APPENDIX C: Laboratory Results

CDM Smith Geotechnical Laboratory Testing Summary Sheet

Client: USACE | Project Number: 51115-29493[illegible] | Reviewed By: Matthew Polsky - Lab Manager

Project Name: New Haven Harbor | Task: 6568-F0024-TK1.08

Project Location: New Haven, CT | Assigned By: Jonathan Barker | Date Reviewed: 9/6/2024

Sample Date	Sample Location	Sample	Depth (ft)	Identification Tests								Strength Tests				Soil Description
				Water Content %	LL %	PL %	Gravel %	Sand %	Fines %	Org. %	Spec. Gravity	$\bar{\sigma}_c$ psi	Failure Criteria (CIU)	$\sigma_1 - \sigma_3$ or τ psi	Strain %	
7/22/24	FD-24-B-01	SS-02	2	18.1			0.1	91.7	8.2							Dark brown poorly graded sand with silt
7/22/24	FD-24-B-01	SS-06	10	30.8			3.3	78.3	18.4							Dark brown silty sand
7/22/24	FD-24-B-01	SS-07	12.5	24.4			0.2	97.0	2.8							Gray-brown poorly graded sand
7/22/24	FD-24-B-01	SS-09	16	96.9	117	59	0.0	3.9	96.1							Dark gray organic silt
7/21/24	FD24-B-02	SS-02	2	26.0			0.0	94.5	5.5							Gray-brown poorly graded sand with silt
7/21/24	FD24-B-02	SS-06	10	27.8			0.0	85.7	14.3							Gray Silty sand
7/21/24	FD24-B-02	SS-10	18	23.8			0.0	88.5	11.5							Gray-brown poorly graded sand with silt
7/20/24	FD-24-B-03	SS-02	2	33.7			1.0	84.0	15.0							Gray silty sand
7/20/24	FD-24-B-03	SS-08	14	30.4			11.1	75.1	13.8							Gray silty sand
7/19/24	FD24-B-04	SS-02	2	19.0			0.5	92.3	7.2							Red-brown poorly graded sand with silt
7/19/24	FD24-B-04	SS-05	8	25.2			0.0	58.6	41.4							Red-brown silty sand
7/19/24	FD24-B-04	SS-09	16	28.0			0.0	23.5	76.5							Red-brown silt with sand
7/19/24	FD24-B-04	SS-15	28	37.4			0.0	3.3	96.7							Red-brown silt
7/24/24	FD-24-B-05	SS-02	2	21.4			2.0	91.2	6.8							Gray-brown poorly graded sand with silt
7/24/24	FD-24-B-05	SS-04	6	19.0			1.4	97.2	1.4							Gray-brown poorly graded sand

CDM Smith Geotechnical Laboratory Testing Summary Sheet

Client: USACE | Project Number: 51115-29493€ | Reviewed By: Matthew Polsky - Lab Manager

Project Name: New Haven Harbor | Task: 6568-F0024-TK1.08

Project Location: New Haven, CT | Assigned By: Jonathan Barker | Date Reviewed: 9/6/2024

Sample Date	Sample Location	Sample	Depth (ft)	Identification Tests								Strength Tests				
				Water Content %	LL %	PL %	Gravel %	Sand %	Fines %	Org. %	Spec. Gravity	$\bar{\sigma}_c$ psi	Failure Criteria (CIU)	$\sigma_1 - \sigma_3$ or τ psi	Strain %	Soil Description
8/10/24	FD24-B-06	SS-03	4.6	102.2	106	47	0.0	0.6	99.4							Dark gray organic silt
8/10/24	FD24-B-06	SS-07	12.6	114.5	132	49	0.0	1.6	98.4							Gray organic clay
7/10/24	FD24-B-07	SS-02	2.0	114.4	106	48	0.0	10.3	89.7							Gray organic silt
7/10/24	FD24-B-07	SS-08	15.5	38.9	33	24	0.0	56.3	43.7							Gray silty sand
7/10/24	FD24-B-07	SS-11	21.5	24.0			0.6	95.9	3.5							Brown poorly graded sand
7/23/24	FD24-B-08	SS-02	2.0	90.7	88	39	0.0	10.6	89.4							Gray organic silt
7/23/24	FD24-B-08	SS-06	10.0	17.4			0.3	92.5	7.2							Brown poorly graded sand with silt
7/23/24	FD24-B-08	SS-09	16.0	13.1			26.6	69.9	3.5							Brown poorly graded sand with gravel
7/23/24	FD24-B-08	SS-11	20.0	24.5			0.2	78.5	21.3							Red-brown silty sand
7/23/24	FD24-B-08	SS-17	32.0	25.4			0.0	51.6	48.4							Red-brown silty sand
7/12/24	FD24-B-09	SS-03	3.8	106.8	102	42	0.0	8.5	91.5							Dark gray organic clay
7/12/24	FD24-B-09	SS-06	9.8	71.7	77	34	0.0	12.9	87.1							Gray organic clay
7/12/24	FD24-B-09	SS-13	24.1	17.3			0.8	92.3	6.9							Brown poorly graded sand with silt
7/11/24	FD24-B-10	SS-02	2.0	92.2	92	42	0.0	7.9	92.1							Gray organic silt
7/11/24	FD24-B-10	SS-05	8.2	127.1	108	44	0.0	2.6	97.4							Gray organic silt

CDM Smith Geotechnical Laboratory Testing Summary Sheet

Client: USACE | Project Number: 51115-29493[illegible] | Reviewed By: Matthew Polsky - Lab Manager

Project Name: New Haven Harbor | Task: 6568-F0024-TK1.08

Project Location: New Haven, CT | Assigned By: Jonathan Barker | Date Reviewed: 9/6/2024

Sample Date	Sample Location	Sample	Depth (ft)	Identification Tests								Strength Tests				
				Water Content %	LL %	PL %	Gravel %	Sand %	Fines %	Org. %	Spec. Gravity	$\bar{\sigma}_c$ psi	Failure Criteria (CIU)	$\sigma_1 - \sigma_3$ or τ psi	Strain %	Soil Description
7/11/24	FD24-B-10	SS-13	24.2	20.5	--	NP	0.0	89.5	10.5							Brown poorly graded sand with silt
7/11/24	FD24-B-10	SS-16	30.5	15.1			10.6	85.5	3.9							Brown poorly graded sand
7/3/24	FD24-B-11	SS-05	7.4	113.7			0.0	4.9	95.1							Gray organic silt
7/3/24	FD24-B-11	SS-12	21.4	45.3	41	24	0.0	45.2	54.8							Gray-brown sandy lean clay
7/3/24	FD24-B-11	SS-14	26.6	17.5			7.0	87.4	5.6							Brown poorly graded sand with silt
7/3/24	FD24-B-11	SS-20	37.0	23.7			0.0	46.9	53.1							Red-brown sandy silt
7/25/24	FD24-B-12	SS-02	2.0	38.5	--	NP	0.0	28.8	71.2							Gray silt with sand
7/25/24	FD24-B-12	SS-04	6.0	22.6			0.7	94.2	5.1							Gray-brown poorly graded sand with silt
7/25/24	FD24-B-12	SS-07	12.0	16.2			21.4	69.9	8.7							Brown well-graded sand with silt and gravel
7/25/24	FD24-B-12	SS-09	16.0	28.4	--	NP	0.0	3.9	96.1							Red-brown silt
7/2/24	FD24-B-13	SS-01	0.0	117.0	95	44	0.0	1.8	98.2							Gray organic silt
7/2/24	FD24-B-13	SS-04	4.9	24.2			0.0	91.2	8.8							Red-brown poorly graded sand with silt
7/2/24	FD24-B-13	SS-06	8.6	25.9			0.0	65.6	34.4							Red-brown silty sand
7/2/24	FD24-B-13	SS-10	17.0	27.9			0.0	10.4	89.6							Red-brown silt
7/26/24	FD24-B-14	SS-02	2.0	146.2	113	46	0.0	1.2	98.8							Gray organic silt

CDM Smith Geotechnical Laboratory Testing Summary Sheet

Client: USACE | Project Number: 51115-29493€ | Reviewed By: Matthew Polsky - Lab Manager

Project Name: New Haven Harbor | Task: 6568-F0024-TK1.08

Project Location: New Haven, CT | Assigned By: Jonathan Barker | Date Reviewed: 9/6/2024

Sample Date	Sample Location	Sample	Depth (ft)	Identification Tests								Strength Tests				
				Water Content %	LL %	PL %	Gravel %	Sand %	Fines %	Org. %	Spec. Gravity	$\bar{\sigma}_c$ psi	Failure Criteria (CIU)	$\sigma_1 - \sigma_3$ or τ psi	Strain %	Soil Description
7/26/24	FD24-B-14	SS-07	12.0	27.4			0.0	62.2	37.8							Brown silty sand
7/26/24	FD24-B-14	SS-09	16.0	16.3			12.4	77.1	10.5							Brown poorly graded sand with silt
7/26/24	FD24-B-14	SS-12	22.0	23.7			0.0	27.6	72.4							Red-brown silt with sand
8/3/24	FD24-B-15	SS-03	3.7	134.0	119	51	0.0	3.0	97.0							Dark Gray organic silt
8/3/24	FD24-B-15	SS-07	11.6	18.0			17.3	80.0	2.7							Brown poorly graded sand with gravel
8/3/24	FD24-B-15	SS-10	17.6	28.5			0.0	44.7	55.3							Red-brown sandy silt
8/4/24	FD24-B-16	SS-02	2.0	115.2	120	54	0.0	6.4	93.6							Dark Gray organic silt
8/4/24	FD24-B-16	SS-05	8.0	25.0			0.0	28.9	71.1							Brown silt with sand
8/4/24	FD24-B-16	SS-11	19.8	27.3			0.0	30.4	69.6							Red-brown sandy silt
8/5/24	FD24-B-17	SS-01	0.0	179.6	119	51	0.0	1.3	98.7							Dark Gray organic silt
8/5/24	FD24-B-17	SS-06	10.1	124.9			0.0	20.3	79.7							Black silt with sand
8/5/24	FD24-B-17	SS-11	18.1	29.6			0.0	86.8	13.2							Red-Brown silty sand
7/1/24	FD24-B-18	SS-02	3.9	134.9	117	55	0.0	1.0	99.0							Gray organic silt
7/1/24	FD24-B-18	SS-05	18.9	110.2	151	65	0.0	2.0	98.0							Dark Gray organic silt
7/1/24	FD24-B-18	SS-09	33.9	26.3			0.0	70.9	29.1							Red-Brown silty sand

CDM Smith Geotechnical Laboratory Testing Summary Sheet

Client: USACE | Project Number: 51115-29493[illegible] | Reviewed By: Matthew Polsky - Lab Manager

Project Name: New Haven Harbor | Task: 6568-F0024-TK1.08

Project Location: New Haven, CT | Assigned By: Jonathan Barker | Date Reviewed: 9/25/2024

Sample Date	Sample Location	Sample	Depth (ft)	Identification Tests								Strength Tests				Soil Description
				Water Content %	LL %	PL %	Gravel %	Sand %	Fines %	Org. %	Spec. Gravity	$\bar{\sigma}_c$ psi	Failure Criteria (CIU)	$\sigma_1 - \sigma_3$ or τ psi	Strain %	
8/8/24	FD24-B-19	SS-03	4.7	31.1			0.0	91.3	8.7							Red-brown poorly graded sand with silt
8/8/24	FD24-B-19	SS-04	6.7	23.5			0.0	57.2	42.8							Red-brown silty sand
6/30/24	FD24-B-20	SS-02	4.5	167.3	121	63	0.0	4.8	95.2							Gray organic silt
6/30/24	FD24-B-20	SS-04	14.5	128.0	96	43	0.0	13.5	86.5							Gray organic silt
6/30/24	FD24-B-20	SS-05	19.5	15.8			31.4	50.0	18.6							Mottled brown silty sand with gravel
6/30/24	FD24-B-20	SS-06	24.5	20.4			0.0	92.8	7.2							Red-brown poorly graded sand with silt
6/30/24	FD24-B-20	SS-07	29.5	20.6			0.0	72.0	28.0							Red-brown silty sand
7/8/24	FD24-CAD-01	SS-03	9.2	19.3			0.0	90.9	9.1							Gray-brown poorly graded sand with silt
7/8/24	FD24-CAD-01	SS-05	14.2	66.0			0.0	27.6	72.4							Gray organic silt with sand
7/8/24	FD24-CAD-01	SS-08	29.2	66.2			0.0	28.0	72.0							Gray organic silt with sand
7/8/24	FD24-CAD-01	SS-11	44.2	19.7			0.7	93.7	5.6							Red-brown poorly graded sand with silt
7/9/24	FD24-CAD-02	SS-05	20.3	104.0			0.0	8.3	91.7							Gray organic silt
7/9/24	FD24-CAD-02	SS-09	40.6	21.1	--	NP	0.2	94.5	5.3							Red-brown poorly graded sand with silt
7/9/24	FD24-CAD-02	SS-11	50.6	29.7	--	NP	0.0	10.5	89.5							Red-brown silt
7/9/24	FD24-CAD-02	SS-15	70.6	35.6			0.0	0.8	99.2							Red-brown silt (with thin clay layers)

CDM Smith Geotechnical Laboratory Testing Summary Sheet

Client: USACE | Project Number: 51115-29493€ | Reviewed By: Matthew Polsky - Lab Manager

Project Name: New Haven Harbor | Task: 6568-F0024-TK1.08

Project Location: New Haven, CT | Assigned By: Jonathan Barker | Date Reviewed: 9/11/2024

Sample Date	Sample Location	Sample	Depth (ft)	Identification Tests								Strength Tests				Soil Description
				Water Content %	LL %	PL %	Gravel %	Sand %	Fines %	Org. %	Spec. Gravity	$\bar{\sigma}_c$ psi	Failure Criteria (CIU)	$\sigma_1 - \sigma_3$ or τ psi	Strain %	
8/1/24	FD24-CAD-03	SS-02	4.5	22.4	--	NP	1.0	94.2	4.8							Gray and brown poorly graded sand
8/1/24	FD24-CAD-03	SS-04	14.5	67.5			0.0	8.5	91.5							Gray organic silt
8/1/24	FD24-CAD-03	SS-07	29.5	77.4			0.0	13.3	86.7							Gray organic silt
8/1/24	FD24-CAD-03	SS-11	44.5	16.6	--	NP	12.1	81.1	6.8							Brown poorly graded sand with silt
7/6/24	FD24-CAD-04	SS-04	15.8	91.2	112	42	0.0	6.4	93.6							Gray organic clay
7/6/24	FD24-CAD-04	SS-09	41.7	15.9			7.9	87.0	5.1							Red-brown poorly graded sand with silt
7/6/24	FD24-CAD-04	SS-13	63.3	36.7	44	23	0.0	0.8	99.2							Red-brown lean clay
7/6/24	FD24-CAD-04	SS-15	73.3	28.4			0.0	7.8	92.2							Red-brown silt
7/27/24	FD24-CAD-05	SS-02	6.0	51.3	73	31	0.0	35.1	64.9							Dark gray sandy organic clay
7/27/24	FD24-CAD-05	SS-08	35.0	99.3	82	39	0.0	19.9	80.1							Dark gray organic silt with sand
7/27/24	FD24-CAD-05	SS-09	40.0	23.6			0.5	93.6	5.9							Dark gray poorly graded sand with silt
7/27/24	FD24-CAD-05	SS-12	55.0	24.6			0.0	29.1	70.9							Red-brown silt with sand
7/5/24	FD24-CAD-06	SS-02	5.7	101.8	89	43	0.0	8.6	91.4							Dark gray organic silt
7/5/24	FD24-CAD-06	SS-06	25.7	89.5	104	39	0.0	9.1	90.9							Dark gray organic clay
7/5/24	FD24-CAD-06	SS-09	40.7	19.3			4.3	88.8	6.9							Red-brown poorly graded sand with silt
7/5/24	FD24-CAD-06	SS-12	56.0	29.5			0.0	3.3	96.7							Red-brown silt

CDM Smith Geotechnical Laboratory Testing Summary Sheet

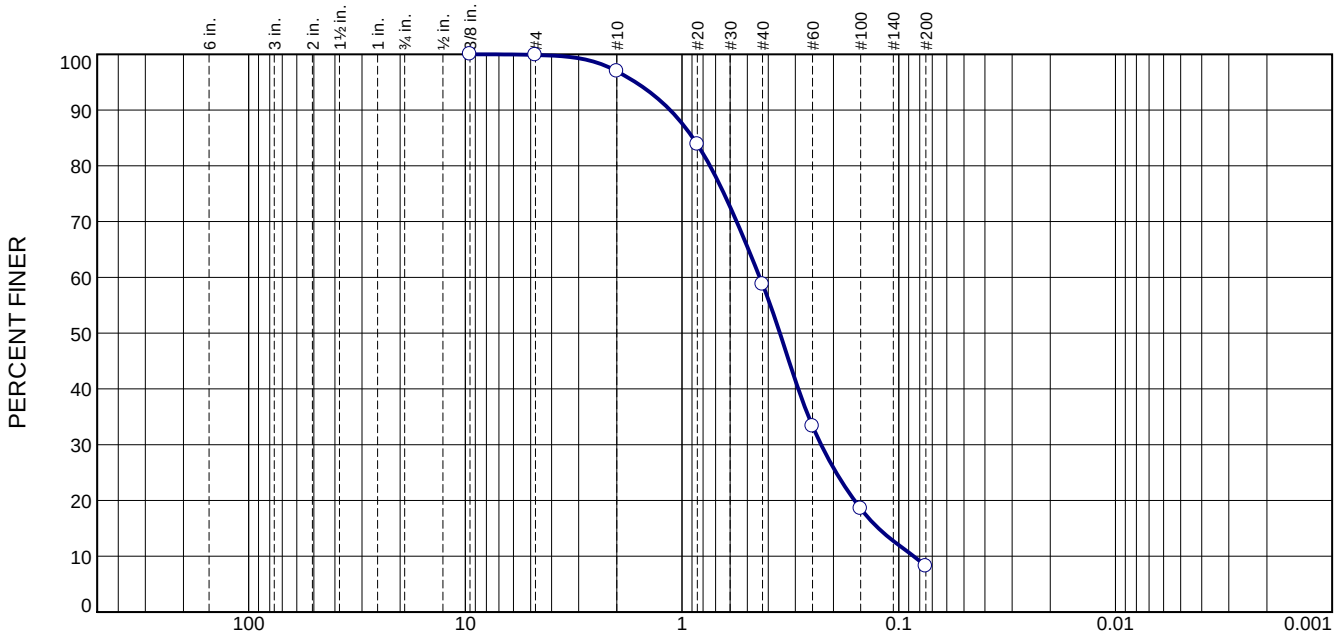
Client: USACE | Project Number: 51115-29493[illegible] | Reviewed By: Matthew Polsky - Lab Manager

Project Name: New Haven Harbor | Task: 6568-F0024-TK1.08

Project Location: New Haven, CT | Assigned By: Jonathan Barker | Date Reviewed: 9/12/2024

Sample Date	Sample Location	Sample	Depth (ft)	Identification Tests								Strength Tests				Soil Description
				Water Content %	LL %	PL %	Gravel %	Sand %	Fines %	Org. %	Spec. Gravity	$\bar{\sigma}_c$ psi	Failure Criteria (CIU)	$\sigma_1 - \sigma_3$ or τ psi	Strain %	
8/23/24	FD-24-RC-01	SS-01	1.7	23.8			0.2	97.0	2.8							Gray-Brown poorly graded sand
8/31/24	FD-24-RC-02	SS-02	5.7	89.2			0.4	31.3	68.3							Gray sandy silt
7/15/24	FD-24-RC-03	SS-01	2.0	26.8			0.0	81.1	18.9							Dark Gray silty sand
7/15/24	FD-24-RC-03	SS-05	7.9	17.4			12.6	82.4	5.0							Dark Gray poorly graded sand with silt
8/16/24	FD-24-RC-04	SS-02	2.0	21.9			0.7	91.8	7.5							Gray poorly graded sand with silt
8/11/24	FD-24-RC-05	SS-05	5.7	28.9			1.6	75.5	22.9							Gray silty sand
8/11/24	FD-24-RC-05	SS-09	13.7	19.6			0.0	26.8	73.2							Red-Brown silt with sand
9/1/24	FD-24-RC-06	SS-01	2.3	33.5			0.7	70.4	28.9							Gray silty sand
8/22/24	FD-24-RC-07	SS-02	5.5	123.5	114	44	0.0	11.2	88.8							Gray organic clay
8/22/24	FD-24-RC-07	SS-04	15.5	17.8			0.0	83.9	16.1							Brown silty sand
8/30/24	FD-24-RC-09	SS-03	8.3	155.8	95	44	0.0	8.9	91.1							Gray organic silt
8/30/24	FD-24-RC-09	SS-06	22.3	20.4			0.0	85.8	14.2							Gray-Brown silty sand
8/21/24	FD-24-RC-10	SS-02	3.7	24.9			0.0	90.8	9.2							Gray poorly graded sand with silt

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	2.9	38.3	50.5	8.2	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
.375	100.0		
#4	99.9		
#10	97.0		
#20	83.8		
#40	58.7		
#60	33.3		
#100	18.5		
#200	8.2		

* (no specification provided)

Material Description

Dark brown poorly graded sand with silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/29/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 18.1%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 1.1355 D_{85}= 0.8901

D_{60}= 0.4380 D_{50}= 0.3537

D_{30}= 0.2281 D_{15}= 0.1240

D_{10}= 0.0854

C_u= 5.13 C_c= 1.39

USCS (ASTM D2487)

SP-SM

Date Sampled: 7/22/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-B-01 **Depth:** 2'

Sample Number: SS-02

CDM Smith

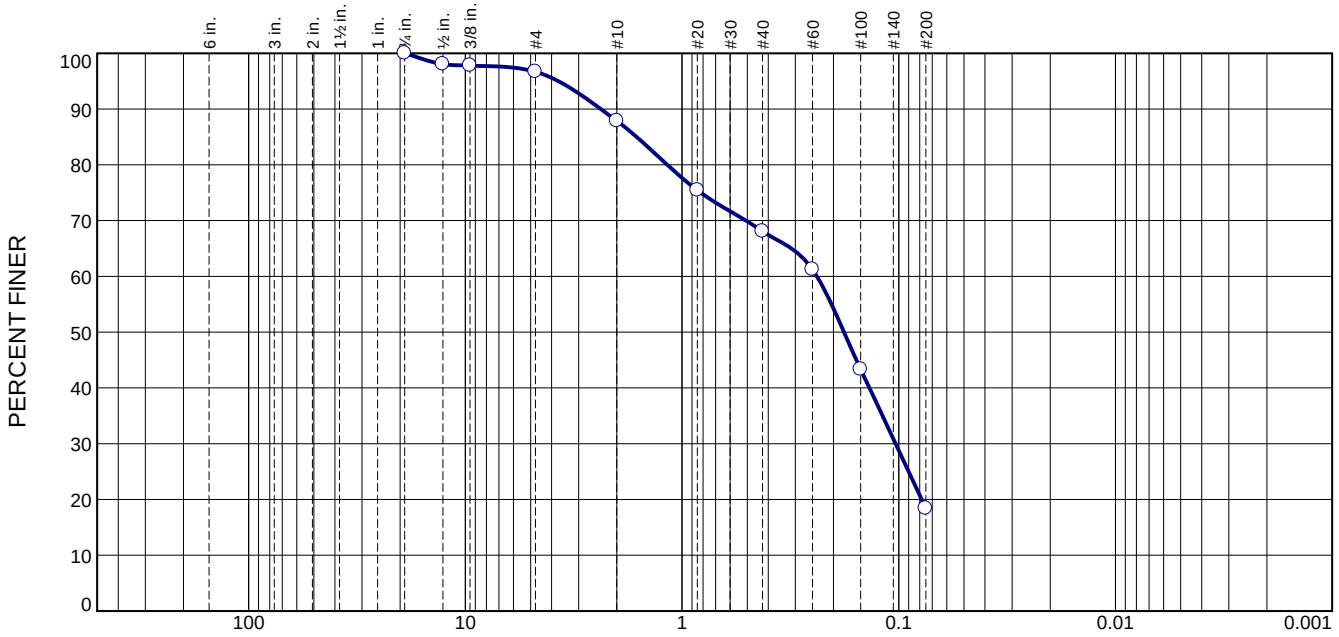
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.3	8.8	19.8	49.7	18.4	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
.75	100.0		
0.5	98.0		
.375	97.8		
#4	96.7		
#10	87.9		
#20	75.4		
#40	68.1		
#60	61.2		
#100	43.3		
#200	18.4		

* (no specification provided)

Material Description
Dark brown silty sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/29/24 **Technician:** KMS

Test Notes
As Received Moisture Content = 30.8%

Atterberg (ASTM D4318)
PL= **LL=**NV **PI=**

Coefficients
D_{90}= 2.3724 D_{85}= 1.6209
D_{60}= 0.2383 D_{50}= 0.1790
D_{30}= 0.1034 D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
SM

Date Sampled: 7/22/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

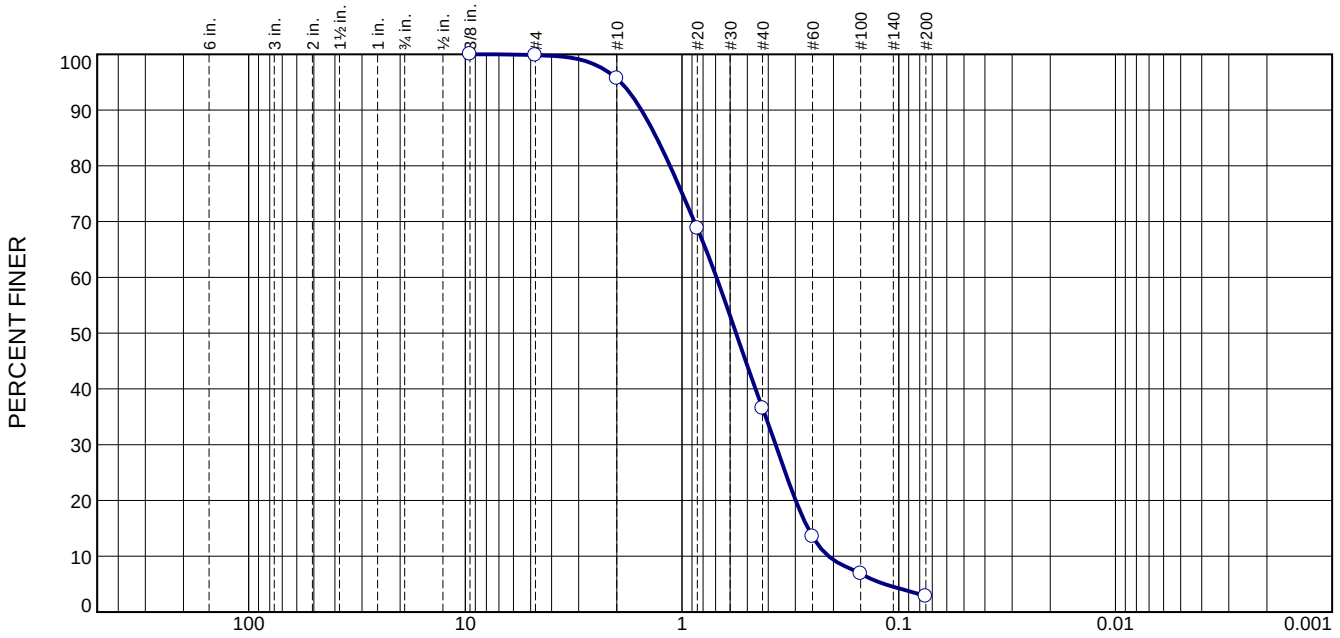
Source of Sample: FD-24-B-01 **Depth:** 10'
Sample Number: SS-06

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	4.2	59.1	33.7	2.8	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
.375	100.0		
#4	99.8		
#10	95.6		
#20	68.8		
#40	36.5		
#60	13.5		
#100	6.9		
#200	2.8		

* (no specification provided)

Material Description

Gray-brown poorly graded sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/29/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 24.4%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 1.5396 D_{85}= 1.3099

D_{60}= 0.6934 D_{50}= 0.5635

D_{30}= 0.3702 D_{15}= 0.2624

D_{10}= 0.2106

C_u= 3.29 C_c= 0.94

USCS (ASTM D2487)

SP

Date Sampled: 7/22/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-B-01 **Depth:** 12.5'

Sample Number: SS-07

CDM Smith

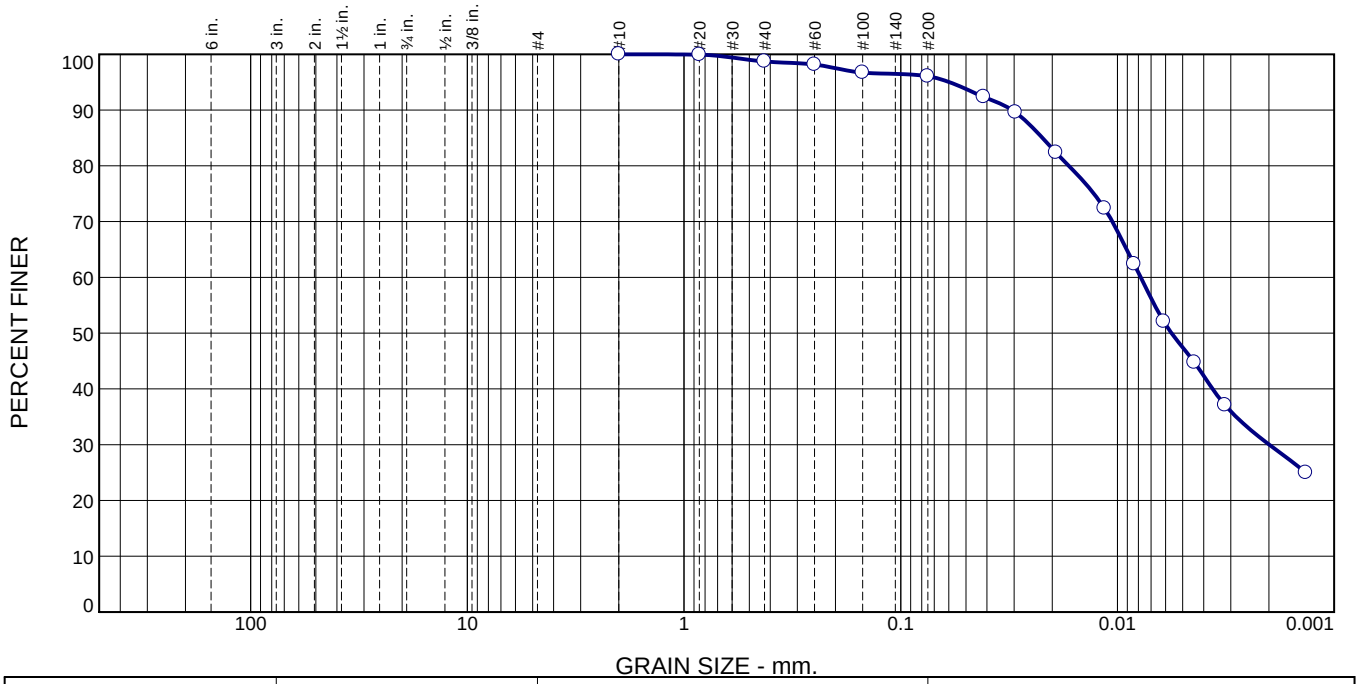
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.3	2.6	66.0	30.1

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	99.9		
#40	98.7		
#60	98.2		
#100	96.7		
#200	96.1		
0.0414 mm.	92.4		
0.0296 mm.	89.6		
0.0192 mm.	82.4		
0.0115 mm.	72.4		
0.0084 mm.	62.4		
0.0061 mm.	52.1		
0.0044 mm.	44.8		
0.0032 mm.	37.1		
0.0014 mm.	25.0		

· (no specification provided)

Material Description
Dark gray organic silt

Atterberg (ASTM D4318)
PL= 59 **LL=** 117 **PI=** 58

Coefficients
D_{90}= 0.0306 D_{85}= 0.0222
D_{60}= 0.0078 D_{50}= 0.0056
D_{30}= 0.0020 D_{15}=
D_{10}=
C_u= C_c=

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/30/24 **Technician:** KMS

Test Notes
As Received Moisture Content = 96.9%

Hydrometer Test (ASTM D7928)

Test Date: 8/29/24 **Technician:** KMS

USCS (ASTM D2487)
OH

Date Sampled: 7/22/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

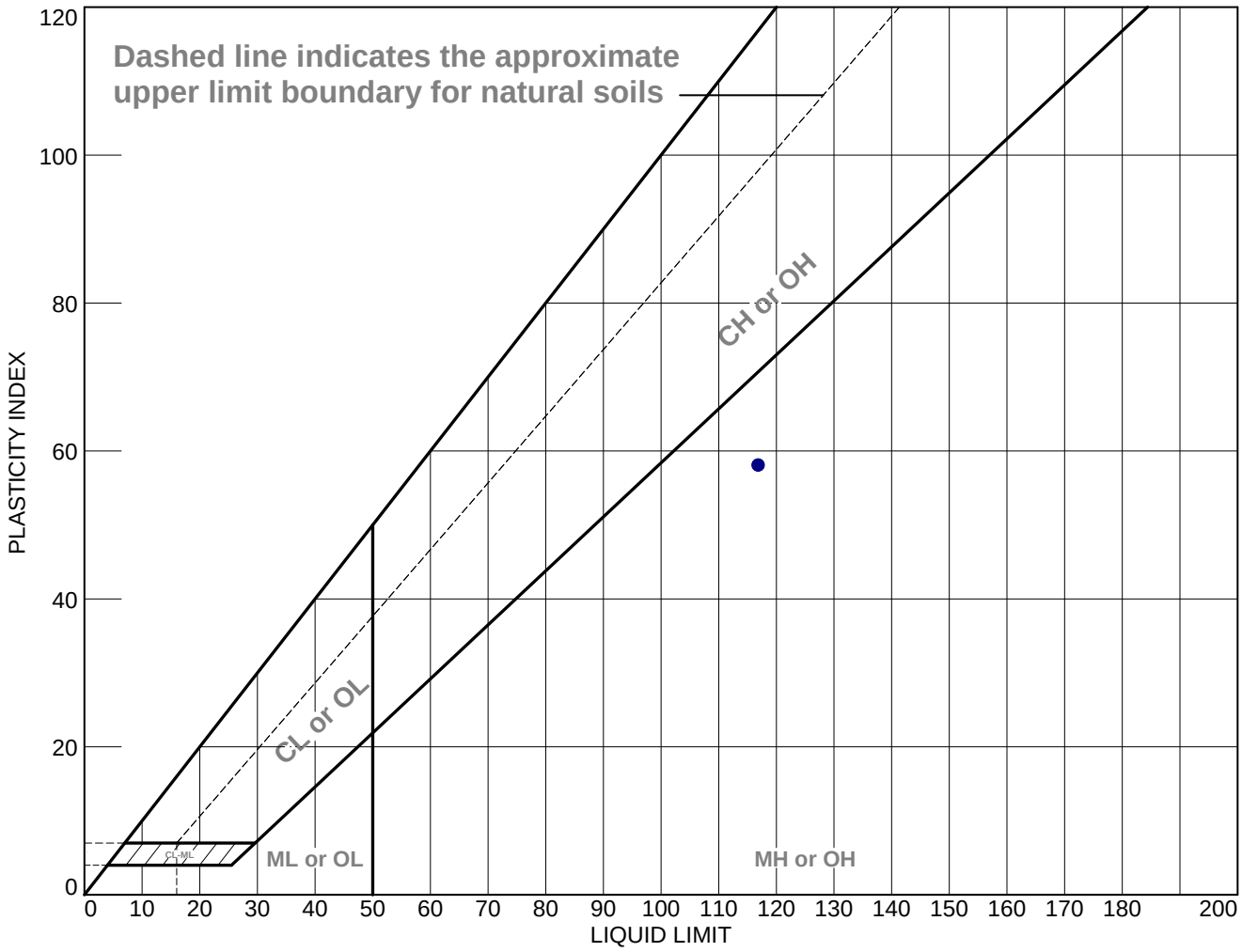
Source of Sample: FD-24-B-01 **Depth:** 16'
Sample Number: SS-09

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	FD-24-B-01	SS-09	16'	96.8	59	117	58	OH

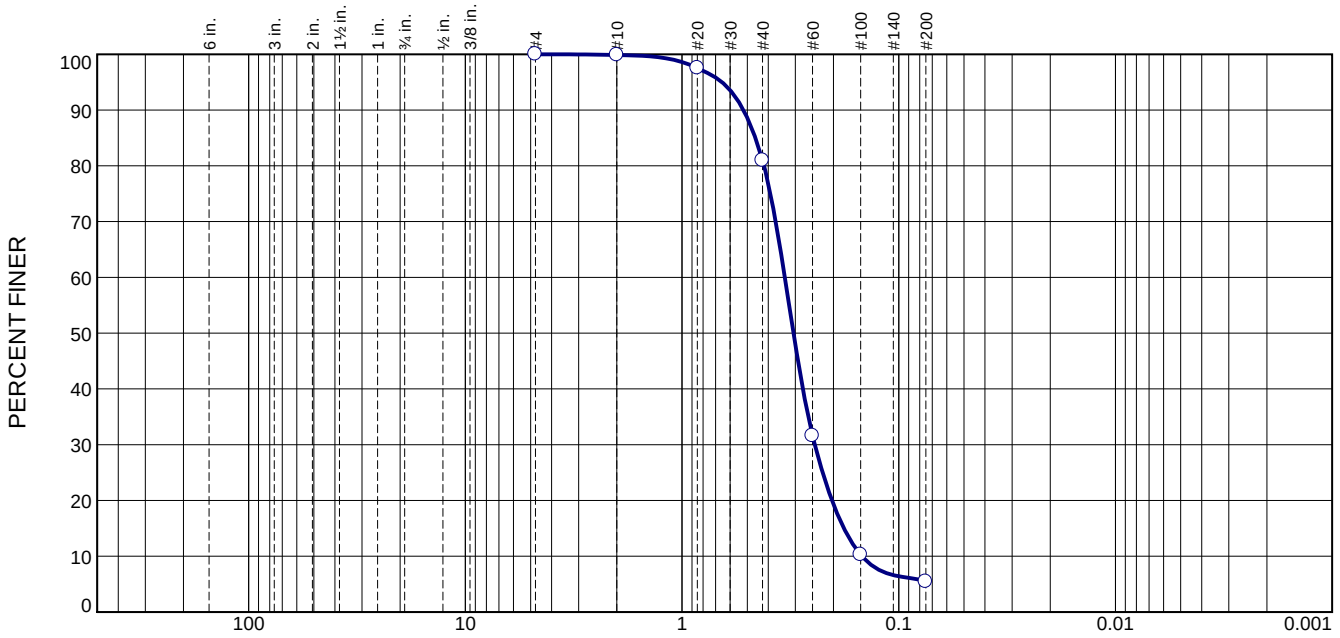
CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No.: 51115.294936

Tested By: KMS **Checked By:** MBP

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	18.9	75.5	5.5	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	99.9		
#20	97.5		
#40	81.0		
#60	31.6		
#100	10.3		
#200	5.5		

* (no specification provided)

Material Description

Gray-brown poorly graded sand with silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/29/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 26.0%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 0.5209 D_{85}= 0.4588

D_{60}= 0.3356 D_{50}= 0.3058

D_{30}= 0.2440 D_{15}= 0.1792

D_{10}= 0.1480

C_u= 2.27 C_c= 1.20

USCS (ASTM D2487)

SP-SM

Source of Sample: FD-24-B-02 **Depth:** 2'
Sample Number: SS-02

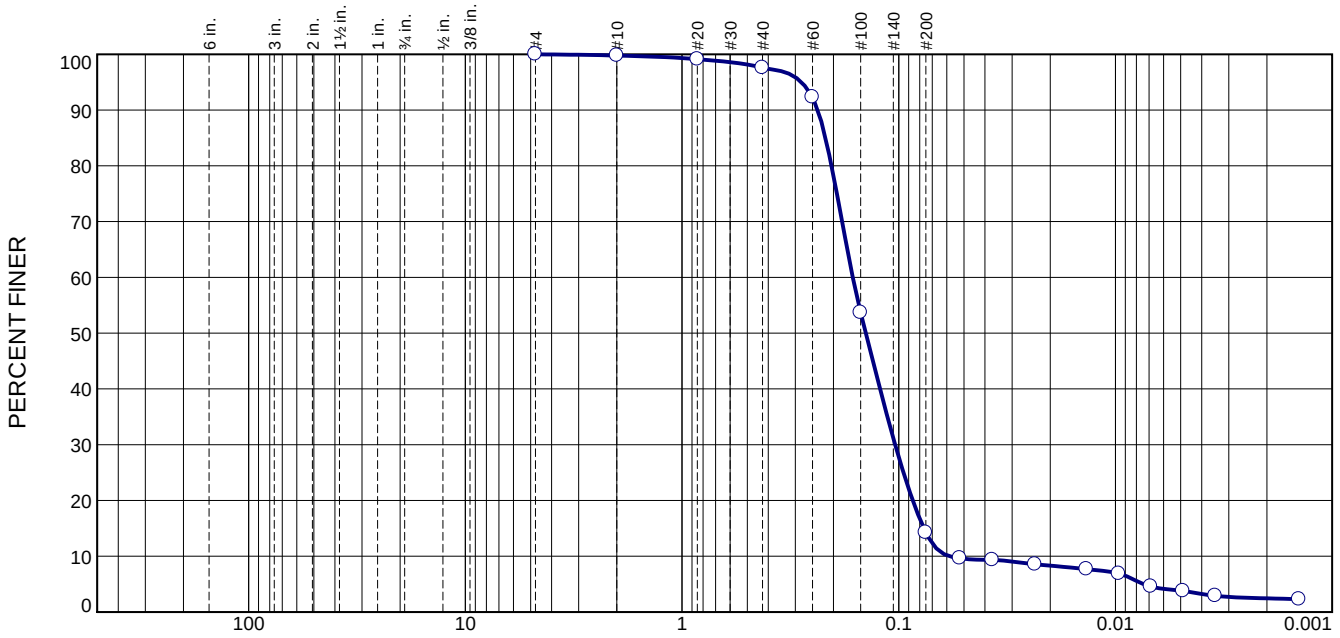
Date Sampled: 7/21/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	2.2	83.3	11.9	2.4

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	99.8		
#20	99.1		
#40	97.6		
#60	92.3		
#100	53.7		
#200	14.3		
0.0523 mm.	9.6		
0.0370 mm.	9.3		
0.0235 mm.	8.6		
0.0136 mm.	7.7		
0.0096 mm.	6.9		
0.0069 mm.	4.6		
0.0049 mm.	3.8		
0.0035 mm.	2.9		
0.0014 mm.	2.3		

· (no specification provided)

Material Description

Gray silty sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/30/24 **Technician:** KMS

Test Notes

As Recieved Moisture Content = 27.75%

Hydrometer Test (ASTM D7928)

Test Date: 8/29/24 **Technician:** KMS

Atterberg (ASTM D4318)

PL= **LL=** NP **PI=**

Coefficients

D_{90}= 0.2361 D_{85}= 0.2178

D_{60}= 0.1631 D_{50}= 0.1419

D_{30}= 0.1039 D_{15}= 0.0766

D_{10}= 0.0584

C_u= 2.79 C_c= 1.13

USCS (ASTM D2487)

SM

Date Sampled: 7/21/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-B-02 **Depth:** 10'

Sample Number: SS-06

CDM Smith

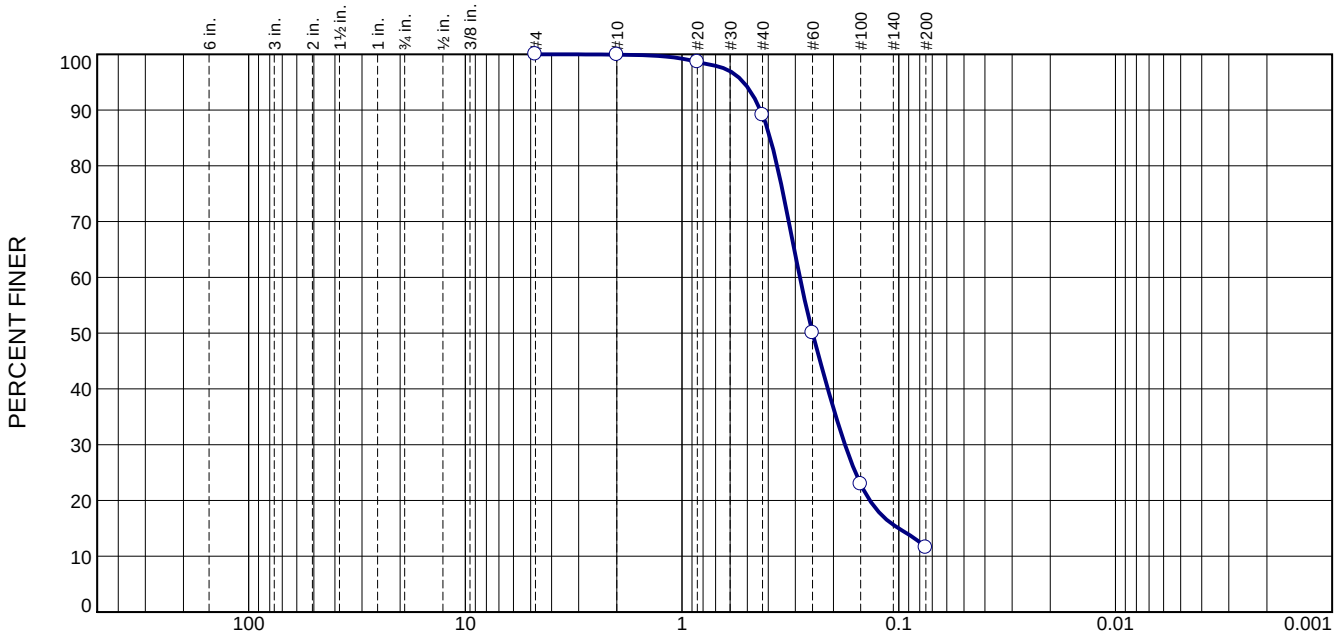
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	10.8	77.6	11.5	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	99.9		
#20	98.6		
#40	89.1		
#60	50.1		
#100	22.9		
#200	11.5		

* (no specification provided)

Material Description

Gray-brown poorly graded sand with silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/29/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 23.8%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 0.4349 D_{85}= 0.3922

D_{60}= 0.2859 D_{50}= 0.2497

D_{30}= 0.1771 D_{15}= 0.1001

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

SP-SM

Date Sampled: 7/21/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-B-02 **Depth:** 18'

Sample Number: SS-10

CDM Smith

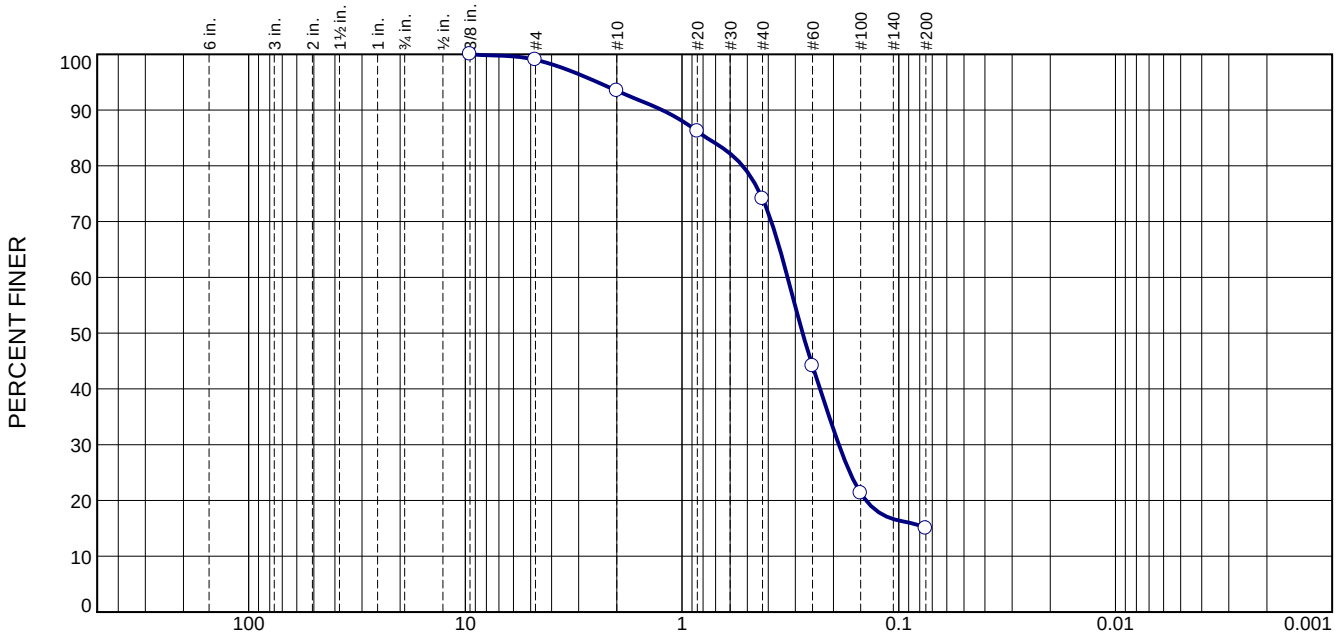
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.0	5.6	19.3	59.1	15.0	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
.375	100.0		
#4	99.0		
#10	93.4		
#20	86.2		
#40	74.1		
#60	44.1		
#100	21.3		
#200	15.0		

* (no specification provided)

Material Description
Gray silty sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/29/24 **Technician:** KMS

Test Notes
As Received Moisture Content = 33.7%

Atterberg (ASTM D4318)
PL= **LL=**NV **PI=**

Coefficients
D_{90}= 1.2373 D_{85}= 0.7681
D_{60}= 0.3259 D_{50}= 0.2777
D_{30}= 0.1890 D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
SM

Date Sampled: 7/20/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

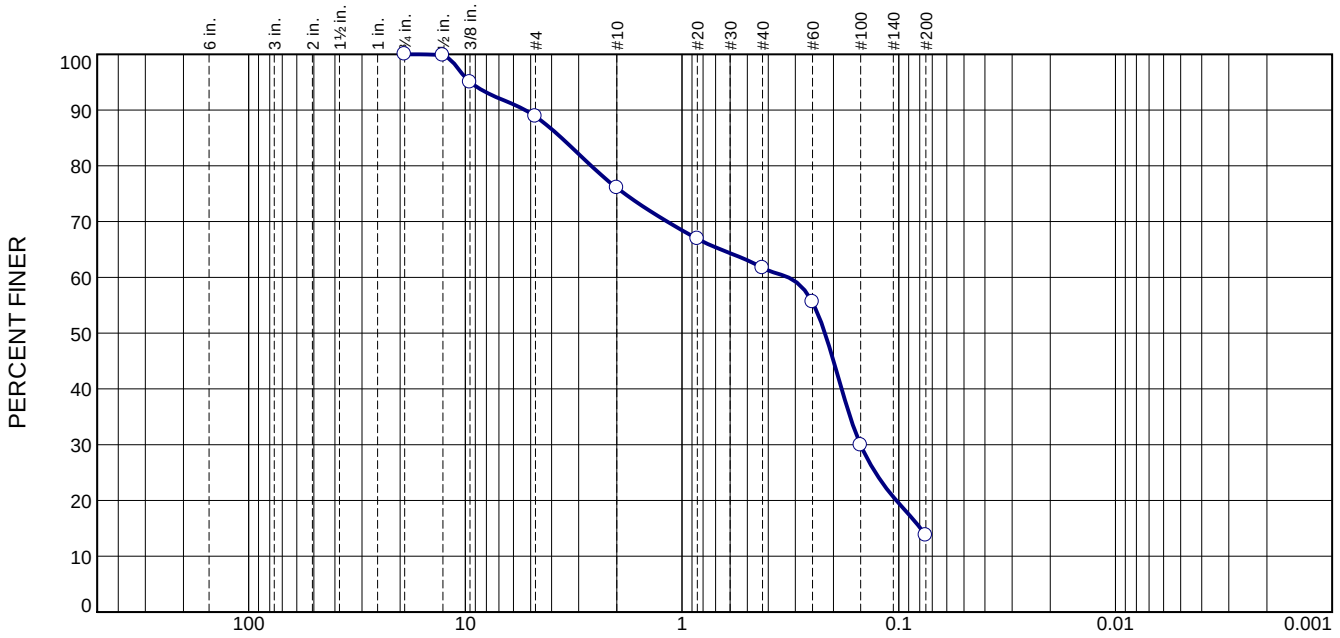
Source of Sample: FD-24-B-03 **Depth:** 2'
Sample Number: SS-02

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	11.1	12.9	14.3	47.9	13.8	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
.75	100.0		
0.5	99.8		
.375	95.0		
#4	88.9		
#10	76.0		
#20	66.9		
#40	61.7		
#60	55.6		
#100	29.9		
#200	13.8		

* (no specification provided)

Material Description
Gray silty sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/29/24 **Technician:** KMS

Test Notes
As Received Moisture Content = 30.4%

Atterberg (ASTM D4318)
PL= **LL=**NV **PI=**

Coefficients
D_{90}= 5.3011 D_{85}= 3.5973
D_{60}= 0.3237 D_{50}= 0.2190
D_{30}= 0.1503 D_{15}= 0.0793
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
SM

Date Sampled: 7/20/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

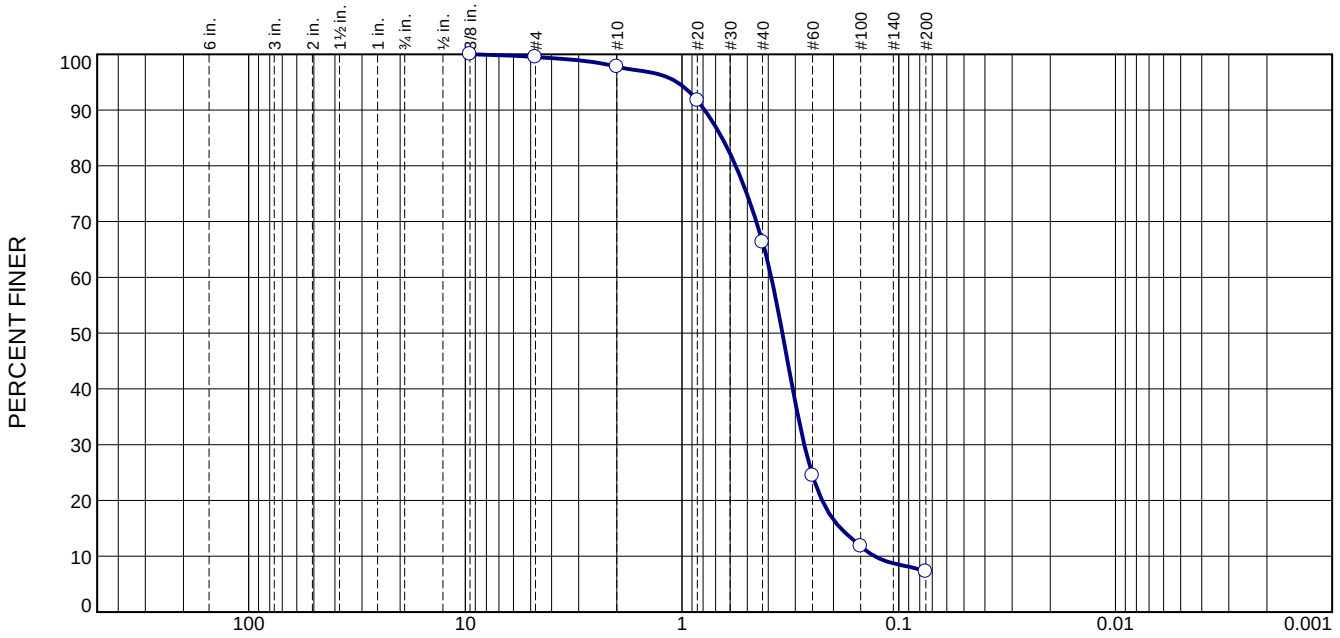
Source of Sample: FD-24-B-03 **Depth:** 14'
Sample Number: SS-08

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.5	1.7	31.5	59.1	7.2	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
.375	100.0		
#4	99.5		
#10	97.8		
#20	91.7		
#40	66.3		
#60	24.5		
#100	11.8		
#200	7.2		

* (no specification provided)

Material Description

Red-brown poorly graded sand with silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/29/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 19.0%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 0.7863 D_{85}= 0.6535

D_{60}= 0.3875 D_{50}= 0.3444

D_{30}= 0.2730 D_{15}= 0.1854

D_{10}= 0.1294

C_u= 2.99 C_c= 1.49

USCS (ASTM D2487)

SP-SM

Date Sampled: 7/19/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-B-04 **Depth:** 2'

