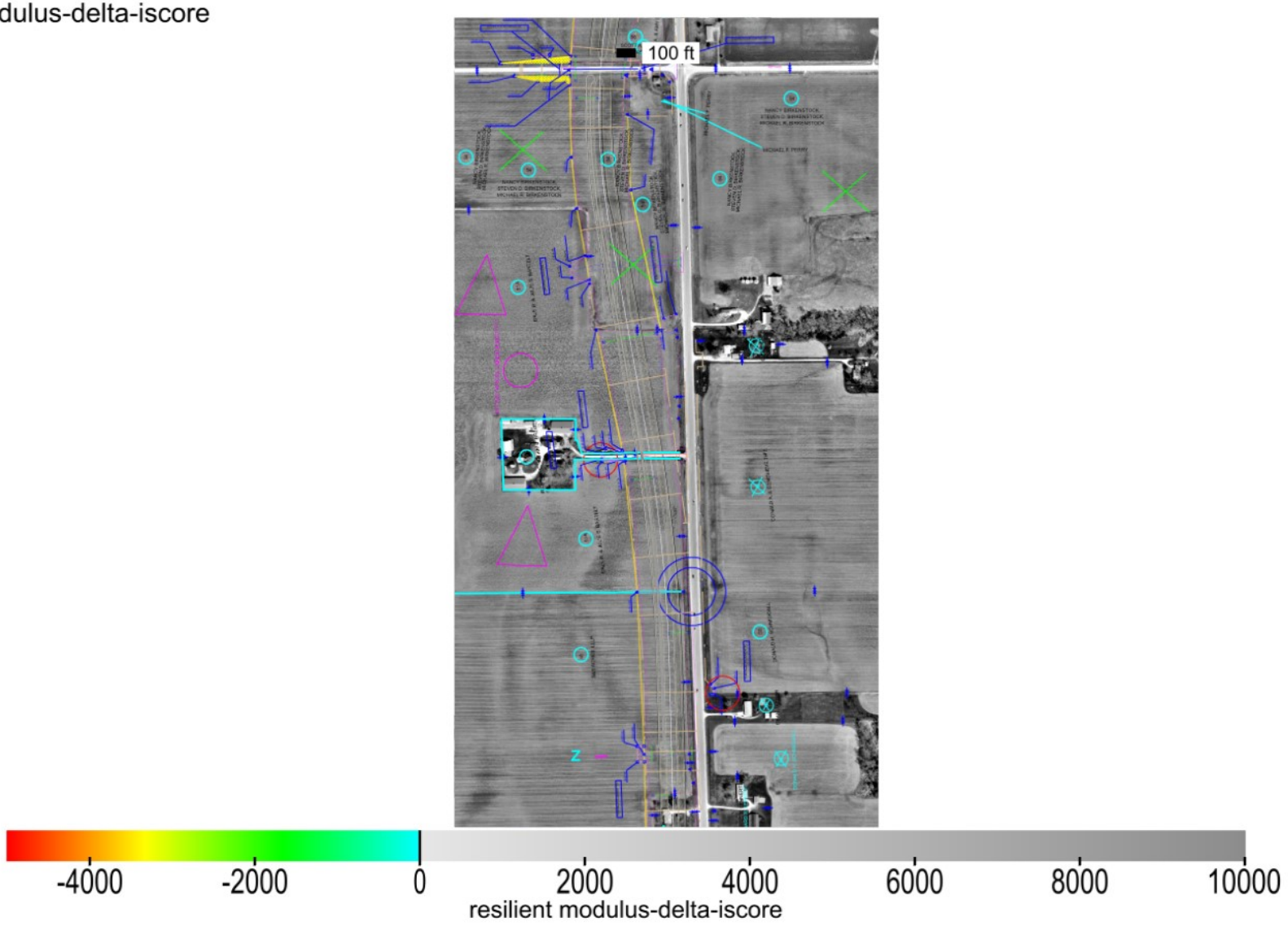


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_151341a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	No	100	3000	5464.5	8013.2	31191.83	6118.86	8013.3	17600.85

resilient modulus-delta-iscore

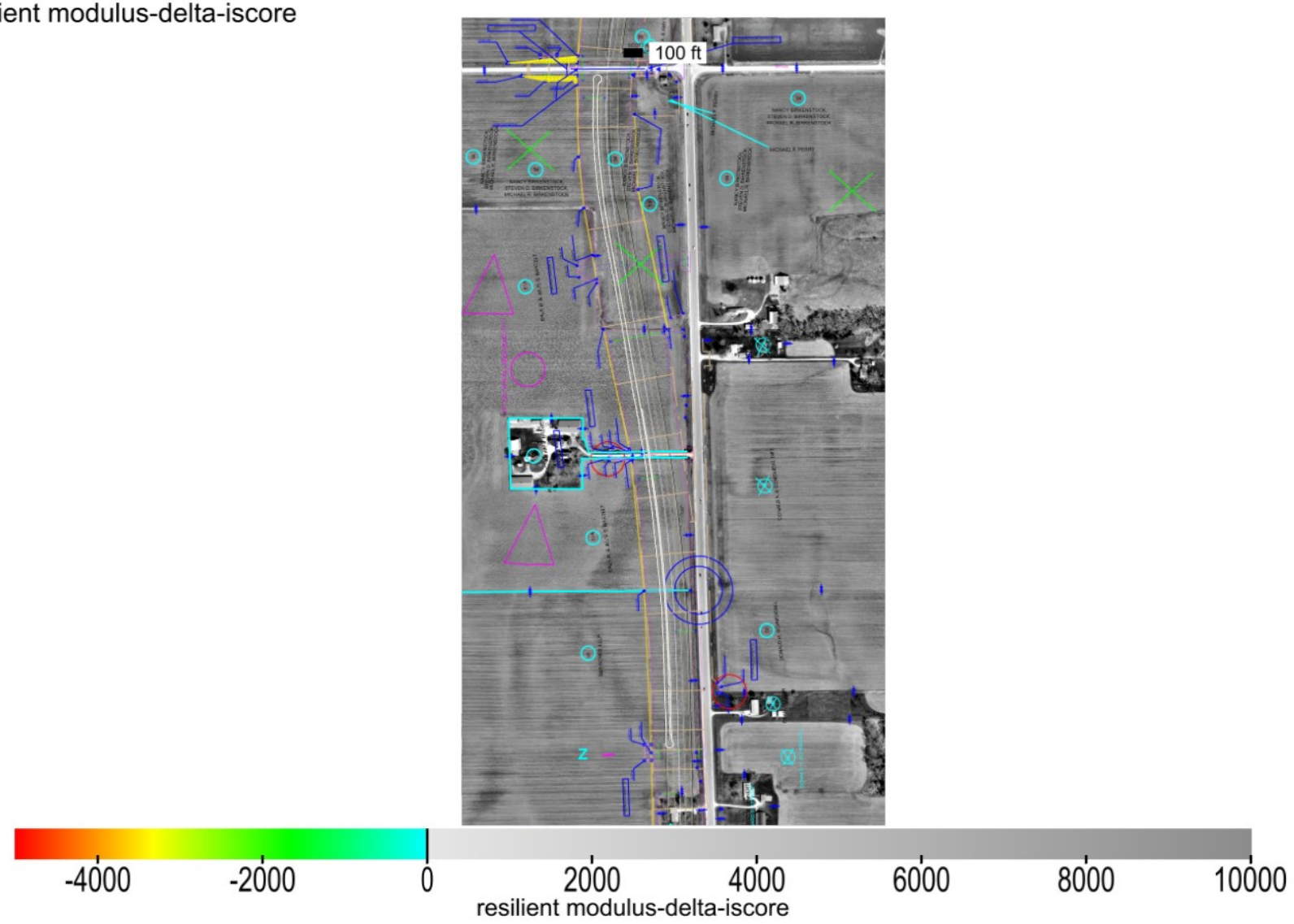


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_151341a

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

blobs: resilient modulus-delta-iscore



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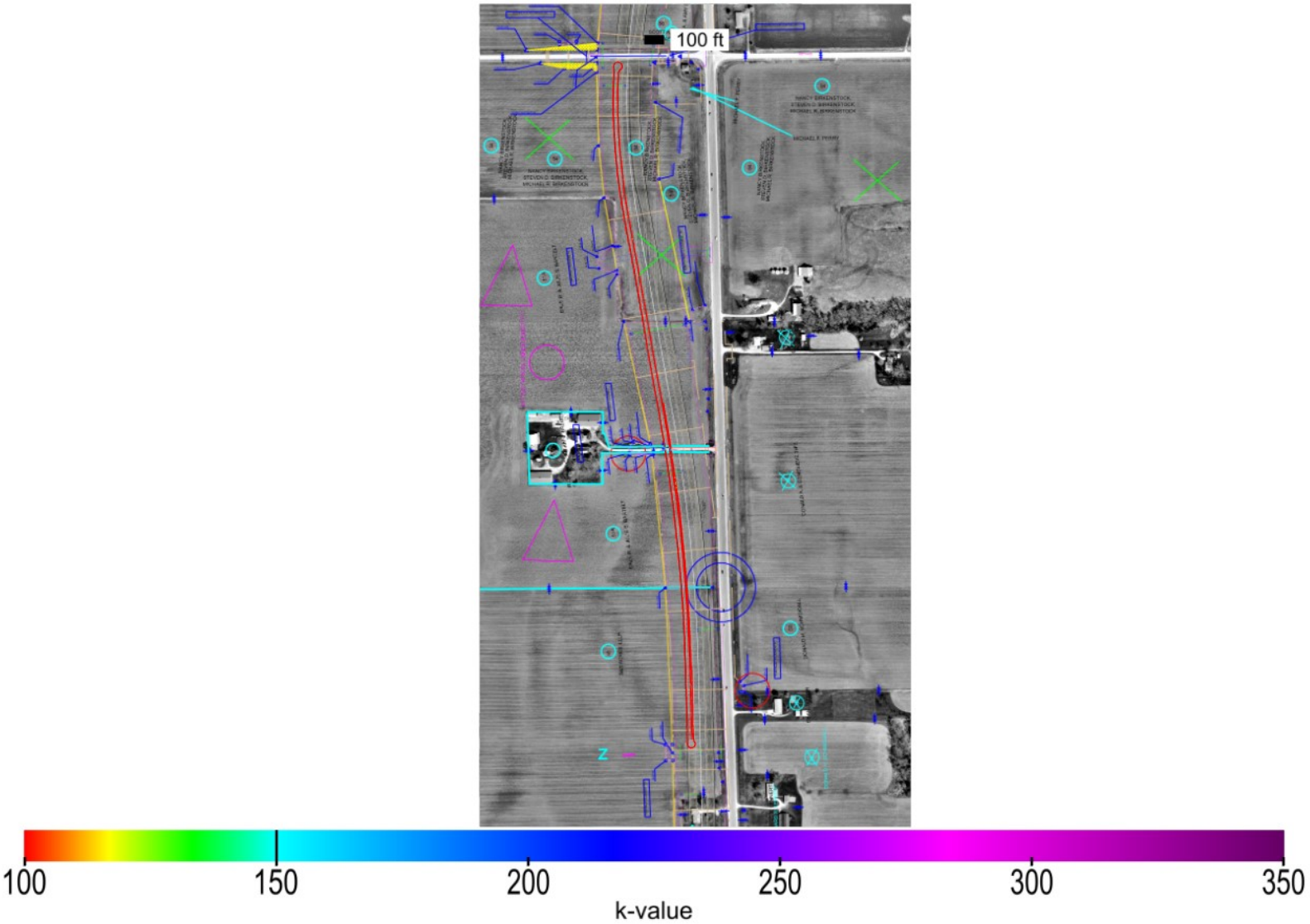
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_151341a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.3	14.6	-0.95	150	35	39.6	208.64	12.44	31.44	-115	-110.4	58.64

k-value



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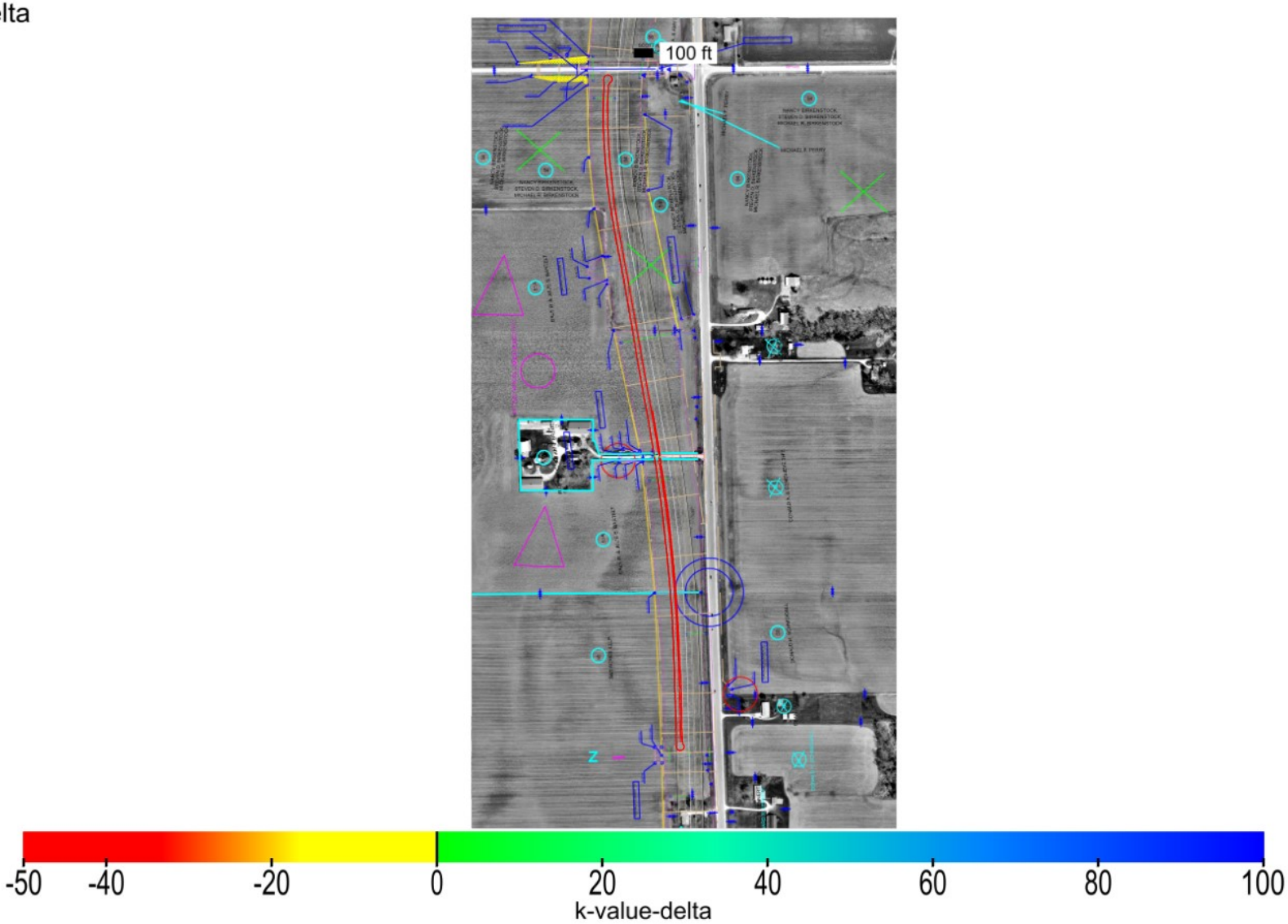
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_151341a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.3	14.6	-0.95	150	35	39.6	208.64	12.44	31.44	-115	-110.4	58.64

k-value-delta

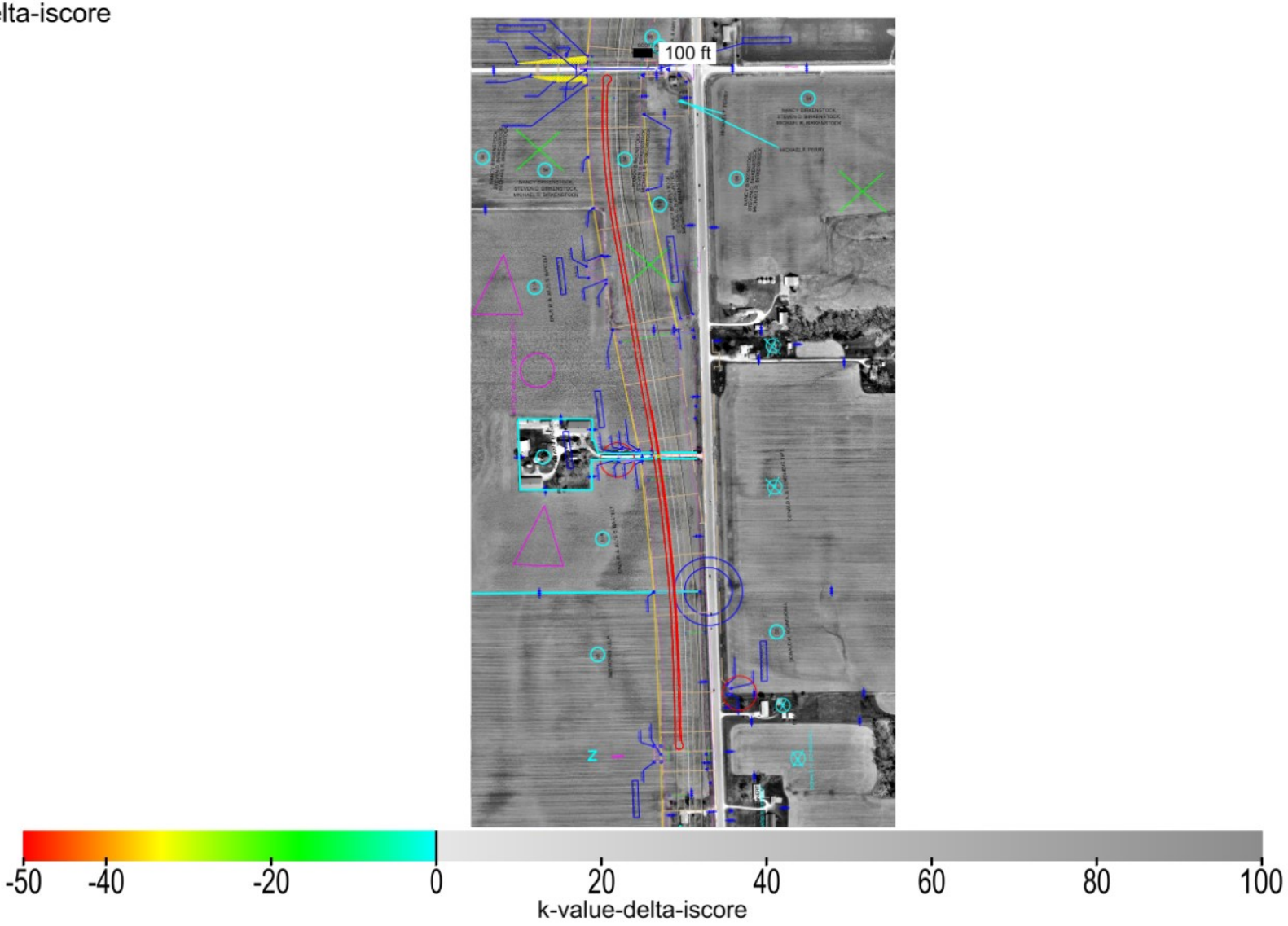


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_151341a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	0.3	150	-115	-110.4	58.64	-115	-110.42	-16.93

k-value-delta-iscore



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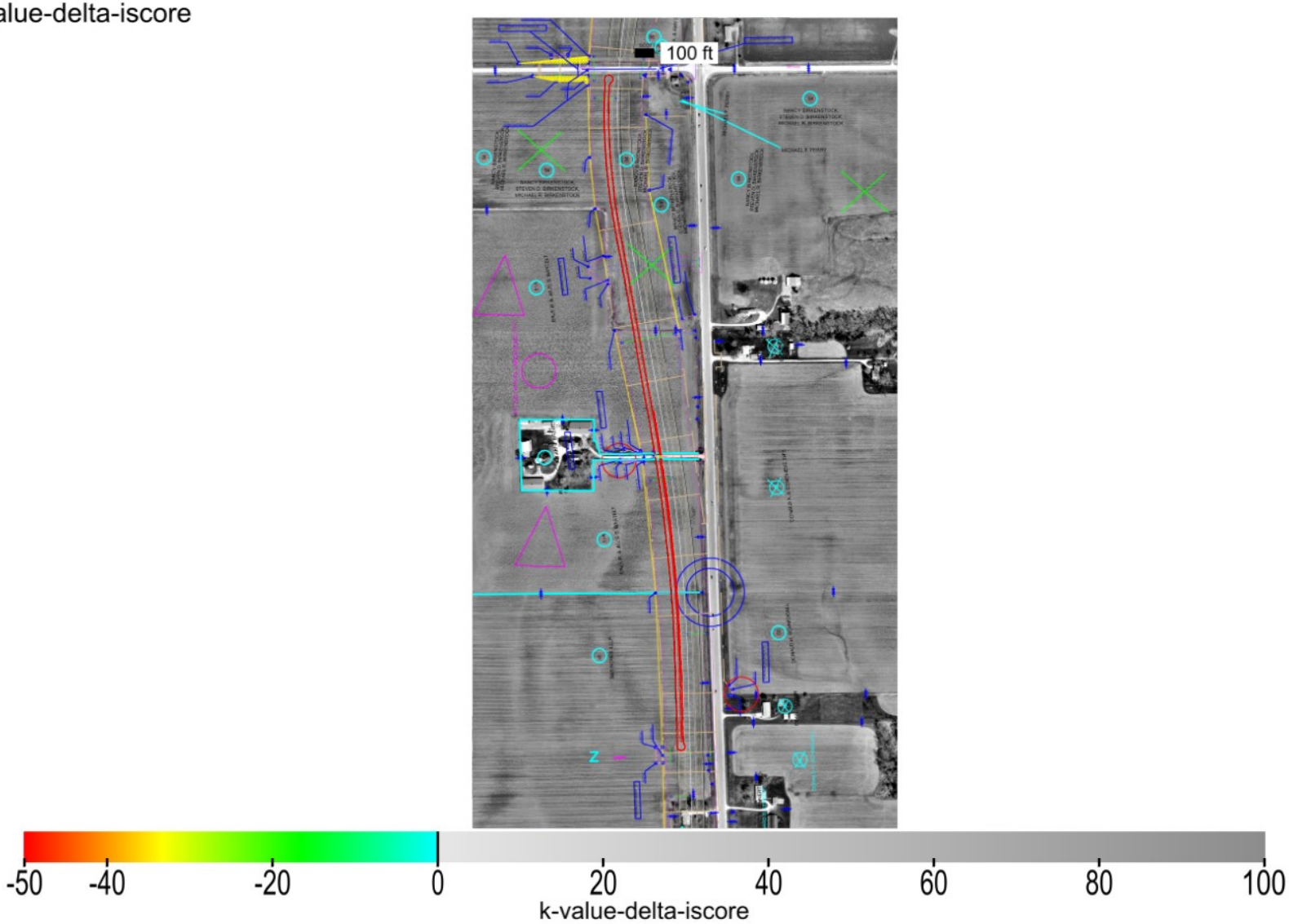
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_151341a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	58668	100	none	0

blobs: k-value-delta-iscore



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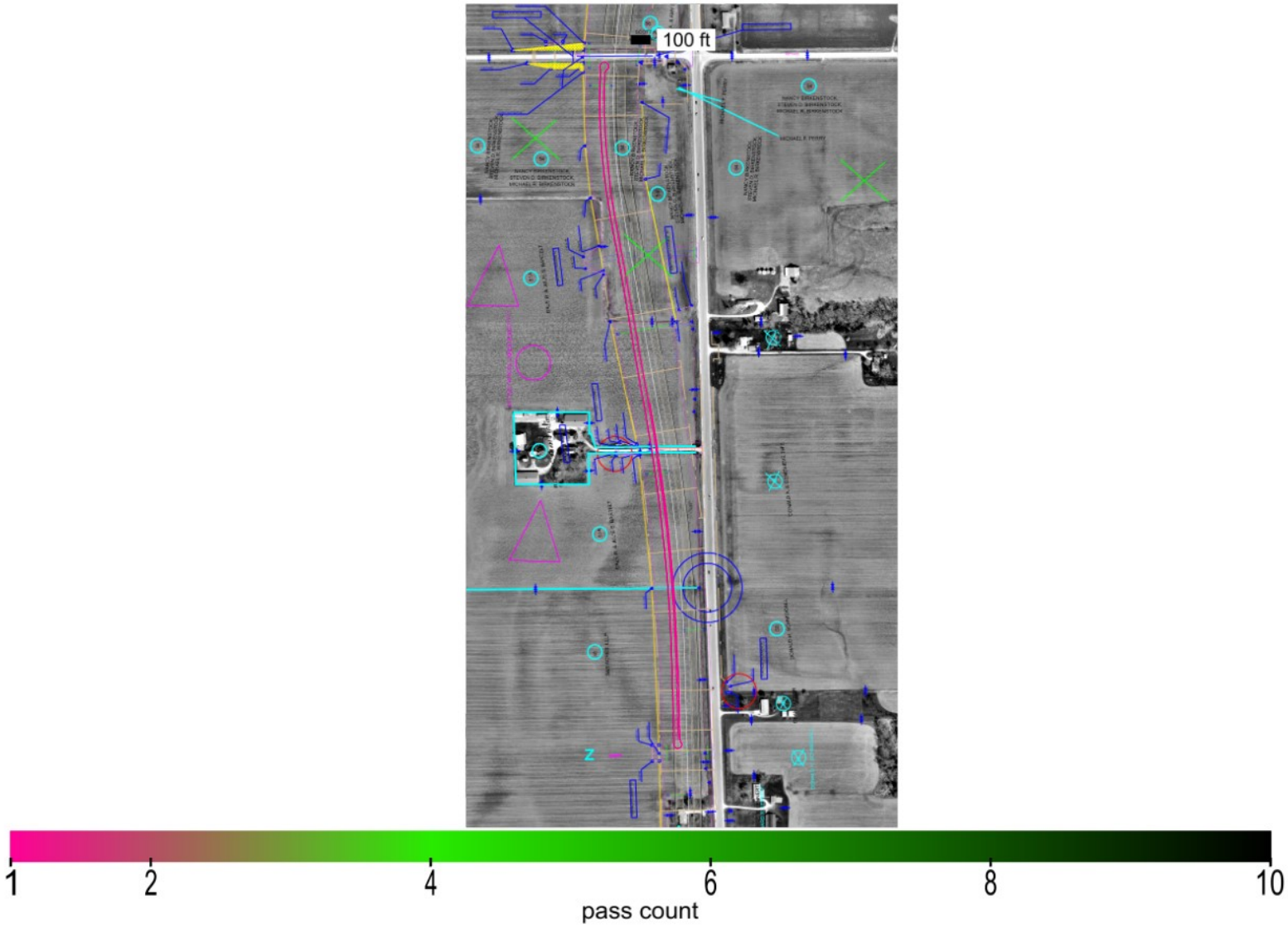
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_151341a

minimum	average	maximum
1	1.01	2

pass count



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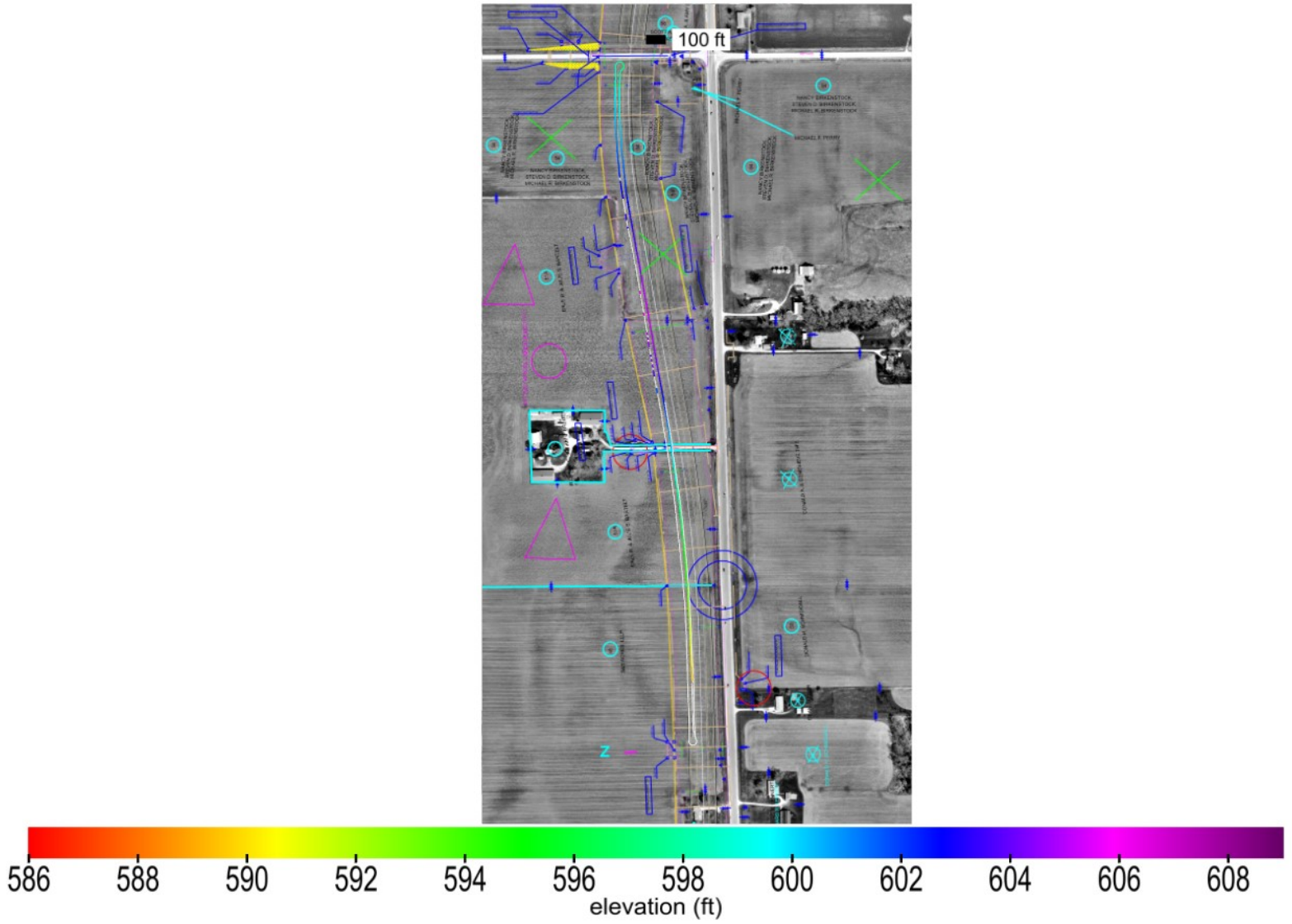
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_151341a

minimum	average	maximum
589.323	600.032	606.052

elevation



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Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_151341a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	58668	1.347	12	3000	150	40

materials

Subgrade_Treatment Select Cohesive_IADOT (2102.02D)

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Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_151341a

20200511_151843.jpg

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IOWADOT

E-Compaction Report

Project:	US61 Des Moines County	Mapping Duration (hrs):	0.54	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2020_05_11_155617a	No. of Measurements:	63411	Machine ID:	Ingios_FCS00210
Date and Time:	5/11/2020 3:56:17 PM	Location:	Des Moines 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	20.8	-1.7	150	35	38.7	94.74	7.11	18.39	-115	-111.3	-55.26
Moisture Content	No												

Mapped Area

square feet	acres
63411	1.46

Pass Count

min.	avg.	max.
1	1.15	6

Elevation (ft)

min.	avg.	max.
586.28	593.88	604.09

Velocity (fps)

min.	avg.	max.
0.62	5.49	6.19

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	63411	1.456	12	3000	150	40

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IOWADOT

E-Compaction Report

Project:	US61 Des Moines County	Mapping Duration (hrs):	0.54	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2020_05_11_155617a	No. of Measurements:	63411	Machine ID:	Ingios_FCS00210
Date and Time:	5/11/2020 3:56:17 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
125.83	CQI > = 95
100	80% of Resilient Modulus MVs >= 3000
8.34	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:	US61 Des Moines County	Mapping Duration (hrs):	0.54	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2020_05_11_155617a	No. of Measurements:	63411	Machine ID:	Ingios_FCS00210
Date and Time:	5/11/2020 3:56:17 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
20.8	CQI > = 95
0	80% of k-Value MVs >= 150
18.39	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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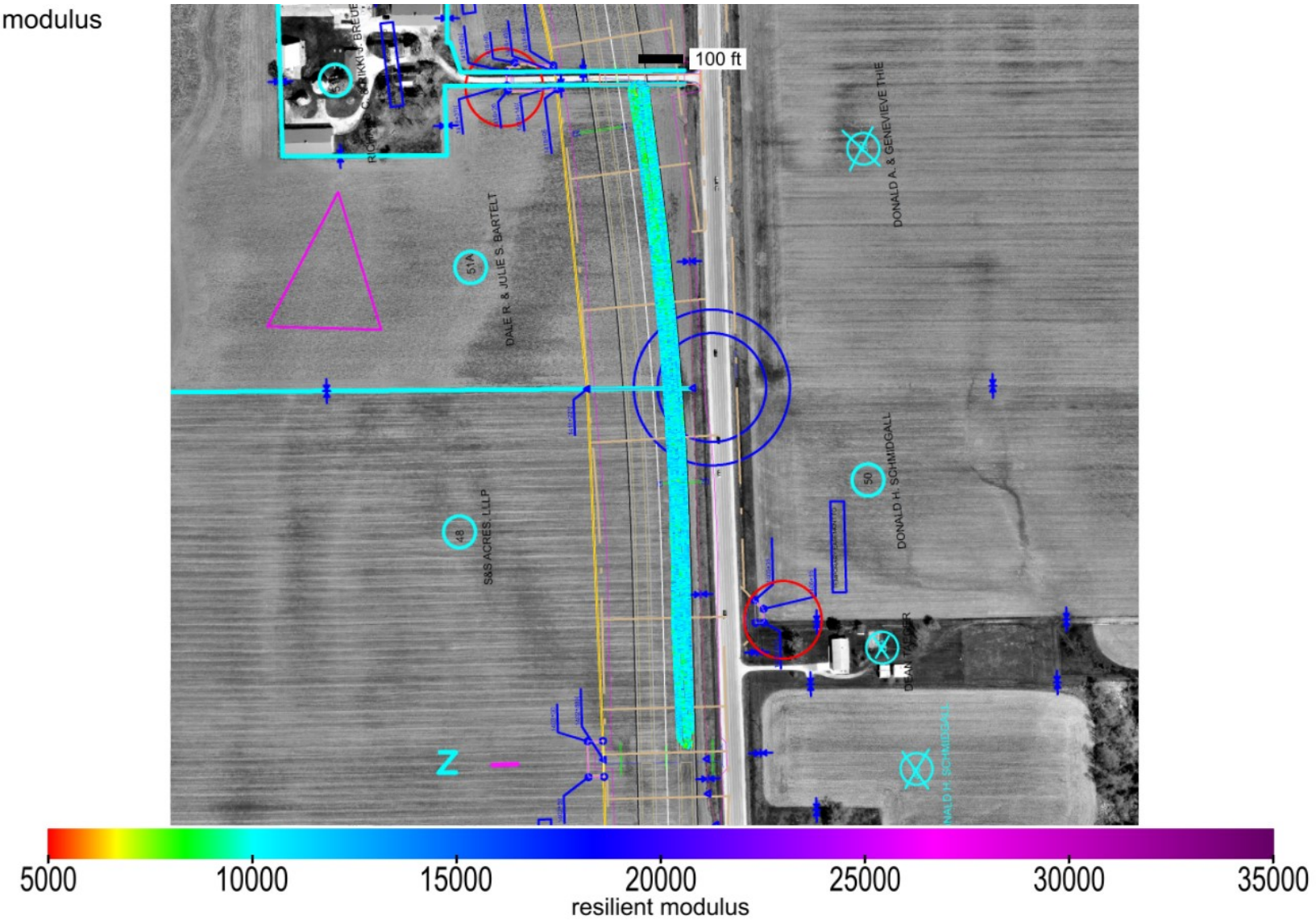
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_155617a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	No	100	125.83	3.23	3000	6401.01	10416.7	15745.08	868.3	8.34	3401.01	7416.7	12745.08

resilient modulus



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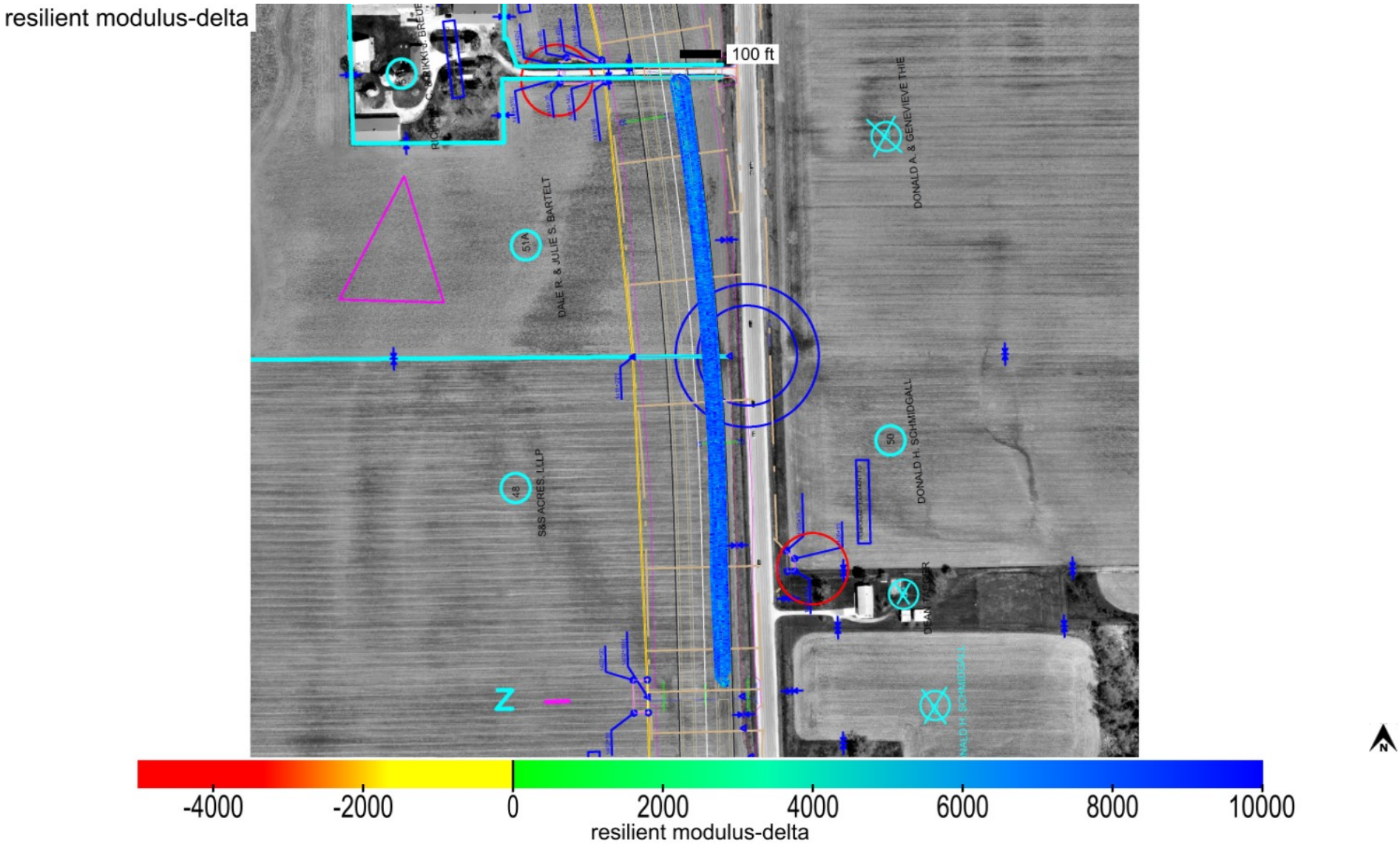
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_155617a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	No	100	125.83	3.23	3000	6401.01	10416.7	15745.08	868.3	8.34	3401.01	7416.7	12745.08



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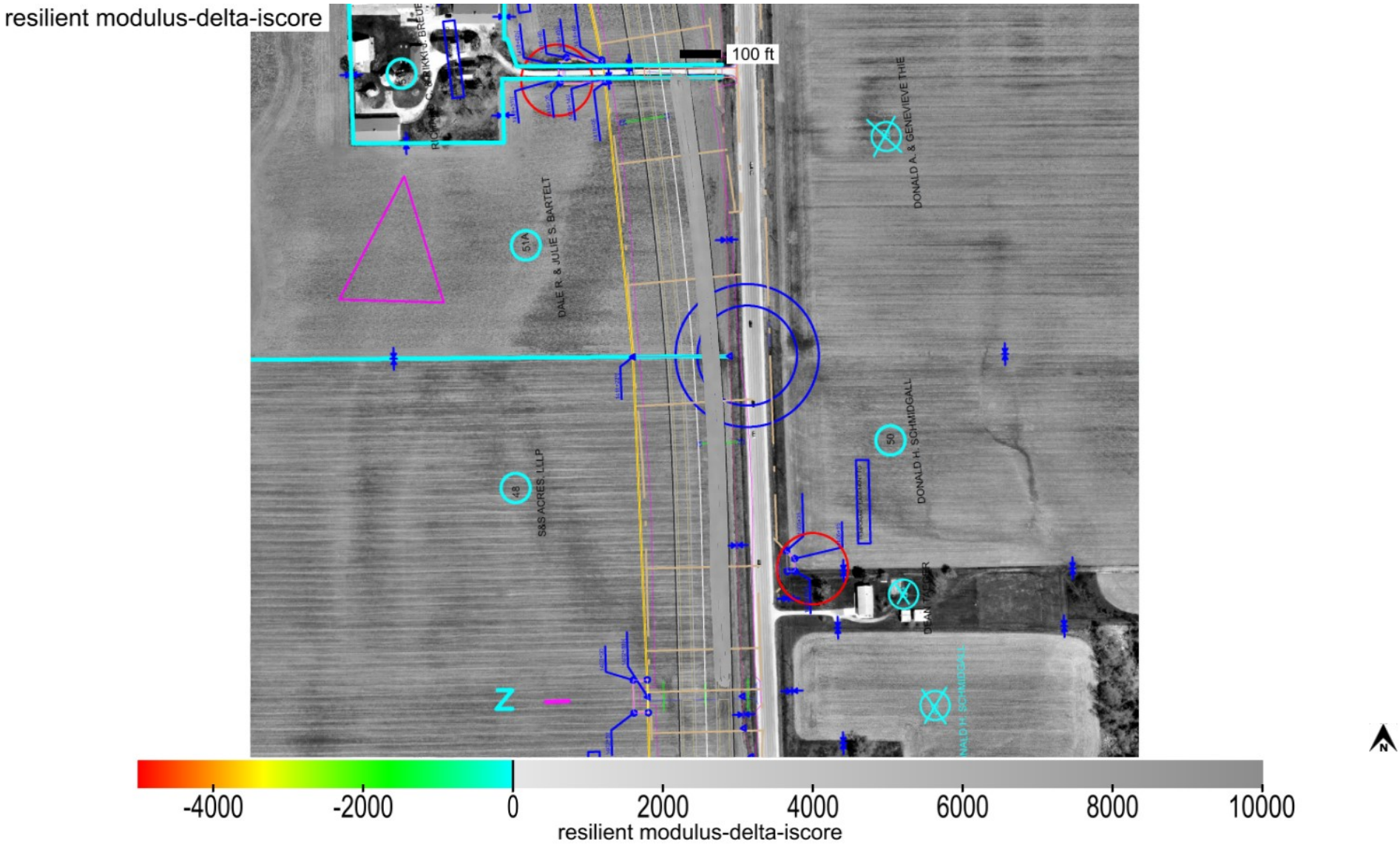
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_155617a

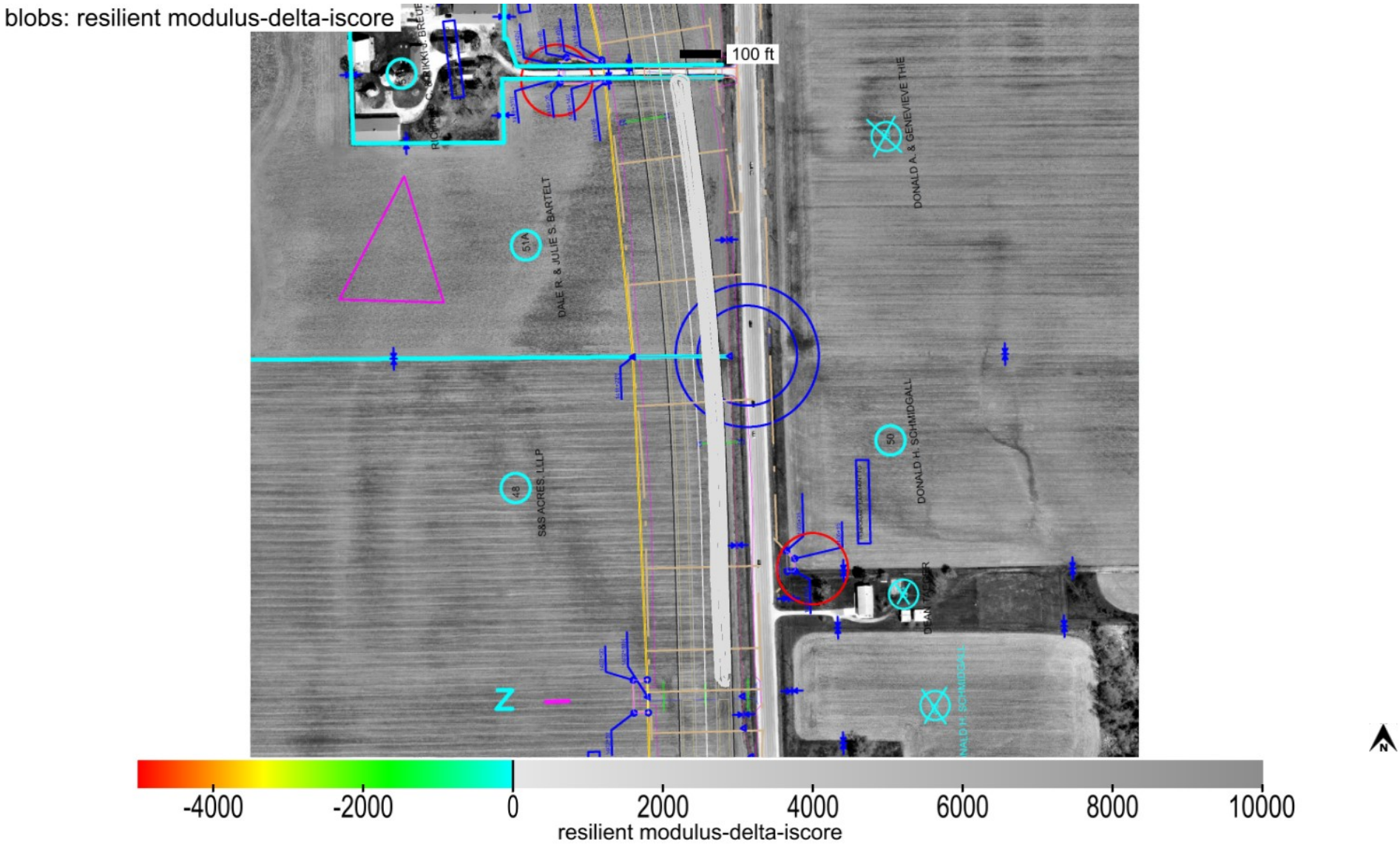
Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	No	100	3000	3401.01	7416.7	12745.08	5752.05	7417.47	8654.67



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_29-us61_cs56-fcs00210_2020_05_11_155617a