Sample Number: SS-02

CDM Smith

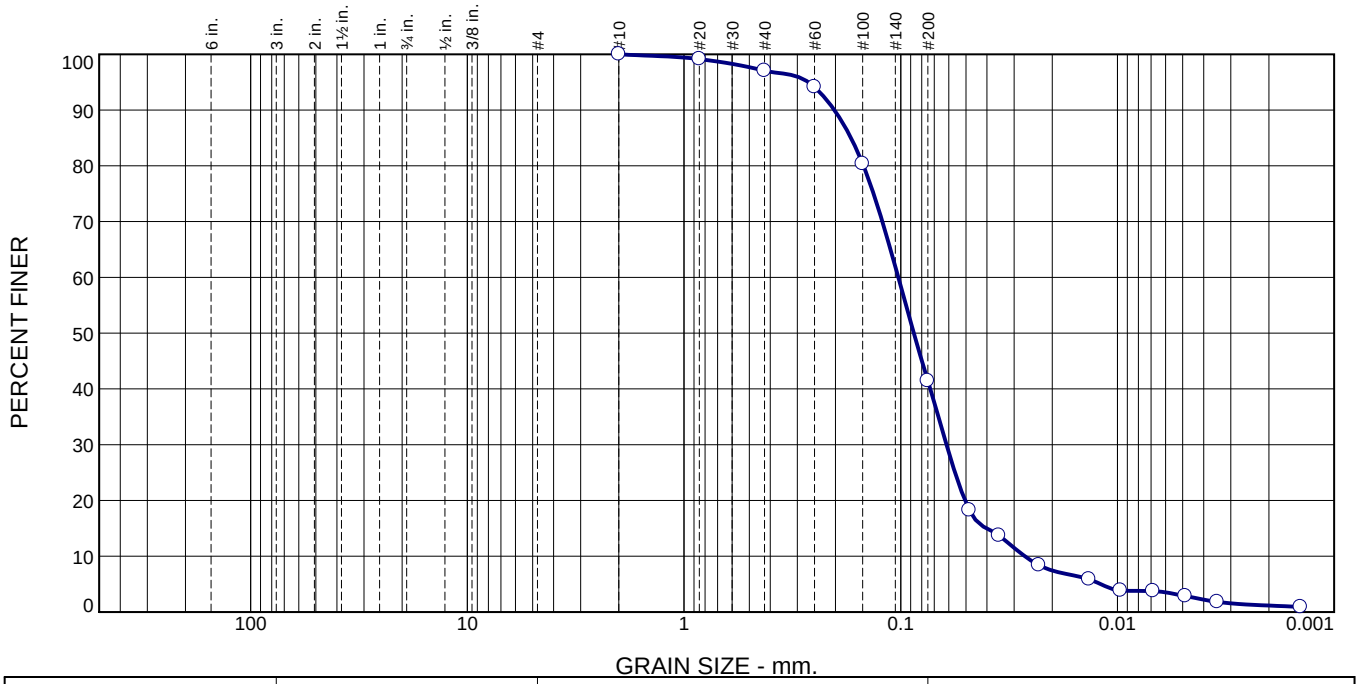
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	3.0	55.6	40.2	1.2

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	99.1		
#40	97.0		
#60	94.1		
#100	80.4		
#200	41.4		
0.0482 mm.	18.3		
0.0352 mm.	13.7		
0.0230 mm.	8.4		
0.0135 mm.	5.9		
0.0097 mm.	3.8		
0.0068 mm.	3.7		
0.0049 mm.	2.9		
0.0035 mm.	1.8		
0.0014 mm.	0.9		

· (no specification provided)

Material Description

Red-brown silty sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/30/24 **Technician:** KMS/MBP

Test Notes

As Received Moisture Content = 25.2%

Hydrometer Test (ASTM D7928)

Test Date: 8/29/24 **Technician:** KMS

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 0.2025 D_{85}= 0.1698

D_{60}= 0.1026 D_{50}= 0.0870

D_{30}= 0.0615 D_{15}= 0.0403

D_{10}= 0.0268

C_u= 3.83 C_c= 1.38

USCS (ASTM D2487)

SM

Date Sampled: 7/19/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-B-04 **Depth:** 8'

Sample Number: SS-05

CDM Smith

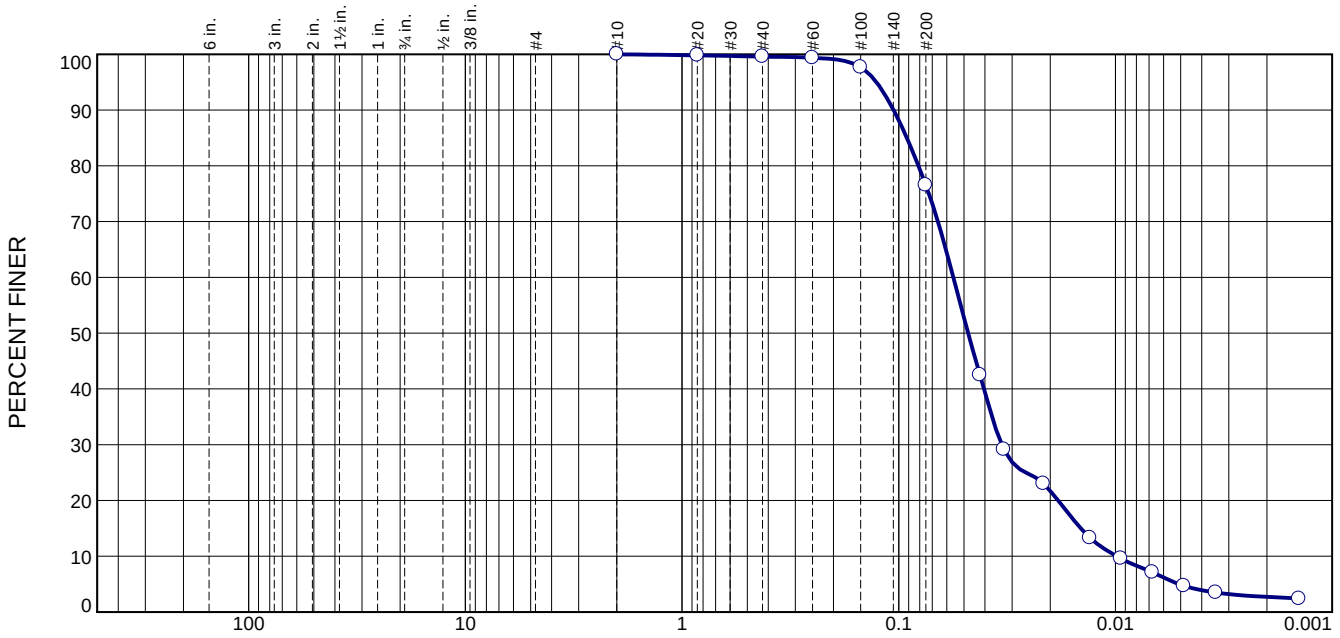
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.4	23.1	73.8	2.7

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	99.8		
#40	99.6		
#60	99.4		
#100	97.7		
#200	76.5		
0.0422 mm.	42.5		
0.0327 mm.	29.1		
0.0215 mm.	23.0		
0.0131 mm.	13.3		
0.0094 mm.	9.6		
0.0068 mm.	7.1		
0.0048 mm.	4.7		
0.0034 mm.	3.5		
0.0014 mm.	2.4		

* (no specification provided)

Material Description

Red-brown silt with sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/30/24 **Technician:** KMS/MBP

Test Notes

As Received Moisture Content = 28.0%

Hydrometer Test (ASTM D7928)

Test Date: 8/29/24 **Technician:** KMS

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 0.1056 D_{85}= 0.0917

D_{60}= 0.0560 D_{50}= 0.0478

D_{30}= 0.0335 D_{15}= 0.0145

D_{10}= 0.0099

C_u= 5.68 C_c= 2.04

USCS (ASTM D2487)

ML

Date Sampled: 7/19/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-B-04 **Depth:** 16'

Sample Number: SS-09

CDM Smith

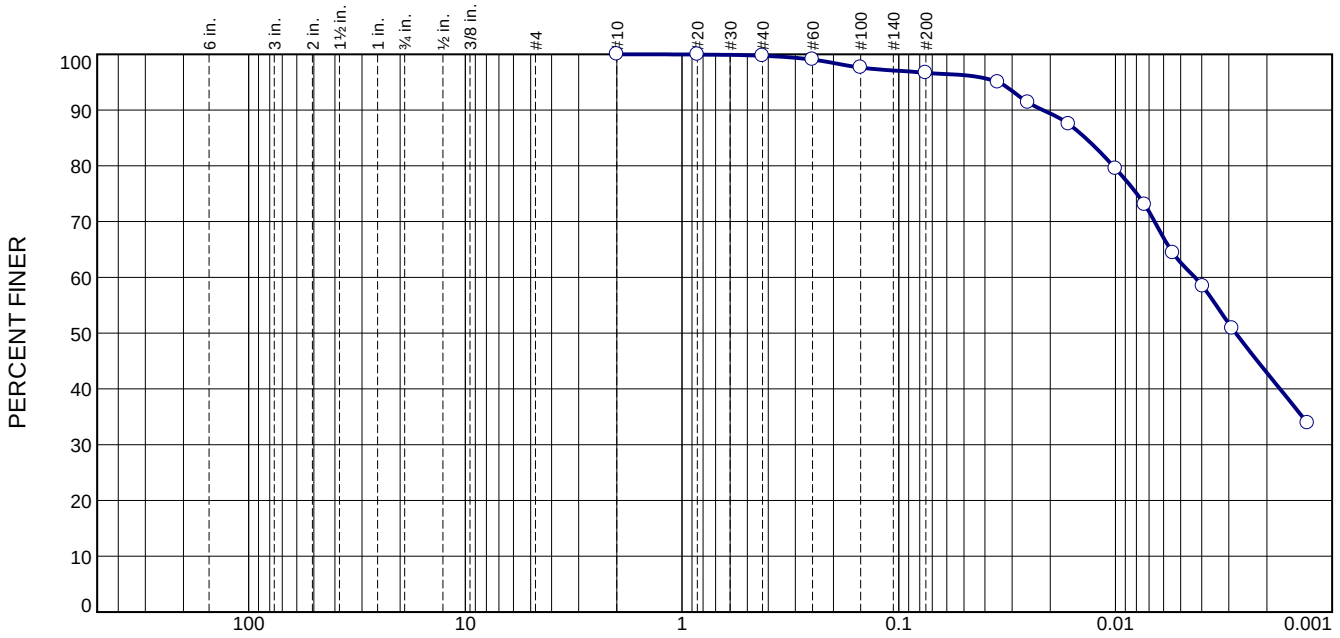
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.3	3.0	53.8	42.9

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	99.9		
#40	99.7		
#60	99.0		
#100	97.6		
#200	96.7		
0.0349 mm.	95.0		
0.0253 mm.	91.4		
0.0164 mm.	87.5		
0.0100 mm.	79.5		
0.0073 mm.	73.0		
0.0054 mm.	64.4		
0.0040 mm.	58.4		
0.0029 mm.	50.9		
0.0013 mm.	33.9		

· (no specification provided)

Material Description
Red-brown silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/30/24 **Technician:** KMS

Test Notes
As Received Moisture Content = 37.4%

Hydrometer Test (ASTM D7928)

Test Date: 8/29/24 **Technician:** KMS

Atterberg (ASTM D4318)
PL= **LL=**NV **PI=**

Coefficients
D_{90}= 0.0216 D_{85}= 0.0138
D_{60}= 0.0043 D_{50}= 0.0028
D_{30}= D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
ML/OH

Date Sampled: 7/19/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

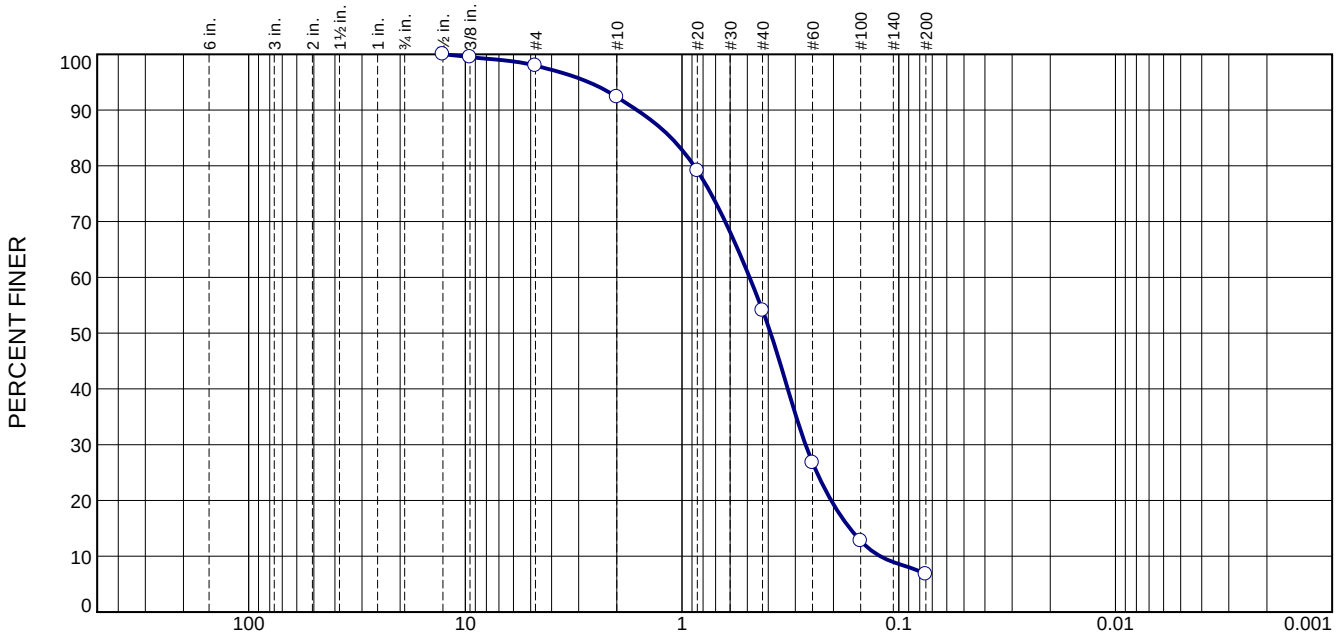
Source of Sample: FD-24-B-04 **Depth:** 28'
Sample Number: SS-15

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.0	5.7	38.2	47.3	6.8	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
0.5	100.0		
.375	99.5		
#4	98.0		
#10	92.3		
#20	79.1		
#40	54.1		
#60	26.8		
#100	12.8		
#200	6.8		

* (no specification provided)

Material Description

Gray-brown poorly graded sand with silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/29/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 21.4%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 1.6161 D_{85}= 1.1215

D_{60}= 0.4883 D_{50}= 0.3902

D_{30}= 0.2693 D_{15}= 0.1681

D_{10}= 0.1217

C_u= 4.01 C_c= 1.22

USCS (ASTM D2487)

SP-SM

Source of Sample: FD-24-B-05 **Depth:** 2'
Sample Number: SS-02

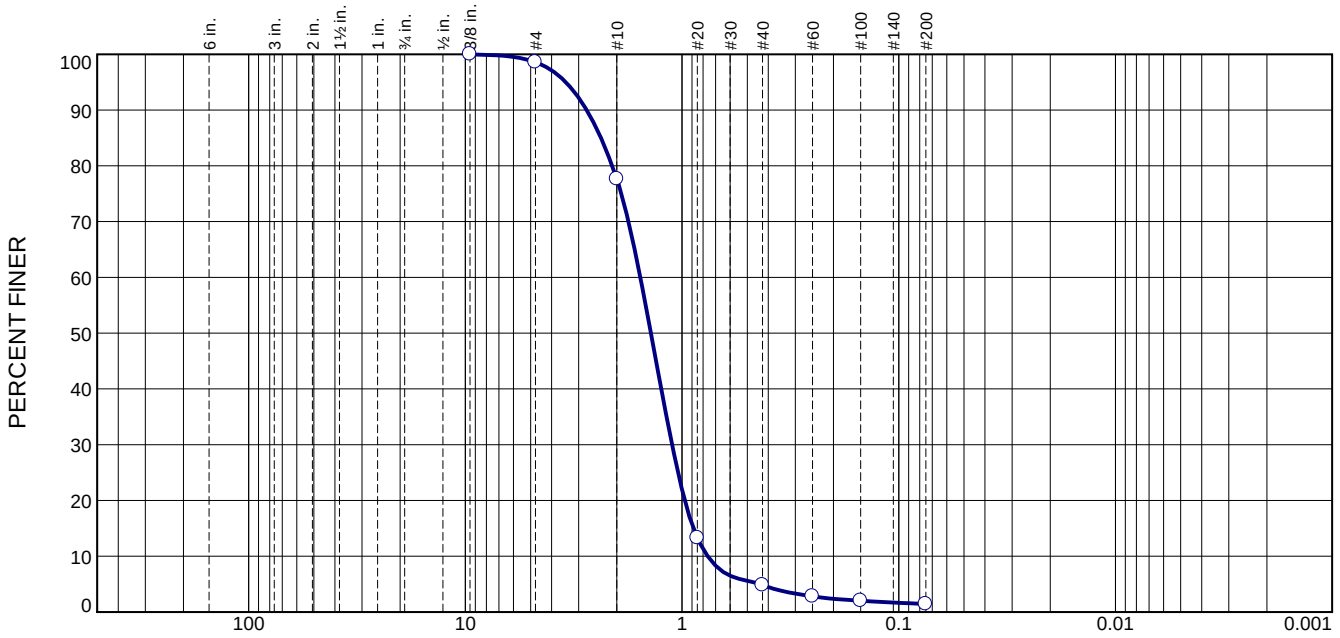
Date Sampled: 7/24/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.4	21.0	72.8	3.4	1.4	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
.375	100.0		
#4	98.6		
#10	77.6		
#20	13.3		
#40	4.8		
#60	2.8		
#100	2.0		
#200	1.4		

* (no specification provided)

Material Description

Gray-brown poorly graded sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/29/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 19.0%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 2.7561 D_{85}= 2.3680

D_{60}= 1.5577 D_{50}= 1.3924

D_{30}= 1.1121 D_{15}= 0.8866

D_{10}= 0.7614

C_u= 2.05 C_c= 1.04

USCS (ASTM D2487)

SP

Date Sampled: 7/24/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-B-05 **Depth:** 6'

Sample Number: SS-04

CDM Smith

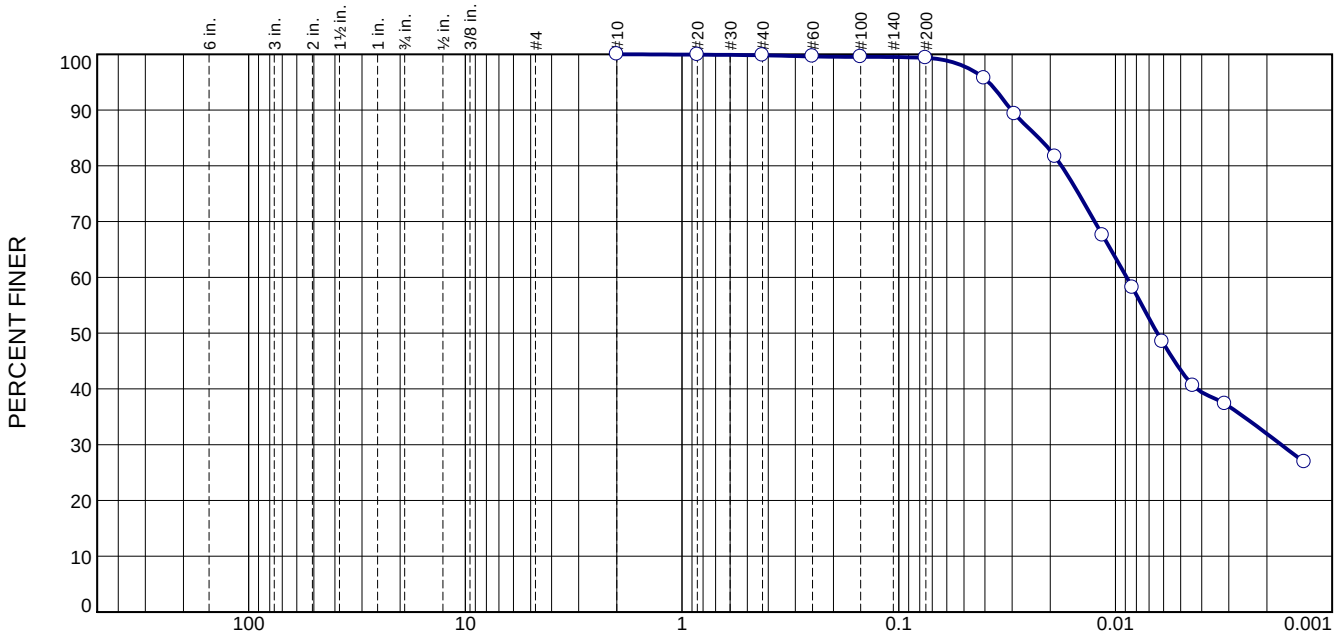
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.2	0.4	67.5	31.9

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	99.9		
#40	99.8		
#60	99.6		
#100	99.5		
#200	99.4		
0.0403 mm.	95.7		
0.0292 mm.	89.3		
0.0190 mm.	81.6		
0.0115 mm.	67.6		
0.0084 mm.	58.2		
0.0061 mm.	48.5		
0.0044 mm.	40.6		
0.0031 mm.	37.3		
0.0013 mm.	26.9		

· (no specification provided)

Material Description
Dark gray organic silt

Atterberg (ASTM D4318)
PL= 47 **LL=** 106 **PI=** 59

Coefficients
D_{90}= 0.0302 D_{85}= 0.0226
D_{60}= 0.0089 D_{50}= 0.0064
D_{30}= 0.0017 D_{15}=
D_{10}=
C_u= C_c=

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/30/24 **Technician:** KMS

Test Notes
As Received Moisture Content = 102.2%

Hydrometer Test (ASTM D7928)

Test Date: 8/29/24 **Technician:** KMS

USCS (ASTM D2487)
OH

Date Sampled: 8/10/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

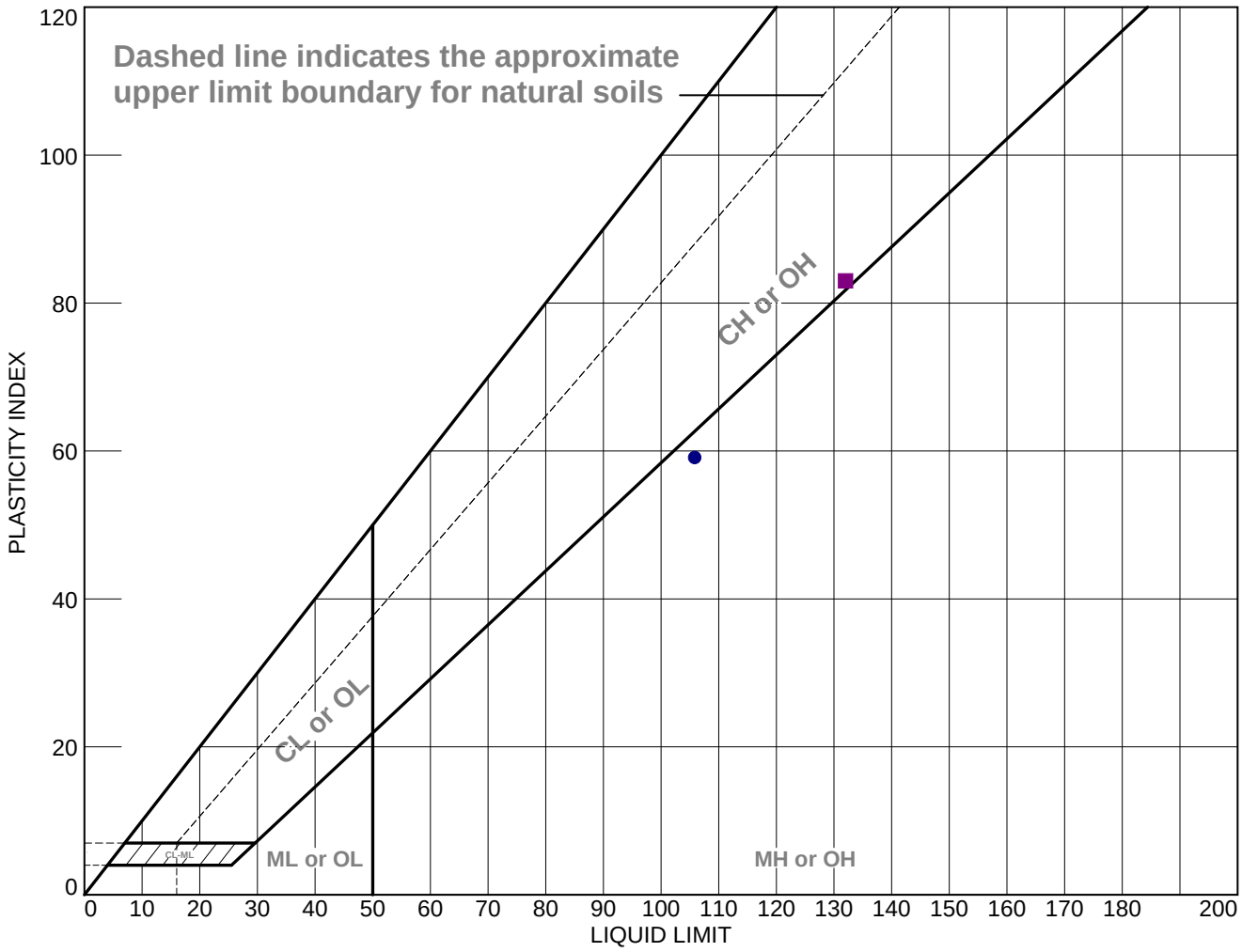
Source of Sample: FD-24-B-06 **Depth:** 4.6'
Sample Number: SS-03

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	FD-24-B-06	SS-03	4.6'	102.2	47	106	59	OH
■	FD-24-B-06	SS-07	12.6'	114.5	49	132	83	OH

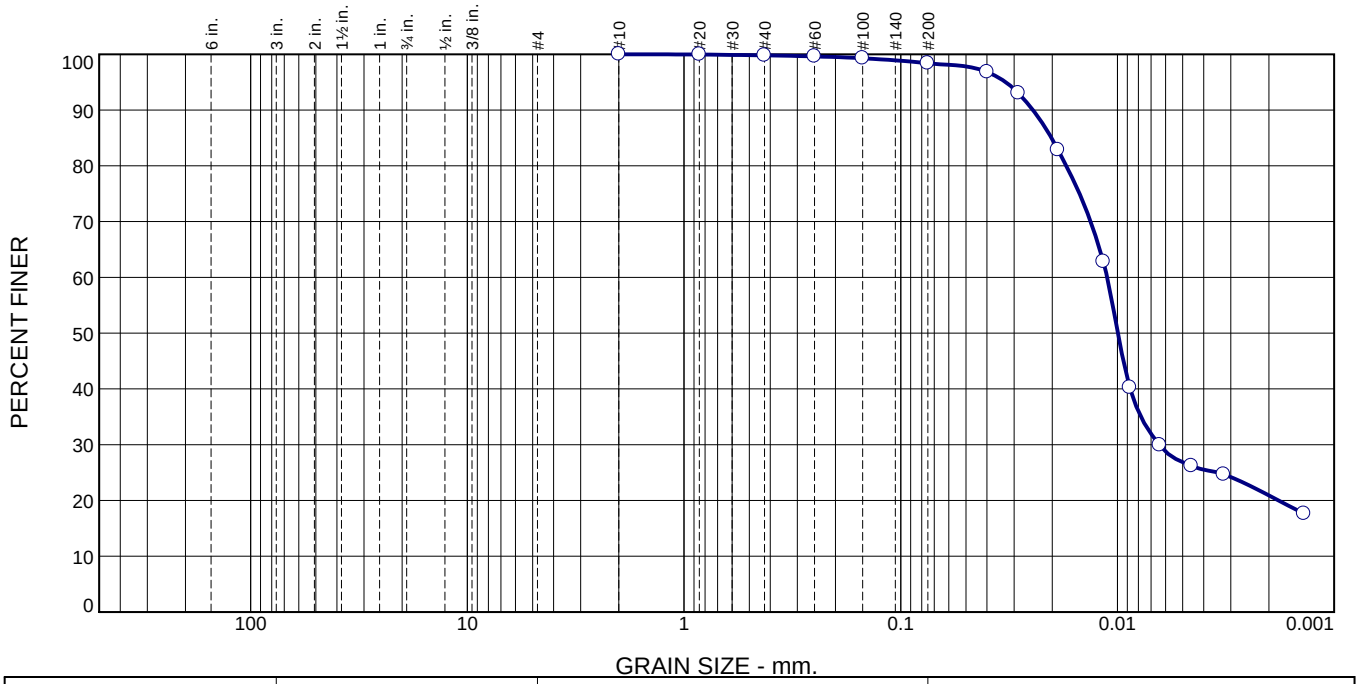
CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No.: 51115.294936

Tested By: ○ KMS/MBP □ KMS **Checked By:** MBP

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.2	1.4	77.5	20.9

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	99.9		
#40	99.8		
#60	99.6		
#100	99.3		
#200	98.4		
0.0399 mm.	96.8		
0.0287 mm.	93.0		
0.0188 mm.	82.9		
0.0116 mm.	62.8		
0.0088 mm.	40.2		
0.0064 mm.	29.9		
0.0046 mm.	26.2		
0.0032 mm.	24.7		
0.0014 mm.	17.6		

· (no specification provided)

Material Description
Gray organic clay

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/30/24 **Technician:** KMS

Test Notes
As Received Moisture Content = 114.5%

Hydrometer Test (ASTM D7928)

Test Date: 8/29/24 **Technician:** KMS

Atterberg (ASTM D4318)
PL= 49 **LL=** 132 **PI=** 83

Coefficients
D_{90}= 0.0246 D_{85}= 0.0202
D_{60}= 0.0112 D_{50}= 0.0099
D_{30}= 0.0064 D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
OH

Date Sampled: 8/10/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

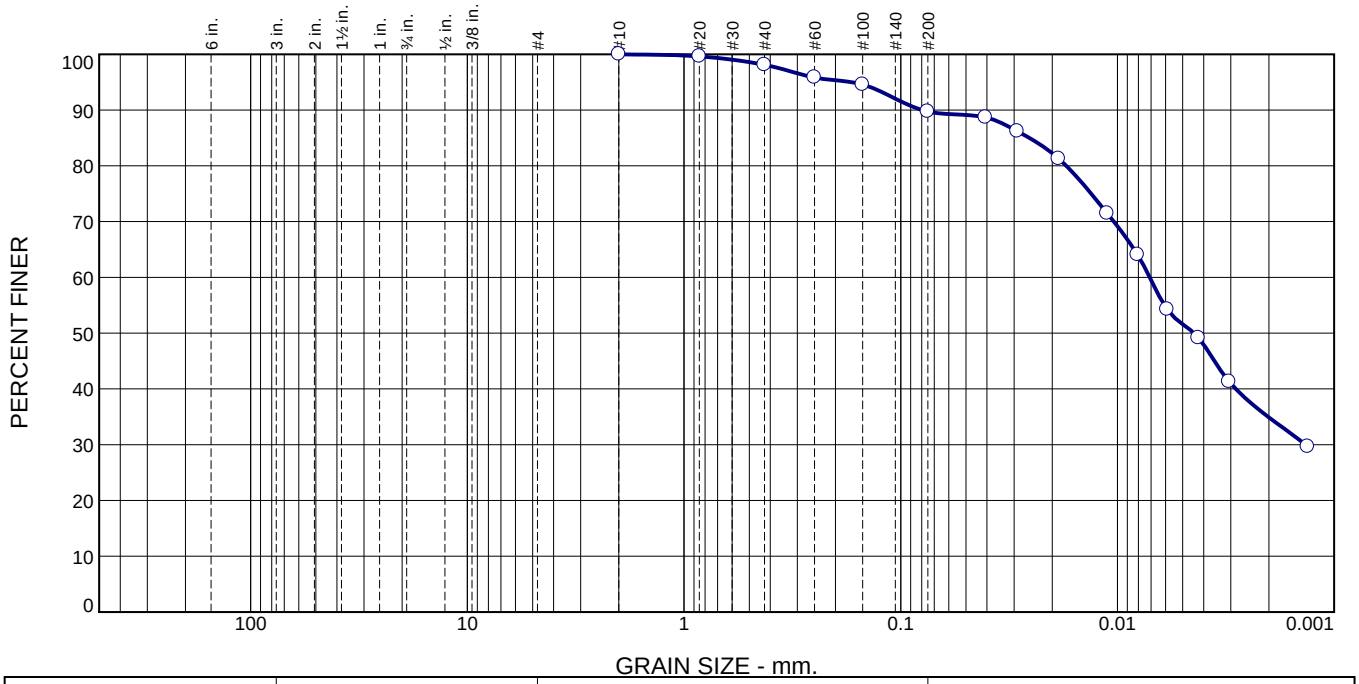
Source of Sample: FD-24-B-06 **Depth:** 12.6'
Sample Number: SS-07

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Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.9	8.4	54.8	34.9

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	99.6		
#40	98.1		
#60	95.8		
#100	94.6		
#200	89.7		
0.0406 mm.	88.7		
0.0290 mm.	86.2		
0.0187 mm.	81.3		
0.0112 mm.	71.5		
0.0081 mm.	64.1		
0.0059 mm.	54.3		
0.0042 mm.	49.2		
0.0031 mm.	41.3		
0.0013 mm.	29.7		

· (no specification provided)

Material Description
Gray organic silt

Atterberg (ASTM D4318)
PL= 48 **LL=** 106 **PI=** 58

Coefficients
D_{90}= 0.0799 D_{85}= 0.0255
D_{60}= 0.0071 D_{50}= 0.0044
D_{30}= 0.0014 D_{15}=
D_{10}=
C_u= C_c=

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/30/24 **Technician:** KMS/MBP

Test Notes
As Received Moisture Content = 114.4%

Hydrometer Test (ASTM D7928)

Test Date: 8/29/24 **Technician:** KMS

USCS (ASTM D2487)
OH

Date Sampled: 7/10/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

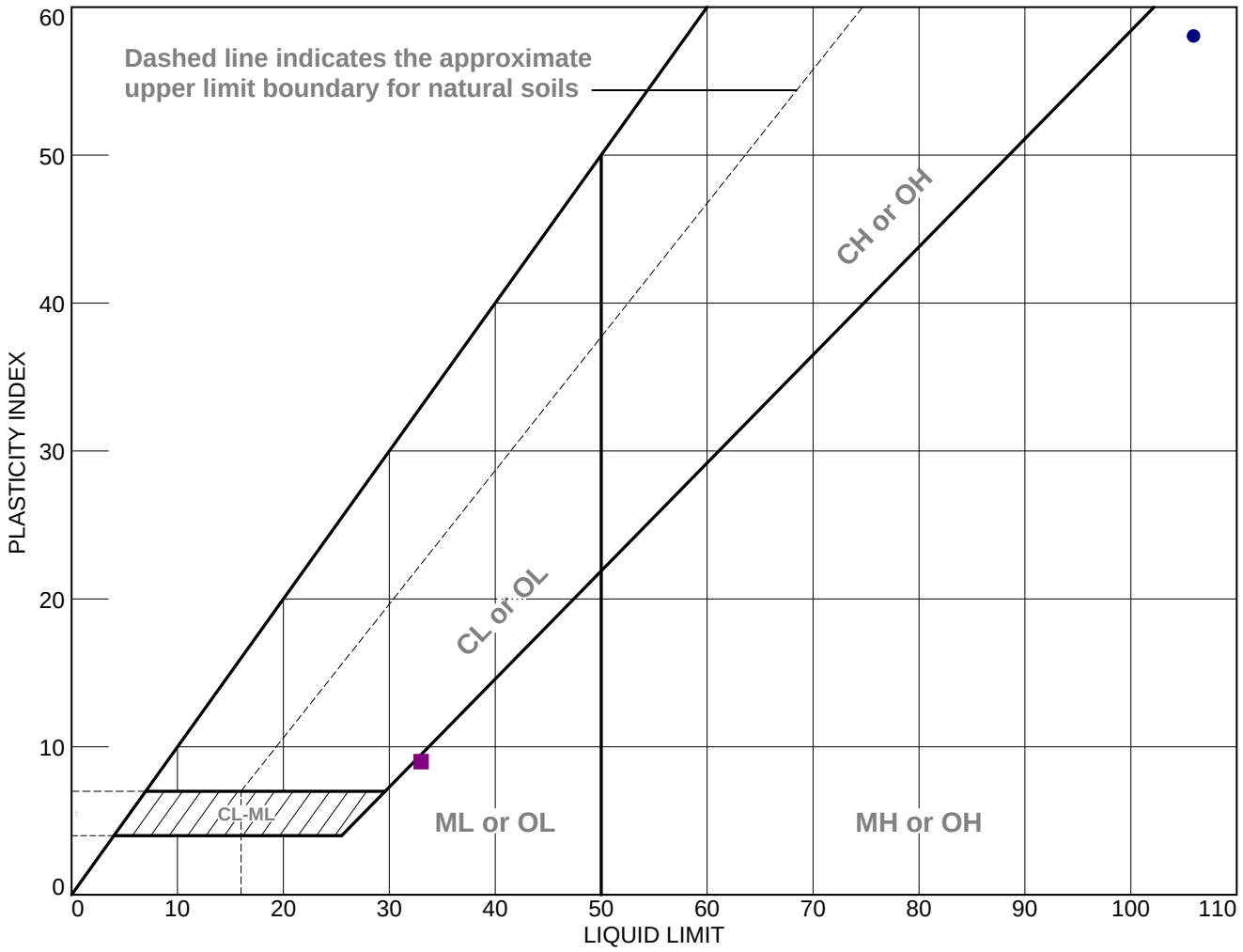
Source of Sample: FD-24-B-07 **Depth:** 2'
Sample Number: SS-02

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	FD-24-B-07	SS-02	2'	114.4	48	106	58	OH
■	FD-24-B-07	SS-08	15.5'	38.9	24	33	9	SM

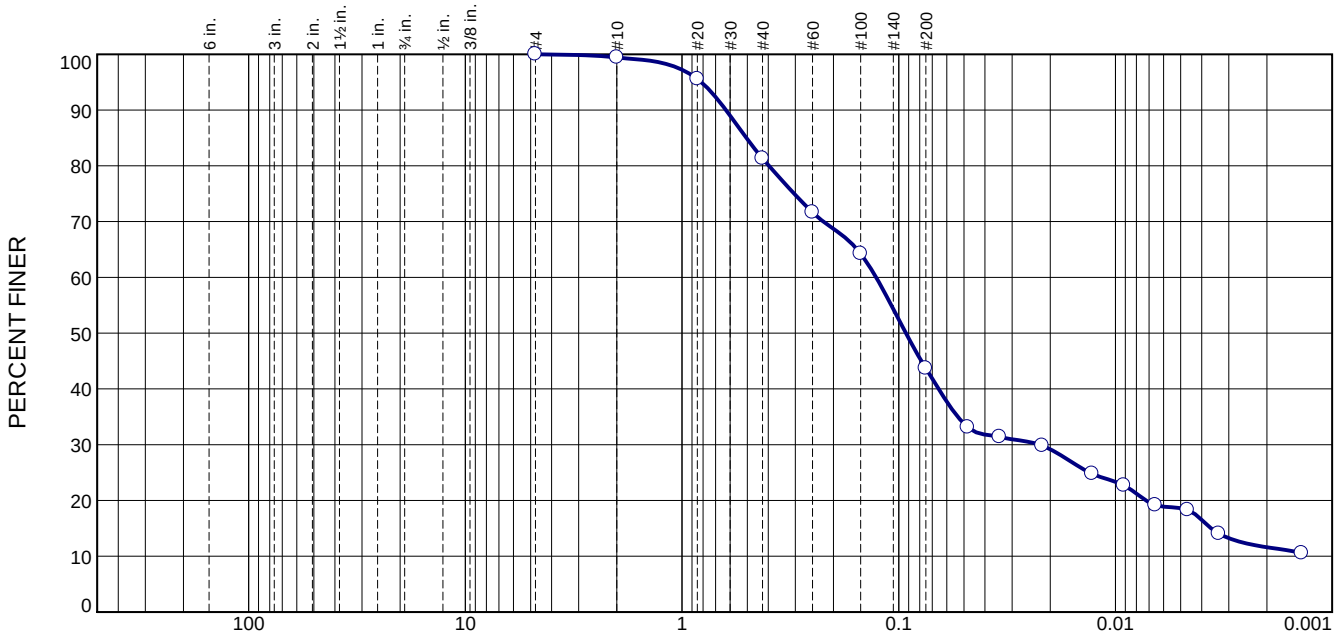
CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No.: 51115.294936

Tested By: ○ KMS/MBP □ KMS **Checked By:** MBP

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.6	18.1	37.6	32.1	11.6

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	99.4		
#20	95.6		
#40	81.3		
#60	71.7		
#100	64.2		
#200	43.7		
0.0481 mm.	33.1		
0.0342 mm.	31.4		
0.0218 mm.	29.8		
0.0128 mm.	24.8		
0.0091 mm.	22.7		
0.0065 mm.	19.2		
0.0046 mm.	18.3		
0.0033 mm.	14.0		
0.0014 mm.	10.6		

· (no specification provided)

Material Description
Gray silty sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/4/24 **Technician:** KMS/MBP

Test Notes
As Received Moisture Content = 38.9%

Hydrometer Test (ASTM D7928)

Test Date: 9/3/24 **Technician:** KMS

Atterberg (ASTM D4318)
PL= 24 **LL=** 33 **PI=** 9

Coefficients
D_{90}= 0.6273 D_{85}= 0.5050
D_{60}= 0.1272 D_{50}= 0.0927
D_{30}= 0.0224 D_{15}= 0.0036
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
SM

Date Sampled: 7/10/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

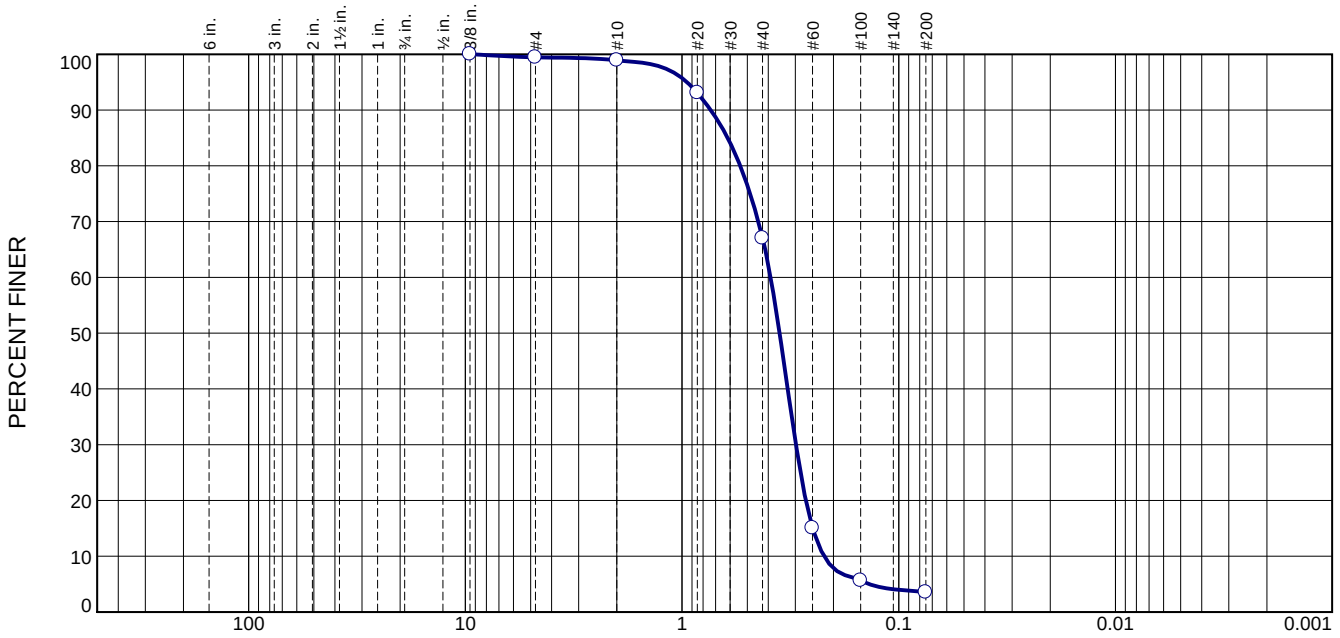
Source of Sample: FD-24-B-07 **Depth:** 15.5'
Sample Number: SS-08

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.6	0.5	31.9	63.5	3.5	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
.375	100.0		
#4	99.4		
#10	98.9		
#20	93.1		
#40	67.0		
#60	15.1		
#100	5.6		
#200	3.5		

* (no specification provided)

Material Description

Brown poorly graded sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/29/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 24.0%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 0.7371 D_{85}= 0.6158

D_{60}= 0.3903 D_{50}= 0.3549

D_{30}= 0.2979 D_{15}= 0.2498

D_{10}= 0.2211

C_u= 1.76 C_c= 1.03

USCS (ASTM D2487)

SP

Source of Sample: FD-24-B-07 **Depth:** 20'
Sample Number: SS-11

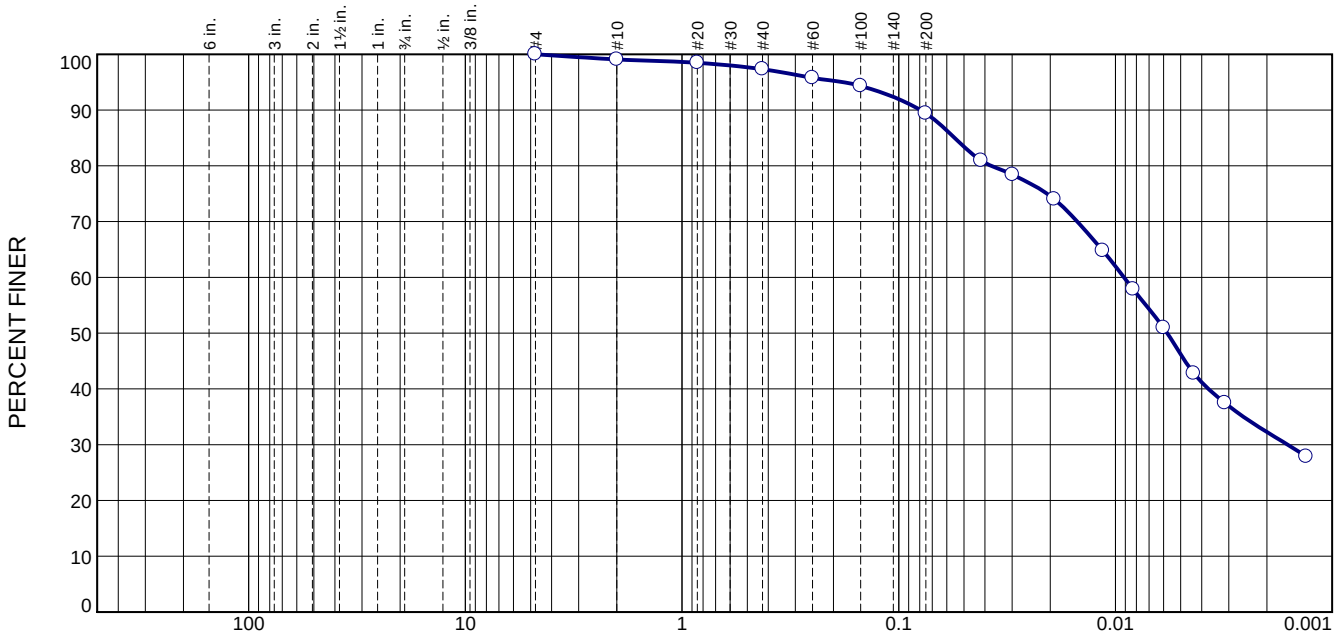
Date Sampled: 7/10/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.9	1.8	7.9	57.1	32.3

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	99.1		
#20	98.5		
#40	97.3		
#60	95.8		
#100	94.3		
#200	89.4		
0.0417 mm.	80.9		
0.0298 mm.	78.4		
0.0192 mm.	74.0		
0.0114 mm.	64.8		
0.0083 mm.	57.9		
0.0060 mm.	50.9		
0.0043 mm.	42.8		
0.0031 mm.	37.5		
0.0013 mm.	27.9		

· (no specification provided)

Material Description

Gray organic silt

Atterberg (ASTM D4318)

PL= 39 **LL=** 88 **PI=** 49

Coefficients

D_{90}= 0.0794 D_{85}= 0.0553

D_{60}= 0.0091 D_{50}= 0.0058

D_{30}= 0.0016 D_{15}=

D_{10}=

C_u= C_c=

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/4/24 **Technician:** KMS/MBP

Test Notes

As Received Moisture Content = 90.7%

Hydrometer Test (ASTM D7928)

Test Date: 9/3/24 **Technician:** KMS

USCS (ASTM D2487)

OH

Date Sampled: 7/23/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-B-08 **Depth:** 2'

Sample Number: SS-02

CDM Smith

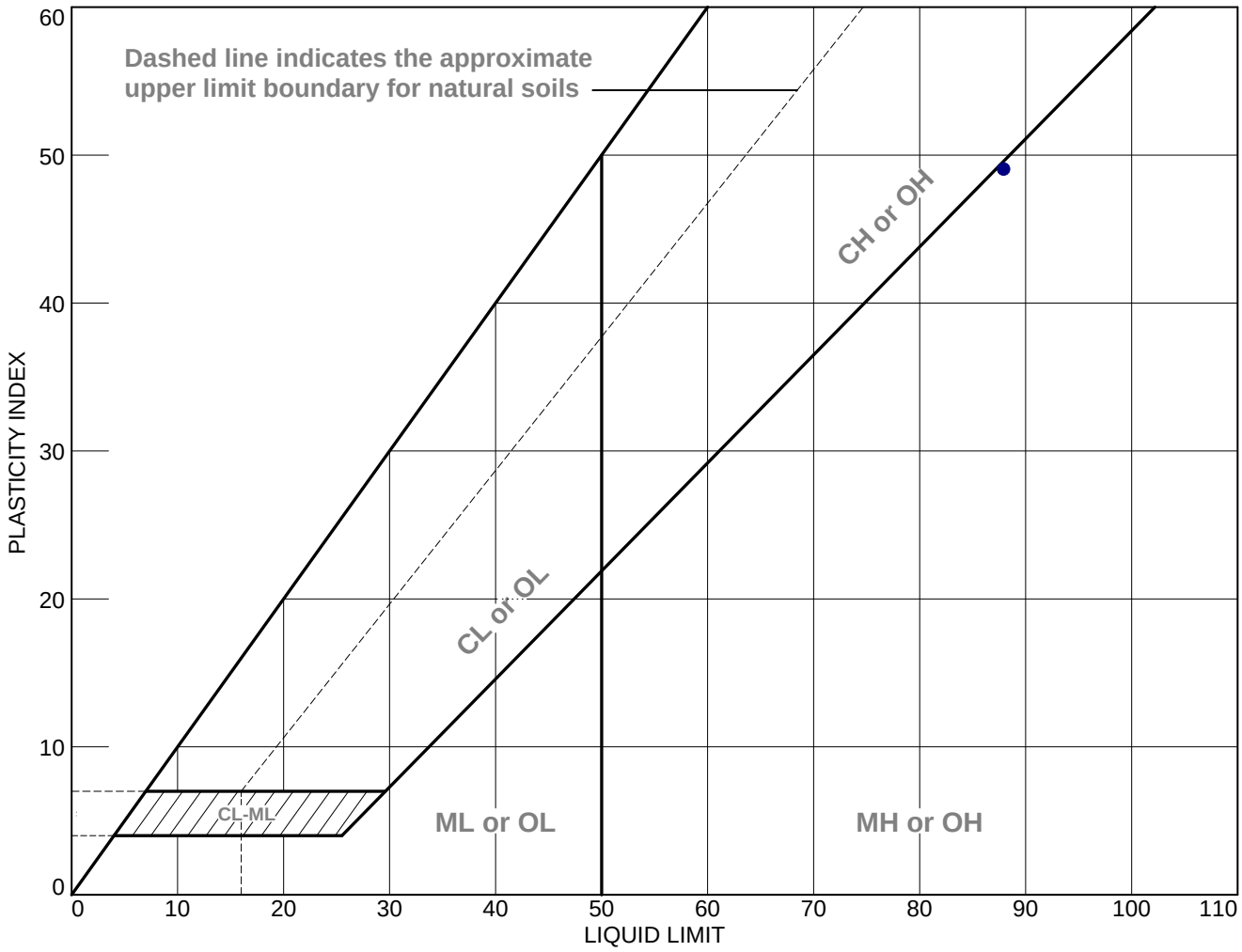
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	FD-24-B-08	SS-02	2'	90.7	39	88	49	OH

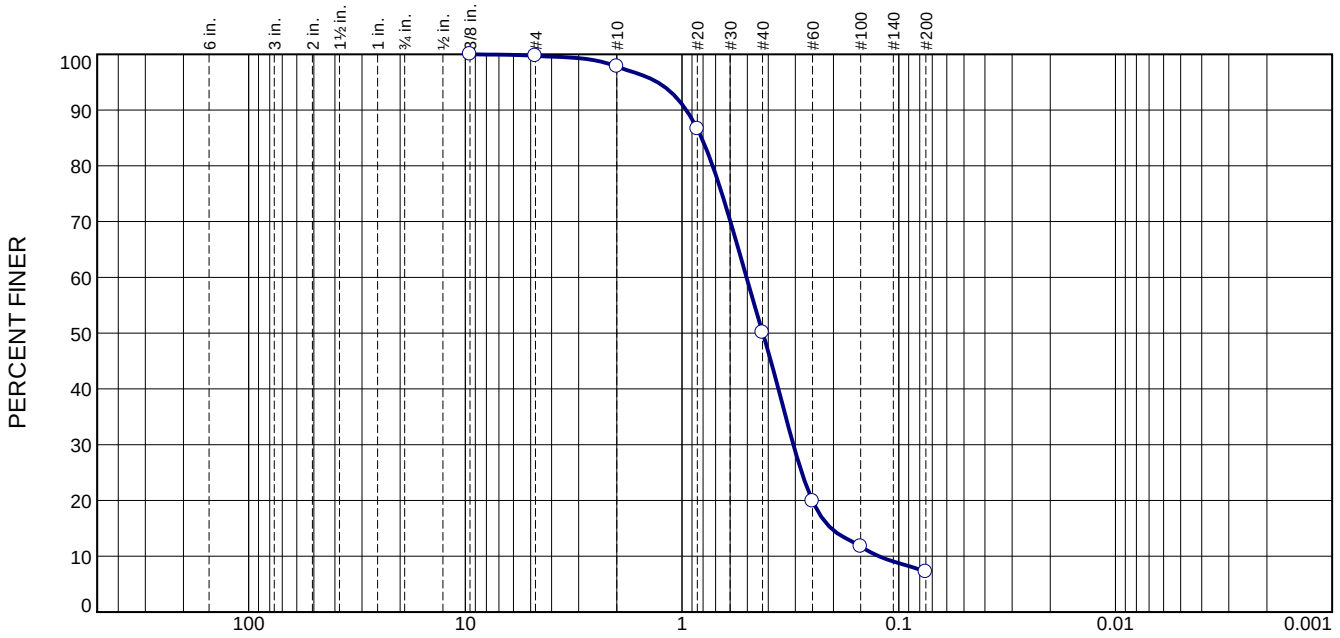
CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No.: 51115.294936

Tested By: KMS/MBP **Checked By:** MBP

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	1.9	47.7	42.9	7.2	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
.375	100.0		
#4	99.7		
#10	97.8		
#20	86.6		
#40	50.1		
#60	19.9		
#100	11.7		
#200	7.2		

* (no specification provided)

Material Description

Brown poorly graded sand with silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/29/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 17.4%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 0.9560 D_{85}= 0.8113

D_{60}= 0.5045 D_{50}= 0.4240

D_{30}= 0.3064 D_{15}= 0.2051

D_{10}= 0.1235

C_u= 4.09 C_c= 1.51

USCS (ASTM D2487)

SP-SM

Source of Sample: FD-24-B-08 **Depth:** 10.0'
Sample Number: SS-06

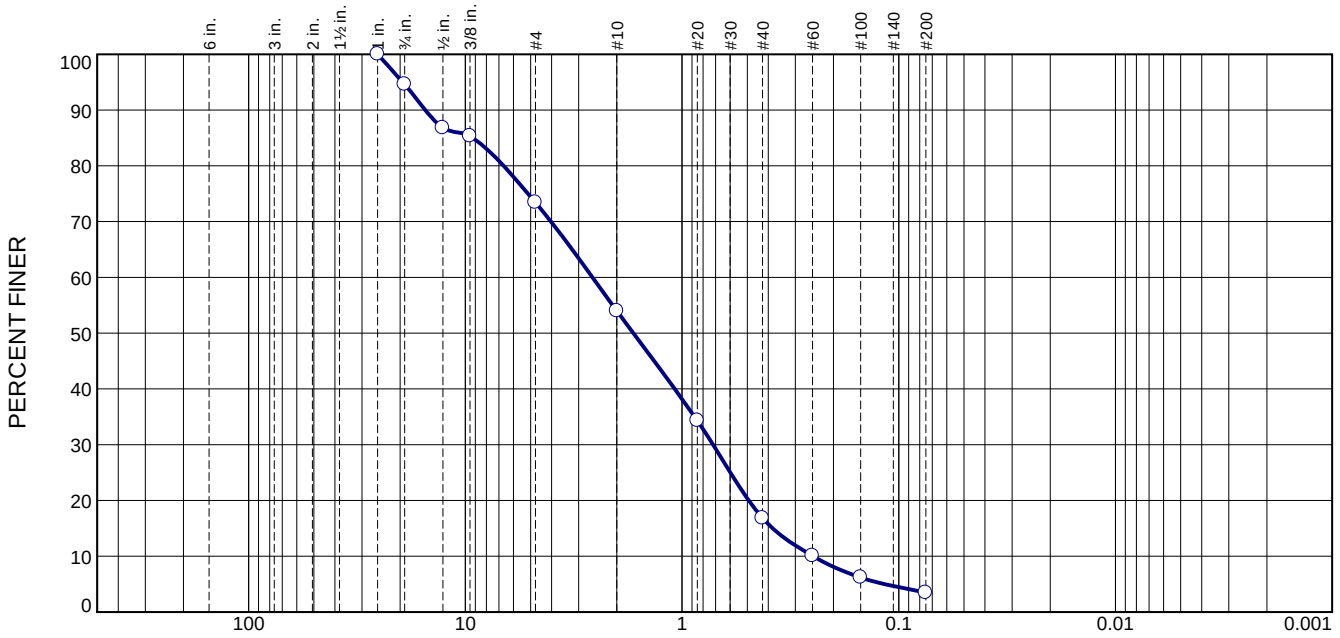
Date Sampled: 7/23/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	5.4	21.2	19.4	37.2	13.3	3.5	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1	100.0		
.75	94.6		
0.5	86.8		
.375	85.3		
#4	73.4		
#10	54.0		
#20	34.3		
#40	16.8		
#60	10.1		
#100	6.2		
#200	3.5		

* (no specification provided)

Material Description

Brown poorly graded sand with gravel

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/29/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 13.1%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 15.3303 D_{85}= 9.2498

D_{60}= 2.5928 D_{50}= 1.6773

D_{30}= 0.7191 D_{15}= 0.3822

D_{10}= 0.2483

C_u= 10.44 C_c= 0.80

USCS (ASTM D2487)

SP

Source of Sample: FD-24-B-08 **Depth:** 16.0'
Sample Number: SS-09

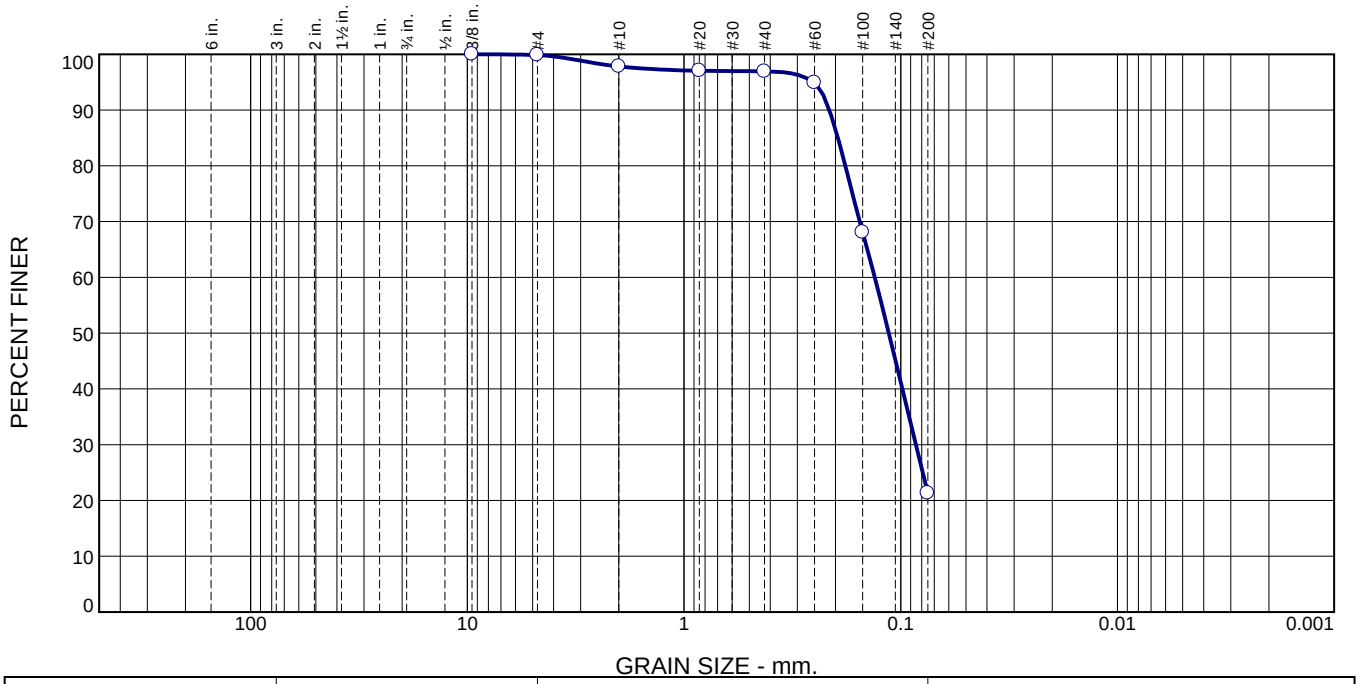
Date Sampled: 7/23/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	2.0	0.9	75.6	21.3	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
.375	100.0		
#4	99.8		
#10	97.8		
#20	97.0		
#40	96.9		
#60	94.9		
#100	68.1		
#200	21.3		

* (no specification provided)

Material Description
Red-brown silty sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/29/24 **Technician:** KMS

Test Notes
As Received Moisture Content = 24.5%

Atterberg (ASTM D4318)
PL= **LL=**NV **PI=**

Coefficients
D_{90}= 0.2136 D_{85}= 0.1949
D_{60}= 0.1319 D_{50}= 0.1135
D_{30}= 0.0851 D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
SM

Source of Sample: FD-24-B-08 **Depth:** 20.0'
Sample Number: SS-11

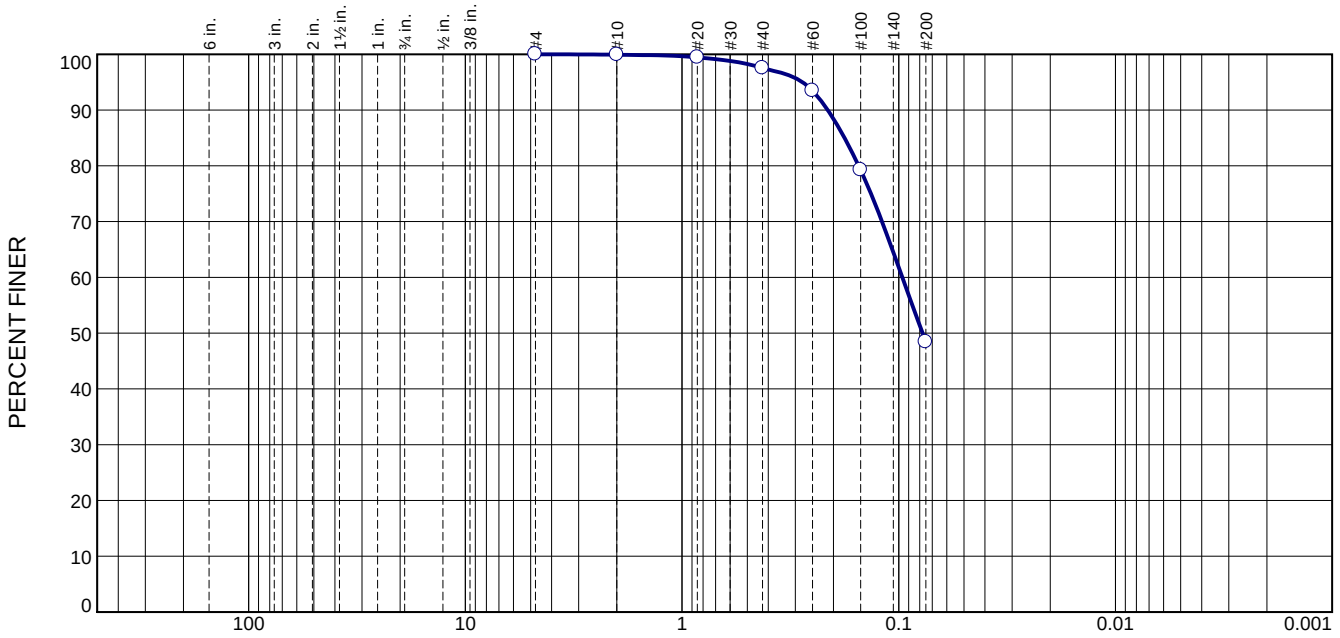
Date Sampled: 7/23/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	2.4	49.1	48.4	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	99.9		
#20	99.4		
#40	97.5		
#60	93.5		
#100	79.2		
#200	48.4		

* (no specification provided)

Material Description
Red-brown silty sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/29/24 **Technician:** KMS

Test Notes
As Received Moisture Content = 25.4%

Atterberg (ASTM D4318)
PL= **LL=** NV **PI=**

Coefficients
D_{90}= 0.2126 D_{85}= 0.1779
D_{60}= 0.0962 D_{50}= 0.0777
D_{30}= D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
SM

Date Sampled: 7/23/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

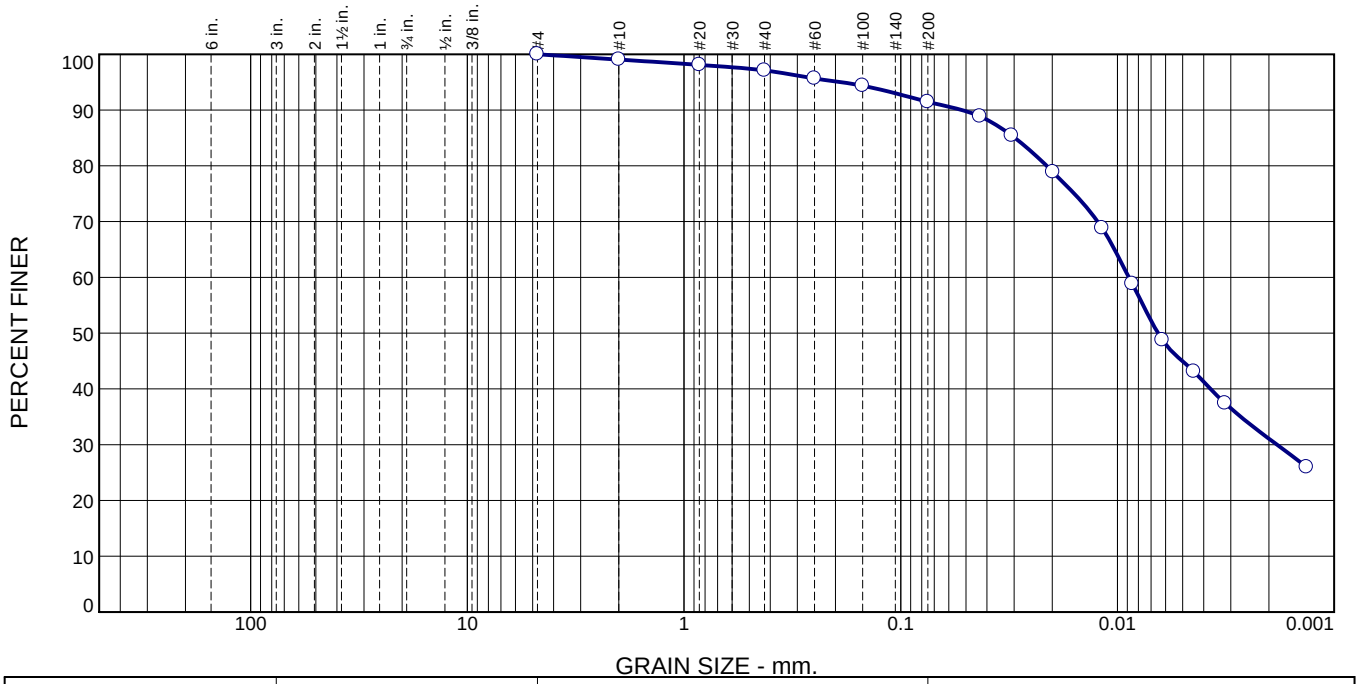
Source of Sample: FD-24-B-08 **Depth:** 32'
Sample Number: SS-17

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.0	1.9	5.6	60.4	31.1

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	99.0		
#20	98.1		
#40	97.1		
#60	95.7		
#100	94.4		
#200	91.5		
0.0431 mm.	88.9		
0.0308 mm.	85.4		
0.0198 mm.	78.9		
0.0118 mm.	68.9		
0.0085 mm.	58.9		
0.0062 mm.	48.7		
0.0044 mm.	43.1		
0.0032 mm.	37.4		
0.0013 mm.	26.0		

· (no specification provided)

Material Description
Dark gray organic clay

Atterberg (ASTM D4318)
PL= 42 **LL=** 102 **PI=** 60

Coefficients
D_{90}= 0.0521 D_{85}= 0.0297
D_{60}= 0.0089 D_{50}= 0.0065
D_{30}= 0.0018 D_{15}=
D_{10}=
C_u= C_c=

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/4/24 **Technician:** KMS/MBP

Test Notes
As Received Moisture Content = 106.8%

Hydrometer Test (ASTM D7928)

Test Date: 9/3/24 **Technician:** KMS

USCS (ASTM D2487)
OH

Date Sampled: 7/12/24
Date Received:
Checked By: MBP
Title: Lab Manager

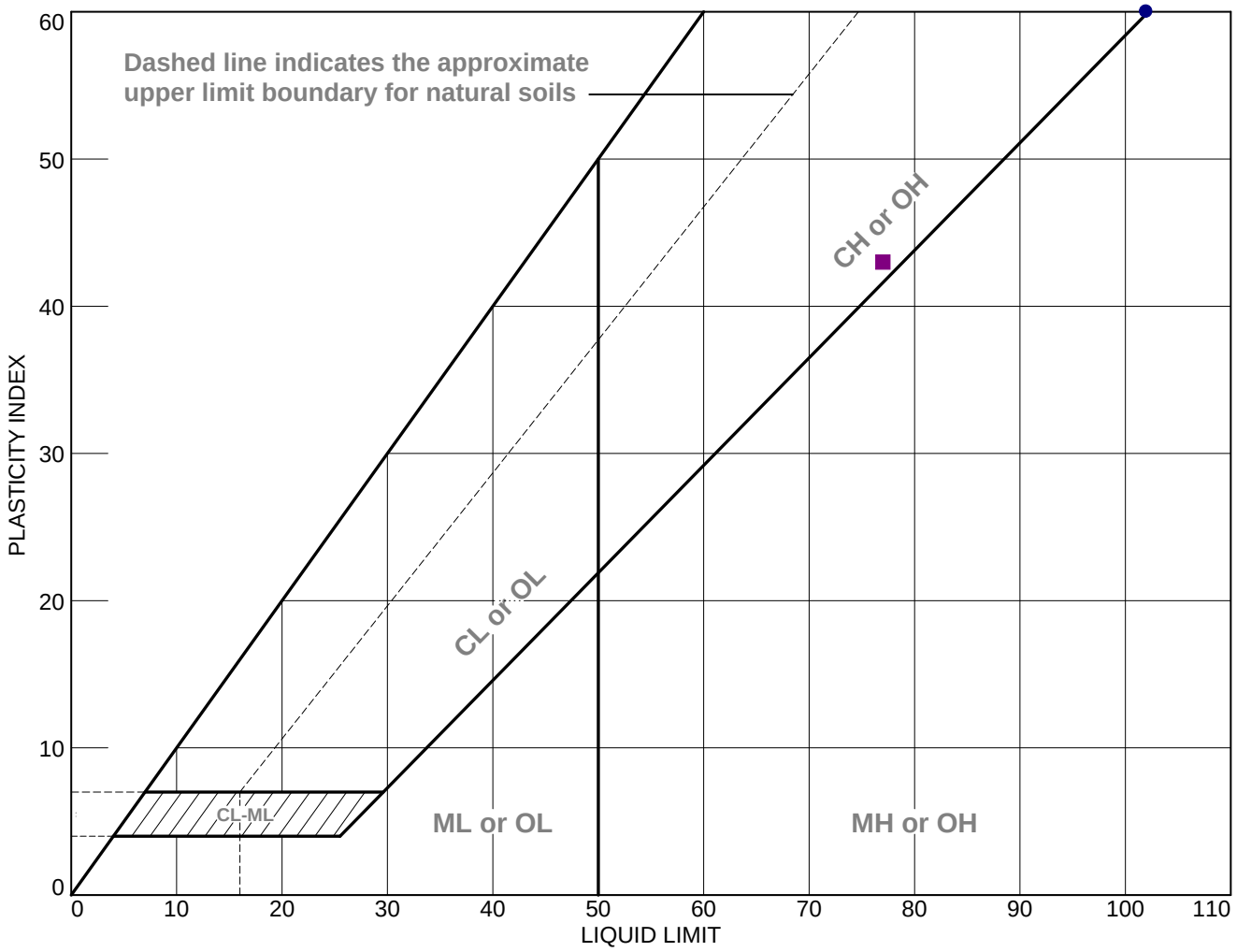
Source of Sample: FD-24-B-09 **Depth:** 3.8'
Sample Number: SS-03

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	FD-24-B-09	SS-03	3.8'	106.8	42	102	60	OH
■	FD-24-B-09	SS-06	9.8'	71.7	34	77	43	OH

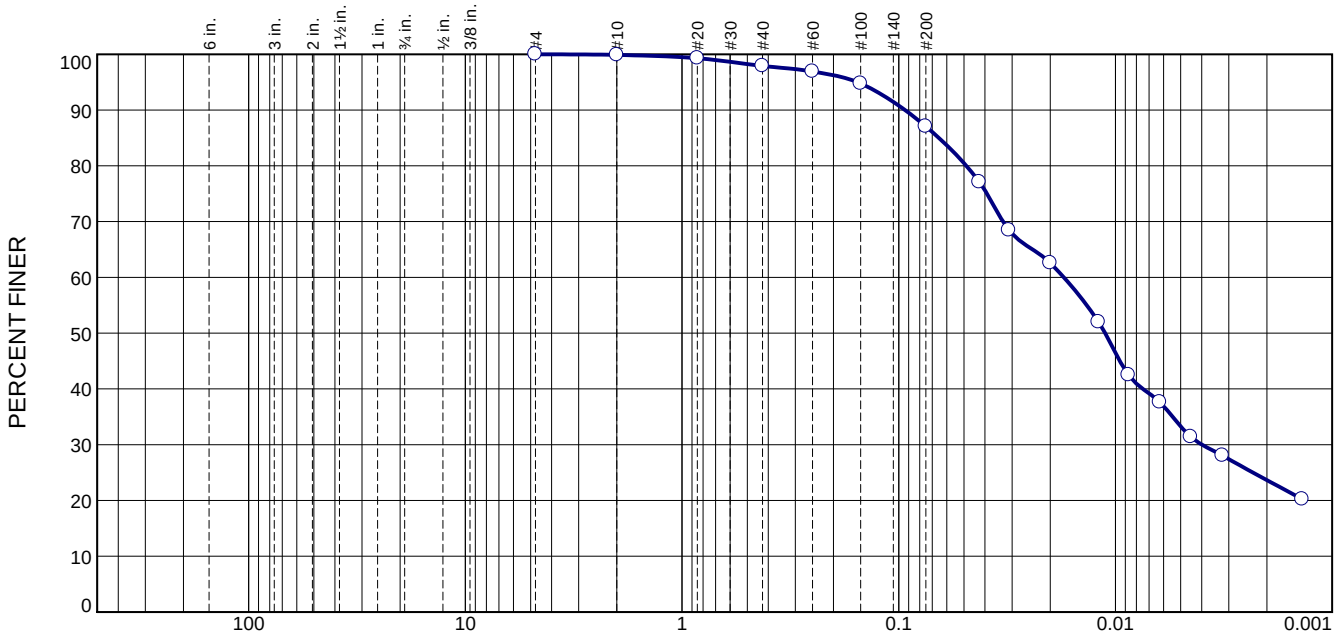
CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No.: 51115.294936

Tested By: KMS/MBP **Checked By:** MBP

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	2.0	10.8	63.5	23.6

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	99.9		
#20	99.3		
#40	97.9		
#60	96.9		
#100	94.8		
#200	87.1		
0.0424 mm.	77.1		
0.0310 mm.	68.5		
0.0200 mm.	62.6		
0.0120 mm.	52.0		
0.0087 mm.	42.5		
0.0062 mm.	37.6		
0.0045 mm.	31.4		
0.0032 mm.	28.0		
0.0014 mm.	20.2		

· (no specification provided)

Material Description

Gray organic clay

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/4/24 **Technician:** KMS/MBP

Test Notes

As Received Moisture Content = 71.7%

Hydrometer Test (ASTM D7928)

Test Date: 9/3/24 **Technician:** KMS

Atterberg (ASTM D4318)

PL= 34 **LL=** 77 **PI=** 43

Coefficients

D_{90}= 0.0935 D_{85}= 0.0653

D_{60}= 0.0173 D_{50}= 0.0111

D_{30}= 0.0040 D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

OH

Date Sampled: 7/12/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-B-09 **Depth:** 9.8'

Sample Number: SS-06

CDM Smith

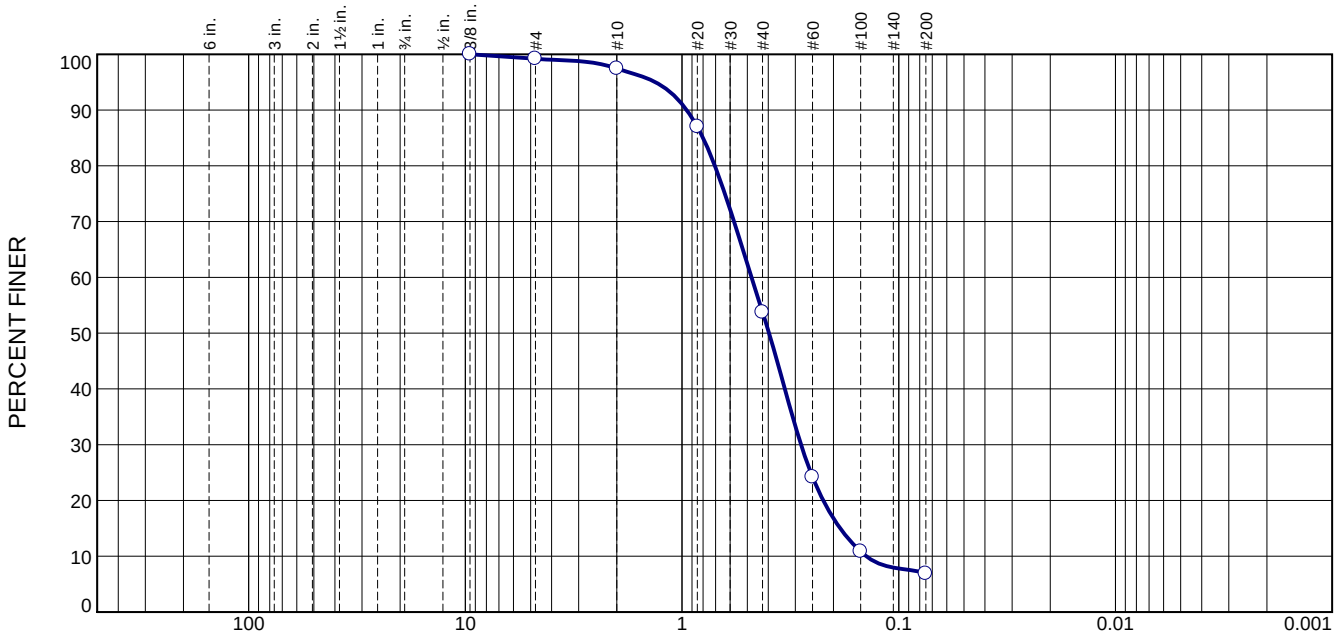
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.8	1.7	43.8	46.8	6.9	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
.375	100.0		
#4	99.2		
#10	97.5		
#20	87.0		
#40	53.7		
#60	24.2		
#100	10.8		
#200	6.9		

* (no specification provided)

Material Description

Brown poorly graded sand with silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/30/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 17.3%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 0.9511 D_{85}= 0.7991

D_{60}= 0.4782 D_{50}= 0.3969

D_{30}= 0.2824 D_{15}= 0.1865

D_{10}= 0.1416

C_u= 3.38 C_c= 1.18

USCS (ASTM D2487)

SP-SM

Source of Sample: FD-24-B-09 **Depth:** 24.1'
Sample Number: SS-13

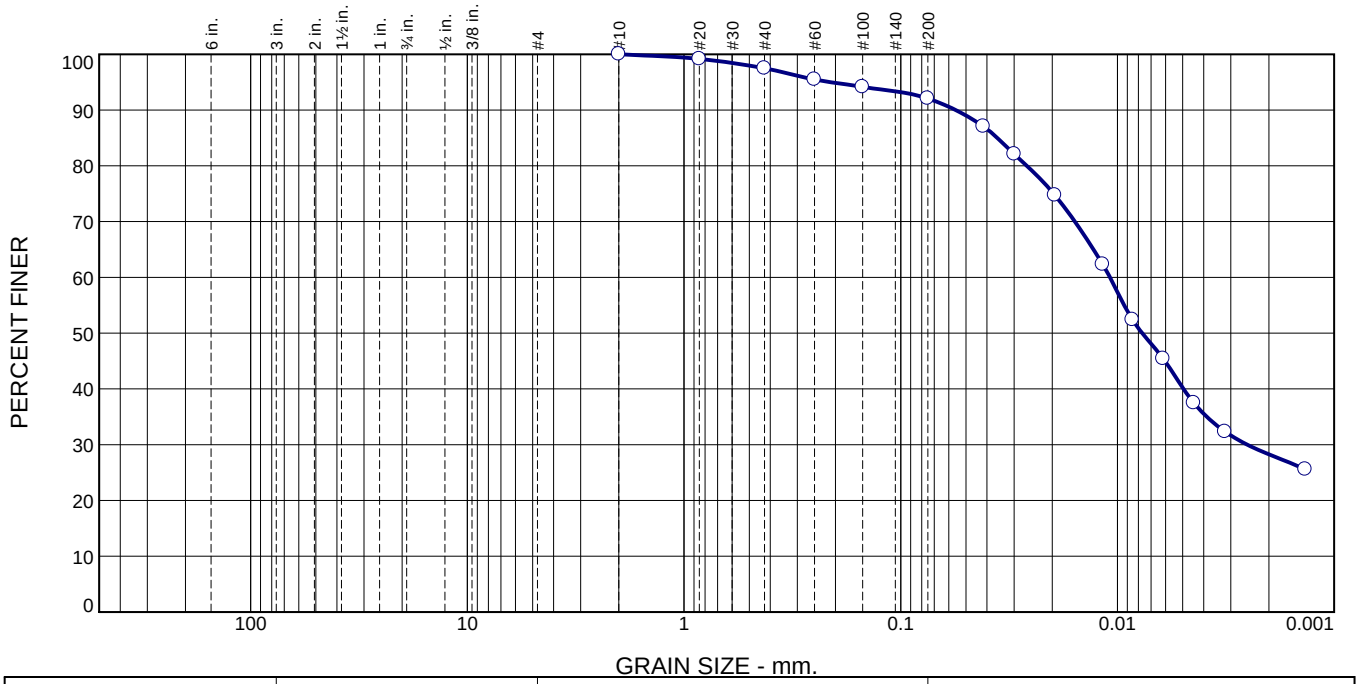
Date Sampled: 7/12/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	2.5	5.4	63.8	28.3

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	99.2		
#40	97.5		
#60	95.5		
#100	94.1		
#200	92.1		
0.0416 mm.	87.1		
0.0299 mm.	82.1		
0.0194 mm.	74.7		
0.0117 mm.	62.3		
0.0085 mm.	52.4		
0.0061 mm.	45.4		
0.0044 mm.	37.5		
0.0032 mm.	32.3		
0.0014 mm.	25.5		

· (no specification provided)

Material Description
Gray organic silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/4/24 **Technician:** KMS/MBP

Test Notes
As Received Moisture Content = 92.2%

Hydrometer Test (ASTM D7928)

Test Date: 9/3/24 **Technician:** KMS

Atterberg (ASTM D4318)
PL= 42 **LL=** 92 **PI=** 50

Coefficients
D_{90}= 0.0558 D_{85}= 0.0358
D_{60}= 0.0108 D_{50}= 0.0077
D_{30}= 0.0025 D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
OH

Date Sampled: 7/11/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

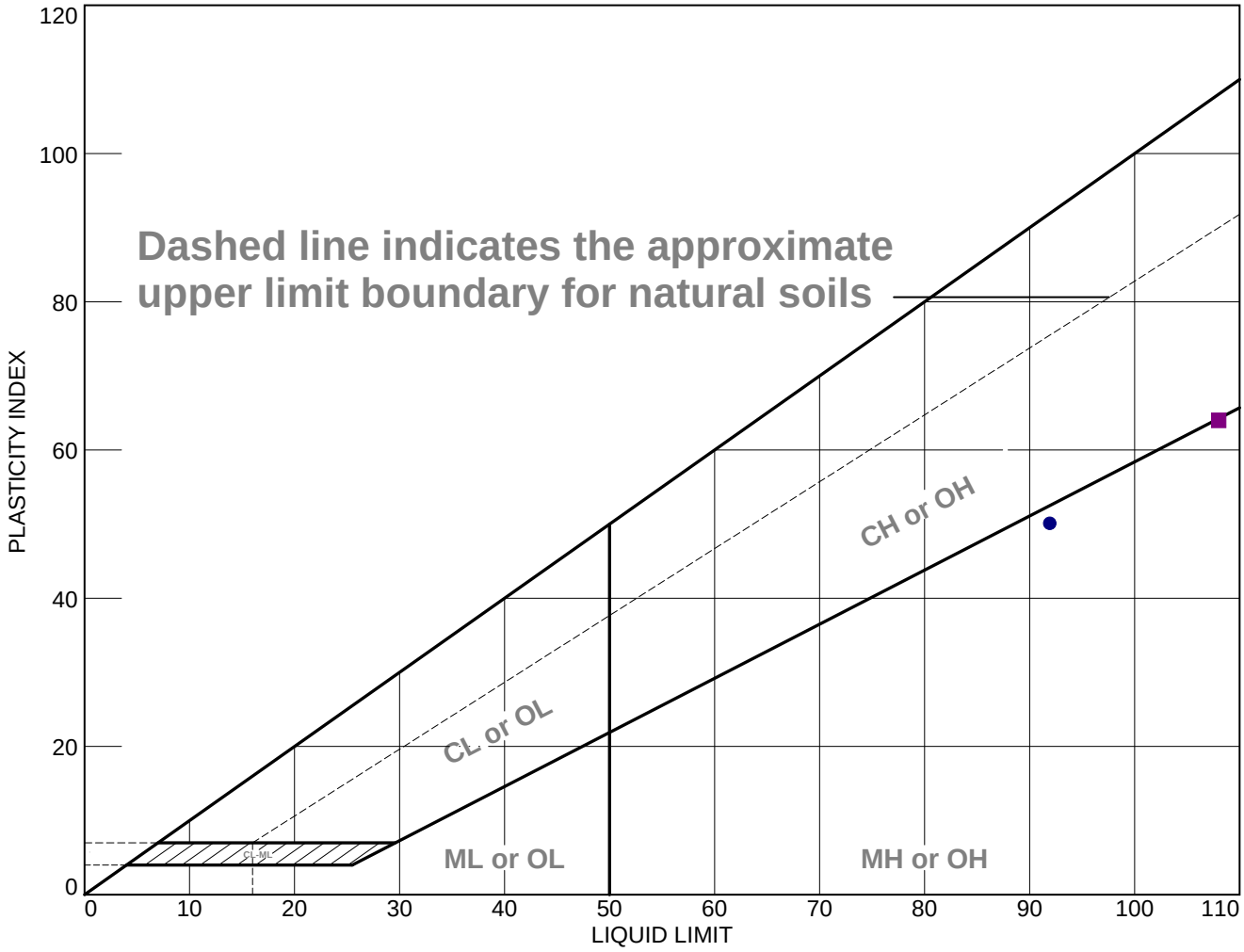
Source of Sample: FD-24-B-10 **Depth:** 2'
Sample Number: SS-02

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	FD-24-B-10	SS-02	2'	92.2	42	92	50	OH
■	FD-24-B-10	SS-05	8.2'	127.1	44	108	64	OH
▲	FD-24-B-10	SS-13	24.2'	20.5	NP	NP	NP	SP-SM

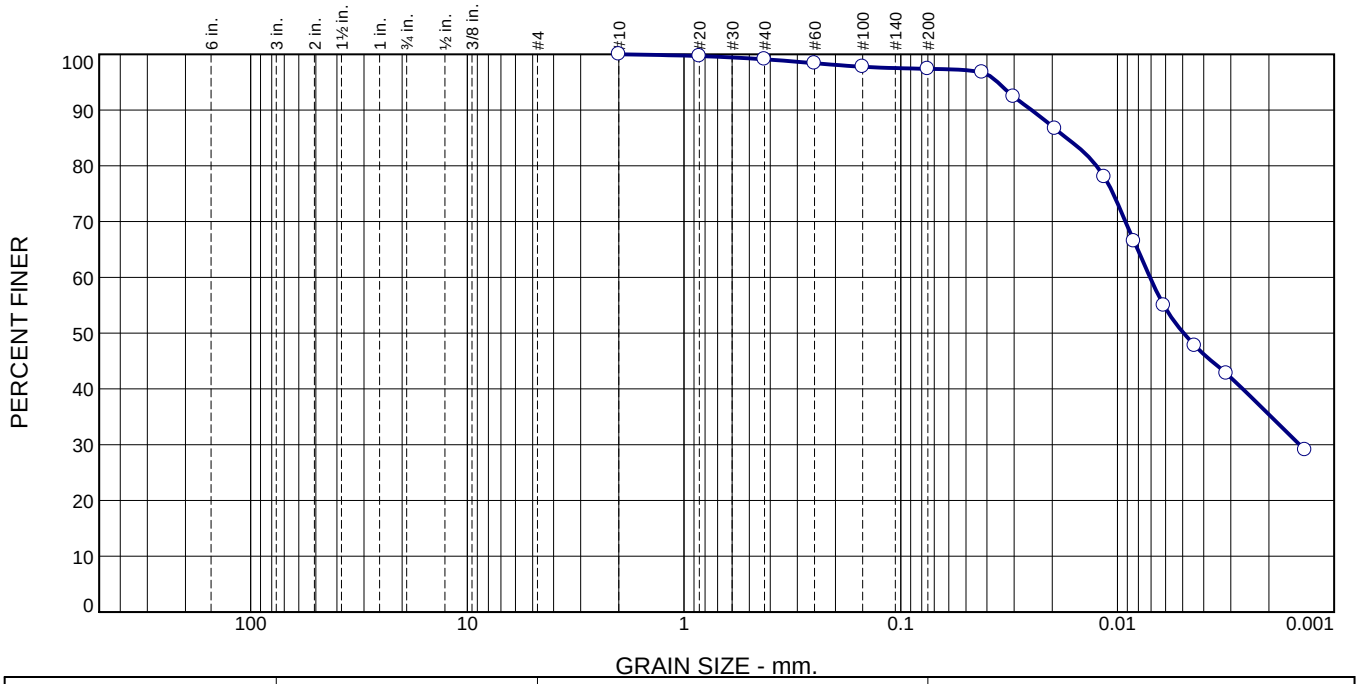
CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No.: 51115.294936

Tested By: ○ KMS/MBP □ KMS △ KMS/MBP **Checked By:** MBP

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.9	1.7	62.0	35.4

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	99.7		
#40	99.1		
#60	98.4		
#100	97.8		
#200	97.4		
0.0421 mm.	96.7		
0.0302 mm.	92.4		
0.0194 mm.	86.7		
0.0115 mm.	78.0		
0.0084 mm.	66.5		
0.0061 mm.	55.0		
0.0044 mm.	47.8		
0.0031 mm.	42.8		
0.0014 mm.	29.1		

· (no specification provided)

Material Description
Gray organic silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/4/24 **Technician:** KMS/MBP

Test Notes
As Received Moisture Content = 127.1%

Hydrometer Test (ASTM D7928)

Test Date: 9/3/24 **Technician:** KMS

Atterberg (ASTM D4318)
PL= 44 **LL=** 108 **PI=** 64

Coefficients
D_{90}= 0.0249 D_{85}= 0.0172
D_{60}= 0.0071 D_{50}= 0.0050
D_{30}= 0.0014 D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
OH

Date Sampled: 7/11/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

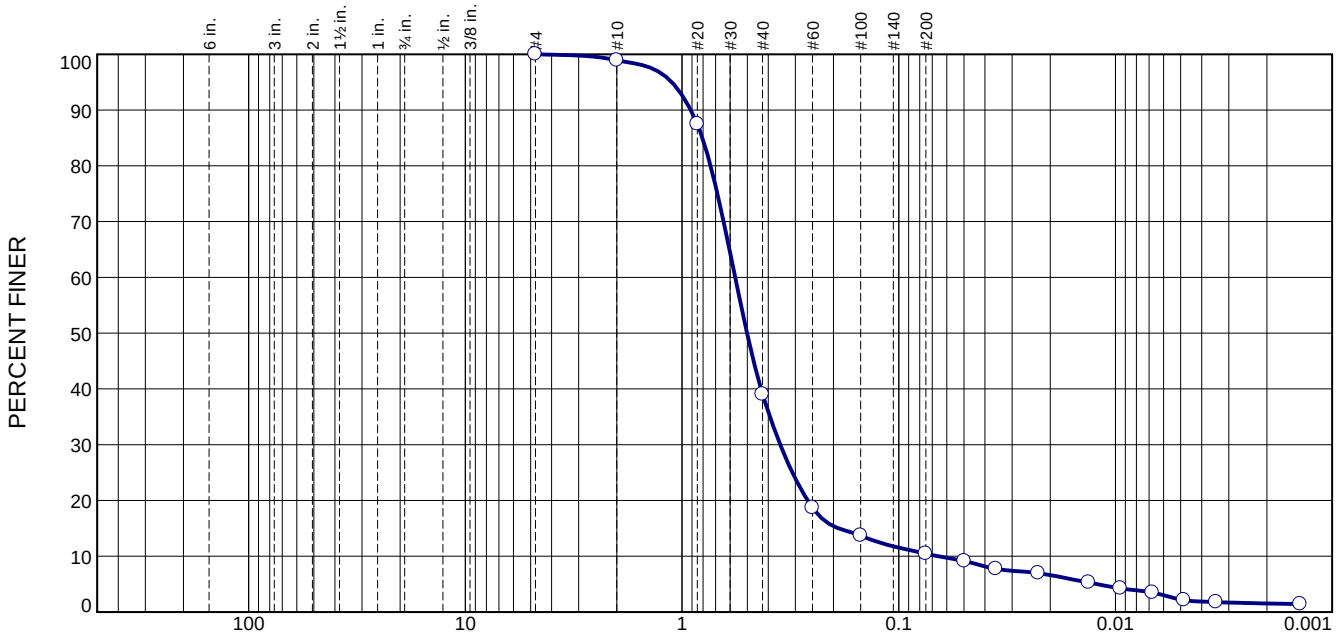
Source of Sample: FD-24-B-10 **Depth:** 8.2'
Sample Number: SS-05

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.1	59.9	28.5	9.0	1.5

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	98.9		
#20	87.5		
#40	39.0		
#60	18.7		
#100	13.7		
#200	10.5		
0.0498 mm.	9.1		
0.0357 mm.	7.7		
0.0227 mm.	7.0		
0.0133 mm.	5.3		
0.0095 mm.	4.2		
0.0068 mm.	3.5		
0.0048 mm.	2.1		
0.0034 mm.	1.8		
0.0014 mm.	1.4		

· (no specification provided)

Material Description

Brown poorly graded sand with silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/4/24 **Technician:** KMS/MBP

Test Notes

As Received Moisture Content = 20.5%

Hydrometer Test (ASTM D7928)

Test Date: 9/3/24 **Technician:** KMS

Atterberg (ASTM D4318)

PL= NP **LL=** NP **PI=** NP

Coefficients

D_{90}= 0.9108 D_{85}= 0.8043

D_{60}= 0.5686 D_{50}= 0.5015

D_{30}= 0.3524 D_{15}= 0.1900

D_{10}= 0.0657

C_u= 8.66 C_c= 3.32

USCS (ASTM D2487)

SP-SM

Date Sampled: 7/11/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-B-10 **Depth:** 24.2'

Sample Number: SS-13

CDM Smith

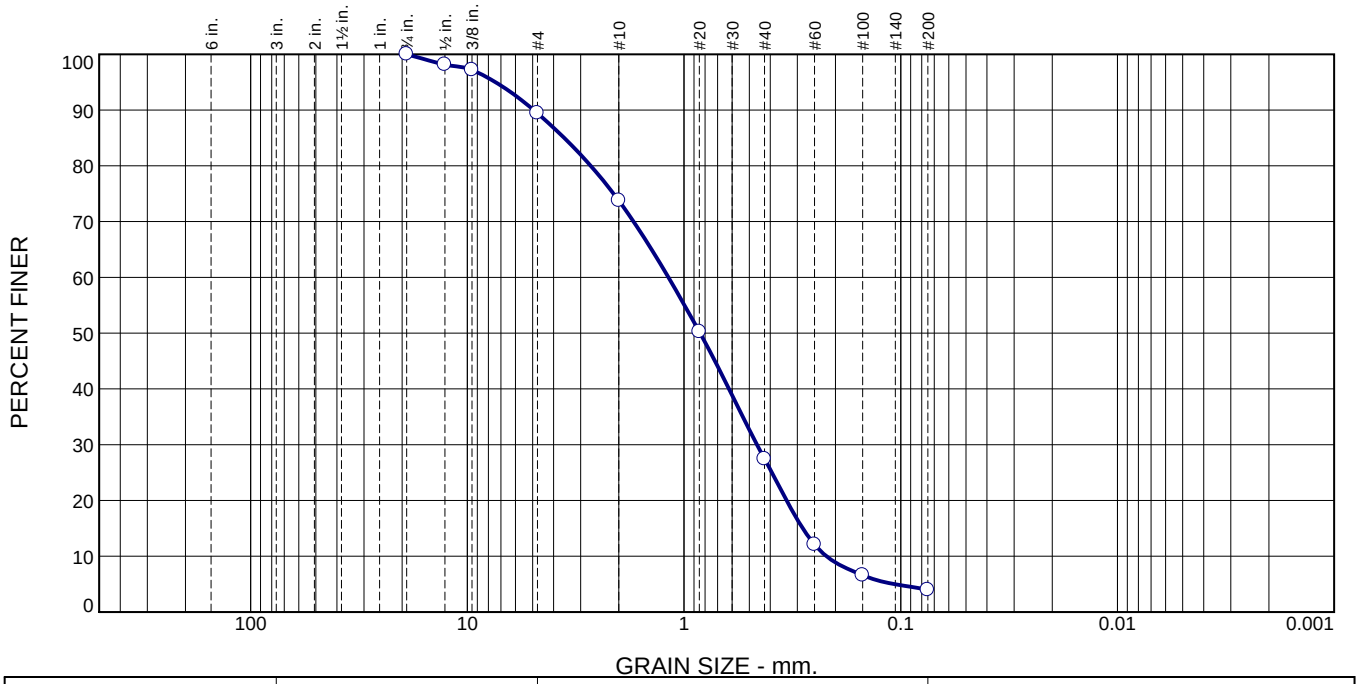
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	10.6	15.7	46.3	23.5	3.9	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
.75	100.0		
0.5	98.1		
.375	97.2		
#4	89.4		
#10	73.7		
#20	50.3		
#40	27.4		
#60	12.1		
#100	6.6		
#200	3.9		

* (no specification provided)

Material Description
Brown poorly graded sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/30/24 **Technician:** KMS

Test Notes
As Received Moisture Content = 15.1%

Atterberg (ASTM D4318)
PL= **LL=**NV **PI=**

Coefficients
D_{90}= 4.9399 D_{85}= 3.5710
D_{60}= 1.1813 D_{50}= 0.8427
D_{30}= 0.4609 D_{15}= 0.2833
D_{10}= 0.2202
C_u= 5.36 C_c= 0.82

USCS (ASTM D2487)
SP

Date Sampled: 7/11/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

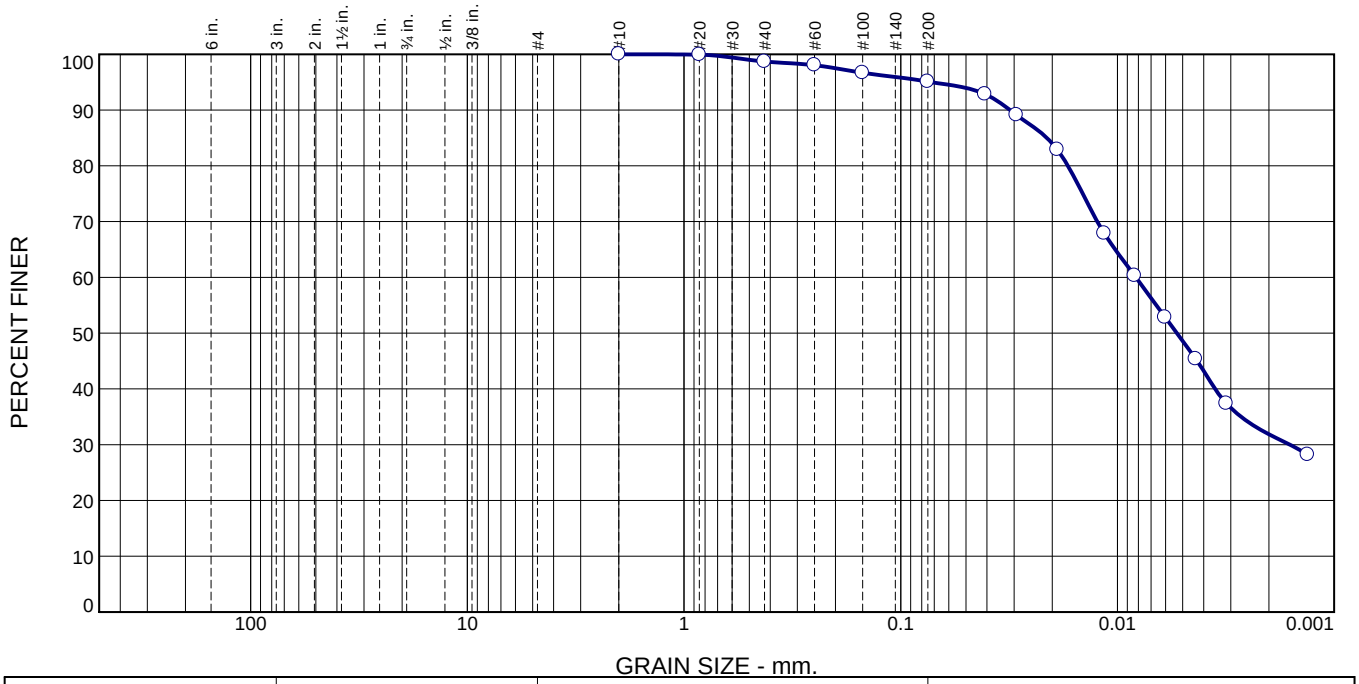
Source of Sample: FD-24-B-10 **Depth:** 30.5'
Sample Number: SS-16

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.3	3.6	63.2	31.9

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	99.9		
#40	98.7		
#60	98.0		
#100	96.7		
#200	95.1		
0.0408 mm.	92.8		
0.0292 mm.	89.1		
0.0189 mm.	82.9		
0.0115 mm.	67.9		
0.0083 mm.	60.3		
0.0060 mm.	52.8		
0.0044 mm.	45.4		
0.0031 mm.	37.4		
0.0013 mm.	28.2		

· (no specification provided)

Material Description
Gray organic silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/5/24 **Technician:** KMS

Test Notes
As Received Moisture Content = 113.7%

Hydrometer Test (ASTM D7928)

Test Date: 9/4/24 **Technician:** KMS

Atterberg (ASTM D4318)
PL= 44 **LL=** 108 **PI=** 64

Coefficients
D_{90}= 0.0313 D_{85}= 0.0212
D_{60}= 0.0082 D_{50}= 0.0053
D_{30}= 0.0016 D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
OH

Date Sampled: 7/3/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

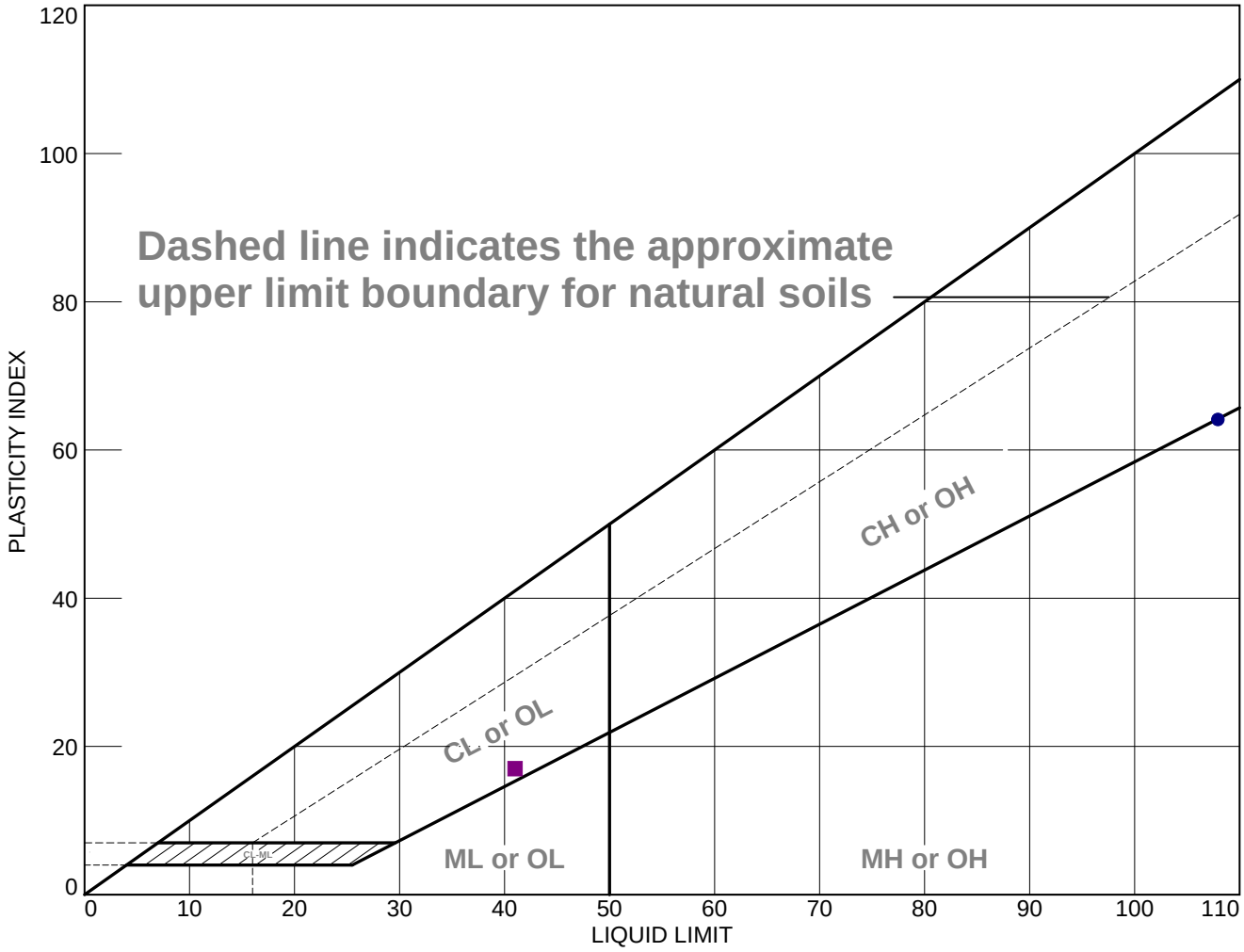
Source of Sample: FD-24-B-11 **Depth:** 7.4'
Sample Number: SS-05

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	FD-24-B-11	SS-05	7.4'	113.7	44	108	64	OH
■	FD-24-B-11	SS-12	21.4'	45.3	24	41	17	CL

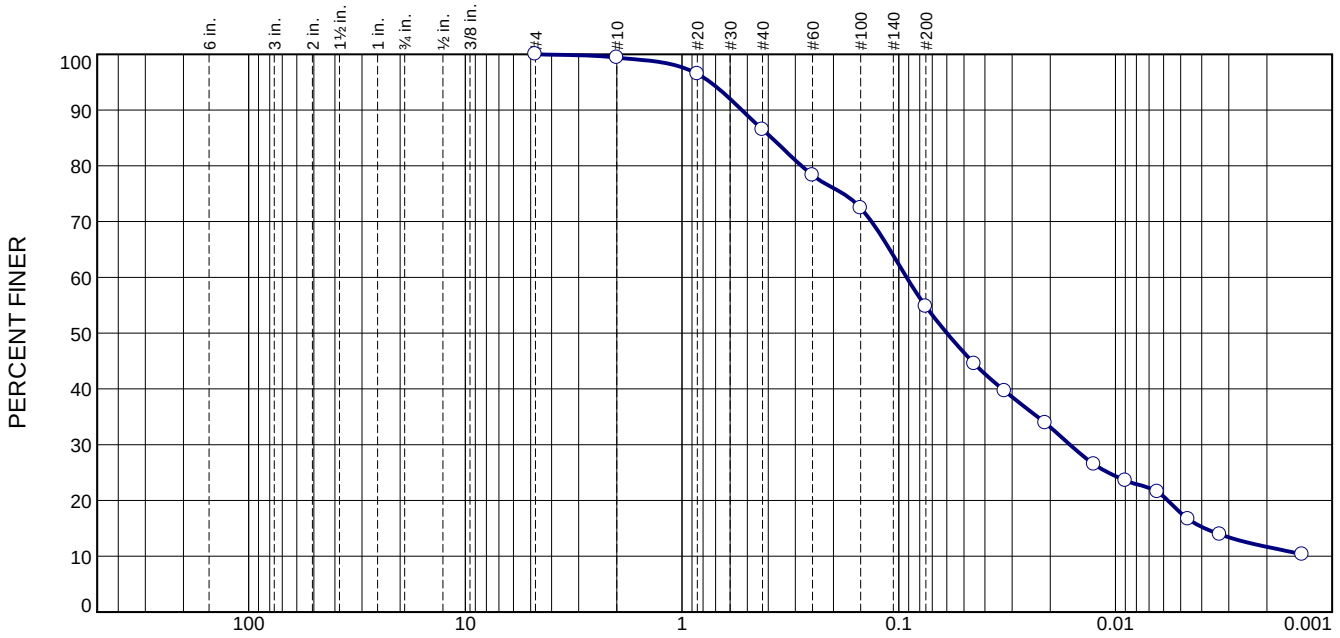
CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No.: 51115.294936

Tested By: ○ KMS □ KMS/MBP **Checked By:** MBP

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.6	12.9	31.7	43.1	11.7

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	99.4		
#20	96.5		
#40	86.5		
#60	78.3		
#100	72.4		
#200	54.8		
0.0448 mm.	44.5		
0.0324 mm.	39.6		
0.0211 mm.	33.9		
0.0126 mm.	26.5		
0.0090 mm.	23.6		
0.0064 mm.	21.5		
0.0046 mm.	16.7		
0.0033 mm.	13.9		
0.0014 mm.	10.3		

* (no specification provided)

Material Description

Gray-brown sandy lean clay

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/5/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 45.3%

Hydrometer Test (ASTM D7928)

Test Date: 9/4/24 **Technician:** KMS

Atterberg (ASTM D4318)