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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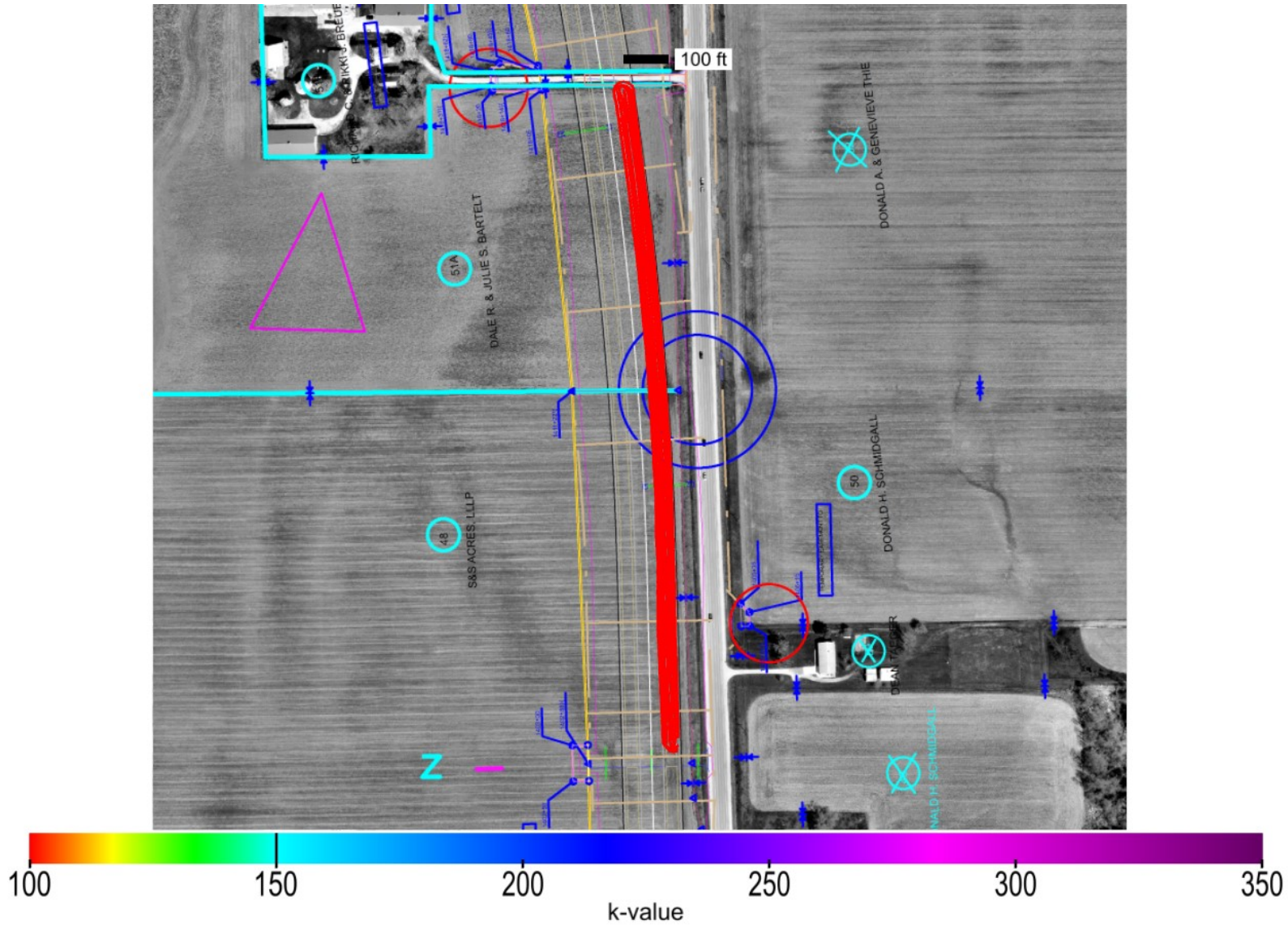
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_155617a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0	20.8	-1.7	150	35	38.7	94.74	7.11	18.39	-115	-111.3	-55.26

k-value



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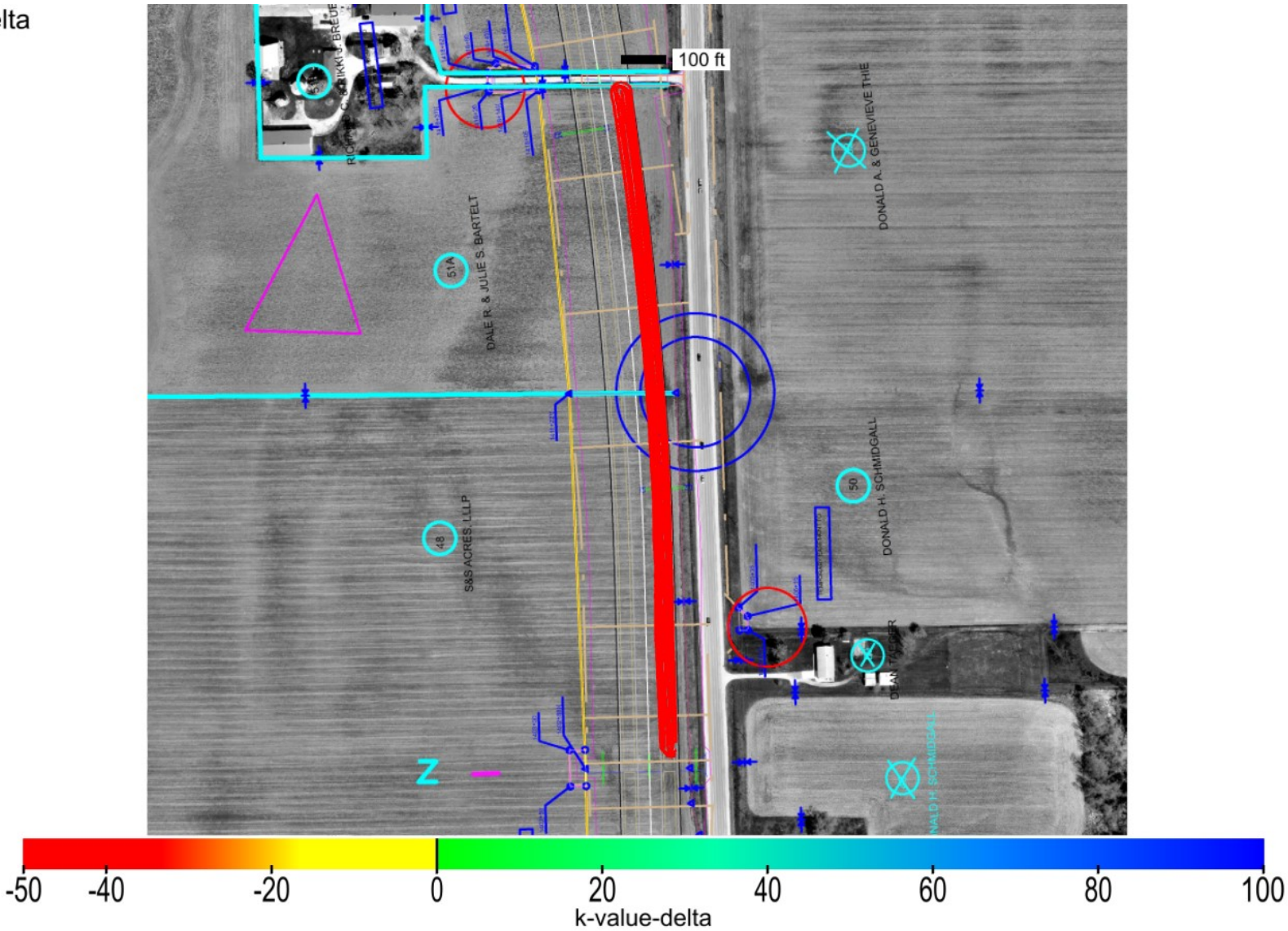
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_155617a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0	20.8	-1.7	150	35	38.7	94.74	7.11	18.39	-115	-111.3	-55.26

k-value-delta



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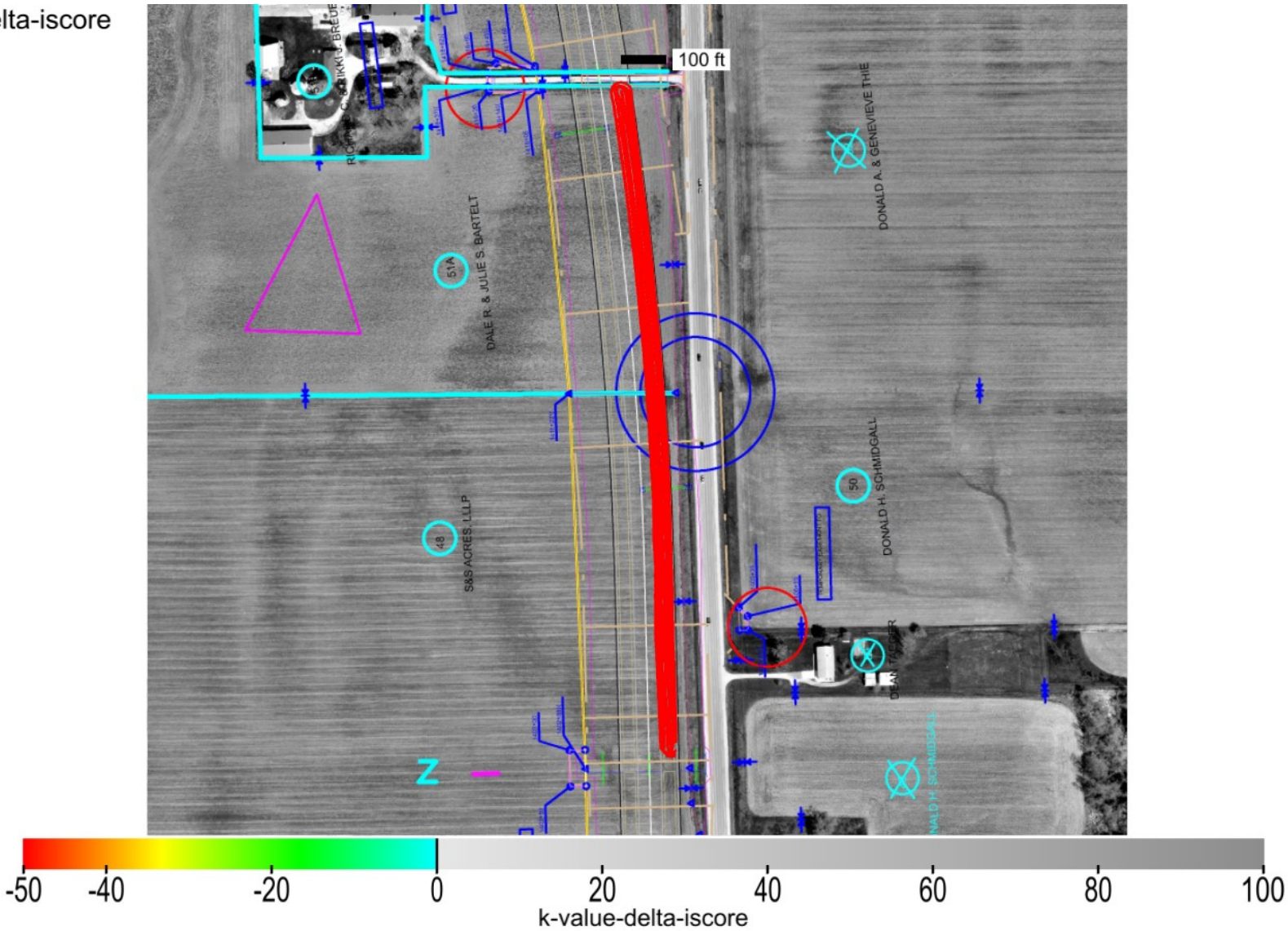
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_155617a

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	-111.3	-55.26	-115	-111.32	-100.41

k-value-delta-iscore



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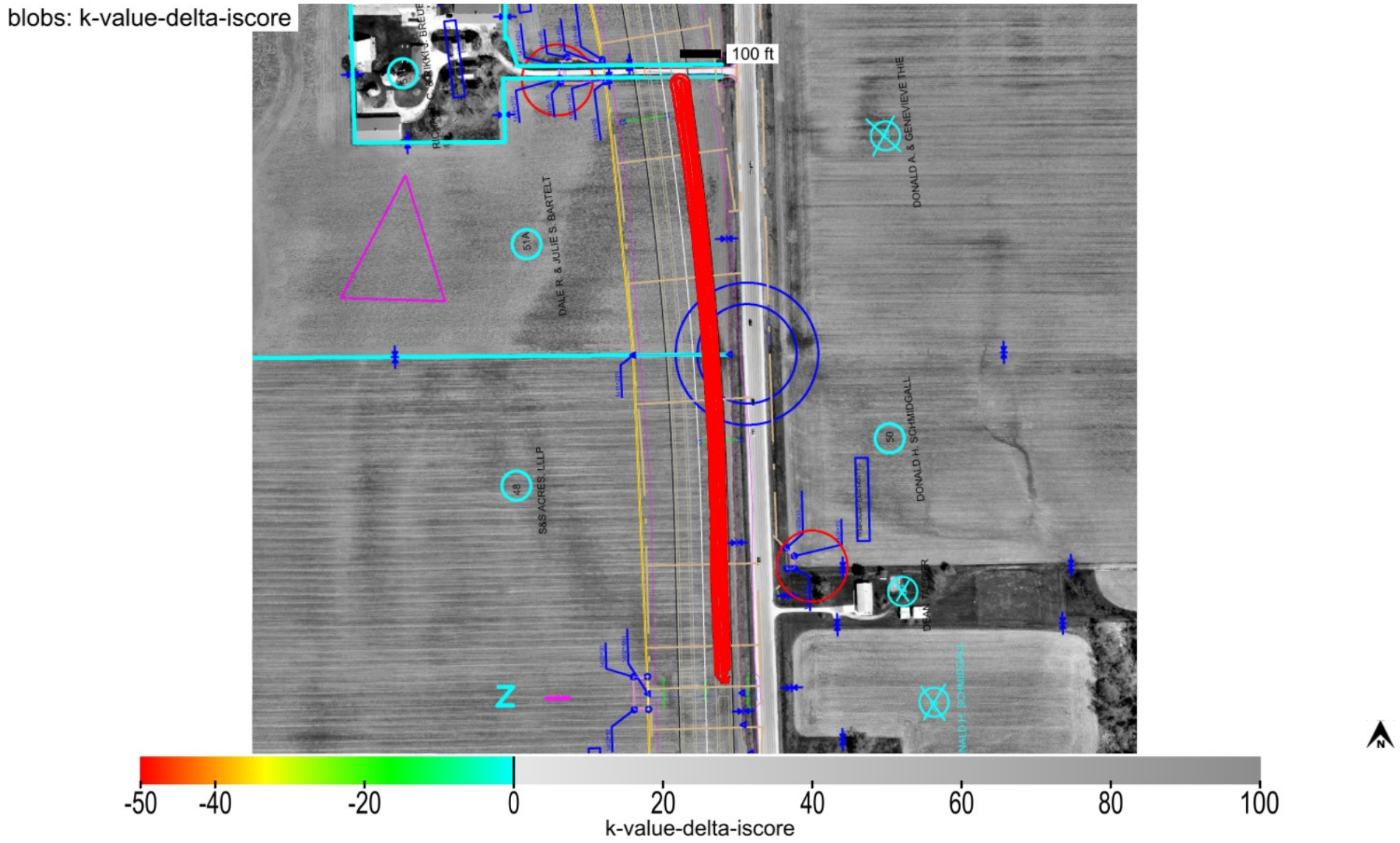
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_155617a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	63411	100	none	0



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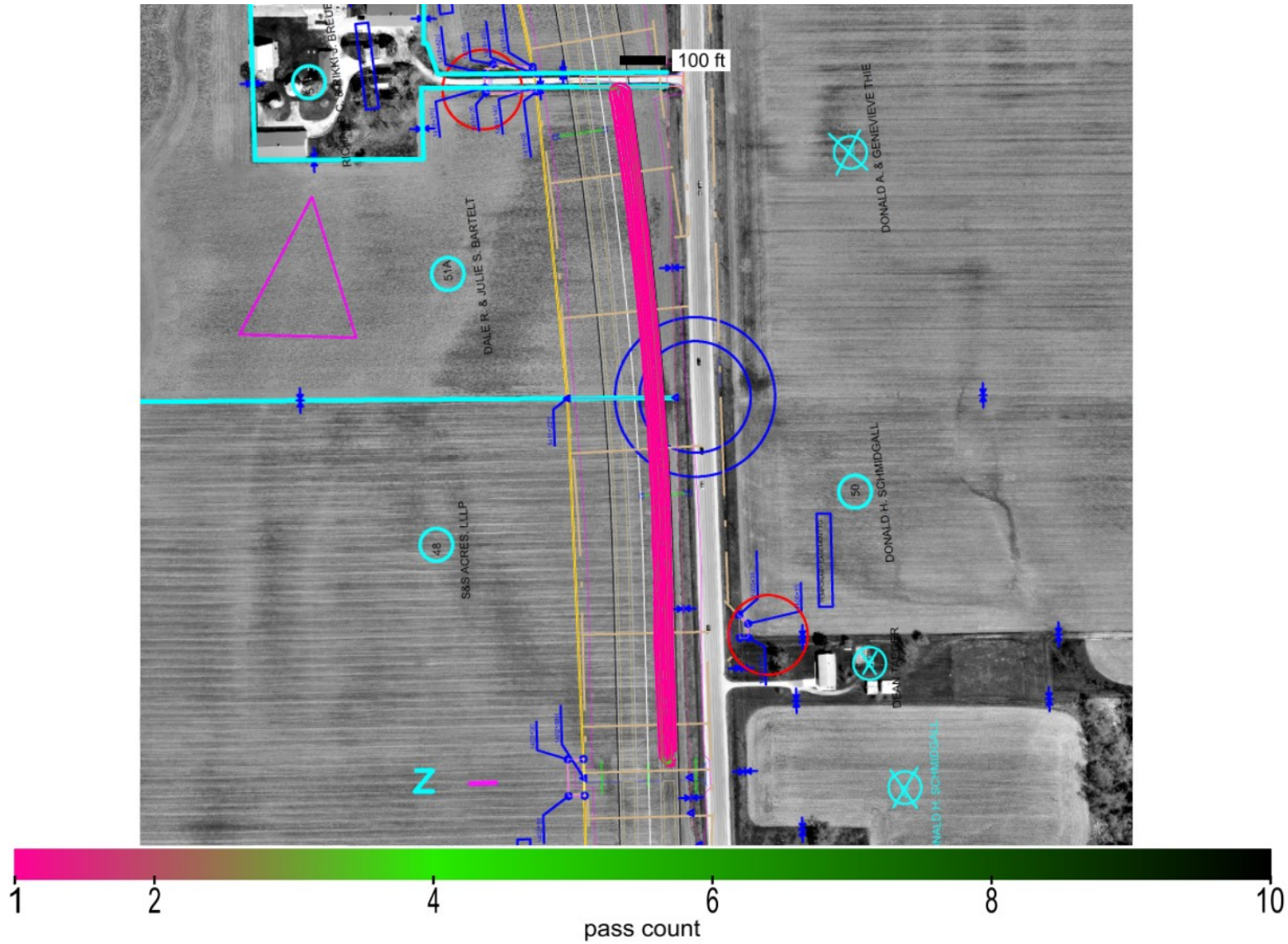
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_155617a

minimum	average	maximum
1	1.15	6

pass count



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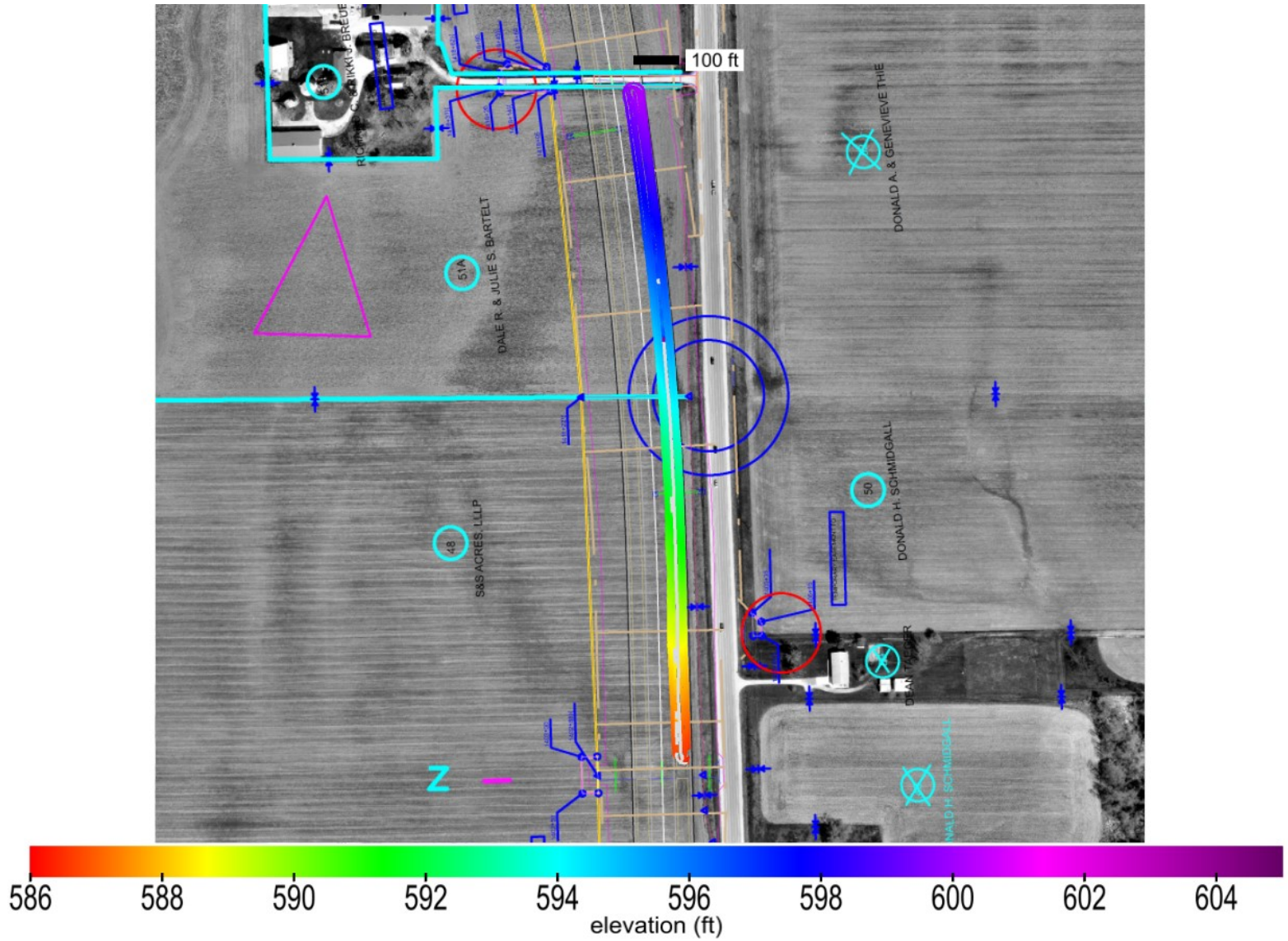
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_155617a

minimum	average	maximum
586.285	593.881	604.093

elevation



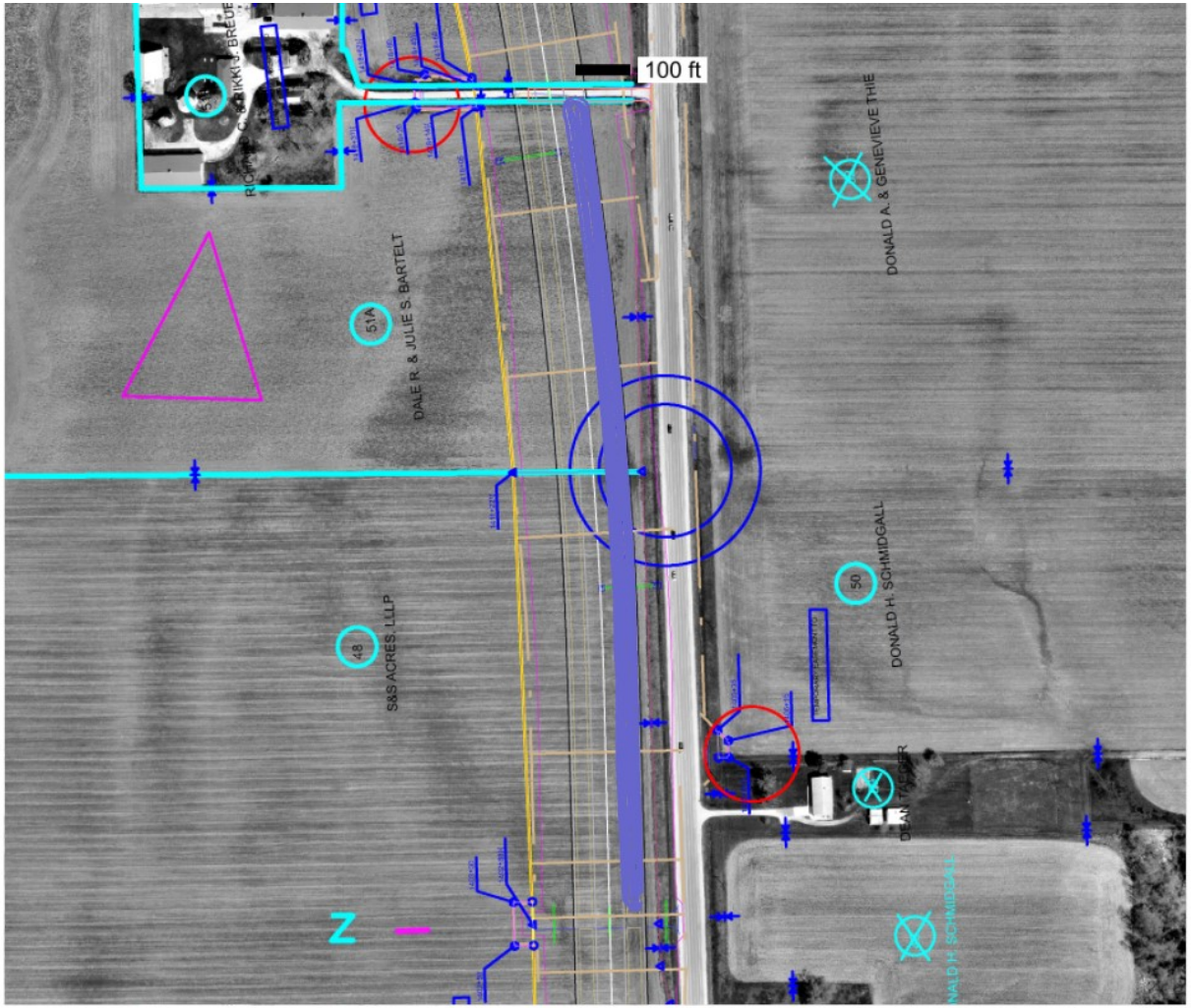
This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_155617a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	63411	1.456	12	3000	150	40

materials



Subgrade_Treatment Select Cohesive_IADOT (2102.02D)

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Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_155617a

20200511_152551.jpg

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IOWADOT

E-Compaction Report

Project:	US61 Des Moines County	Mapping Duration (hrs):	0.25	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2020_05_11_162901a	No. of Measurements:	28277	Machine ID:	Ingios_FCS00210
Date and Time:	5/11/2020 4:29:01 PM	Location:	Des Moines 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	21.22	-1.87	150	35	37.8	102.99	6.63	17.56	-115	-112.2	-47.01
Moisture Content	No												

Mapped Area

square feet	acres
28277	0.65

Pass Count

min.	avg.	max.
1	1.19	4

Elevation (ft)

min.	avg.	max.
600.26	603.38	605.17

Velocity (fps)

min.	avg.	max.
1.34	5.46	5.98

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	28277	0.649	12	3000	150	40

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IOWADOT

E-Compaction Report

Project:	US61 Des Moines County	Mapping Duration (hrs):	0.25	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2020_05_11_162901a	No. of Measurements:	28277	Machine ID:	Ingios_FCS00210
Date and Time:	5/11/2020 4:29:01 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
124.97	CQI > = 95
100	80% of Resilient Modulus MVs >= 3000
10.06	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:	US61 Des Moines County	Mapping Duration (hrs):	0.25	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2020_05_11_162901a	No. of Measurements:	28277	Machine ID:	Ingios_FCS00210
Date and Time:	5/11/2020 4:29:01 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
21.22	CQI > = 95
0	80% of k-Value MVs >= 150
17.56	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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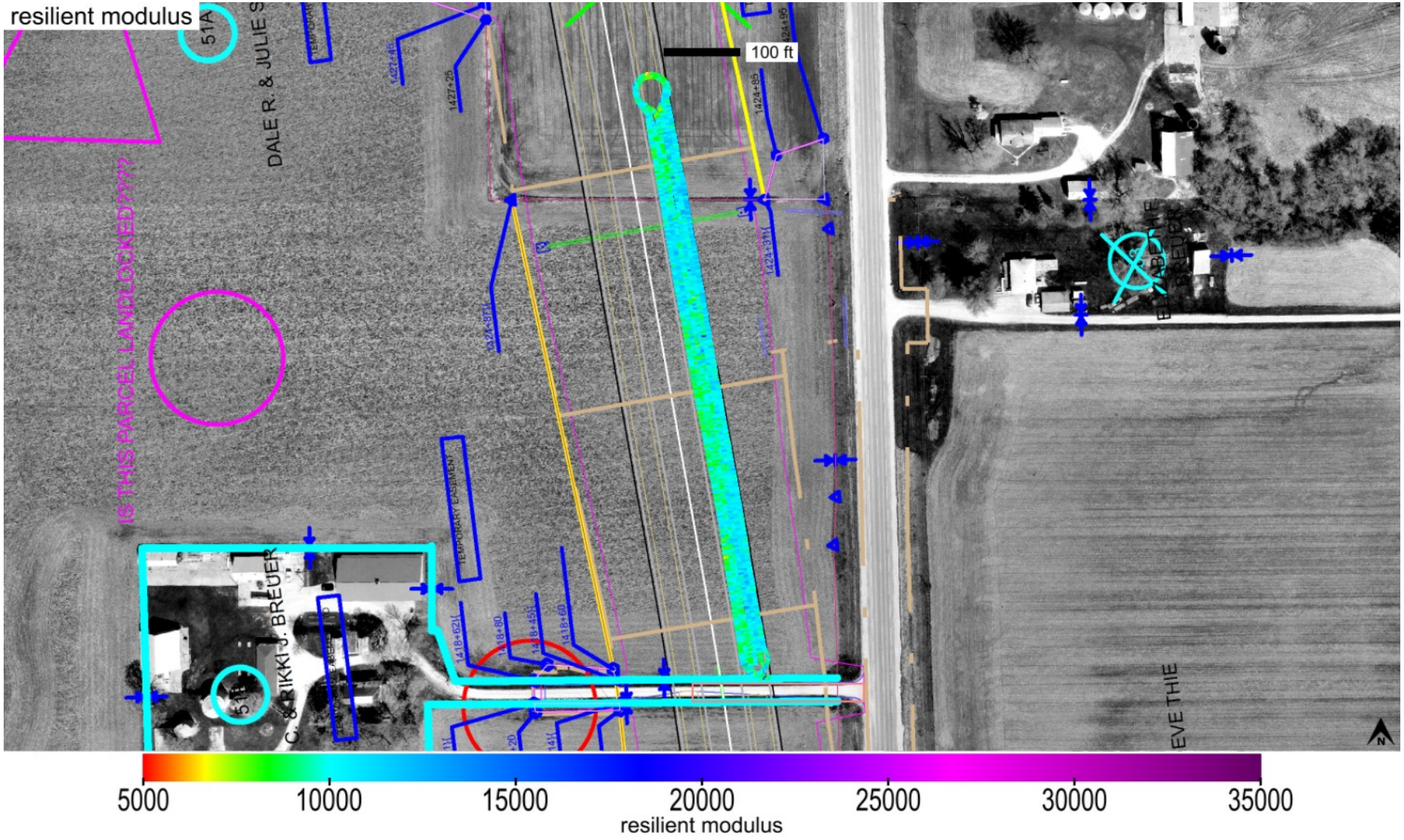
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_162901a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	No	100	124.97	2.66	3000	6119.99	10121.6	16481.53	1018.01	10.06	3119.99	7121.6	13481.53



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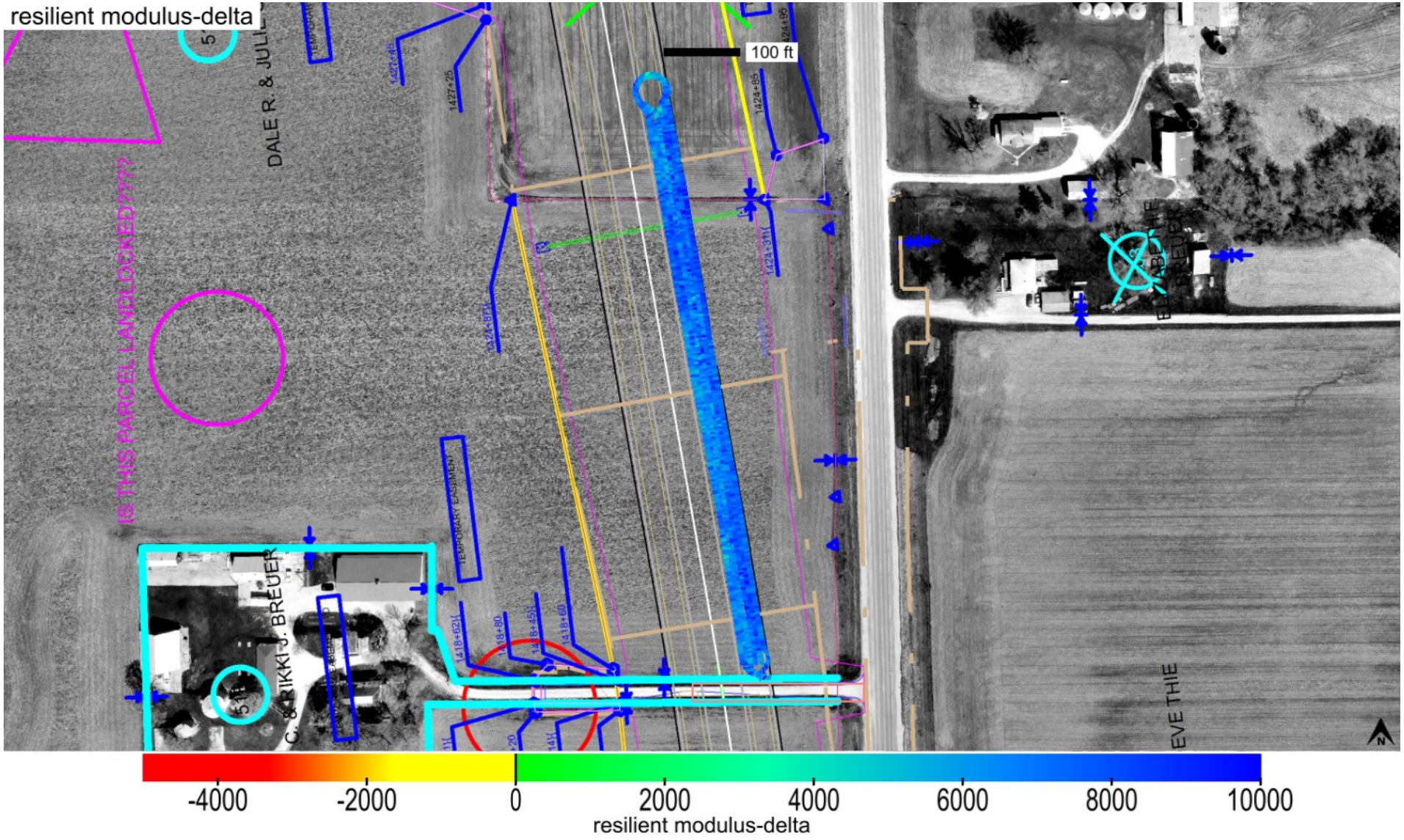
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_162901a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	No	100	124.97	2.66	3000	6119.99	10121.6	16481.53	1018.01	10.06	3119.99	7121.6	13481.53



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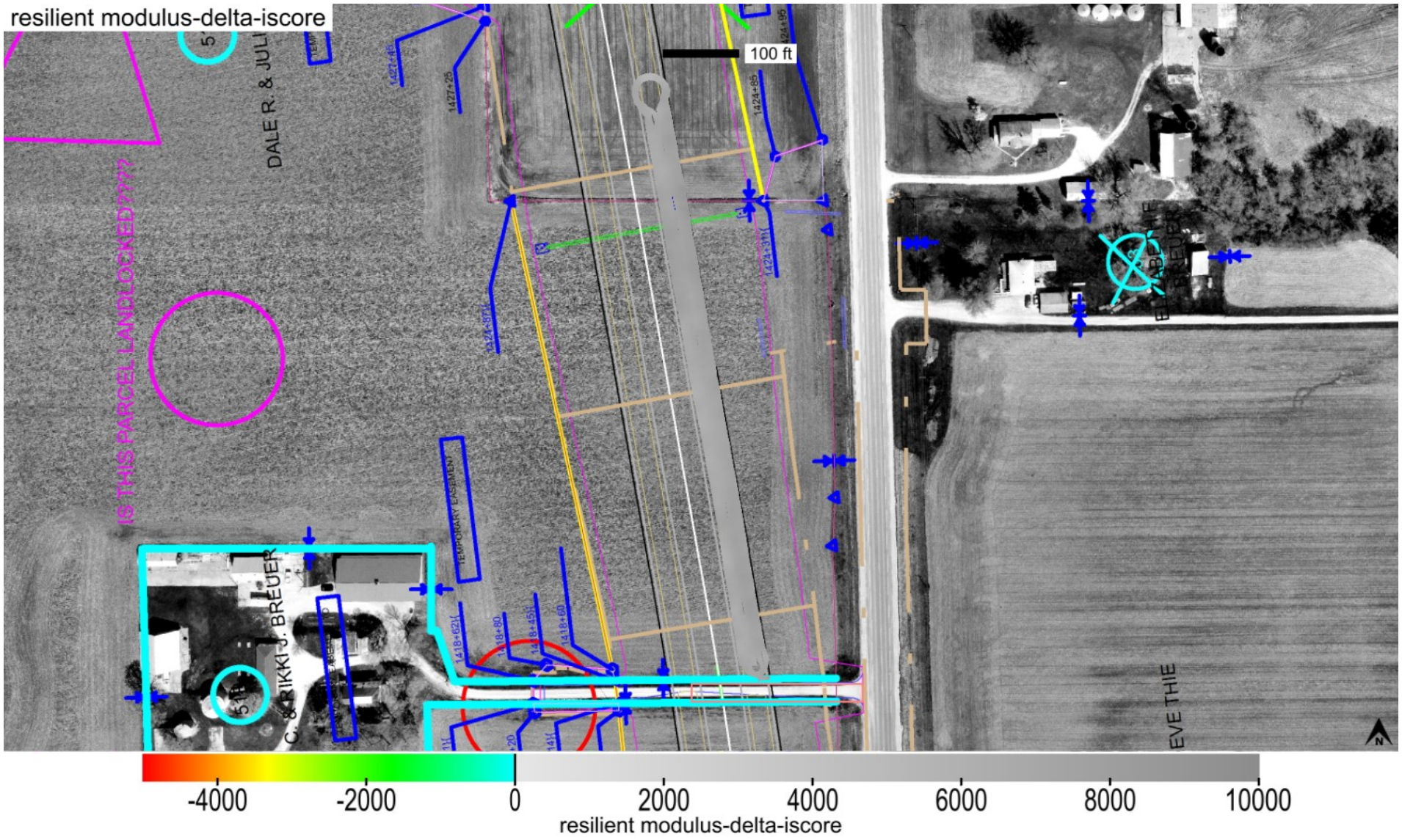
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_162901a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	No	100	3000	3119.99	7121.6	13481.53	5004.89	7121.74	8818.04



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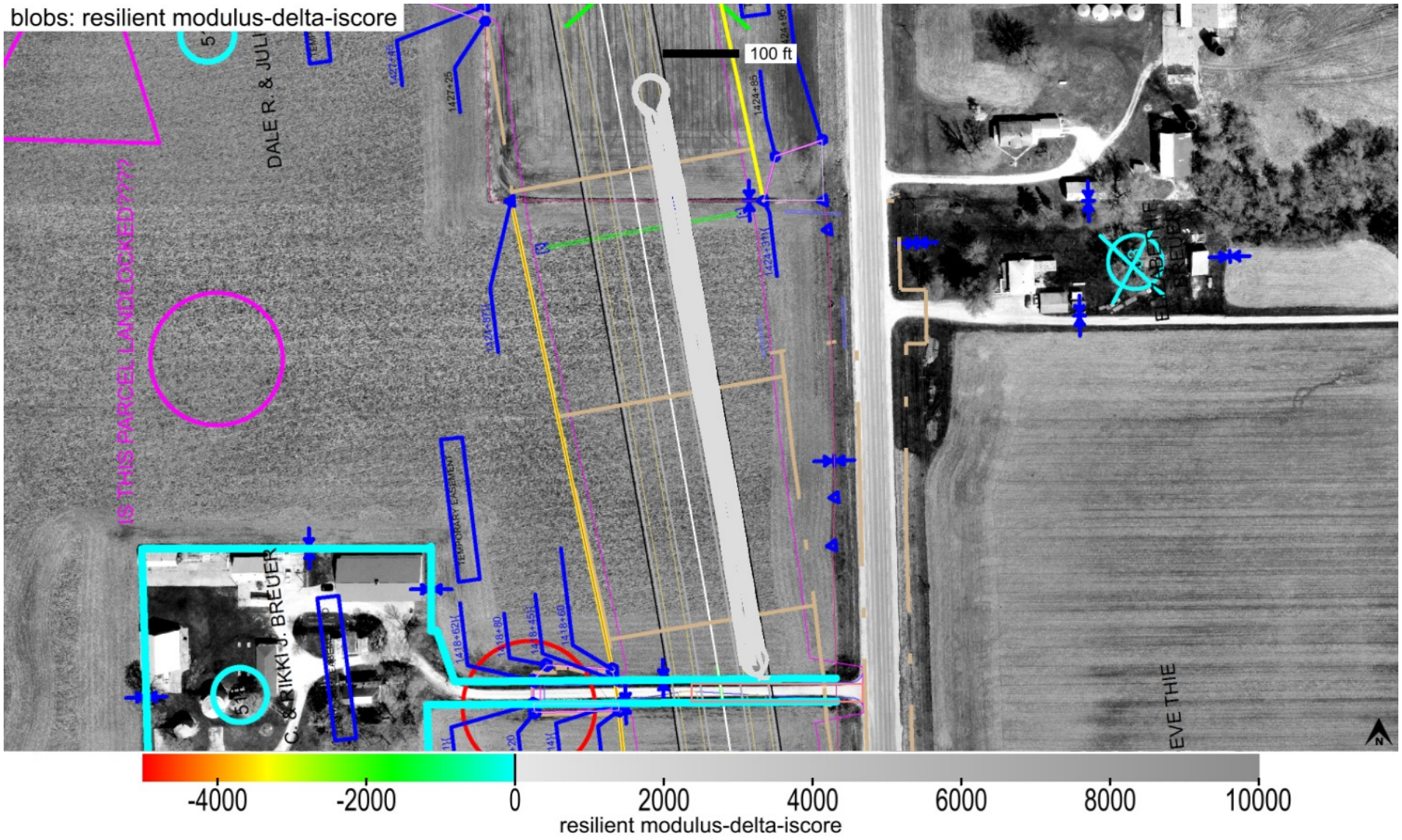
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_162901a

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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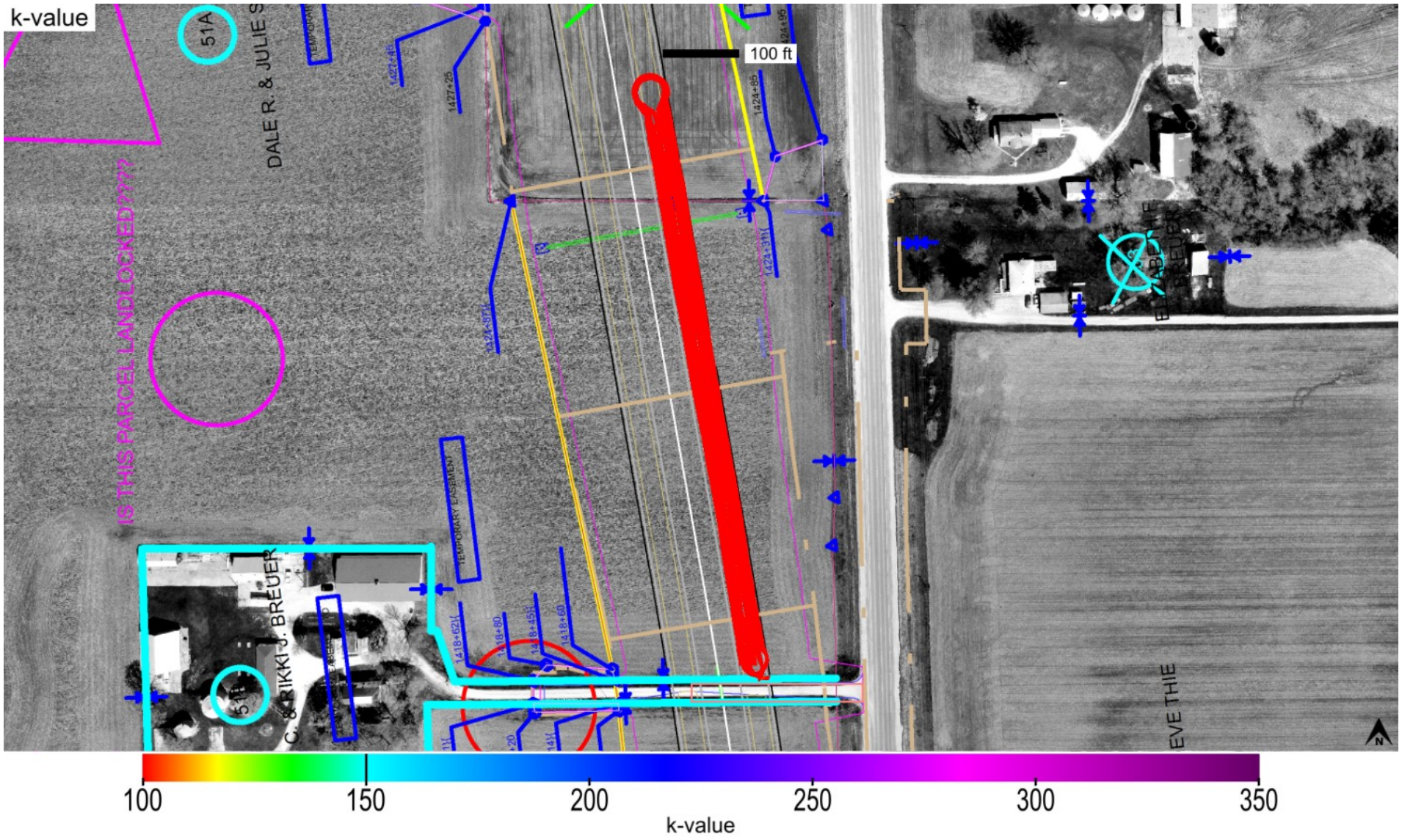
IOWADOT

E-Compaction Report

Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_162901a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0	21.22	-1.87	150	35	37.8	102.99	6.63	17.56	-115	-112.2	-47.01



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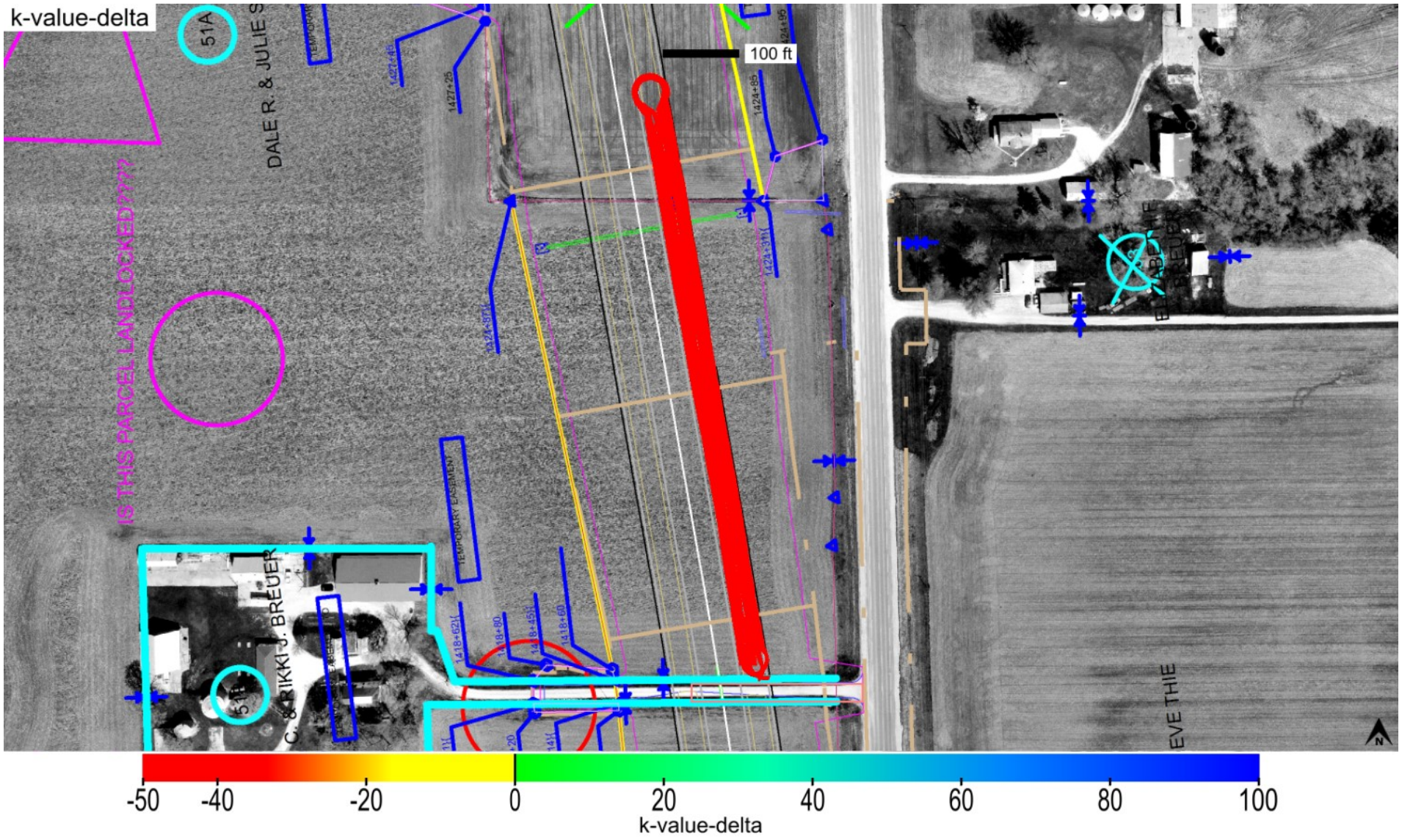
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_162901a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0	21.22	-1.87	150	35	37.8	102.99	6.63	17.56	-115	-112.2	-47.01



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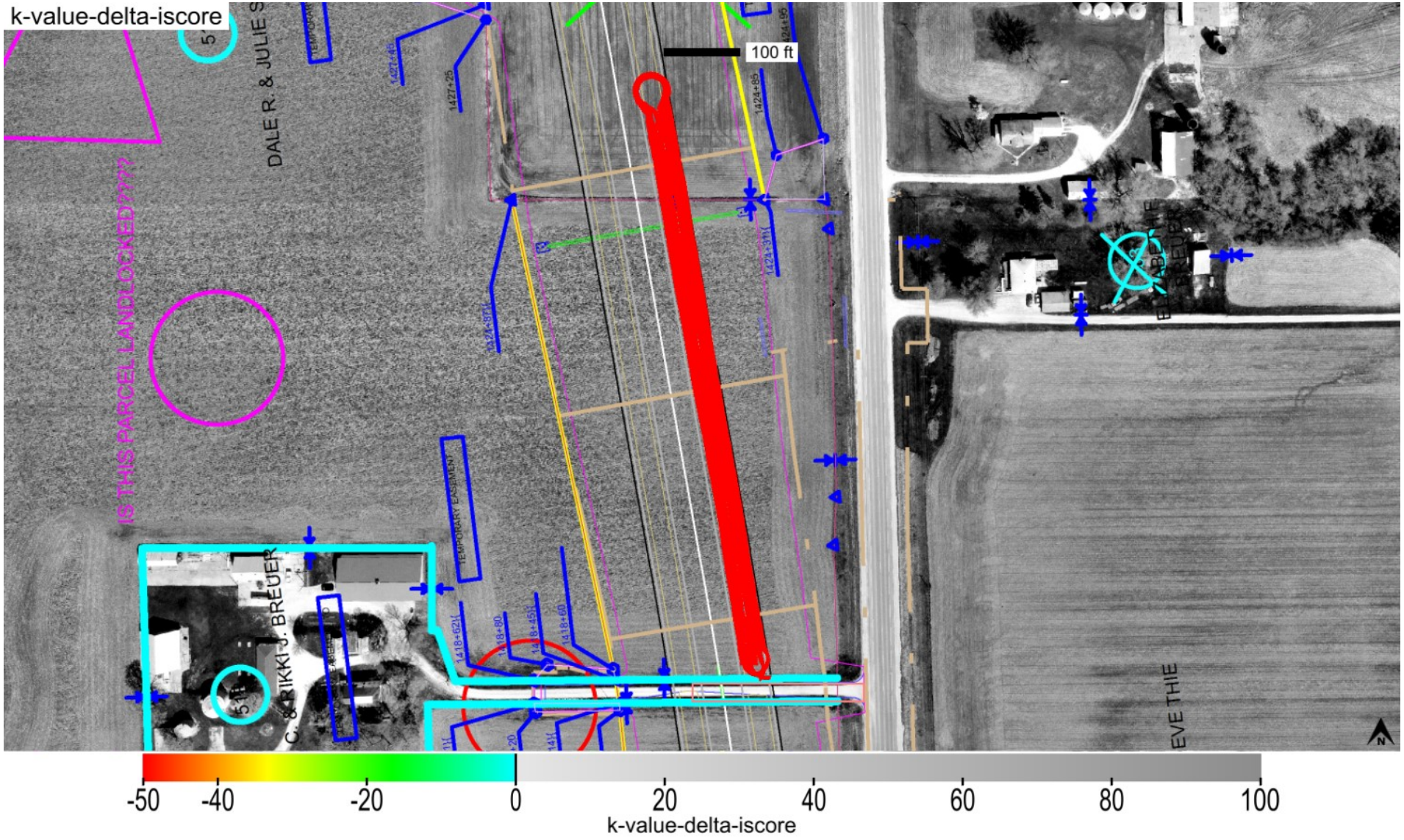
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_162901a

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	-112.2	-47.01	-115	-112.18	-97.44



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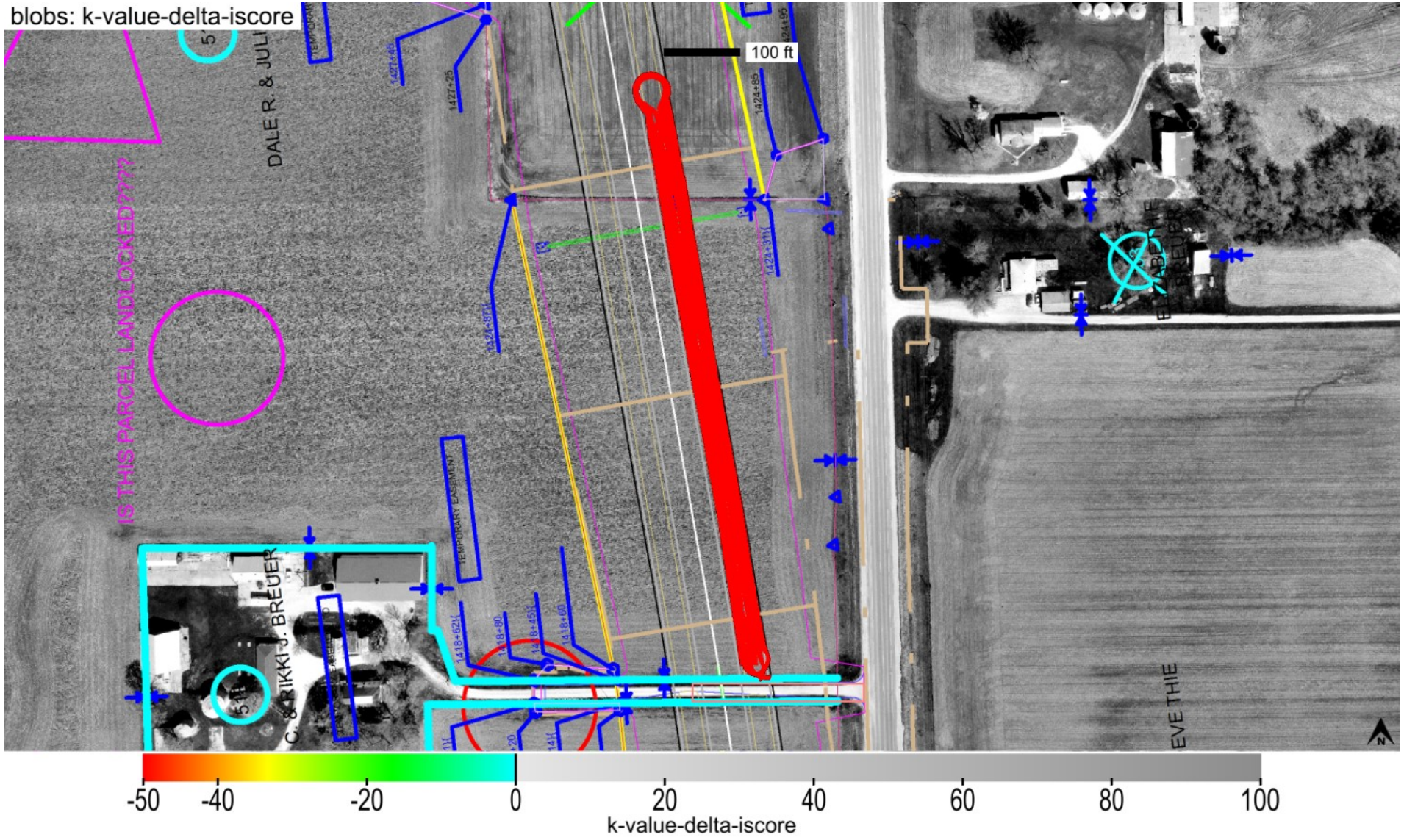
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_162901a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	28277	100	none	0



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Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_162901a

minimum	average	maximum
1	1.19	4

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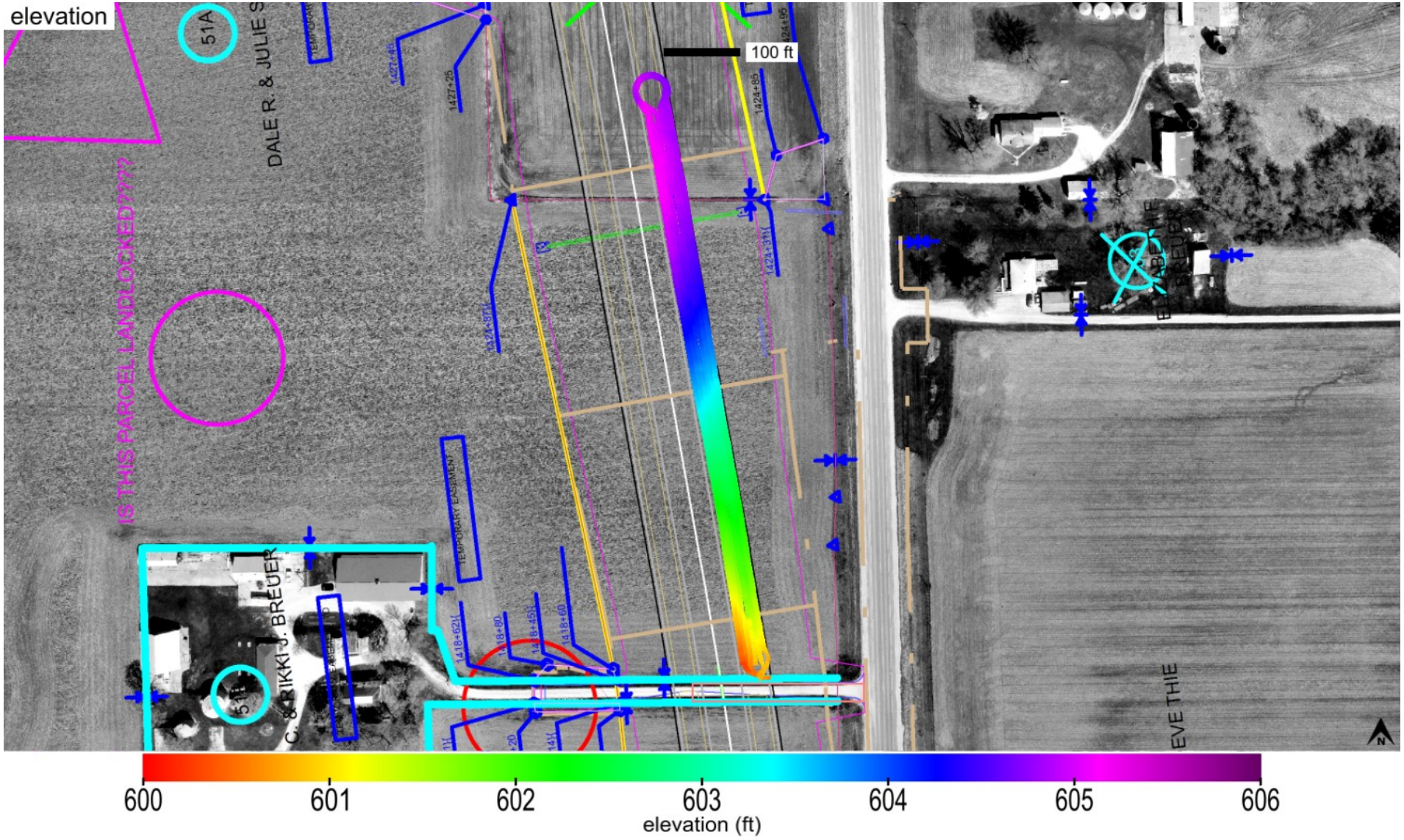
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_162901a

minimum	average	maximum
600.261	603.385	605.173



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Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_162901a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	28277	0.649	12	3000	150	40

Subgrade_Treatment Select Cohesive_IADOT (2102.02D)

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Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_162901a

20200511_173243.jpg

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IOWADOT

E-Compaction Report

Project:	US61 Des Moines County	Mapping Duration (hrs):	0.28	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2020_05_11_164444a	No. of Measurements:	29509	Machine ID:	Ingios_FCS00210
Date and Time:	5/11/2020 4:44:44 PM	Location:	Des Moines 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	24.83	-3.59	150	35	35.5	117.18	3.67	10.34	-115	-114.5	-32.82
Moisture Content	No												

Mapped Area

square feet	acres
29509	0.68

Pass Count

min.	avg.	max.
1	1.28	5

Elevation (ft)

min.	avg.	max.
599.72	603.27	605.25

Velocity (fps)

min.	avg.	max.
1.42	5.46	5.74

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	29509	0.677	12	3000	150	40

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IOWADOT

E-Compaction Report

Project:	US61 Des Moines County	Mapping Duration (hrs):	0.28	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2020_05_11_164444a	No. of Measurements:	29509	Machine ID:	Ingios_FCS00210
Date and Time:	5/11/2020 4:44:44 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
125	CQI > = 95
100	80% of Resilient Modulus MVs >= 3000
9.99	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:	US61 Des Moines County	Mapping Duration (hrs):	0.28	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2020_05_11_164444a	No. of Measurements:	29509	Machine ID:	Ingios_FCS00210
Date and Time:	5/11/2020 4:44:44 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
24.83	CQI > = 95
0	80% of k-Value MVs >= 150
10.34	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.