PL= 24 **LL=** 41 **PI=** 17

Coefficients

D_{90}= 0.5300 D_{85}= 0.3855

D_{60}= 0.0920 D_{50}= 0.0600

D_{30}= 0.0162 D_{15}= 0.0039

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

CL

Source of Sample: FD-24-B-11 **Depth:** 21.4'
Sample Number: SS-12

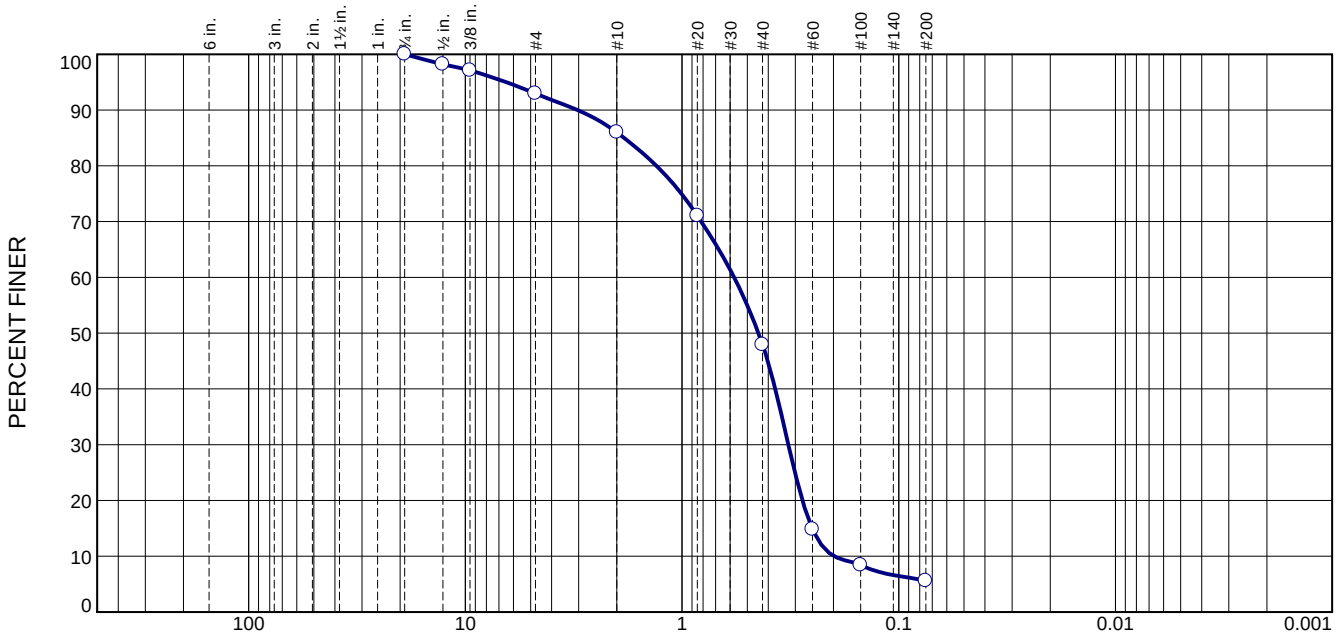
Date Sampled: 7/3/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	7.0	7.0	38.1	42.3	5.6	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
.75	100.0		
0.5	98.2		
.375	97.1		
#4	93.0		
#10	86.0		
#20	71.1		
#40	47.9		
#60	14.8		
#100	8.4		
#200	5.6		

* (no specification provided)

Material Description

Brown poorly graded sand with silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/30/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 17.5%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 3.0394 D_{85}= 1.8517

D_{60}= 0.5750 D_{50}= 0.4444

D_{30}= 0.3232 D_{15}= 0.2513

D_{10}= 0.1989

C_u= 2.89 C_c= 0.91

USCS (ASTM D2487)

SP-SM

Date Sampled: 7/3/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-B-11 **Depth:** 26.6'

Sample Number: SS-14

CDM Smith

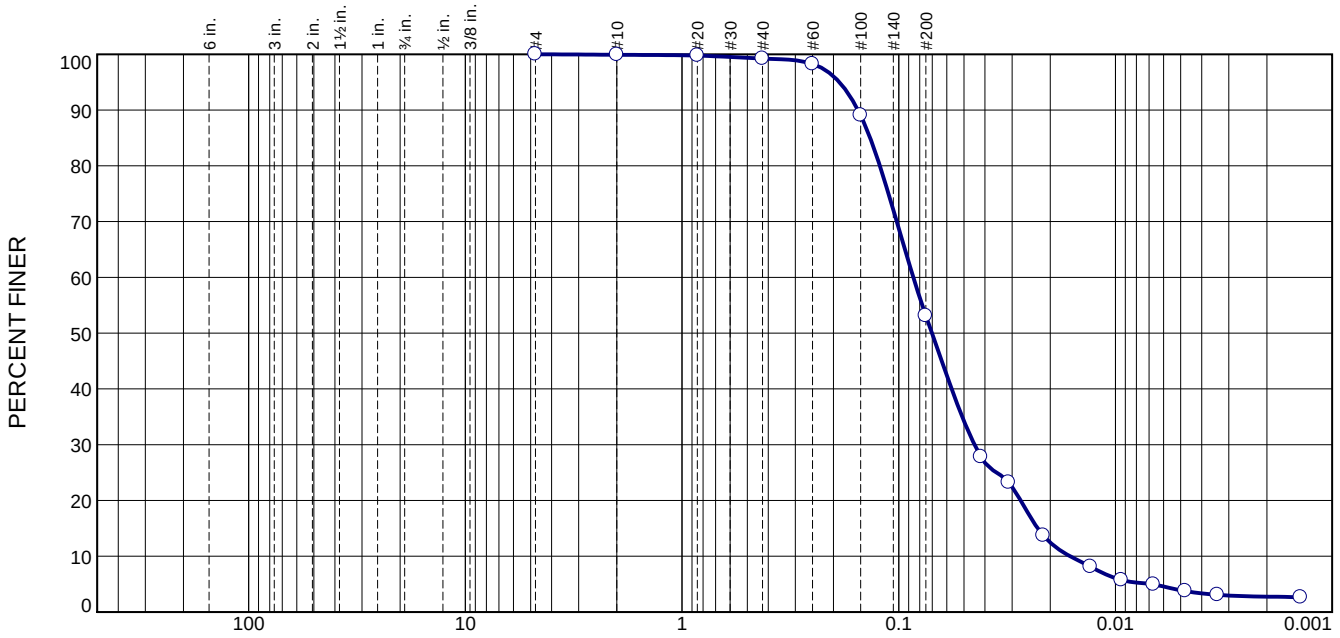
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	0.7	46.1	50.3	2.8

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	99.9		
#20	99.8		
#40	99.2		
#60	98.3		
#100	89.0		
#200	53.1		
0.0418 mm.	27.8		
0.0311 mm.	23.2		
0.0215 mm.	13.7		
0.0130 mm.	8.1		
0.0094 mm.	5.7		
0.0067 mm.	4.9		
0.0048 mm.	3.7		
0.0034 mm.	3.1		
0.0014 mm.	2.6		

· (no specification provided)

Material Description

Red-brown sandy silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/5/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 23.7%

Hydrometer Test (ASTM D7928)

Test Date: 9/4/24 **Technician:** KMS

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 0.1543 D_{85}= 0.1356

D_{60}= 0.0857 D_{50}= 0.0703

D_{30}= 0.0447 D_{15}= 0.0229

D_{10}= 0.0162

C_u= 5.29 C_c= 1.44

USCS (ASTM D2487)

ML

Date Sampled: 7/3/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-B-11 **Depth:** 37'

Sample Number: SS-20

CDM Smith

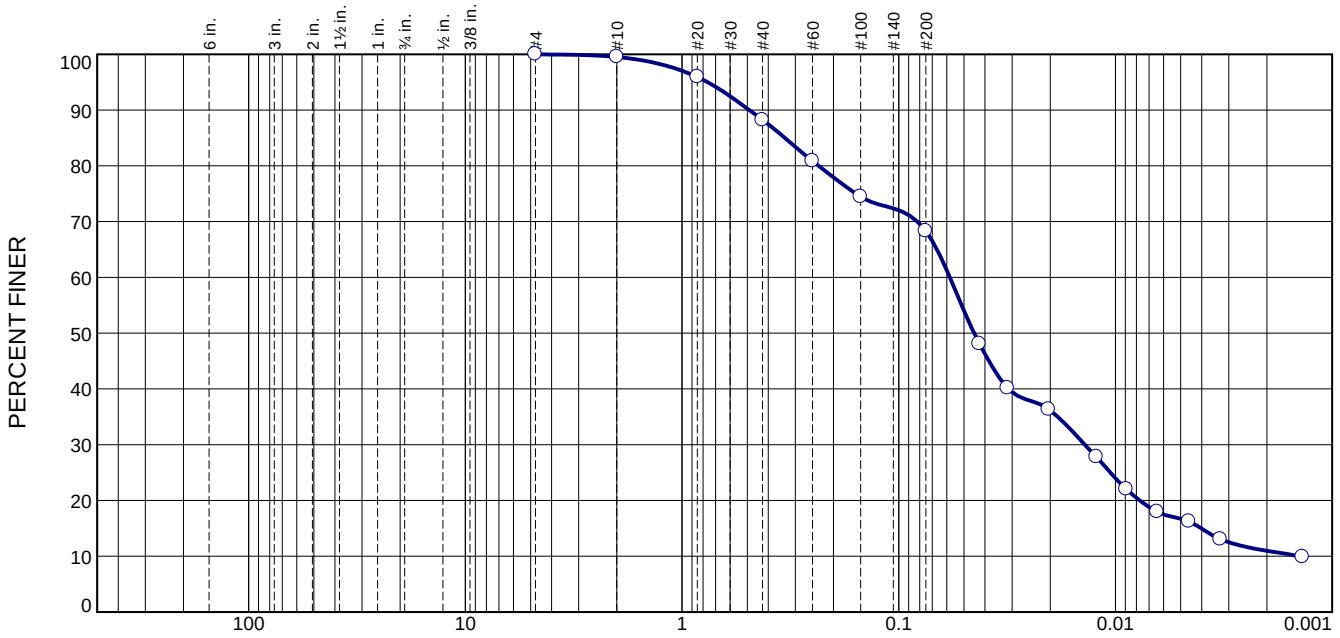
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.5	11.3	19.9	57.3	11.0

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	99.5		
#20	95.9		
#40	88.2		
#60	80.9		
#100	74.5		
#200	68.3		
0.0424 mm.	48.1		
0.0315 mm.	40.2		
0.0203 mm.	36.3		
0.0123 mm.	27.8		
0.0089 mm.	22.0		
0.0064 mm.	18.0		
0.0046 mm.	16.2		
0.0033 mm.	13.0		
0.0014 mm.	9.9		

· (no specification provided)

Material Description

Gray silt with sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/5/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 38.5%

Hydrometer Test (ASTM D7928)

Test Date: 9/4/24 **Technician:** KMS

Atterberg (ASTM D4318)

PL= NP **LL=** NP **PI=** NP

Coefficients

D_{90}= 0.4897 D_{85}= 0.3354

D_{60}= 0.0581 D_{50}= 0.0449

D_{30}= 0.0138 D_{15}= 0.0040

D_{10}= 0.0014

C_u= 41.04 C_c= 2.33

USCS (ASTM D2487)

ML

Source of Sample: FD-24-B-12 **Depth:** 2'
Sample Number: SS-02

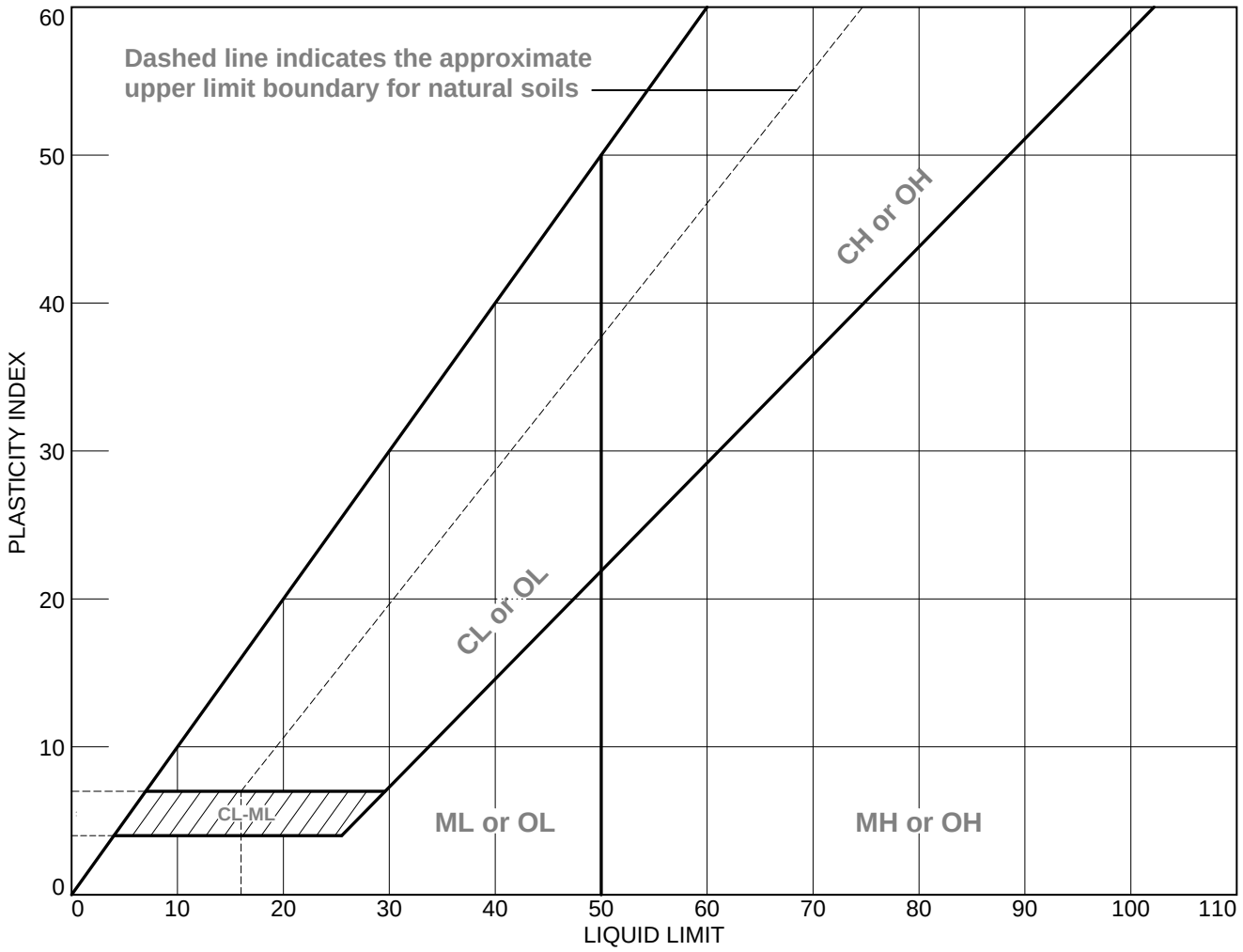
Date Sampled: 7/25/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	FD-24-B-12	SS-02	2'	38.5	NP	NP	NP	ML
■	FD-24-B-12	SS-09	16'	28.4	NP	NP	NP	ML

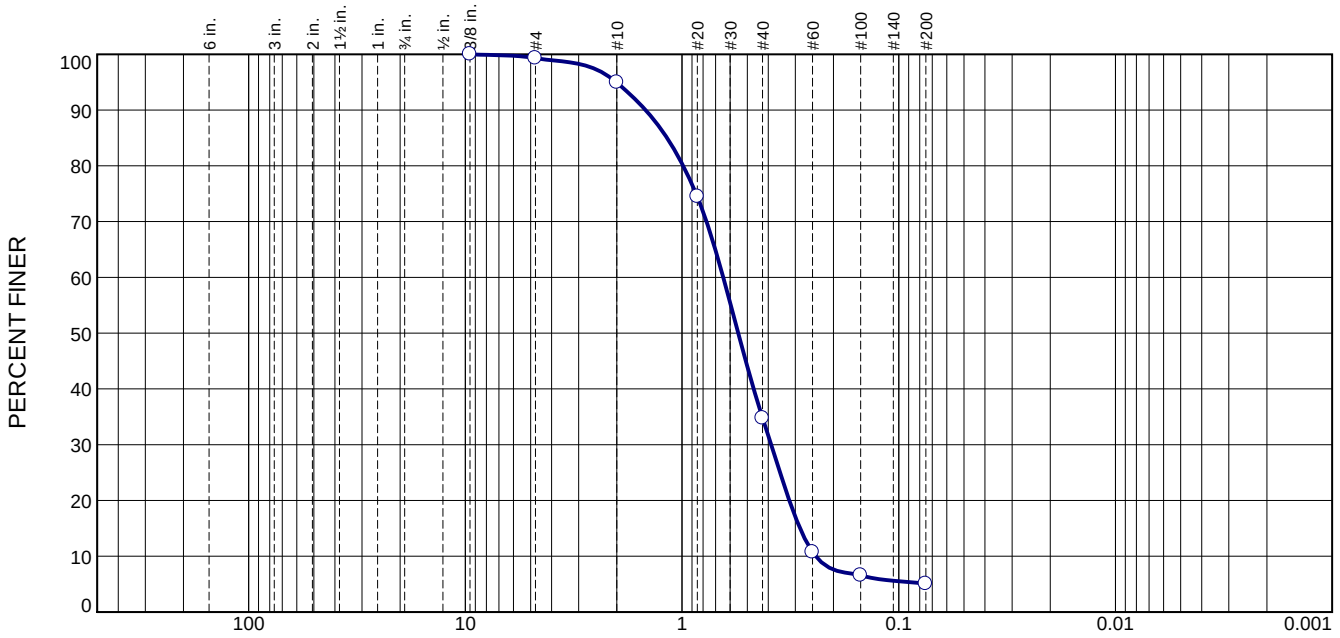
CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No.: 51115.294936

Tested By: ○ KMS/MBP □ KMS **Checked By:** MBP

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.7	4.4	60.1	29.7	5.1	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
.375	100.0		
#4	99.3		
#10	94.9		
#20	74.5		
#40	34.8		
#60	10.7		
#100	6.6		
#200	5.1		

* (no specification provided)

Material Description

Gray-brown poorly graded sand with silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/30/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 22.6%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 1.4741 D_{85}= 1.1735

D_{60}= 0.6456 D_{50}= 0.5505

D_{30}= 0.3881 D_{15}= 0.2855

D_{10}= 0.2420

C_u= 2.67 C_c= 0.96

USCS (ASTM D2487)

SP-SM

Date Sampled: 7/25/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-B-12 **Depth:** 6'

Sample Number: SS-04

CDM Smith

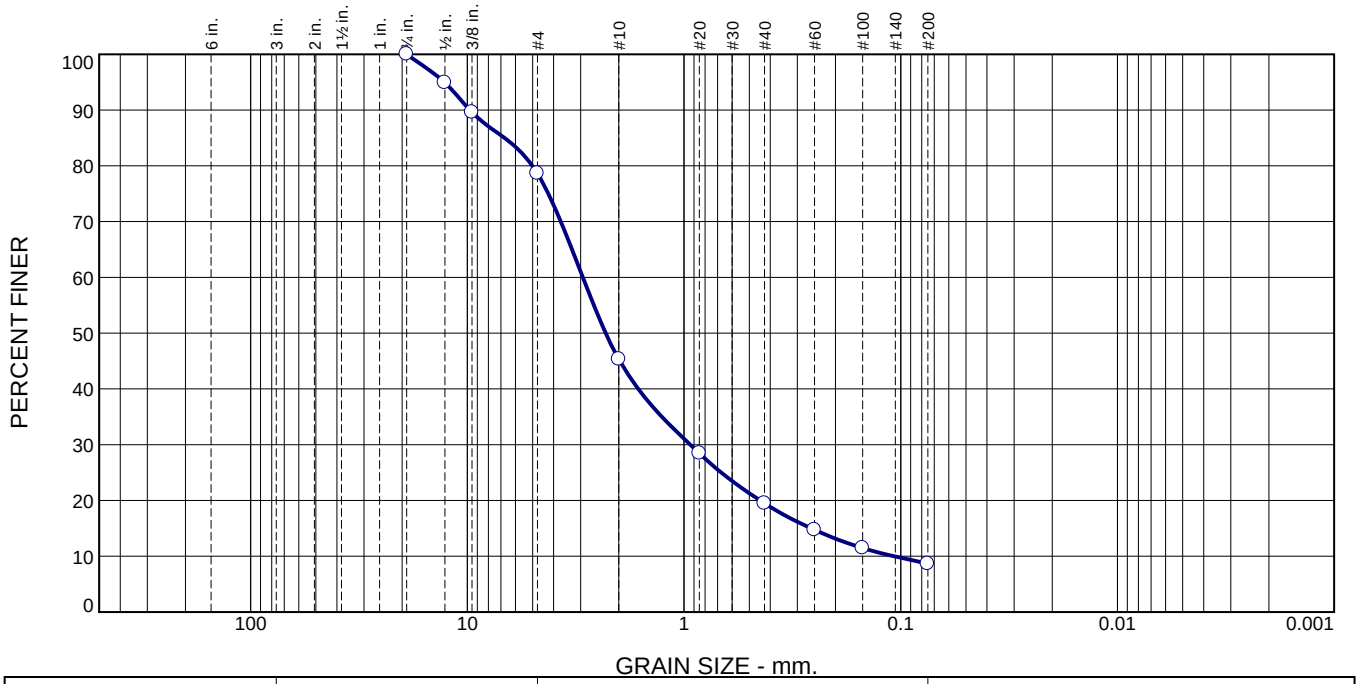
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	21.4	33.3	25.8	10.8	8.7	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
.75	100.0		
0.5	94.9		
.375	89.6		
#4	78.6		
#10	45.3		
#20	28.5		
#40	19.5		
#60	14.7		
#100	11.5		
#200	8.7		

* (no specification provided)

Material Description

Brown well-graded sand with silt and gravel

Sieve Test (ASTM D6913 & D1140)

Test Date: 8/30/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 16.2%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 9.7471 D_{85}= 6.7363

D_{60}= 2.9318 D_{50}= 2.3005

D_{30}= 0.9350 D_{15}= 0.2588

D_{10}= 0.1072

C_u= 27.35 C_c= 2.78

USCS (ASTM D2487)

SW-SM

Date Sampled: 7/25/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-B-12 **Depth:** 12'

Sample Number: SS-07

CDM Smith

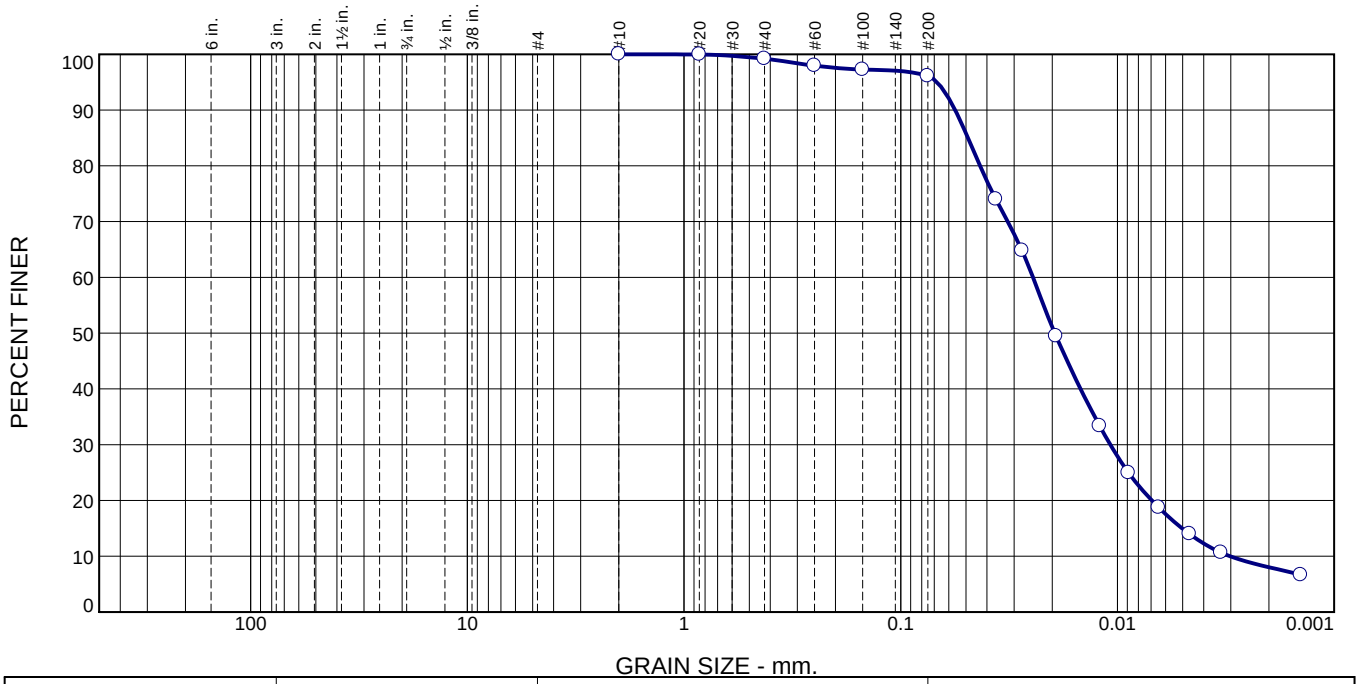
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.8	3.1	88.1	8.0

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	100.0		
#40	99.2		
#60	98.0		
#100	97.3		
#200	96.1		
0.0364 mm.	74.0		
0.0276 mm.	64.8		
0.0192 mm.	49.5		
0.0121 mm.	33.4		
0.0089 mm.	24.9		
0.0064 mm.	18.7		
0.0046 mm.	14.0		
0.0033 mm.	10.6		
0.0014 mm.	6.6		

· (no specification provided)

Material Description

Red-brown silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/5/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 28.4%

Hydrometer Test (ASTM D7928)

Test Date: 9/4/24 **Technician:** KMS

Atterberg (ASTM D4318)

PL= NP **LL=** NP **PI=** NP

Coefficients

D_{90}= 0.0561 D_{85}= 0.0489

D_{60}= 0.0245 D_{50}= 0.0195

D_{30}= 0.0108 D_{15}= 0.0050

D_{10}= 0.0030

C_u= 8.11 C_c= 1.57

USCS (ASTM D2487)

ML

Date Sampled: 7/25/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-B-12 **Depth:** 16'

Sample Number: SS-09

CDM Smith

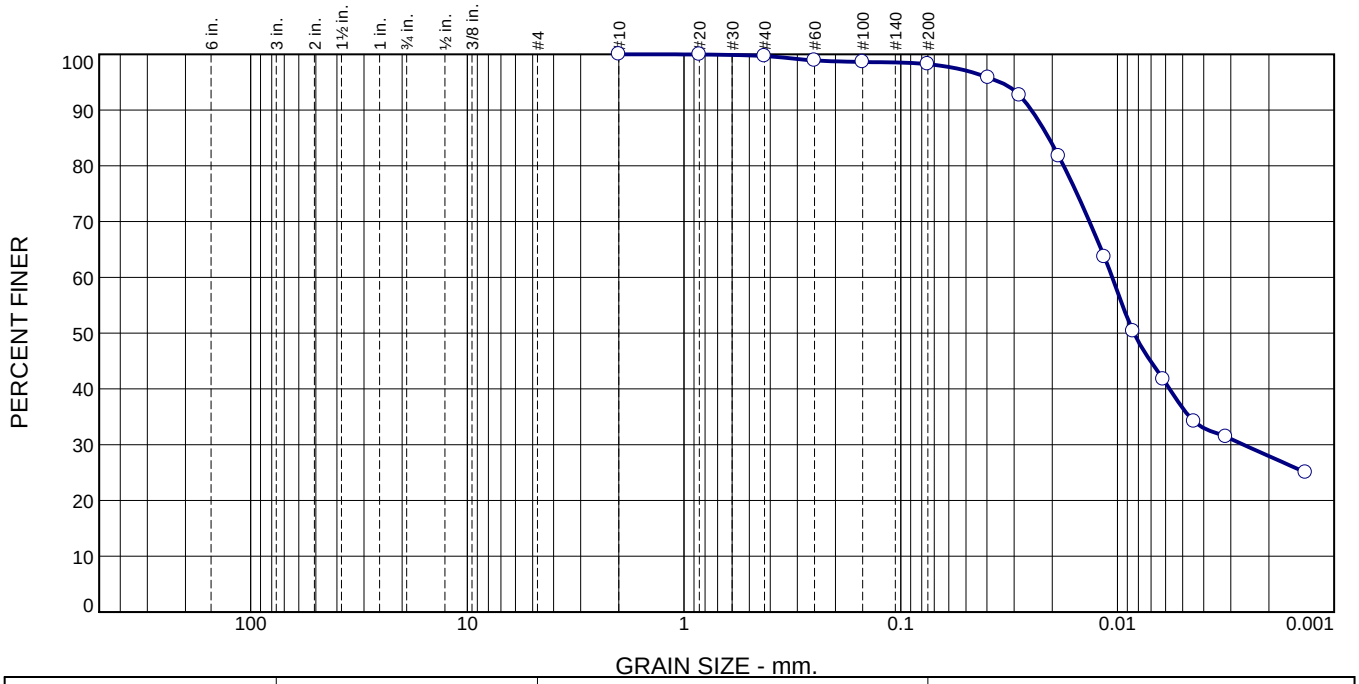
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.3	1.5	70.3	27.9

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	100.0		
#40	99.7		
#60	98.9		
#100	98.6		
#200	98.2		
0.0395 mm.	95.8		
0.0283 mm.	92.7		
0.0187 mm.	81.8		
0.0115 mm.	63.7		
0.0085 mm.	50.4		
0.0061 mm.	41.7		
0.0044 mm.	34.2		
0.0032 mm.	31.4		
0.0014 mm.	25.0		

· (no specification provided)

Material Description
Gray organic silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/5/24 **Technician:** KMS

Test Notes
As Received Moisture Content = 117.0%

Hydrometer Test (ASTM D7928)

Test Date: 9/4/24 **Technician:** KMS

Atterberg (ASTM D4318)
PL= 44 **LL=** 95 **PI=** 51

Coefficients
D_{90}= 0.0249 D_{85}= 0.0207
D_{60}= 0.0106 D_{50}= 0.0084
D_{30}= 0.0026 D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
OH

Date Sampled: 7/2/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

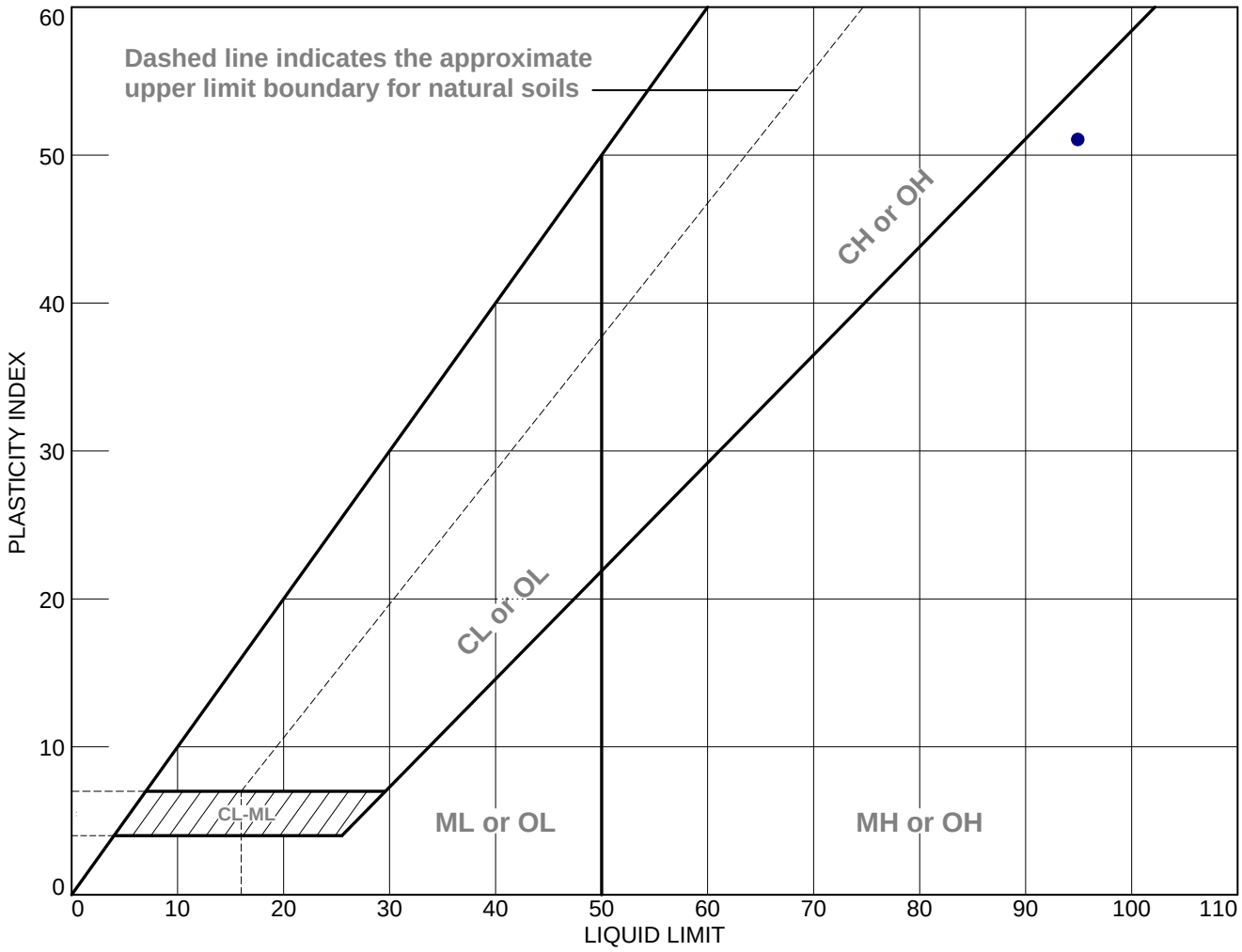
Source of Sample: FD-24-B-13 **Depth:** 0'
Sample Number: SS-01

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	FD-24-B-13	SS-01	0'	117.0	44	95	51	OH

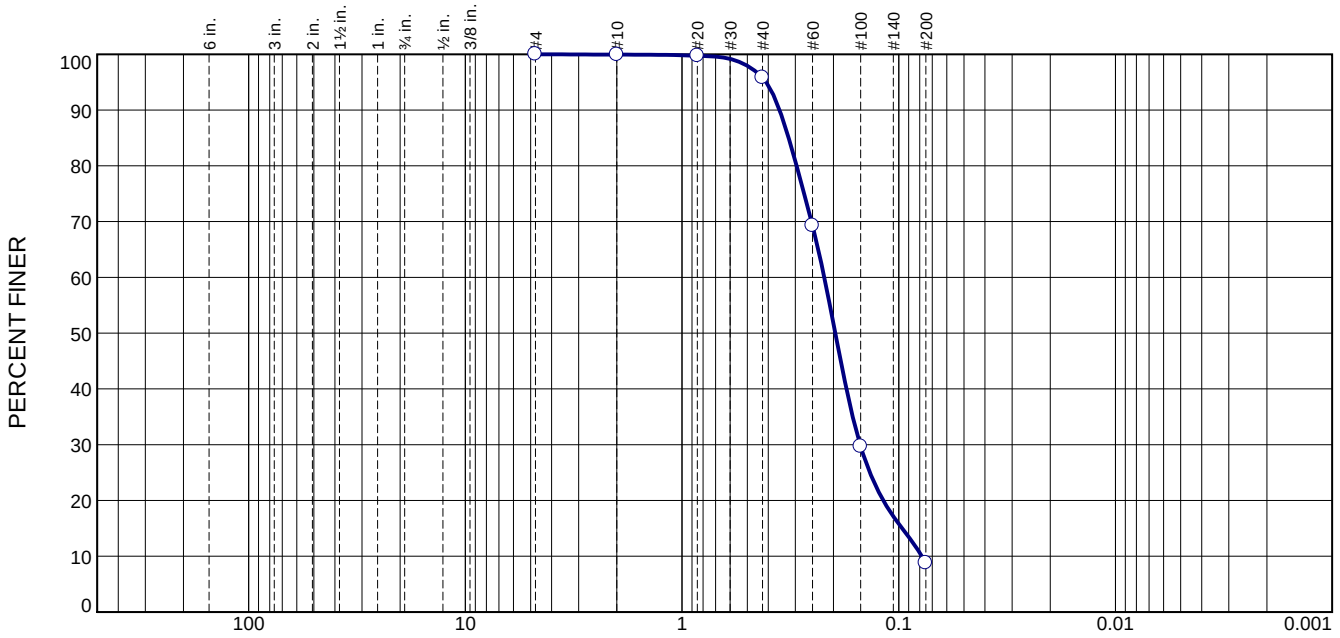
CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No.: 51115.294936

Tested By: KMS/MBP **Checked By:** MBP

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	4.1	87.0	8.8	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	99.9		
#20	99.7		
#40	95.8		
#60	69.3		
#100	29.7		
#200	8.8		

* (no specification provided)

Material Description

Red-brown poorly graded sand with silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/4/24 **Technician:** KMS/MBP

Test Notes

As Received Moisture Content = 24.2%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 0.3551 D_{85}= 0.3221

D_{60}= 0.2206 D_{50}= 0.1963

D_{30}= 0.1509 D_{15}= 0.0965

D_{10}= 0.0782

C_u= 2.82 C_c= 1.32

USCS (ASTM D2487)

SP-SM

Date Sampled: 7/2/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-B-13 **Depth:** 4.9'

Sample Number: SS-04

CDM Smith

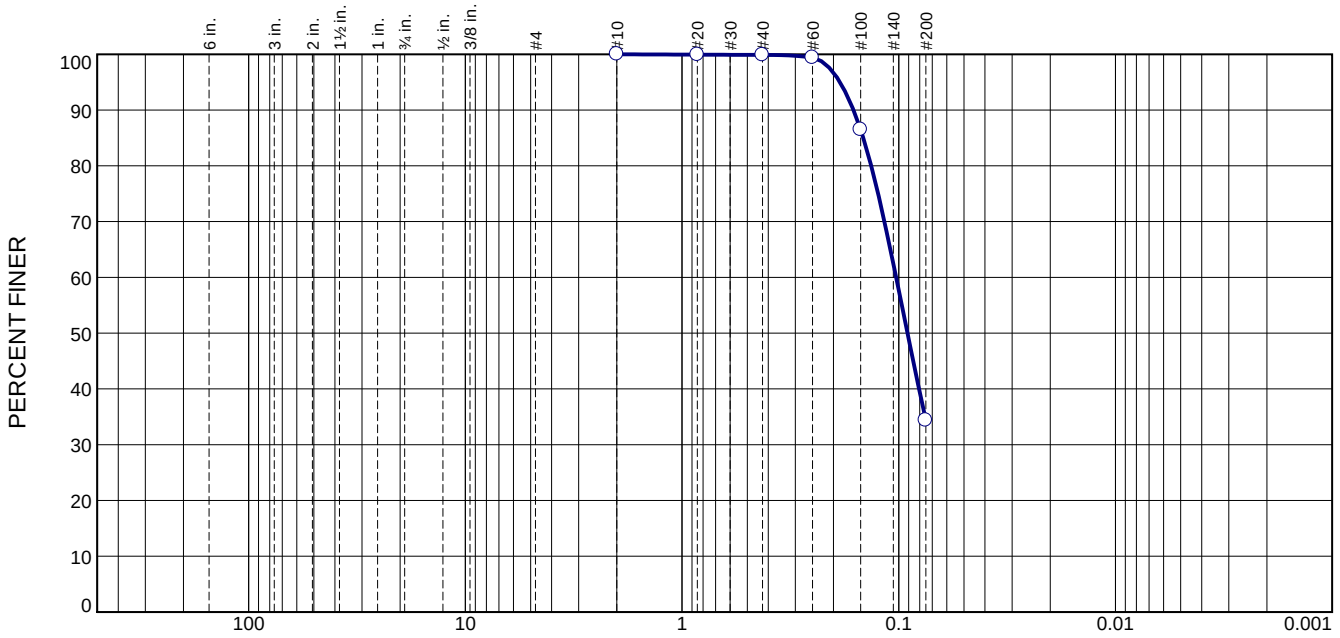
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.1	65.5	34.4	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	99.9		
#40	99.9		
#60	99.4		
#100	86.5		
#200	34.4		

* (no specification provided)

Material Description
Red-brown silty sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/4/24 **Technician:** KMS/MBP

Test Notes
As Received Moisture Content = 25.9%

Atterberg (ASTM D4318)
PL= **LL=** NV **PI=**

Coefficients
D_{90}= 0.1619 D_{85}= 0.1458
D_{60}= 0.1028 D_{50}= 0.0911
D_{30}= D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
SM

Date Sampled: 7/2/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

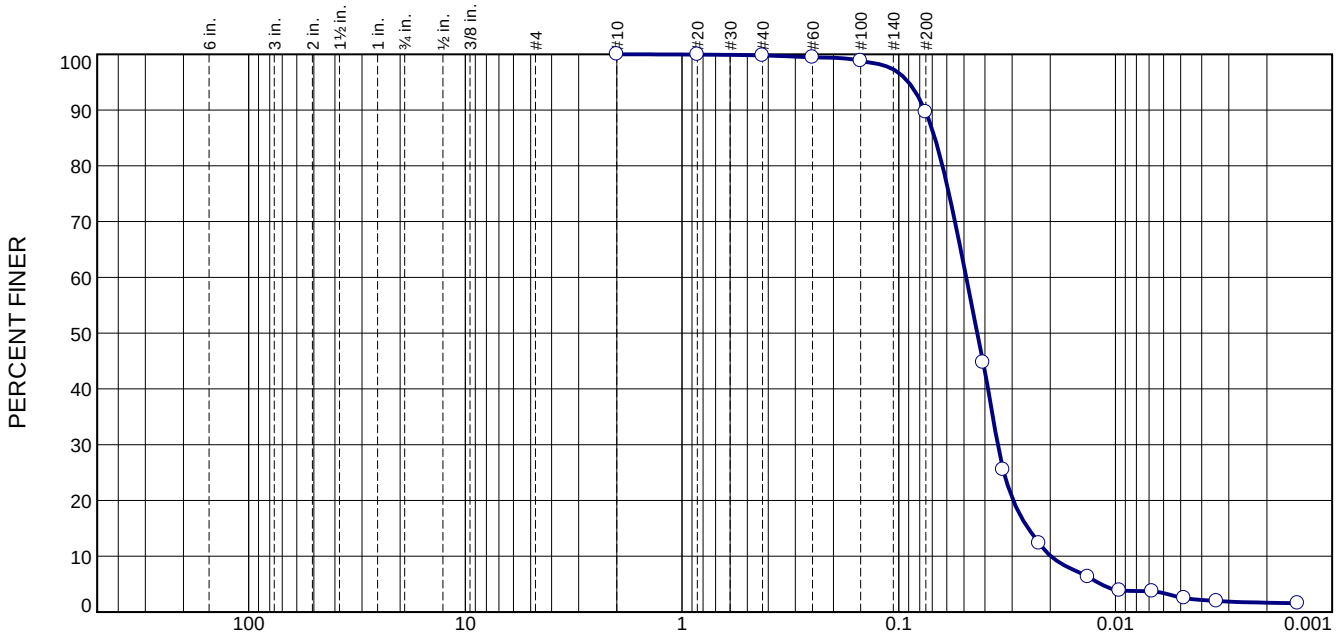
Source of Sample: FD-24-B-13 **Depth:** 8.6'
Sample Number: SS-06

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.2	10.2	87.9	1.7

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	99.9		
#40	99.8		
#60	99.5		
#100	98.8		
#200	89.6		
0.0408 mm.	44.7		
0.0330 mm.	25.5		
0.0225 mm.	12.3		
0.0134 mm.	6.3		
0.0096 mm.	3.9		
0.0068 mm.	3.7		
0.0048 mm.	2.5		
0.0034 mm.	2.0		
0.0014 mm.	1.6		

* (no specification provided)

Material Description

Red-brown silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/5/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 27.9%

Hydrometer Test (ASTM D7928)

Test Date: 9/4/24 **Technician:** KMS

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 0.0757 D_{85}= 0.0681

D_{60}= 0.0488 D_{50}= 0.0434

D_{30}= 0.0350 D_{15}= 0.0253

D_{10}= 0.0199

C_u= 2.46 C_c= 1.26

USCS (ASTM D2487)

ML

Date Sampled: 7/2/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-B-13 **Depth:** 17'

Sample Number: SS-10

CDM Smith

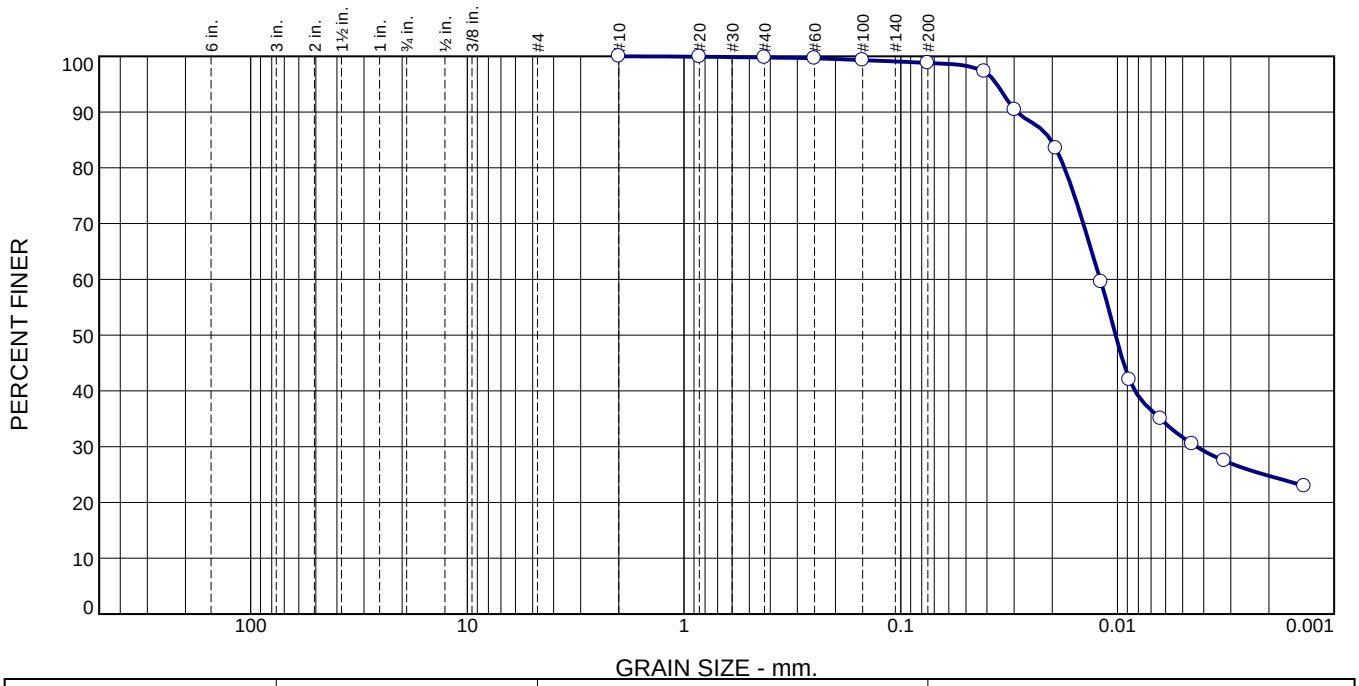
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.2	1.0	74.0	24.8

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	99.9		
#40	99.8		
#60	99.6		
#100	99.3		
#200	98.8		
0.0412 mm.	97.3		
0.0298 mm.	90.4		
0.0193 mm.	83.5		
0.0119 mm.	59.6		
0.0088 mm.	42.0		
0.0063 mm.	35.0		
0.0045 mm.	30.5		
0.0032 mm.	27.5		
0.0014 mm.	22.9		

· (no specification provided)

Material Description
Gray organic silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/5/24 **Technician:** KMS

Test Notes
As Received Moisture Content = 146.2%

Hydrometer Test (ASTM D7928)

Test Date: 9/4/24 **Technician:** KMS

Atterberg (ASTM D4318)
PL= 46 **LL=** 113 **PI=** 67

Coefficients
D_{90}= 0.0291 D_{85}= 0.0203
D_{60}= 0.0120 D_{50}= 0.0102
D_{30}= 0.0043 D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
OH

Date Sampled: 7/26/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

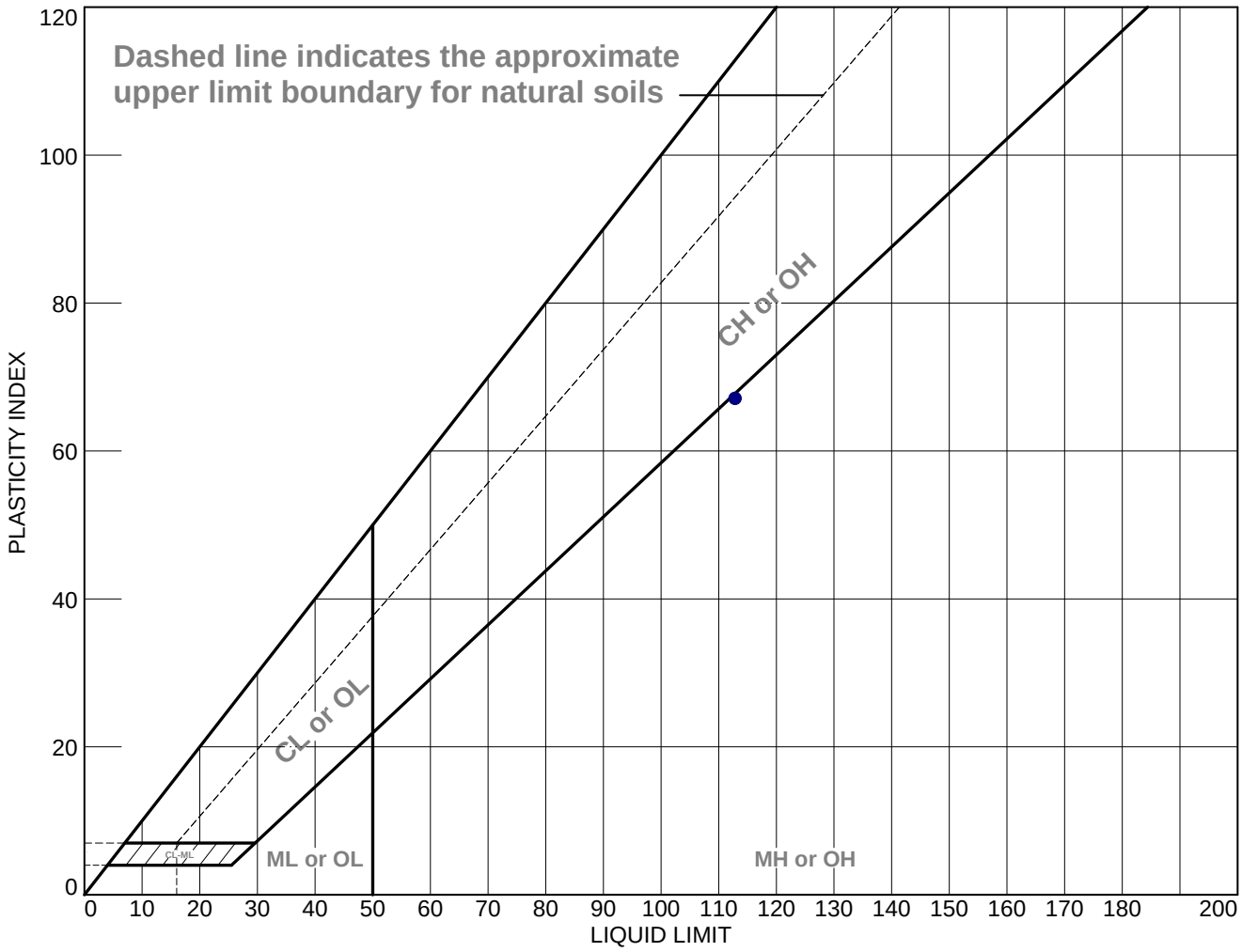
Source of Sample: FD-24-B-14 **Depth:** 2'
Sample Number: SS-02

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	FD-24-B-14	SS-02	2'	146.2	46	113	67	OH

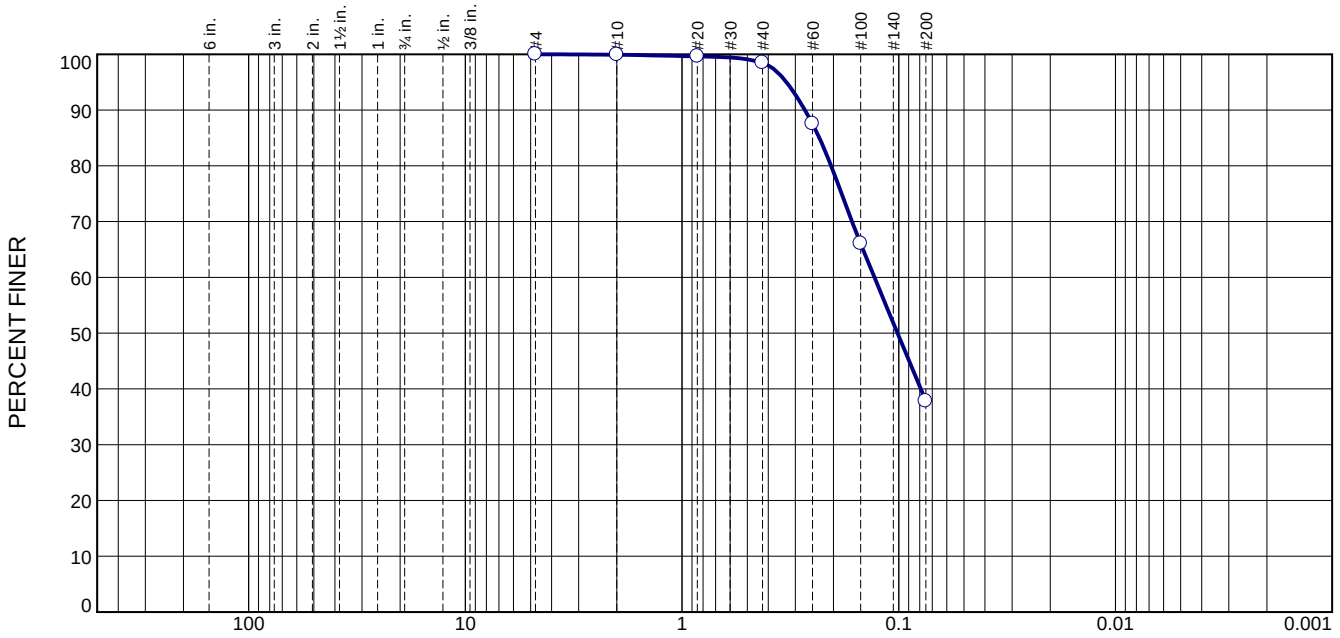
CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No.: 51115.294936

Tested By: KMS/MBP **Checked By:** MBP

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	1.4	60.7	37.8	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	99.9		
#20	99.6		
#40	98.5		
#60	87.5		
#100	66.0		
#200	37.8		

* (no specification provided)

Material Description
Brown silty sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/4/24 **Technician:** MBP

Test Notes
As Received Moisture Content = 27.4%

Atterberg (ASTM D4318)
PL= **LL=** NV **PI=**

Coefficients
D_{90}= 0.2712 D_{85}= 0.2322
D_{60}= 0.1295 D_{50}= 0.1013
D_{30}= D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
SM

Date Sampled: 7/26/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

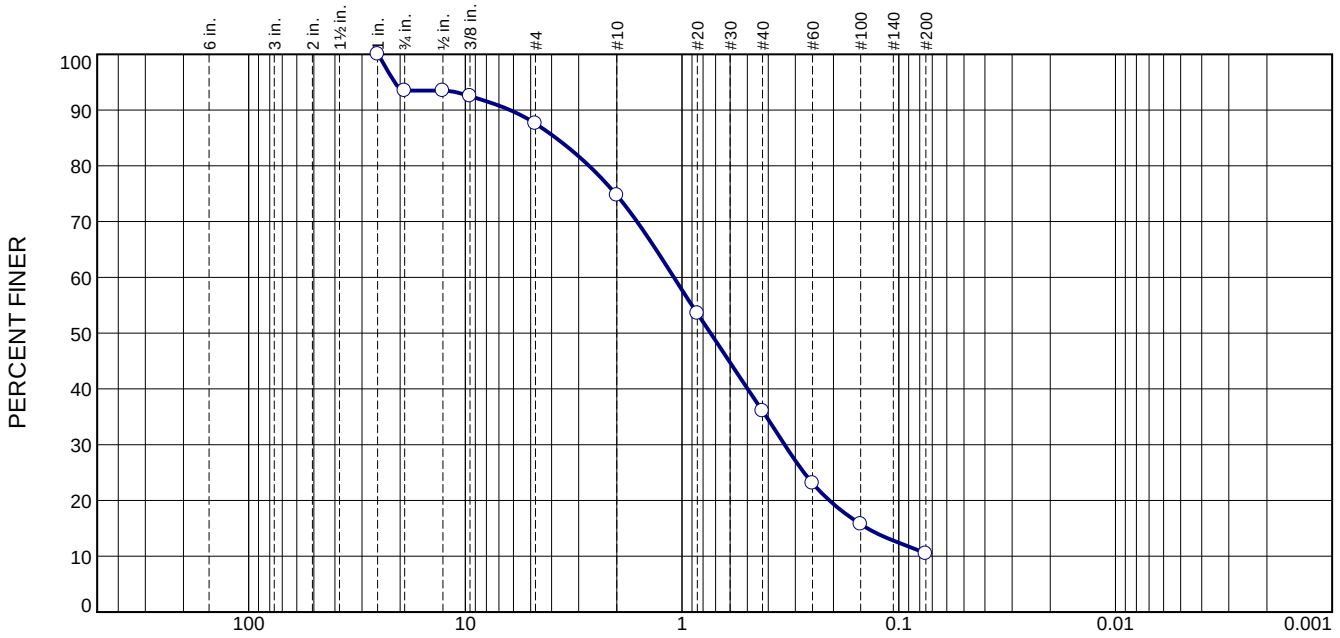
Source of Sample: FD-24-B-14 **Depth:** 12'
Sample Number: SS-07