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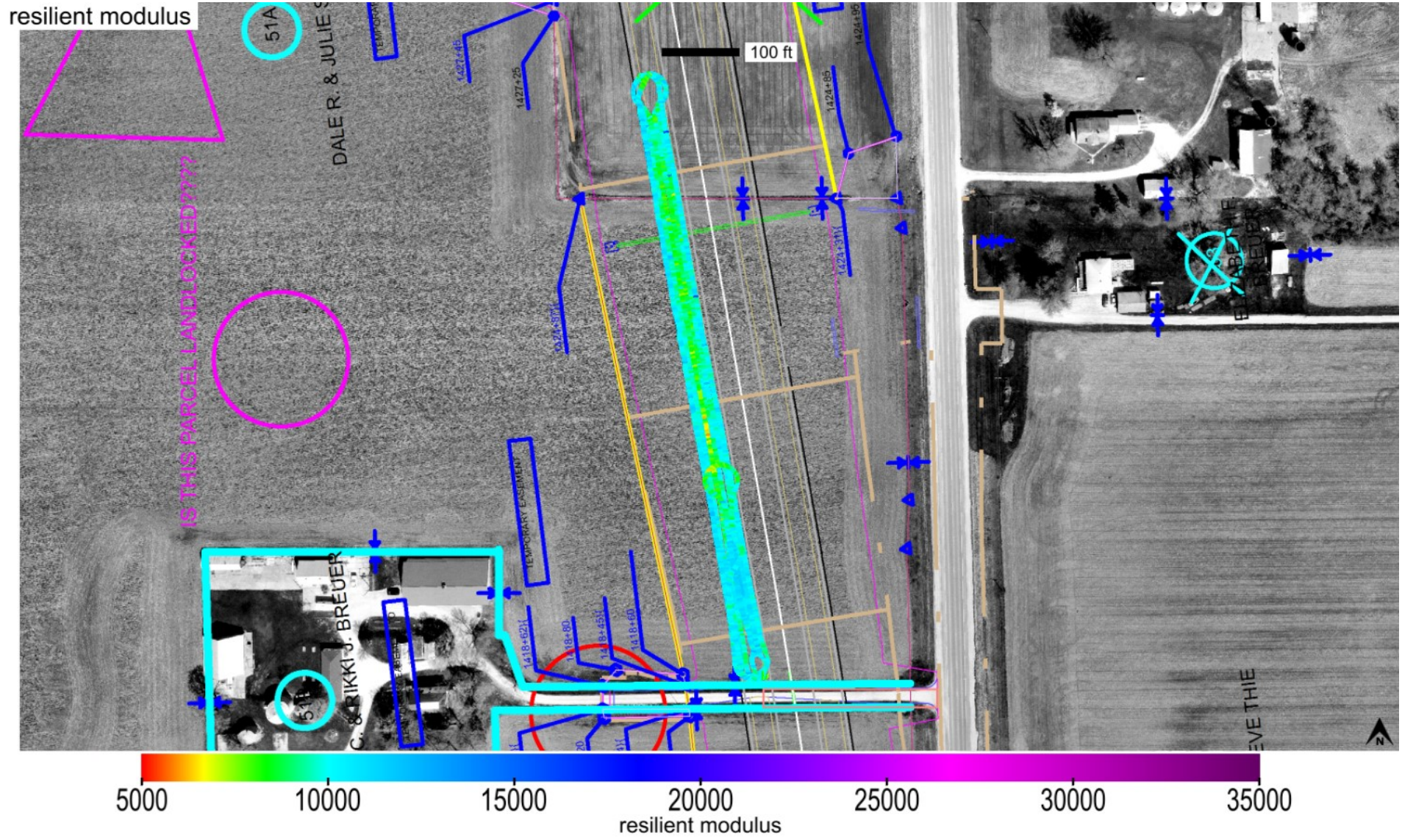
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_164444a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	No	100	125	2.66	3000	5993.35	9875.3	15940.41	986.64	9.99	2993.35	6875.3	12940.41



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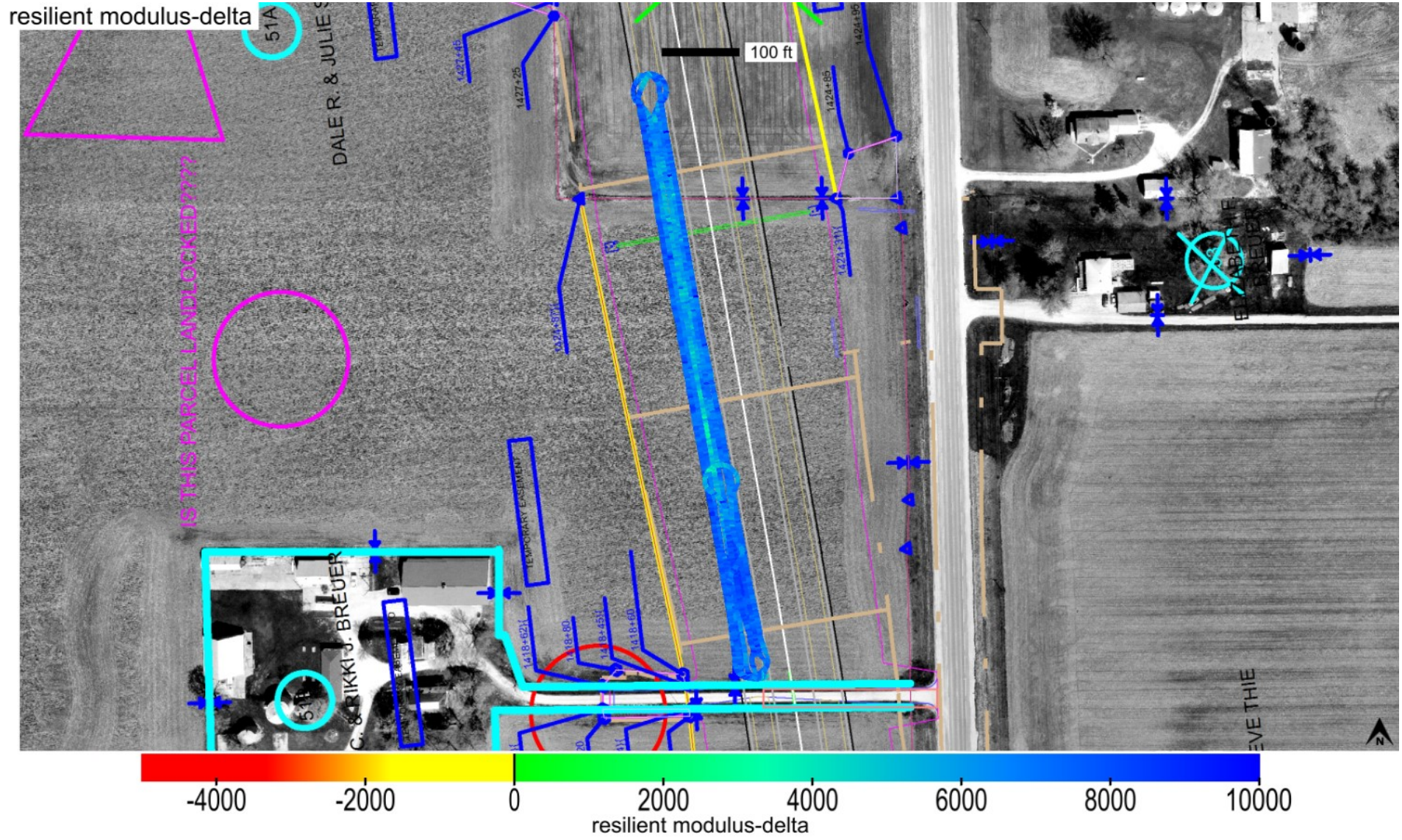
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_164444a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	No	100	125	2.66	3000	5993.35	9875.3	15940.41	986.64	9.99	2993.35	6875.3	12940.41



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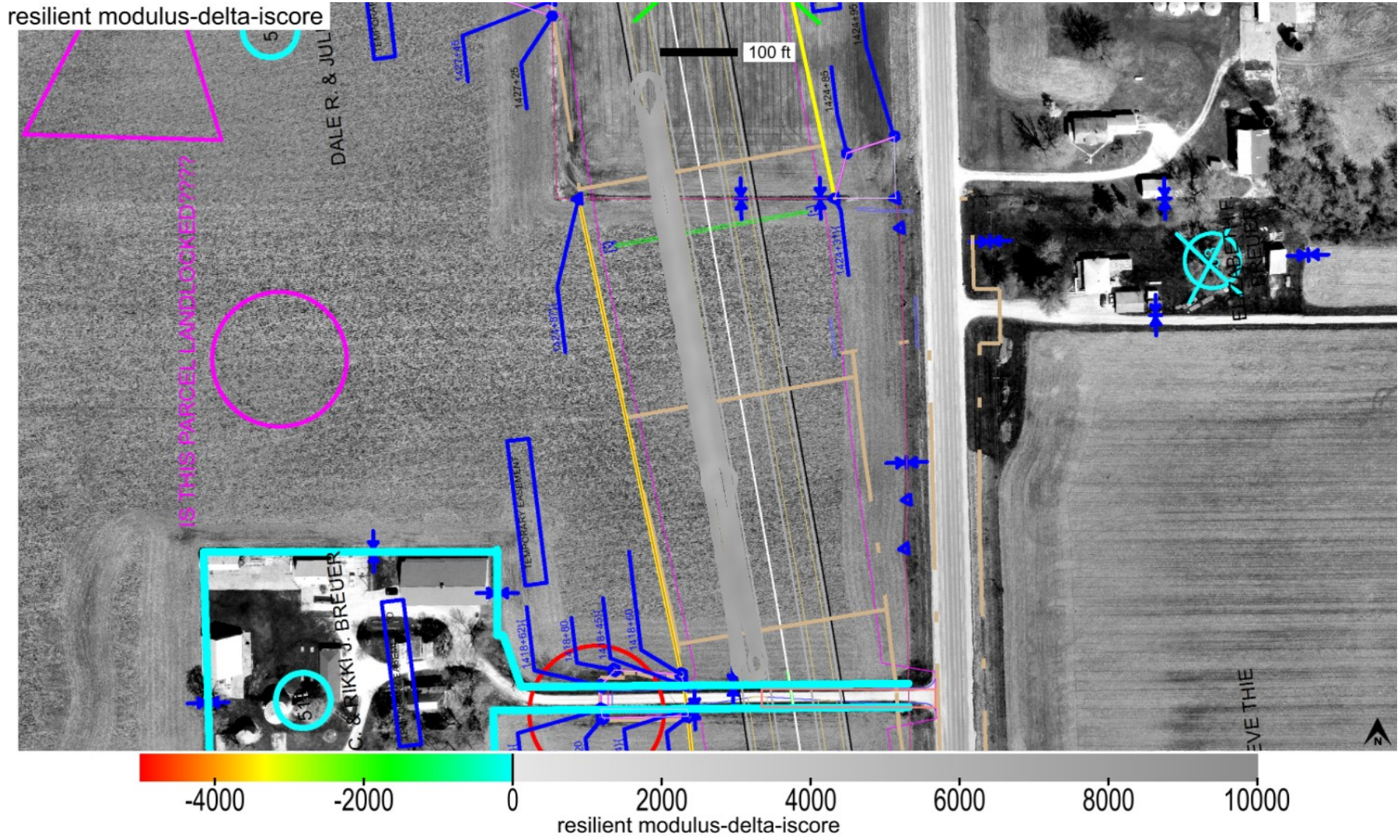
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_164444a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	No	100	3000	2993.35	6875.3	12940.41	5319.54	6858.68	8181.62



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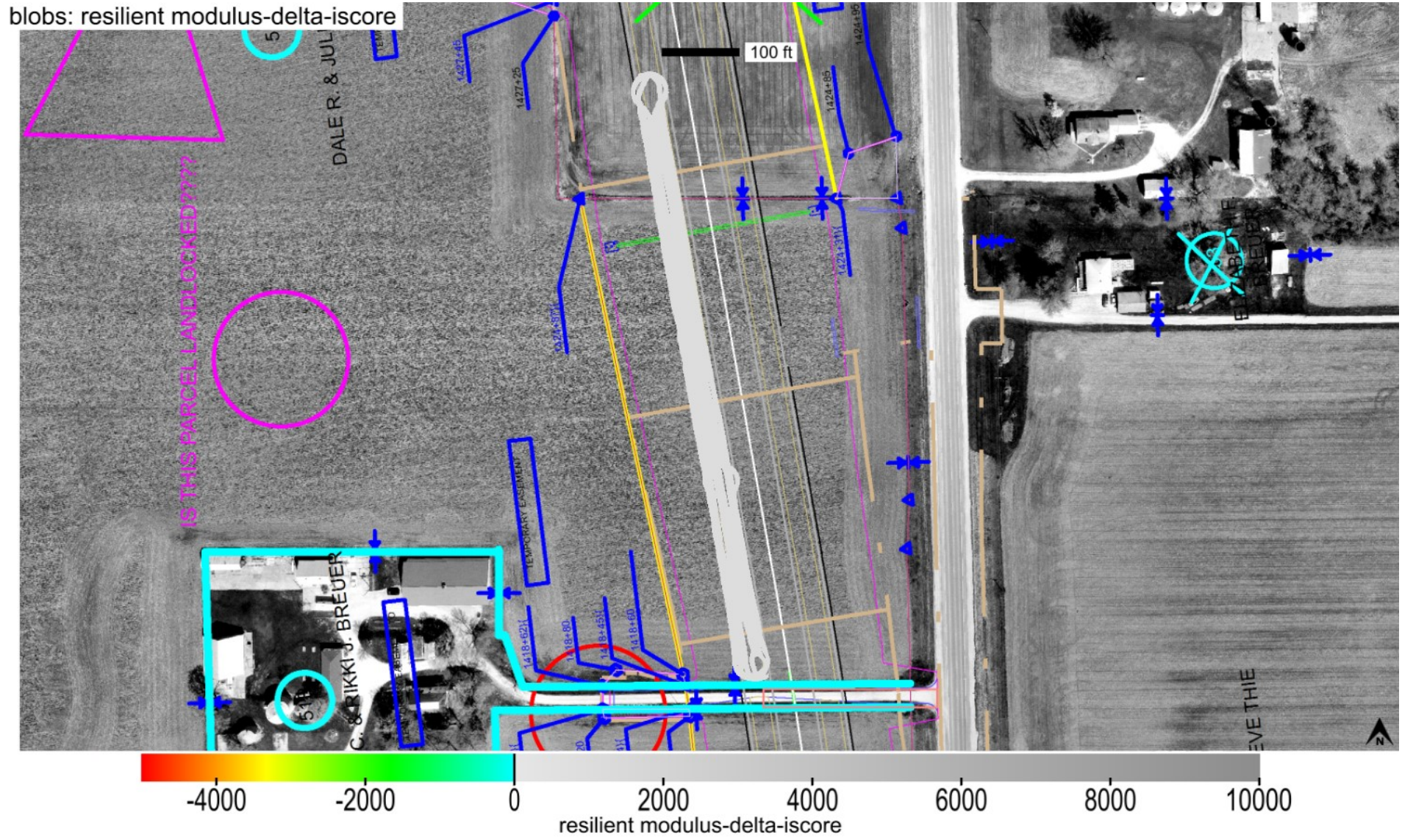
ingios GEOTECHNICS

Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_164444a

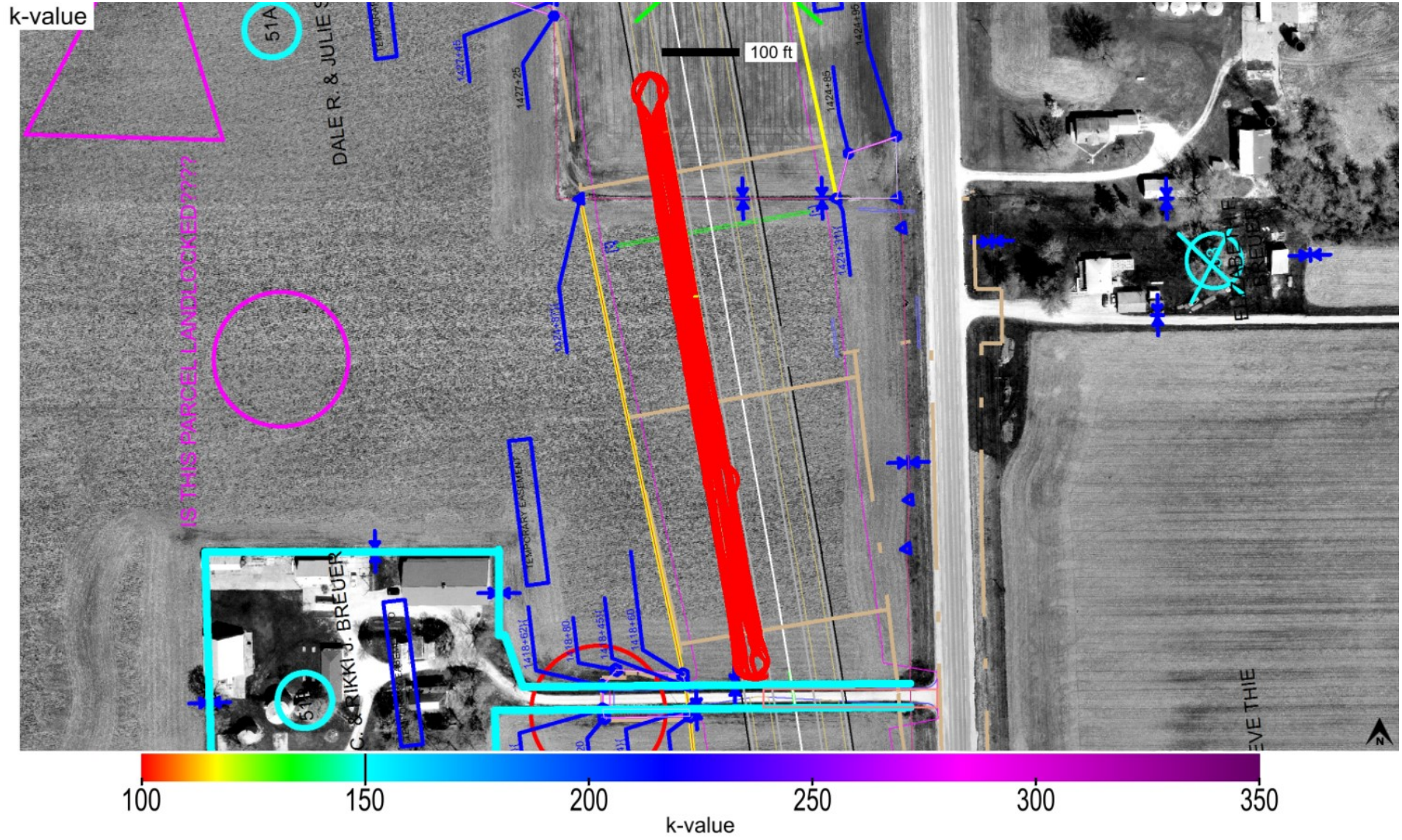
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0



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_29-us61_cs56-fcs00210_2020_05_11_164444a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0	24.83	-3.59	150	35	35.5	117.18	3.67	10.34	-115	-114.5	-32.82



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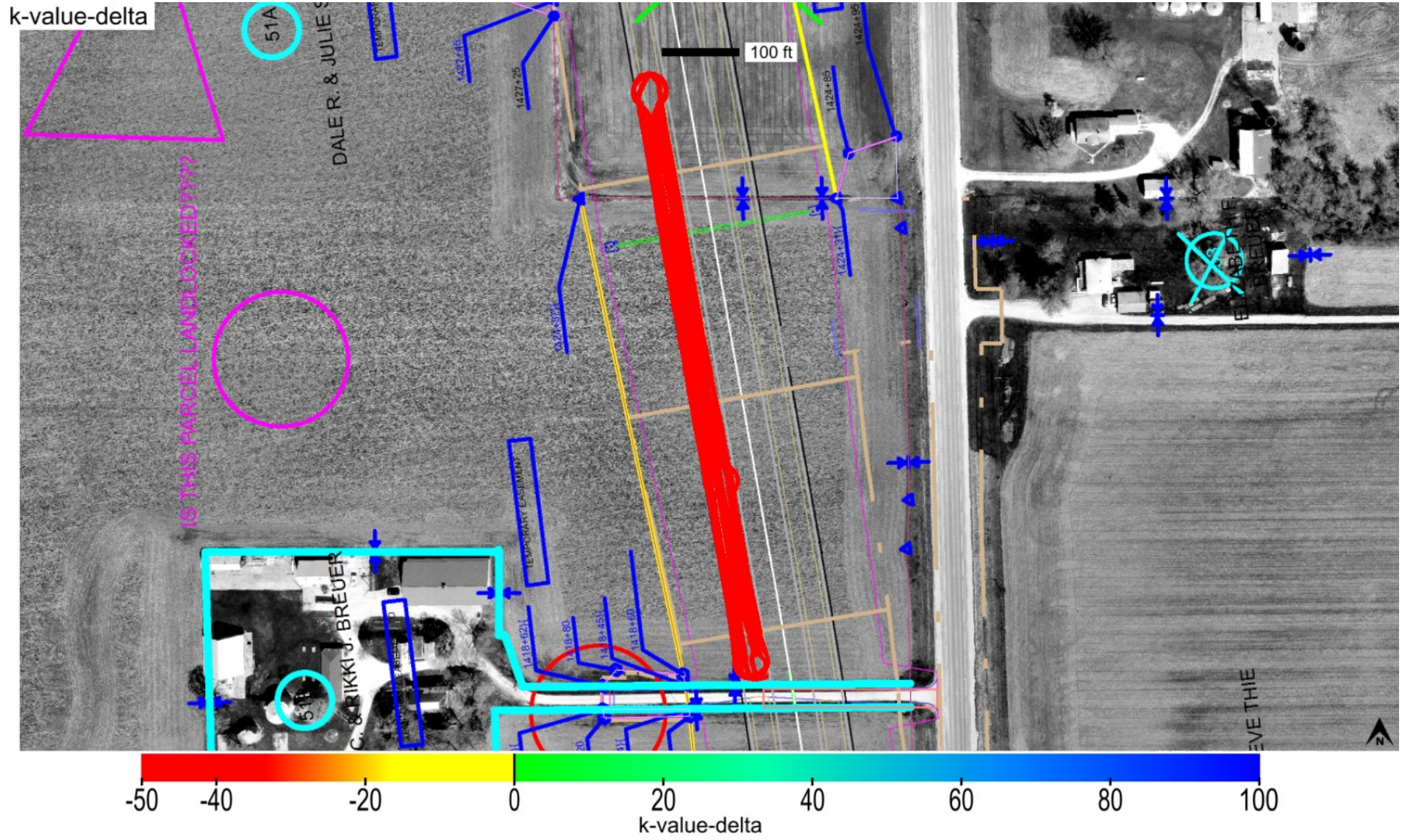
ingios GEOTECHNICS

Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_164444a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0	24.83	-3.59	150	35	35.5	117.18	3.67	10.34	-115	-114.5	-32.82

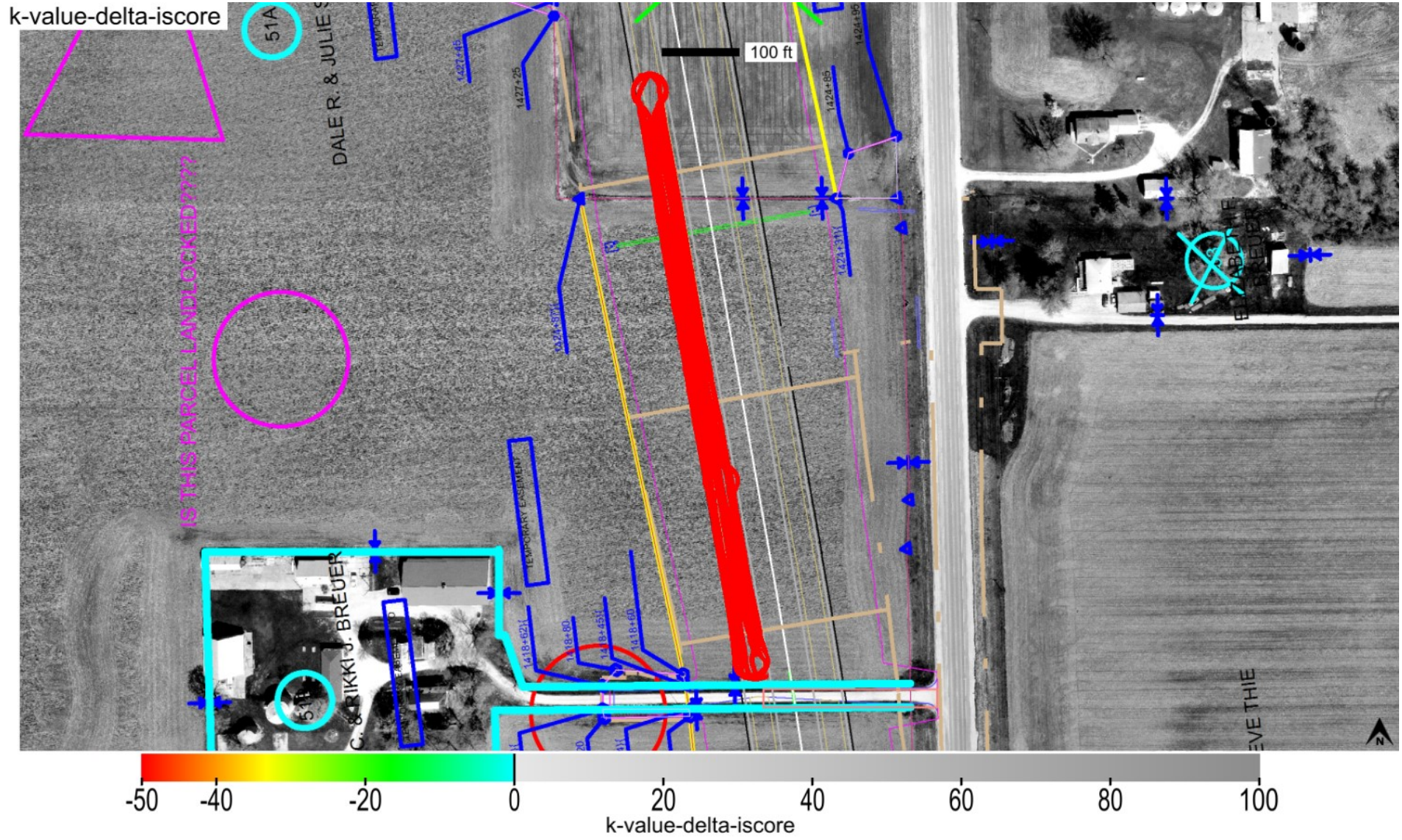


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_164444a

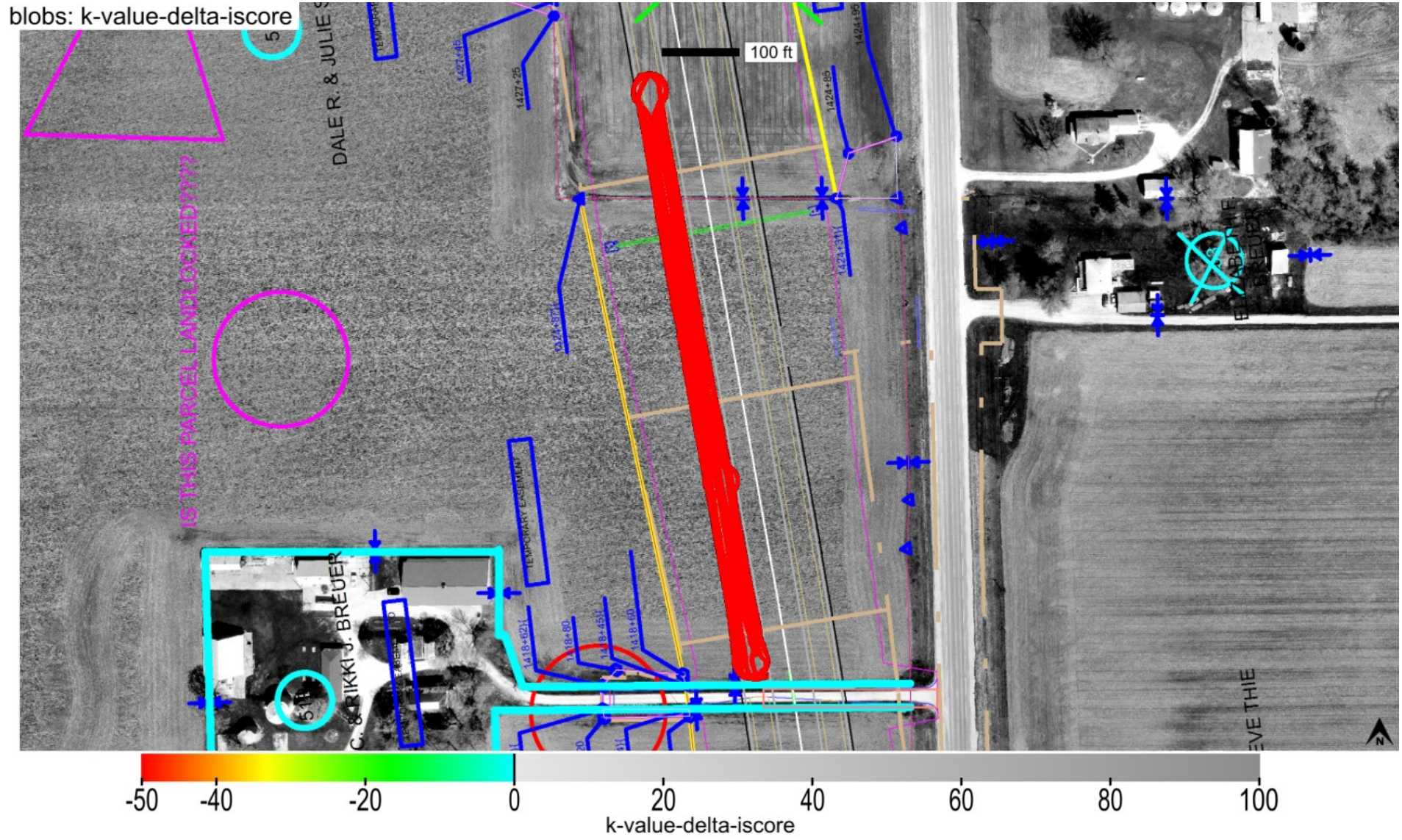
Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	0	150	-115	-114.5	-32.82	-115	-114.49	-104.32



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_29-us61_cs56-fcs00210_2020_05_11_164444a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	29509	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.

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Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_164444a

minimum	average	maximum
1	1.28	5

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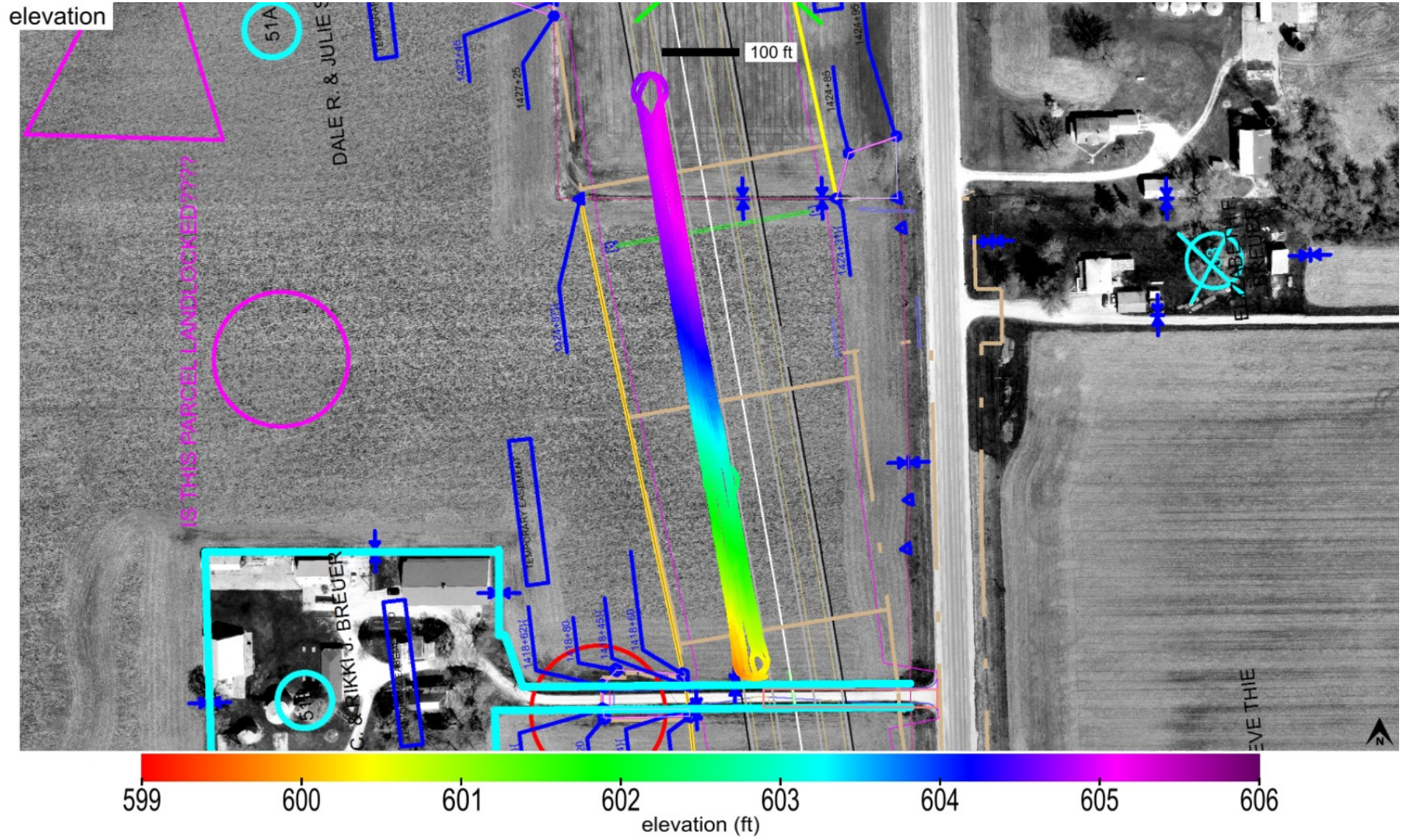
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_164444a

minimum	average	maximum
599.72	603.272	605.248



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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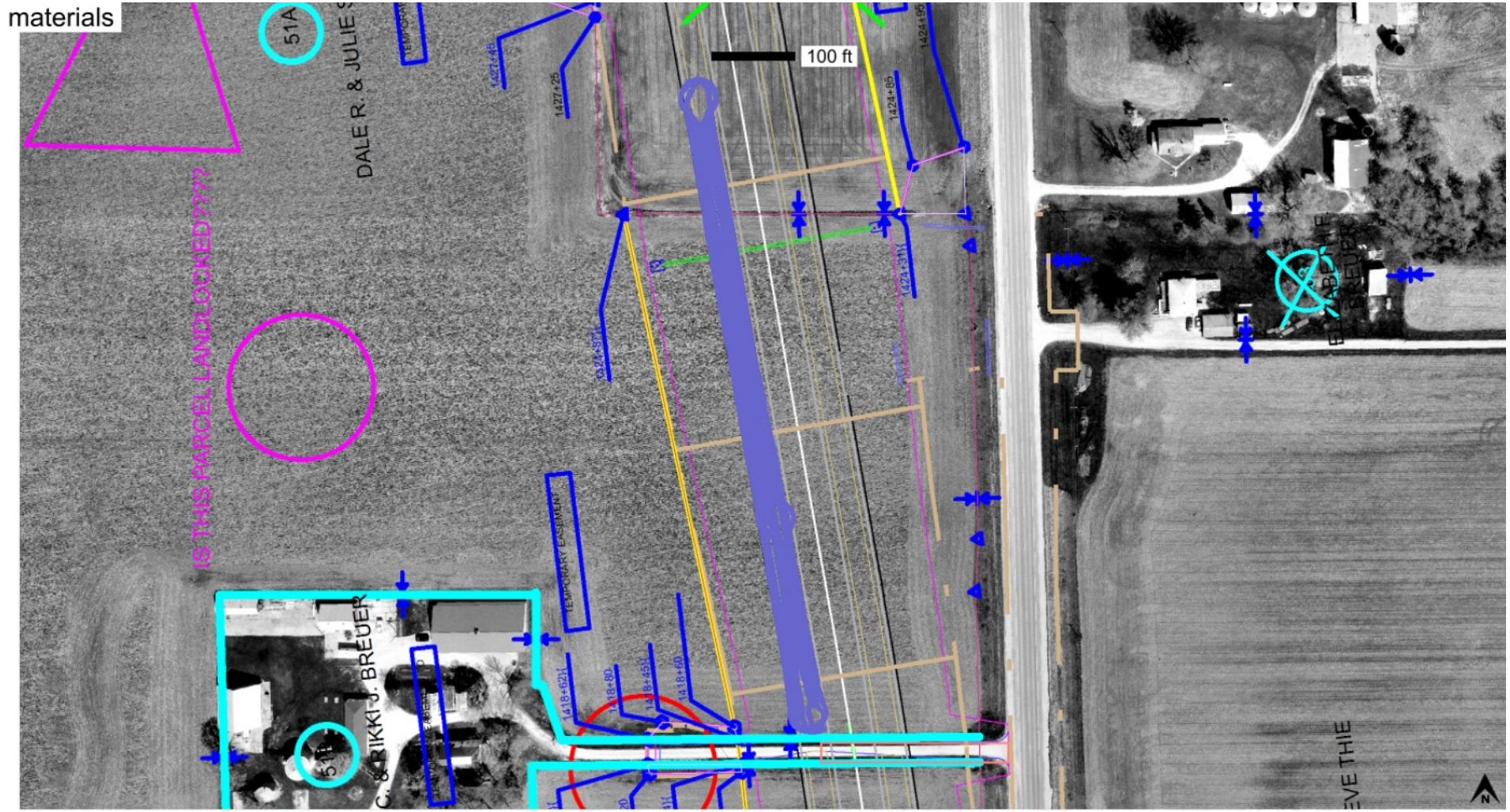
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_164444a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	29509	0.677	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_29-us61_cs56-fcs00210_2020_05_11_164444a

20200511_165301.jpg

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IOWADOT

E-Compaction Report

Project:	US61 Des Moines County	Mapping Duration (hrs):	0.46	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2020_05_11_170203a	No. of Measurements:	55062	Machine ID:	Ingios_FCS00210
Date and Time:	5/11/2020 5:02:03 PM	Location:	Des Moines 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	20.4	-1.67	150	35	38.3	106.45	7.35	19.2	-115	-111.7	-43.55
Moisture Content	No												

Mapped Area

square feet	acres
55062	1.26

Pass Count

min.	avg.	max.
1	1.13	4

Elevation (ft)

min.	avg.	max.
586.44	592.93	600.21

Velocity (fps)

min.	avg.	max.
0.6	5.5	5.96

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	55062	1.264	12	3000	150	40

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IOWADOT

E-Compaction Report

Project:	US61 Des Moines County	Mapping Duration (hrs):	0.46	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2020_05_11_170203a	No. of Measurements:	55062	Machine ID:	Ingios_FCS00210
Date and Time:	5/11/2020 5:02:03 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
125.6	CQI > = 95
100	80% of Resilient Modulus MVs >= 3000
8.79	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:	US61 Des Moines County	Mapping Duration (hrs):	0.46	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2020_05_11_170203a	No. of Measurements:	55062	Machine ID:	Ingios_FCS00210
Date and Time:	5/11/2020 5:02:03 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
20.4	CQI > = 95
0	80% of k-Value MVs >= 150
19.2	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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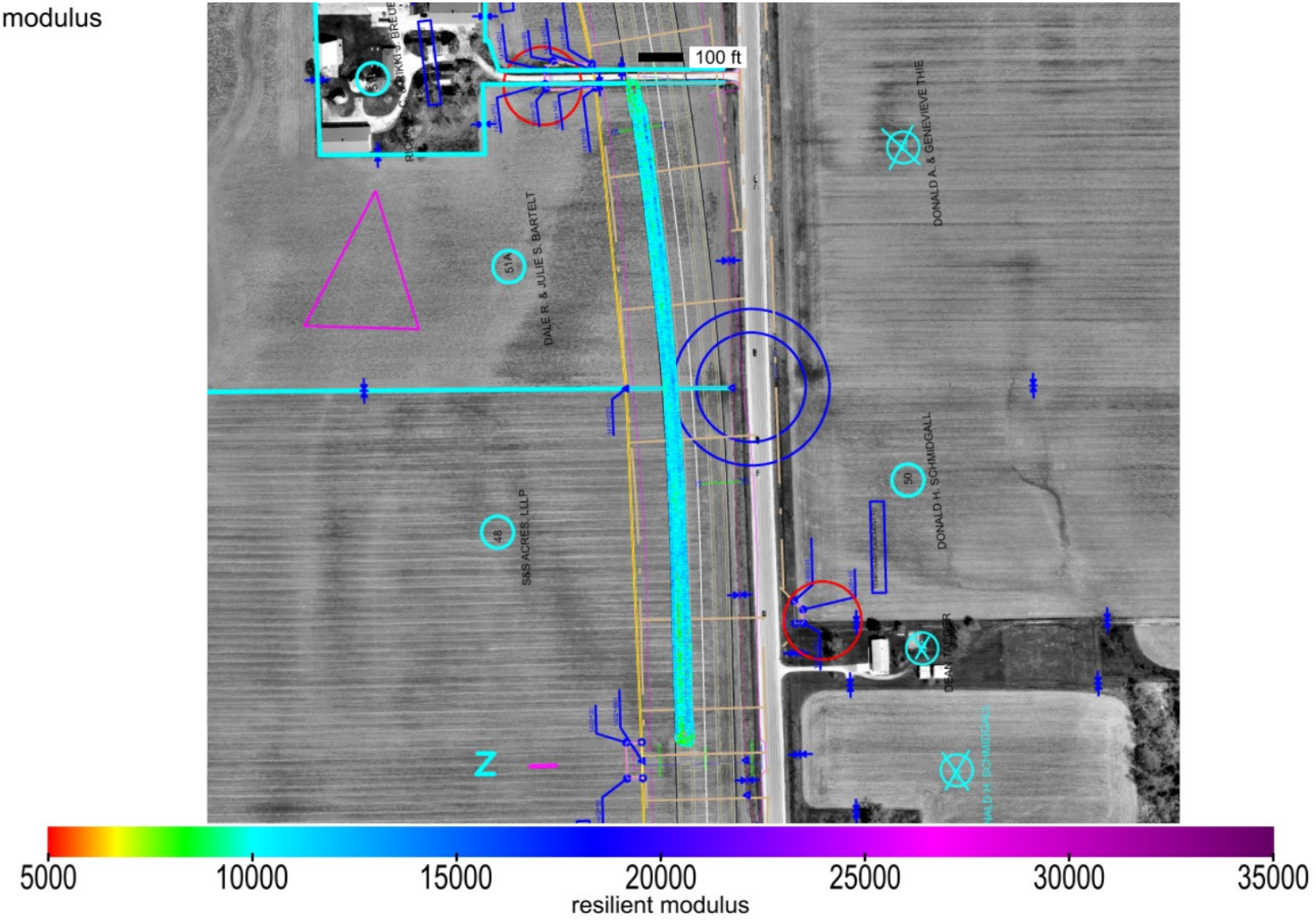
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_170203a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	No	100	125.6	3.08	3000	6545.36	10642.1	15746.2	935.18	8.79	3545.36	7642.1	12746.2

resilient modulus

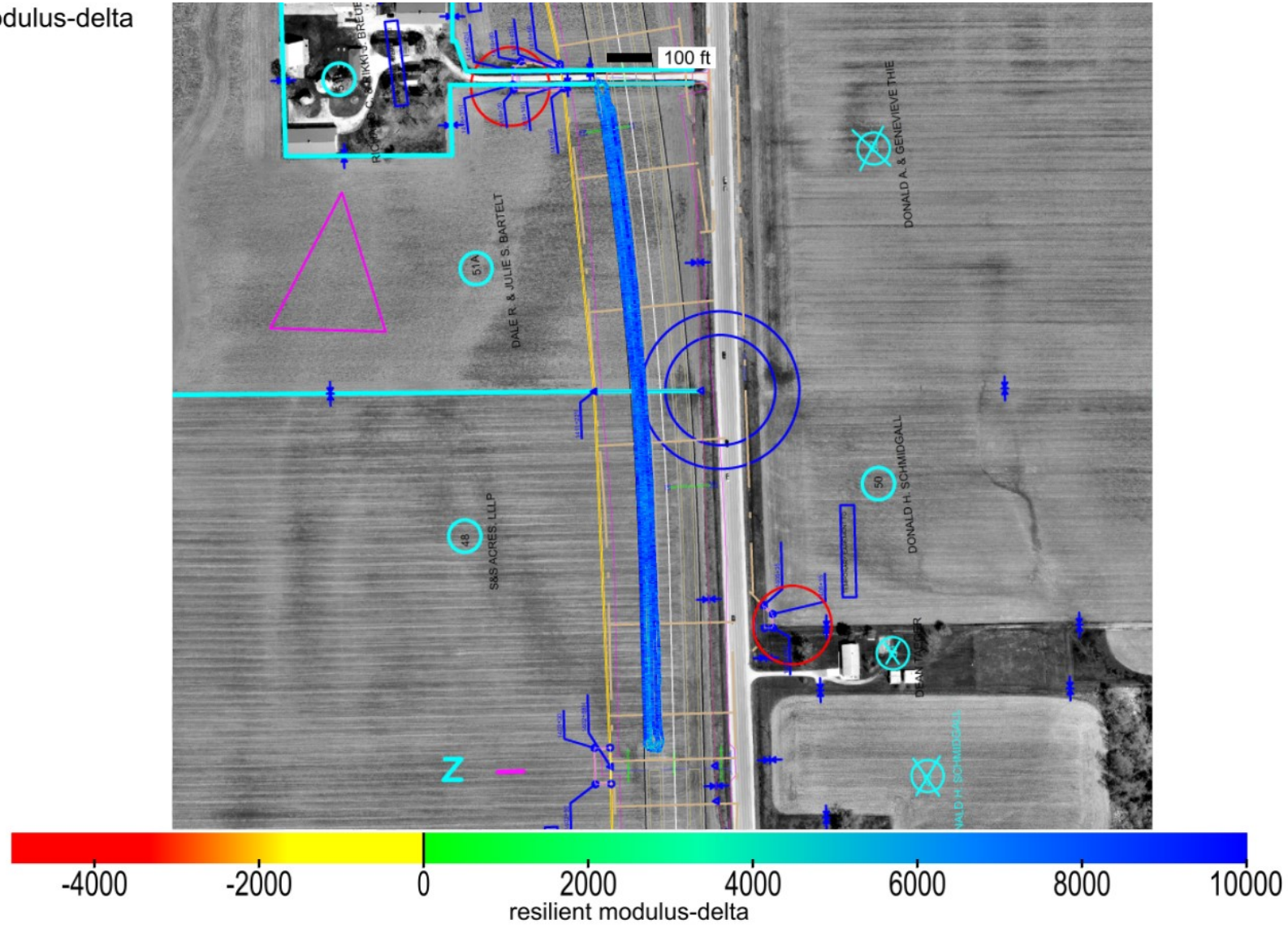


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_170203a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	No	100	125.6	3.08	3000	6545.36	10642.1	15746.2	935.18	8.79	3545.36	7642.1	12746.2

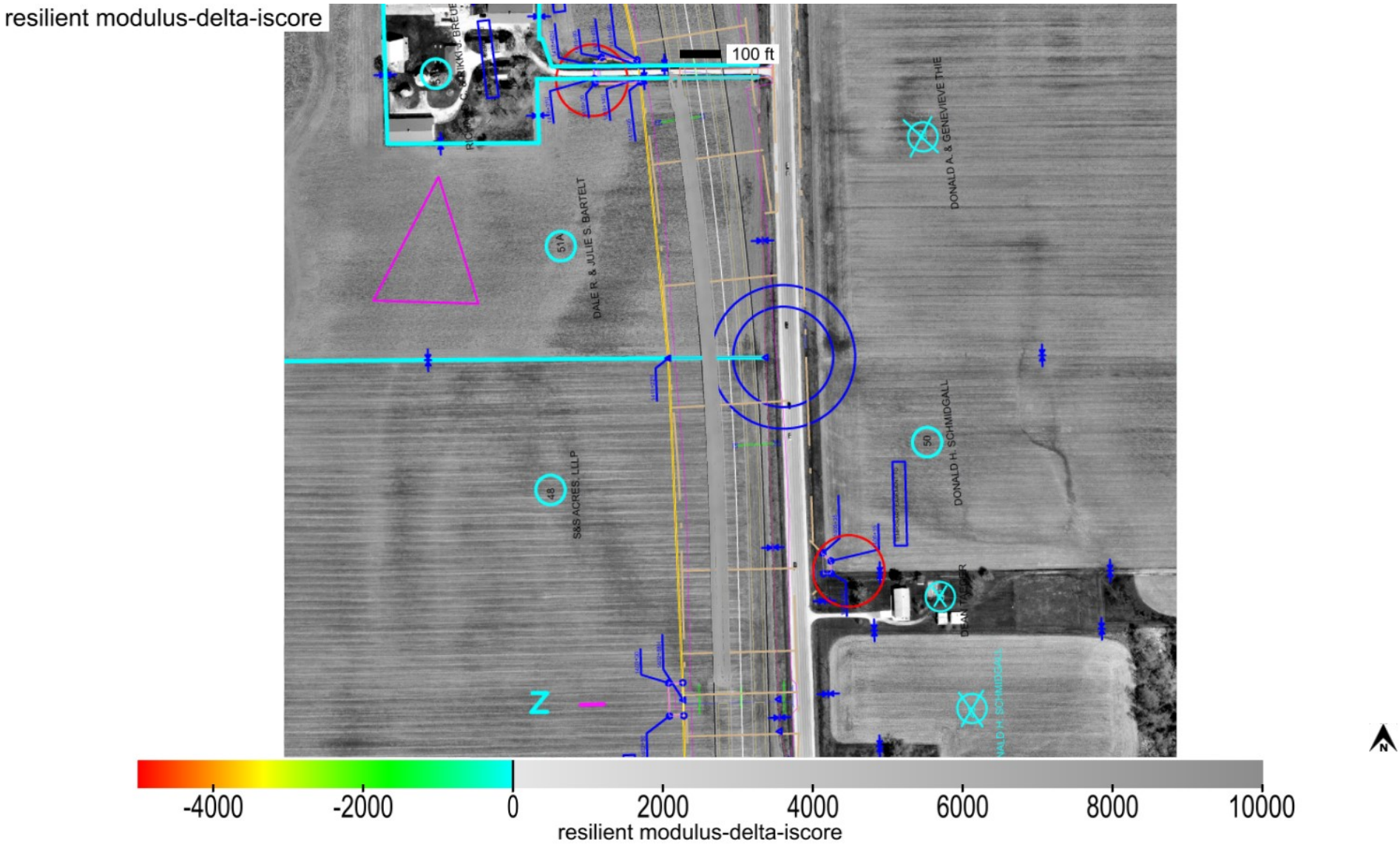
resilient modulus-delta



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

Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_170203a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	No	100	3000	3545.36	7642.1	12746.2	5612.03	7643.53	9179.25

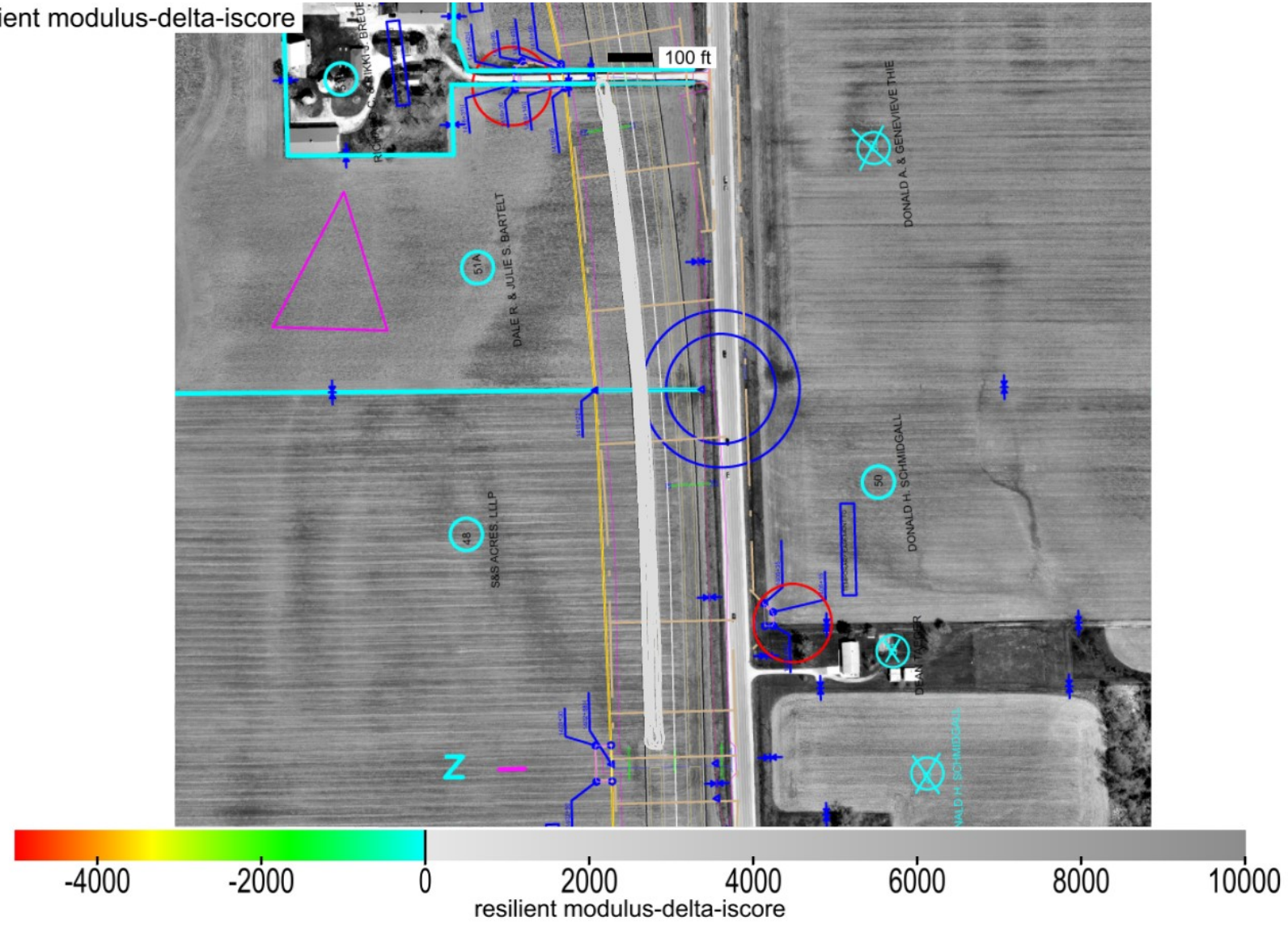


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_170203a

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

blobs: resilient modulus-delta-iscore

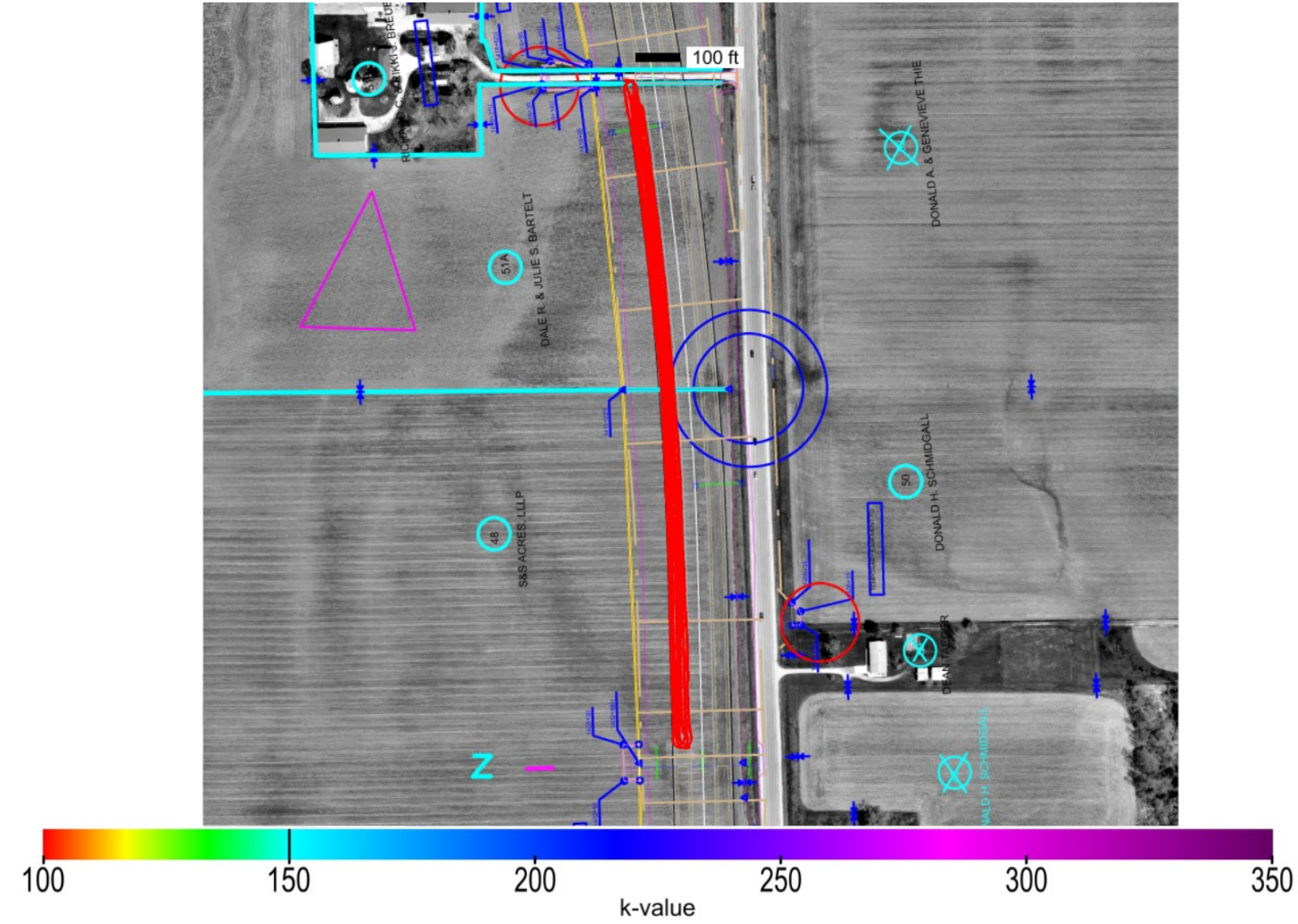


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_170203a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0	20.4	-1.67	150	35	38.3	106.45	7.35	19.2	-115	-111.7	-43.55

k-value

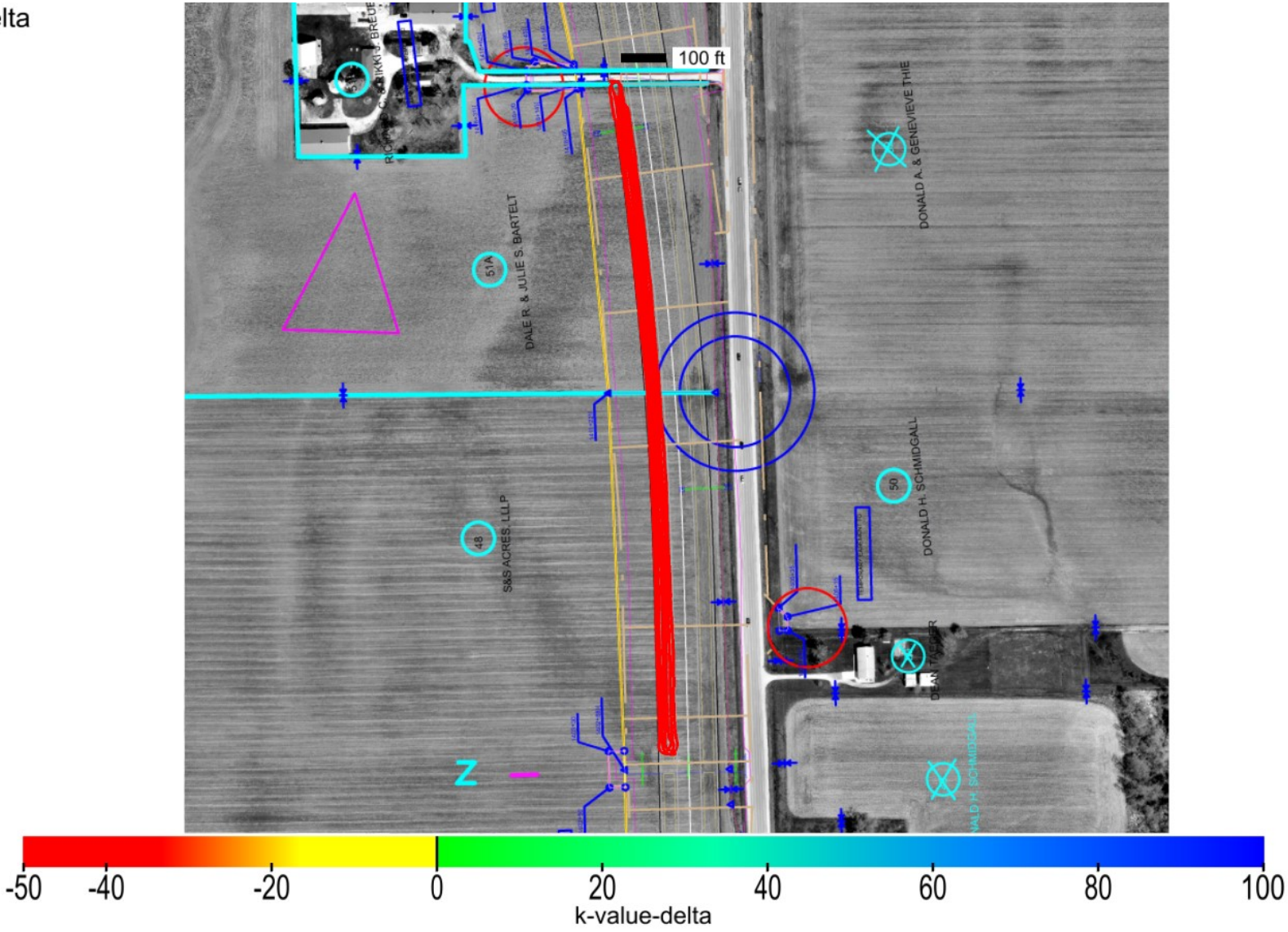


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_170203a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0	20.4	-1.67	150	35	38.3	106.45	7.35	19.2	-115	-111.7	-43.55

k-value-delta



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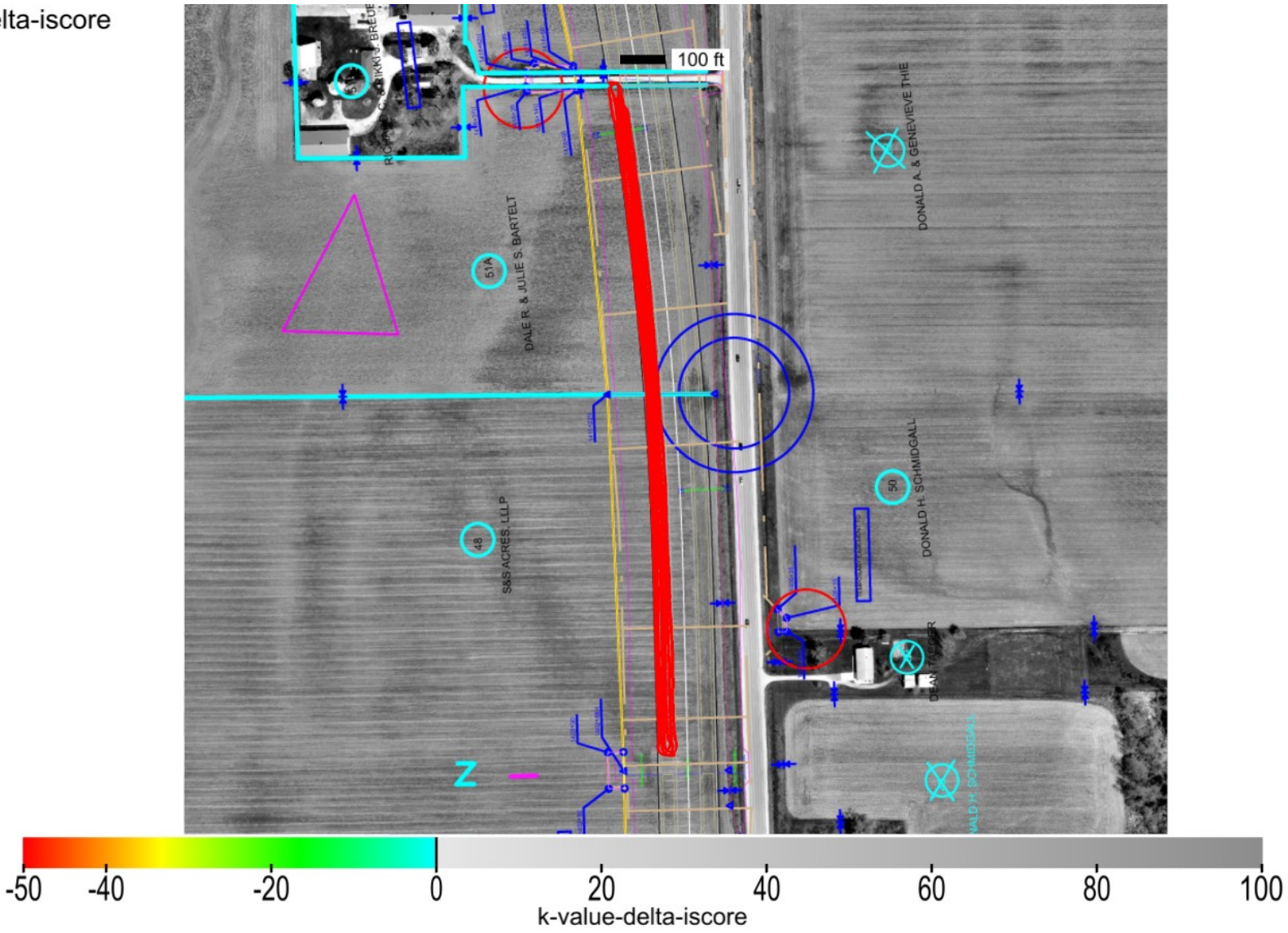
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_170203a

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	-111.7	-43.55	-115	-111.65	-95.34

k-value-delta-iscore



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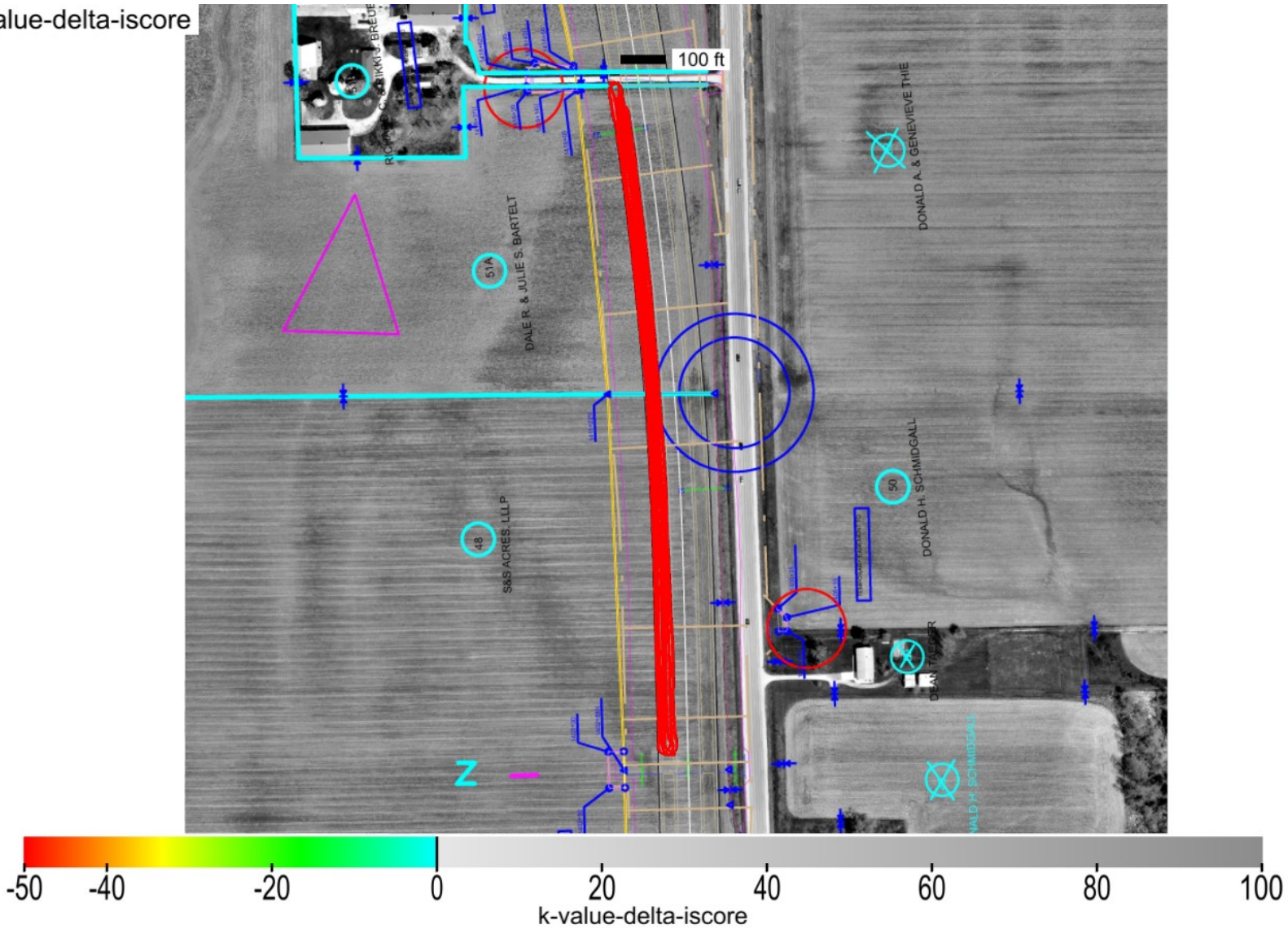
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_170203a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	55061	100	none	0

blobs: k-value-delta-iscore

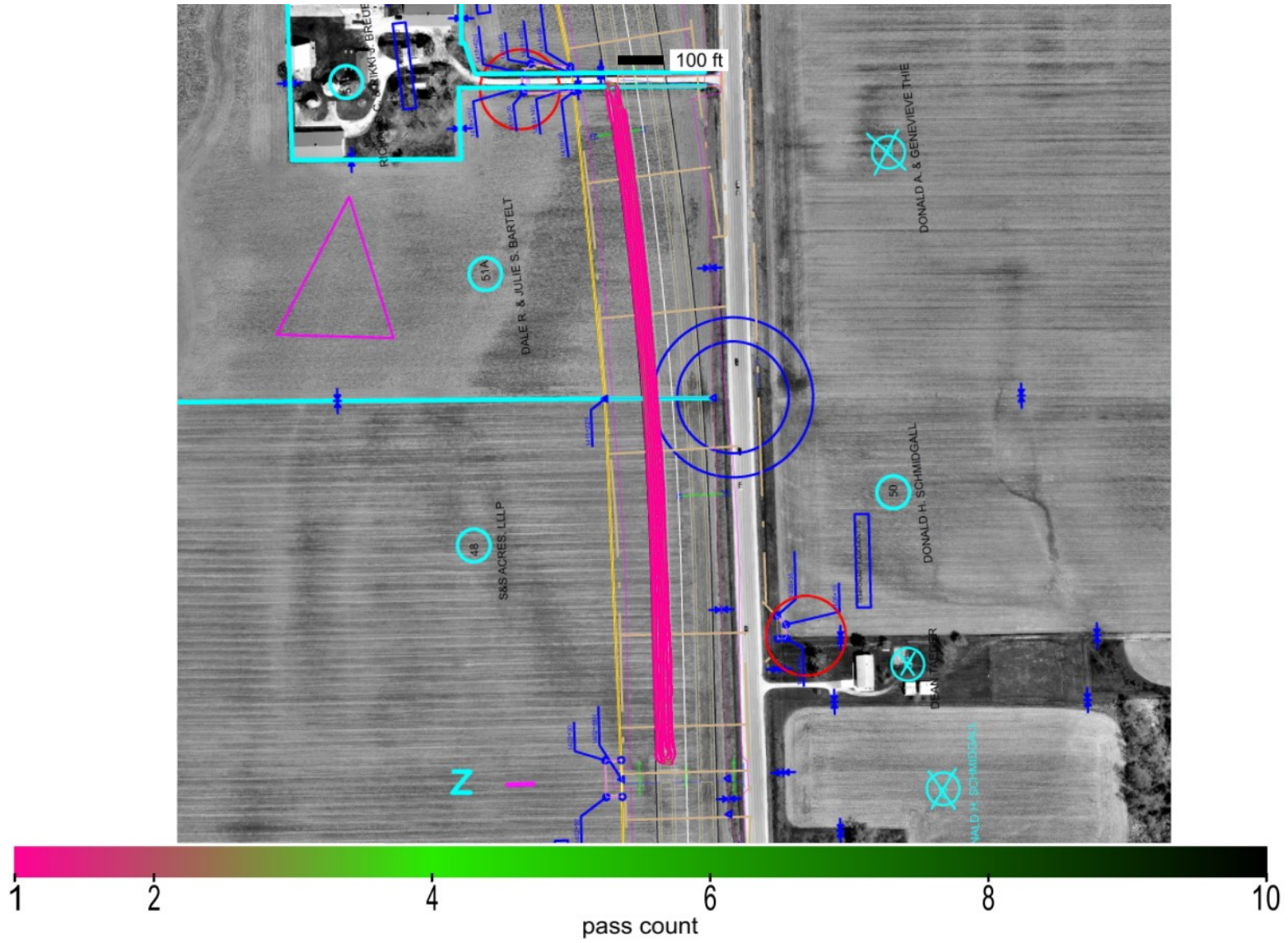


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_170203a

minimum	average	maximum
1	1.13	4

pass count

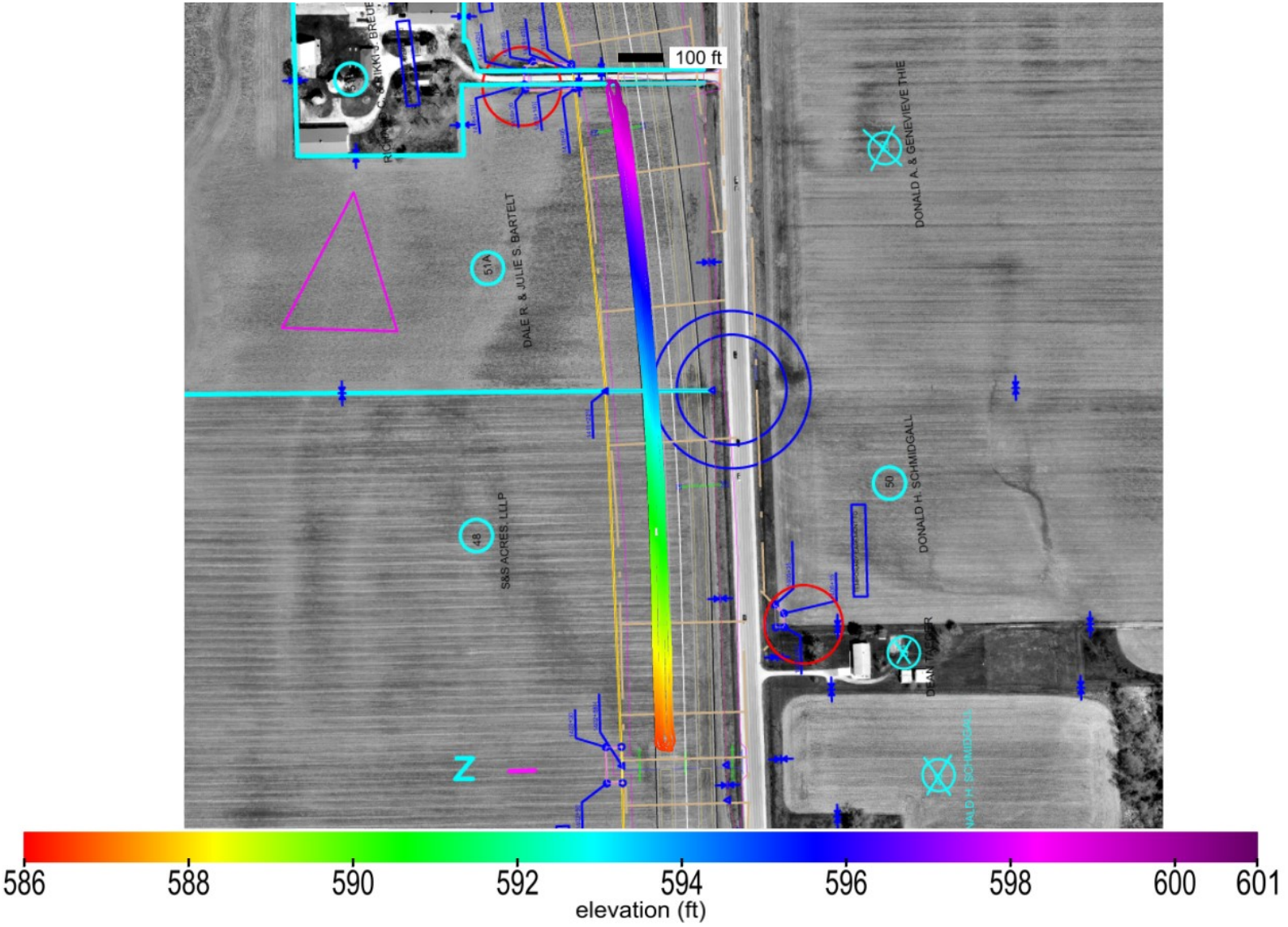


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_170203a

minimum	average	maximum
586.442	592.926	600.209

elevation



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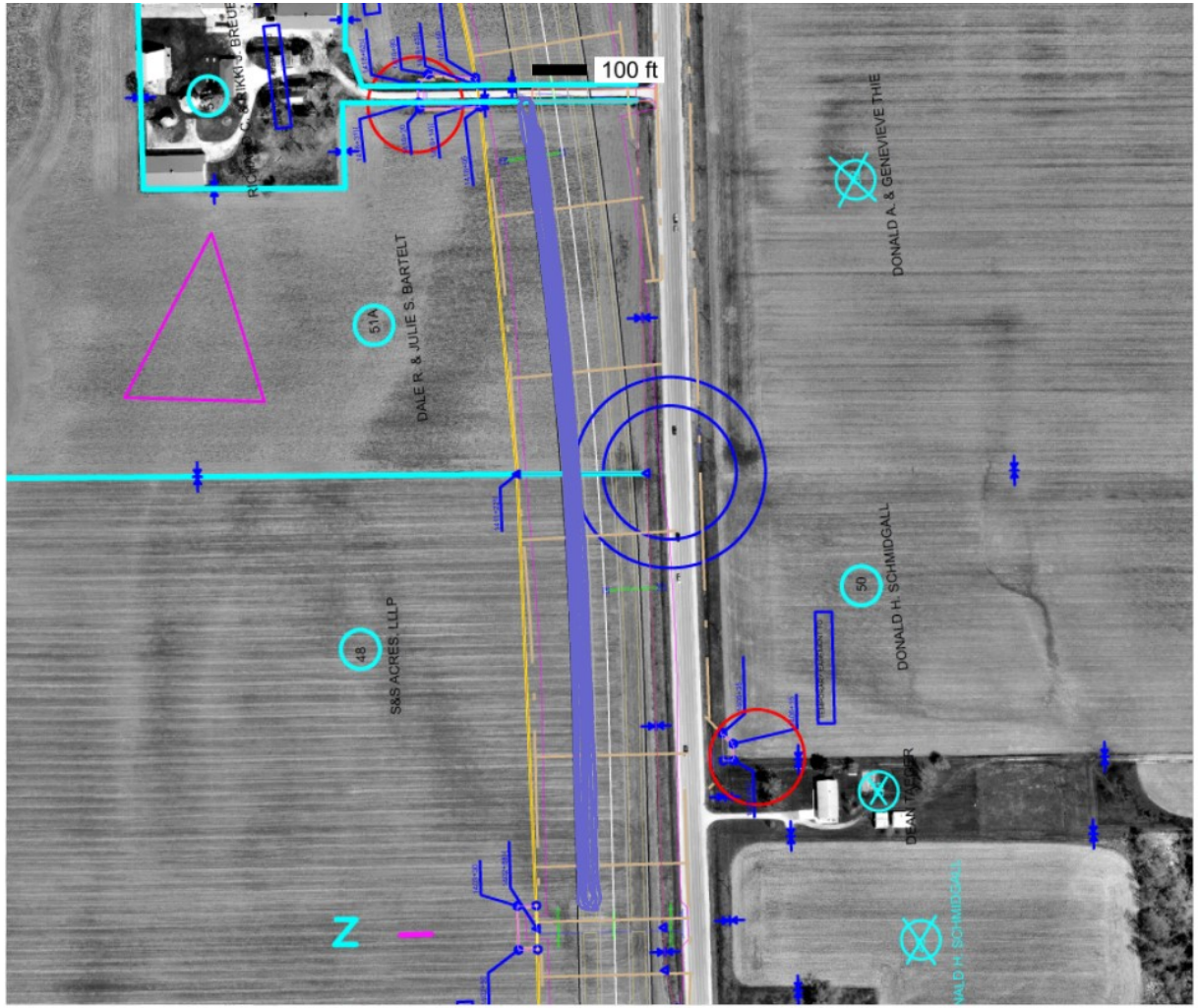
Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_170203a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Select Subgrade	24006	100	55062	1.264	12	3000	150	40

materials



Subgrade_Treatment Select Cohesive_IADOT (2102.02D)

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Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_170203a

20200511_173243.jpg

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Map ID: iadot_29-us61_cs56-fcs00210_2020_05_11_170203a

20200511_173414.jpg

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IOWADOT

E-Compaction Report

Project:	US61 Des Moines County	Mapping Duration (hrs):	0.34	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2020_06_16_134239a	No. of Measurements:	30297	Machine ID:	Ingios_FCS00210
Date and Time:	6/16/2020 1:42:39 PM	Location:	Des Moines 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	93.4	114.05	1.46	8553	6107.46	11090.8	24287.88	2076.07	18.72	-2445.54	2537.8	15734.88
k-value	Yes	0.6	16.66	-0.06	150	60	71.5	160	19.99	27.95	-90	-78.5	10
Moisture Content	No												

Mapped Area

square feet	acres
30297	0.7

Pass Count

min.	avg.	max.
1	1.49	5

Elevation (ft)

min.	avg.	max.
616.88	620.68	622.67

Velocity (fps)

min.	avg.	max.
1.06	5.48	6.16

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	30297	0.696	12	8553	150	40

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IOWADOT

E-Compaction Report

Project:	US61 Des Moines County	Mapping Duration (hrs):	0.34	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2020_06_16_134239a	No. of Measurements:	30297	Machine ID:	Ingios_FCS00210
Date and Time:	6/16/2020 1:42:39 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
114.05	CQI > = 95
93.4	80% of Resilient Modulus MVs >= 8553
18.72	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:	US61 Des Moines County	Mapping Duration (hrs):	0.34	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2020_06_16_134239a	No. of Measurements:	30297	Machine ID:	Ingios_FCS00210
Date and Time:	6/16/2020 1:42:39 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
16.66	CQI > = 95
0.6	80% of k-Value MVs >= 150
27.95	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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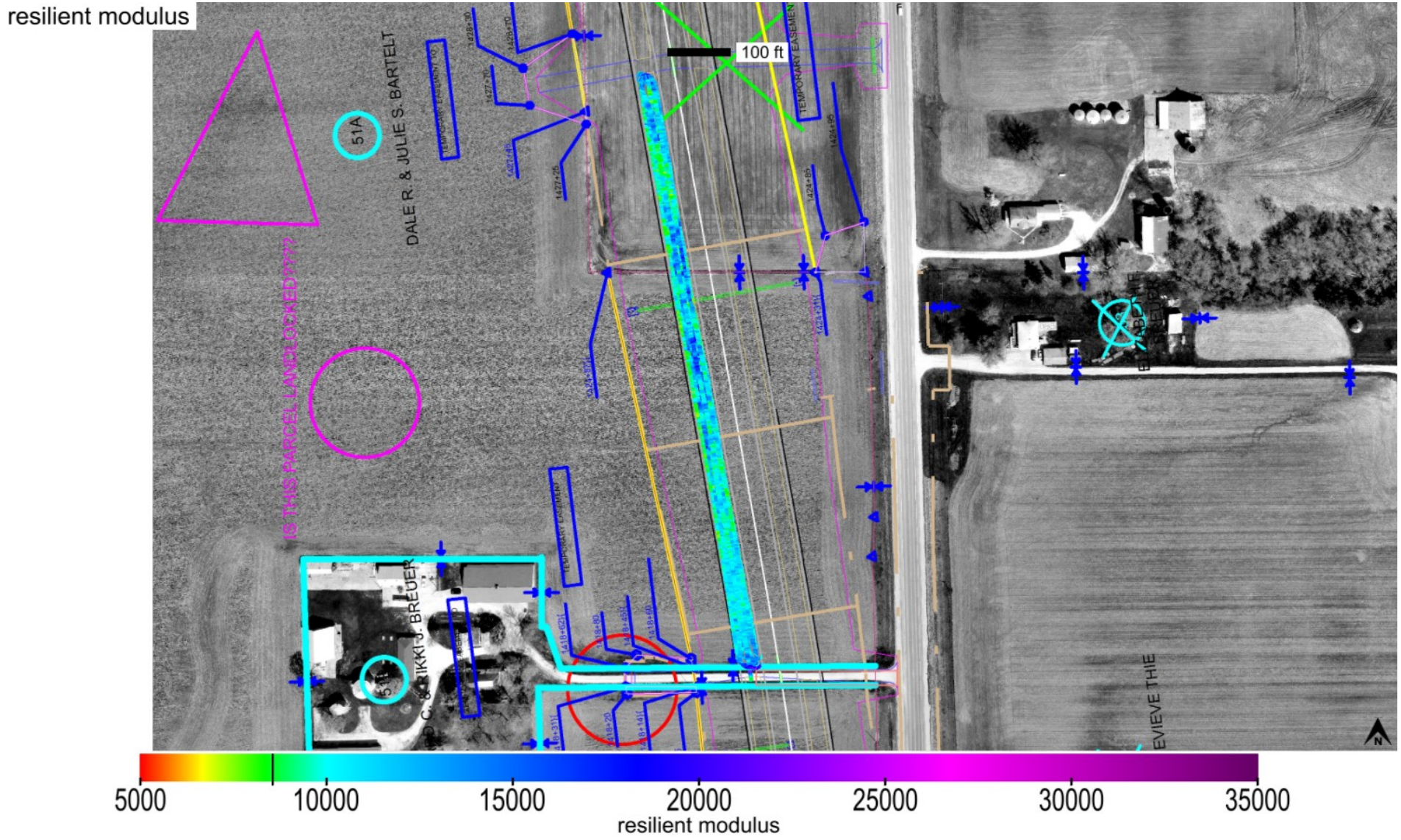
Map ID: iadot_29-us61_cs56-fcs00210_2020_06_16_134239a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	93.4	114.05	1.46	8553	6107.46	11090.8	24287.88	2076.07	18.72	-2445.54	2537.8	15734.88



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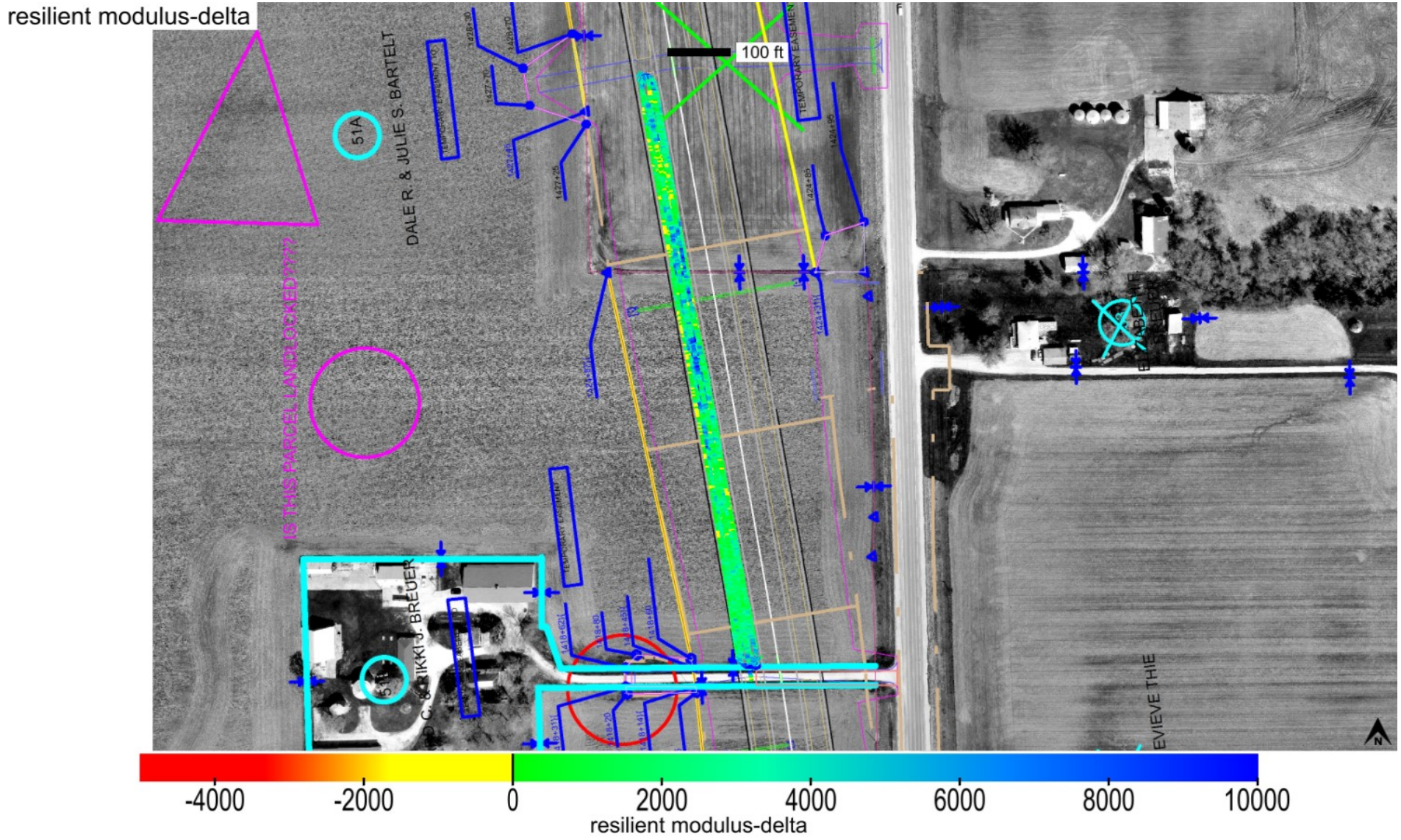
Map ID: iadot_29-us61_cs56-fcs00210_2020_06_16_134239a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	93.4	114.05	1.46	8553	6107.46	11090.8	24287.88	2076.07	18.72	-2445.54	2537.8	15734.88

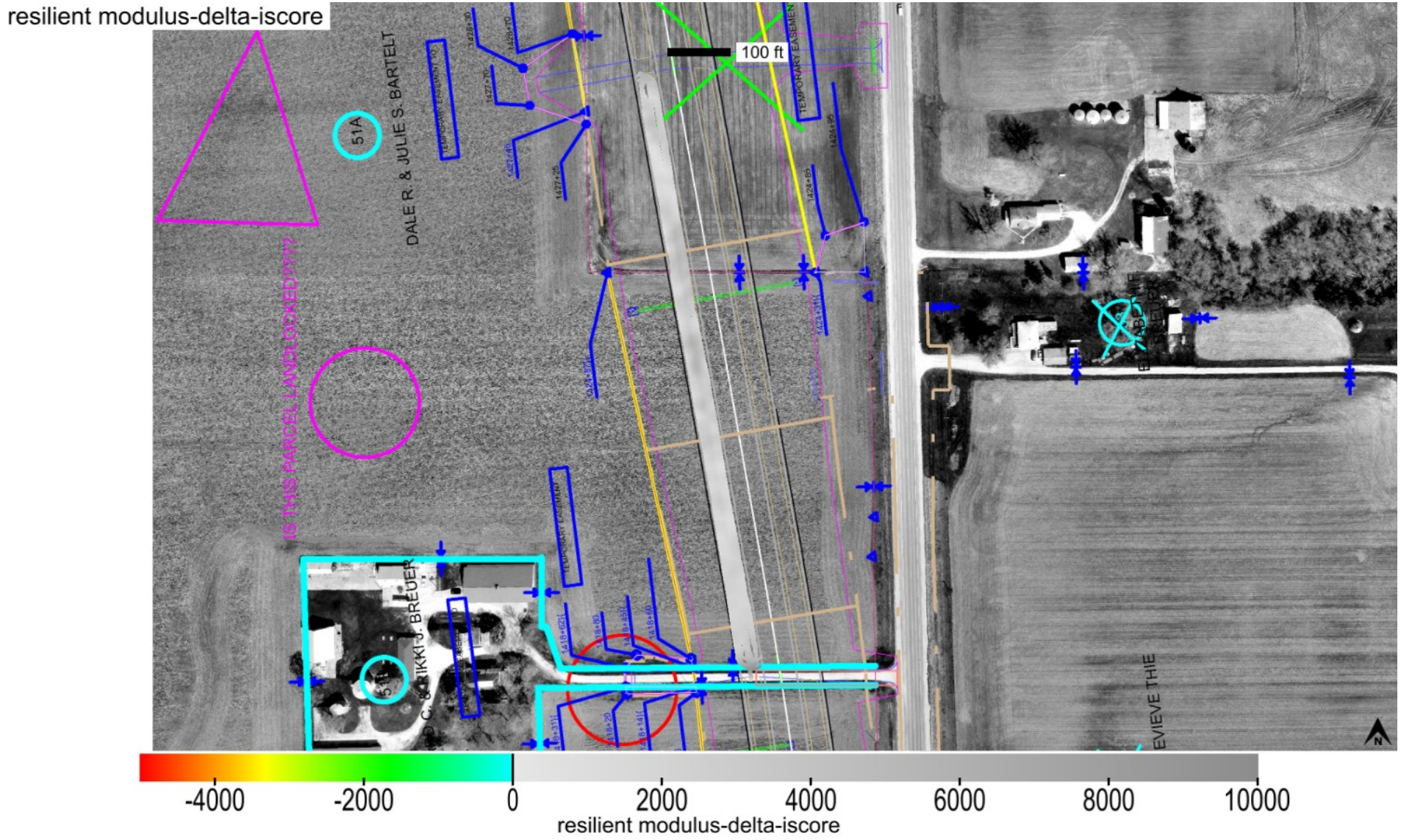


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_29-us61_cs56-fcs00210_2020_06_16_134239a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	93.4	8553	-2445.54	2537.8	15734.88	155.73	2596.23	10137.79