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.5	5.9	12.9	38.7	25.5	10.5	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1	100.0		
.75	93.5		
0.5	93.5		
.375	92.5		
#4	87.6		
#10	74.7		
#20	53.5		
#40	36.0		
#60	23.1		
#100	15.7		
#200	10.5		

* (no specification provided)

Material Description

Brown poorly graded sand with silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/4/24 **Technician:** MBP

Test Notes

As Received Moisture Content = 16.3%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 6.2233 D_{85}= 3.8163

D_{60}= 1.0906 D_{50}= 0.7384

D_{30}= 0.3363 D_{15}= 0.1396

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

SP-SM

Source of Sample: FD-24-B-14 **Depth:** 16'
Sample Number: SS-09

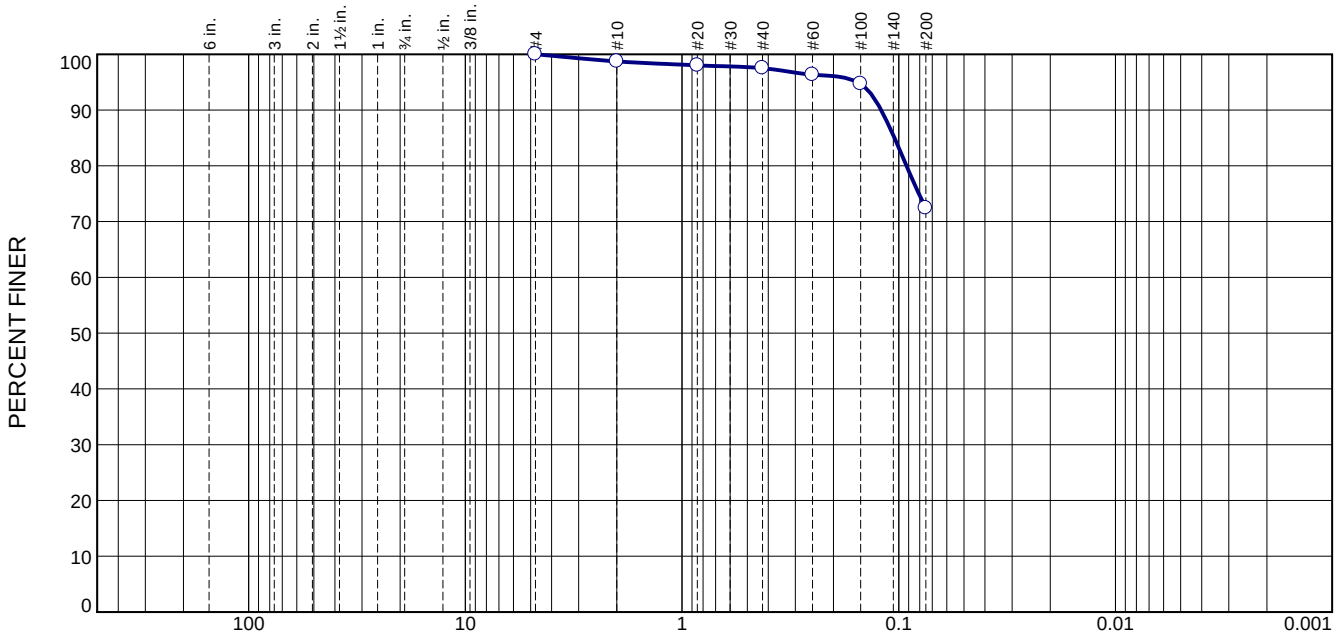
Date Sampled: 7/26/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.3	1.2	25.1	72.4	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	98.7		
#20	98.0		
#40	97.5		
#60	96.3		
#100	94.7		
#200	72.4		

* (no specification provided)

Material Description
Red-brown silt with sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/4/24 **Technician:** KMS/MBP

Test Notes
As Received Moisture Content = 23.7%

Atterberg (ASTM D4318)
PL= **LL=**NV **PI=**

Coefficients
D_{90}= 0.1206 D_{85}= 0.1046
D_{60}= D_{50}=
D_{30}= D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
ML

Date Sampled: 7/26/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

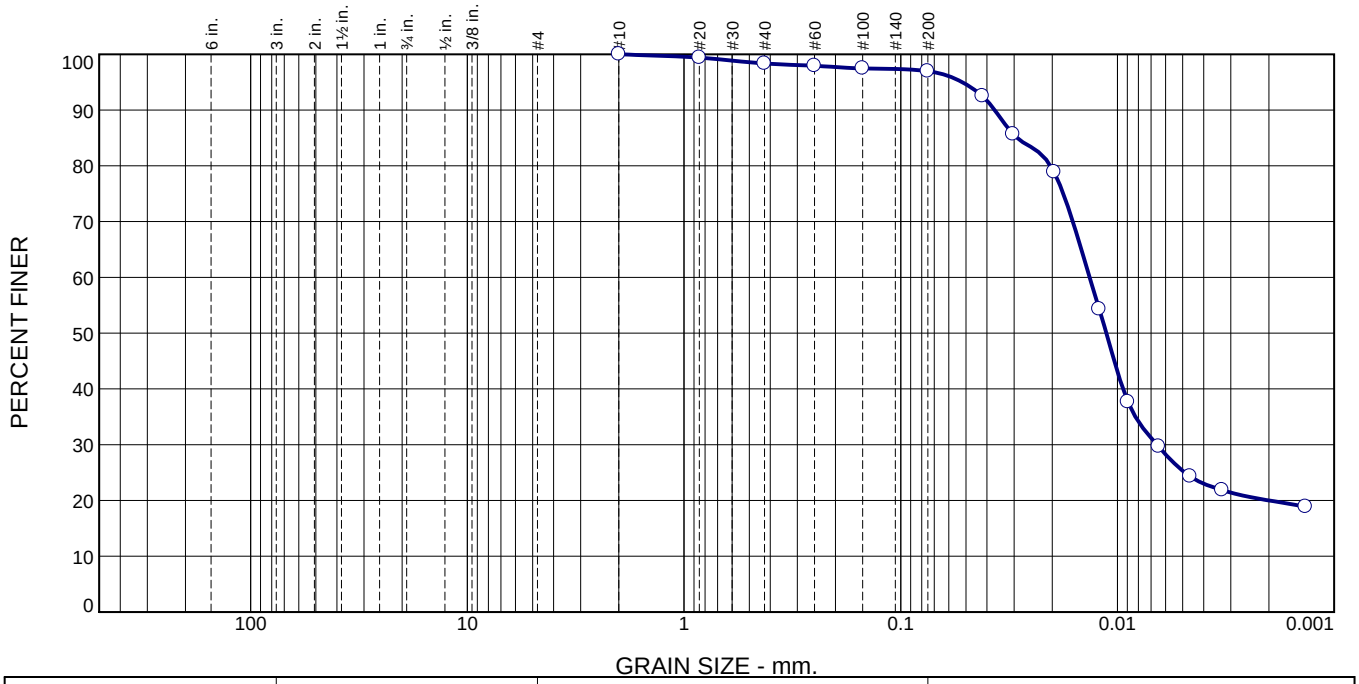
Source of Sample: FD-24-B-14 **Depth:** 22'
Sample Number: SS-12

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.7	1.3	77.0	20.0

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	99.4		
#40	98.3		
#60	97.9		
#100	97.5		
#200	97.0		
0.0419 mm.	92.5		
0.0303 mm.	85.7		
0.0196 mm.	78.9		
0.0121 mm.	54.3		
0.0090 mm.	37.7		
0.0065 mm.	29.7		
0.0046 mm.	24.3		
0.0033 mm.	21.9		
0.0014 mm.	18.9		

· (no specification provided)

Material Description
Dark Gray organic silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/5/24 **Technician:** KMS

Test Notes
As Recieved Moisture Content = 134.0%

Hydrometer Test (ASTM D7928)

Test Date: 9/4/24 **Technician:** KMS

Atterberg (ASTM D4318)
PL= 51 **LL=** 119 **PI=** 68

Coefficients
D_{90}= 0.0368 D_{85}= 0.0291
D_{60}= 0.0134 D_{50}= 0.0112
D_{30}= 0.0066 D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
OH

Source of Sample: FD-24-B-15 **Depth:** 3.7'
Sample Number: SS-03

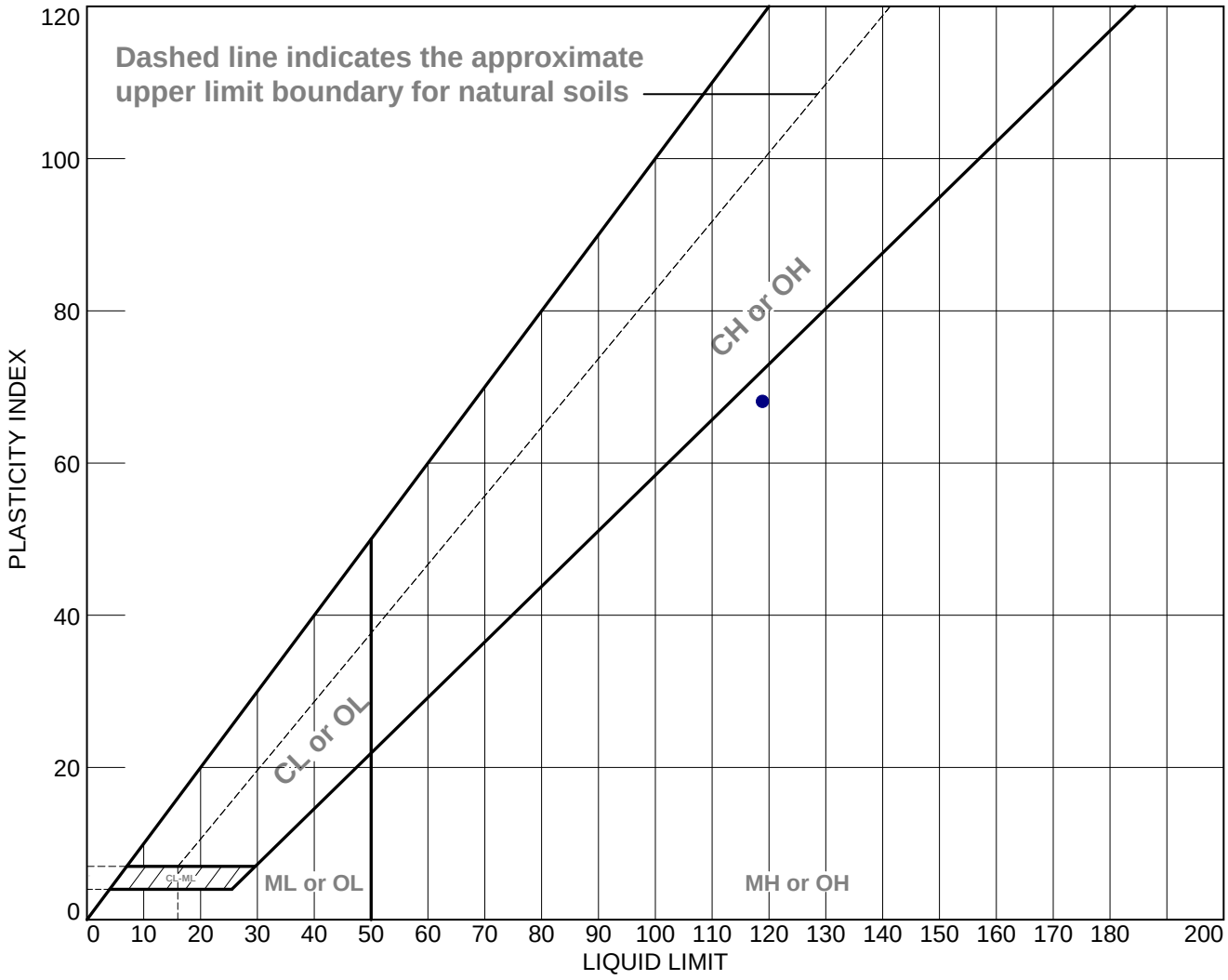
Date Sampled: 8/3/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	FD-24-B-15	SS-03	3.7'	134	51	119	68	OH

CDM Smith

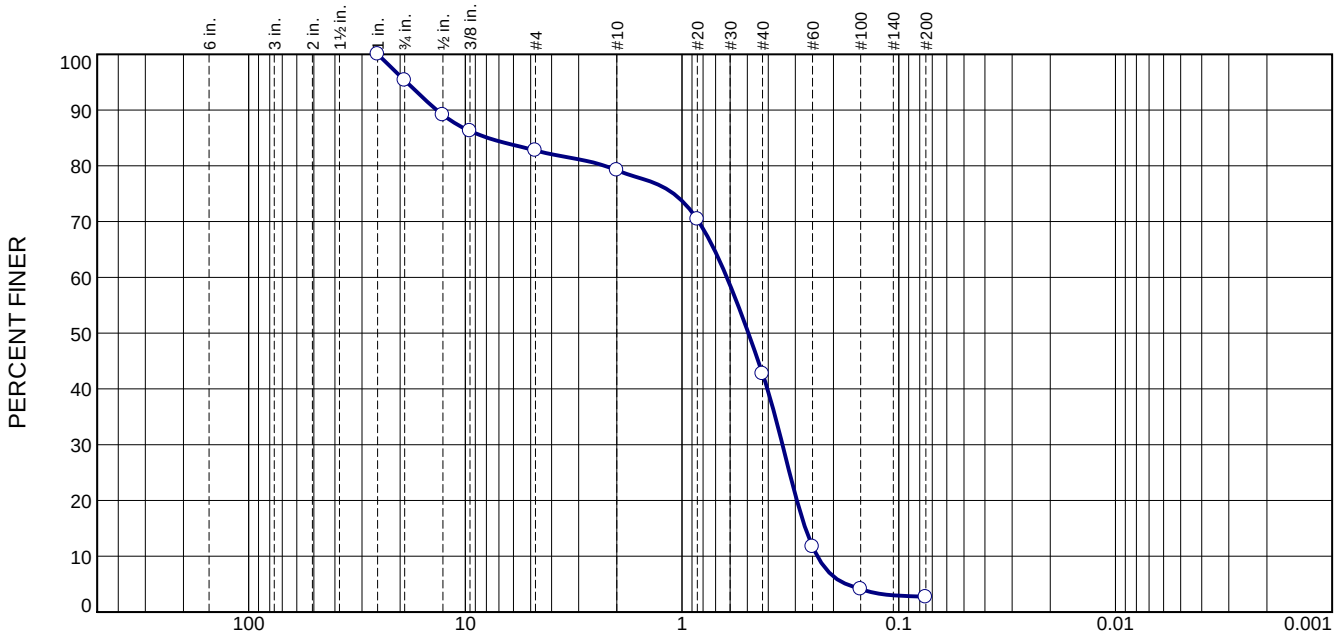
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No.: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.7	12.6	3.5	36.5	40.0	2.7	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1	100.0		
.75	95.3		
0.5	89.1		
.375	86.2		
#4	82.7		
#10	79.2		
#20	70.4		
#40	42.7		
#60	11.7		
#100	4.1		
#200	2.7		

* (no specification provided)

Material Description

Brown poorly graded sand with gravel

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/4/24 **Technician:** KMS/MBP

Test Notes

As Received Moisture Content = 18.0%

Atterberg (ASTM D4318)

PL= **LL=** NP **PI=**

Coefficients

D_{90}= 13.5559 D_{85}= 7.8583

D_{60}= 0.6214 D_{50}= 0.4945

D_{30}= 0.3442 D_{15}= 0.2697

D_{10}= 0.2376

C_u= 2.62 C_c= 0.80

USCS (ASTM D2487)

SP

Date Sampled: 8/3/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-B-15 **Depth:** 11.6'

Sample Number: SS-07

CDM Smith

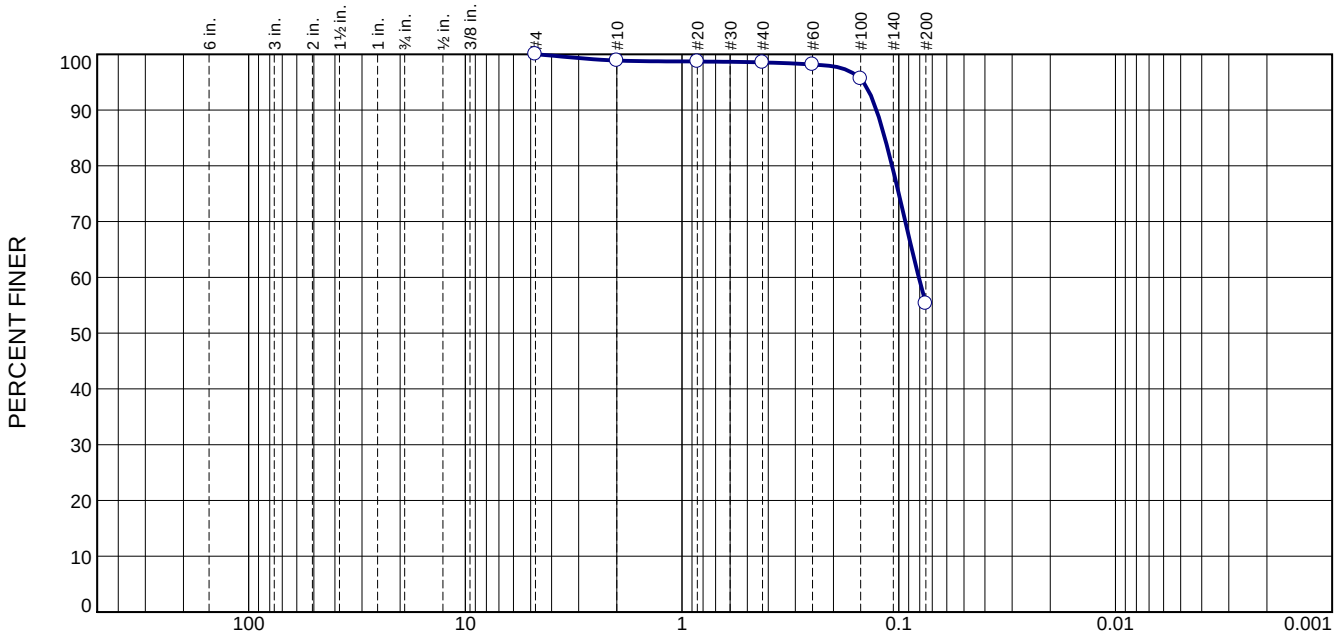
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.1	0.4	43.2	55.3	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	98.9		
#20	98.7		
#40	98.5		
#60	98.1		
#100	95.6		
#200	55.3		

* (no specification provided)

Material Description
Red-brown sandy silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/4/24 **Technician:** KMS/MBP

Test Notes
As Received Moisture Content = 28.5%

Atterberg (ASTM D4318)
PL= **LL=** NP **PI=**

Coefficients
D_{90}= 0.1268 D_{85}= 0.1159
D_{60}= 0.0809 D_{50}=
D_{30}= D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
ML

Date Sampled: 8/3/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

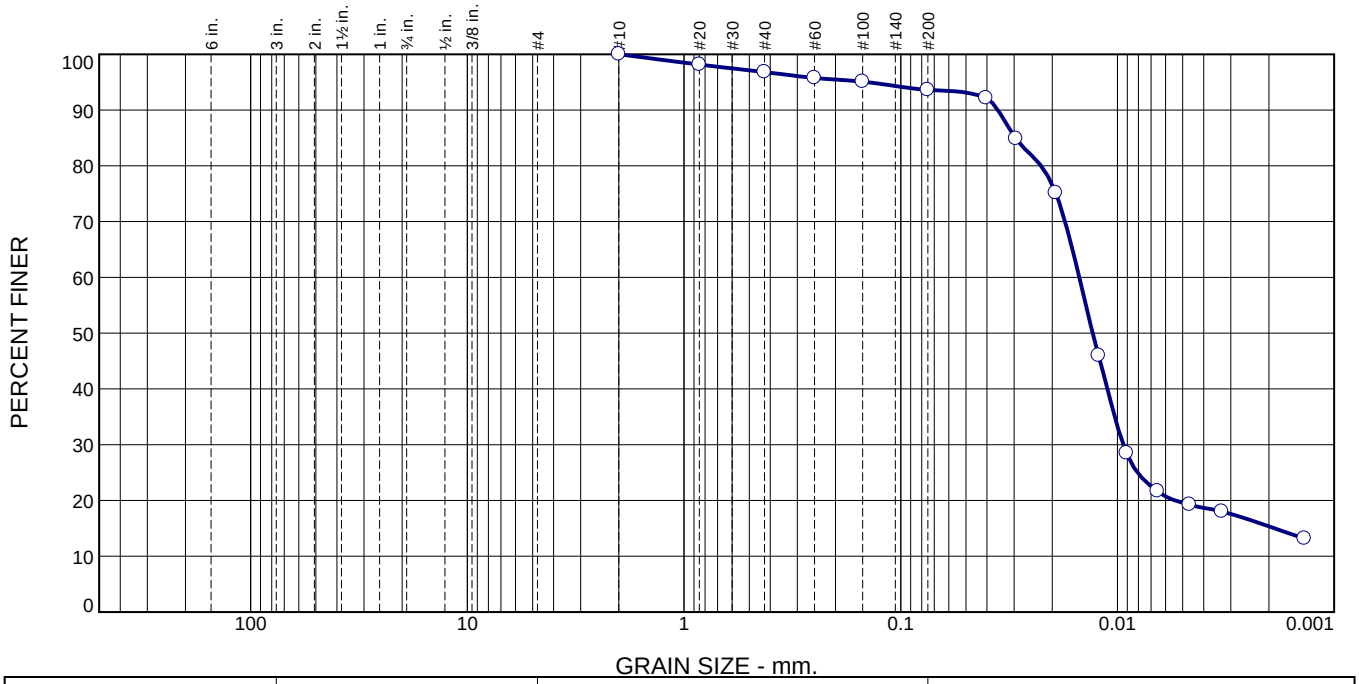
Source of Sample: FD-24-B-15 **Depth:** 17.6'
Sample Number: SS-10

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	3.2	3.2	78.2	15.4

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	98.2		
#40	96.8		
#60	95.7		
#100	95.1		
#200	93.6		
0.0404 mm.	92.1		
0.0294 mm.	84.9		
0.0193 mm.	75.1		
0.0122 mm.	46.0		
0.0091 mm.	28.5		
0.0065 mm.	21.7		
0.0046 mm.	19.2		
0.0033 mm.	18.0		
0.0014 mm.	13.2		

· (no specification provided)

Material Description
Dark Gray organic silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/6/24 **Technician:** MBP

Test Notes
As Recieved Moisture Content = 115.2%

Hydrometer Test (ASTM D7928)

Test Date: 9/5/24 **Technician:** KMS

Atterberg (ASTM D4318)
PL= 54 **LL=** 119 **PI=** 65

Coefficients
D_{90}= 0.0356 D_{85}= 0.0296
D_{60}= 0.0150 D_{50}= 0.0130
D_{30}= 0.0094 D_{15}= 0.0019
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
OH

Date Sampled: 8/4/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

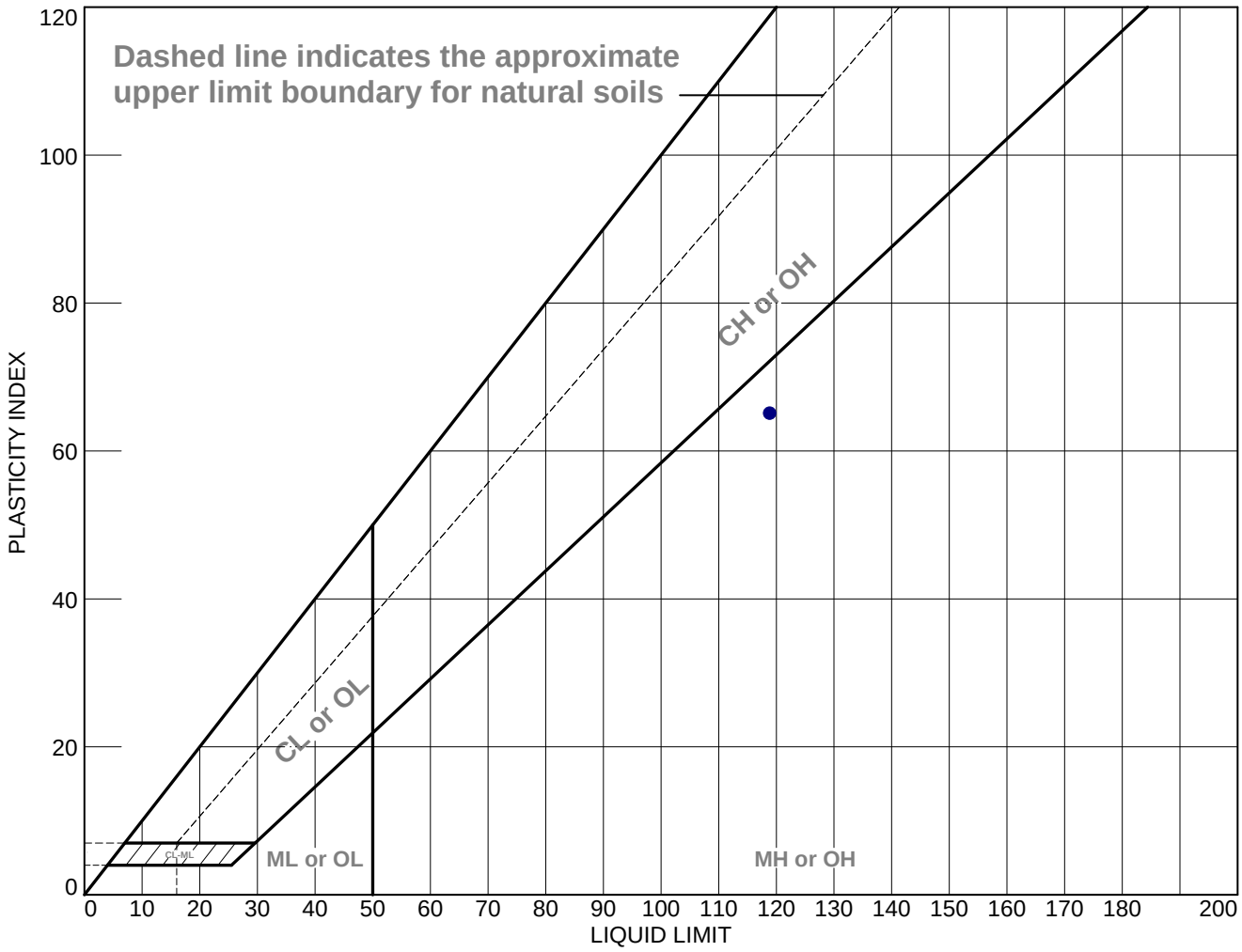
Source of Sample: FD-24-B-16 **Depth:** 2'
Sample Number: SS-02

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	FD-24-B-16	SS-02	2'	115.2	54	119	65	OH

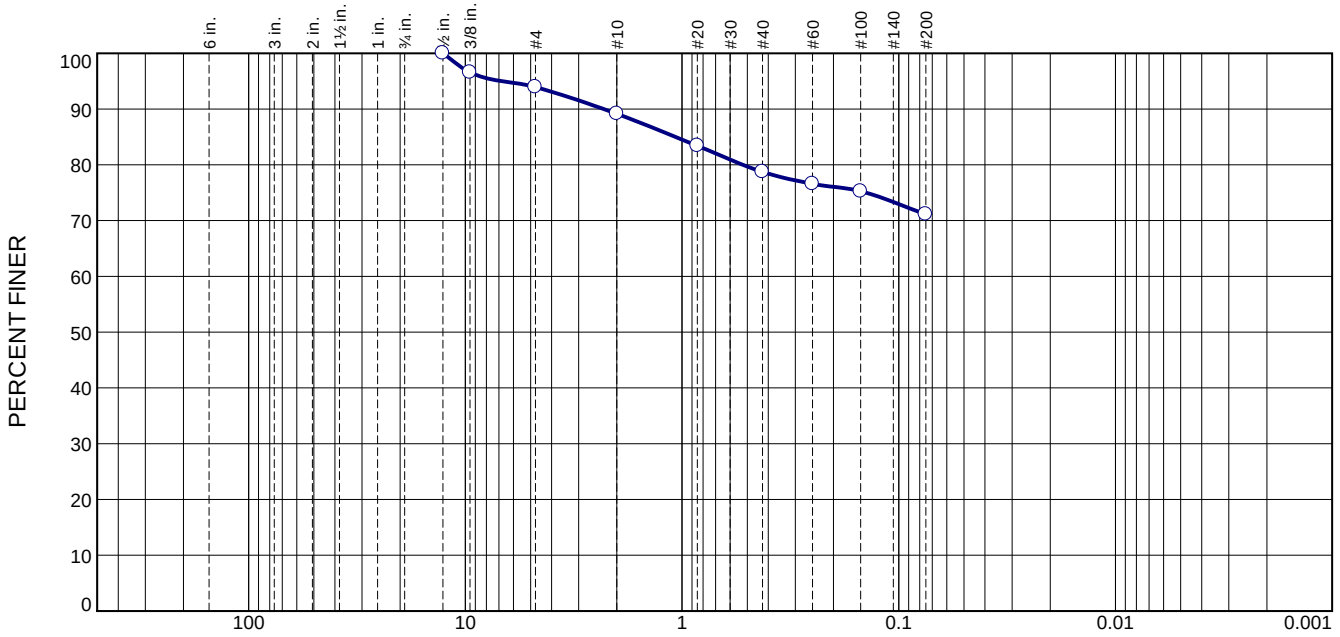
CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No.: 51115.294936

Tested By: KMS **Checked By:** MBP

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	6.1	4.8	10.4	7.6	71.1	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
0.5	100.0		
.375	96.6		
#4	93.9		
#10	89.1		
#20	83.4		
#40	78.7		
#60	76.6		
#100	75.3		
#200	71.1		

* (no specification provided)

Material Description
Brown silt with sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/4/24 **Technician:** KMS/MBP

Test Notes
As Received Moisture Content = 25.0%

Atterberg (ASTM D4318)
PL= **LL=** NP **PI=**

Coefficients
D_{90}= 2.3023 D_{85}= 1.0726
D_{60}= D_{50}=
D_{30}= D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
ML

Date Sampled: 8/4/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

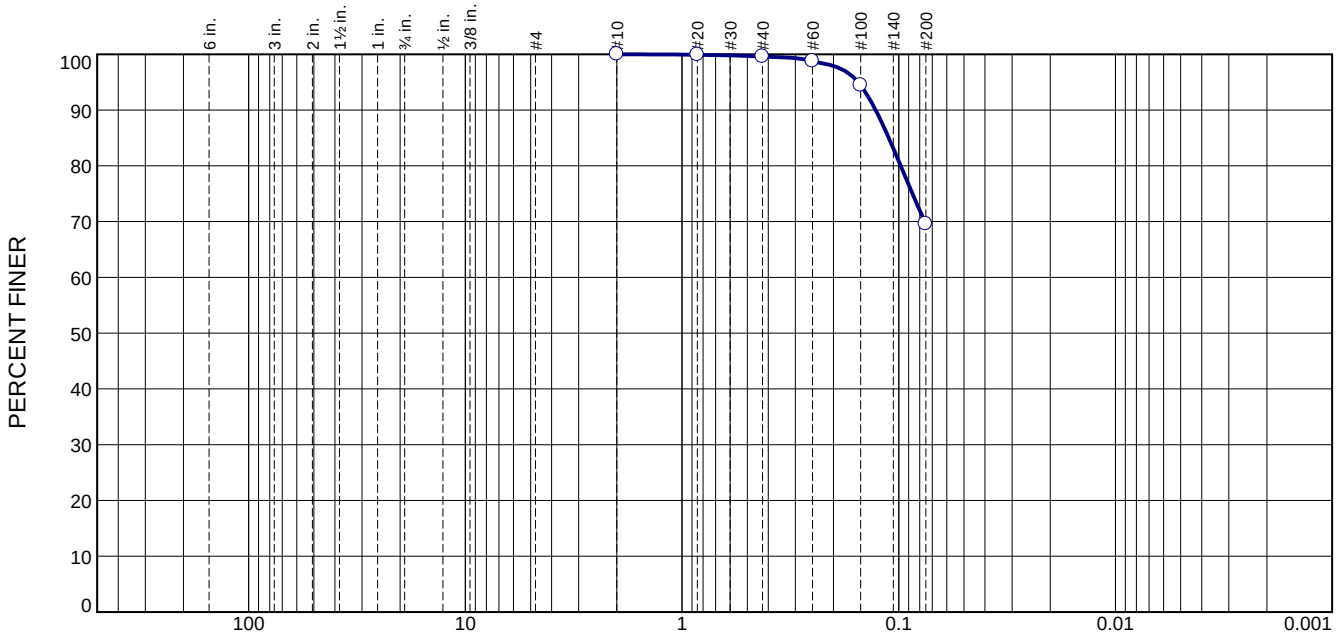
Source of Sample: FD-24-B-16 **Depth:** 8'
Sample Number: SS-05

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.4	30.0	69.6	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	99.9		
#40	99.6		
#60	98.8		
#100	94.4		
#200	69.6		

* (no specification provided)

Material Description
Red-brown sandy silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/4/24 **Technician:** KMS/MBP

Test Notes
As Received Moisture Content =27.3 %

Atterberg (ASTM D4318)
PL= **LL=** NP **PI=**

Coefficients
D_{90}= 0.1278 D_{85}= 0.1111
D_{60}= D_{50}=
D_{30}= D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
ML

Source of Sample: FD-24-B-16 **Depth:** 19.8'
Sample Number: SS-11

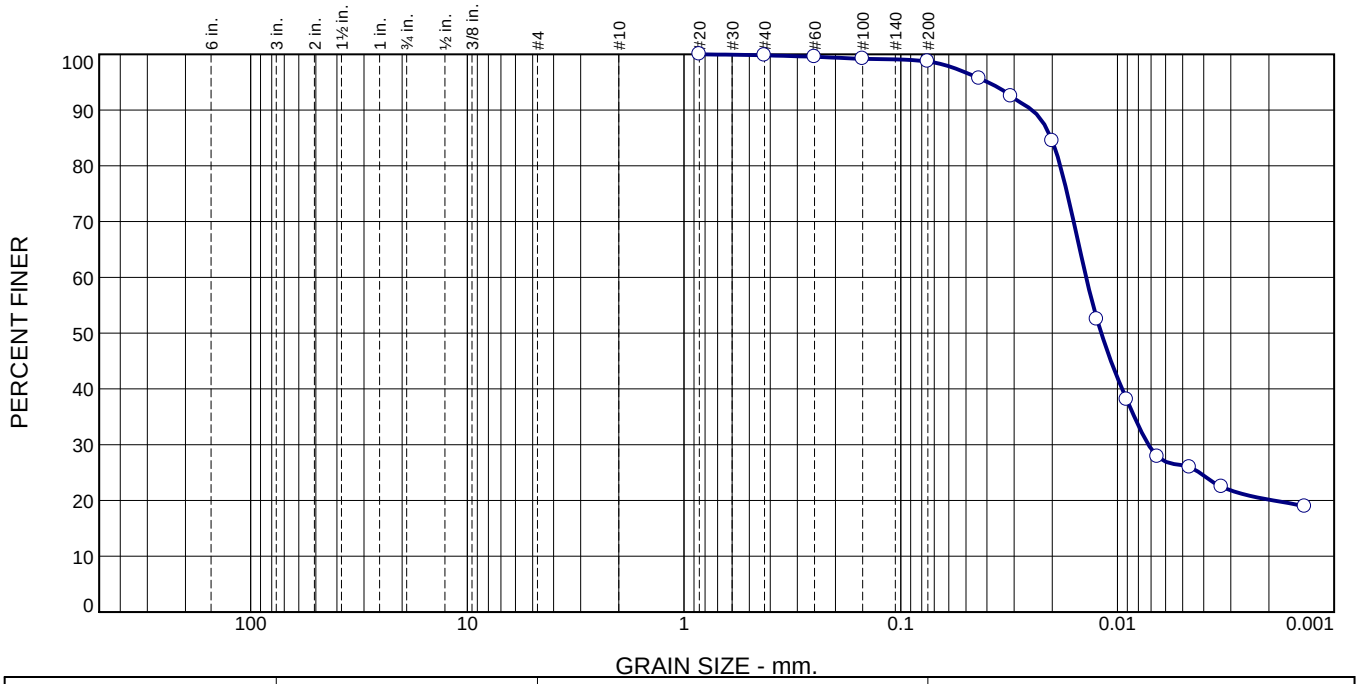
Date Sampled: 8/4/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.2	1.1	78.6	20.1

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#20	100.0		
#40	99.8		
#60	99.5		
#100	99.2		
#200	98.7		
0.0434 mm.	95.7		
0.0310 mm.	92.5		
0.0200 mm.	84.5		
0.0124 mm.	52.5		
0.0091 mm.	38.1		
0.0065 mm.	27.9		
0.0046 mm.	26.0		
0.0033 mm.	22.4		
0.0014 mm.	18.9		

· (no specification provided)

Material Description
Dark Gray organic silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/6/24 **Technician:** MBP

Test Notes
As Recieved Moisture Content = 179.6%

Hydrometer Test (ASTM D7928)

Test Date: 9/5/24 **Technician:** KMS

Atterberg (ASTM D4318)
PL= 51 **LL=** 119 **PI=** 68

Coefficients
D_{90}= 0.0248 D_{85}= 0.0202
D_{60}= 0.0139 D_{50}= 0.0119
D_{30}= 0.0072 D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
OH

Date Sampled: 8/5/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

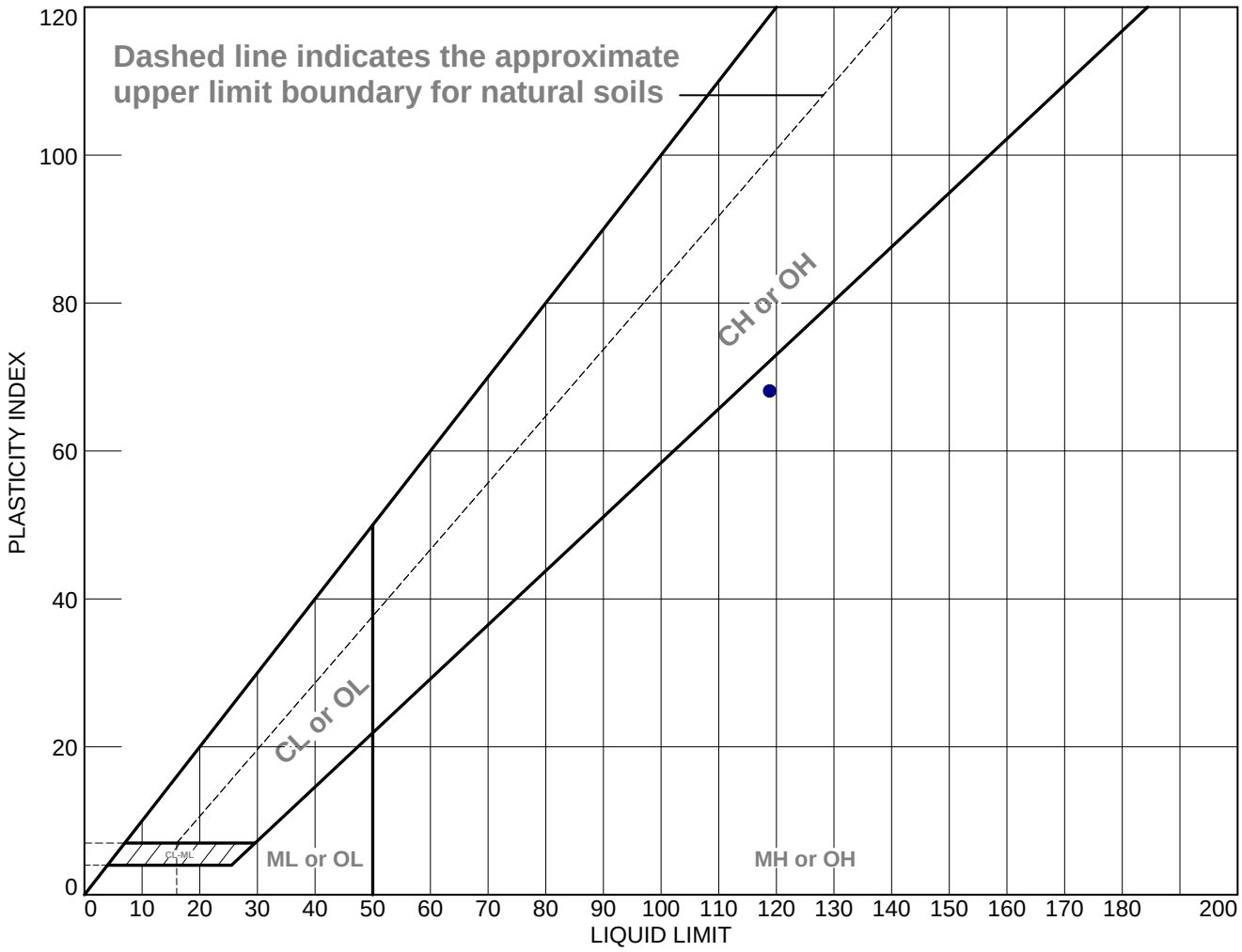
Source of Sample: FD-24-B-17 **Depth:** 0'
Sample Number: SS-01

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	FD-24-B-17	SS-01	0'	179.6	51	119	68	OH

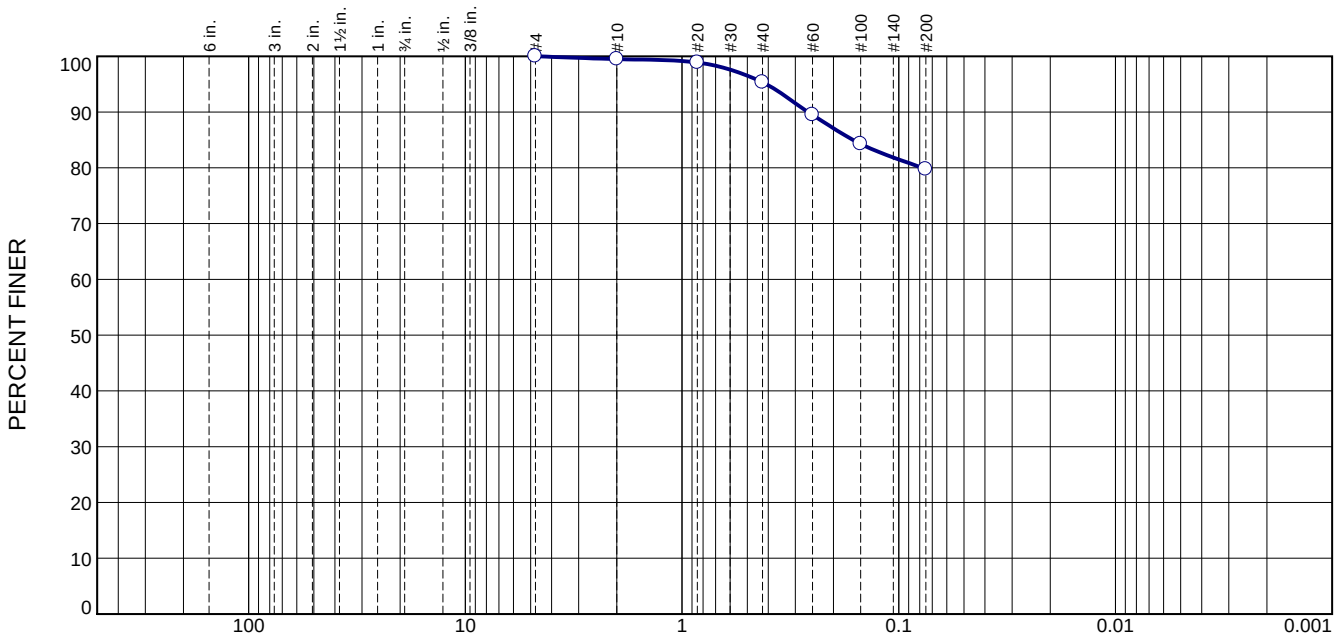
CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No.: 51115.294936

Tested By: MBP **Checked By:** MBP

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.5	4.2	15.6	79.7	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	99.5		
#20	98.9		
#40	95.3		
#60	89.5		
#100	84.3		
#200	79.7		

* (no specification provided)

Material Description

Black organic silt with sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/4/24 **Technician:** MBP

Test Notes

As Recieved Moisture Content = 124.9%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 0.2623 D_{85}= 0.1627

D_{60}= D_{50}=

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

OL

Date Sampled: 8/5/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-B-17 **Depth:** 10.1'

Sample Number: SS-06

CDM Smith

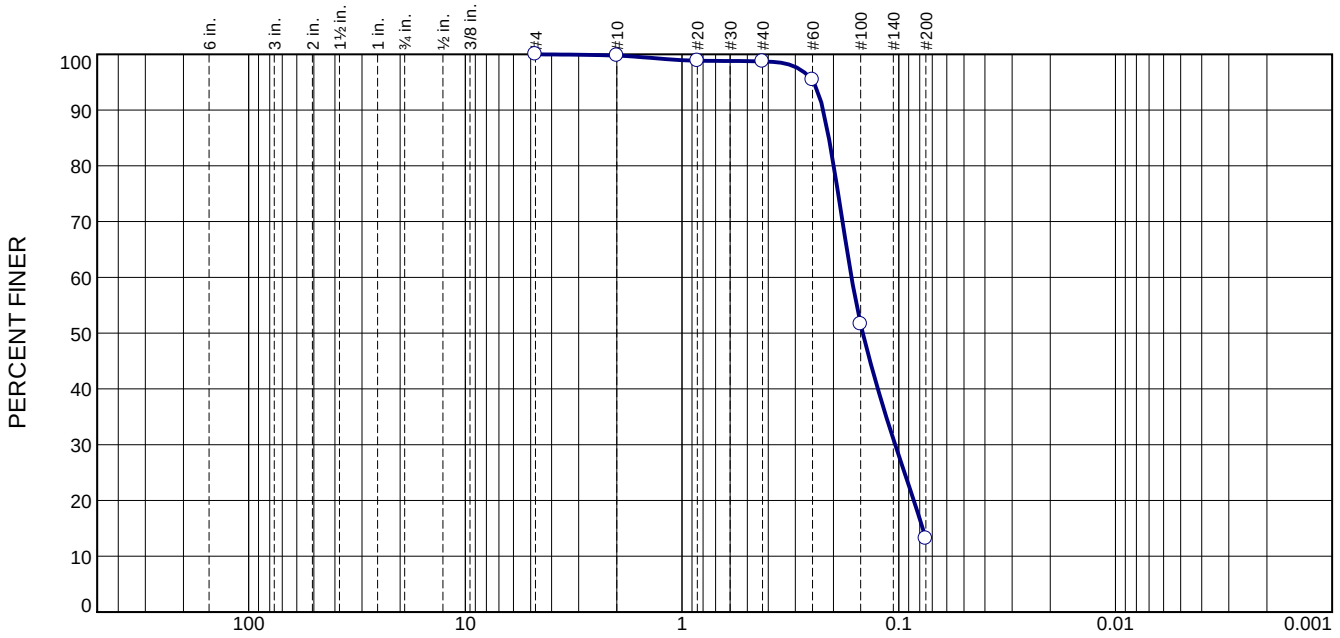
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	1.1	85.5	13.2	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	99.8		
#20	98.8		
#40	98.7		
#60	95.4		
#100	51.6		
#200	13.2		

* (no specification provided)

Material Description
Red-Brown silty sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/4/24 **Technician:** MBP

Test Notes
As Recieved Moisture Content = 29.6%

Atterberg (ASTM D4318)
PL= **LL=**NV **PI=**

Coefficients
D_{90}= 0.2232 D_{85}= 0.2101
D_{60}= 0.1653 D_{50}= 0.1465
D_{30}= 0.1038 D_{15}= 0.0775
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
SM

Source of Sample: FD-24-B-17 **Depth:** 18.1'
Sample Number: SS-11

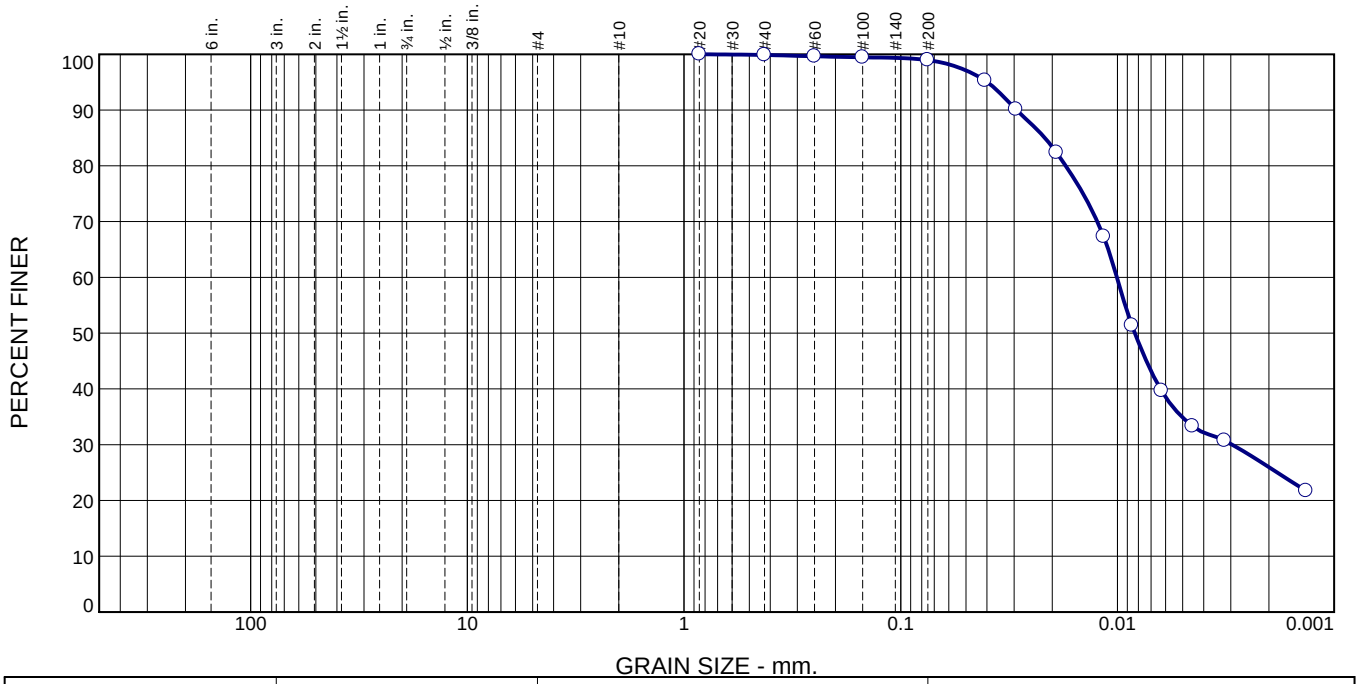
Date Sampled: 8/5/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.1	0.9	73.0	26.0

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#20	100.0		
#40	99.9		
#60	99.6		
#100	99.5		
#200	99.0		
0.0408 mm.	95.3		
0.0294 mm.	90.1		
0.0191 mm.	82.4		
0.0116 mm.	67.3		
0.0086 mm.	51.4		
0.0063 mm.	39.7		
0.0045 mm.	33.3		
0.0032 mm.	30.8		
0.0013 mm.	21.7		

· (no specification provided)

Material Description
Gray organic silt

Atterberg (ASTM D4318)
PL= 55 **LL=** 117 **PI=** 62

Coefficients
D_{90}= 0.0292 D_{85}= 0.0216
D_{60}= 0.0101 D_{50}= 0.0083
D_{30}= 0.0030 D_{15}=
D_{10}=
C_u= C_c=

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/6/24 **Technician:** MBP

Test Notes
As Recieved Moisture Content = 134.9%

Hydrometer Test (ASTM D7928)

Test Date: 9/5/24 **Technician:** KMS

USCS (ASTM D2487)
OH

Date Sampled: 7/1/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

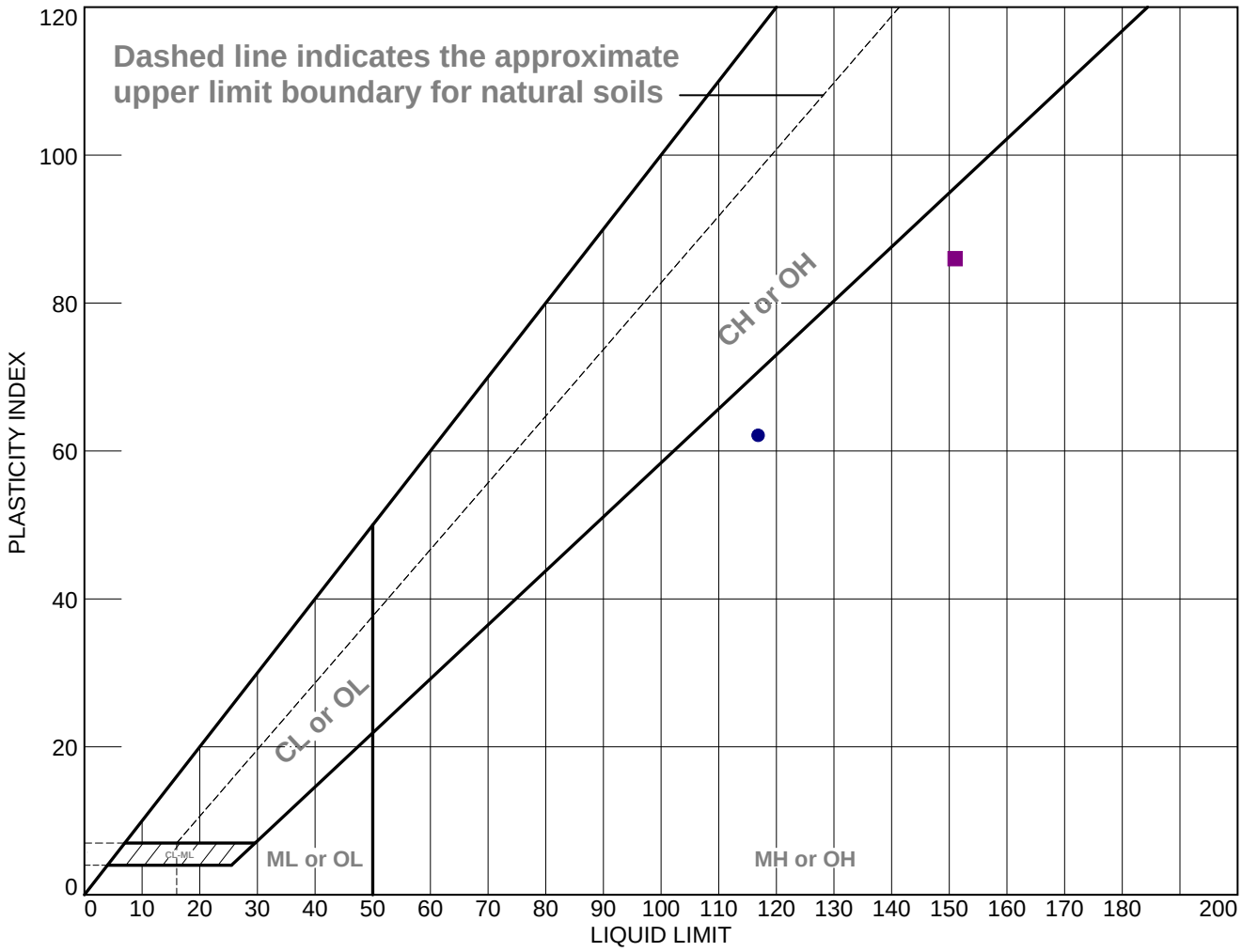
Source of Sample: FD-24-B-18 **Depth:** 3.9'
Sample Number: SS-02

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	FD-24-B-18	SS-02	3.9'	134.9	55	117	62	OH
■	FD-24-B-18	SS-05	18.9'	110.2	65	151	86	OH