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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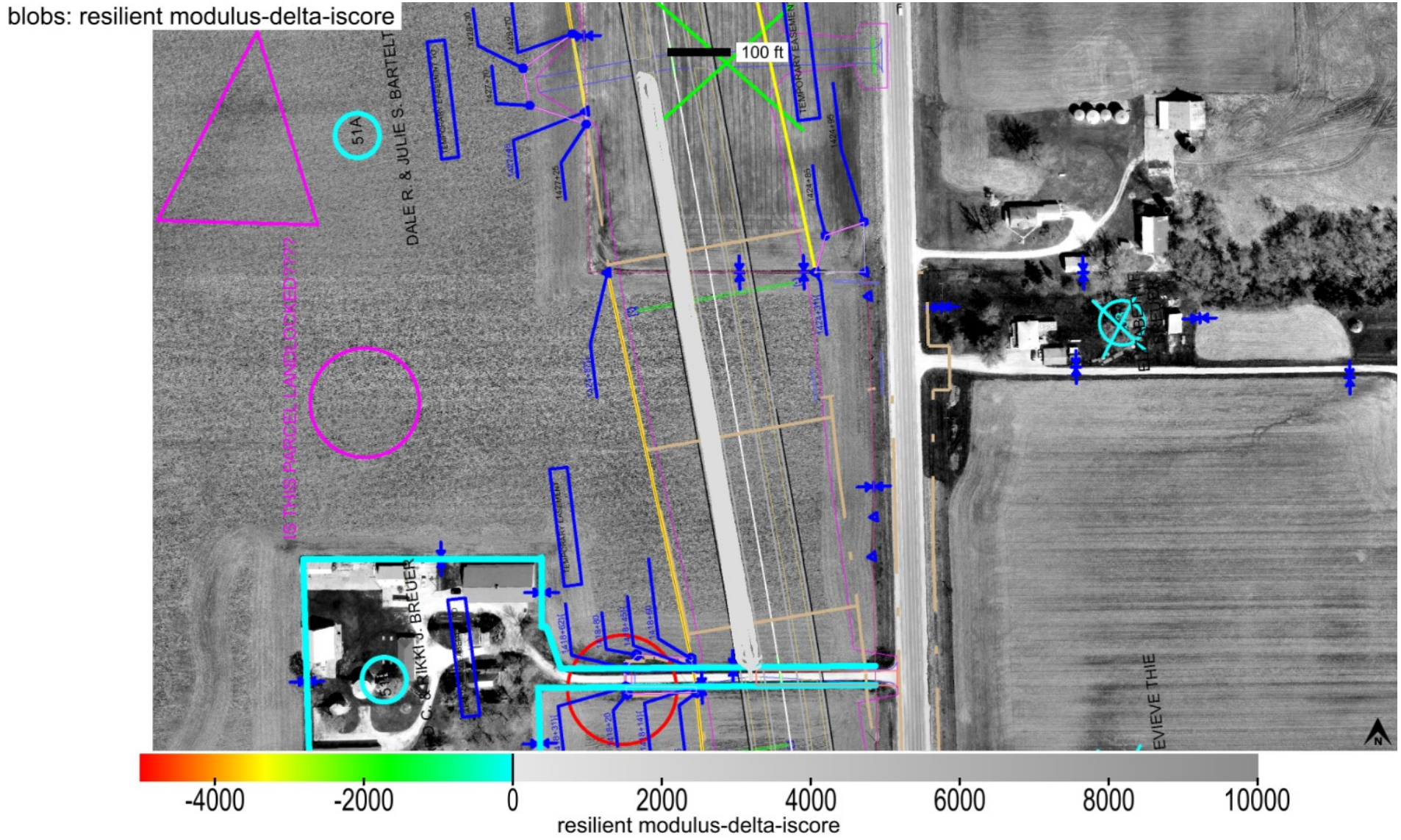
Map ID: iadot_29-us61_cs56-fcs00210_2020_06_16_134239a

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



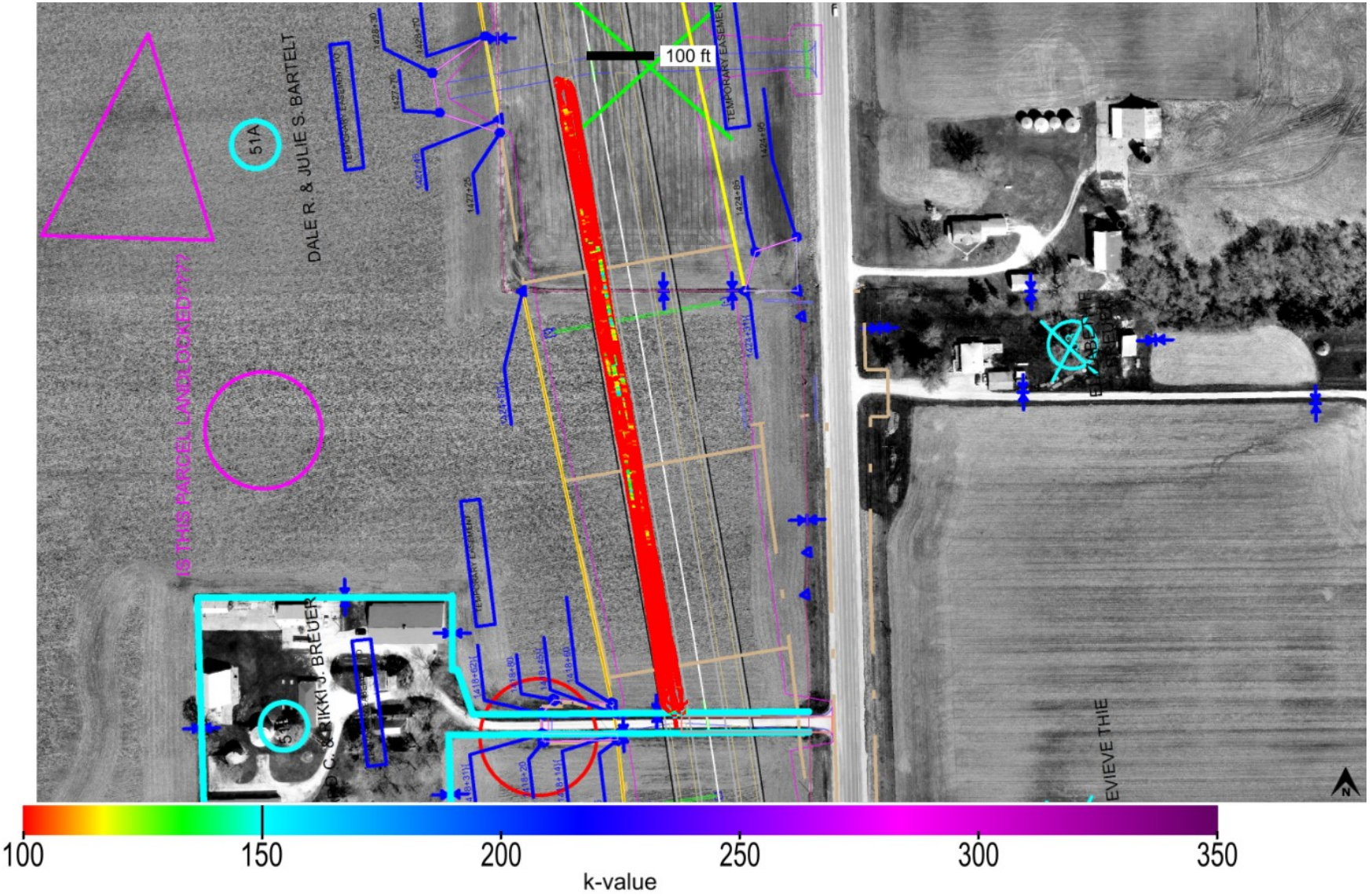
This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_29-us61_cs56-fcs00210_2020_06_16_134239a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.6	16.66	-0.06	150	60	71.5	160	19.99	27.95	-90	-78.5	10

k-value



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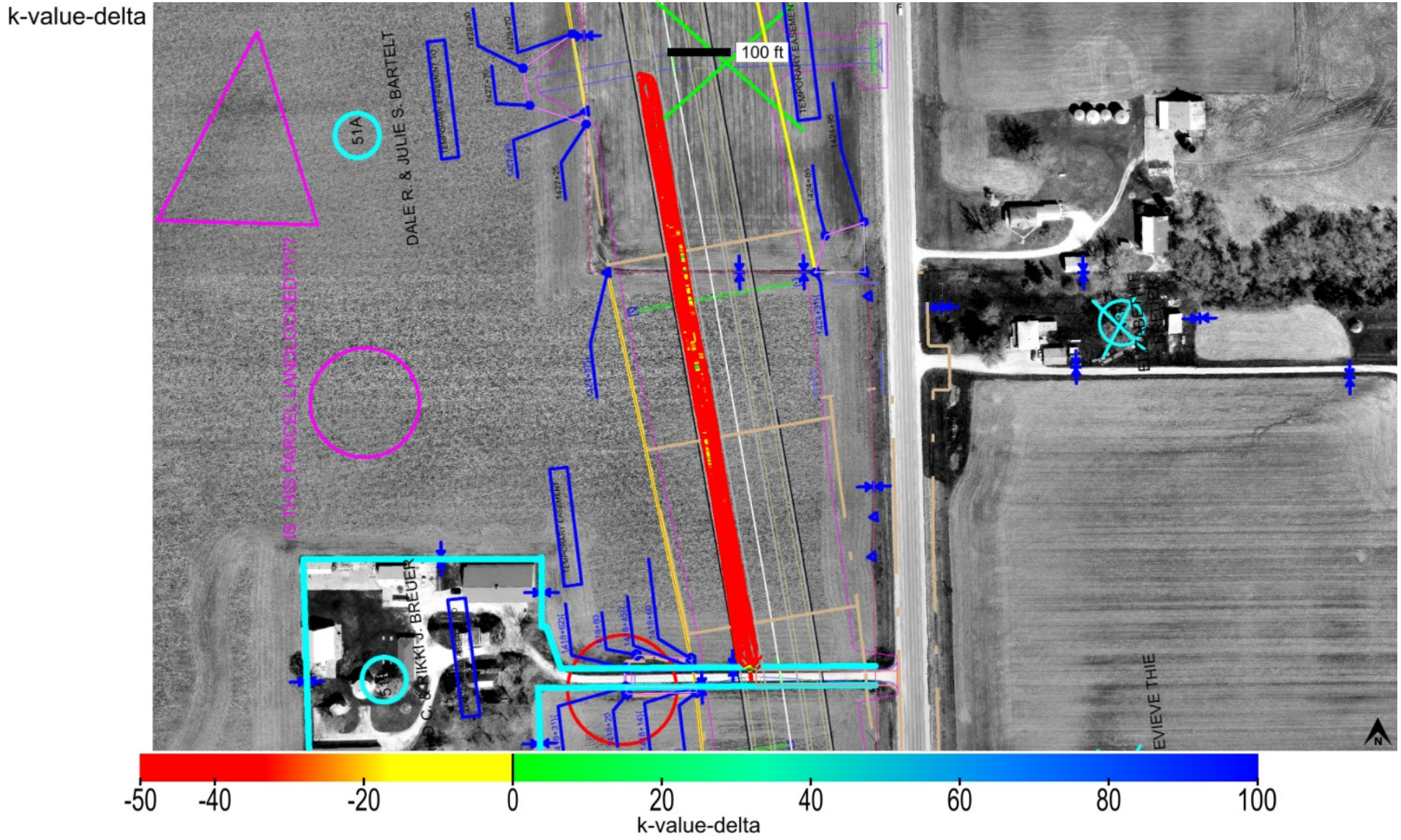
Map ID: iadot_29-us61_cs56-fcs00210_2020_06_16_134239a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.6	16.66	-0.06	150	60	71.5	160	19.99	27.95	-90	-78.5	10



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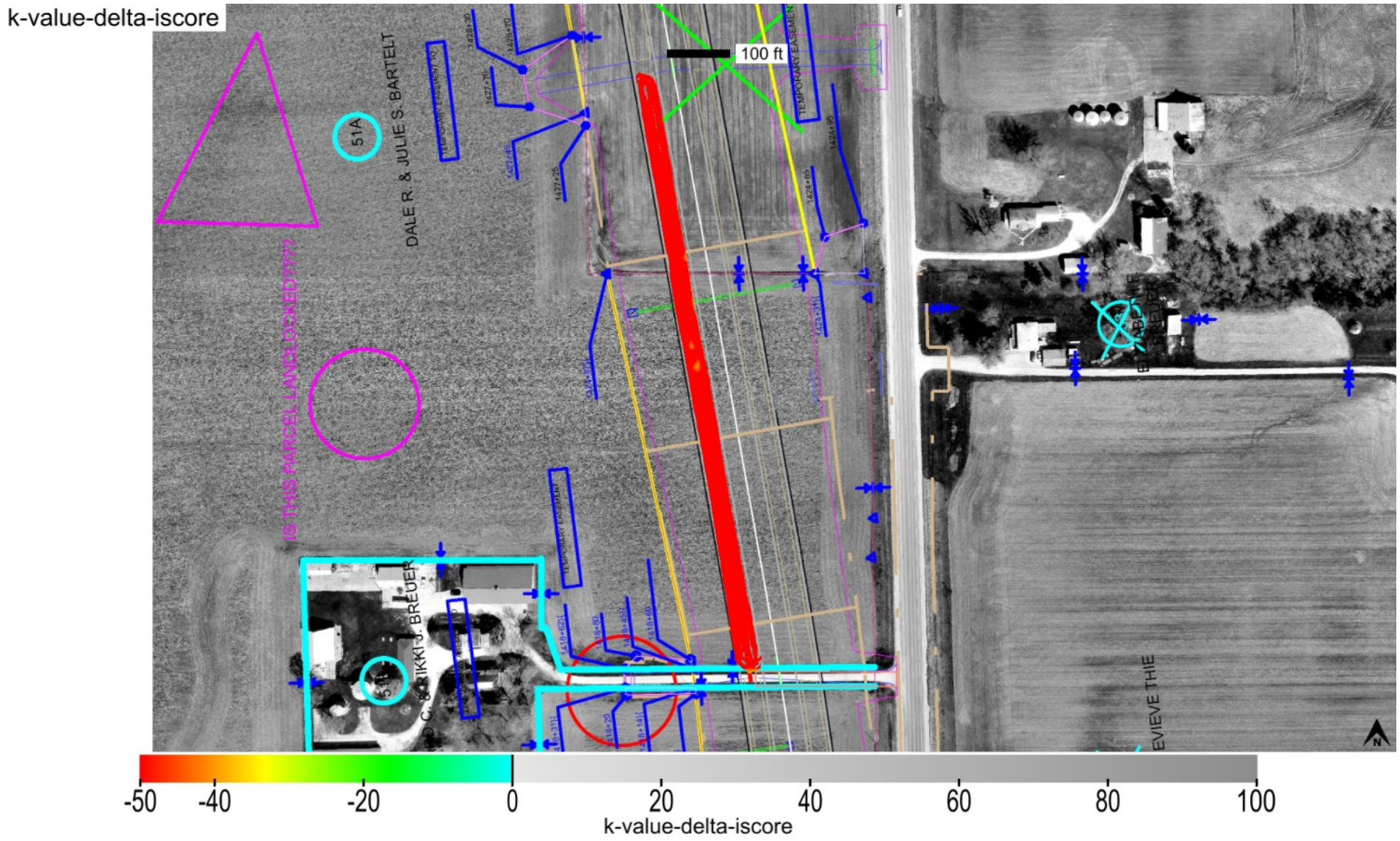
ingios GEOTECHNICS

Map ID: iadot_29-us61_cs56-fcs00210_2020_06_16_134239a

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	-78.5	10	-90	-77.88	-37.85



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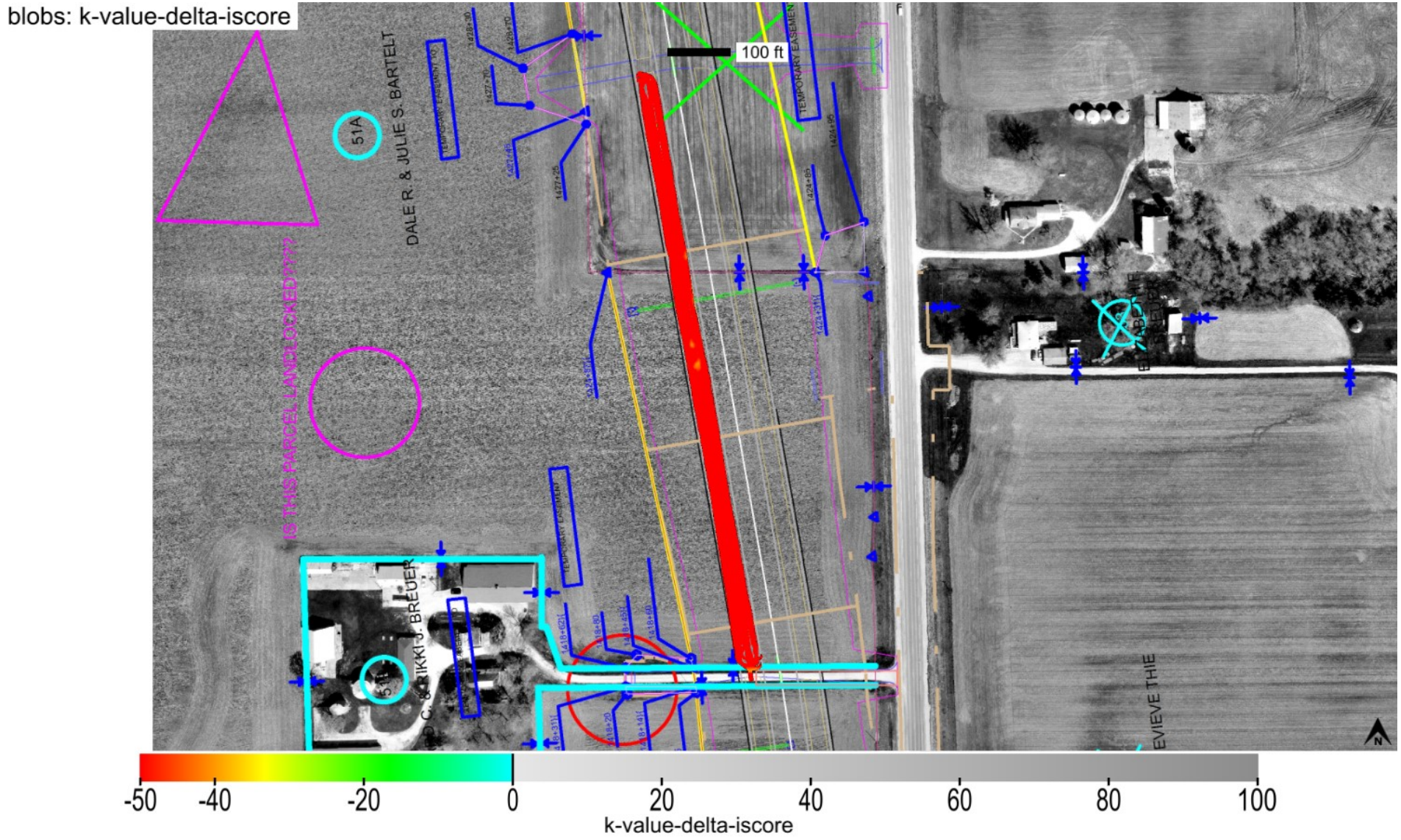
ingios GEOTECHNICS

Map ID: iadot_29-us61_cs56-fcs00210_2020_06_16_134239a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	30296	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.

ingios GEOTECHNICS

Map ID: iadot_29-us61_cs56-fcs00210_2020_06_16_134239a

minimum	average	maximum
1	1.49	5

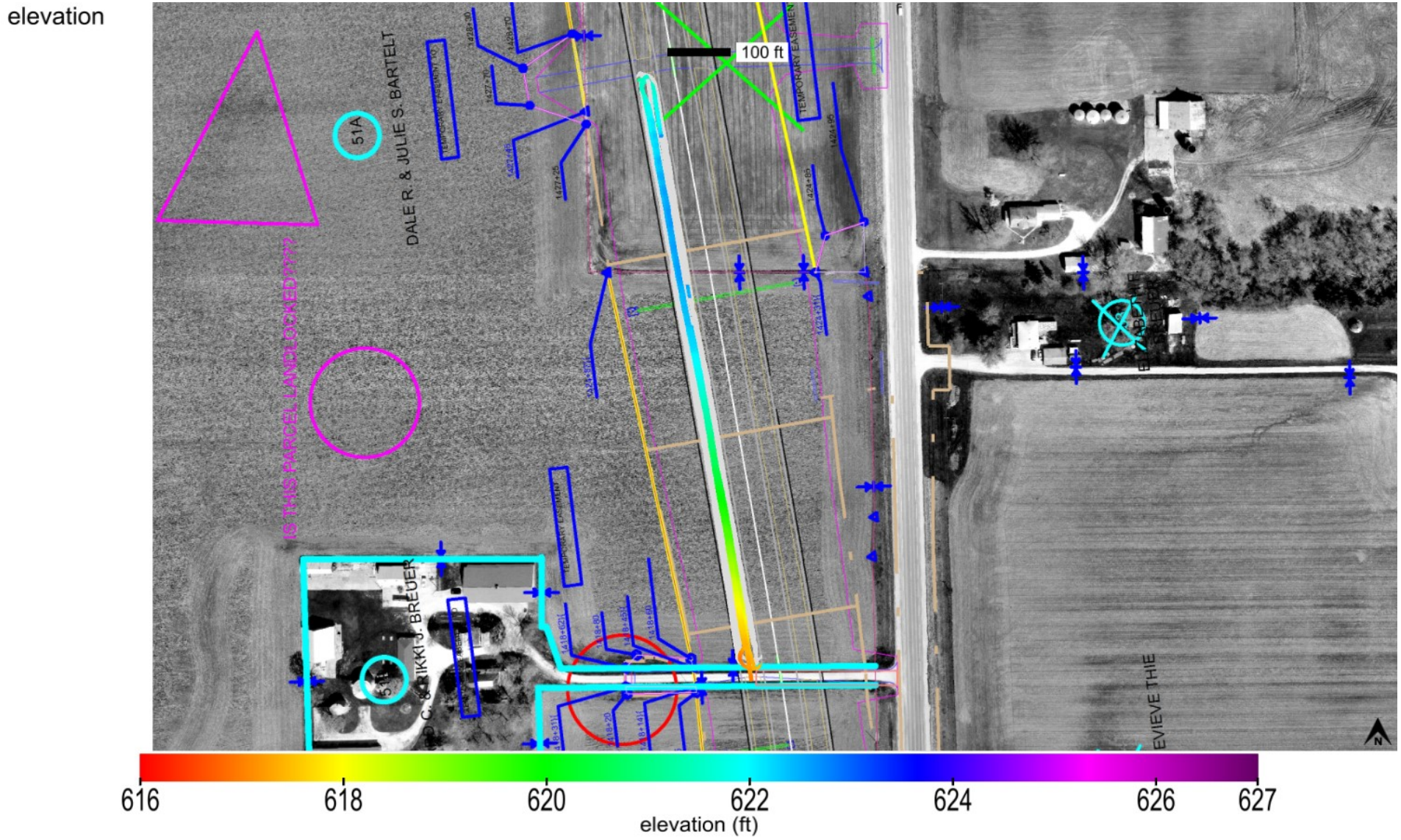
pass count

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_29-us61_cs56-fcs00210_2020_06_16_134239a

minimum	average	maximum
616.885	620.681	622.669



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_29-us61_cs56-fcs00210_2020_06_16_134239a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	30297	0.696	12	8553	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.

Map ID: iadot_29-us61_cs56-fcs00210_2020_06_16_134239a

20200616_172929.jpg

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US61 Des Moines County	Mapping Duration (hrs):	1.43	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2020_06_16_141451a	No. of Measurements:	52210	Machine ID:	Ingios_FCS00210
Date and Time:	6/16/2020 2:14:51 PM	Location:	Des Moines 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	87.1	109.06	1.65	8553	5763.75	9857.8	29254.99	1591.93	16.15	-2789.25	1304.8	20701.99
k-value	Yes	0.3	21.35	-0.29	150	60	64.8	160	11.58	17.86	-90	-85.2	10
Moisture Content	No												

Mapped Area

square feet	acres
52210	1.2

Pass Count

min.	avg.	max.
1	3.55	9

Elevation (ft)

min.	avg.	max.
603.48	610.04	617.83

Velocity (fps)

min.	avg.	max.
0.28	5.5	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	52210	1.199	12	8553	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:	US61 Des Moines County	Mapping Duration (hrs):	1.43	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2020_06_16_141451a	No. of Measurements:	52210	Machine ID:	Ingios_FCS00210
Date and Time:	6/16/2020 2:14:51 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
109.06	CQI > = 95
87.1	80% of Resilient Modulus MVs >= 8553
16.15	COV <= 20
1.03	% 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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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US61 Des Moines County	Mapping Duration (hrs):	1.43	Operator:	Ingios Geotechnics inc
Map ID:	iadot_29-us61_cs56-fcs00210_2020_06_16_141451a	No. of Measurements:	52210	Machine ID:	Ingios_FCS00210
Date and Time:	6/16/2020 2:14:51 PM	Location:	Des Moines County	State Plane:	1402 IOWA SOUTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
21.35	CQI > = 95
0.3	80% of k-Value MVs >= 150
17.86	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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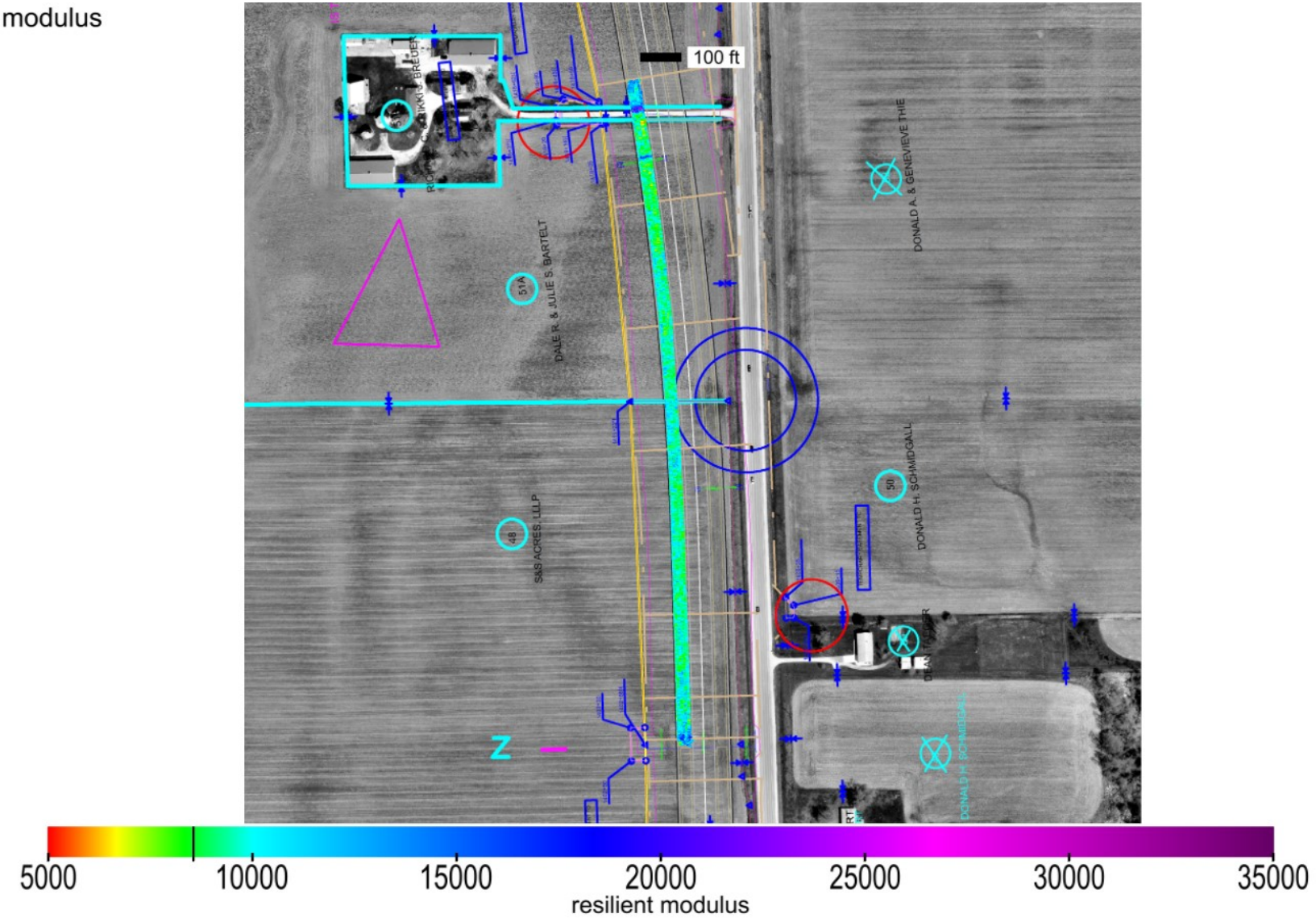
ingios GEOTECHNICS

Map ID: iadot_29-us61_cs56-fcs00210_2020_06_16_141451a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	87.1	109.06	1.65	8553	5763.75	9857.8	29254.99	1591.93	16.15	-2789.25	1304.8	20701.99

resilient modulus



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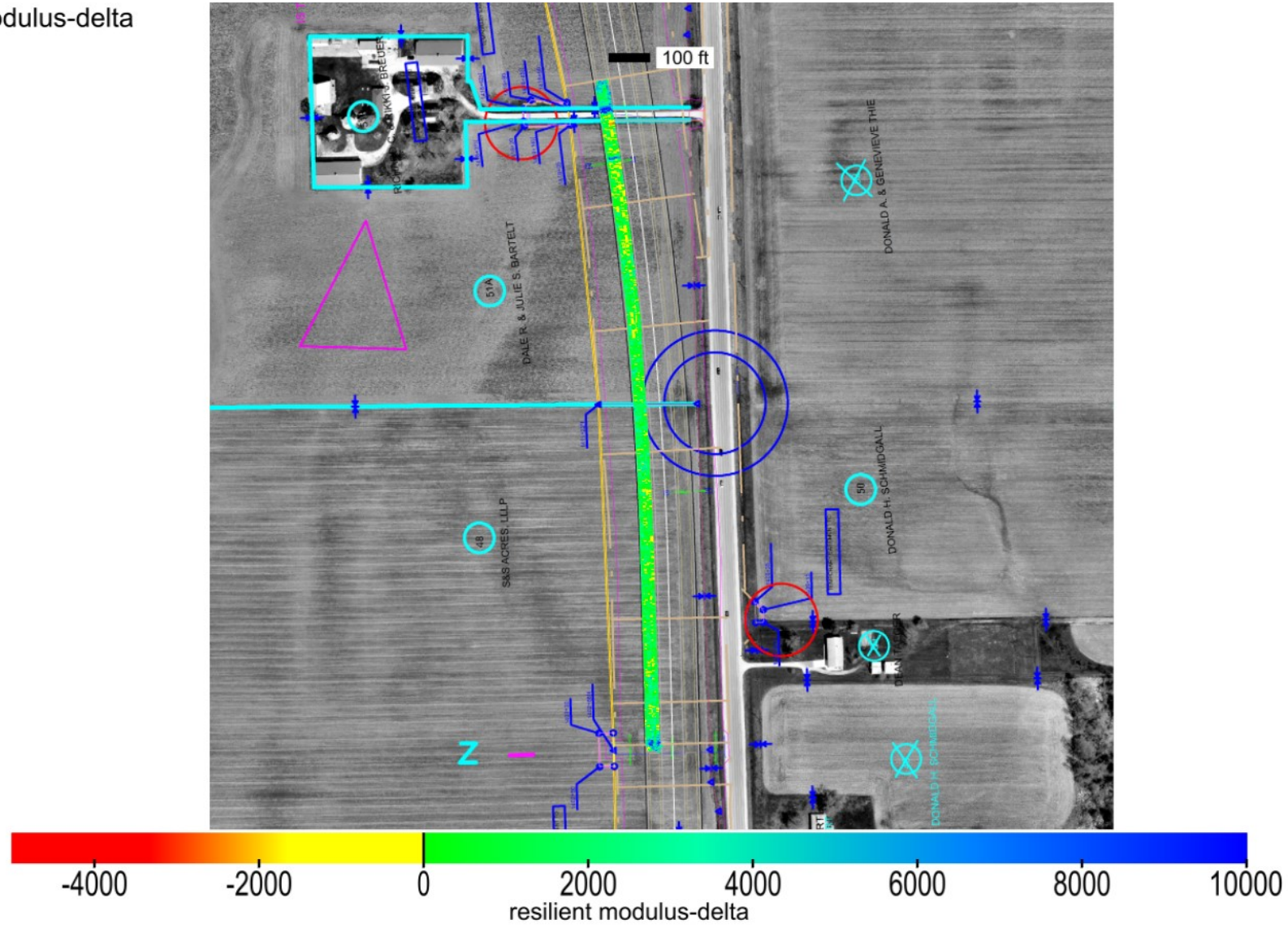
Map ID: iadot_29-us61_cs56-fcs00210_2020_06_16_141451a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	87.1	109.06	1.65	8553	5763.75	9857.8	29254.99	1591.93	16.15	-2789.25	1304.8	20701.99

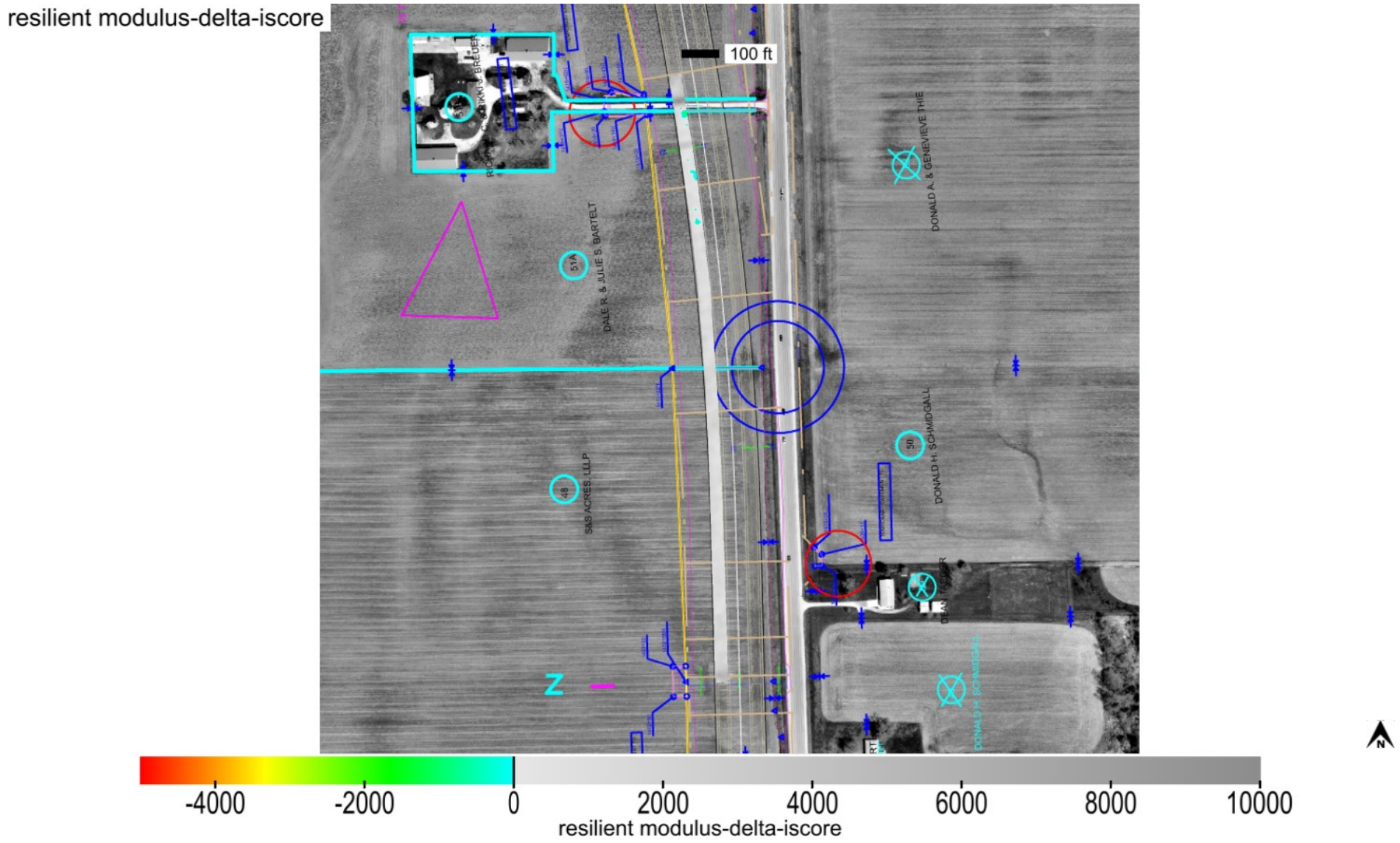
resilient modulus-delta



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

Map ID: iadot_29-us61_cs56-fcs00210_2020_06_16_141451a

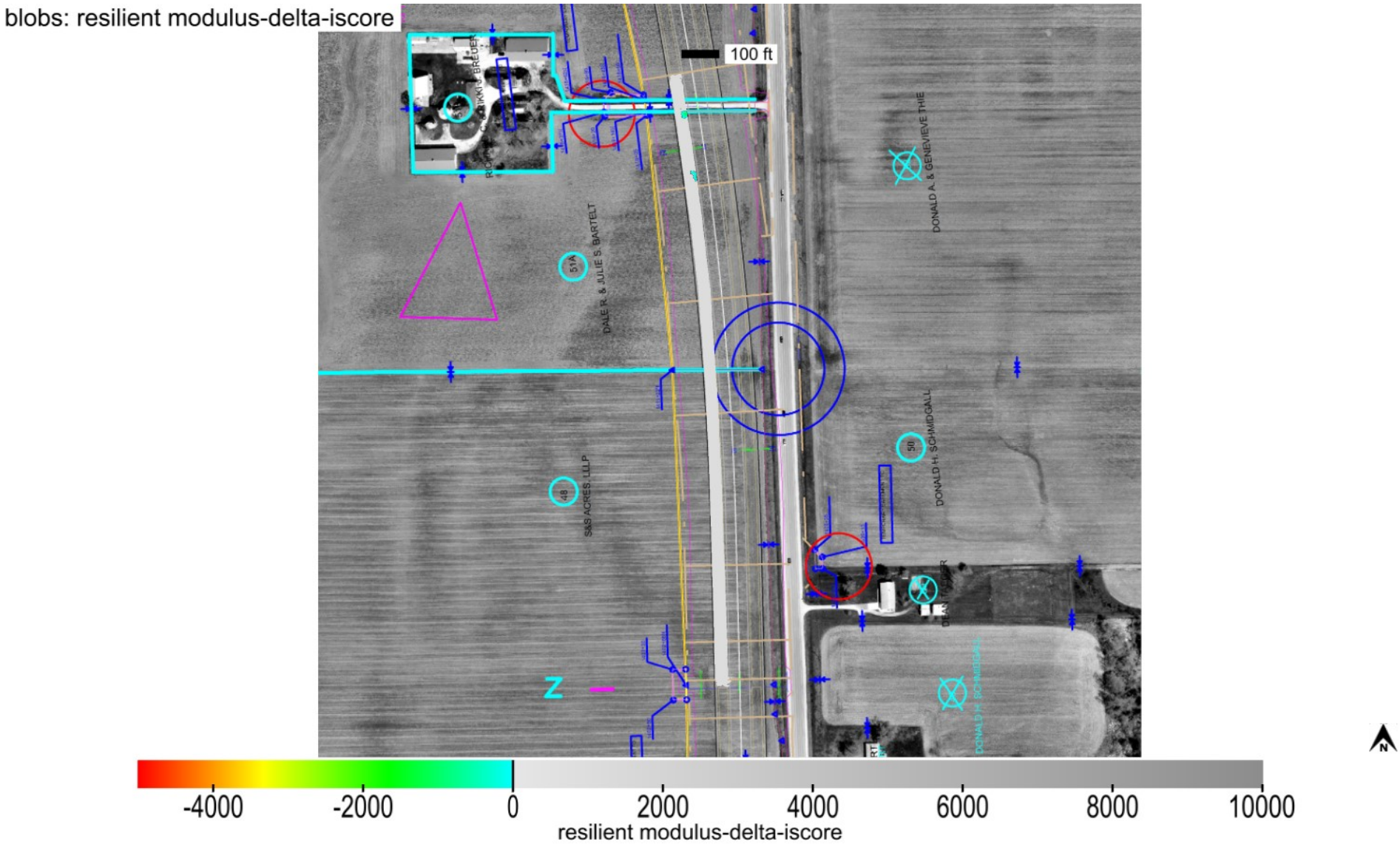
Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	87.1	8553	-2789.25	1304.8	20701.99	-1039.17	1296.75	9740.84



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_29-us61_cs56-fcs00210_2020_06_16_141451a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	2	540	1.03	none	0

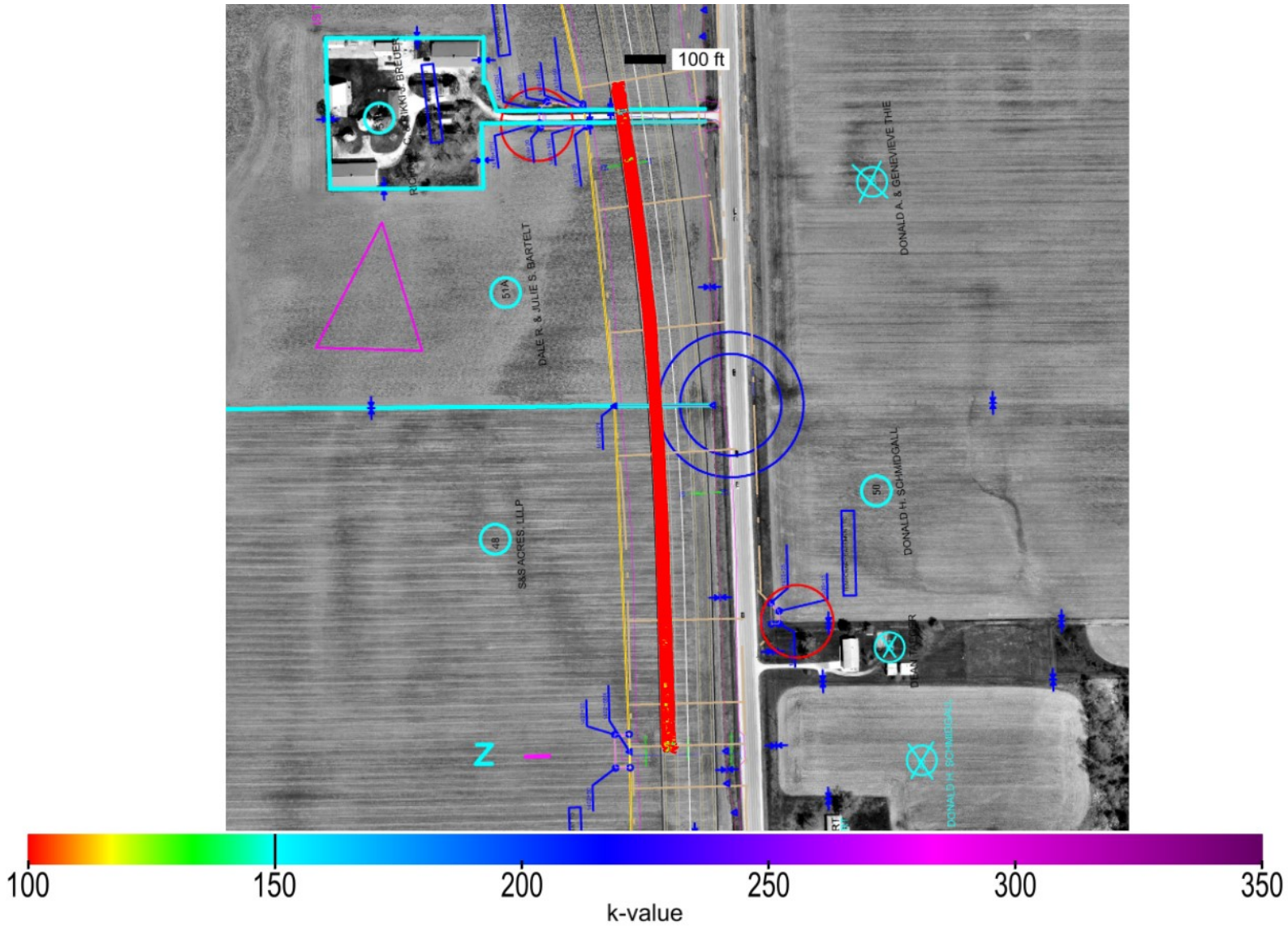


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

Map ID: iadot_29-us61_cs56-fcs00210_2020_06_16_141451a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.3	21.35	-0.29	150	60	64.8	160	11.58	17.86	-90	-85.2	10

k-value



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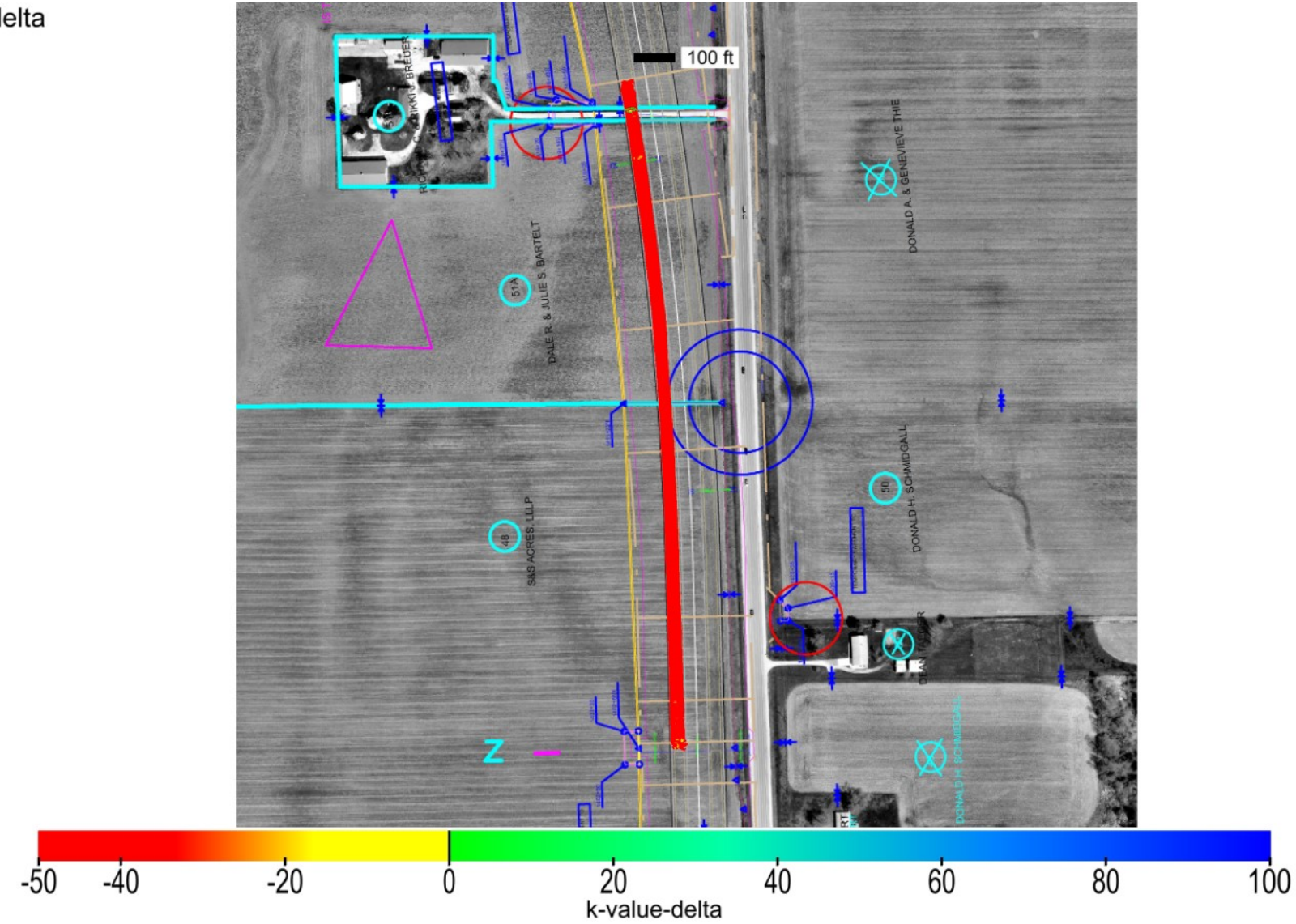
Map ID: iadot_29-us61_cs56-fcs00210_2020_06_16_141451a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	0.3	21.35	-0.29	150	60	64.8	160	11.58	17.86	-90	-85.2	10

k-value-delta



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Map ID: iadot_29-us61_cs56-fcs00210_2020_06_16_141451a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	0.3	150	-90	-85.2	10	-90	-84.95	-35.74

k-value-delta-iscore

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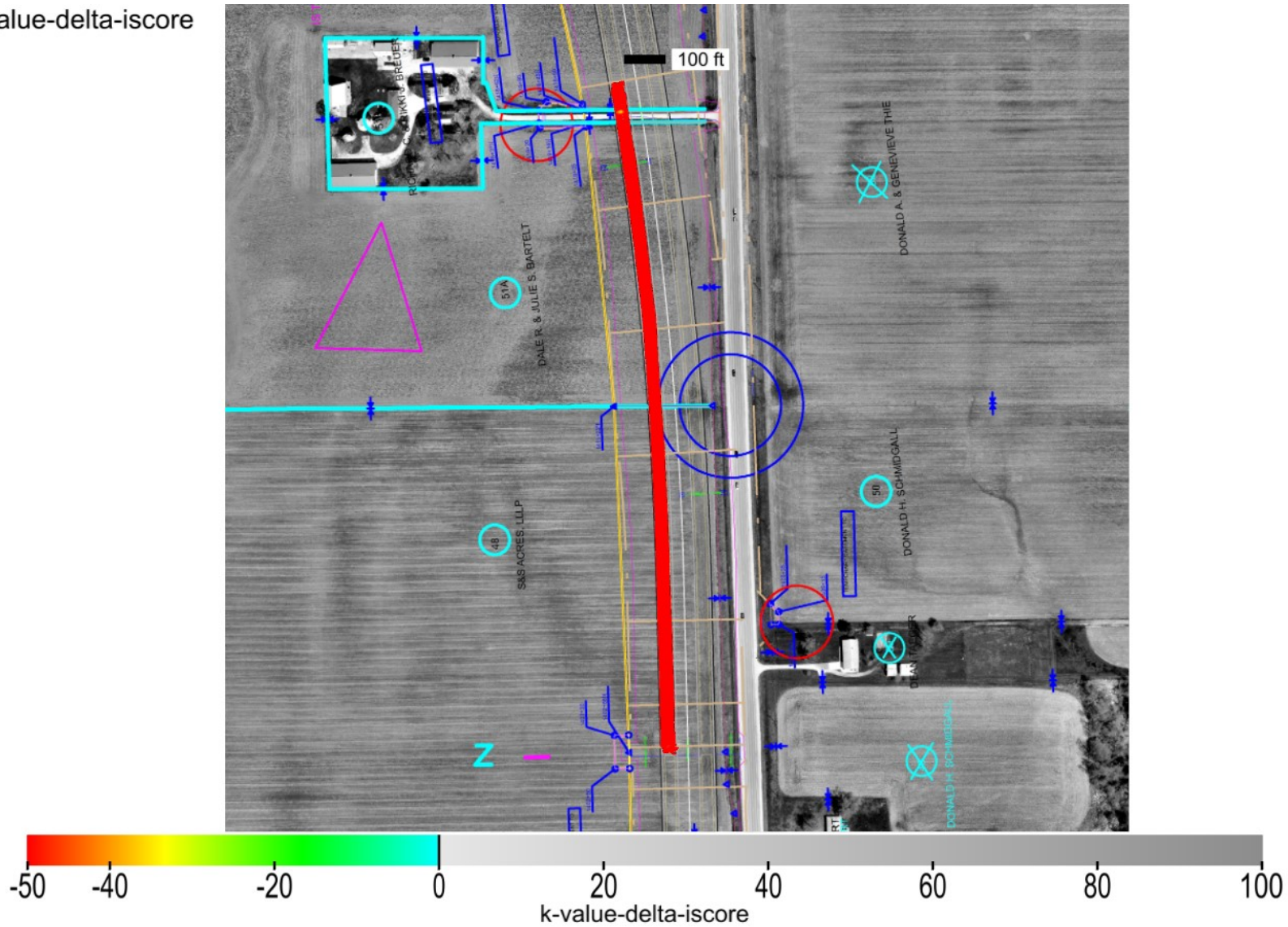
Map ID: iadot_29-us61_cs56-fcs00210_2020_06_16_141451a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	52209	100	none	0

blobs: k-value-delta-iscore



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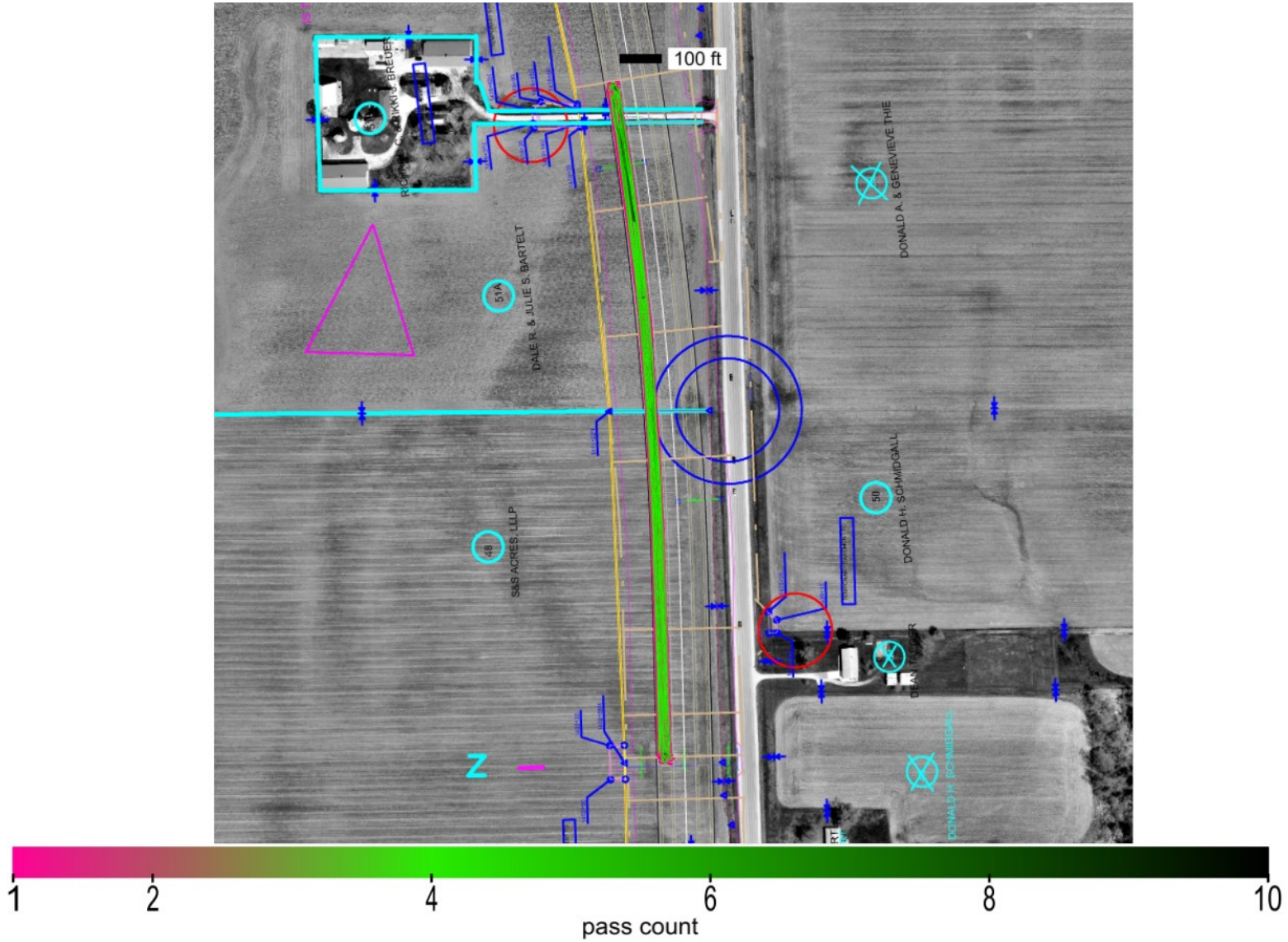
Map ID: iadot_29-us61_cs56-fcs00210_2020_06_16_141451a

minimum	average	maximum
1	3.55	9

pass count



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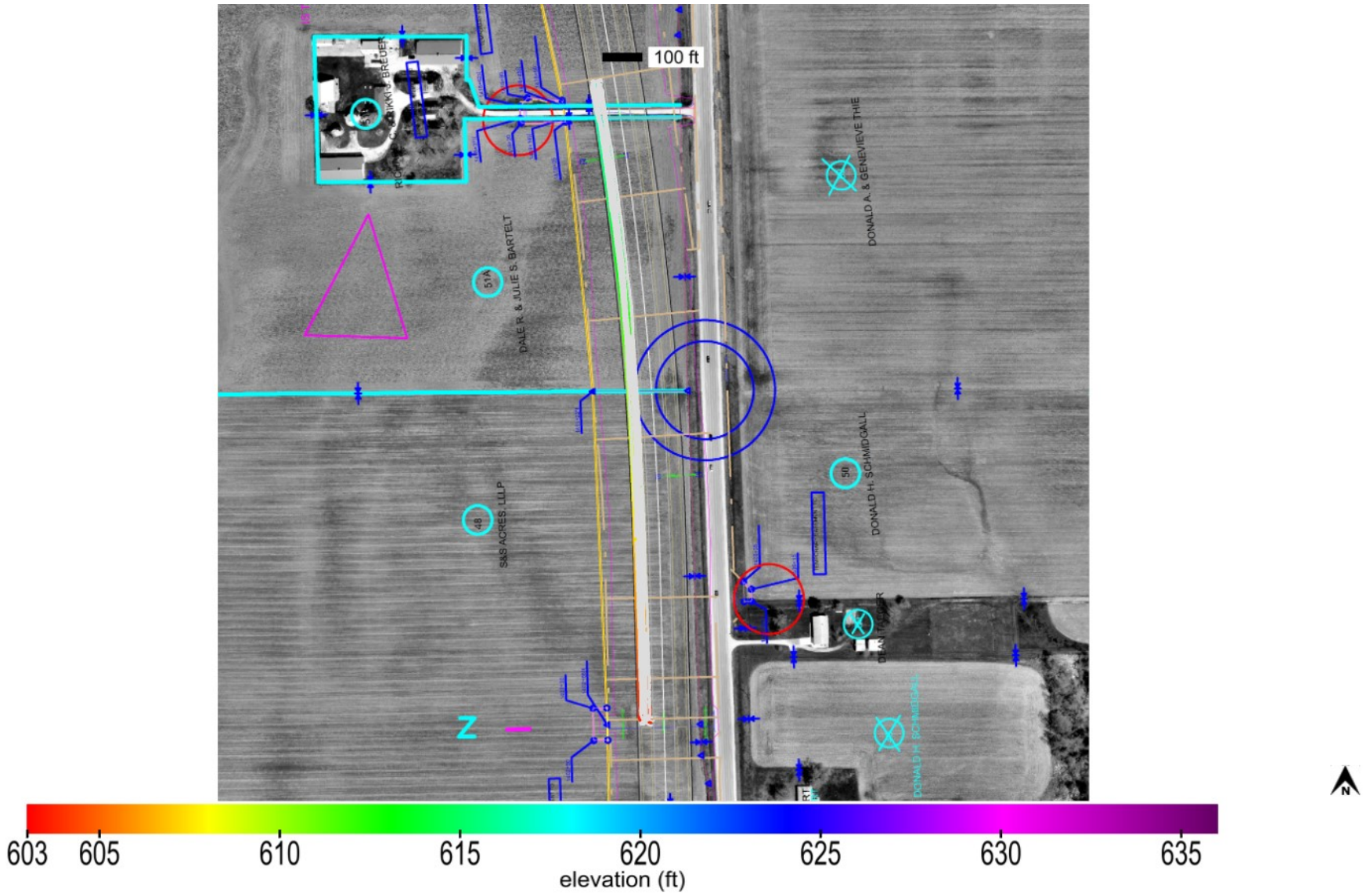
ingios GEOTECHNICS