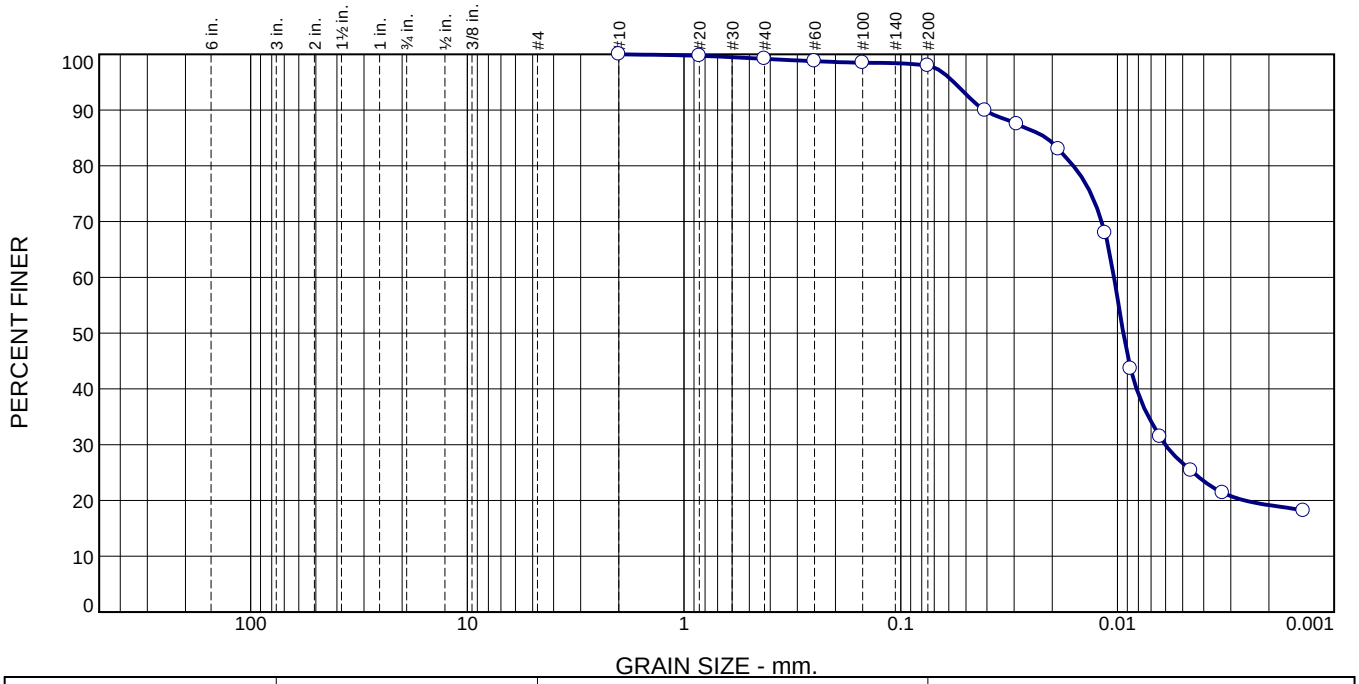
CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No.: 51115.294936

Tested By: MBP/KMS **Checked By:** MBP

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.8	1.2	78.8	19.2

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	99.7		
#40	99.2		
#60	98.8		
#100	98.5		
#200	98.0		
0.0408 mm.	89.9		
0.0291 mm.	87.5		
0.0187 mm.	83.0		
0.0114 mm.	68.0		
0.0087 mm.	43.6		
0.0064 mm.	31.5		
0.0046 mm.	25.4		
0.0033 mm.	21.4		
0.0014 mm.	18.2		

· (no specification provided)

Material Description
Dark gray organic silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/6/24 **Technician:** MBP

Test Notes
As Recieved Moisture Content = 110.2%

Hydrometer Test (ASTM D7928)

Test Date: 9/5/24 **Technician:** KMS

Atterberg (ASTM D4318)
PL= 65 **LL=** 151 **PI=** 86

Coefficients
D_{90}= 0.0411 D_{85}= 0.0213
D_{60}= 0.0104 D_{50}= 0.0094
D_{30}= 0.0060 D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
OH

Date Sampled: 7/1/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

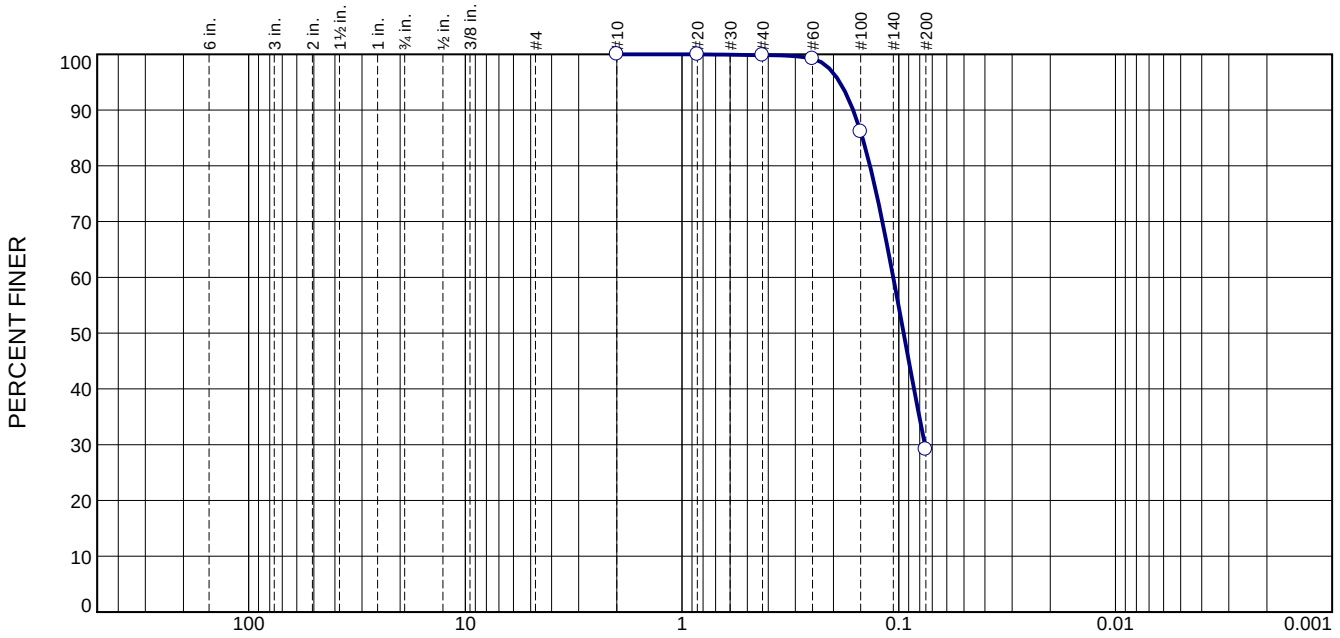
Source of Sample: FD-24-B-18 **Depth:** 18.9'
Sample Number: SS-05

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.2	70.7	29.1	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	100.0		
#40	99.8		
#60	99.2		
#100	86.1		
#200	29.1		

* (no specification provided)

Material Description
Red-Brown silty sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/4/24 **Technician:** MBP

Test Notes
As Recieved Moisture Content = 26.3%

Atterberg (ASTM D4318)
PL= **LL=** NP **PI=**

Coefficients
D_{90}= 0.1624 D_{85}= 0.1470
D_{60}= 0.1060 D_{50}= 0.0949
D_{30}= 0.0758 D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
SM

Date Sampled: 7/1/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

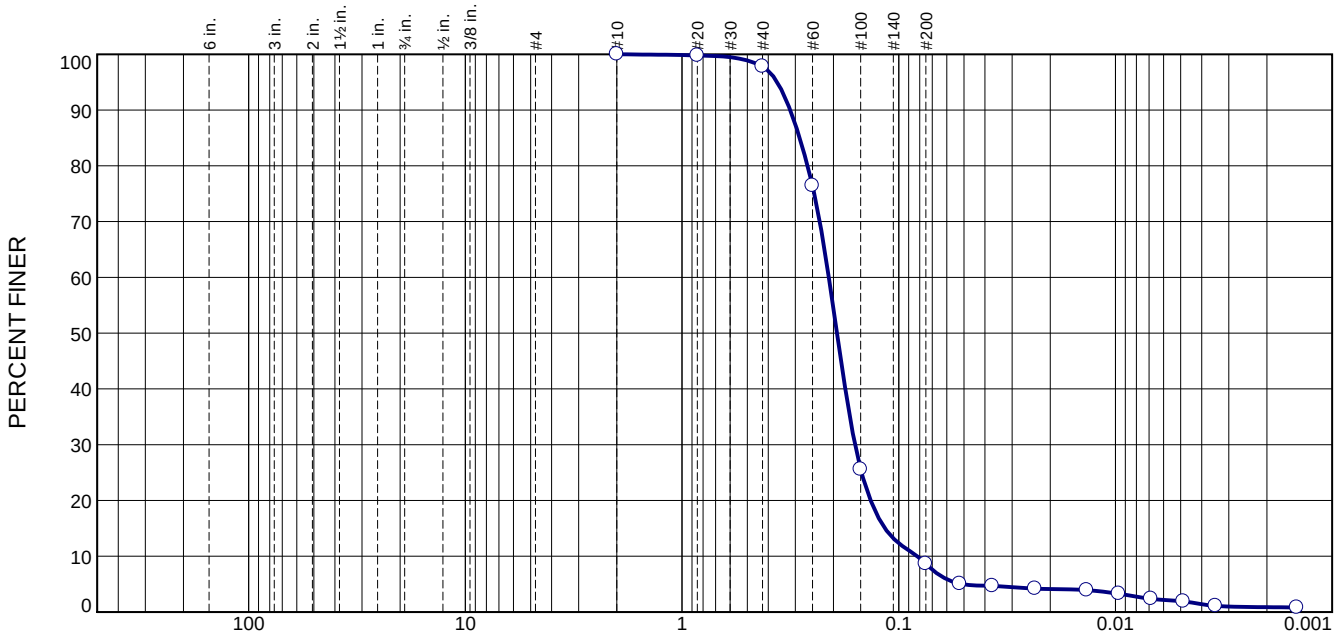
Source of Sample: FD-24-B-18 **Depth:** 33.9'
Sample Number: SS-09

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	2.2	89.1	7.8	0.9

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	99.8		
#40	97.8		
#60	76.5		
#100	25.6		
#200	8.7		
0.0522 mm.	5.1		
0.0370 mm.	4.7		
0.0235 mm.	4.2		
0.0136 mm.	3.9		
0.0096 mm.	3.3		
0.0069 mm.	2.4		
0.0049 mm.	1.9		
0.0034 mm.	1.1		
0.0015 mm.	0.8		

· (no specification provided)

Material Description

Red-brown poorly graded sand with silt

Atterberg (ASTM D4318)

PL= NP **LL=** NP **PI=** NP

Coefficients

D_{90}= 0.3167 D_{85}= 0.2865

D_{60}= 0.2103 D_{50}= 0.1928

D_{30}= 0.1593 D_{15}= 0.1158

D_{10}= 0.0822

C_u= 2.56 C_c= 1.47

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/6/24 **Technician:** KMS/MBP

Test Notes

As Received Moisture Content = 31.1%

Hydrometer Test (ASTM D7928)

Test Date: 9/5/24 **Technician:** KMS

USCS (ASTM D2487)

SP-SM

Date Sampled: 8/8/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-B-19 **Depth:** 4.7'

Sample Number: SS-03

CDM Smith

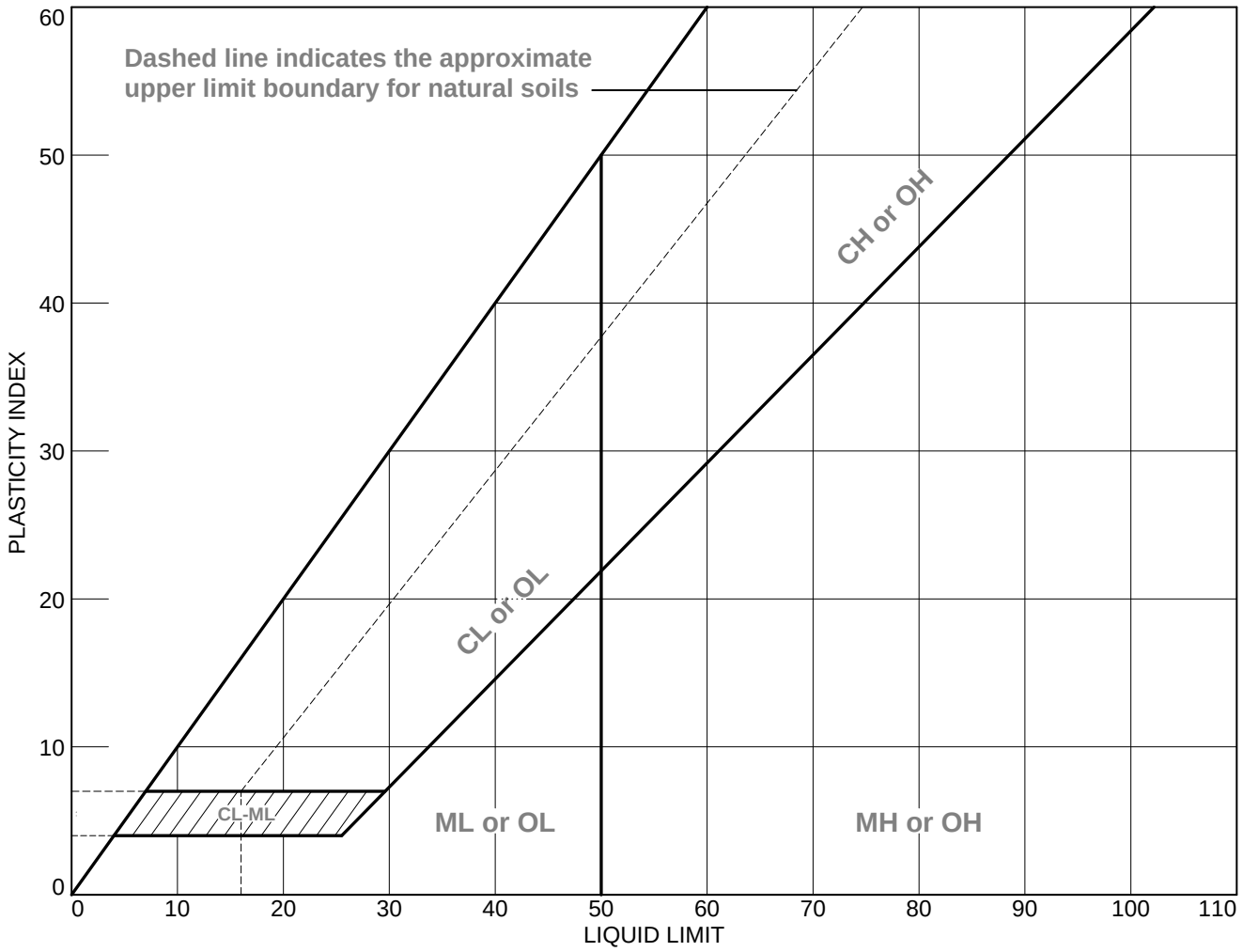
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	FD-24-B-19	SS-03	4.8'	31.1	NP	NP	NP	SP-SM

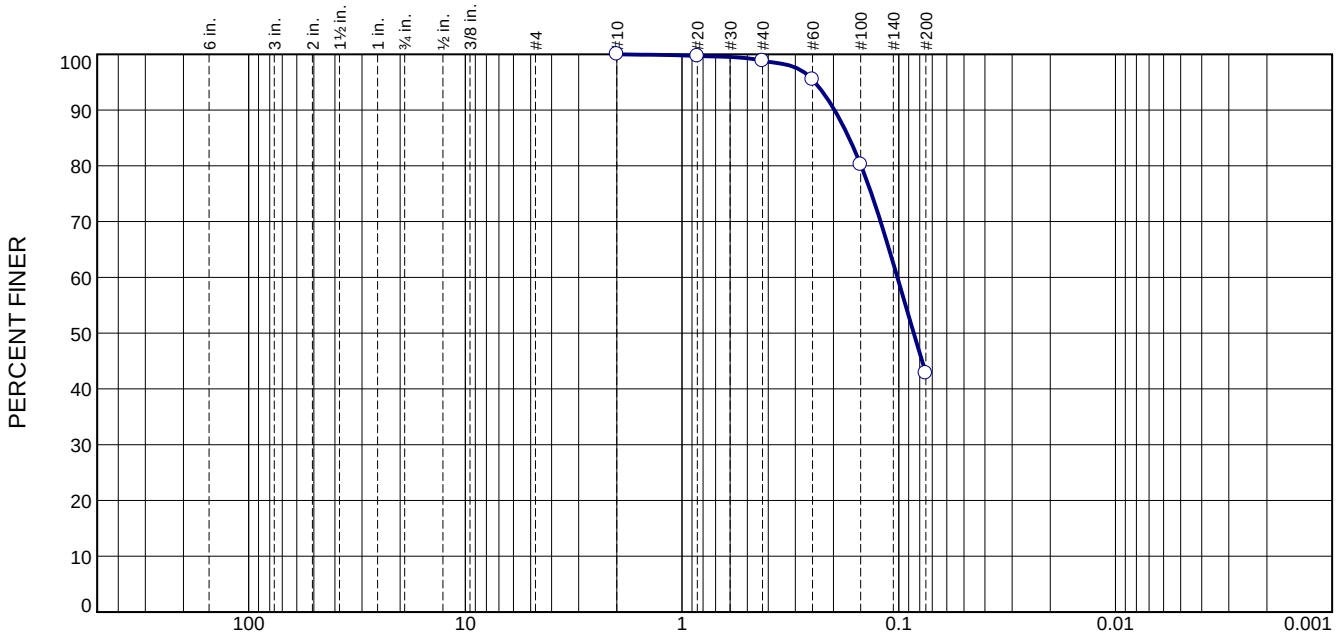
CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No.: 51115.294936

Tested By: KMS **Checked By:** MBP

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.2	56.0	42.8	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	99.7		
#40	98.8		
#60	95.5		
#100	80.2		
#200	42.8		

* (no specification provided)

Material Description
Red-brown silty sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/4/24 **Technician:** KMS/MBP

Test Notes
As Received Moisture Content = 23.5%

Atterberg (ASTM D4318)
PL= **LL=** NV **PI=**

Coefficients
D_{90}= 0.1980 D_{85}= 0.1696
D_{60}= 0.1014 D_{50}= 0.0853
D_{30}= D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
SM

Date Sampled: 8/8/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

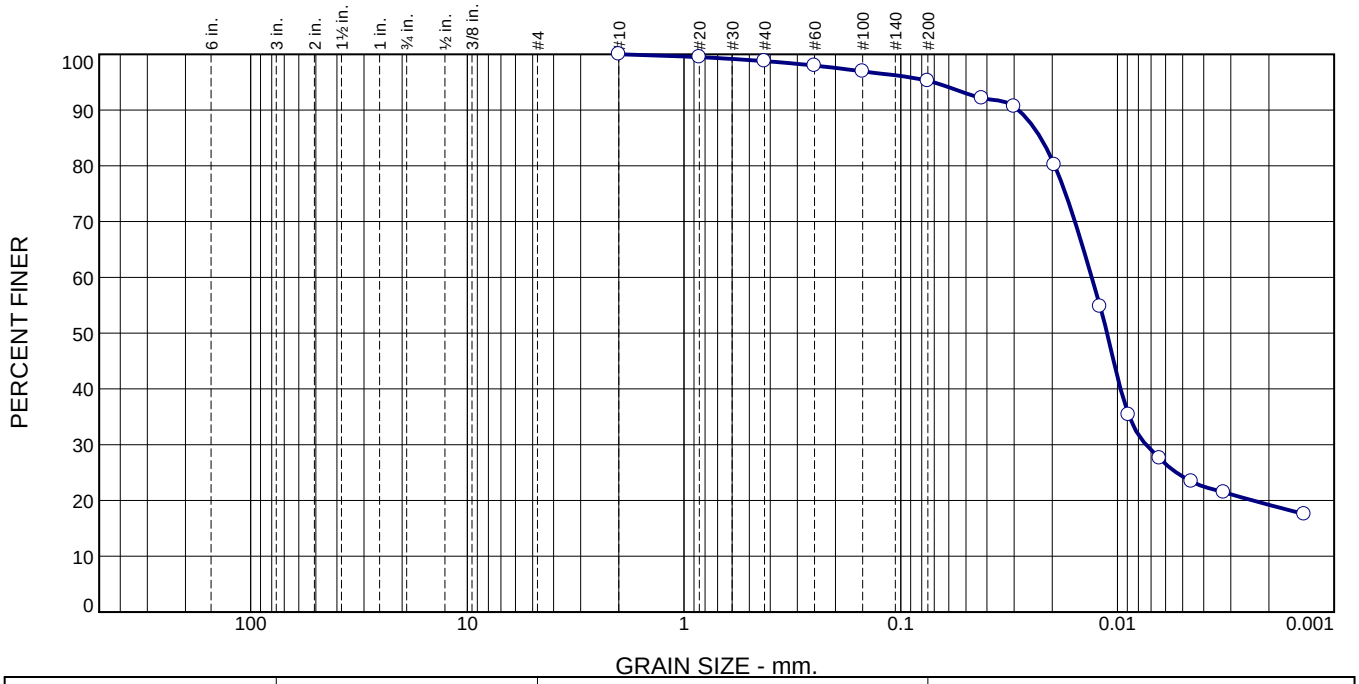
Source of Sample: FD-24-B-19 **Depth:** 6.7'
Sample Number: SS-04

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.2	3.6	76.0	19.2

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	99.5		
#40	98.8		
#60	98.0		
#100	96.9		
#200	95.2		
0.0423 mm.	92.1		
0.0300 mm.	90.6		
0.0195 mm.	80.2		
0.0120 mm.	54.8		
0.0089 mm.	35.4		
0.0064 mm.	27.6		
0.0046 mm.	23.4		
0.0032 mm.	21.5		
0.0014 mm.	17.5		

· (no specification provided)

Material Description
Gray organic silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/6/24 **Technician:** KMS/MBP

Test Notes
As Received Moisture Content = 167.3%

Hydrometer Test (ASTM D7928)

Test Date: 9/5/24 **Technician:** KMS/MBP

Atterberg (ASTM D4318)
PL= 63 **LL=** 121 **PI=** 58

Coefficients
D_{90}= 0.0286 D_{85}= 0.0226
D_{60}= 0.0132 D_{50}= 0.0112
D_{30}= 0.0074 D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
OH

Date Sampled: 6/30/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

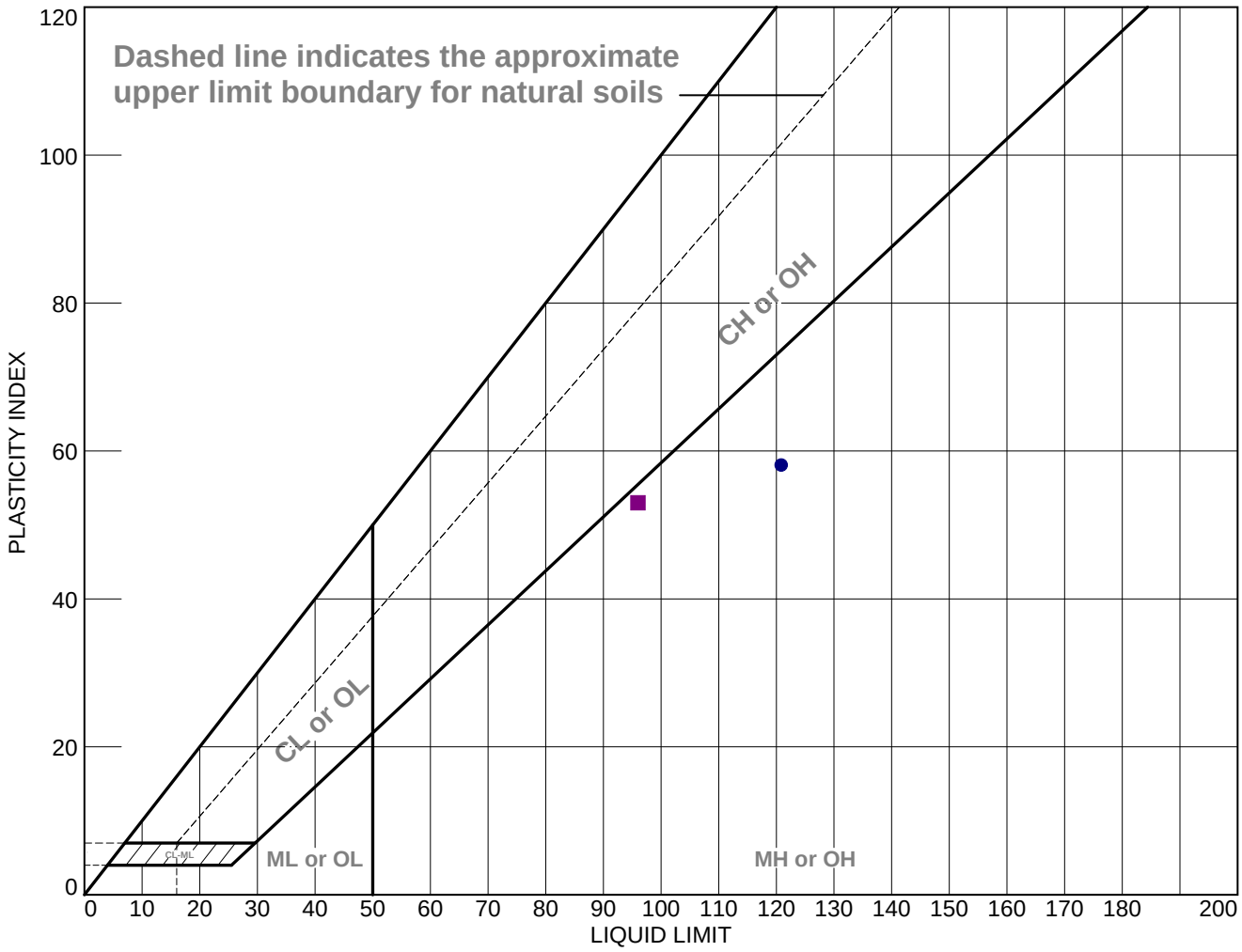
Source of Sample: FD-24-B-20 **Depth:** 4.5'
Sample Number: SS-02

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	FD-24-B-20	SS-02	4.5'	167.3	63	121	58	OH
■	FD-24-B-20	SS-04	14.5'	128.0	43	96	53	OH

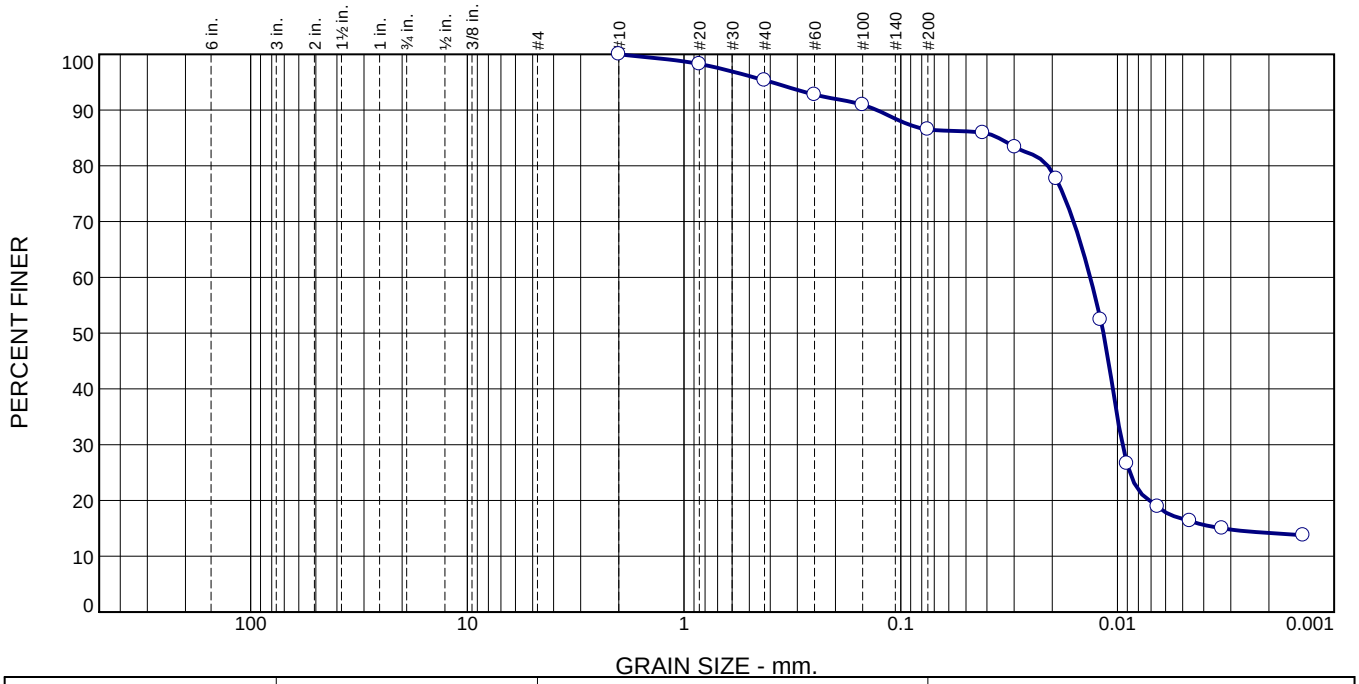
CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No.: 51115.294936

Tested By: KMS/MBP **Checked By:** MBP

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	4.7	8.8	72.3	14.2

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	98.3		
#40	95.3		
#60	92.8		
#100	90.9		
#200	86.5		
0.0417 mm.	85.9		
0.0298 mm.	83.4		
0.0192 mm.	77.7		
0.0120 mm.	52.4		
0.0091 mm.	26.6		
0.0065 mm.	18.9		
0.0046 mm.	16.3		
0.0033 mm.	15.0		
0.0014 mm.	13.7		

· (no specification provided)

Material Description
Dark gray organic silt

Atterberg (ASTM D4318)
PL= 43 **LL=** 96 **PI=** 53

Coefficients
D_{90}= 0.1292 D_{85}= 0.0353
D_{60}= 0.0134 D_{50}= 0.0116
D_{30}= 0.0095 D_{15}= 0.0033
D_{10}=
C_u= C_c=

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/6/24 **Technician:** KMS/MBP

Test Notes
As Received Moisture Content = 128.0%

Hydrometer Test (ASTM D7928)

Test Date: 9/5/24 **Technician:** KMS

USCS (ASTM D2487)
OH

Date Sampled: 6/30/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

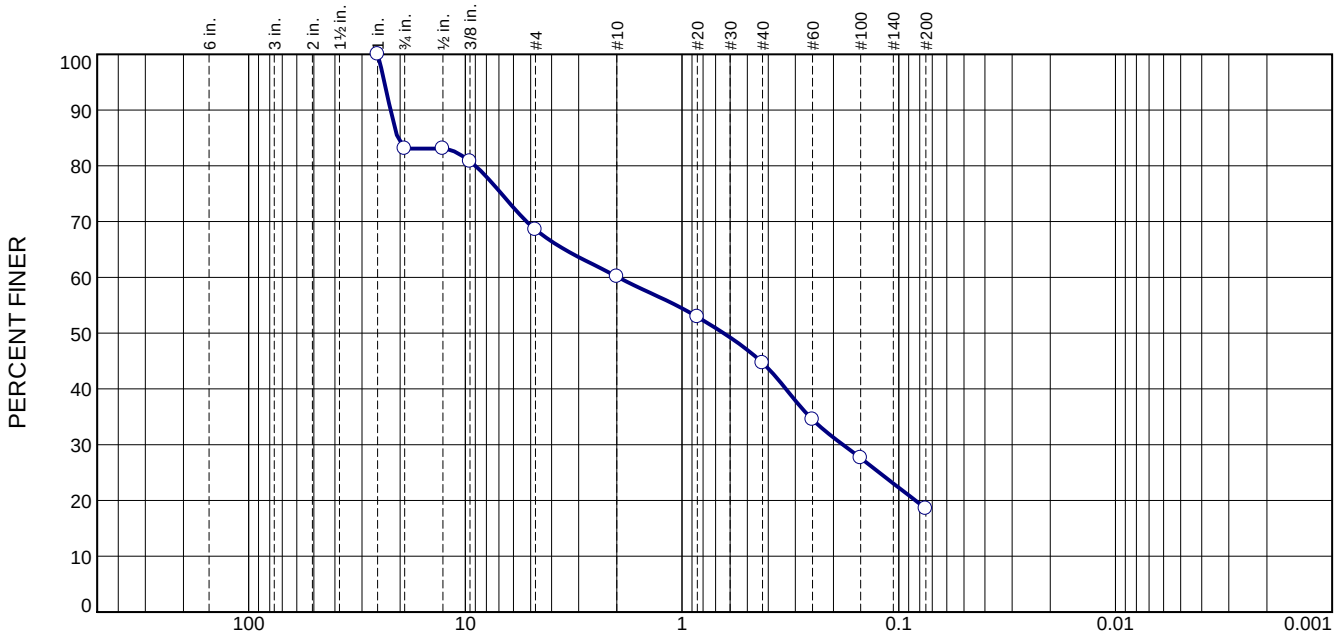
Source of Sample: FD-24-B-20 **Depth:** 14.5'
Sample Number: SS-04

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	16.9	14.5	8.5	15.4	26.1	18.6	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1	100.0		
.75	83.1		
0.5	83.1		
.375	80.8		
#4	68.6		
#10	60.1		
#20	52.9		
#40	44.7		
#60	34.5		
#100	27.6		
#200	18.6		

* (no specification provided)

Material Description

Mottled brown silty sand with gravel

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/4/24 **Technician:** KMS/MBP

Test Notes

As Received Moisture Content = 15.8%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 22.1671 D_{85}= 20.4982

D_{60}= 1.9673 D_{50}= 0.6428

D_{30}= 0.1810 D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

SM

Source of Sample: FD-24-B-20 **Depth:** 19.5'
Sample Number: SS-05

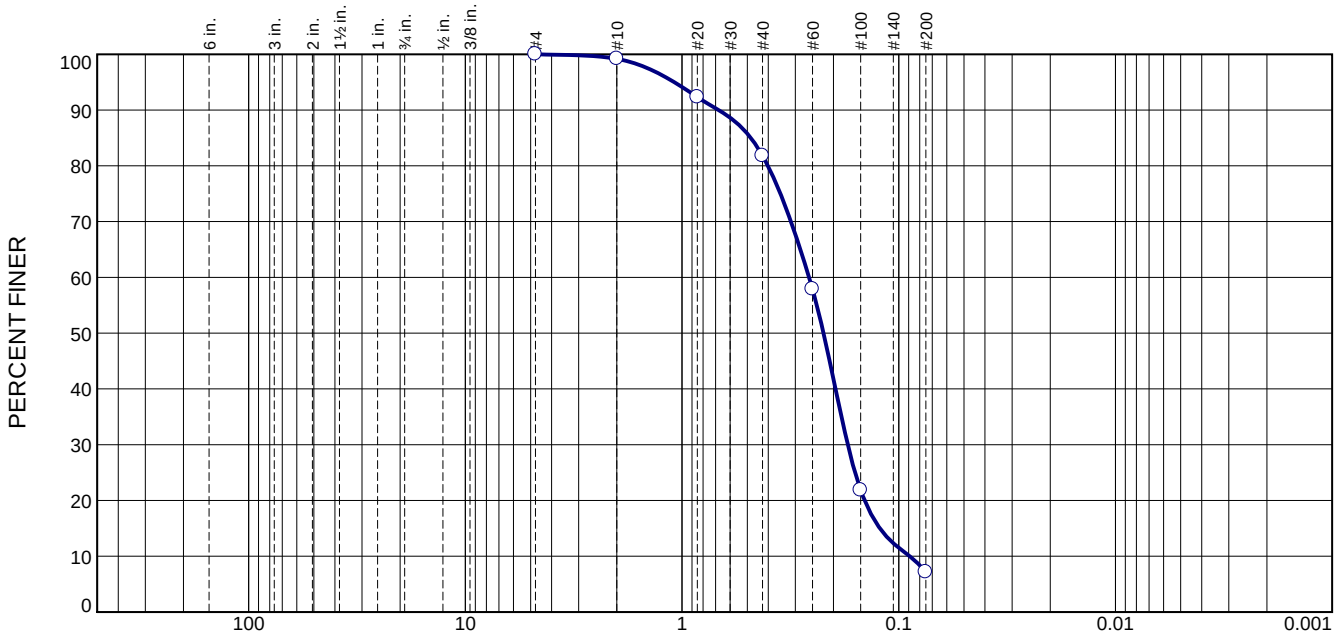
Date Sampled: 6/30/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.8	17.4	74.6	7.2	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	99.2		
#20	92.3		
#40	81.8		
#60	57.9		
#100	21.8		
#200	7.2		

* (no specification provided)

Material Description

Red-brown poorly graded sand with silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/4/24 **Technician:** KMS/MBP

Test Notes

As Received Moisture Content = 20.4%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 0.6782 D_{85}= 0.4815

D_{60}= 0.2594 D_{50}= 0.2223

D_{30}= 0.1719 D_{15}= 0.1223

D_{10}= 0.0891

C_u= 2.91 C_c= 1.28

USCS (ASTM D2487)

SP-SM

Date Sampled: 6/30/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-B-20 **Depth:** 24.5'

Sample Number: SS-06

CDM Smith

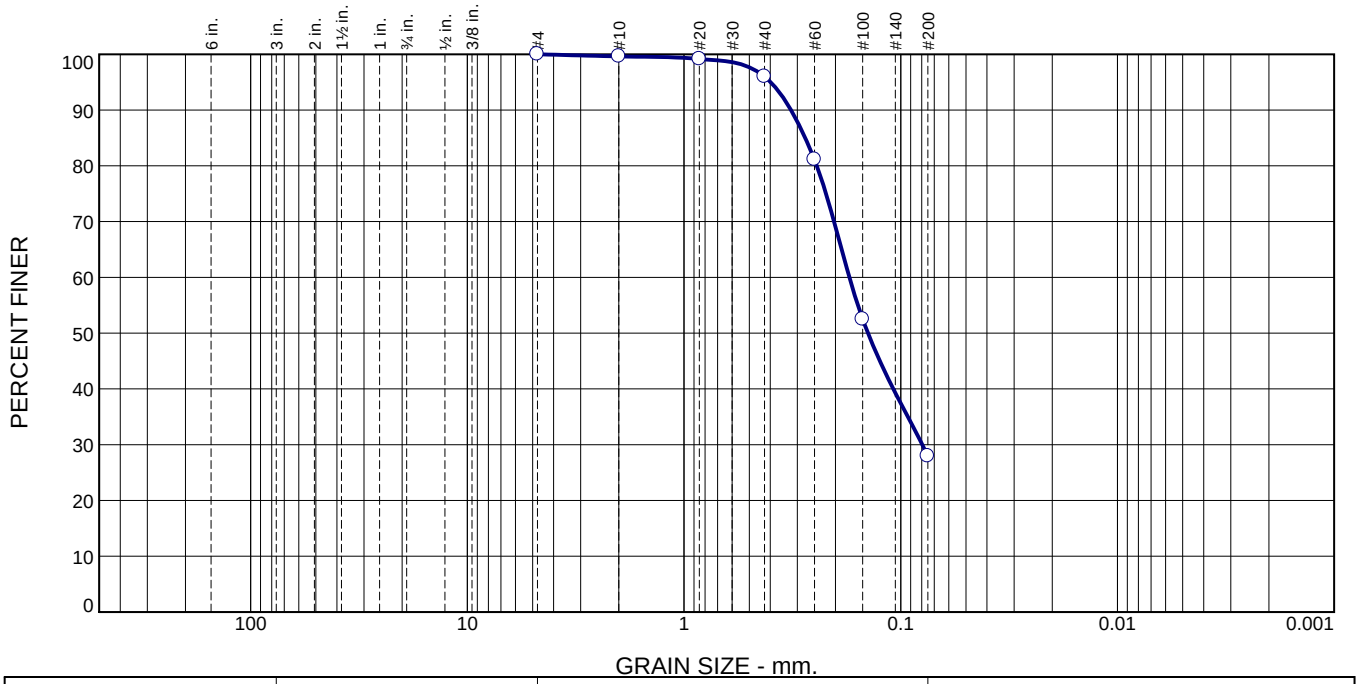
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.4	3.6	68.0	28.0	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	99.6		
#20	99.1		
#40	96.0		
#60	81.1		
#100	52.5		
#200	28.0		

* (no specification provided)

Material Description
Red-brown silty sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/4/24 **Technician:** KMS/MBP

Test Notes
As Received Moisture Content = 20.6%

Atterberg (ASTM D4318)
PL= **LL=** NV **PI=**

Coefficients
D_{90}= 0.3210 D_{85}= 0.2759
D_{60}= 0.1726 D_{50}= 0.1417
D_{30}= 0.0795 D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
SM

Source of Sample: FD-24-B-20 **Depth:** 29.5'
Sample Number: SS-07

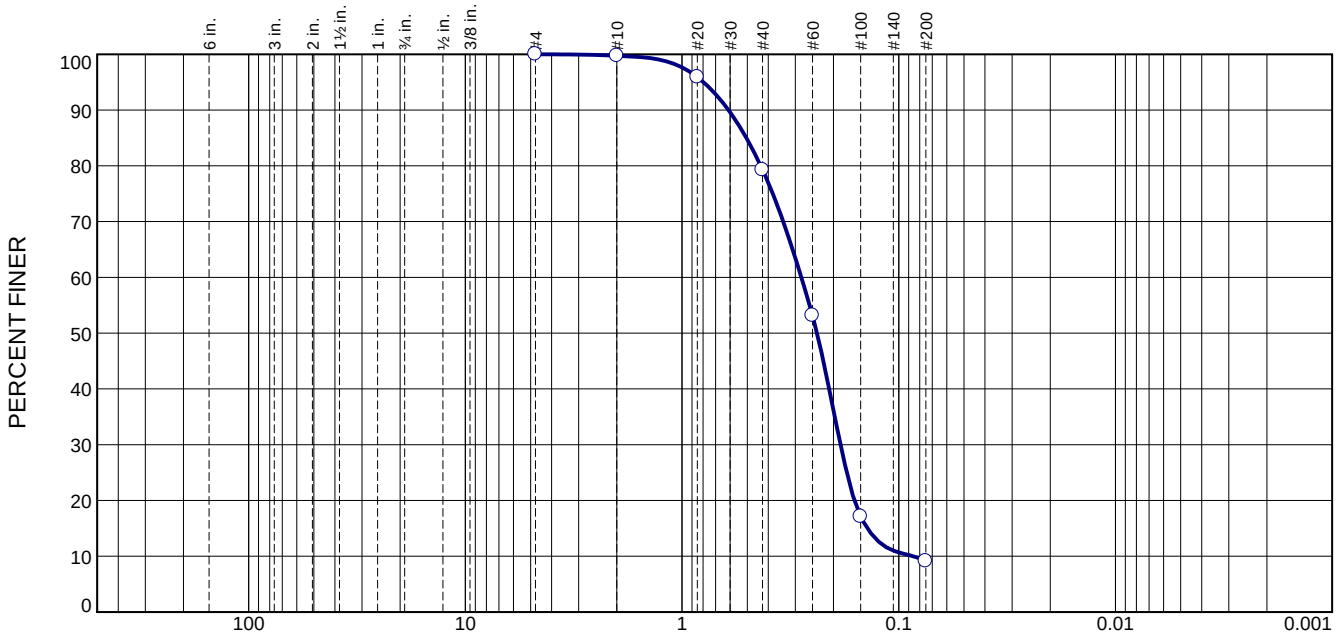
Date Sampled: 6/30/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	20.4	70.2	9.1	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	99.7		
#20	95.9		
#40	79.3		
#60	53.1		
#100	17.1		
#200	9.1		

* (no specification provided)

Material Description

Gray-brown poorly graded sand with silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/25/24 **Technician:** KMS/MBP

Test Notes

As Received Moisture Content = 19.3%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 0.6106 D_{85}= 0.5051

D_{60}= 0.2814 D_{50}= 0.2382

D_{30}= 0.1857 D_{15}= 0.1397

D_{10}= 0.0858

C_u= 3.28 C_c= 1.43

USCS (ASTM D2487)

SP-SM

Date Sampled: 7/8/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD24-CAD-01 **Depth:** 9.2'

Sample Number: SS-03

CDM Smith

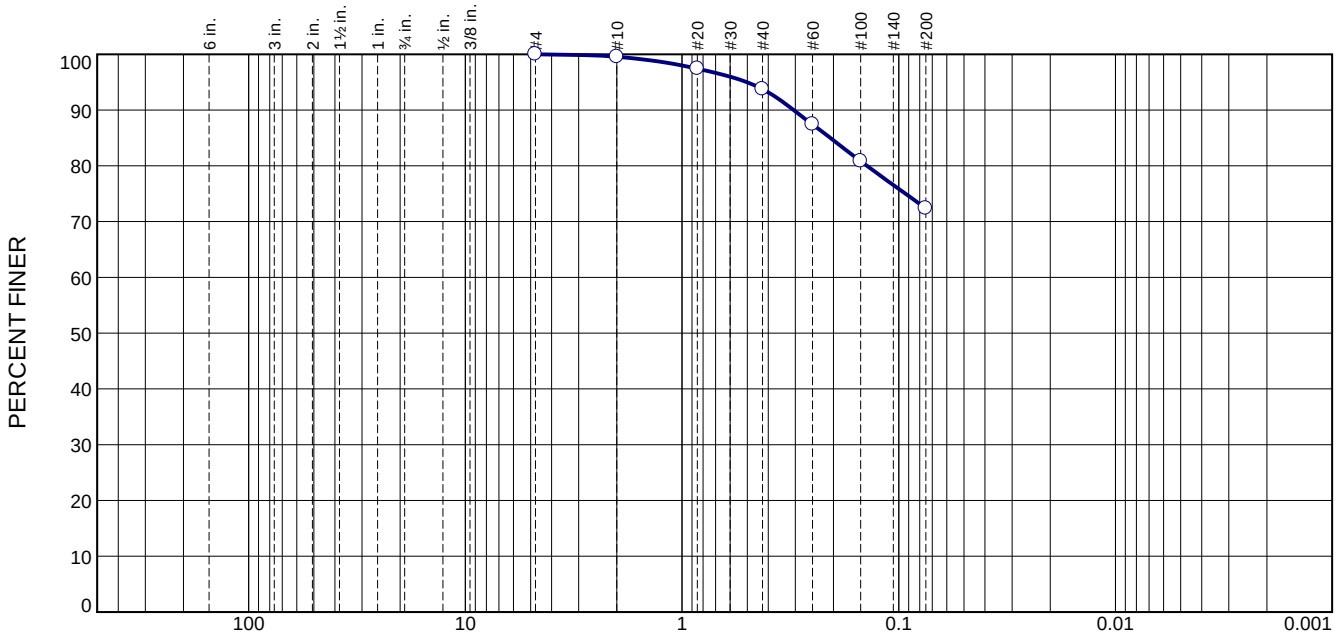
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.4	5.9	21.3	72.4	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	99.6		
#20	97.4		
#40	93.7		
#60	87.4		
#100	80.8		
#200	72.4		

* (no specification provided)

Material Description
Gray organic silt with sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/4/24 **Technician:** KMS/MBP

Test Notes
As Received Moisture Content = 66.0%

Atterberg (ASTM D4318)
PL= **LL=** NV **PI=**

Coefficients
D_{90}= 0.3055 D_{85}= 0.2069
D_{60}= D_{50}=
D_{30}= D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
OH

Date Sampled: 7/8/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

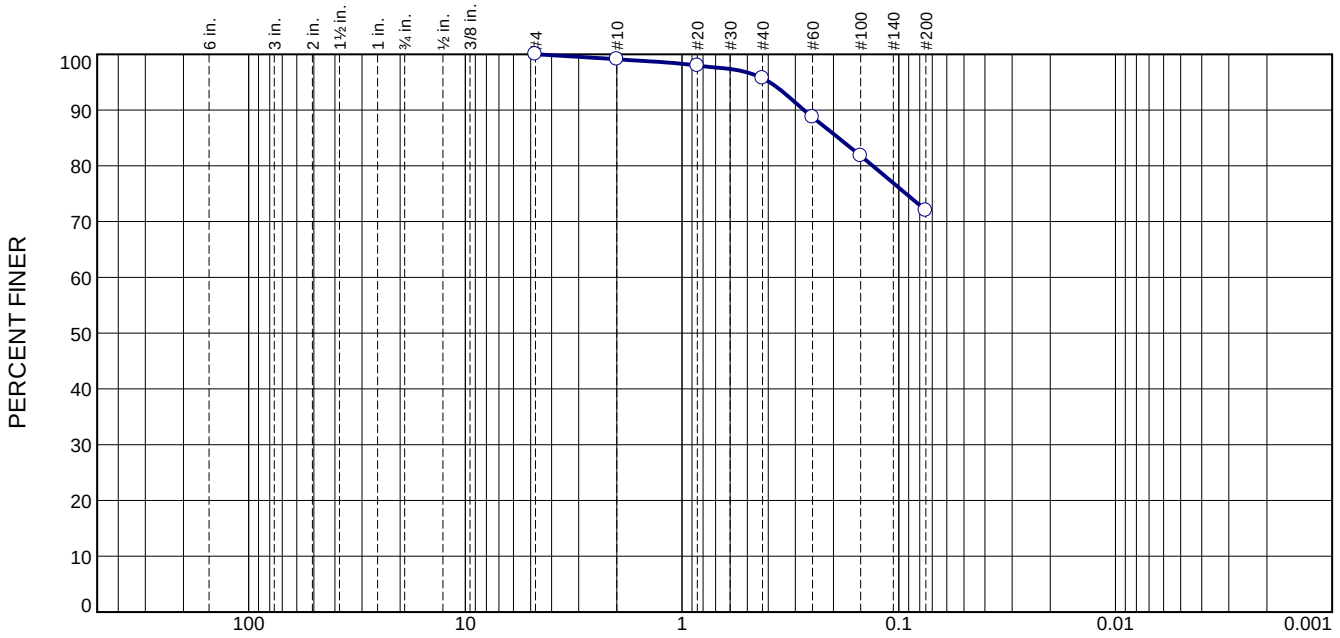
Source of Sample: FD24-CAD-01 **Depth:** 14.2'
Sample Number: SS-05

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.9	3.4	23.7	72.0	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	99.1		
#20	98.0		
#40	95.7		
#60	88.7		
#100	81.8		
#200	72.0		

* (no specification provided)

Material Description
Gray organic silt with sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/4/24 **Technician:** KMS/MBP

Test Notes
As Received Moisture Content = 66.2%

Atterberg (ASTM D4318)
PL= **LL=** NV **PI=**

Coefficients
D_{90}= 0.2740 D_{85}= 0.1897
D_{60}= D_{50}=
D_{30}= D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
OH

Date Sampled: 7/8/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

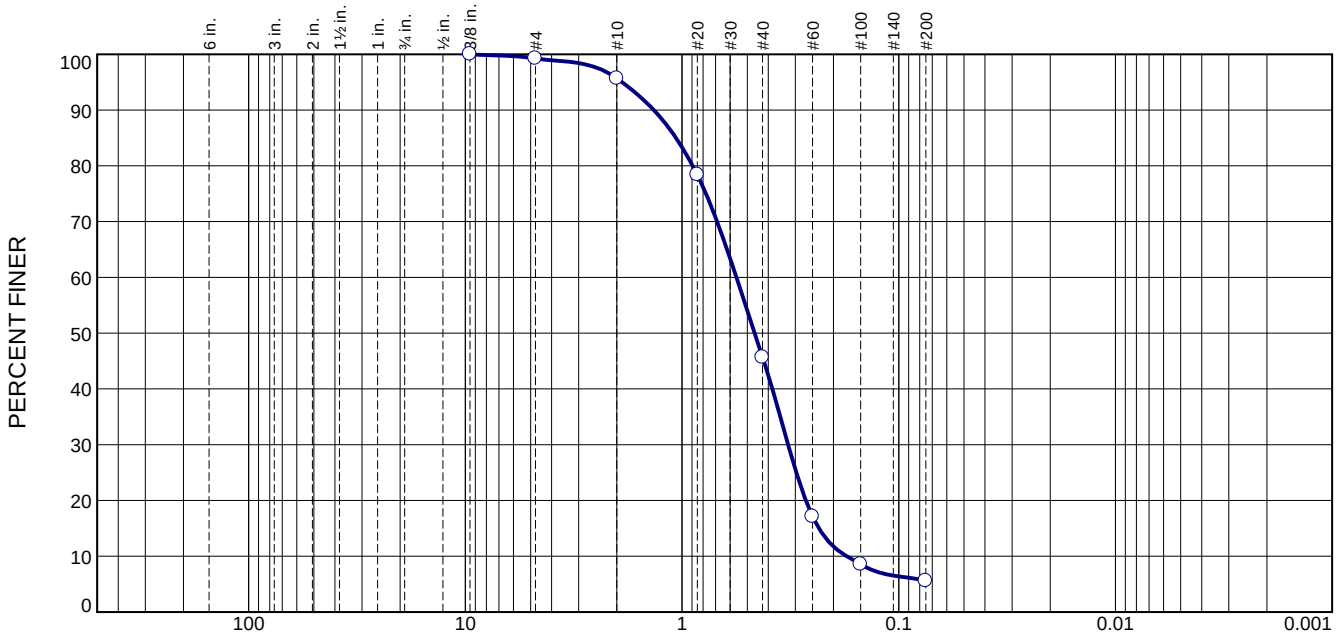
Source of Sample: FD24-CAD-01 **Depth:** 29.2'
Sample Number: SS-08

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.7	3.6	50.1	40.0	5.6	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
.375	100.0		
#4	99.3		
#10	95.7		
#20	78.4		
#40	45.6		
#60	17.1		
#100	8.6		
#200	5.6		

* (no specification provided)

Material Description

Red-brown poorly graded sand with silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/25/24 **Technician:** KMS/MBP

Test Notes

As Received Moisture Content = 19.7%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 1.3504 D_{85}= 1.0665

D_{60}= 0.5612 D_{50}= 0.4628

D_{30}= 0.3240 D_{15}= 0.2337

D_{10}= 0.1738

C_u= 3.23 C_c= 1.08

USCS (ASTM D2487)

SP-SM

Date Sampled: 7/8/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD24-CAD-01 **Depth:** 44.2'

Sample Number: SS-11

CDM Smith

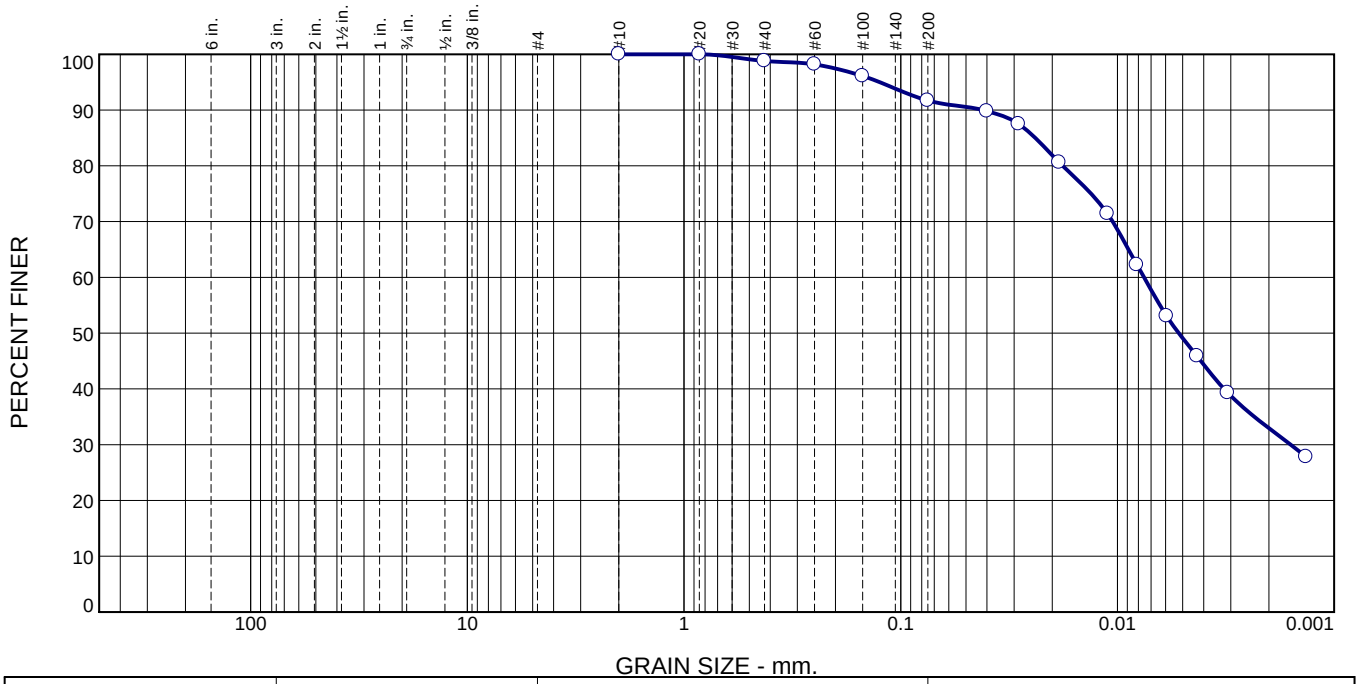
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.2	7.1	58.7	33.0

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	100.0		
#40	98.8		
#60	98.2		
#100	96.1		
#200	91.7		
0.0400 mm.	89.8		
0.0286 mm.	87.5		
0.0186 mm.	80.6		
0.0111 mm.	71.4		
0.0081 mm.	62.3		
0.0059 mm.	53.1		
0.0043 mm.	45.9		
0.0031 mm.	39.3		
0.0013 mm.	27.8		

· (no specification provided)

Material Description
Gray organic silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/10/24 **Technician:** KMS

Test Notes
As Received Moisture Content = 104.0%

Hydrometer Test (ASTM D7928)

Test Date: 9/9/24 **Technician:** KMS

Atterberg (ASTM D4318)
PL= **LL=** NV **PI=**

Coefficients
D_{90}= 0.0418 D_{85}= 0.0239
D_{60}= 0.0075 D_{50}= 0.0052
D_{30}= 0.0016 D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
OH

Date Sampled: 7/9/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

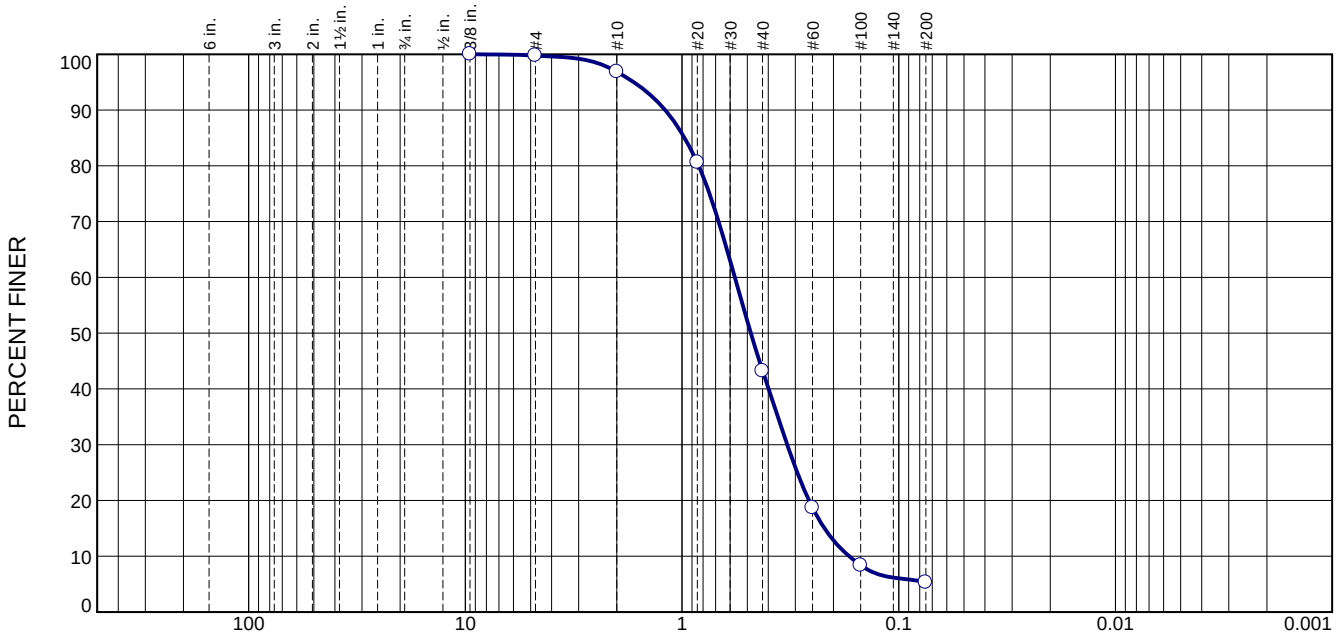
Source of Sample: FD24-CAD-02 **Depth:** 20.3'
Sample Number: SS-05

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	2.9	53.7	37.9	5.3	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
.375	100.0		
#4	99.8		
#10	96.9		
#20	80.6		
#40	43.2		
#60	18.7		
#100	8.4		
#200	5.3		

* (no specification provided)

Material Description

Red-brown poorly graded sand with silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/4/24 **Technician:** KMS/MBP

Test Notes

As Received Moisture Content = 21.1%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 1.1967 D_{85}= 0.9731

D_{60}= 0.5707 D_{50}= 0.4818

D_{30}= 0.3270 D_{15}= 0.2202

D_{10}= 0.1696

C_u= 3.37 C_c= 1.11

USCS (ASTM D2487)

SP-SM

Source of Sample: FD24-CAD-02 **Depth:** 40.6'
Sample Number: SS-09

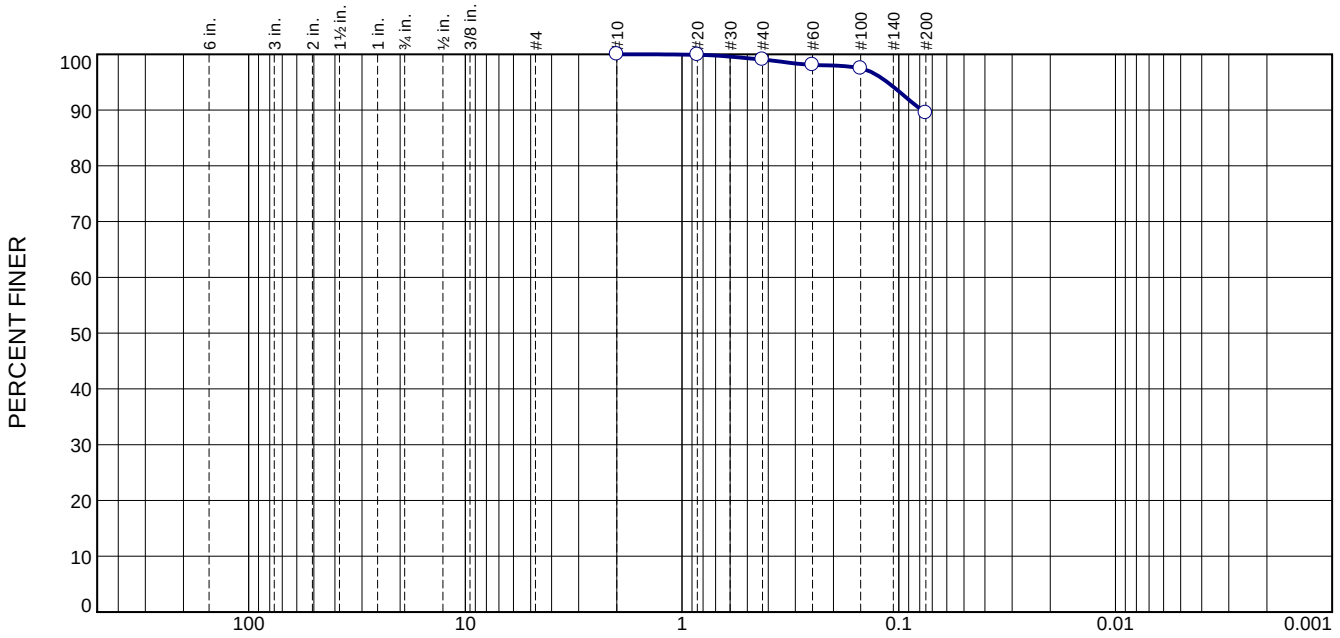
Date Sampled: 7/9/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.0	9.5	89.5	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	99.9		
#40	99.0		
#60	98.1		
#100	97.5		
#200	89.5		

* (no specification provided)

Material Description

Red-brown silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/4/24 **Technician:** KMS/MBP

Test Notes

As Received Moisture Content = 29.7%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 0.0783 D_{85}=

D_{60}= D_{50}=

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

ML

Date Sampled: 7/9/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD24-CAD-02 **Depth:** 50.6'

Sample Number: SS-11

CDM Smith

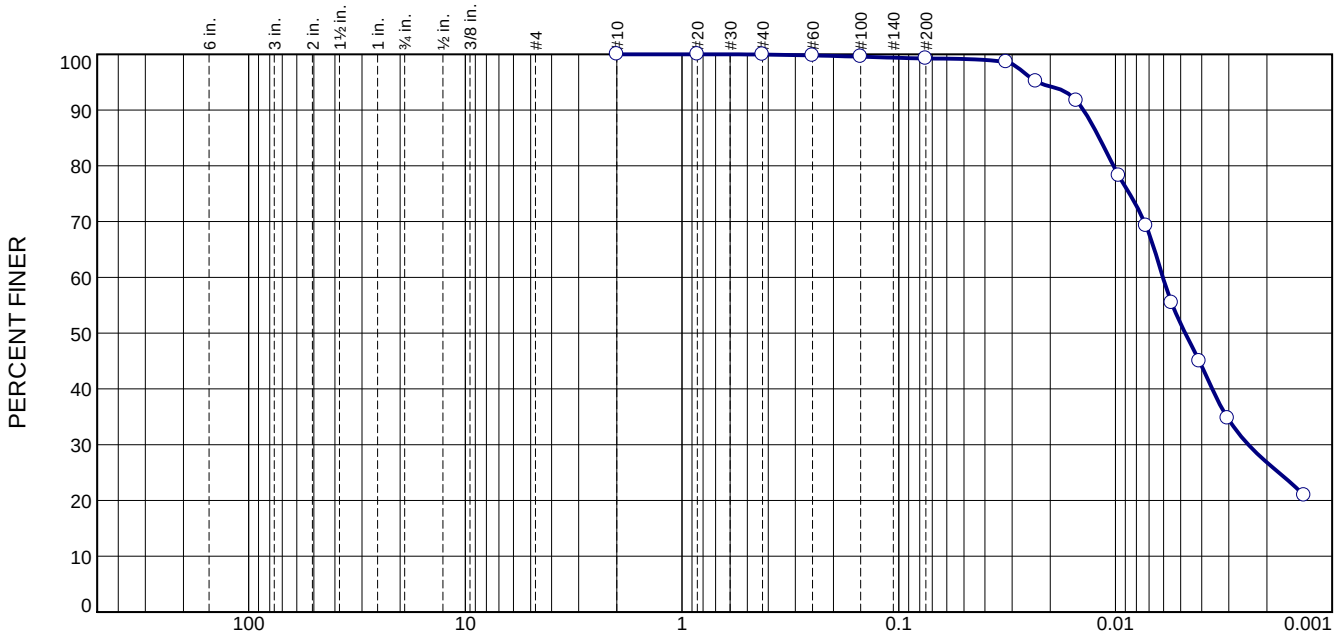
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.1	0.7	72.4	26.8

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	100.0		
#40	99.9		
#60	99.8		
#100	99.6		
#200	99.2		
0.0319 mm.	98.6		
0.0233 mm.	95.2		
0.0152 mm.	91.7		
0.0097 mm.	78.2		
0.0072 mm.	69.3		
0.0055 mm.	55.5		
0.0041 mm.	45.0		
0.0030 mm.	34.7		
0.0013 mm.	20.9		

* (no specification provided)

Material Description

Red-brown silt (with thin clay layers)

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/10/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 35.6%

Hydrometer Test (ASTM D7928)

Test Date: 9/9/24 **Technician:** KMS

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 0.0140 D_{85}= 0.0119

D_{60}= 0.0060 D_{50}= 0.0048

D_{30}= 0.0024 D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

ML

Date Sampled: 7/9/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD24-CAD-02 **Depth:** 70.6'

Sample Number: SS-15

CDM Smith

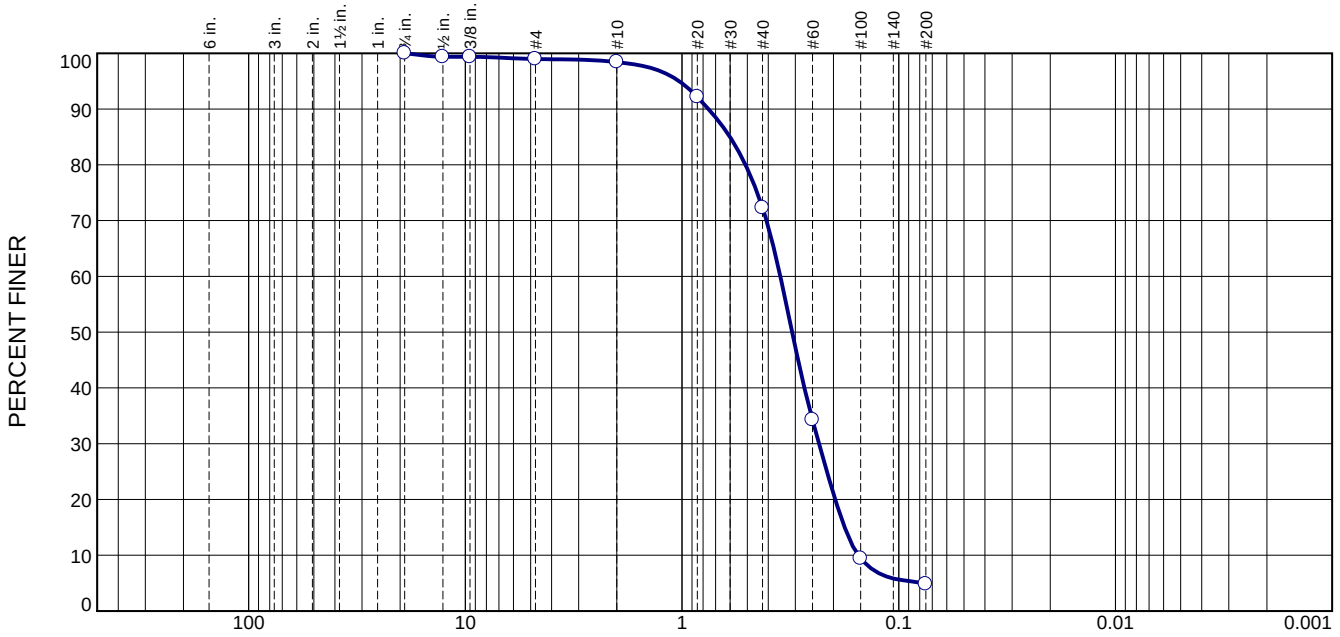
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.0	0.6	26.1	67.5	4.8	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
.75	100.0		
0.5	99.4		
.375	99.4		
#4	99.0		
#10	98.4		
#20	92.2		
#40	72.3		
#60	34.3		
#100	9.4		
#200	4.8		

* (no specification provided)

Material Description

Gray and brown poorly graded sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/6/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 22.4%

Atterberg (ASTM D4318)

PL= NP **LL=** NP **PI=** NP

Coefficients

D_{90}= 0.7556 D_{85}= 0.6010

D_{60}= 0.3522 D_{50}= 0.3103

D_{30}= 0.2331 D_{15}= 0.1777

D_{10}= 0.1542

C_u= 2.28 C_c= 1.00

USCS (ASTM D2487)

SP

Source of Sample: FD24-CAD-03 **Depth:** 4.5'
Sample Number: SS-02

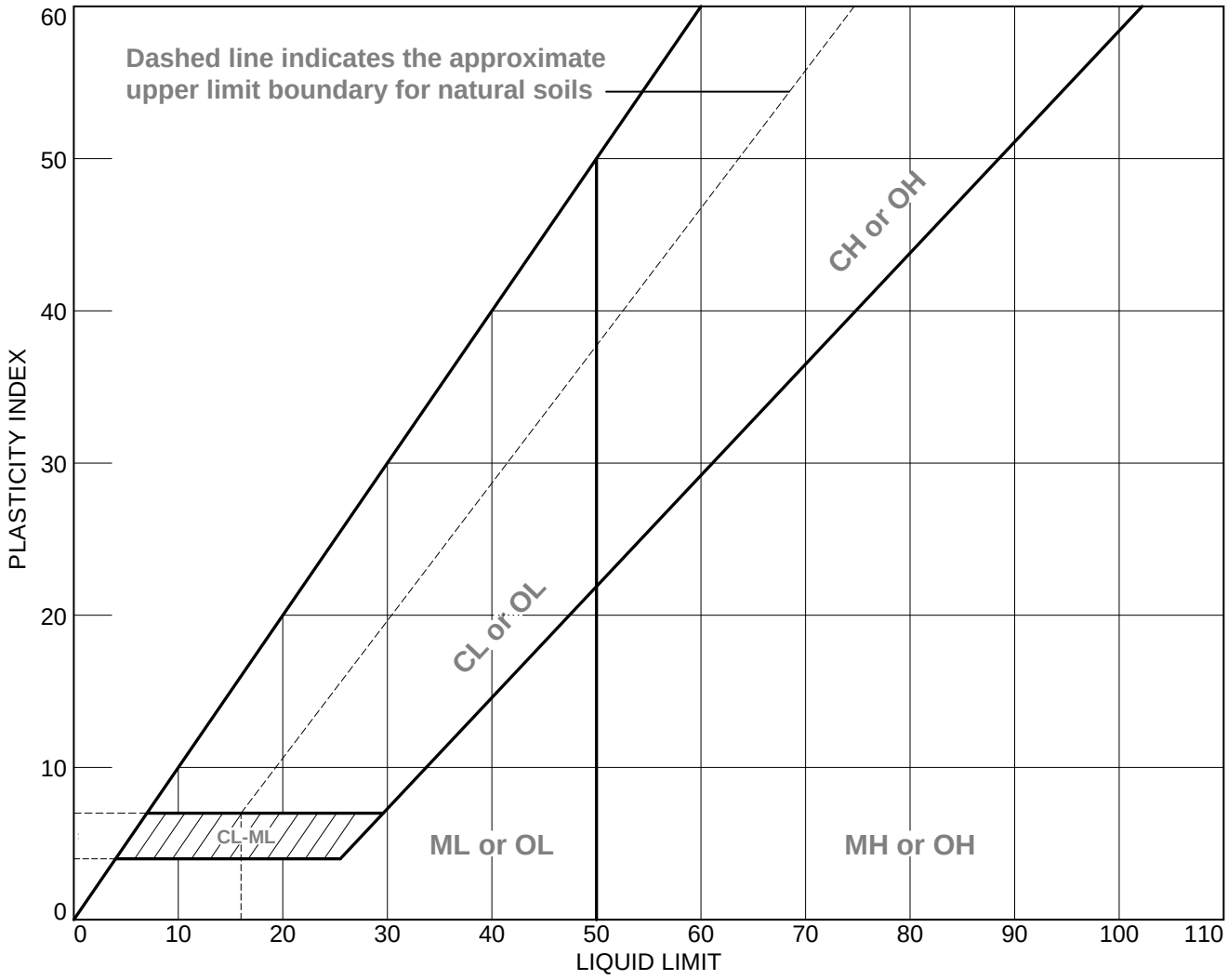
Date Sampled: 8/1/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	FD24-CAD-03	SS-02	4.5'	22.4	NP	NP	NP	SP

CDM Smith

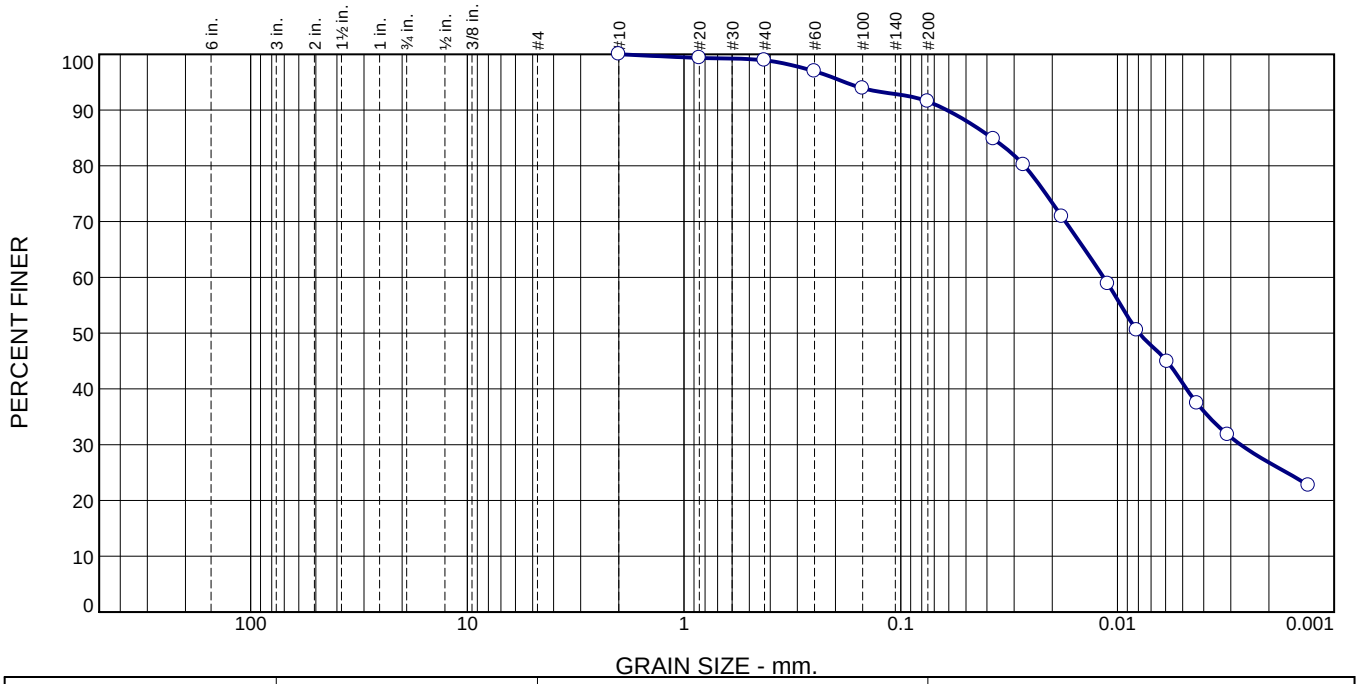
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No.: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.1	7.4	64.7	26.8

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	99.3		
#40	98.9		
#60	97.0		
#100	93.9		
#200	91.5		
0.0373 mm.	84.8		
0.0271 mm.	80.2		
0.0181 mm.	70.9		
0.0111 mm.	58.9		
0.0081 mm.	50.5		
0.0059 mm.	44.9		
0.0043 mm.	37.4		
0.0031 mm.	31.8		
0.0013 mm.	22.7		

· (no specification provided)

Material Description
Gray organic silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/11/24 **Technician:** KMS

Test Notes
As Received Moisture Content = 67.5%

Hydrometer Test (ASTM D7928)

Test Date: 9/10/24 **Technician:** KMS

Atterberg (ASTM D4318)
PL= **LL=** NV **PI=**

Coefficients
D_{90}= 0.0613 D_{85}= 0.0379
D_{60}= 0.0116 D_{50}= 0.0079
D_{30}= 0.0027 D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
OH

Date Sampled: 8/1/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

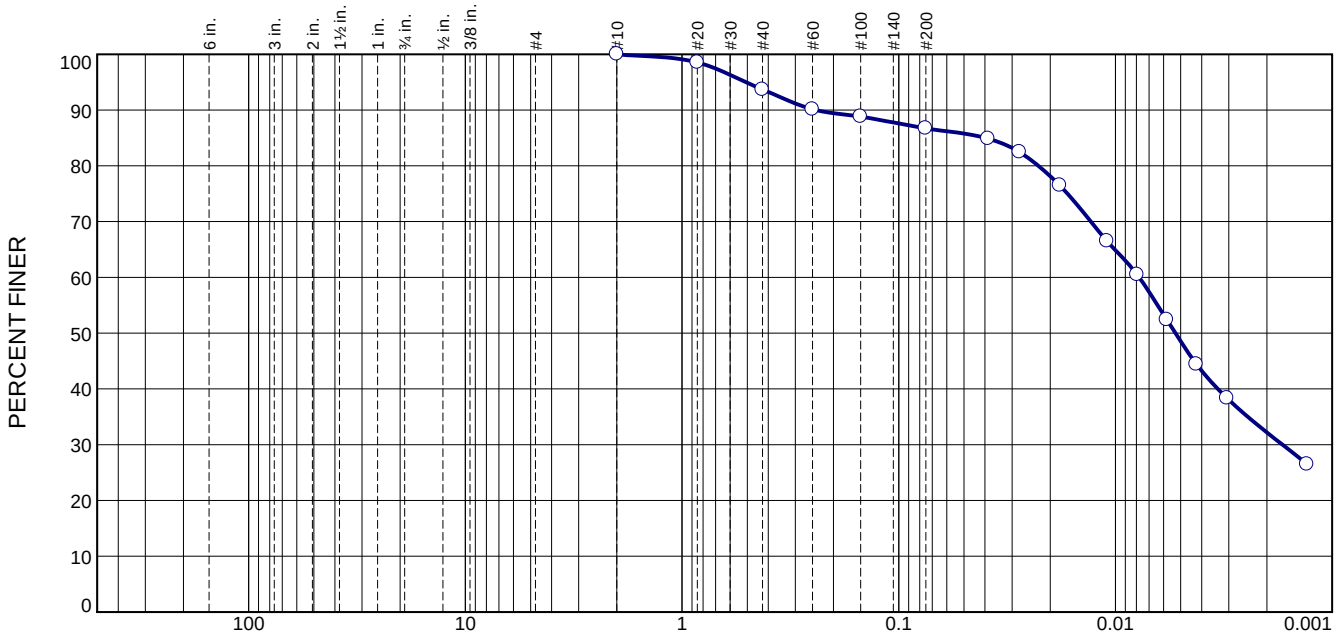
Source of Sample: FD24-CAD-03 **Depth:** 14.5'
Sample Number: SS-04

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	6.3	7.0	54.5	32.2

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	98.5		
#40	93.7		
#60	90.1		
#100	88.8		
#200	86.7		
0.0387 mm.	84.9		
0.0277 mm.	82.5		
0.0181 mm.	76.5		
0.0109 mm.	66.5		
0.0079 mm.	60.5		
0.0058 mm.	52.4		
0.0042 mm.	44.4		
0.0031 mm.	38.3		
0.0013 mm.	26.5		

· (no specification provided)

Material Description

Gray organic silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/11/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 77.4%

Hydrometer Test (ASTM D7928)

Test Date: 9/10/24 **Technician:** KMS

Atterberg (ASTM D4318)

PL= **LL=** NV **PI=**

Coefficients

D_{90}= 0.2424 D_{85}= 0.0398

D_{60}= 0.0078 D_{50}= 0.0053

D_{30}= 0.0017 D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

OH

Date Sampled: 8/1/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD24-CAD-03 **Depth:** 29.5'

Sample Number: SS-07

CDM Smith

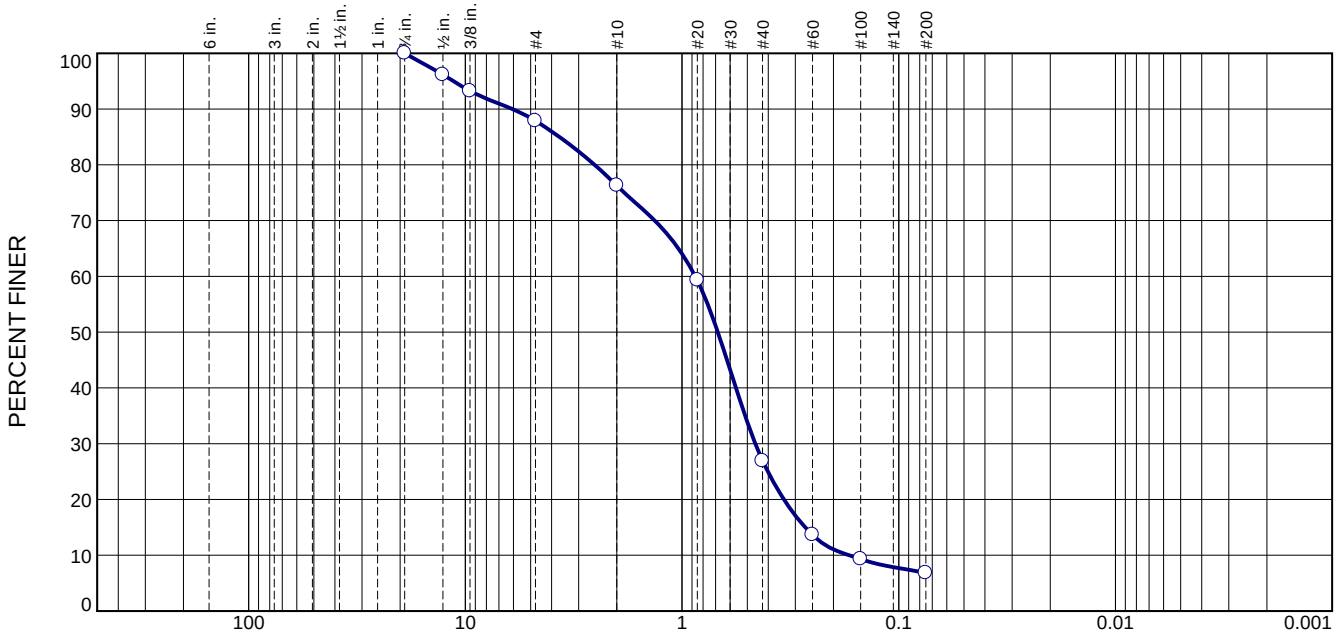
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	12.1	11.6	49.4	20.1	6.8	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
.75	100.0		
0.5	96.2		
.375	93.2		
#4	87.9		
#10	76.3		
#20	59.3		
#40	26.9		
#60	13.6		
#100	9.3		
#200	6.8		

* (no specification provided)

Material Description

Brown poorly graded sand with silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/6/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 16.6%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 6.0706 D_{85}= 3.6818

D_{60}= 0.8683 D_{50}= 0.6837

D_{30}= 0.4595 D_{15}= 0.2700

D_{10}= 0.1692

C_u= 5.13 C_c= 1.44

USCS (ASTM D2487)

SP-SM

Source of Sample: FD24-CAD-03 **Depth:** 44.5'
Sample Number: SS-11

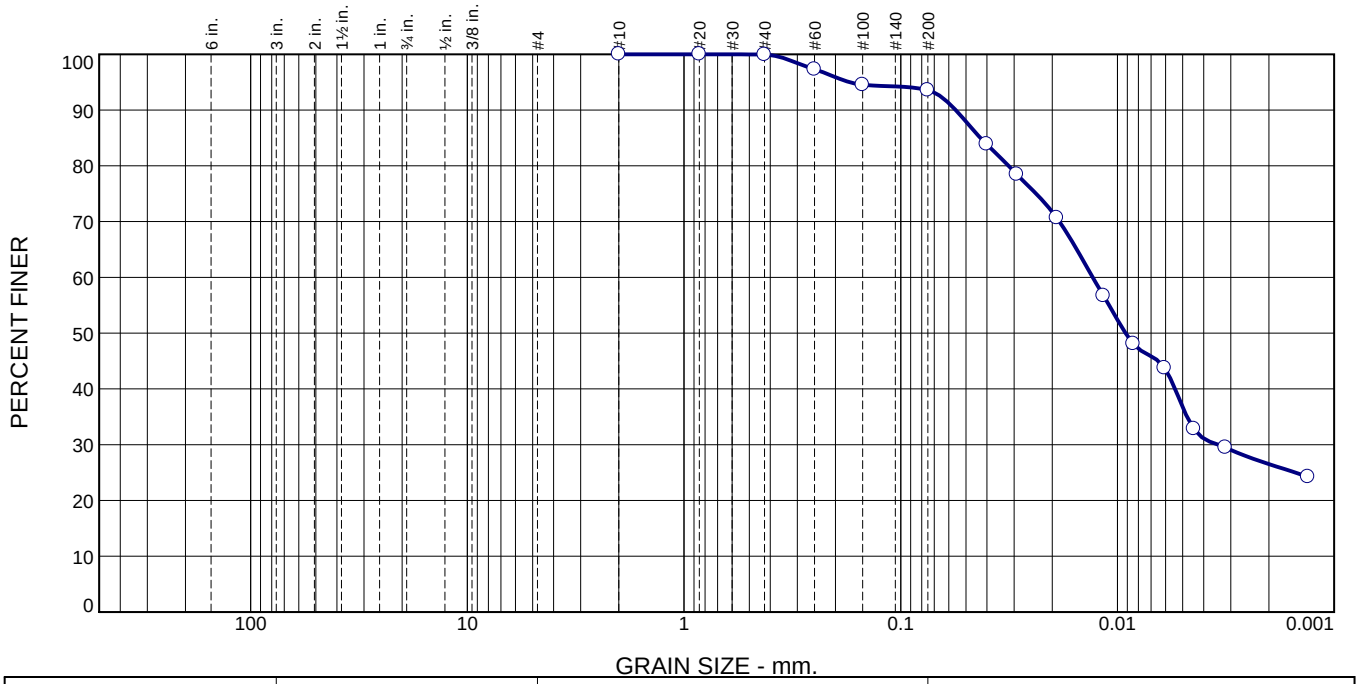
Date Sampled: 8/1/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.1	6.3	67.1	26.5

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	100.0		
#40	99.9		
#60	97.3		
#100	94.5		
#200	93.6		
0.0402 mm.	83.9		
0.0291 mm.	78.5		
0.0190 mm.	70.6		
0.0116 mm.	56.7		
0.0085 mm.	48.1		
0.0061 mm.	43.8		
0.0044 mm.	32.8		
0.0032 mm.	29.5		
0.0013 mm.	24.2		

· (no specification provided)

Material Description
Gray organic clay

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/10/24 **Technician:** KMS

Test Notes
As Received Moisture Content = 91.2%

Hydrometer Test (ASTM D7928)

Test Date: 9/10/24 **Technician:** KMS

Atterberg (ASTM D4318)
PL= 42 **LL=** 112 **PI=** 70

Coefficients
D_{90}= 0.0558 D_{85}= 0.0429
D_{60}= 0.0130 D_{50}= 0.0092
D_{30}= 0.0034 D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
OH

Date Sampled: 7/6/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

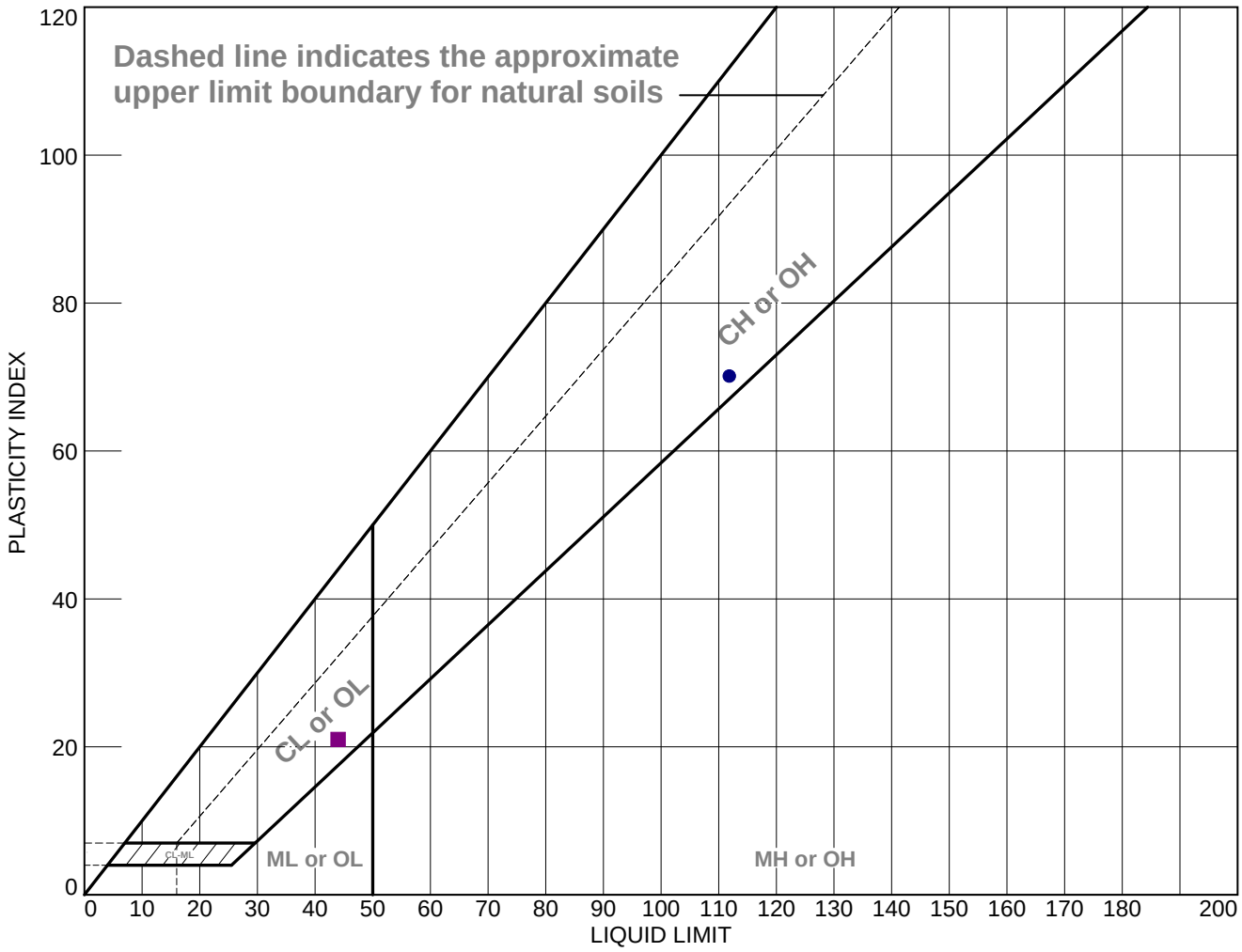
Source of Sample: FD24-CAD-04 **Depth: 15.**8'
Sample Number: SS-04

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	FD24-CAD-04	SS-04	15.8'	91.2	42	112	70	OH
■	FD24-CAD-04	SS-13	63.3'	36.7	23	44	21	CL

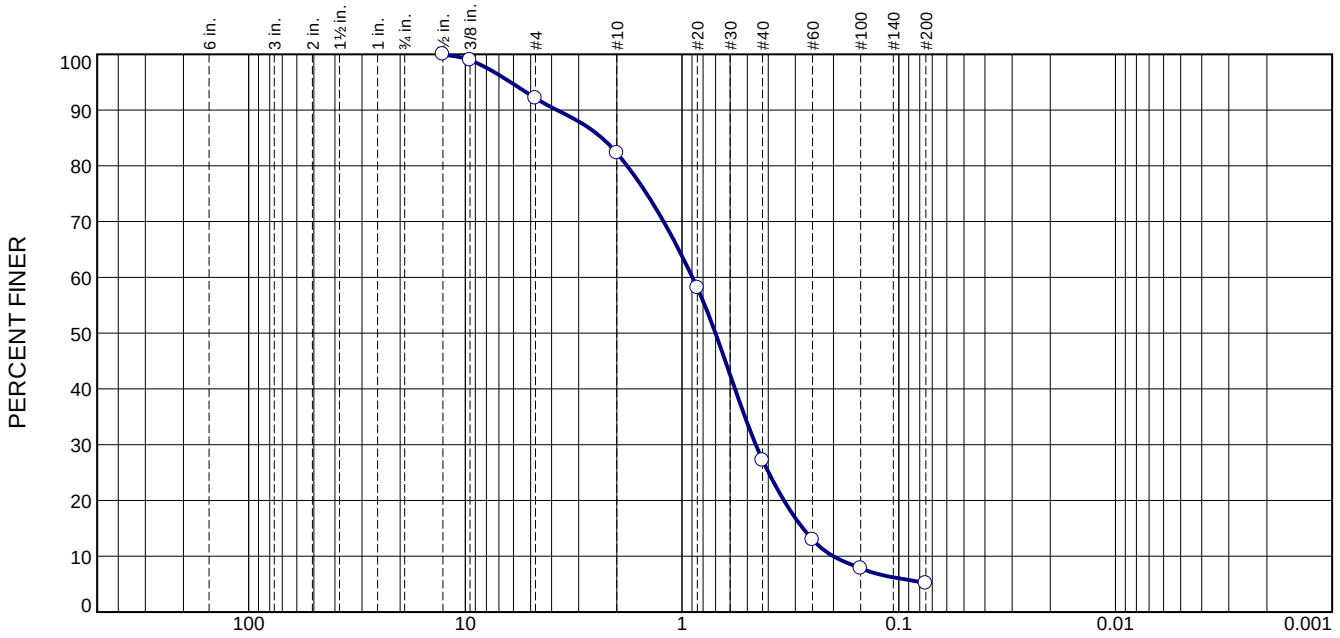
CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No.: 51115.294936

Tested By: ○ KMS/MBP □ KMS **Checked By:** MBP

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	7.9	9.8	55.1	22.1	5.1	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
0.5	100.0		
.375	99.0		
#4	92.1		
#10	82.3		
#20	58.1		
#40	27.2		
#60	13.0		
#100	7.8		
#200	5.1		

* (no specification provided)

Material Description

Red-brown poorly graded sand with silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/6/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 15.9%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 3.7768 D_{85}= 2.3419

D_{60}= 0.8953 D_{50}= 0.7008

D_{30}= 0.4572 D_{15}= 0.2768

D_{10}= 0.2008

C_u= 4.46 C_c= 1.16

USCS (ASTM D2487)

SP-SM

Date Sampled: 7/6/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD24-CAD-04 **Depth:** 41.7

Sample Number: SS-09

CDM Smith

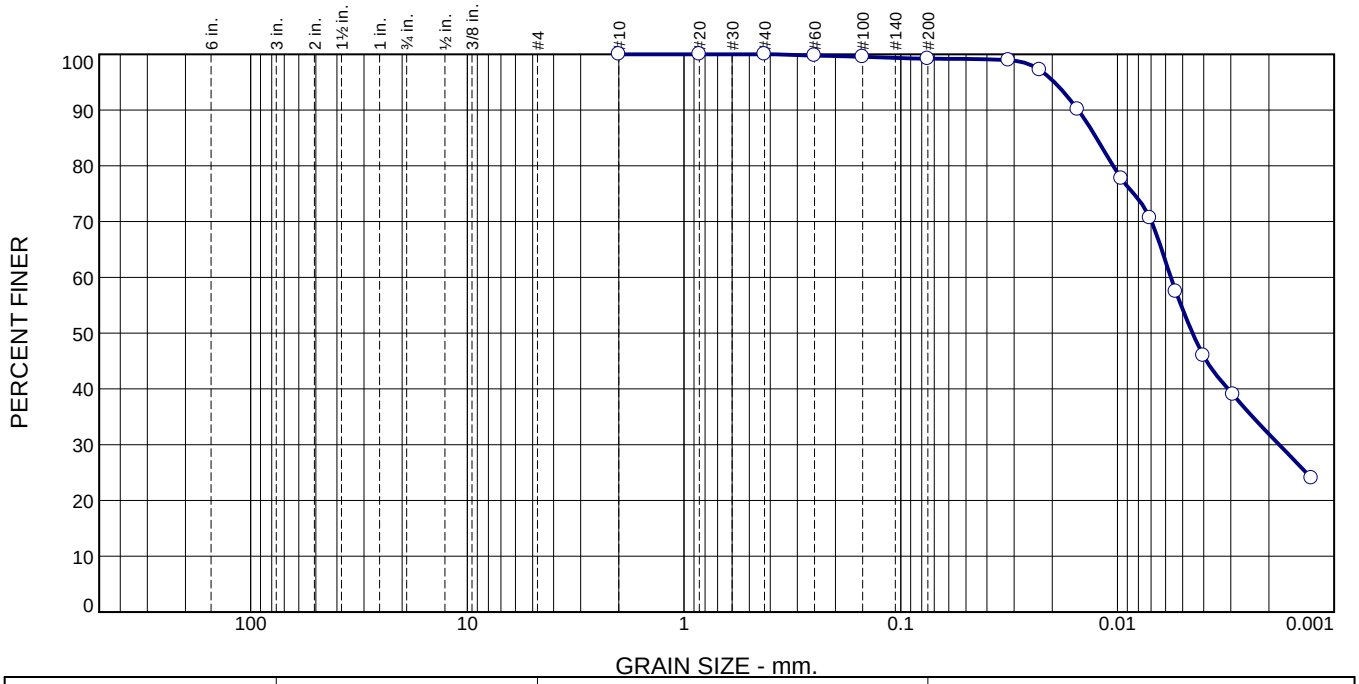
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.0	0.8	67.3	31.9

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	100.0		
#40	100.0		
#60	99.8		
#100	99.5		
#200	99.2		
0.0318 mm.	98.9		
0.0228 mm.	97.2		
0.0153 mm.	90.1		
0.0096 mm.	77.7		
0.0071 mm.	70.7		
0.0054 mm.	57.4		
0.0040 mm.	46.0		
0.0029 mm.	39.0		
0.0013 mm.	24.0		

· (no specification provided)

Material Description
Red-brown lean clay

Atterberg (ASTM D4318)
PL= 23 **LL=** 44 **PI=** 21

Coefficients
D_{90}= 0.0152 D_{85}= 0.0125
D_{60}= 0.0057 D_{50}= 0.0045
D_{30}= 0.0018 D_{15}=
D_{10}=
C_u= C_c=

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/10/24 **Technician:** KMS

Test Notes
As Received Moisture Content = 36.7%
Layers of clay and silt

Hydrometer Test (ASTM D7928)

Test Date: 9/9/24 **Technician:** KMS

USCS (ASTM D2487)
CL

Date Sampled: 7/6/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

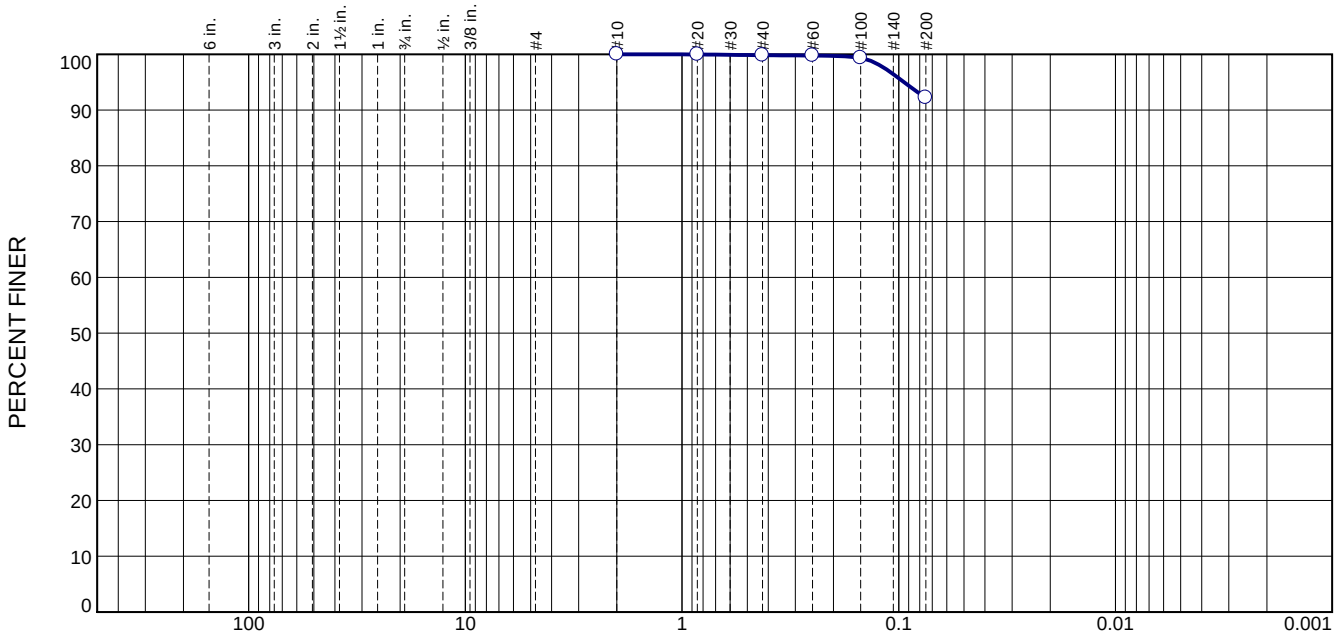
Source of Sample: FD24-CAD-04 **Depth:** 63.3'
Sample Number: SS-13

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.2	7.6	92.2	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	100.0		
#40	99.8		
#60	99.8		
#100	99.3		
#200	92.2		

* (no specification provided)

Material Description

Red-brown silt

Atterberg (ASTM D4318)

PL= LL=NV PI=

Coefficients

D_{90}= D_{85}=

D_{60}= D_{50}=

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/6/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 28.4%

USCS (ASTM D2487)

ML

Date Sampled: 7/6/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD24-CAD-04 **Depth:** 73'

Sample Number: SS-15

CDM Smith

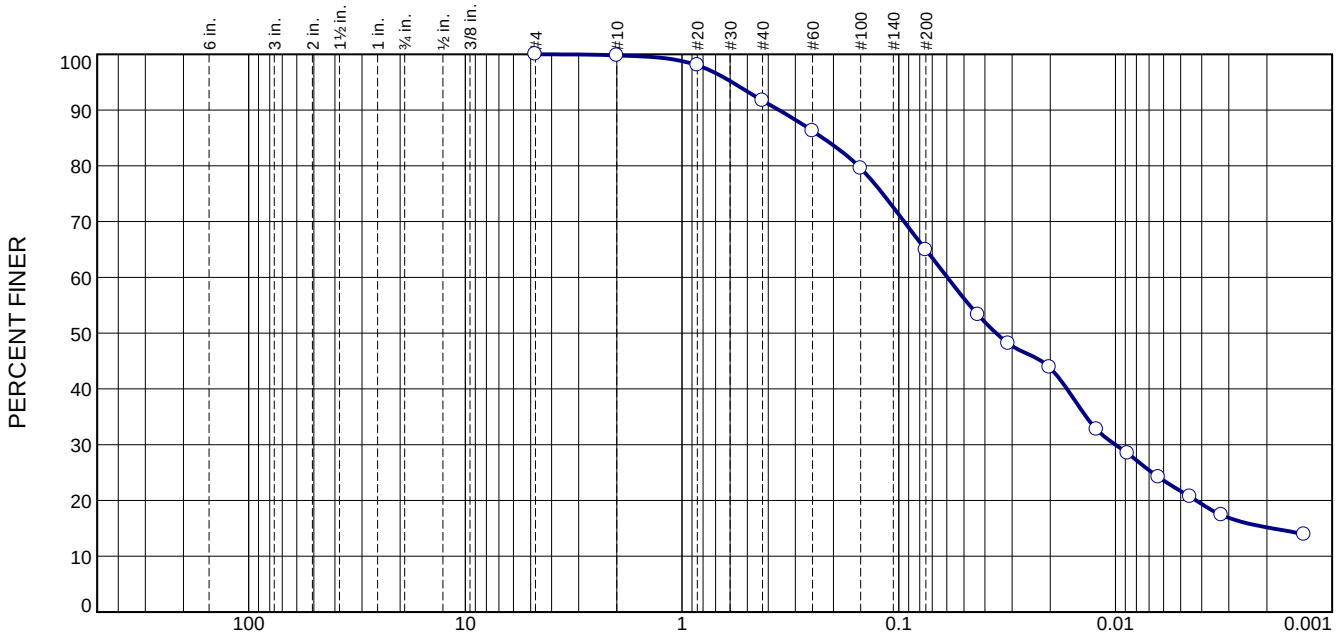
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	8.1	26.8	49.7	15.2

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	99.8		
#20	98.0		
#40	91.7		
#60	86.3		
#100	79.6		
#200	64.9		
0.0431 mm.	53.3		
0.0312 mm.	48.2		
0.0202 mm.	43.9		
0.0122 mm.	32.7		
0.0088 mm.	28.5		
0.0063 mm.	24.2		
0.0045 mm.	20.7		
0.0032 mm.	17.4		
0.0013 mm.	13.9		

· (no specification provided)

Material Description

Dark gray sandy organic clay

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/10/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 51.3%

Hydrometer Test (ASTM D7928)

Test Date: 9/9/24 **Technician:** KMS

Atterberg (ASTM D4318)

PL= 31 **LL=** 73 **PI=** 42

Coefficients

D_{90}= 0.3573 D_{85}= 0.2242

D_{60}= 0.0597 D_{50}= 0.0356

D_{30}= 0.0100 D_{15}= 0.0019

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

OH

Date Sampled: 7/27/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD24-CAD-05 **Depth:** 6'

Sample Number: SS-02

CDM Smith

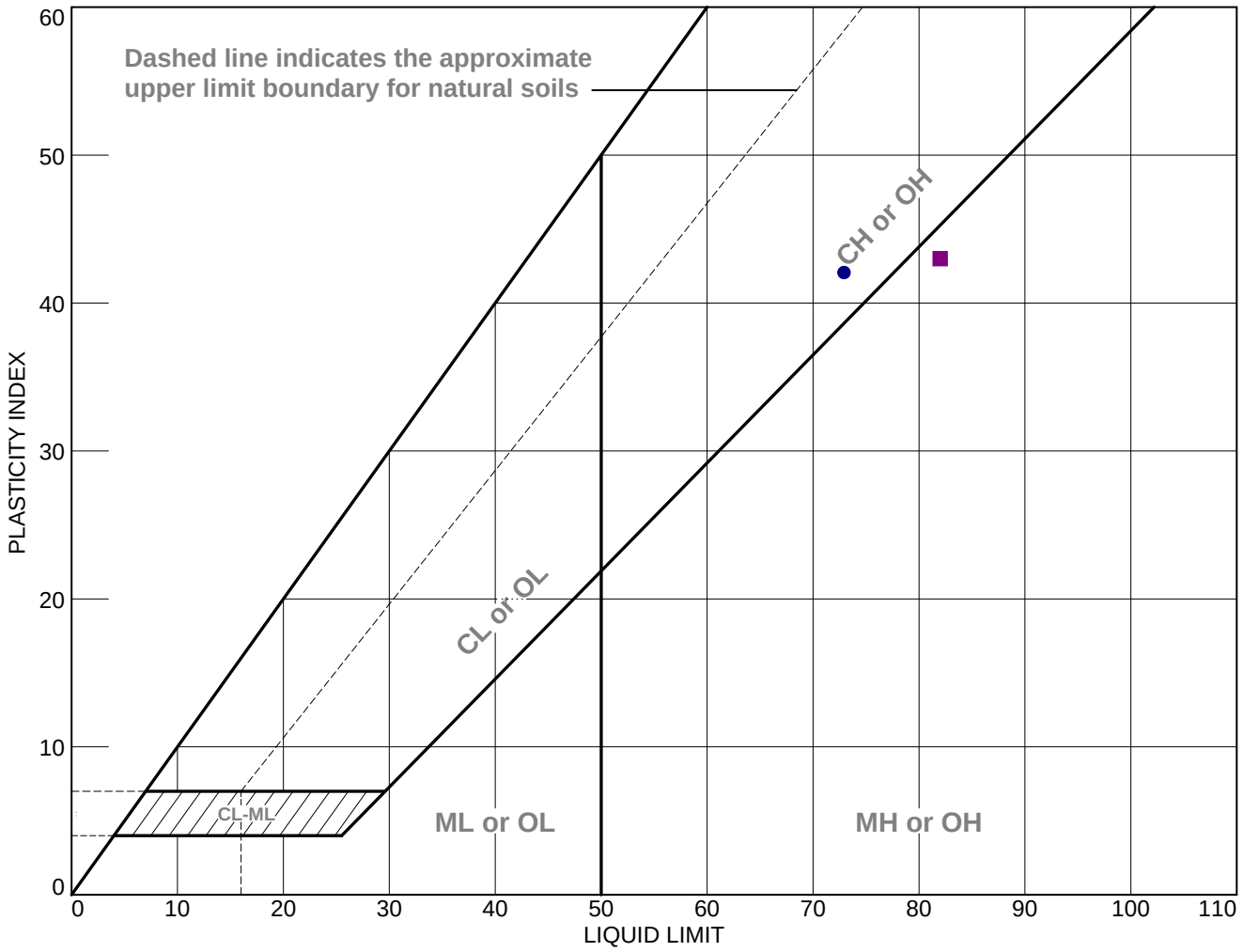
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	FD24-CAD-05	SS-02	6'	51.3	31	73	42	OH
■	FD24-CAD-05	SS-08	35'	99.3	39	82	43	OH

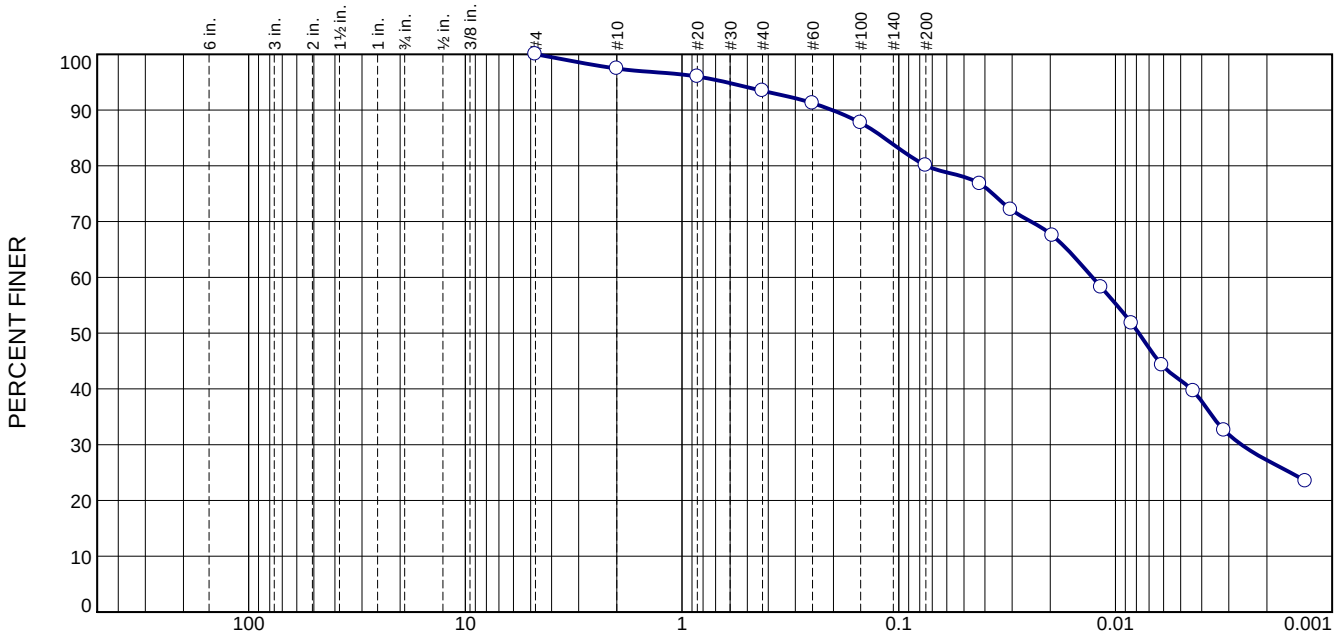
CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No.: 51115.294936