Map ID: iadot_29-us61_cs56-fcs00210_2020_06_16_141451a

minimum	average	maximum
603.476	610.041	617.83

elevation



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Map ID: iadot_29-us61_cs56-fcs00210_2020_06_16_141451a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Granular Subbase	41013	100	52210	1.199	12	8553	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

Map ID: iadot_29-us61_cs56-fcs00210_2020_06_16_141451a

20200616_190732.jpg

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ingios GEOTECHNICS

Map ID: iadot_29-us61_cs56-fcs00210_2020_06_16_141451a

20200616_193433.jpg

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ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.15	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_25_090910a	No. of Measurements:	11188	Machine ID:	Ingios_FCS00210
Date and Time:	9/25/2020 9:09:10 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	116.57	1.15	8554	10015.73	26513.9	54985.65	7120.55	26.86	1461.73	17959.9	46431.65
k-value	Yes	79.1	101.92	1.09	150	60	150.1	160	21.45	14.29	-90	0.1	10
Moisture Content	No												

Mapped Area

square feet	acres
11188	0.26

Pass Count

min.	avg.	max.
1	1	1

Elevation (ft)

min.	avg.	max.
1009.78	1013.48	1022.85

Velocity (fps)

min.	avg.	max.
4.61	5.42	6.14

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Macadam Stone Base	41007	100	11188	0.257	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:	US20 Dubuque County	Mapping Duration (hrs):	0.15	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_25_090910a	No. of Measurements:	11188	Machine ID:	Ingios_FCS00210
Date and Time:	9/25/2020 9:09:10 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
116.57	CQI > = 95
100	80% of Resilient Modulus MVs >= 8554
26.86	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.

ingios GEOTECHNICS

IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.15	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_25_090910a	No. of Measurements:	11188	Machine ID:	Ingios_FCS00210
Date and Time:	9/25/2020 9:09:10 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
101.92	CQI > = 95
79.1	80% of k-Value MVs >= 150
14.29	COV <= 20
14.21	% 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_31-us20_cs56-fcs00210_2020_09_25_090910a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	116.57	1.15	8554	10015.73	26513.9	54985.65	7120.55	26.86	1461.73	17959.9	46431.65

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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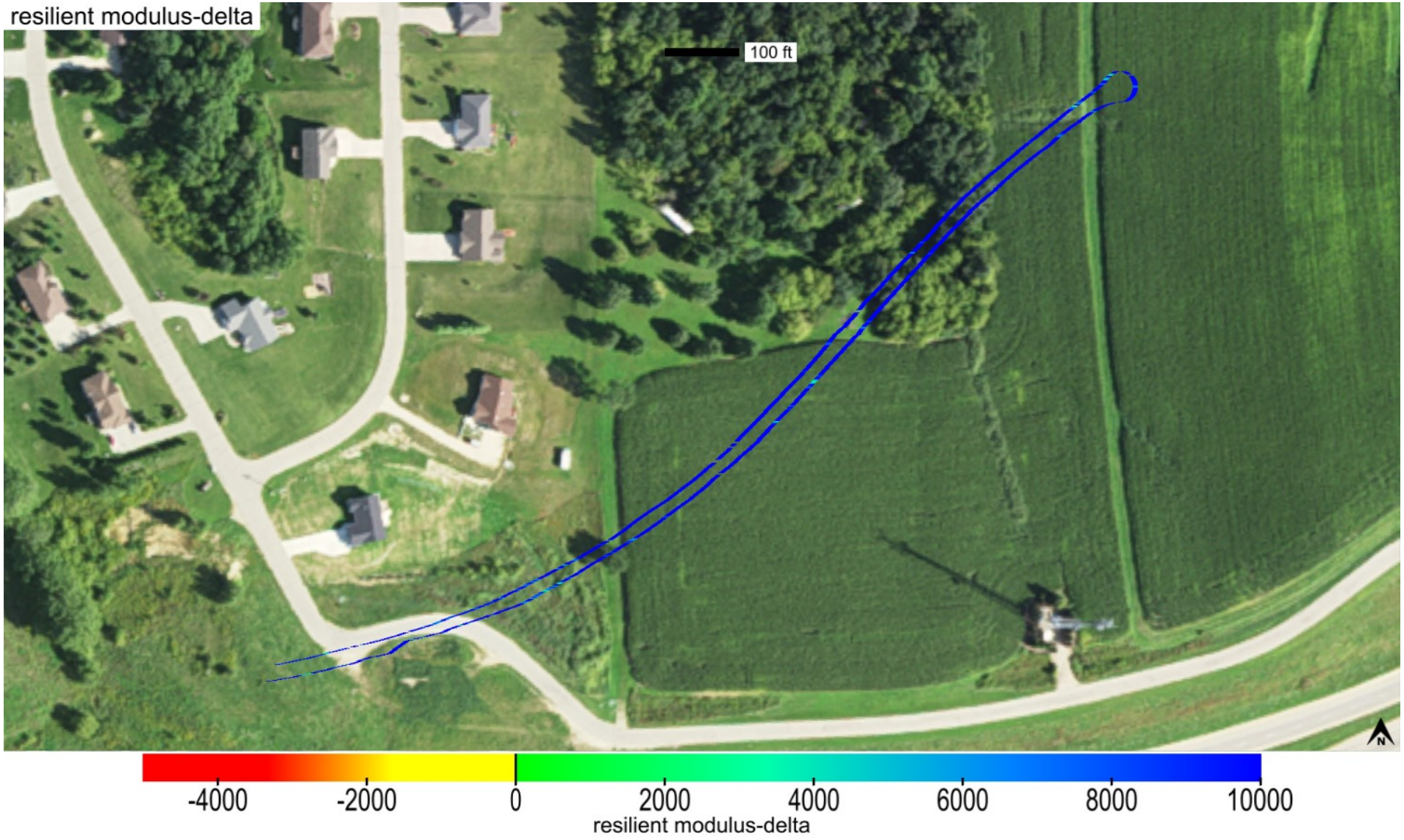
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_25_090910a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	116.57	1.15	8554	10015.73	26513.9	54985.65	7120.55	26.86	1461.73	17959.9	46431.65



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-us20_cs56-fcs00210_2020_09_25_090910a

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	1461.73	17959.9	46431.65	6539.36	17961.26	35277.54

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-us20_cs56-fcs00210_2020_09_25_090910a

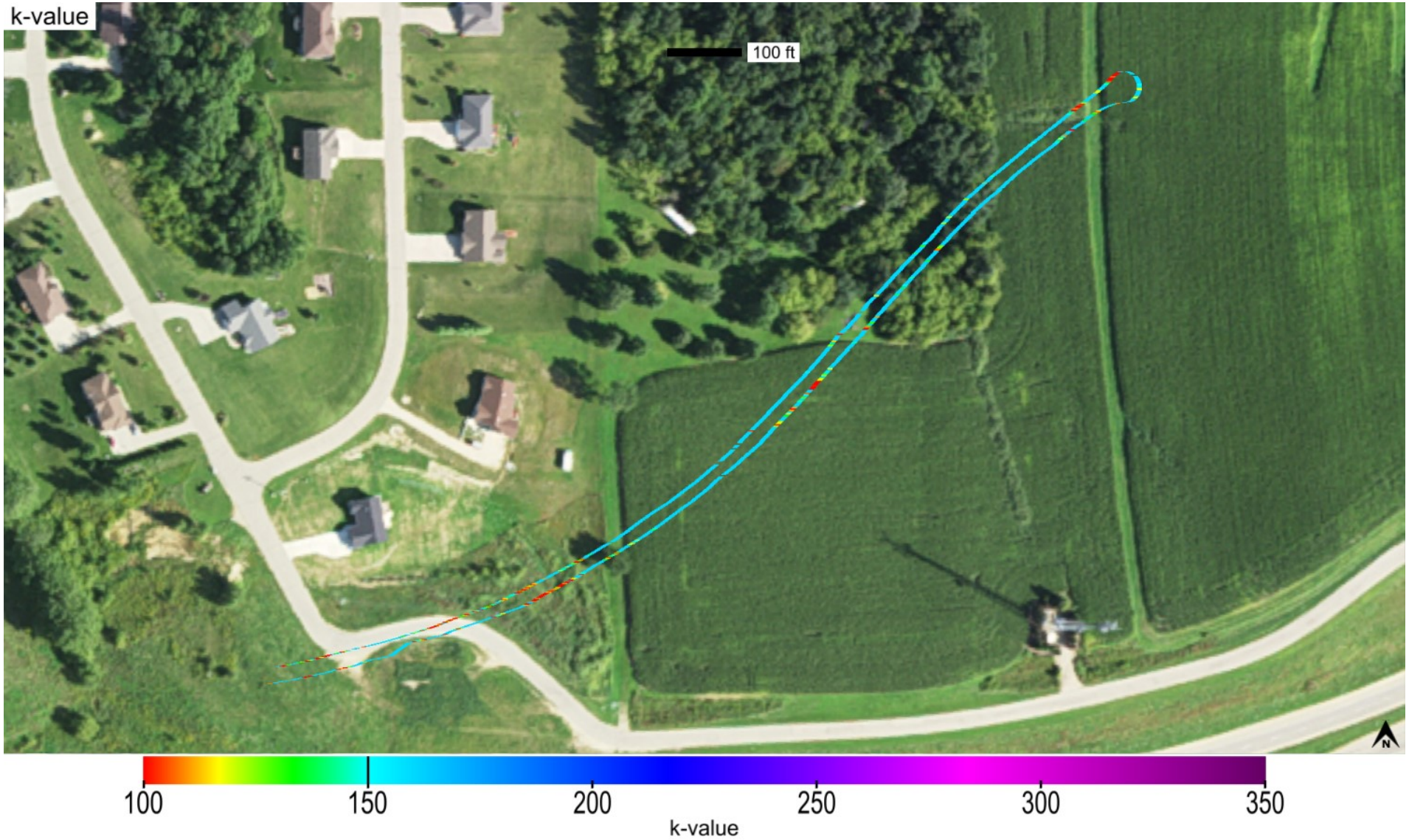
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

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_31-us20_cs56-fcs00210_2020_09_25_090910a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	79.1	101.92	1.09	150	60	150.1	160	21.45	14.29	-90	0.1	10



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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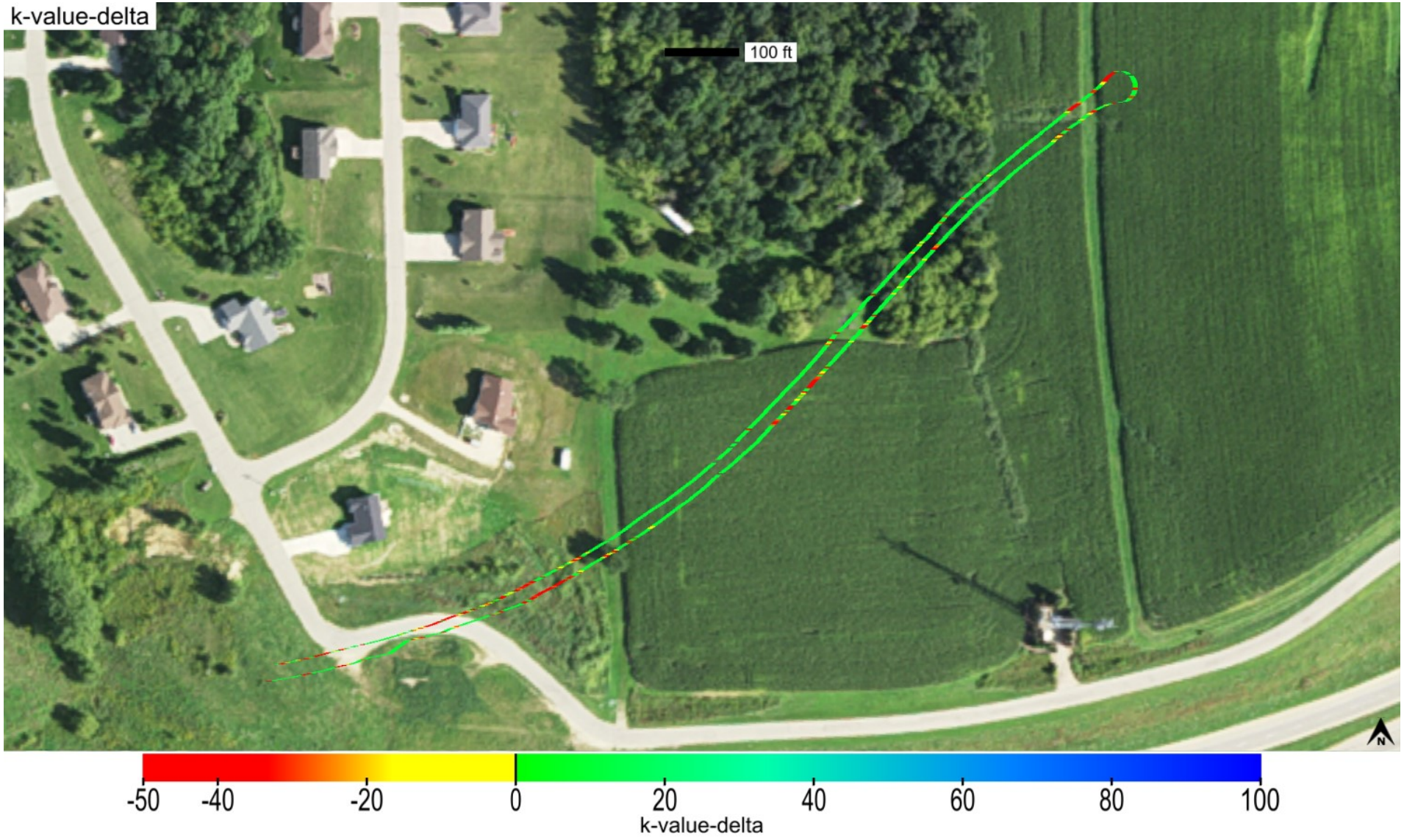
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_25_090910a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	79.1	101.92	1.09	150	60	150.1	160	21.45	14.29	-90	0.1	10



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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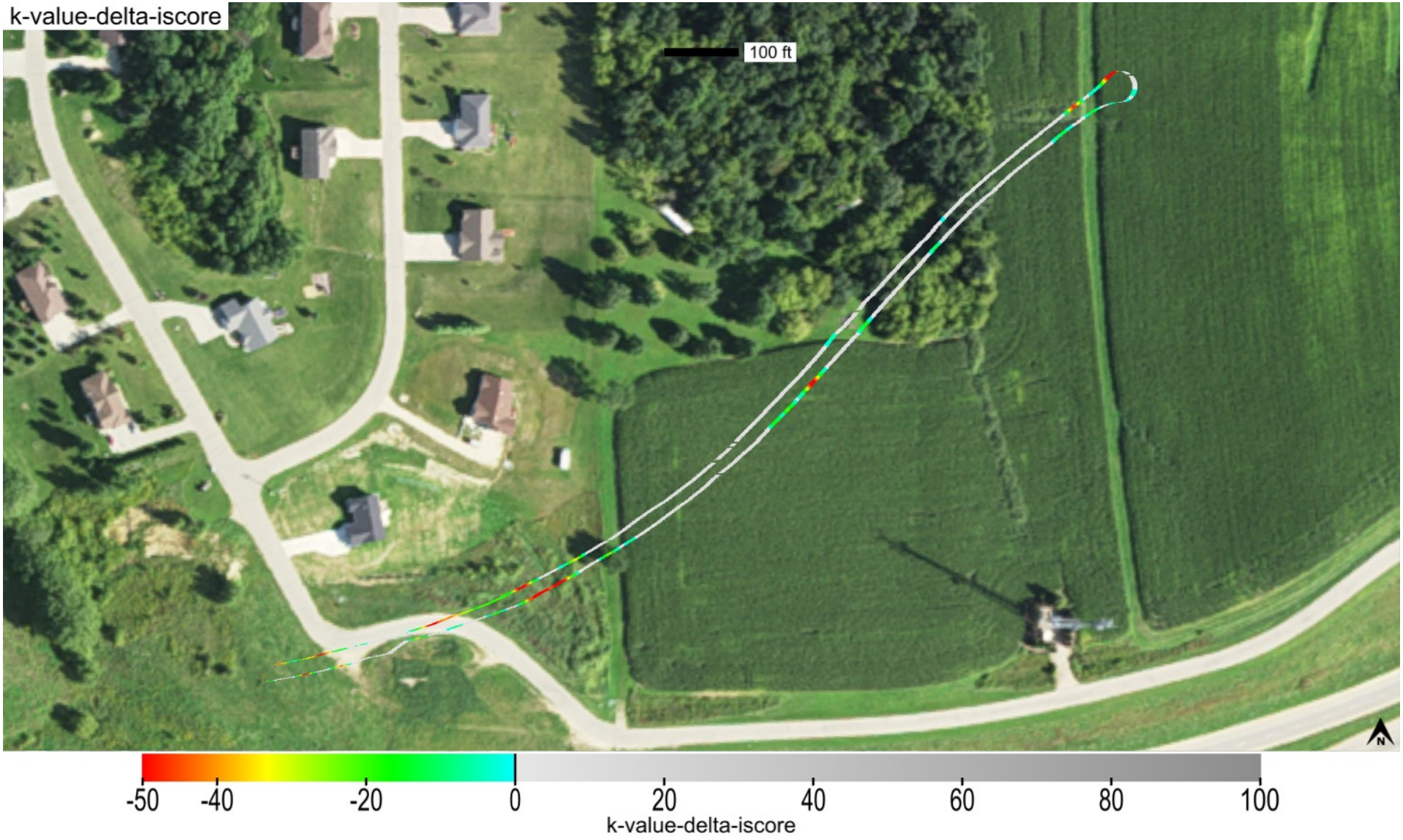
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_25_090910a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	79.1	150	-90	0.1	10	-62.94	0.1	10



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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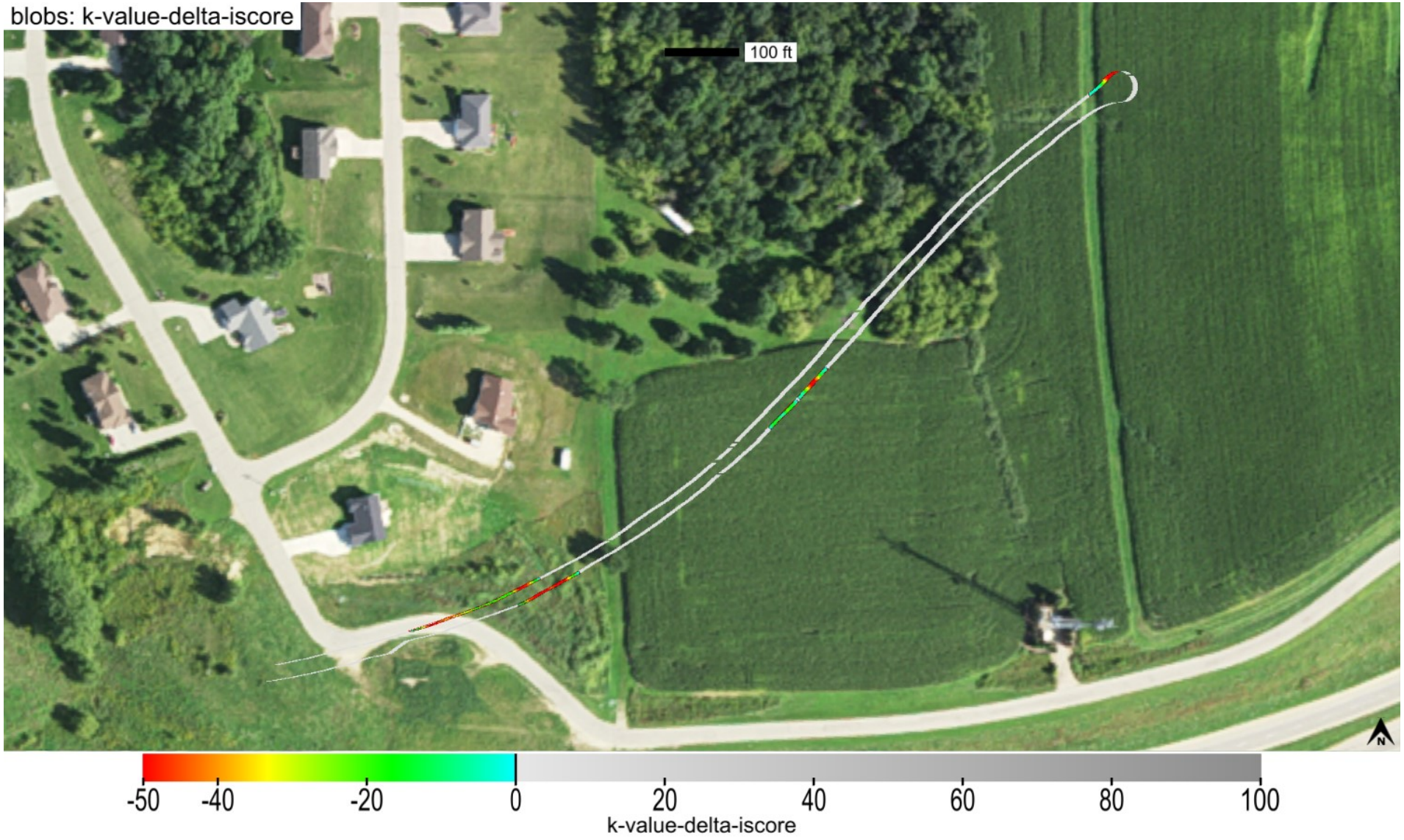
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_25_090910a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	5	1590	14.21	none	0



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

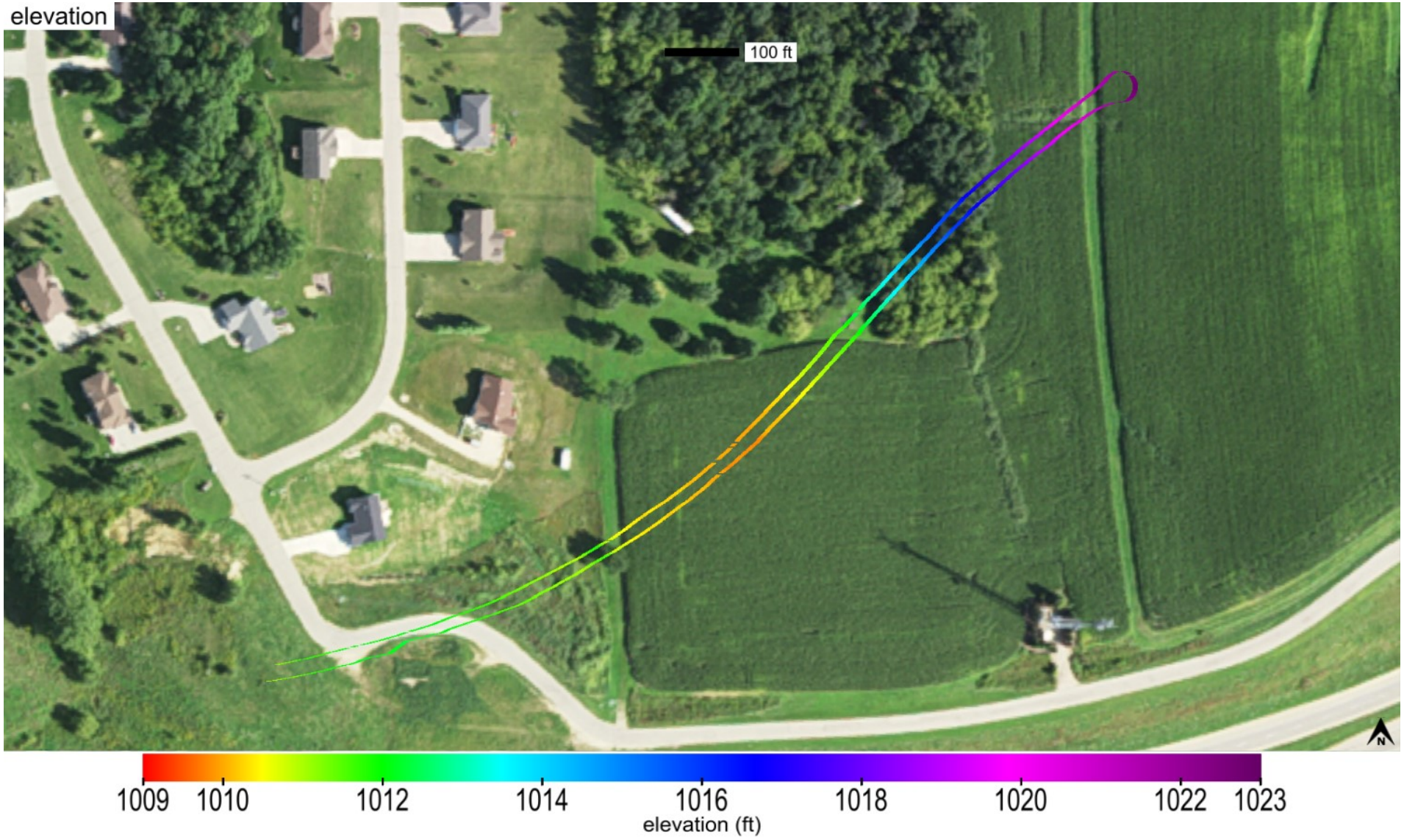
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_25_090910a

minimum	average	maximum
1	1	1

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-us20_cs56-fcs00210_2020_09_25_090910a

minimum	average	maximum
1009.775	1013.479	1022.846



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-us20_cs56-fcs00210_2020_09_25_090910a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Macadam Stone Base	41007	100	11188	0.257	12	8554	150	40

Macadam Stone Base_IADOT (2210)

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-us20_cs56-fcs00210_2020_09_25_090910a

20200925_134634.jpg

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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_25_090910a

20200925_134649.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-us20_cs56-fcs00210_2020_09_25_090910a

20200925_134717.jpg

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.4	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_091558a	No. of Measurements:	40166	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 9:15:58 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	116.82	1.15	8554	9047.16	22476.8	47685.36	5922.68	26.35	493.16	13922.8	39131.36
k-value	Yes	59.3	78.14	0.68	150	60	138.3	160	30.87	22.32	-90	-11.7	10
Moisture Content	No												

Mapped Area

square feet	acres
40166	0.92

Pass Count

min.	avg.	max.
1	1.3	4

Elevation (ft)

min.	avg.	max.
967.27	973.29	977.36

Velocity (fps)

min.	avg.	max.
0.65	5.41	6.87

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Macadam Stone Base	41007	100	40166	0.922	12	8554	150	40

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.4	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_091558a	No. of Measurements:	40166	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 9:15:58 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
116.82	CQI > = 95
100	80% of Resilient Modulus MVs >= 8554
26.35	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:	US20 Dubuque County	Mapping Duration (hrs):	0.4	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_091558a	No. of Measurements:	40166	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 9:15:58 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
78.14	CQI > = 95
59.3	80% of k-Value MVs >= 150
22.32	COV <= 20
57.97	% 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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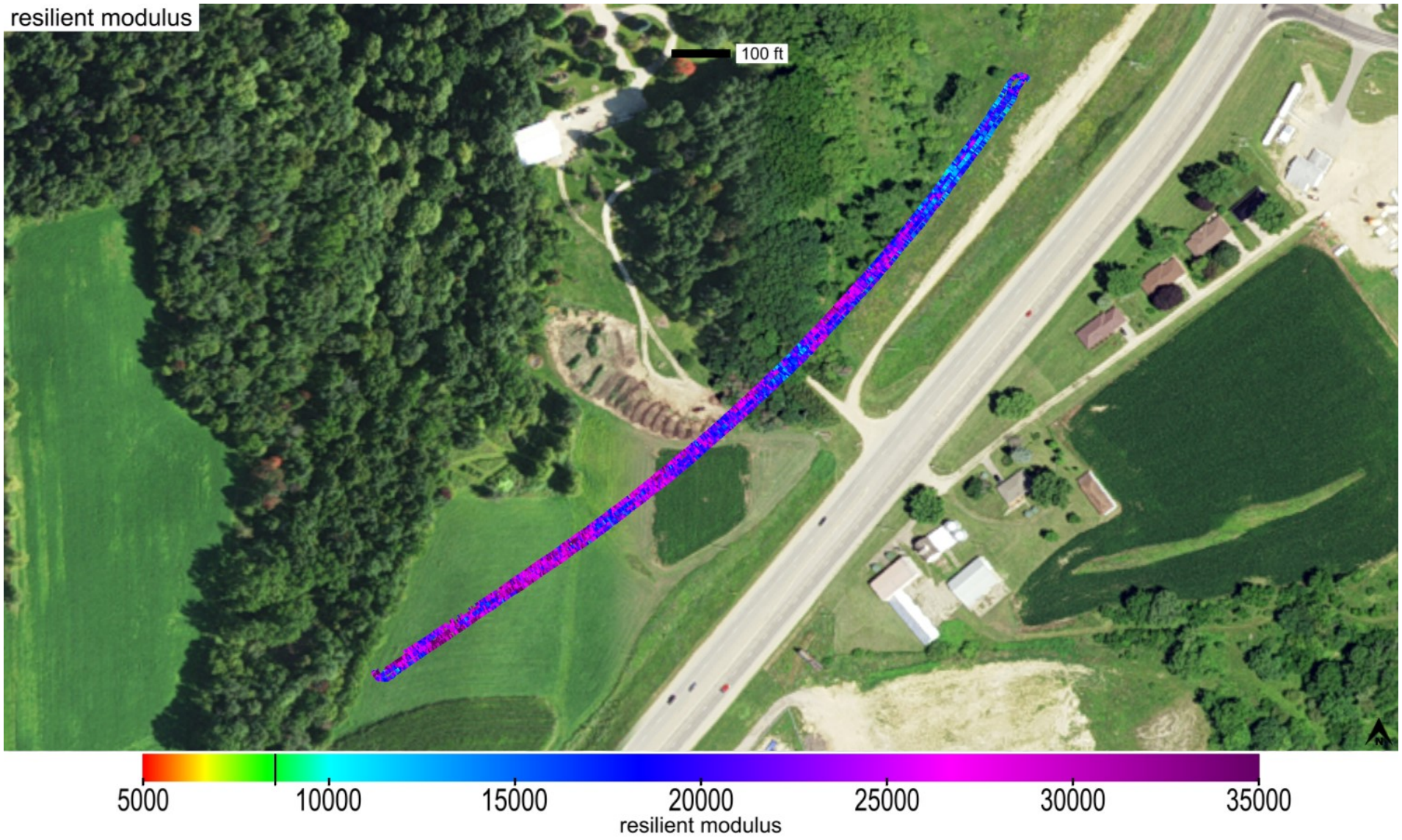
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_091558a

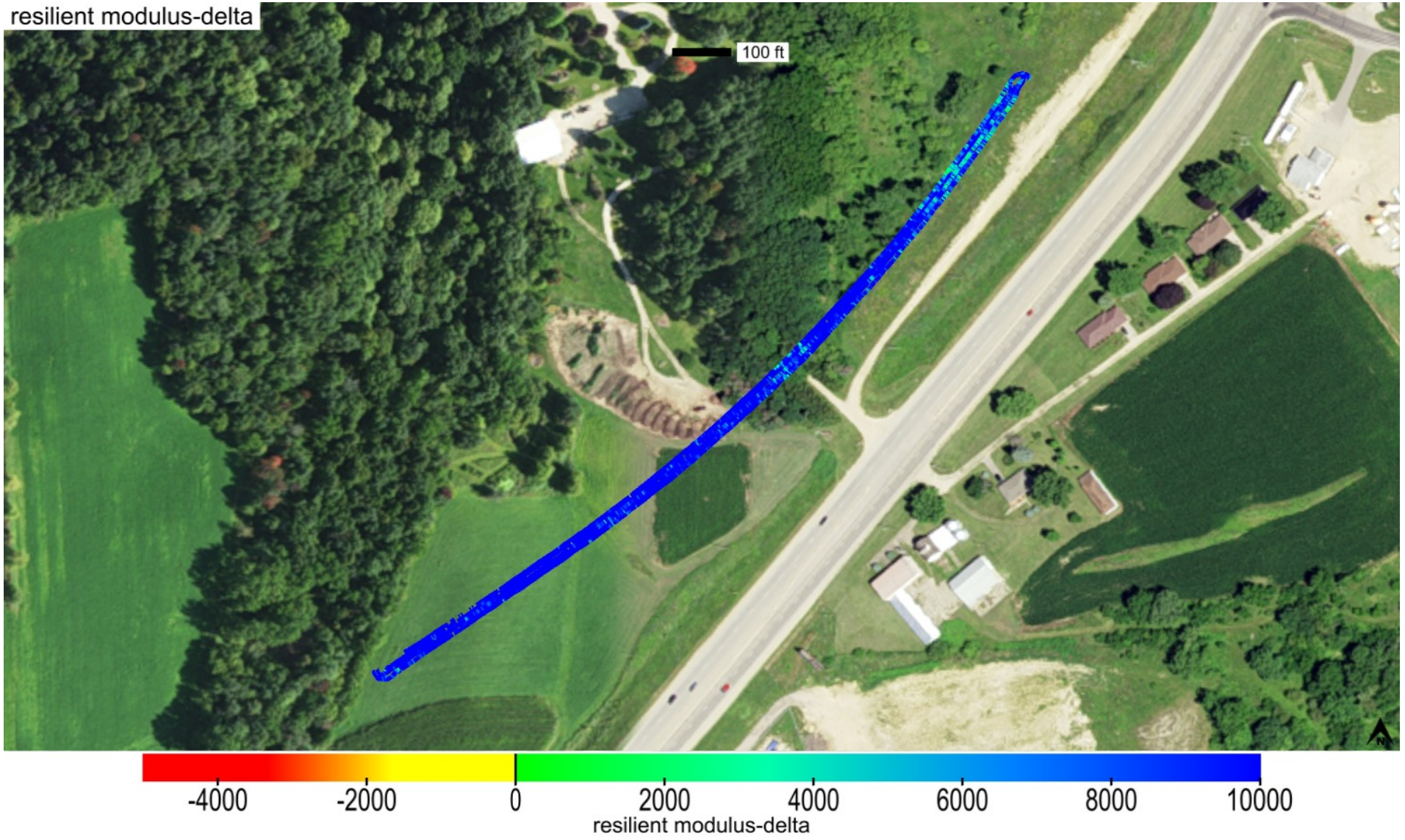
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	116.82	1.15	8554	9047.16	22476.8	47685.36	5922.68	26.35	493.16	13922.8	39131.36



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-us20_cs56-fcs00210_2020_09_29_091558a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	116.82	1.15	8554	9047.16	22476.8	47685.36	5922.68	26.35	493.16	13922.8	39131.36



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-us20_cs56-fcs00210_2020_09_29_091558a

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	493.16	13922.8	39131.36	3676.95	13938.73	26816.42

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-us20_cs56-fcs00210_2020_09_29_091558a

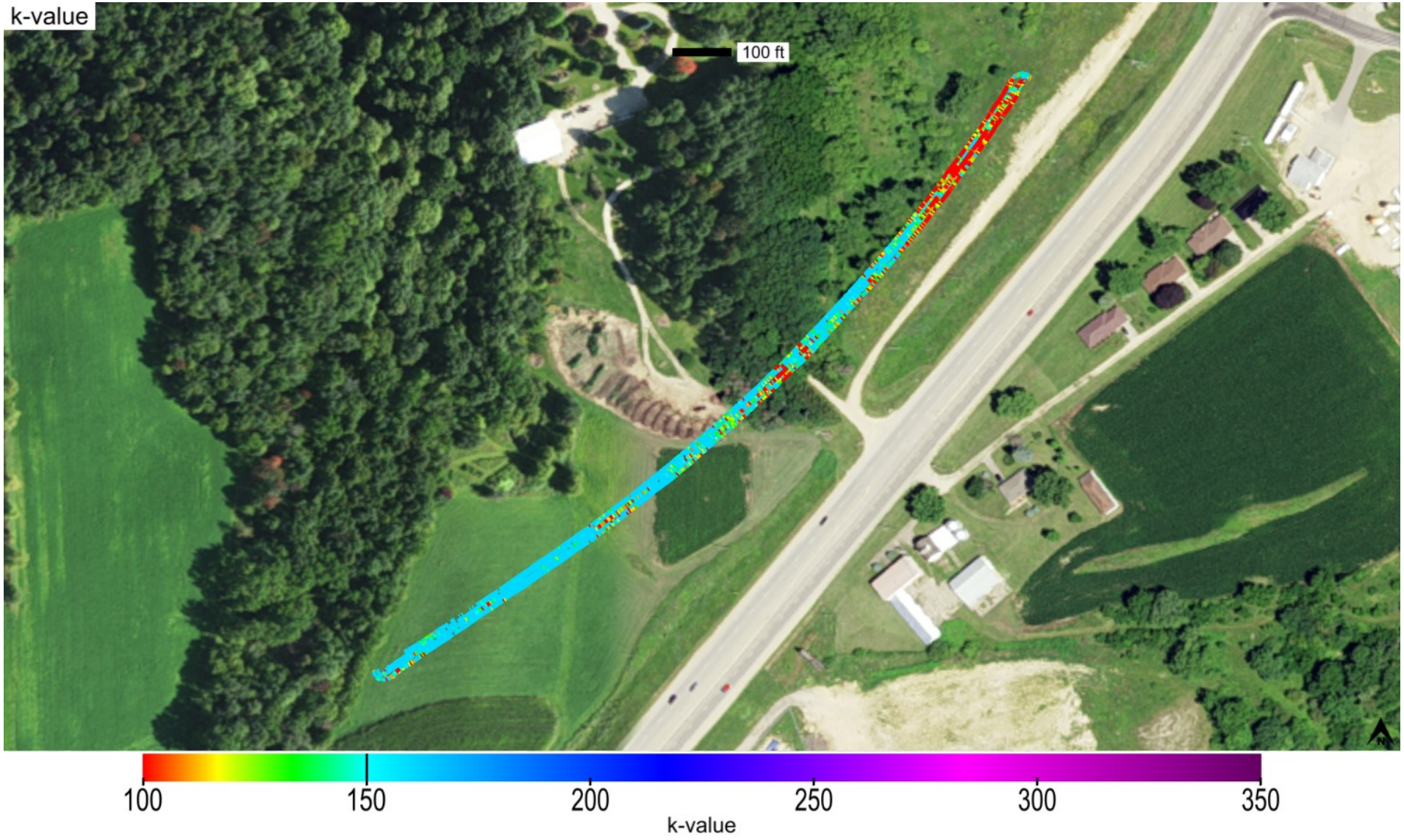
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	0	0	0	none	0

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_31-us20_cs56-fcs00210_2020_09_29_091558a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	59.3	78.14	0.68	150	60	138.3	160	30.87	22.32	-90	-11.7	10



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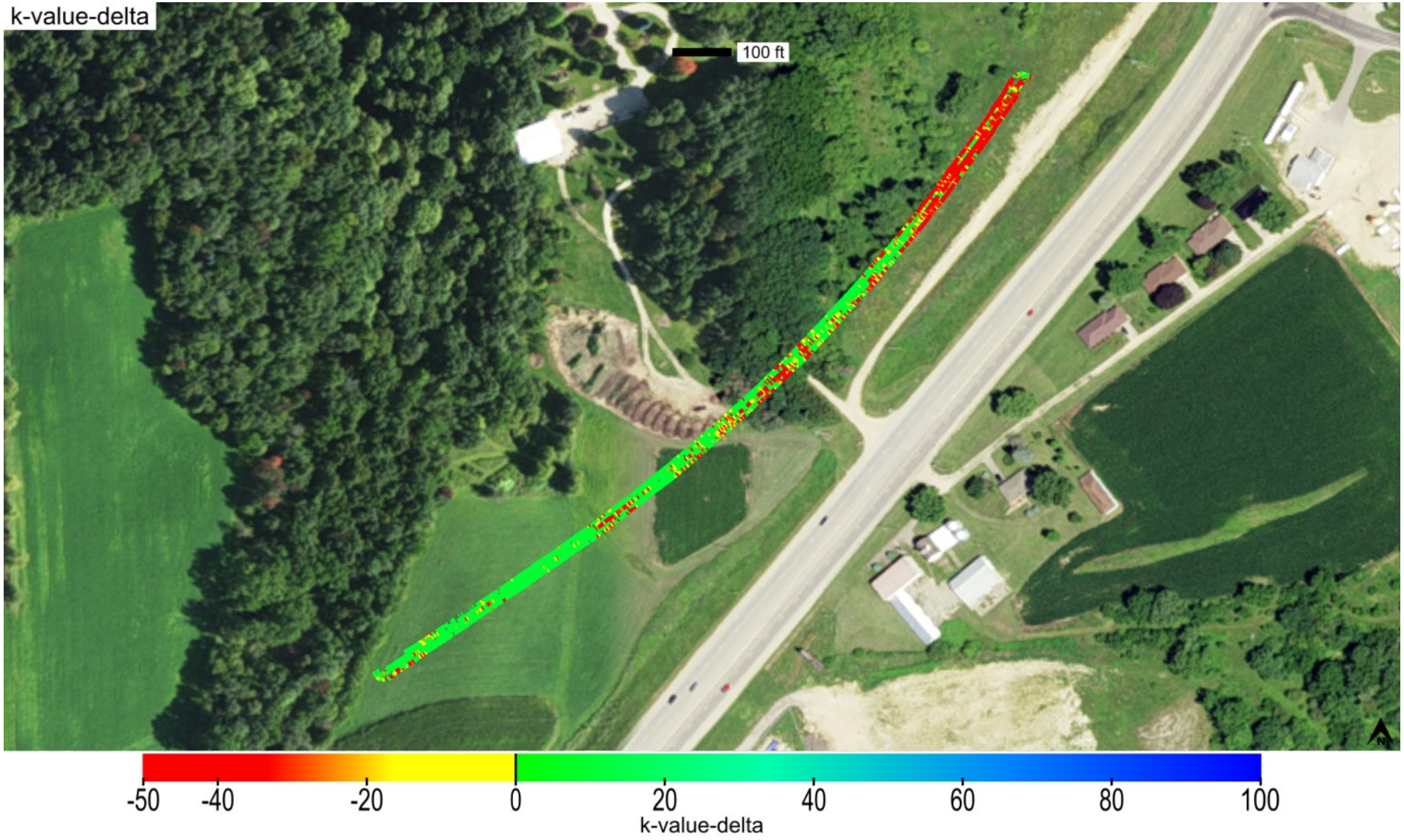
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_091558a

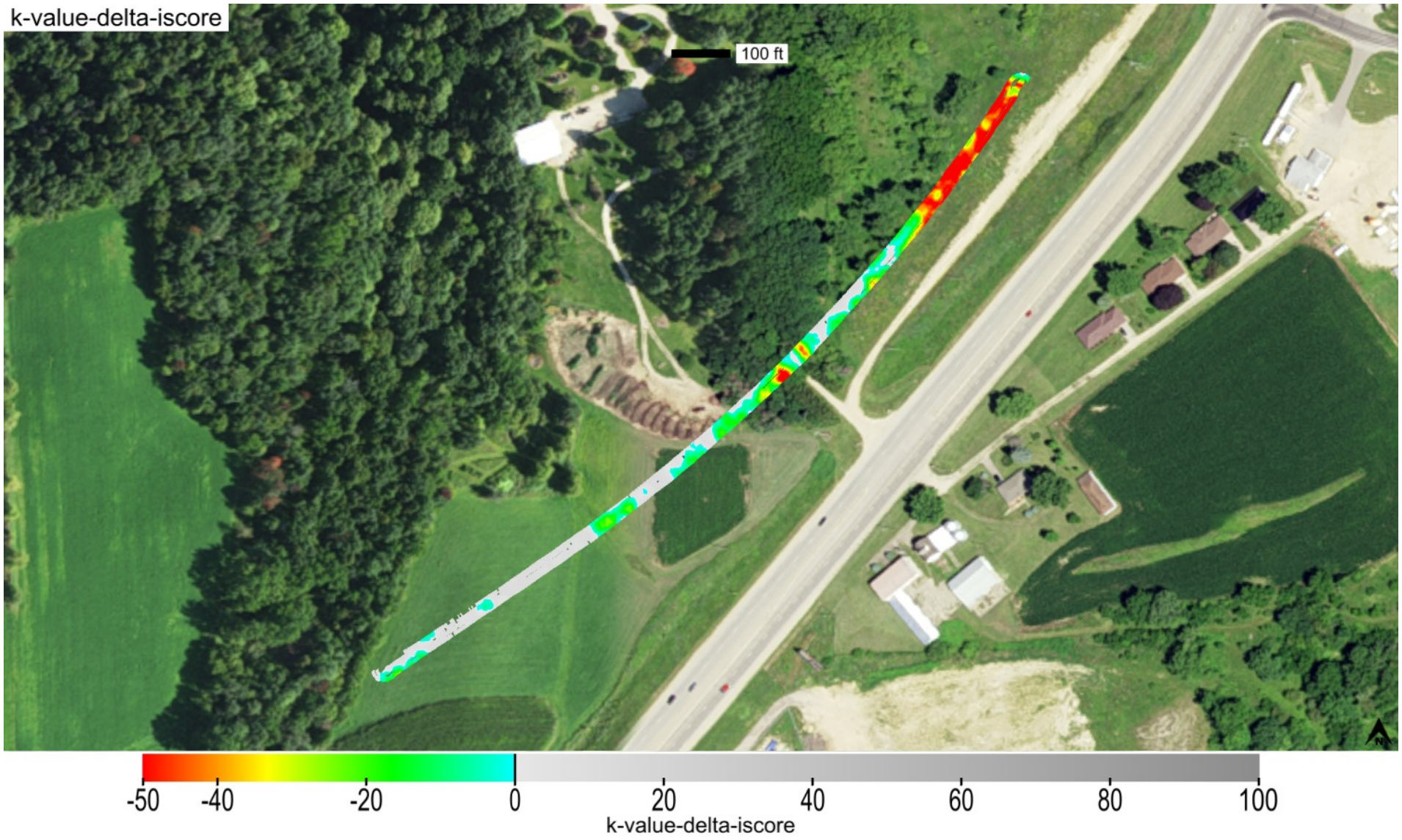
Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	59.3	78.14	0.68	150	60	138.3	160	30.87	22.32	-90	-11.7	10



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-us20_cs56-fcs00210_2020_09_29_091558a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	59.3	150	-90	-11.7	10	-85.93	-11.38	10



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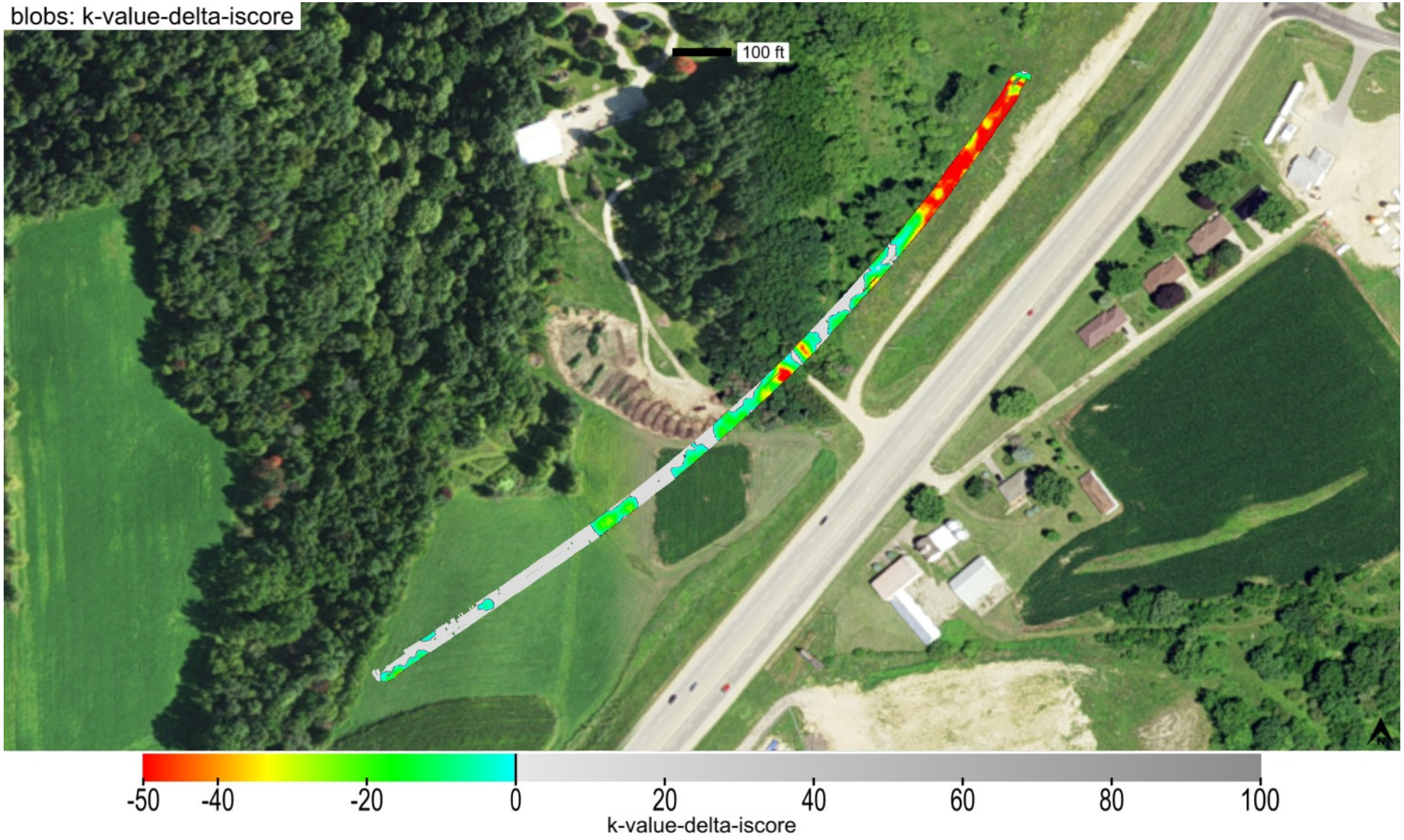
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_091558a

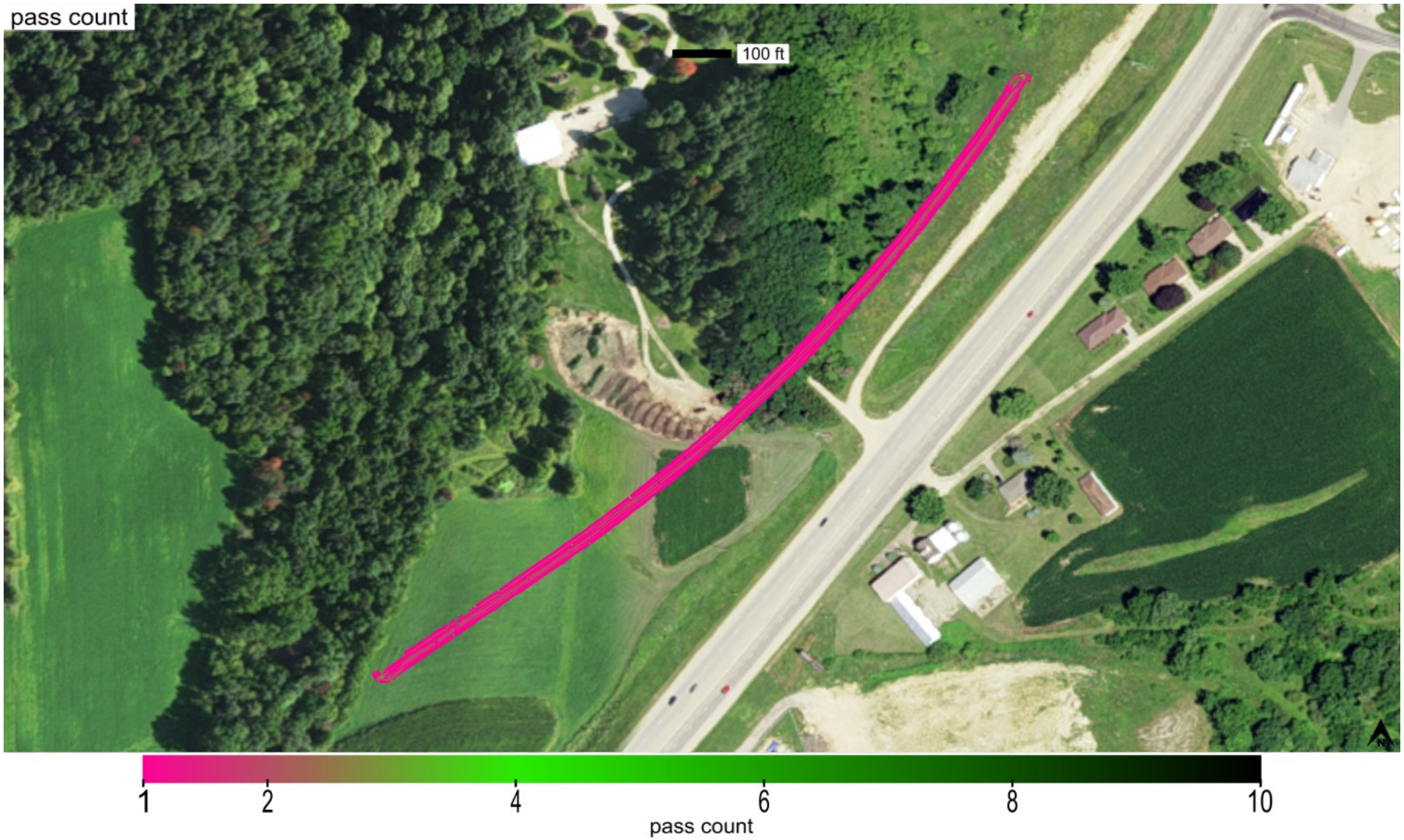
min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	10	23286	57.97	none	0



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-us20_cs56-fcs00210_2020_09_29_091558a

minimum	average	maximum
1	1.3	4

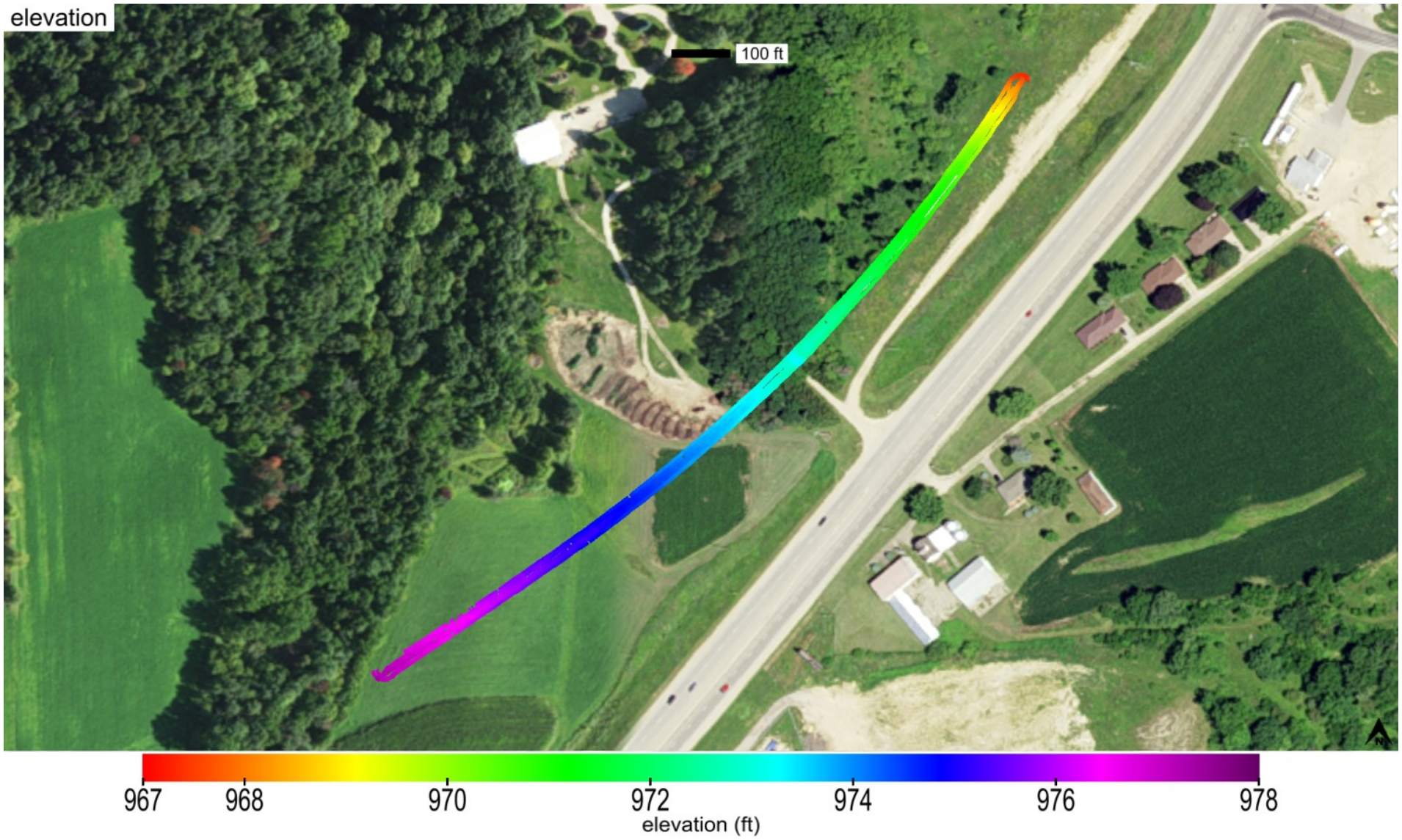


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_091558a

minimum	average	maximum
967.268	973.292	977.36



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-us20_cs56-fcs00210_2020_09_29_091558a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Macadam Stone Base	41007	100	40166	0.922	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.

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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_091558a

20200929_164112.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-us20_cs56-fcs00210_2020_09_29_091558a

20200930_073259.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:	US20 Dubuque County	Mapping Duration (hrs):	0.17	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_094247a	No. of Measurements:	2475	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 9:42:47 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	99.7	119.87	1.5	8554	6564.9	17387.7	26900.08	3410.94	19.62	-1989.1	8833.7	18346.08
k-value	Yes	27	43.39	0.47	150	60	121.3	160	32.98	27.2	-90	-28.7	10
Moisture Content	No												

Mapped Area

square feet	acres
2475	0.06

Pass Count

min.	avg.	max.
1	4.37	8

Elevation (ft)

min.	avg.	max.
967.62	969.67	971.02

Velocity (fps)

min.	avg.	max.
0.12	5.29	5.92

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Macadam Stone Base	41007	100	2475	0.057	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:	US20 Dubuque County	Mapping Duration (hrs):	0.17	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_094247a	No. of Measurements:	2475	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 9:42:47 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
119.87	CQI > = 95
99.7	80% of Resilient Modulus MVs >= 8554
19.62	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:	US20 Dubuque County	Mapping Duration (hrs):	0.17	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_094247a	No. of Measurements:	2475	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 9:42:47 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
43.39	CQI > = 95
27	80% of k-Value MVs >= 150
27.2	COV <= 20
93.13	% 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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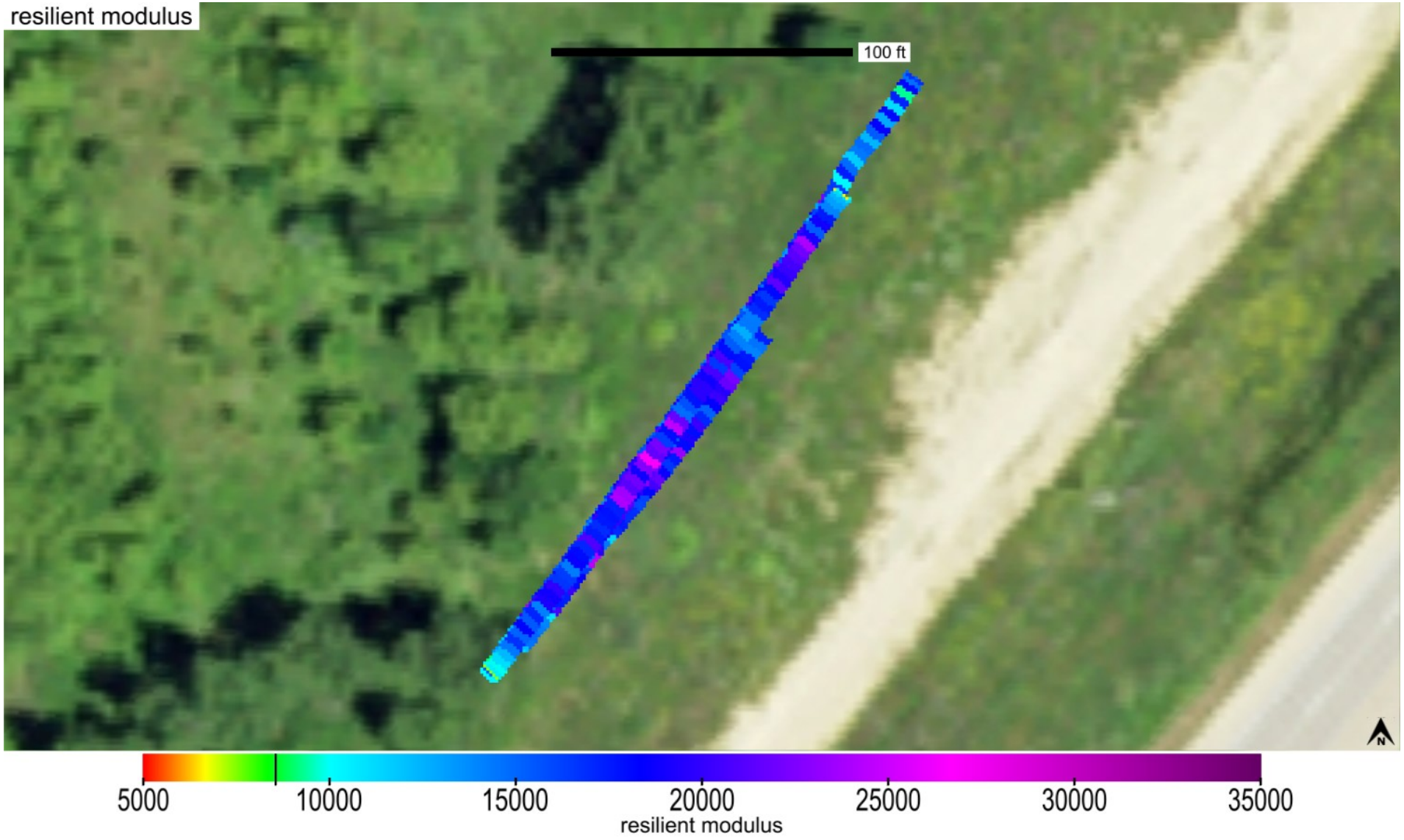
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_094247a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.7	119.87	1.5	8554	6564.9	17387.7	26900.08	3410.94	19.62	-1989.1	8833.7	18346.08



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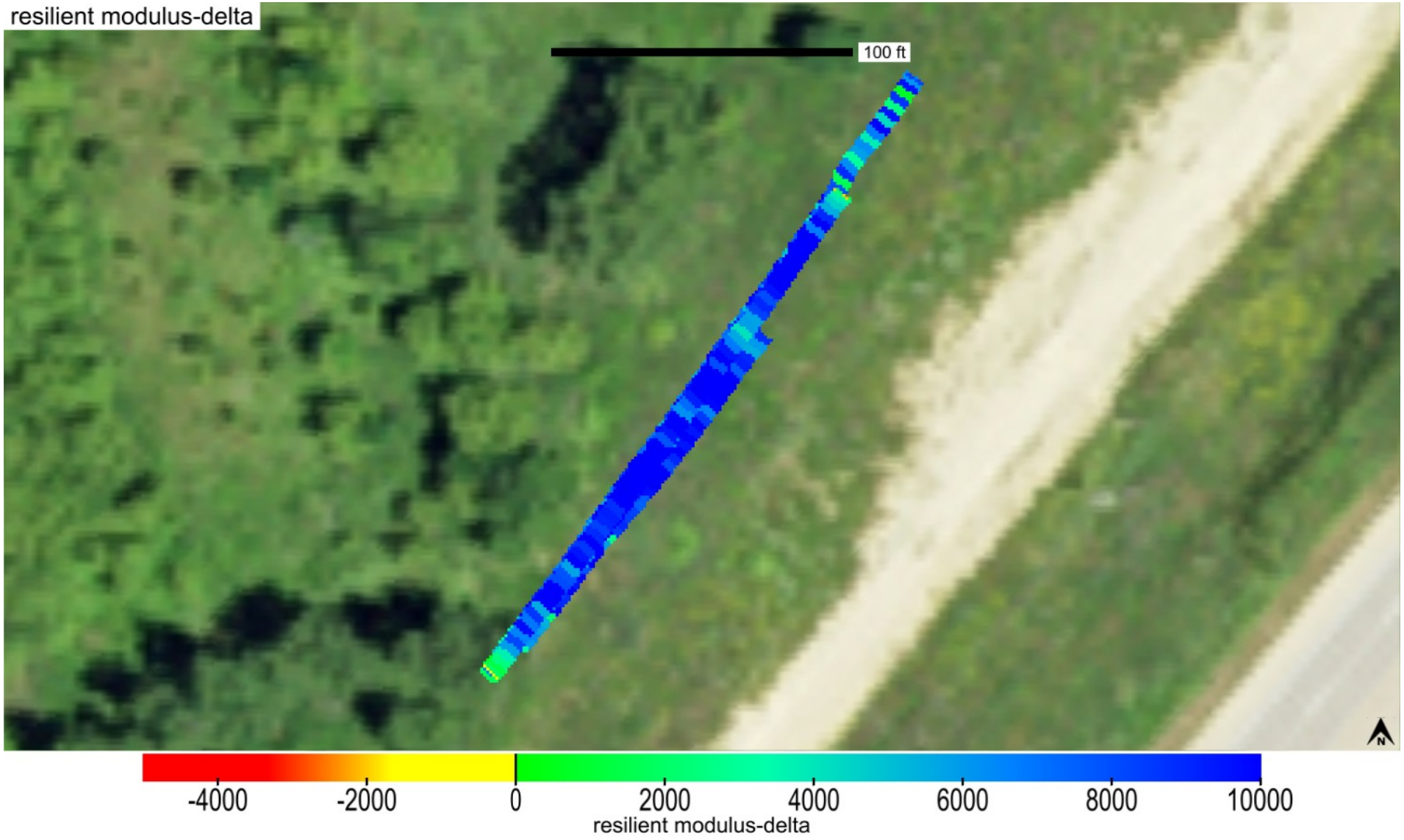
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_094247a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	99.7	119.87	1.5	8554	6564.9	17387.7	26900.08	3410.94	19.62	-1989.1	8833.7	18346.08



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-us20_cs56-fcs00210_2020_09_29_094247a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
resilient modulus	Yes	99.7	8554	-1989.1	8833.7	18346.08	2098.21	8868.9	13084.91

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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_094247a

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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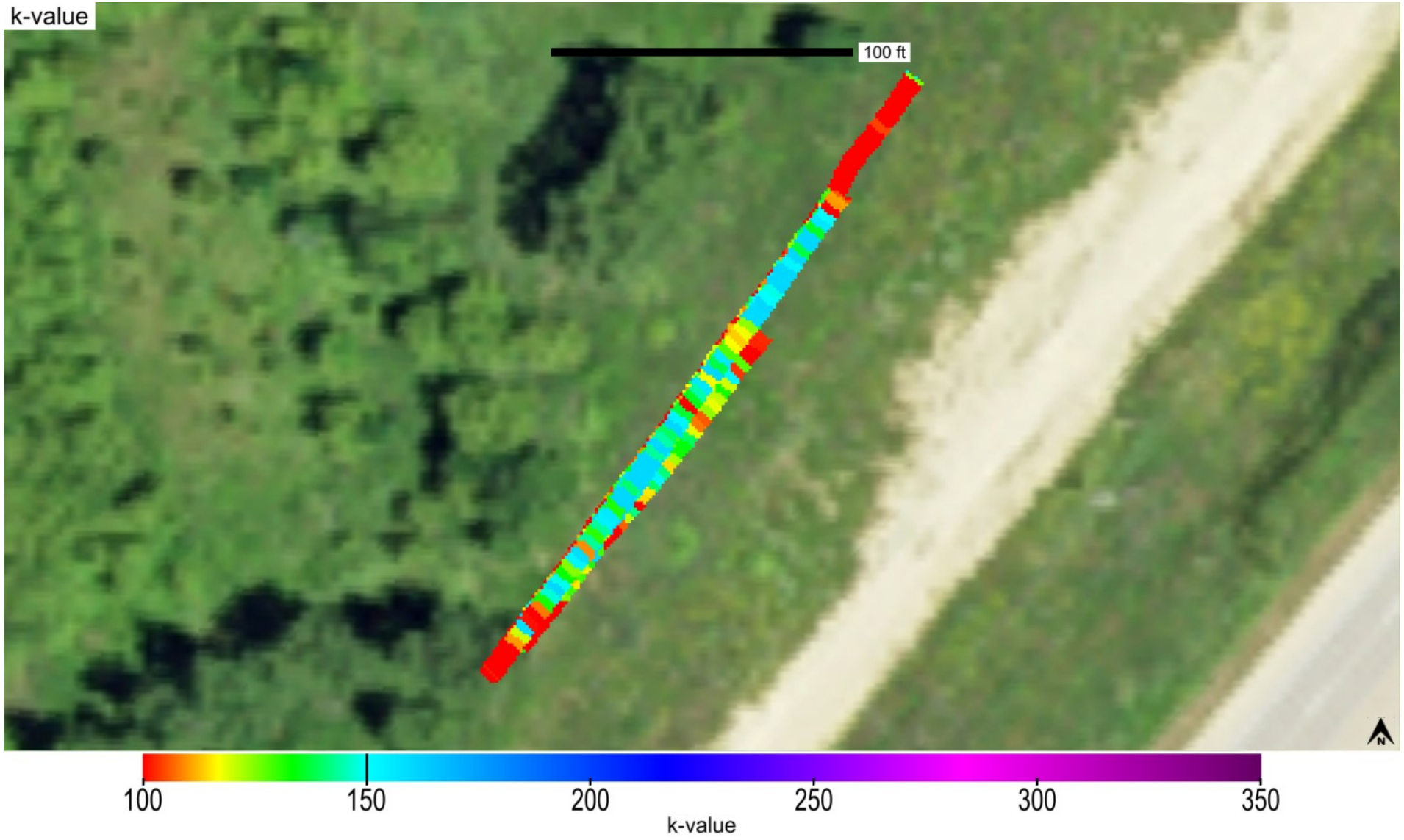
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_094247a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	27	43.39	0.47	150	60	121.3	160	32.98	27.2	-90	-28.7	10



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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_094247a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	27	43.39	0.47	150	60	121.3	160	32.98	27.2	-90	-28.7	10

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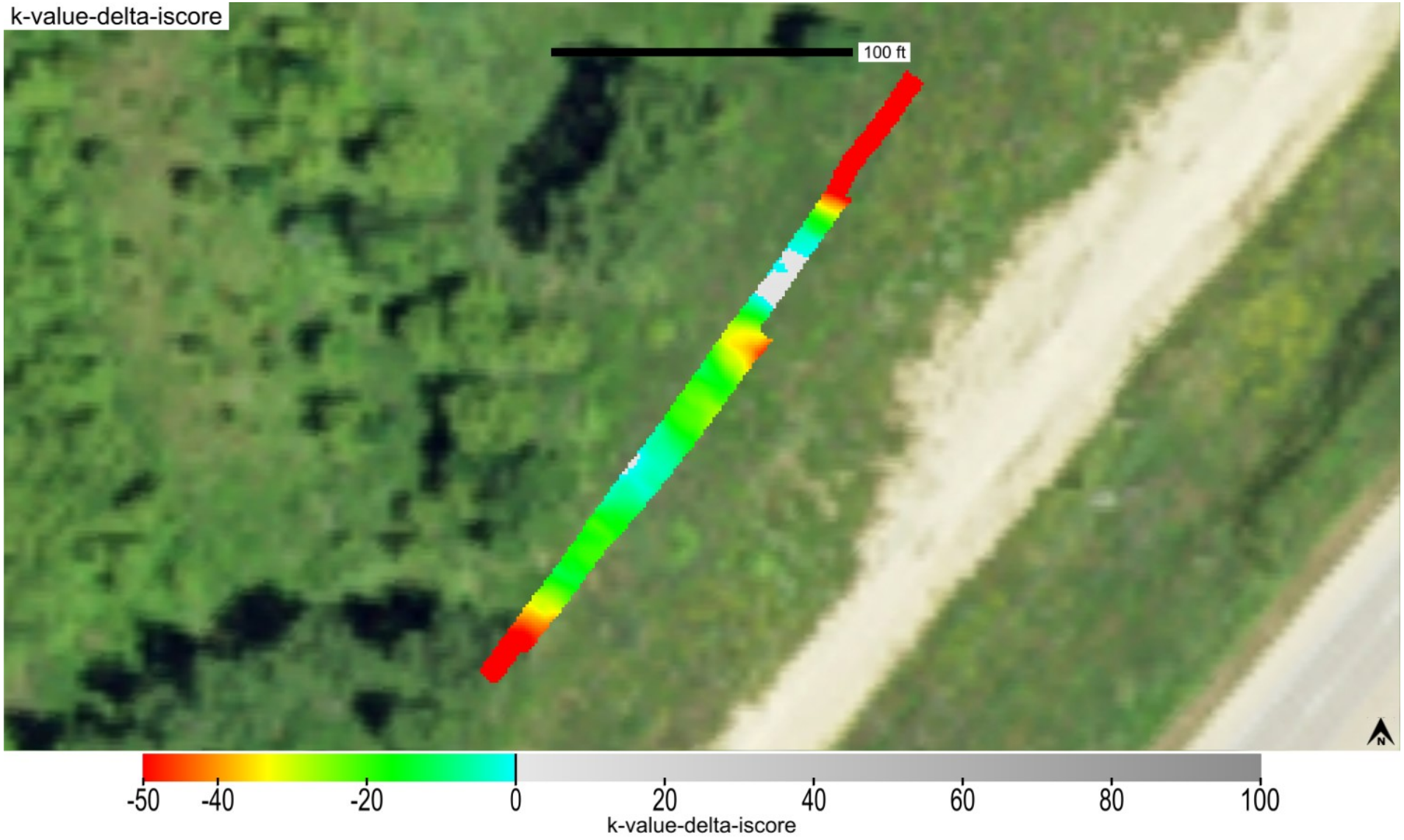
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_094247a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	27	150	-90	-28.7	10	-85.41	-28.18	2.92



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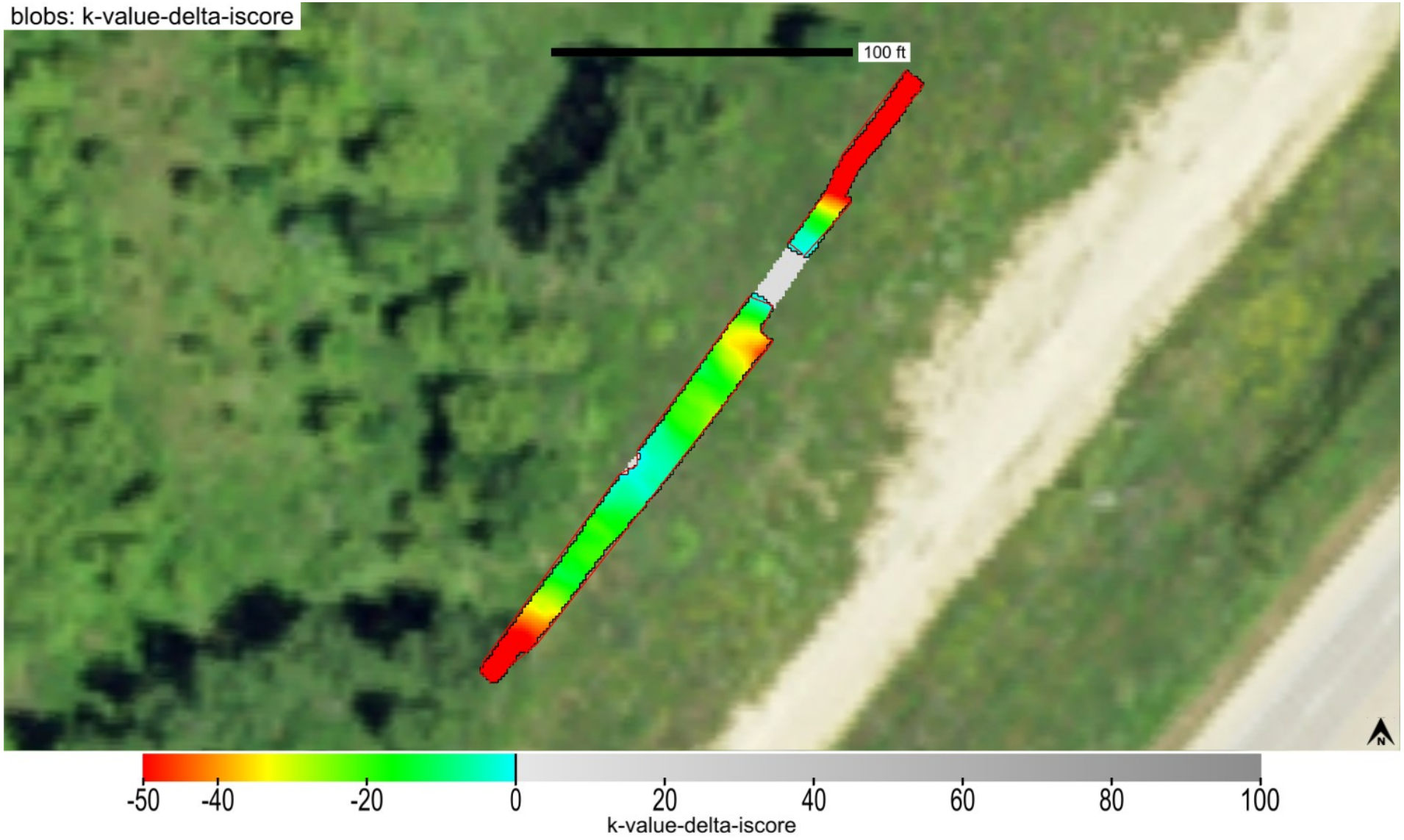
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_094247a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	2	2305	93.13	none	0



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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_094247a

minimum	average	maximum
1	4.37	8

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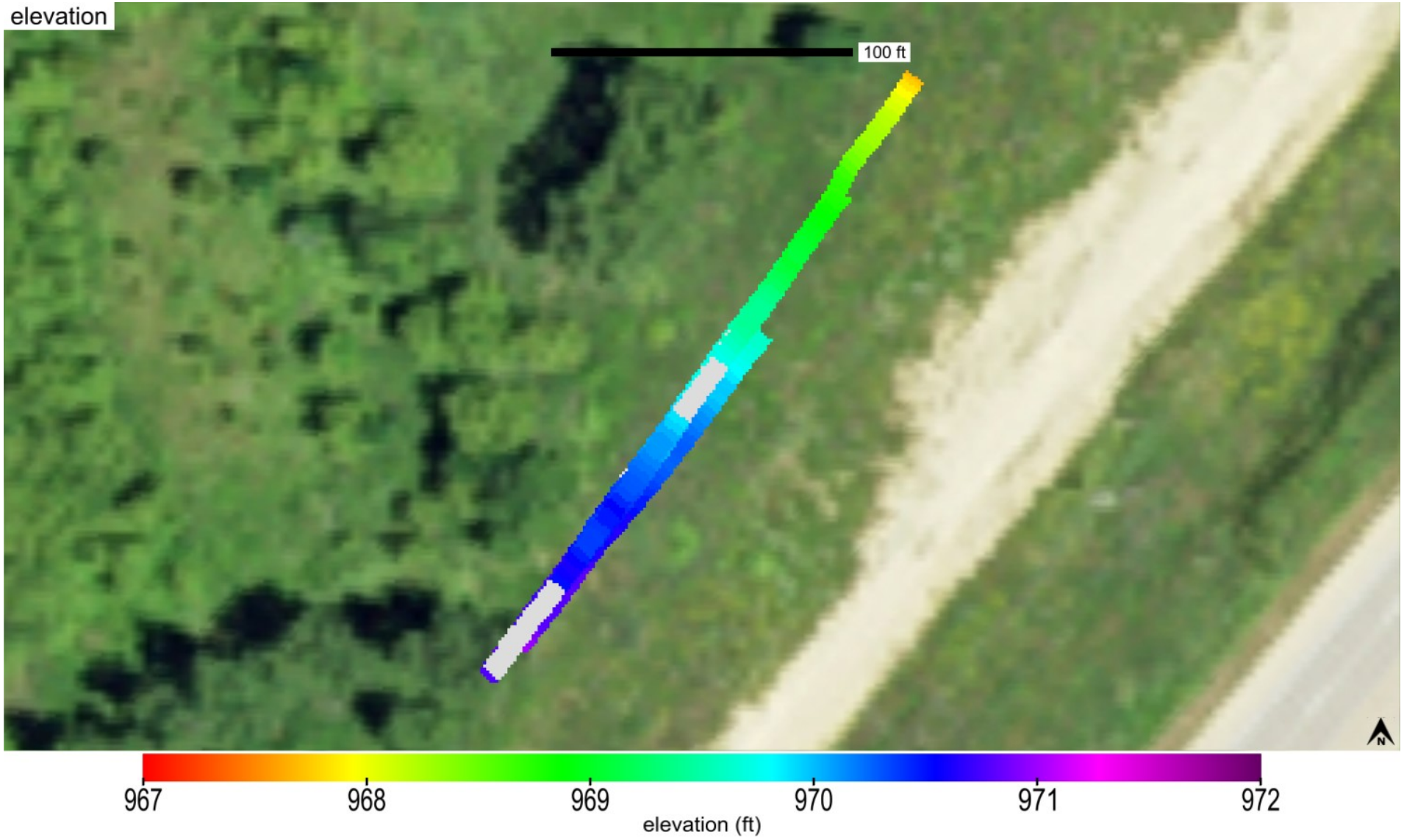
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_094247a

minimum	average	maximum
967.623	969.666	971.015



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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_094247a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Macadam Stone Base	41007	100	2475	0.057	12	8554	150	40

Macadam Stone Base_IADOT (2210)

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.43	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_101333a	No. of Measurements:	37792	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 10:13:33 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	118.44	1.32	8554	9959.98	23689.3	43632.74	5479.18	23.13	1405.98	15135.3	35078.74
k-value	Yes	72	93.61	0.97	150	60	146.7	160	24.59	16.77	-90	-3.3	10
Moisture Content	No												

Mapped Area

square feet	acres
37792	0.87

Pass Count

min.	avg.	max.
1	1.5	4

Elevation (ft)

min.	avg.	max.
976.73	1001.17	1026.42

Velocity (fps)

min.	avg.	max.
1.61	5.44	6.81

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Macadam Stone	41007	100	37792	0.868	12	8554	150	40

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.43	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_101333a	No. of Measurements:	37792	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 10:13:33 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
118.44	CQI > = 95
100	80% of Resilient Modulus MVs >= 8554
23.13	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:	US20 Dubuque County	Mapping Duration (hrs):	0.43	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_101333a	No. of Measurements:	37792	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 10:13:33 AM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
93.61	CQI > = 95
72	80% of k-Value MVs >= 150
16.77	COV <= 20
41.88	% 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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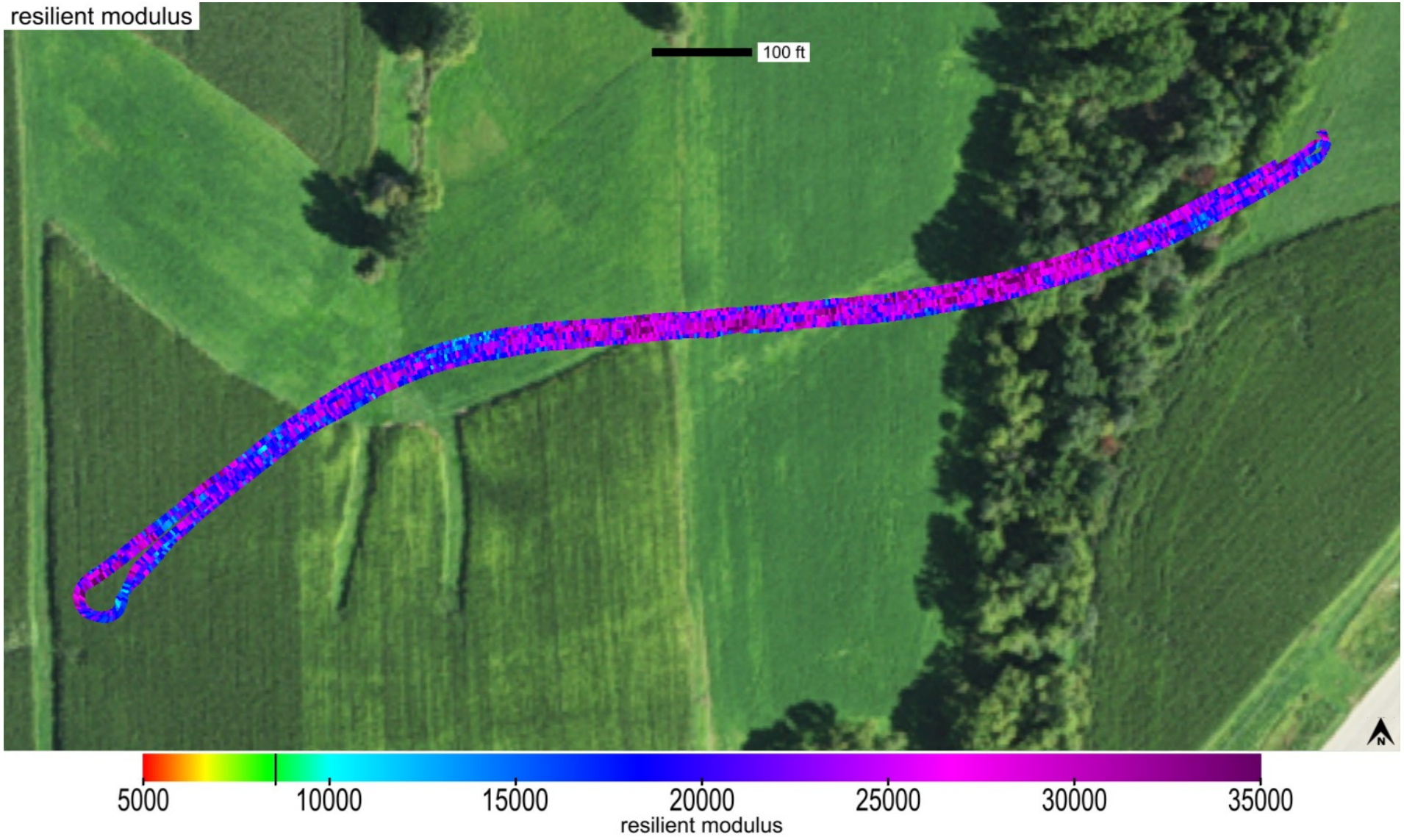
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_101333a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	118.44	1.32	8554	9959.98	23689.3	43632.74	5479.18	23.13	1405.98	15135.3	35078.74



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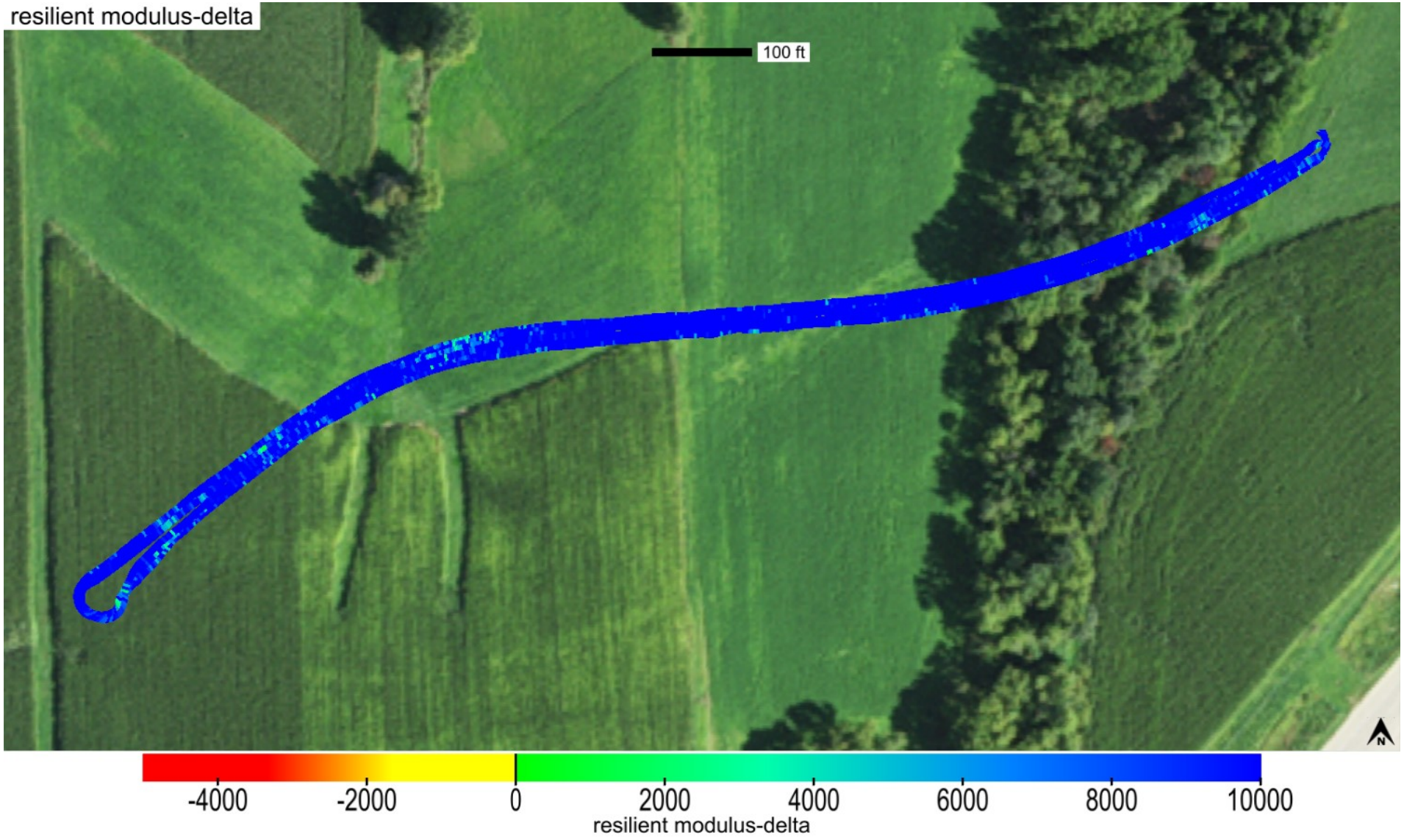
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_101333a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	118.44	1.32	8554	9959.98	23689.3	43632.74	5479.18	23.13	1405.98	15135.3	35078.74



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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_101333a

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	1405.98	15135.3	35078.74	6414.88	15224.36	23783.58

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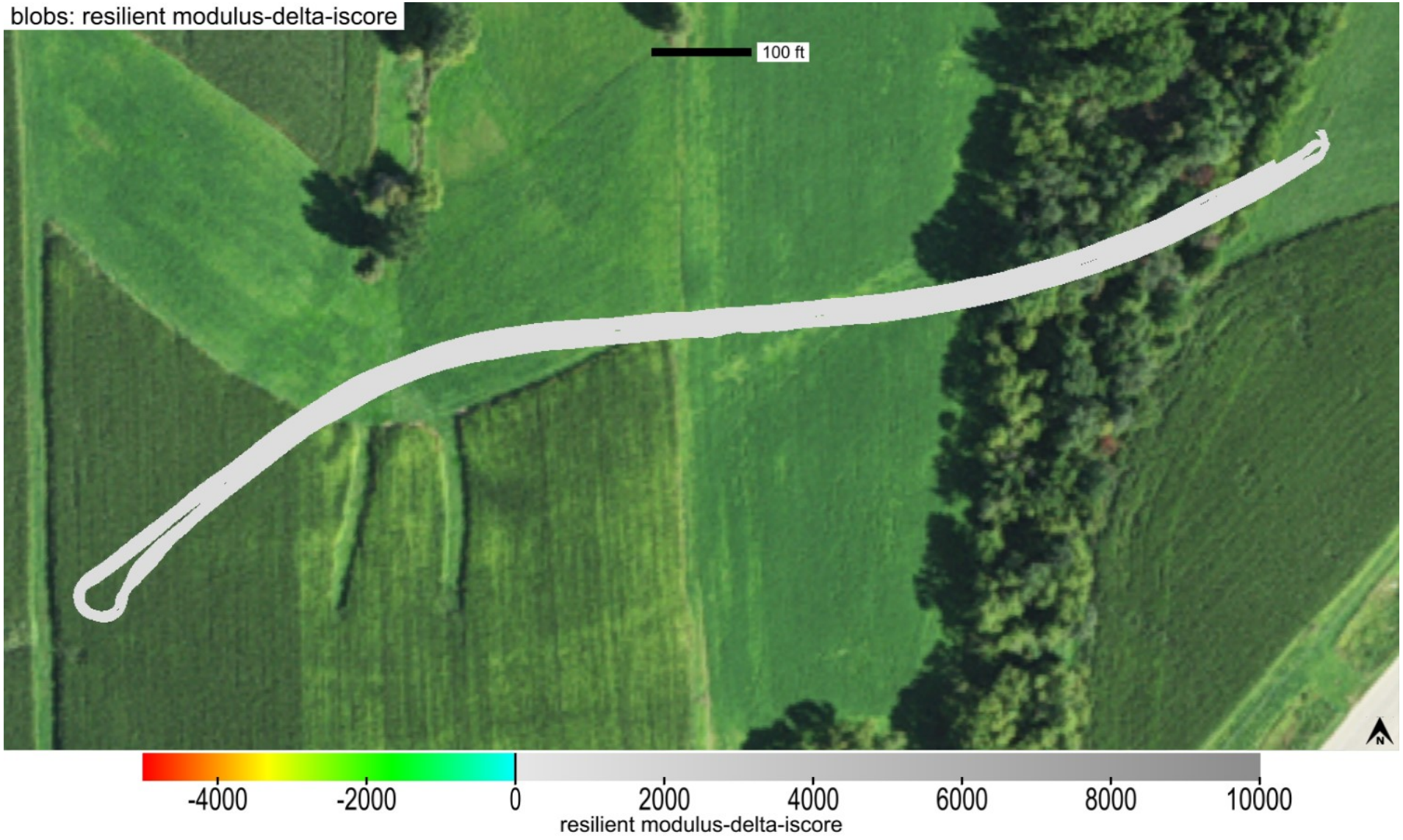
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_101333a

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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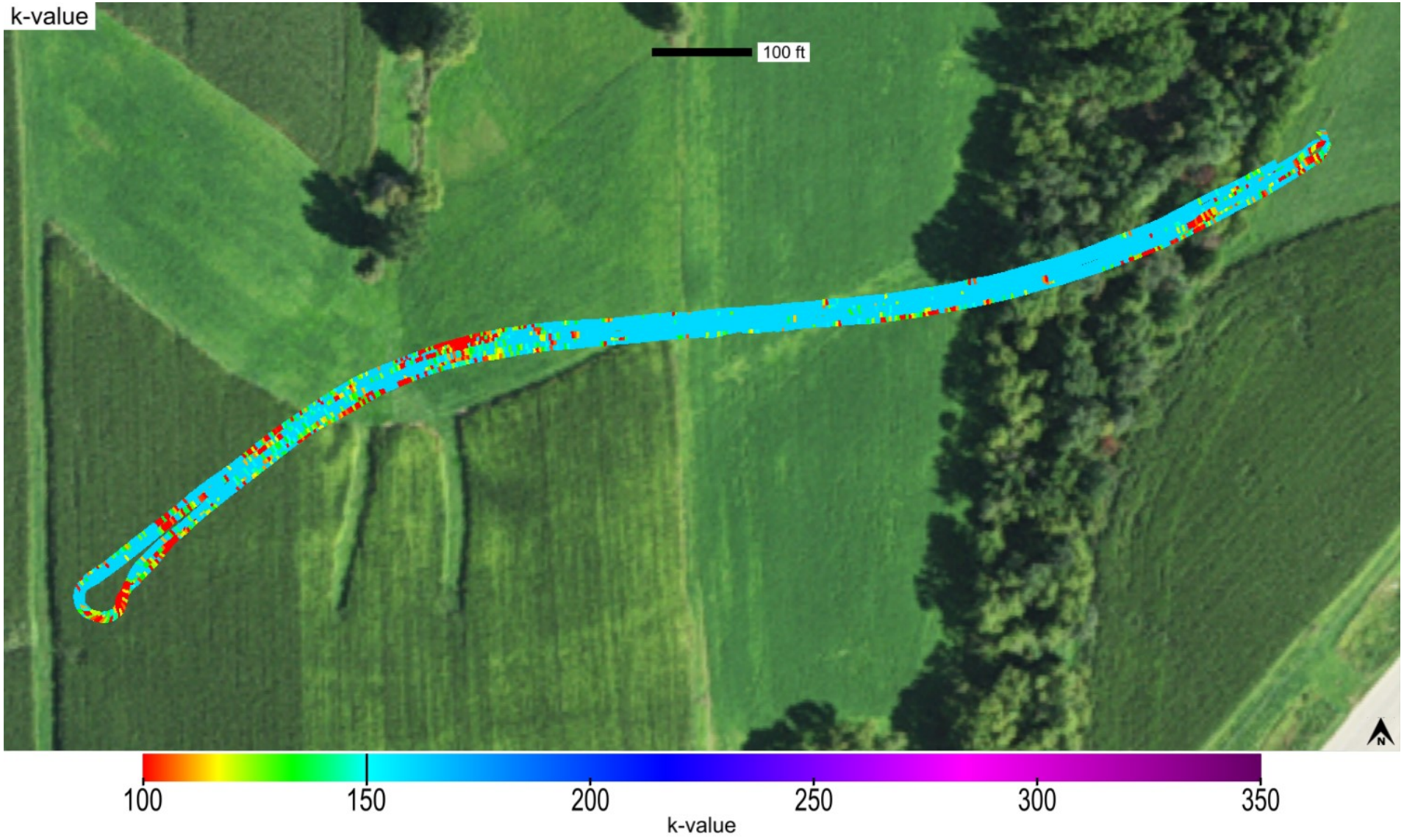
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_101333a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	72	93.61	0.97	150	60	146.7	160	24.59	16.77	-90	-3.3	10



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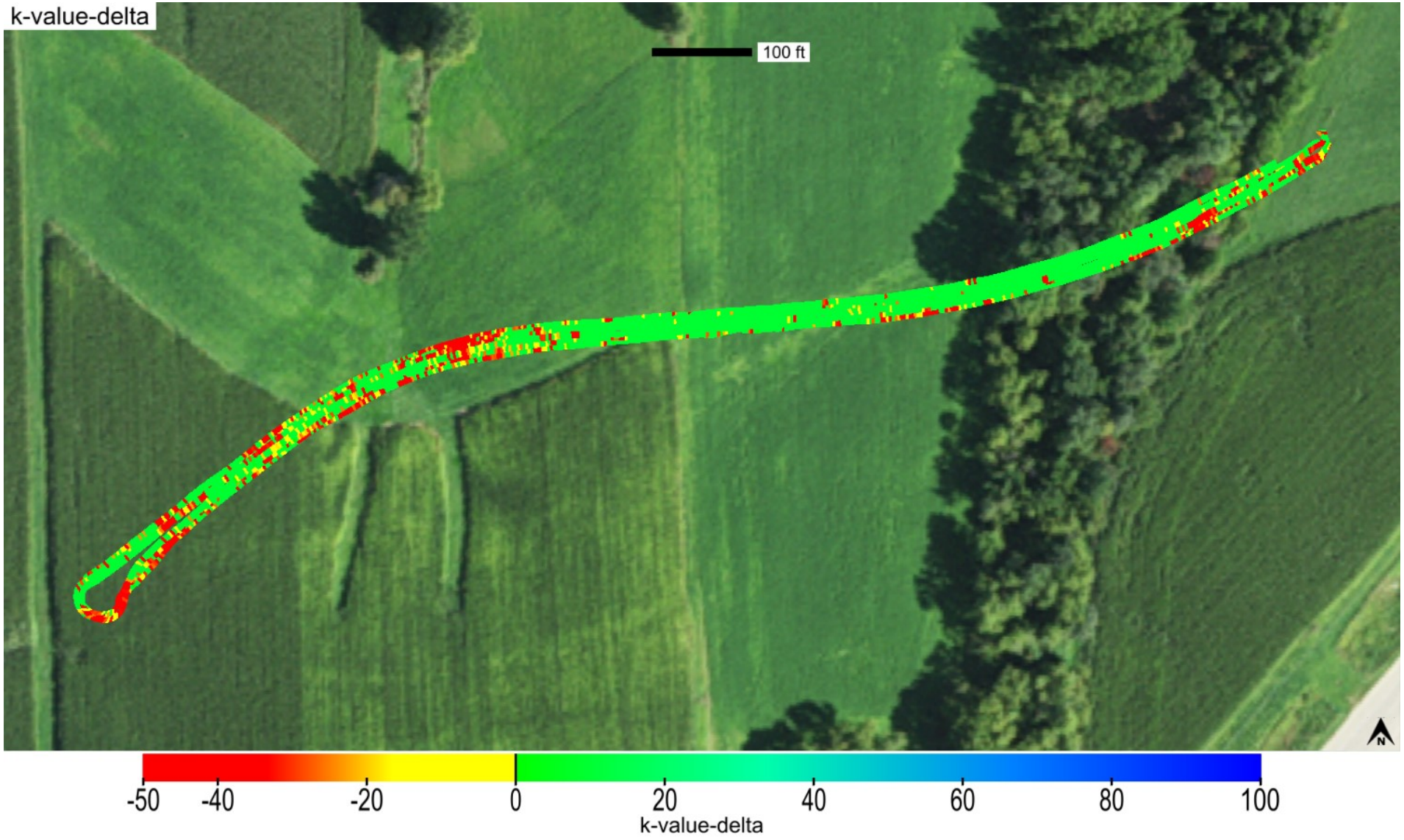
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_101333a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	72	93.61	0.97	150	60	146.7	160	24.59	16.77	-90	-3.3	10



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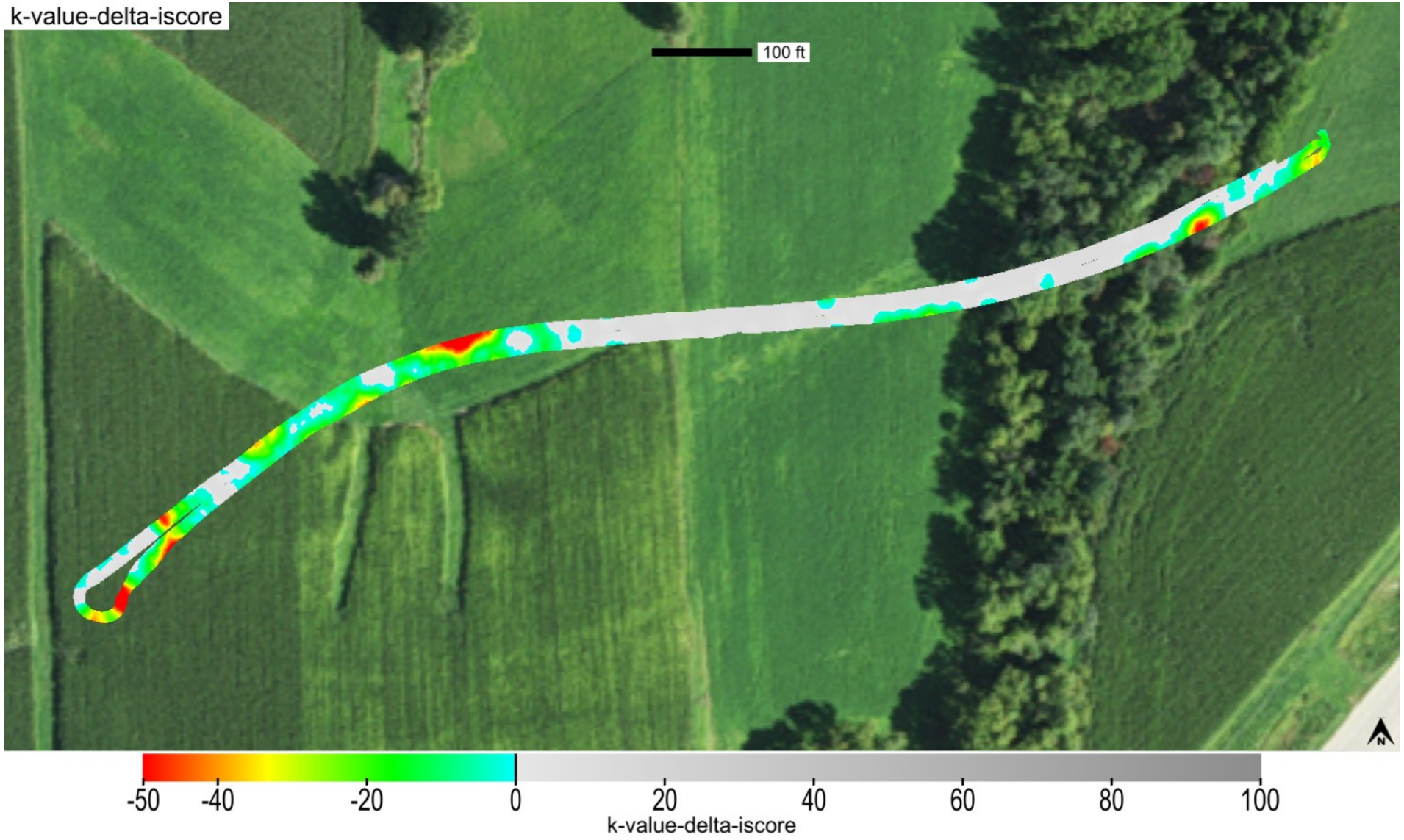
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_101333a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	72	150	-90	-3.3	10	-77.25	-2.96	10



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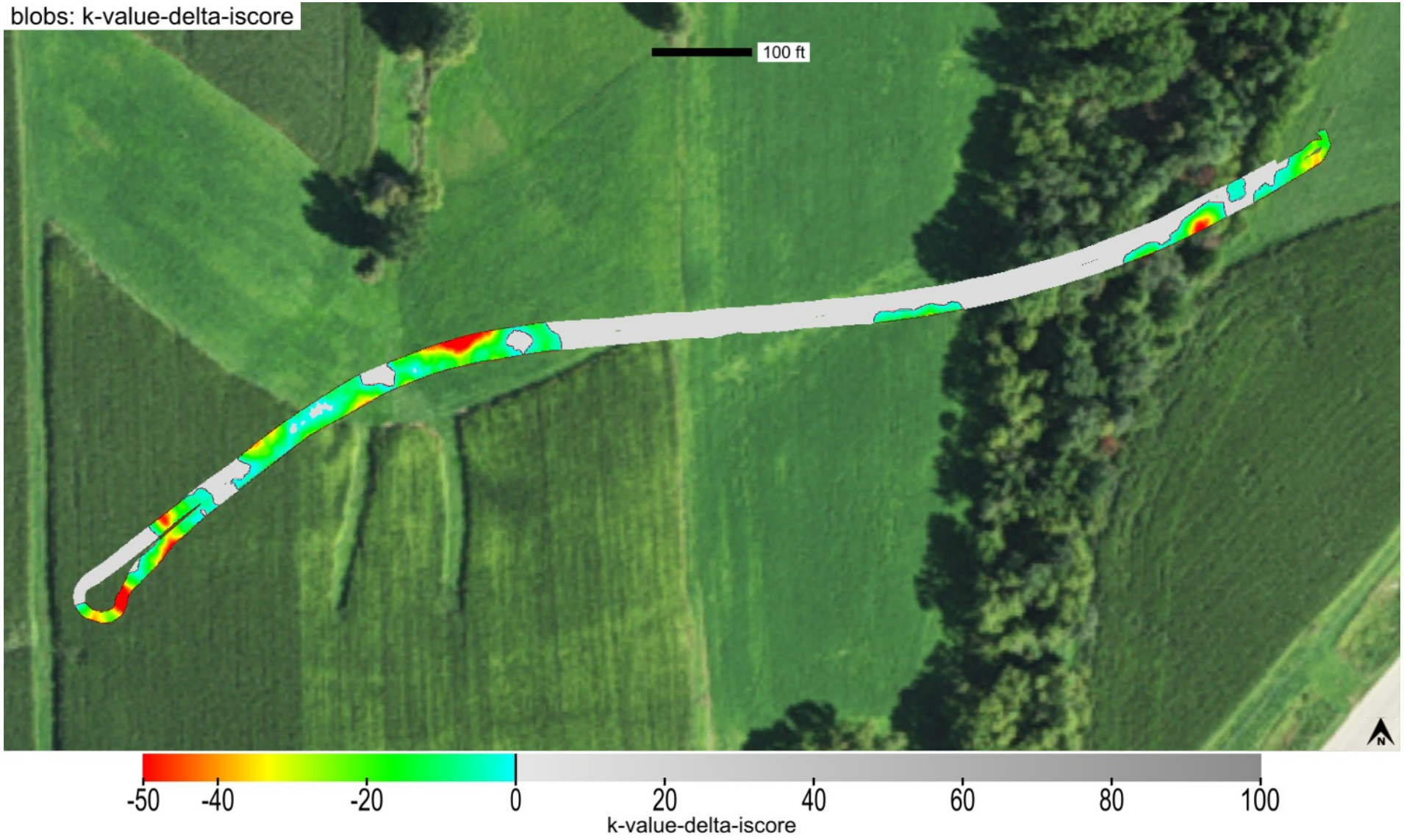
ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_101333a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	6	15826	41.88	none	0

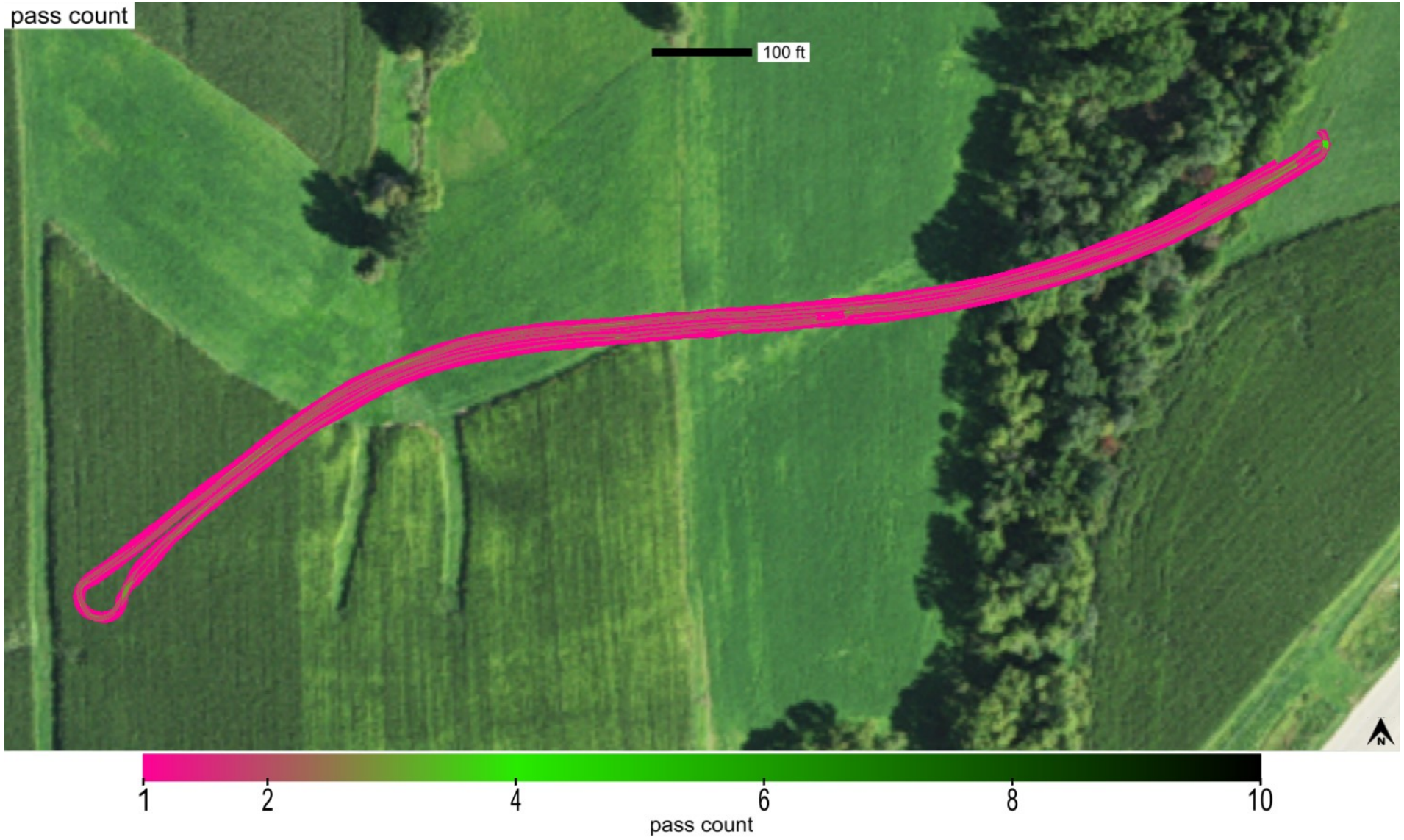


This report is only for use of the client named and it cannot be relied upon by any other person or entity.

ingios GEOTECHNICS

Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_101333a

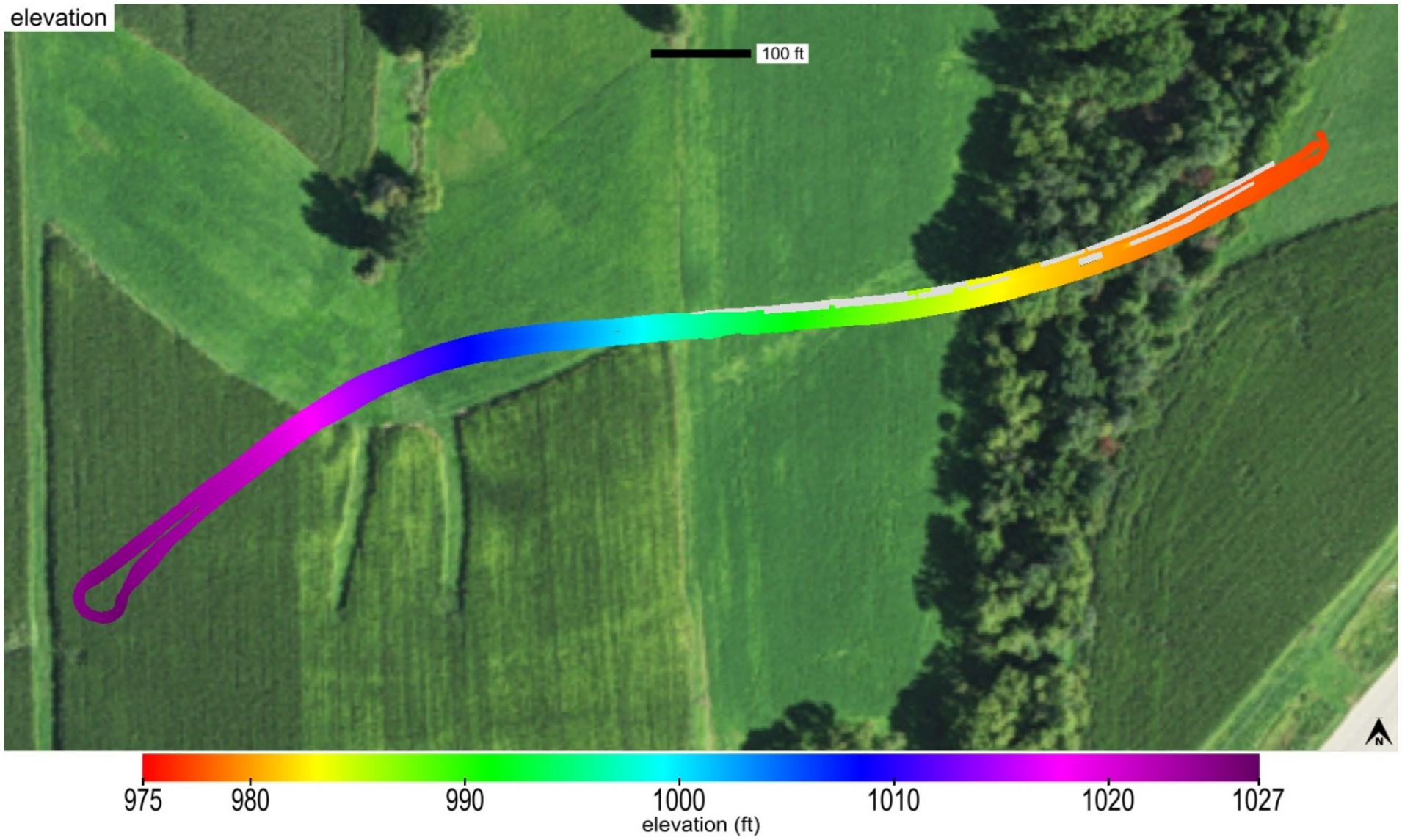
minimum	average	maximum
1	1.5	4



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-us20_cs56-fcs00210_2020_09_29_101333a

minimum	average	maximum
976.727	1001.173	1026.422



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-us20_cs56-fcs00210_2020_09_29_101333a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Macadam Stone	41007	100	37792	0.868	12	8554	150	40

Macadam Stone Base_IADOT (2210)

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.15	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_151141a	No. of Measurements:	1421	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 3:11:41 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	Yes	100	119.18	1.38	9037	9300.73	18841.2	33620.27	4078.34	21.65	263.73	9804.2	24583.27
k-value	Yes	9.8	32.79	1	150	46.87	129.4	173.68	18.1	13.98	-103.13	-20.6	23.68
Moisture Content	No												

Mapped Area

square feet	acres
1421	0.03

Pass Count

min.	avg.	max.
1	6.47	8

Elevation (ft)

min.	avg.	max.
981.8	982.94	983.69

Velocity (fps)

min.	avg.	max.
0.43	5.34	6

Materials

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	1421	0.033	12	9037	150	40

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IOWADOT

E-Compaction Report

Project:	US20 Dubuque County	Mapping Duration (hrs):	0.15	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_151141a	No. of Measurements:	1421	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 3:11:41 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - Resilient Modulus

Quality Value	Criteria
119.18	CQI > = 95
100	80% of Resilient Modulus MVs >= 9037
21.65	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:	US20 Dubuque County	Mapping Duration (hrs):	0.15	Operator:	Ingios Geotechnics inc
Map ID:	iadot_31-us20_cs56-fcs00210_2020_09_29_151141a	No. of Measurements:	1421	Machine ID:	Ingios_FCS00210
Date and Time:	9/29/2020 3:11:41 PM	Location:	Dubuque County	State Plane:	1401 IOWA NORTH

QUALITY ANALYSIS SUMMARY - k-Value

Quality Value	Criteria
32.79	CQI > = 95
9.8	80% of k-Value MVs >= 150
13.98	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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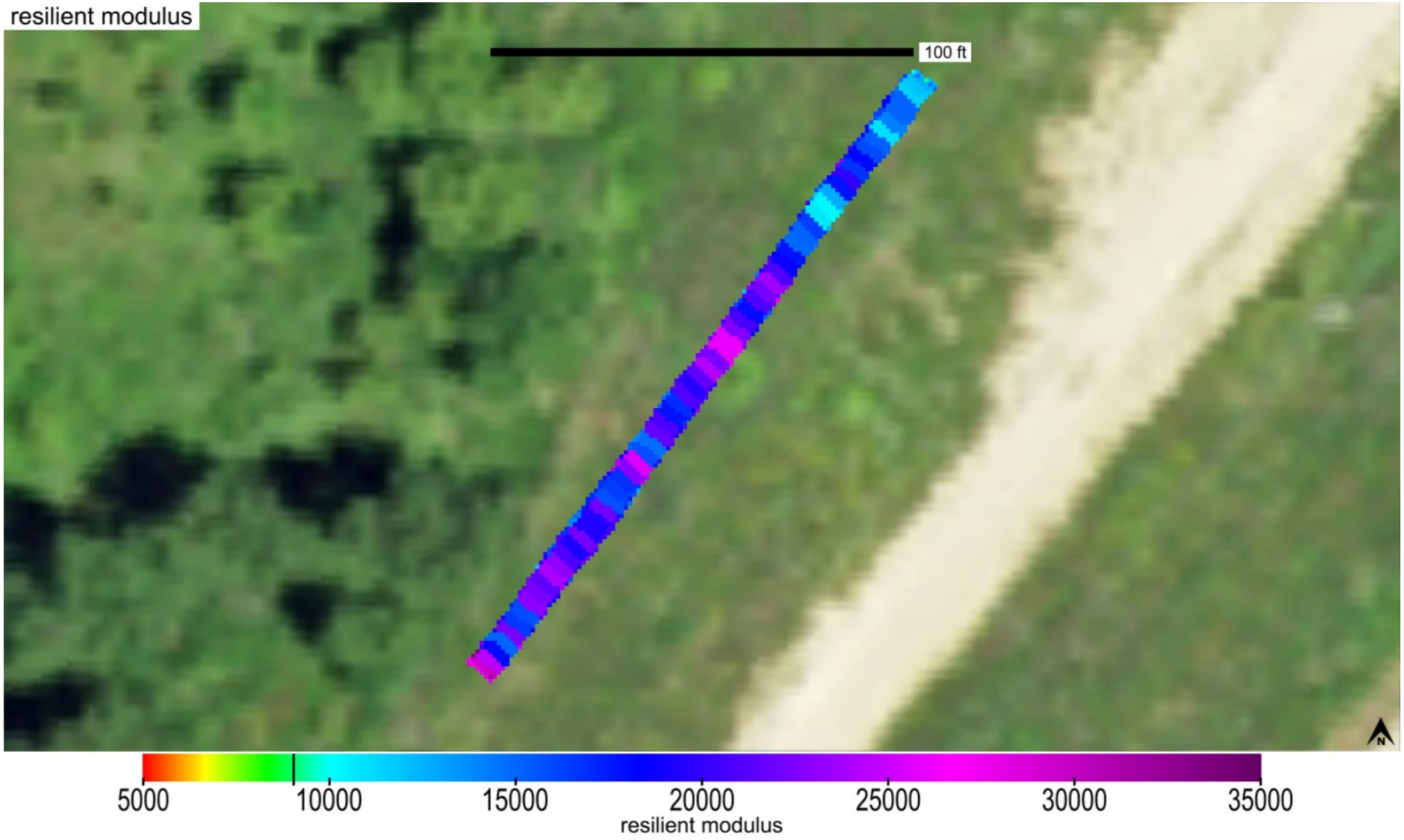
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_151141a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	119.18	1.38	9037	9300.73	18841.2	33620.27	4078.34	21.65	263.73	9804.2	24583.27



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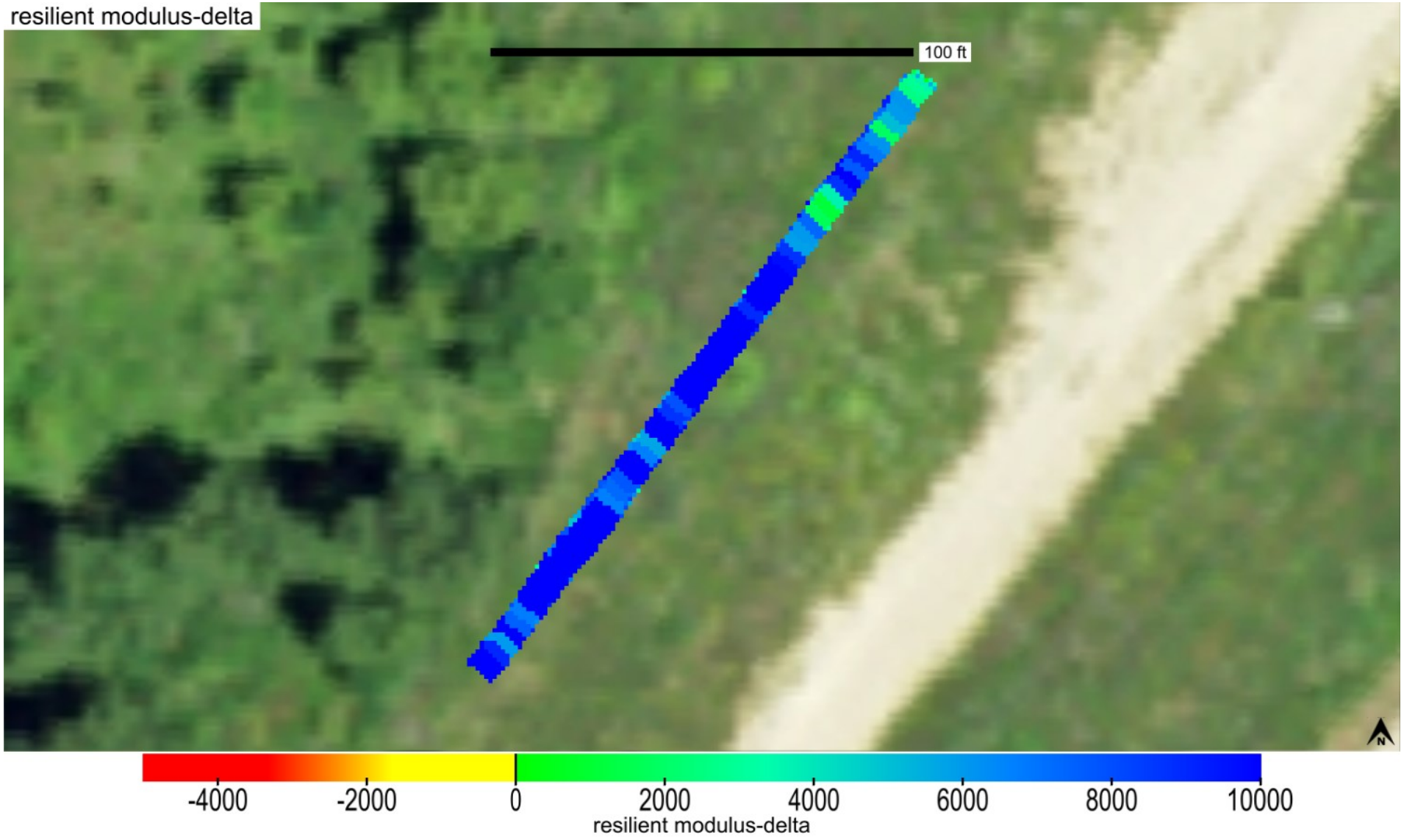
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_151141a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
resilient modulus	Yes	100	119.18	1.38	9037	9300.73	18841.2	33620.27	4078.34	21.65	263.73	9804.2	24583.27



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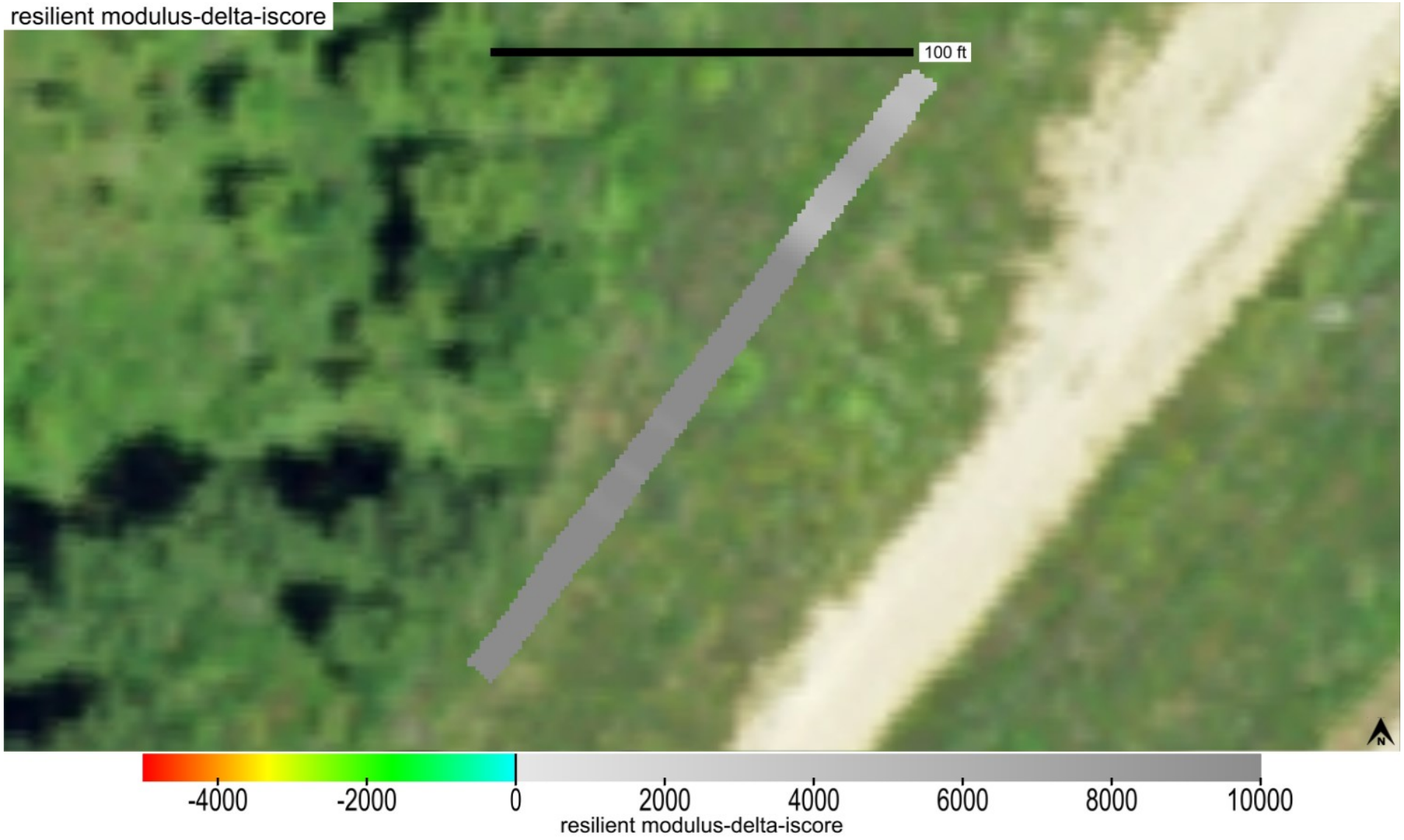
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_151141a

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	263.73	9804.2	24583.27	4087.39	9772.4	14290.31



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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_151141a

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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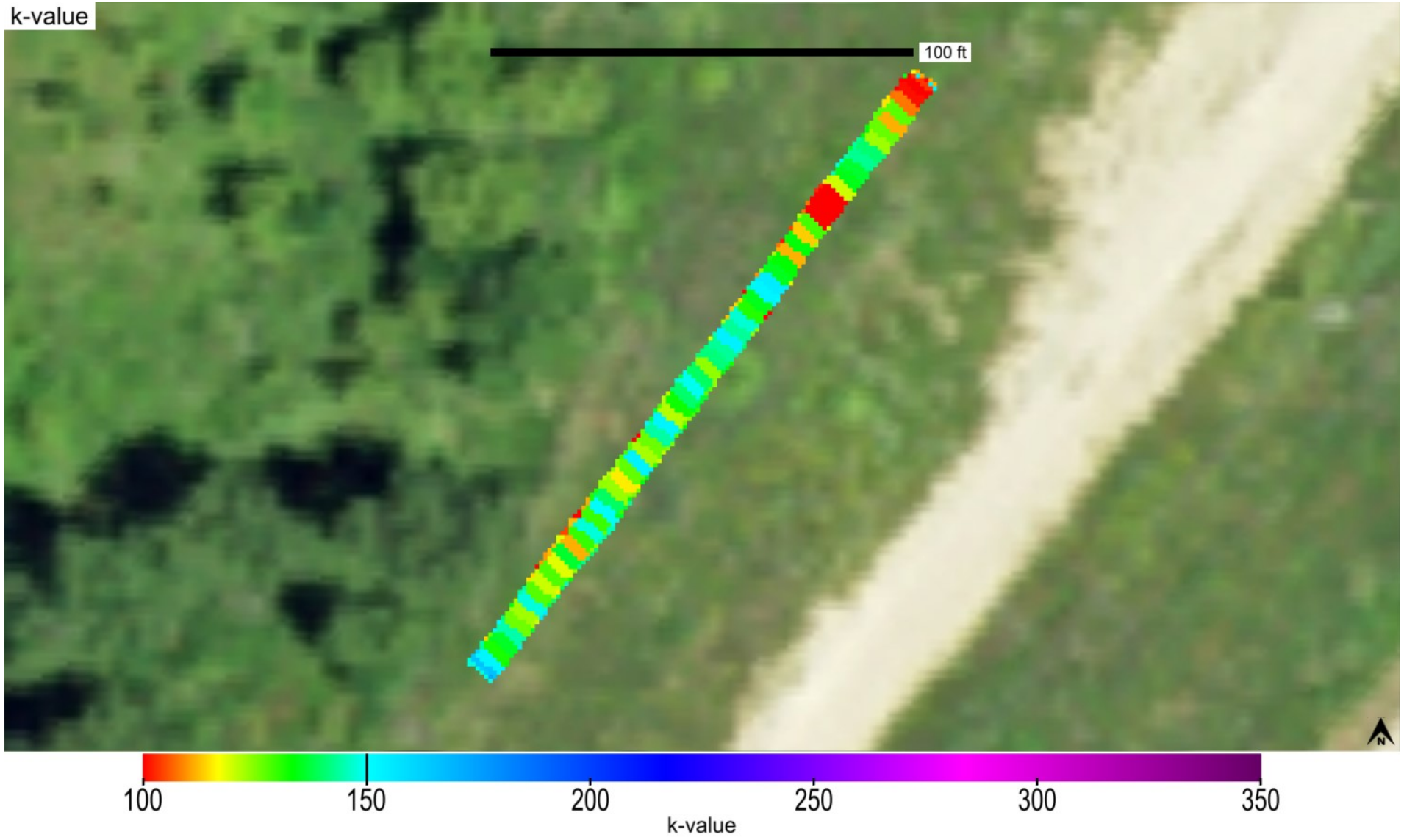
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_151141a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	9.8	32.79	1	150	46.87	129.4	173.68	18.1	13.98	-103.13	-20.6	23.68



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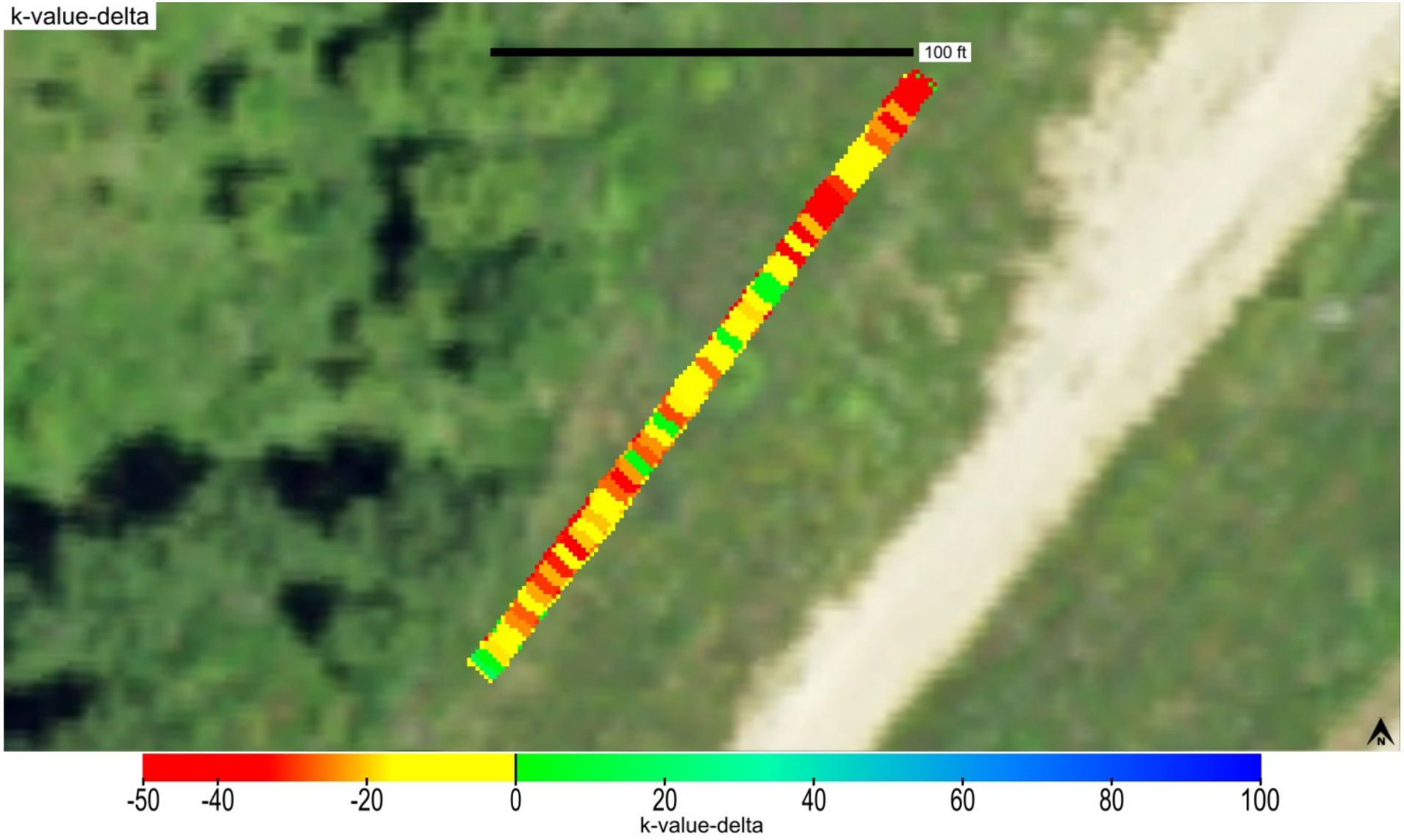
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_151141a

Parameter	Measured	% Passing	CQI	CI	Calc. TV	min.	avg.	max.	std. dev.	cov(%)	min.-delta	avg.-delta	max.-delta
k-value	Yes	9.8	32.79	1	150	46.87	129.4	173.68	18.1	13.98	-103.13	-20.6	23.68



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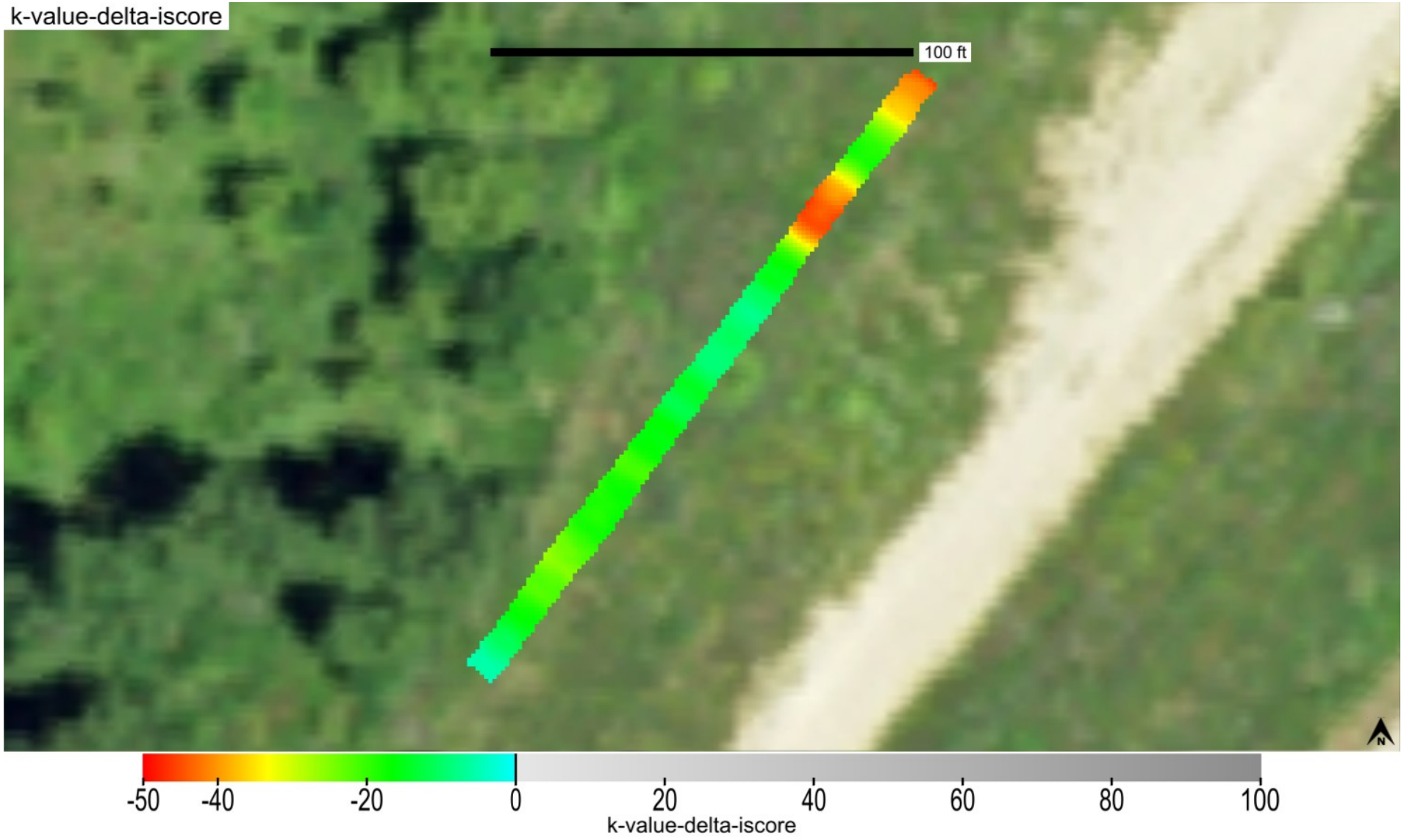
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_151141a

Parameter	Measured	% Passing	Calc. TV	min.-delta	avg.-delta	max.-delta	min.-delta-iscore	avg.-delta-iscore	max.-delta-iscore
k-value	Yes	9.8	150	-103.13	-20.6	23.68	-46.61	-20.59	-4.06



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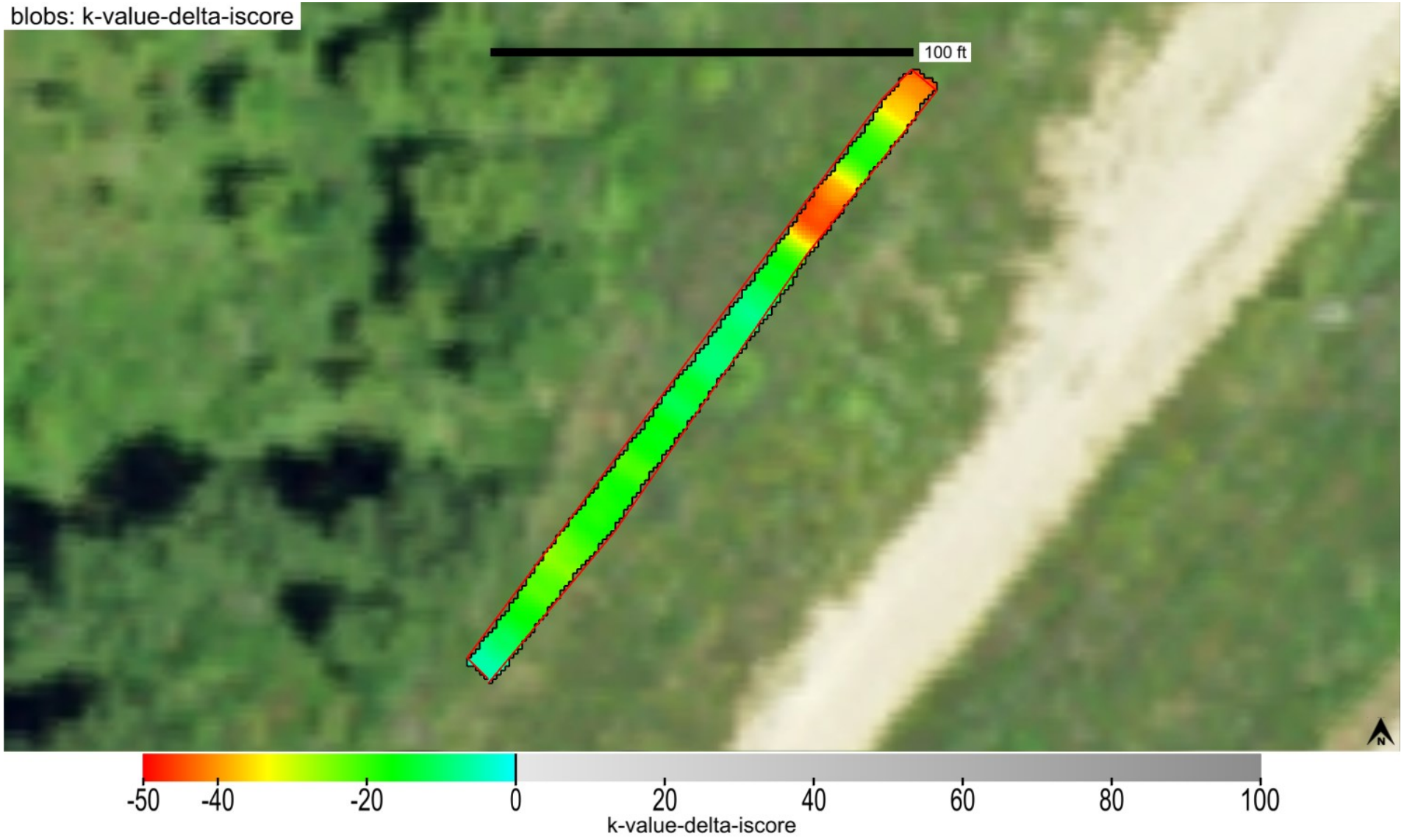
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_151141a

min. area(ft^2)	# of blobs	blob area(ft^2)	% of map	lower bound-tv	upper bound-tv
200	1	1421	100	none	0



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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_151141a

minimum	average	maximum
1	6.47	8

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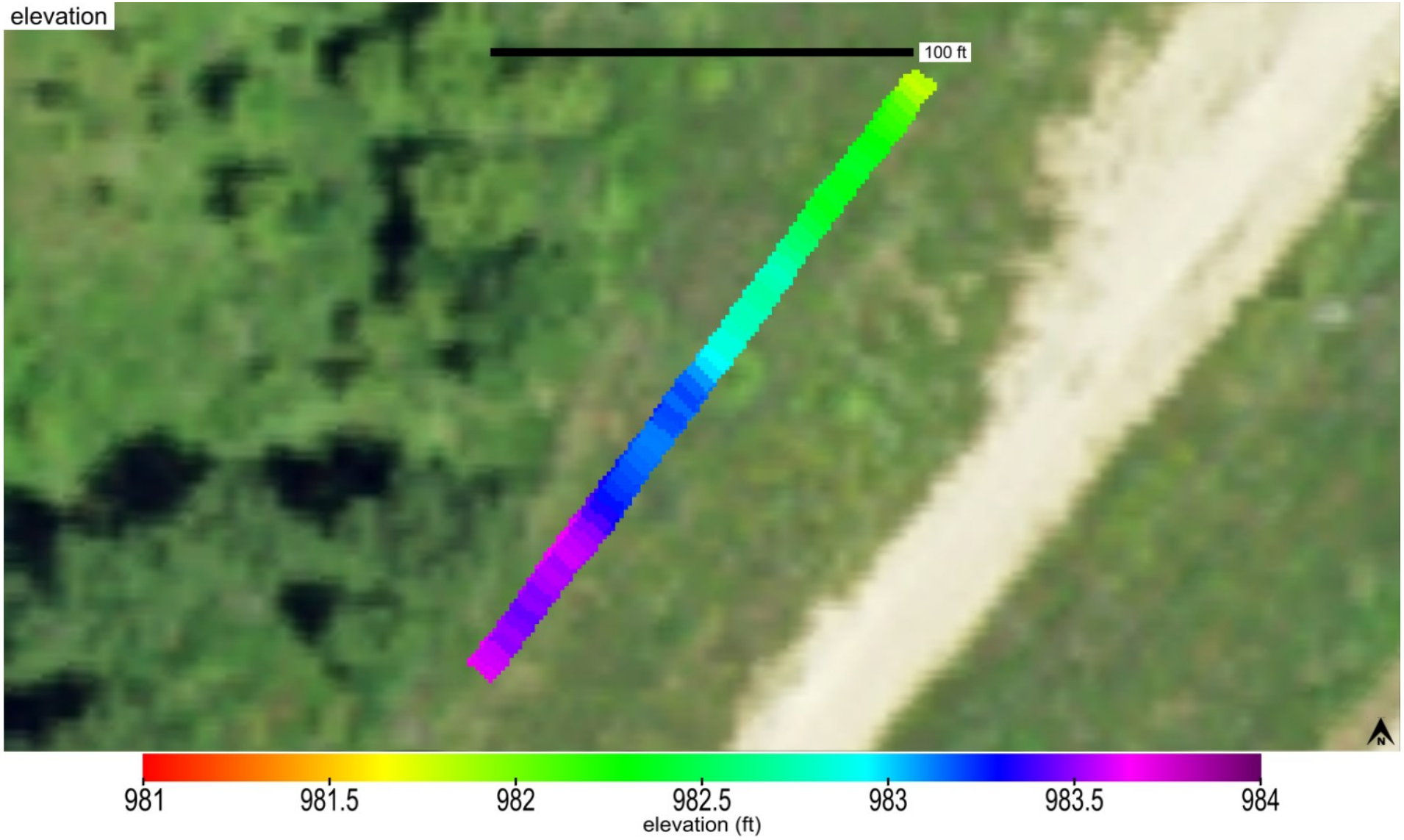
Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_151141a

minimum	average	maximum
981.796	982.945	983.686



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Map ID: iadot_31-us20_cs56-fcs00210_2020_09_29_151141a

name	id	% of total	area-square ft	area-acres	tl-xmv	tl-Mr	tl-k value	tl-w%
Modified Subbase	41014	100	1421	0.033	12	9037	150	40

Modified Subbase_IADOT (2115)

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