Tested By: ○ KMS/MBP □ KMS **Checked By:** MBP

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	2.6	4.0	13.3	52.9	27.2

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	97.4		
#20	96.0		
#40	93.4		
#60	91.2		
#100	87.7		
#200	80.1		
0.0422 mm.	76.8		
0.0304 mm.	72.2		
0.0195 mm.	67.5		
0.0117 mm.	58.2		
0.0084 mm.	51.7		
0.0061 mm.	44.2		
0.0044 mm.	39.6		
0.0032 mm.	32.6		
0.0013 mm.	23.5		

· (no specification provided)

Material Description

Dark gray organic silt with sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/10/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 99.3%

Hydrometer Test (ASTM D7928)

Test Date: 9/9/24 **Technician:** KMS

Atterberg (ASTM D4318)

PL= 39 **LL=** 82 **PI=** 43

Coefficients

D_{90}= 0.2029 D_{85}= 0.1167

D_{60}= 0.0128 D_{50}= 0.0078

D_{30}= 0.0026 D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

OH

Date Sampled: 7/27/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD24-CAD-05 **Depth:** 35'

Sample Number: SS-08

CDM Smith

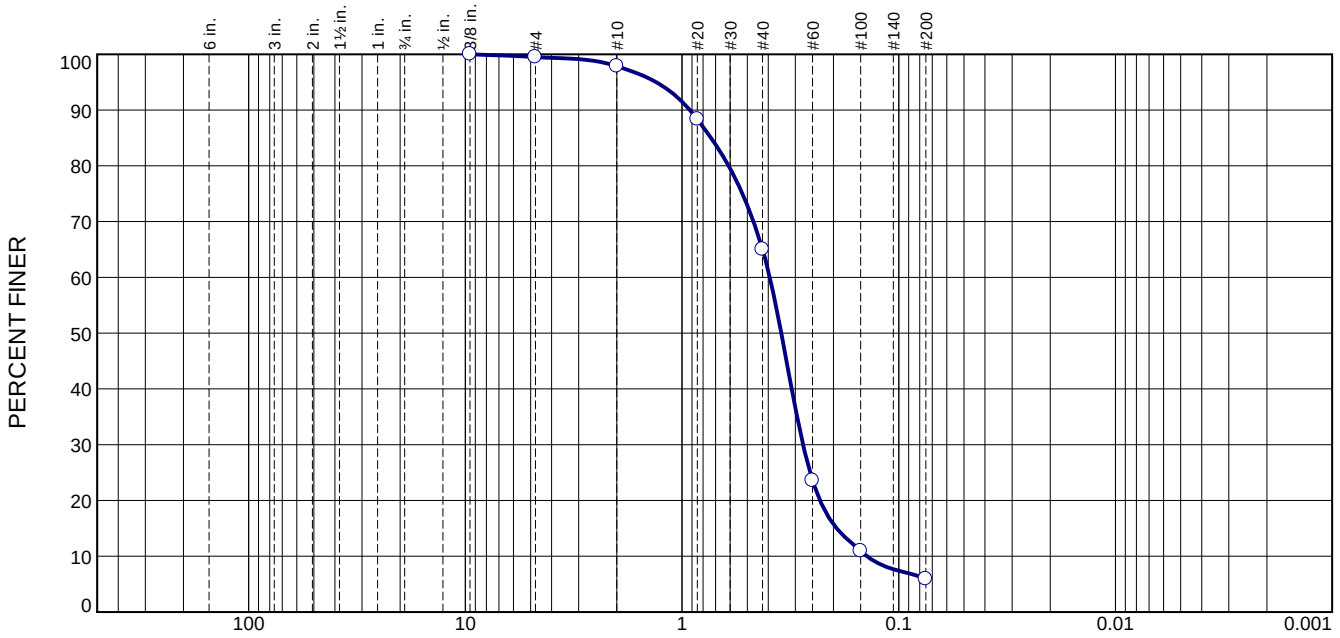
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.5	1.6	32.9	59.1	5.9	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
.375	100.0		
#4	99.5		
#10	97.9		
#20	88.3		
#40	65.0		
#60	23.6		
#100	11.0		
#200	5.9		

* (no specification provided)

Material Description

Dark gray poorly graded sand with silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/6/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 23.6%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 0.9201 D_{85}= 0.7348

D_{60}= 0.3936 D_{50}= 0.3486

D_{30}= 0.2765 D_{15}= 0.1936

D_{10}= 0.1404

C_u= 2.80 C_c= 1.38

USCS (ASTM D2487)

SP-SM

Date Sampled: 7/27/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD24-CAD-05 **Depth:** 40'

Sample Number: SS-09

CDM Smith

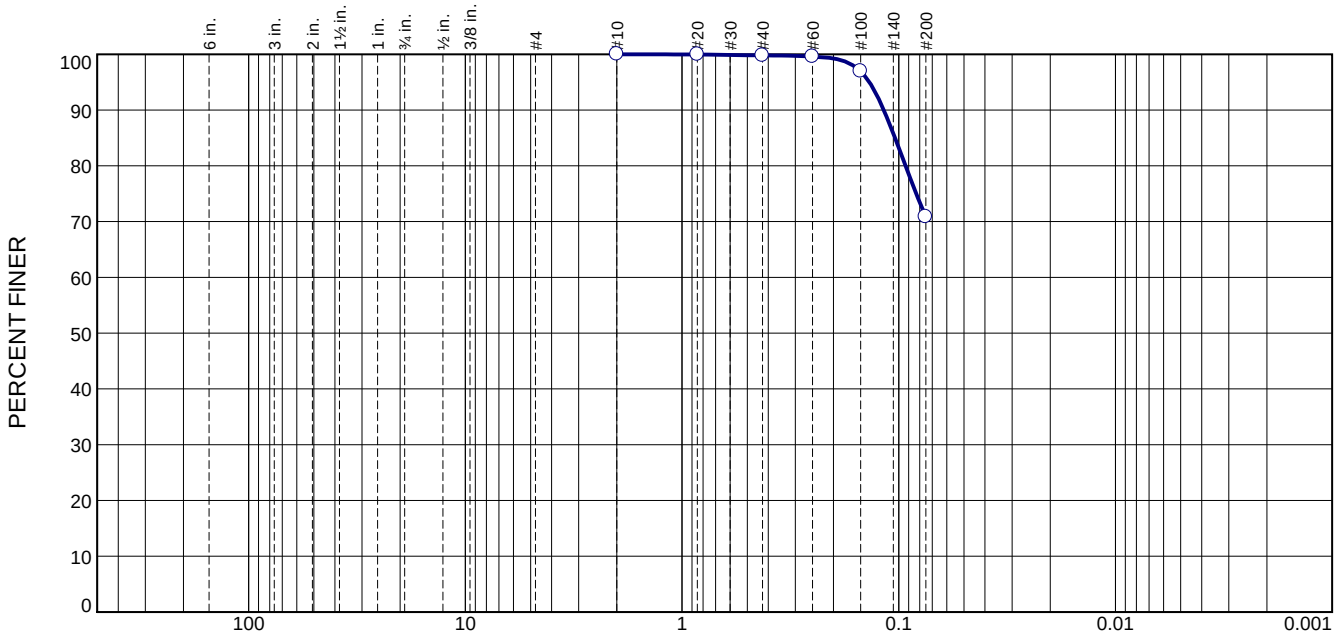
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.2	28.9	70.9	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	100.0		
#40	99.8		
#60	99.6		
#100	97.0		
#200	70.9		

* (no specification provided)

Material Description
Red-brown silt with sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/6/24 **Technician:** KMS

Test Notes
As Received Moisture Content = 24.6%

Atterberg (ASTM D4318)
PL= **LL=**NV **PI=**

Coefficients
D_{90}= 0.1173 D_{85}= 0.1040
D_{60}= D_{50}=
D_{30}= D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
ML

Date Sampled: 7/27/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

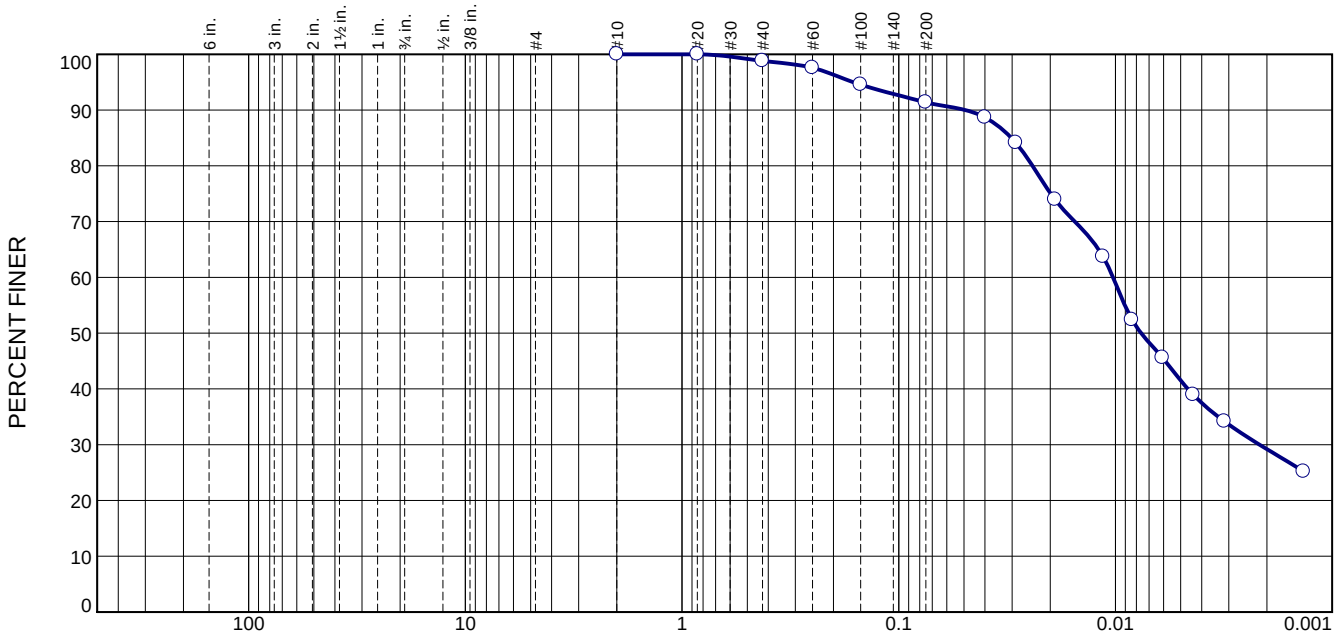
Source of Sample: FD24-CAD-05 **Depth:** 55'
Sample Number: SS-12

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.2	7.4	62.2	29.2

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	100.0		
#40	98.8		
#60	97.6		
#100	94.5		
#200	91.4		
0.0400 mm.	88.7		
0.0288 mm.	84.1		
0.0190 mm.	73.9		
0.0114 mm.	63.7		
0.0084 mm.	52.4		
0.0061 mm.	45.6		
0.0044 mm.	38.9		
0.0031 mm.	34.2		
0.0014 mm.	25.2		

· (no specification provided)

Material Description
Dark gray organic silt

Atterberg (ASTM D4318)
PL= 43 **LL=** 89 **PI=** 46

Coefficients
D_{90}= 0.0492 D_{85}= 0.0302
D_{60}= 0.0103 D_{50}= 0.0076
D_{30}= 0.0022 D_{15}=
D_{10}=
C_u= C_c=

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/10/24 **Technician:** KMS

Test Notes
As Received Moisture Content = 101.8%

Hydrometer Test (ASTM D7928)

Test Date: 9/9/24 **Technician:** KMS

USCS (ASTM D2487)
OH

Date Sampled: 7/5/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

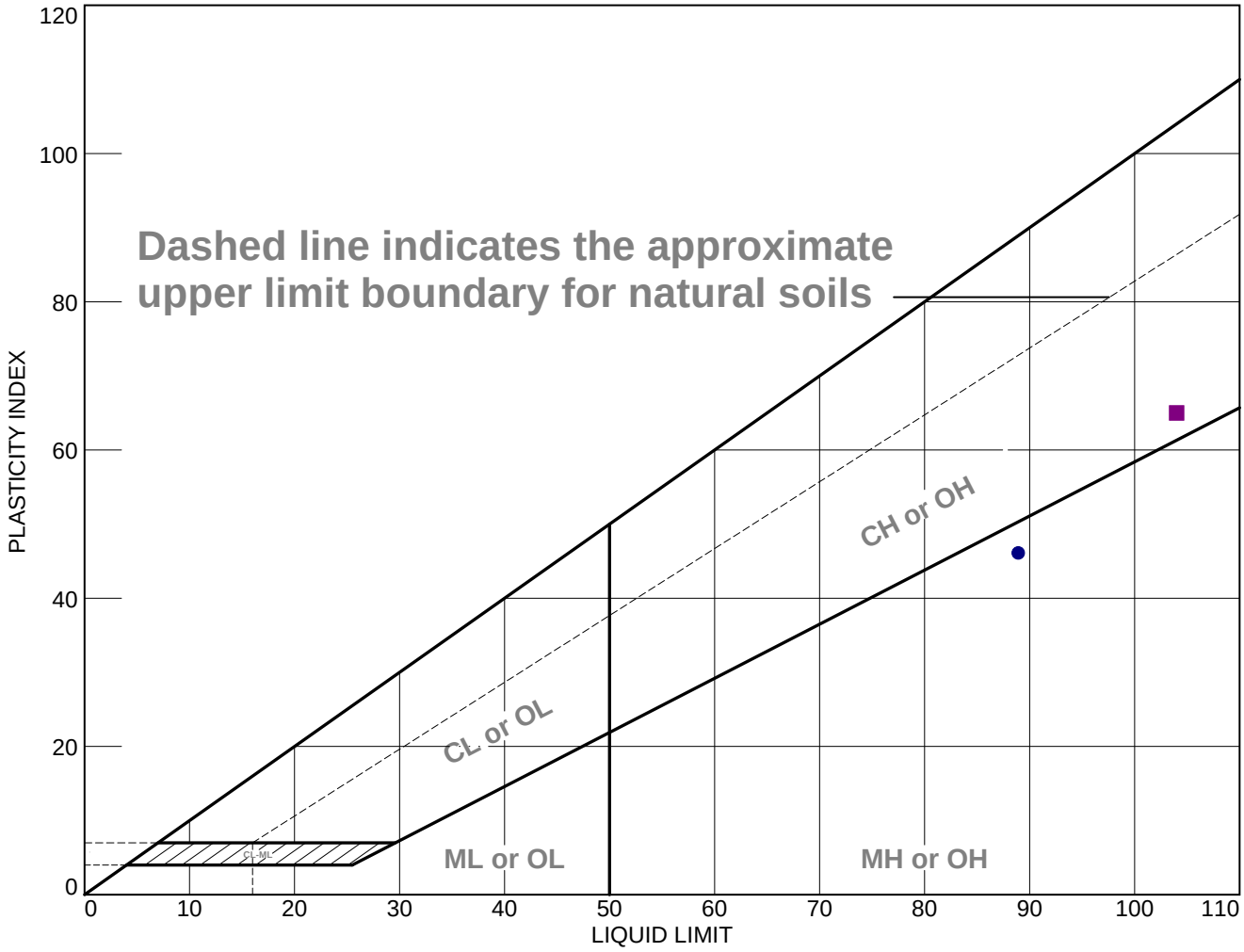
Source of Sample: FD24-CAD-06 **Depth:** 5.7'
Sample Number: SS-02

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	FD24-CAD-06	SS-02	5.7'	101.8	43	89	46	OH
■	FD24-CAD-06	SS-06	25.7'	89.5	39	104	65	OH

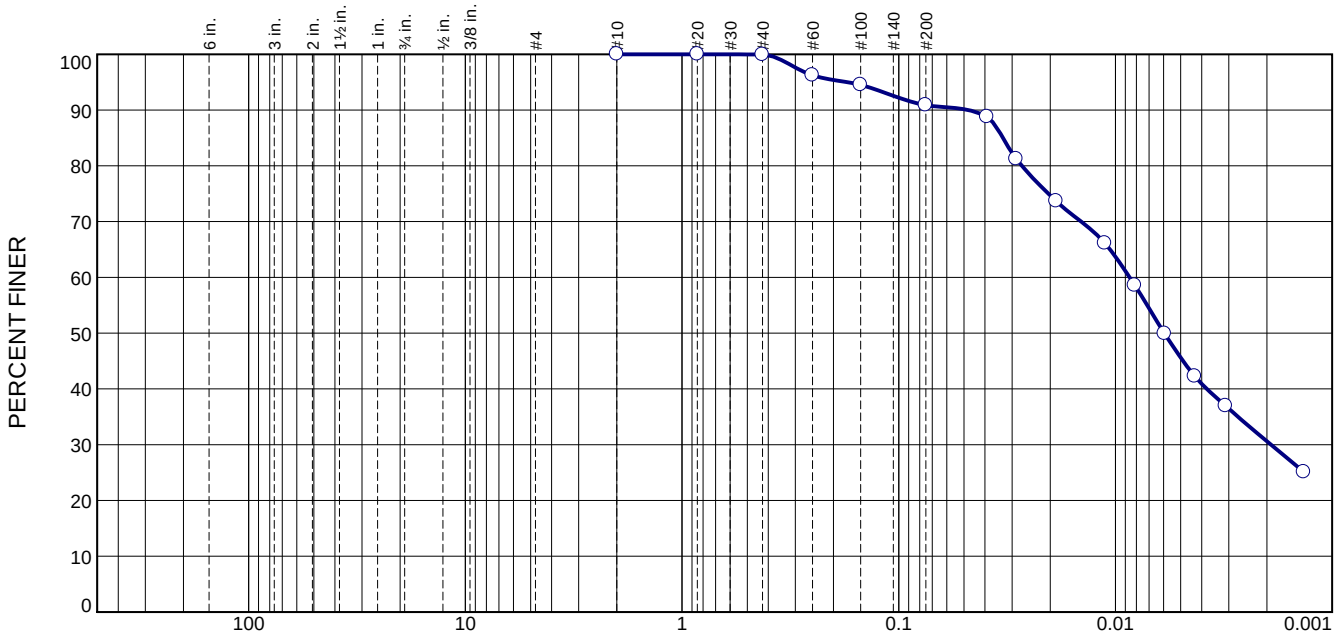
CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No.: 51115.294936

Tested By: ○ KMS/MBP □ KMS **Checked By:** MBP

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.1	9.0	60.3	30.6

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	100.0		
#40	99.9		
#60	96.2		
#100	94.5		
#200	90.9		
0.0392 mm.	88.8		
0.0287 mm.	81.2		
0.0188 mm.	73.7		
0.0112 mm.	66.1		
0.0081 mm.	58.5		
0.0059 mm.	49.9		
0.0043 mm.	42.3		
0.0031 mm.	37.0		
0.0013 mm.	25.1		

· (no specification provided)

Material Description
Dark gray organic clay

Atterberg (ASTM D4318)
PL= 39 **LL=** 104 **PI=** 65

Coefficients
D_{90}= 0.0477 D_{85}= 0.0330
D_{60}= 0.0086 D_{50}= 0.0060
D_{30}= 0.0019 D_{15}=
D_{10}=
C_u= C_c=

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/10/24 **Technician:** KMS

Test Notes
As Received Moisture Content = 89.5%

Hydrometer Test (ASTM D7928)

Test Date: 9/9/24 **Technician:** KMS

USCS (ASTM D2487)
OH

Date Sampled: 7/5/24
Date Received: 8/23/24
Checked By: MBP
Title: Lab Manager

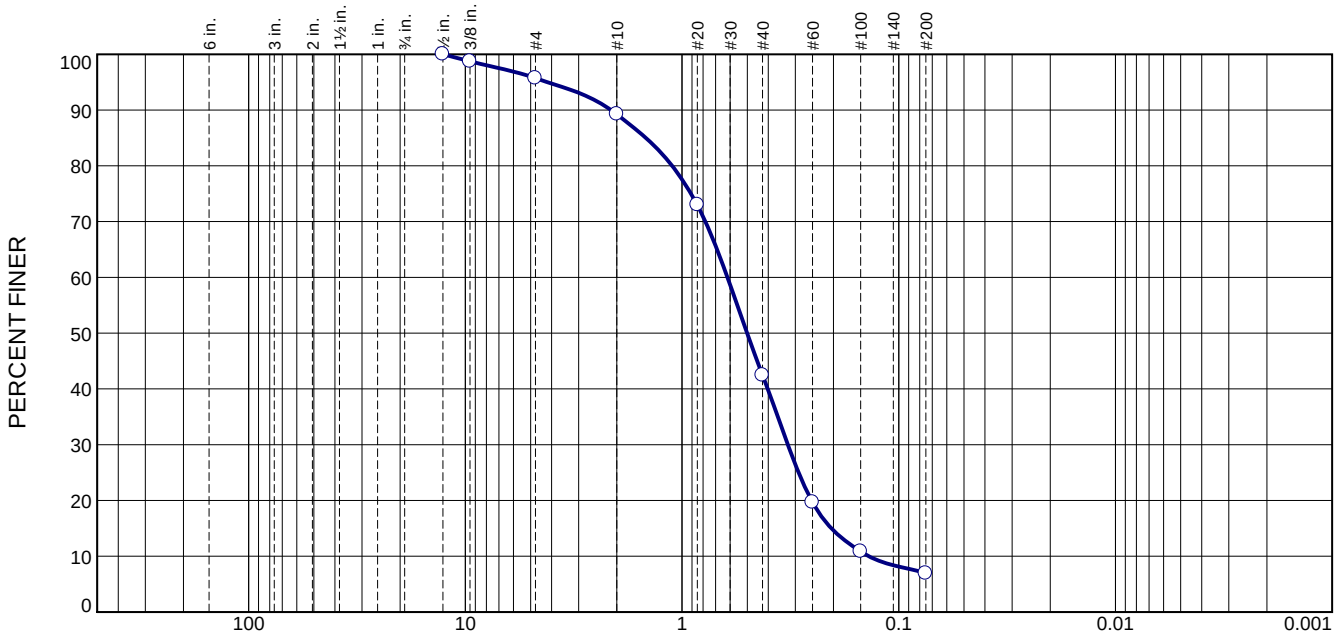
Source of Sample: FD24-CAD-06 **Depth:** 25.7'
Sample Number: SS-06

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	4.3	6.5	46.8	35.5	6.9	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
0.5	100.0		
.375	98.7		
#4	95.7		
#10	89.2		
#20	73.0		
#40	42.4		
#60	19.7		
#100	10.9		
#200	6.9		

* (no specification provided)

Material Description

Red-brown poorly graded sand with silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/6/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 19.3%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 2.1248 D_{85}= 1.4692

D_{60}= 0.6173 D_{50}= 0.5010

D_{30}= 0.3248 D_{15}= 0.2048

D_{10}= 0.1378

C_u= 4.48 C_c= 1.24

USCS (ASTM D2487)

SP-SM

Date Sampled: 7/5/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD24-CAD-06 **Depth:** 40.7'

Sample Number: SS-09

CDM Smith

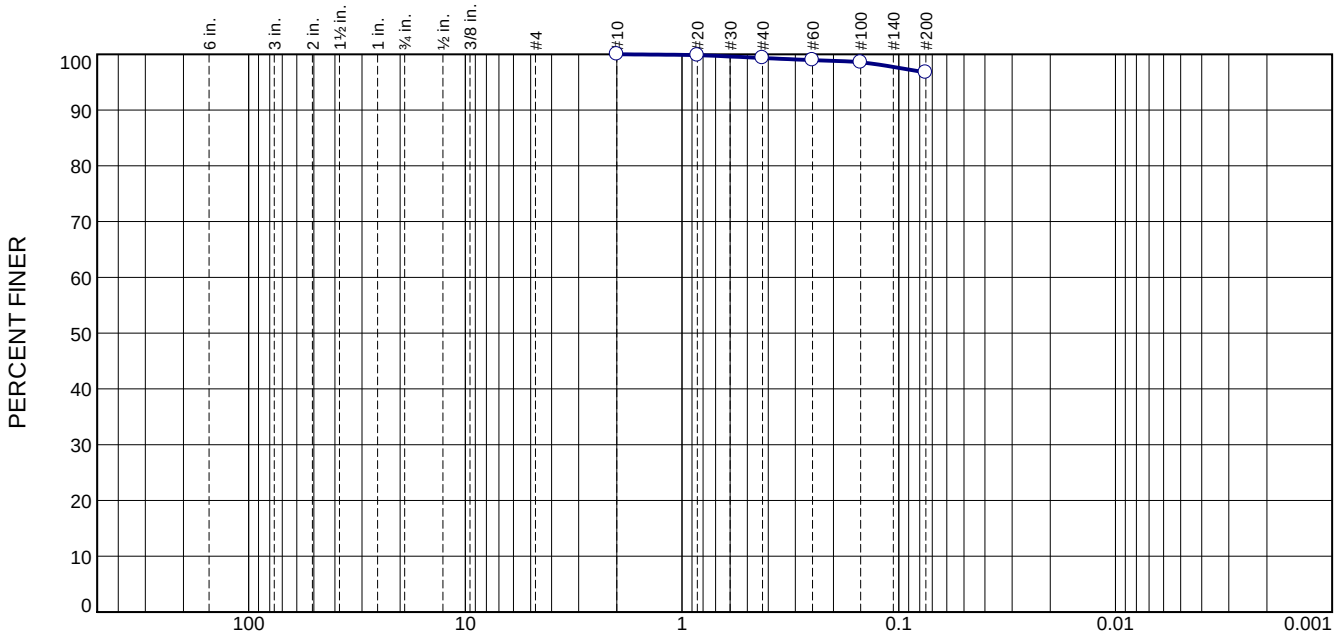
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.7	2.6	96.7	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	99.8		
#40	99.3		
#60	98.9		
#100	98.6		
#200	96.7		

* (no specification provided)

Material Description

Red-brown silt

Atterberg (ASTM D4318)

PL= LL=NV PI=

Coefficients

D_{90}= D_{85}=

D_{60}= D_{50}=

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/6/24 **Technician:** KMS

Test Notes

As Received Moisture Content = 29.5%

USCS (ASTM D2487)

ML

Date Sampled: 7/5/24

Date Received: 8/23/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD24-CAD-06 **Depth:** 56.0'

Sample Number: SS-12

CDM Smith

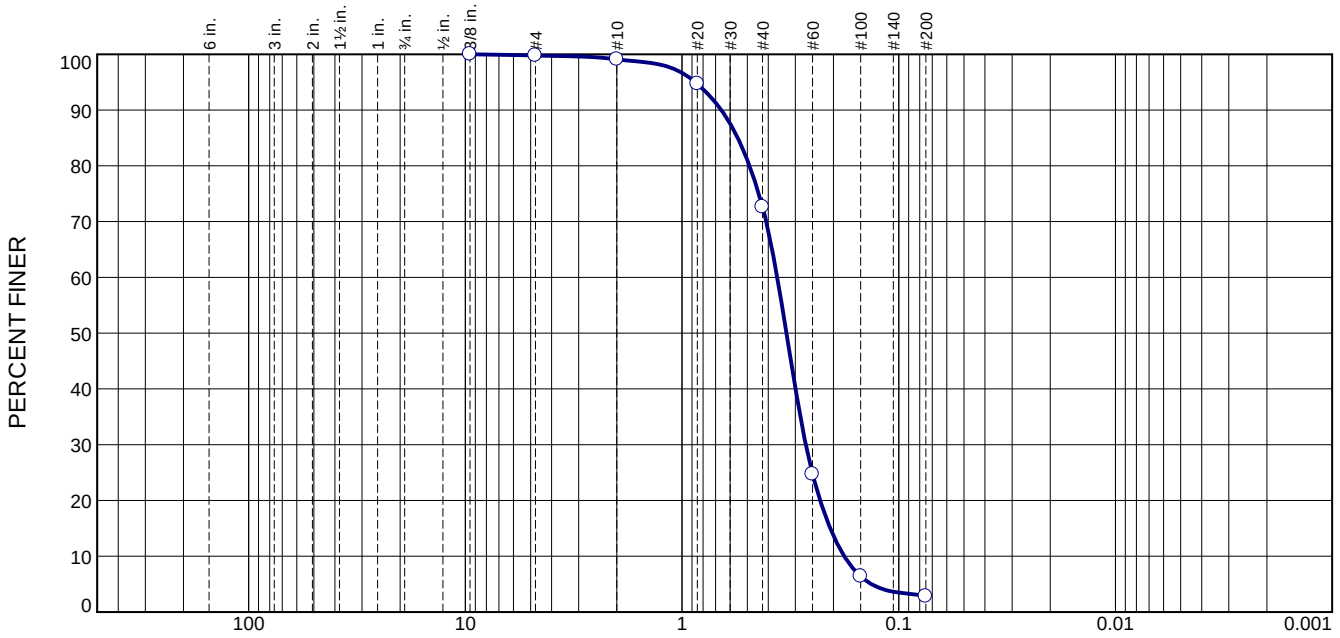
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.7	26.5	69.8	2.8	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
.375	100.0		
#4	99.8		
#10	99.1		
#20	94.7		
#40	72.6		
#60	24.7		
#100	6.4		
#200	2.8		

* (no specification provided)

Material Description

Gray-Brown poorly graded sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/10/24 **Technician:** KMS

Test Notes

As Recieved Moisture Content = 23.8%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 0.6587 D_{85}= 0.5533

D_{60}= 0.3640 D_{50}= 0.3298

D_{30}= 0.2687 D_{15}= 0.2071

D_{10}= 0.1786

C_u= 2.04 C_c= 1.11

USCS (ASTM D2487)

SP

Source of Sample: FD-24-RC-01 **Depth:** 1.7'
Sample Number: SS-01

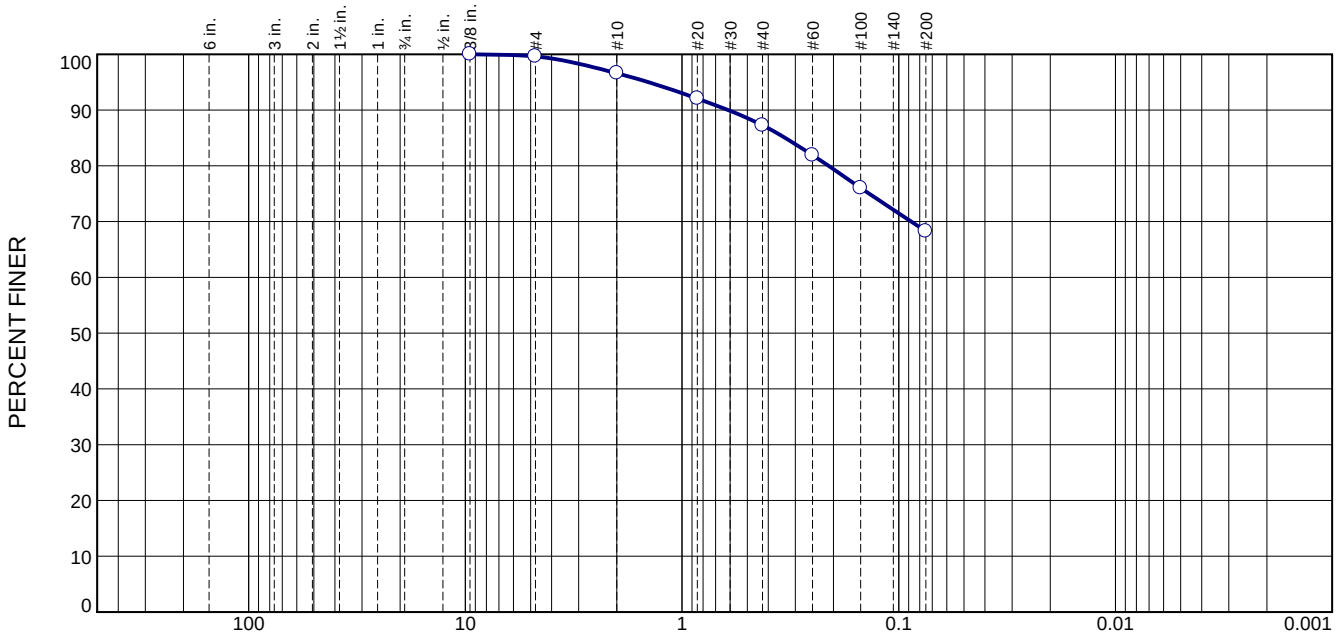
Date Sampled: 8/23/24
Date Received: 9/9/24
Checked By: MBP
Title: Lab Manager

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.4	3.0	9.3	19.0	68.3	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
.375	100.0		
#4	99.6		
#10	96.6		
#20	92.1		
#40	87.3		
#60	81.9		
#100	76.0		
#200	68.3		

* (no specification provided)

Material Description
Gray sandy silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/10/24 **Technician:** KMS

Test Notes
As Recieved Moisture Content = 89.2%

Atterberg (ASTM D4318)
PL= **LL=**NV **PI=**

Coefficients
D_{90}= 0.6130 D_{85}= 0.3343
D_{60}= D_{50}=
D_{30}= D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
ML

Date Sampled: 8/31/24
Date Received: 9/9/24
Checked By: MBP
Title: Lab Manager

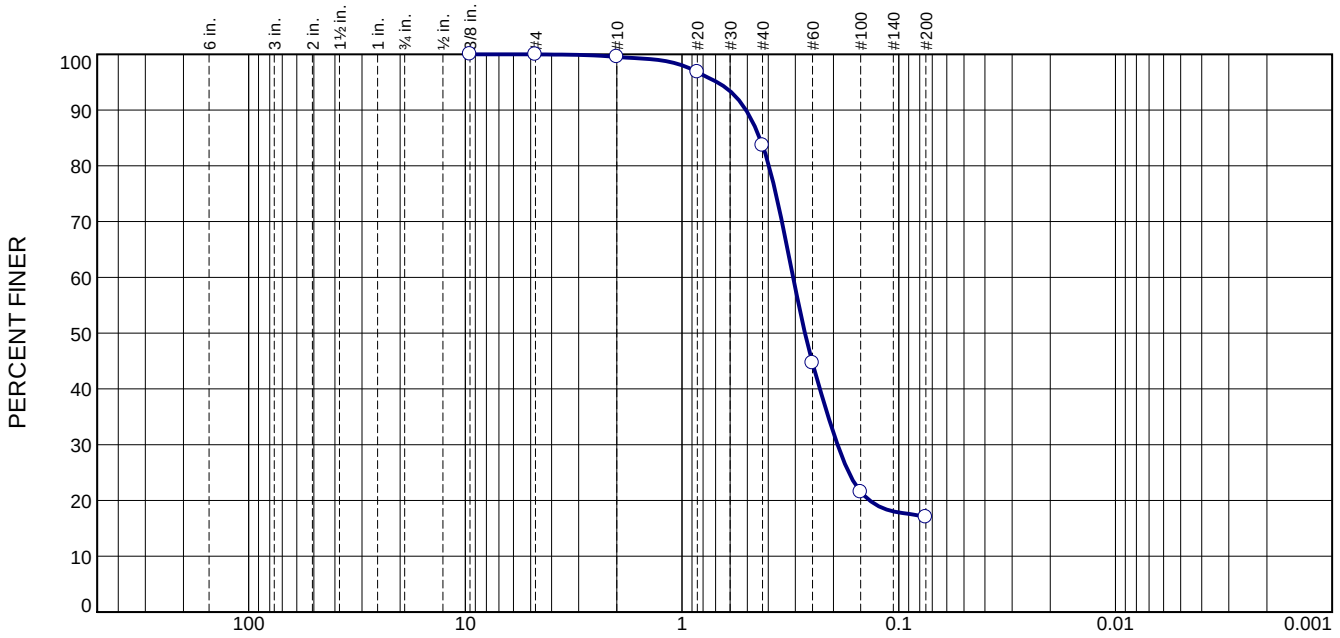
Source of Sample: FD-24-RC-02 **Depth:** 5.7'
Sample Number: SS-02

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.5	15.8	66.7	17.0	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
.375	100.0		
#4	100.0		
#10	99.5		
#20	96.8		
#40	83.7		
#60	44.6		
#100	21.5		
#200	17.0		

* (no specification provided)

Material Description
Dark Gray silty sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/10/24 **Technician:** KMS

Test Notes
As Recieved Moisture Content = 26.8%

Atterberg (ASTM D4318)
PL= **LL=**NV **PI=**

Coefficients
D_{90}= 0.5071 D_{85}= 0.4381
D_{60}= 0.3071 D_{50}= 0.2709
D_{30}= 0.1917 D_{15}=
D_{10}=
C_u= C_c=

USCS (ASTM D2487)
SM

Source of Sample: FD-24-RC-03 **Depth:** 2'
Sample Number: SS-01

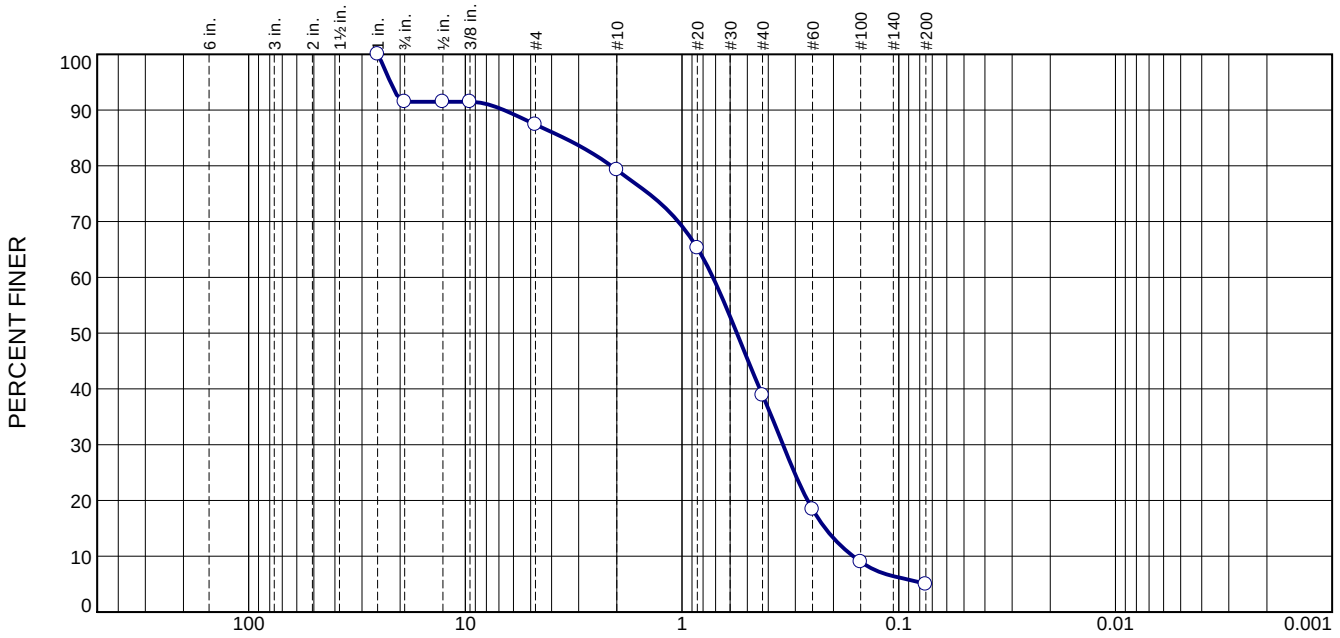
Date Sampled: 7/15/24
Date Received: 9/9/24
Checked By: MBP
Title: Lab Manager

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	8.5	4.1	8.1	40.4	33.9	5.0	

Test Results (ASTM D6913 & D1140)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1	100.0		
.75	91.5		
.5	91.5		
.375	91.5		
#4	87.4		
#10	79.3		
#20	65.3		
#40	38.9		
#60	18.4		
#100	9.0		
#200	5.0		

* (no specification provided)

Material Description

Dark Gray poorly graded sand with silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/10/24 **Technician:** KMS

Test Notes

As Recieved Moisture Content = 17.4%

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 6.6317 D_{85}= 3.5049

D_{60}= 0.7200 D_{50}= 0.5586

D_{30}= 0.3423 D_{15}= 0.2183

D_{10}= 0.1625

C_u= 4.43 C_c= 1.00

USCS (ASTM D2487)

SP-SM

Date Sampled: 7/15/24

Date Received: 9/9/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-RC-03 **Depth:** 7.9'

Sample Number: SS-05

CDM Smith

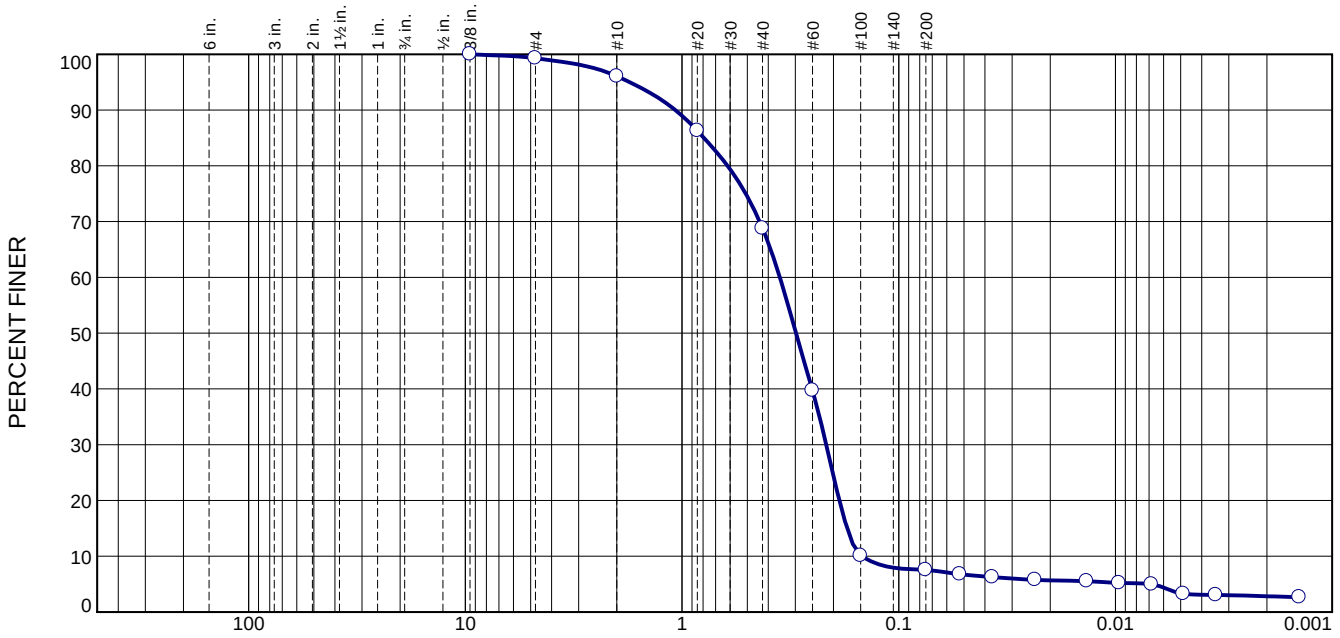
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.7	3.2	27.3	61.3	4.7	2.8

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
.375	100.0		
#4	99.3		
#10	96.1		
#20	86.3		
#40	68.8		
#60	39.7		
#100	10.1		
#200	7.5		
0.0522 mm.	6.8		
0.0370 mm.	6.3		
0.0235 mm.	5.8		
0.0136 mm.	5.5		
0.0096 mm.	5.2		
0.0068 mm.	5.0		
0.0049 mm.	3.3		
0.0034 mm.	3.1		
0.0014 mm.	2.7		

· (no specification provided)

Material Description

Gray poorly graded sand with silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/11/24 **Technician:** KMS

Test Notes

As Recieved Moisture Content = 21.87%

Hydrometer Test (ASTM D7928)

Test Date: 9/10/24 **Technician:** KMS

Atterberg (ASTM D4318)

PL= NP **LL=** NP **PI=** NP

Coefficients

D_{90}= 1.0746 D_{85}= 0.7922

D_{60}= 0.3540 D_{50}= 0.2978

D_{30}= 0.2161 D_{15}= 0.1732

D_{10}= 0.1486

C_u= 2.38 C_c= 0.89

USCS (ASTM D2487)

SP-SM

Date Sampled: 8/16/24

Date Received: 9/9/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-RC-04 **Depth:** 2'

Sample Number: SS-02

CDM Smith

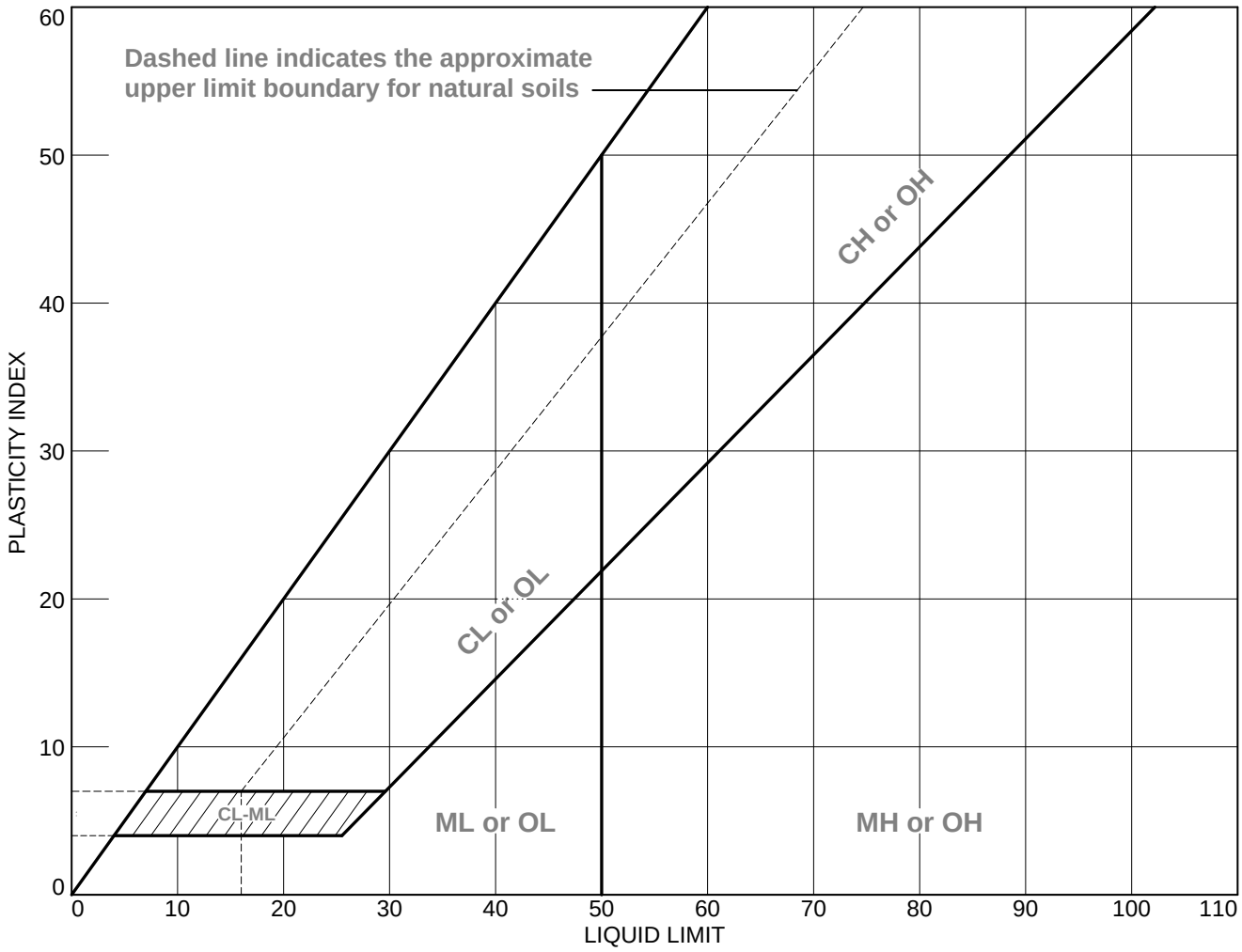
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	FD-24-RC-04	SS-02	2'	21.9	NP	NP	NP	SP-SM

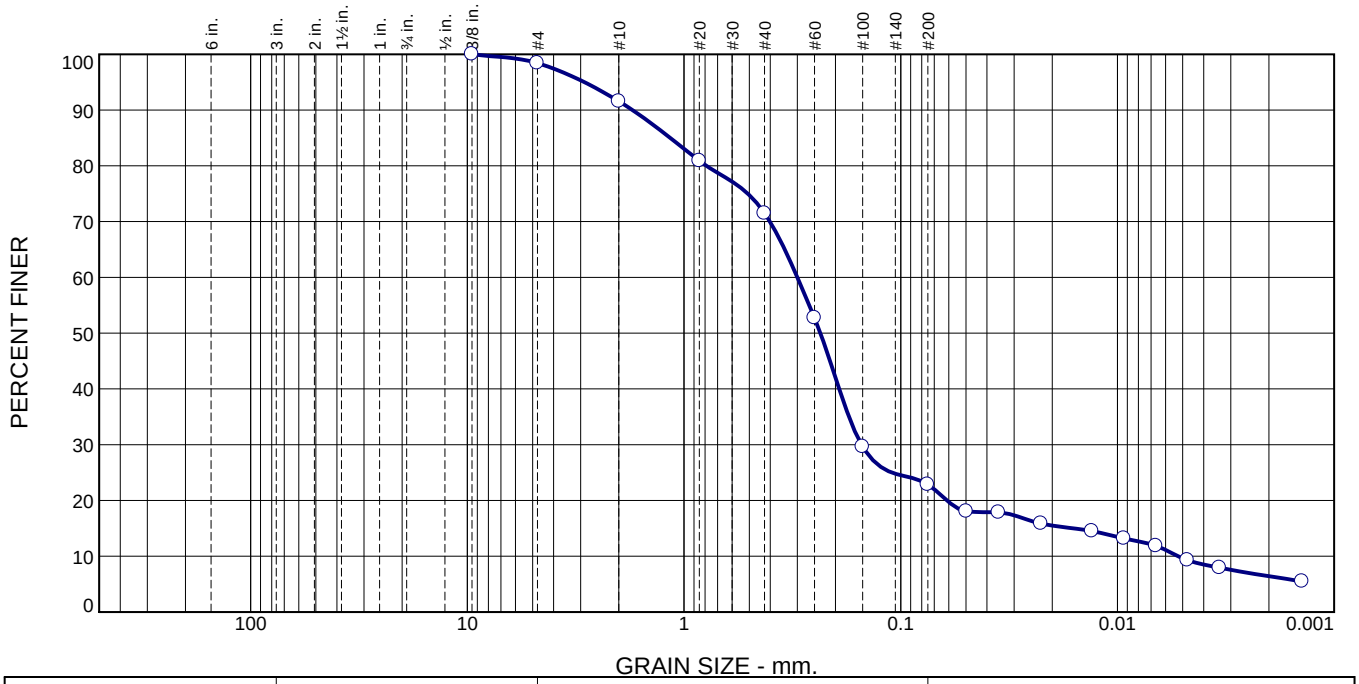
CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No.: 51115.294936

Tested By: KMS **Checked By:** MBP

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.6	6.8	20.1	48.6	16.5	6.4

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
.375	100.0		
#4	98.4		
#10	91.6		
#20	80.9		
#40	71.5		
#60	52.7		
#100	29.6		
#200	22.9		
0.0497 mm.	18.0		
0.0353 mm.	17.8		
0.0225 mm.	15.8		
0.0131 mm.	14.5		
0.0093 mm.	13.2		
0.0066 mm.	11.8		
0.0047 mm.	9.3		
0.0034 mm.	7.9		
0.0014 mm.	5.5		

* (no specification provided)

Material Description

Gray silty sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/11/24 **Technician:** KMS

Test Notes

As Recieved Moisture Content = 28.9%

Hydrometer Test (ASTM D7928)

Test Date: 9/10/24 **Technician:** KMS

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 1.7296 D_{85}= 1.1586

D_{60}= 0.3000 D_{50}= 0.2348

D_{30}= 0.1520 D_{15}= 0.0160

D_{10}= 0.0052

C_u= 57.20 C_c= 14.68

USCS (ASTM D2487)

SM

Date Sampled: 8/11/24

Date Received: 9/9/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-RC-05 **Depth:** 5.7'

Sample Number: SS-04

CDM Smith

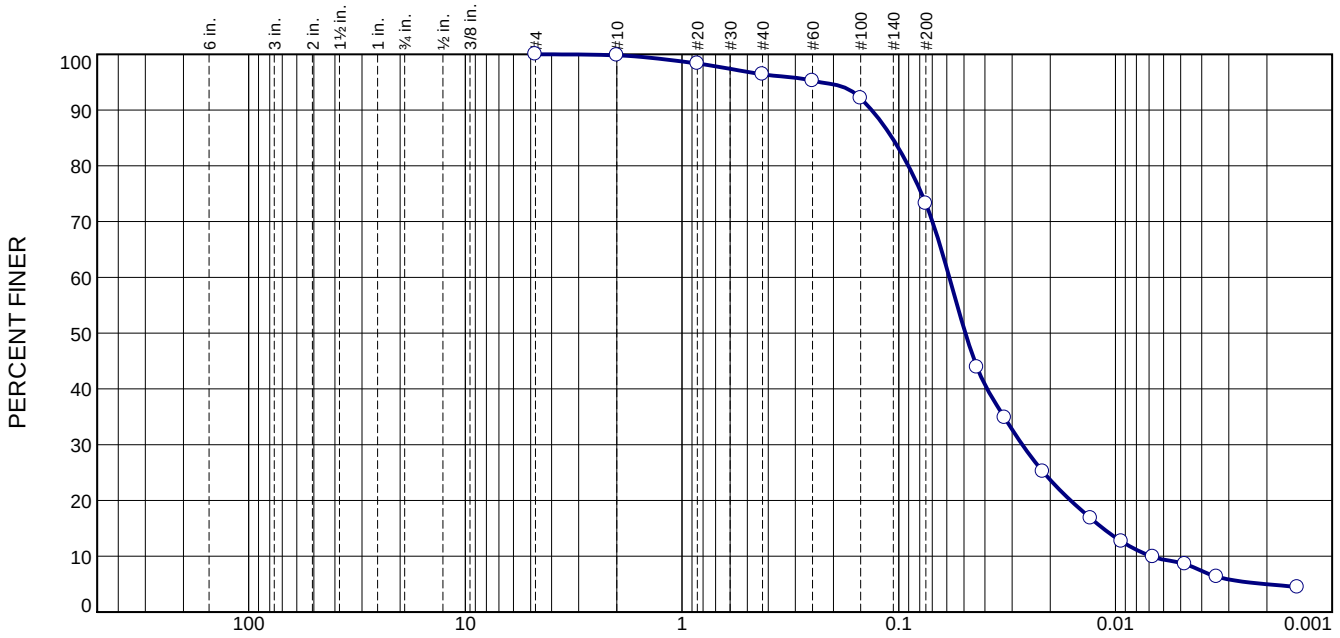
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	3.4	23.2	68.2	5.0

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	99.8		
#20	98.3		
#40	96.4		
#60	95.2		
#100	92.1		
#200	73.2		
0.0435 mm.	43.9		
0.0325 mm.	34.8		
0.0216 mm.	25.2		
0.0130 mm.	16.8		
0.0094 mm.	12.7		
0.0067 mm.	9.9		
0.0048 mm.	8.6		
0.0034 mm.	6.3		
0.0014 mm.	4.4		

· (no specification provided)

Material Description

Red-Brown silt with sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/10/24 **Technician:** KMS

Test Notes

As Recieved Moisture Content = 19.6%

Hydrometer Test (ASTM D7928)

Test Date: 9/10/24 **Technician:** KMS

Atterberg (ASTM D4318)

PL= NP **LL=** NP **PI=** NP

Coefficients

D_{90}= 0.1335 D_{85}= 0.1071

D_{60}= 0.0584 D_{50}= 0.0493

D_{30}= 0.0269 D_{15}= 0.0114

D_{10}= 0.0068

C_u= 8.55 C_c= 1.81

USCS (ASTM D2487)

ML

Date Sampled: 8/11/24

Date Received: 9/9/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-RC-05 **Depth:** 13.7'

Sample Number: SS-09

CDM Smith

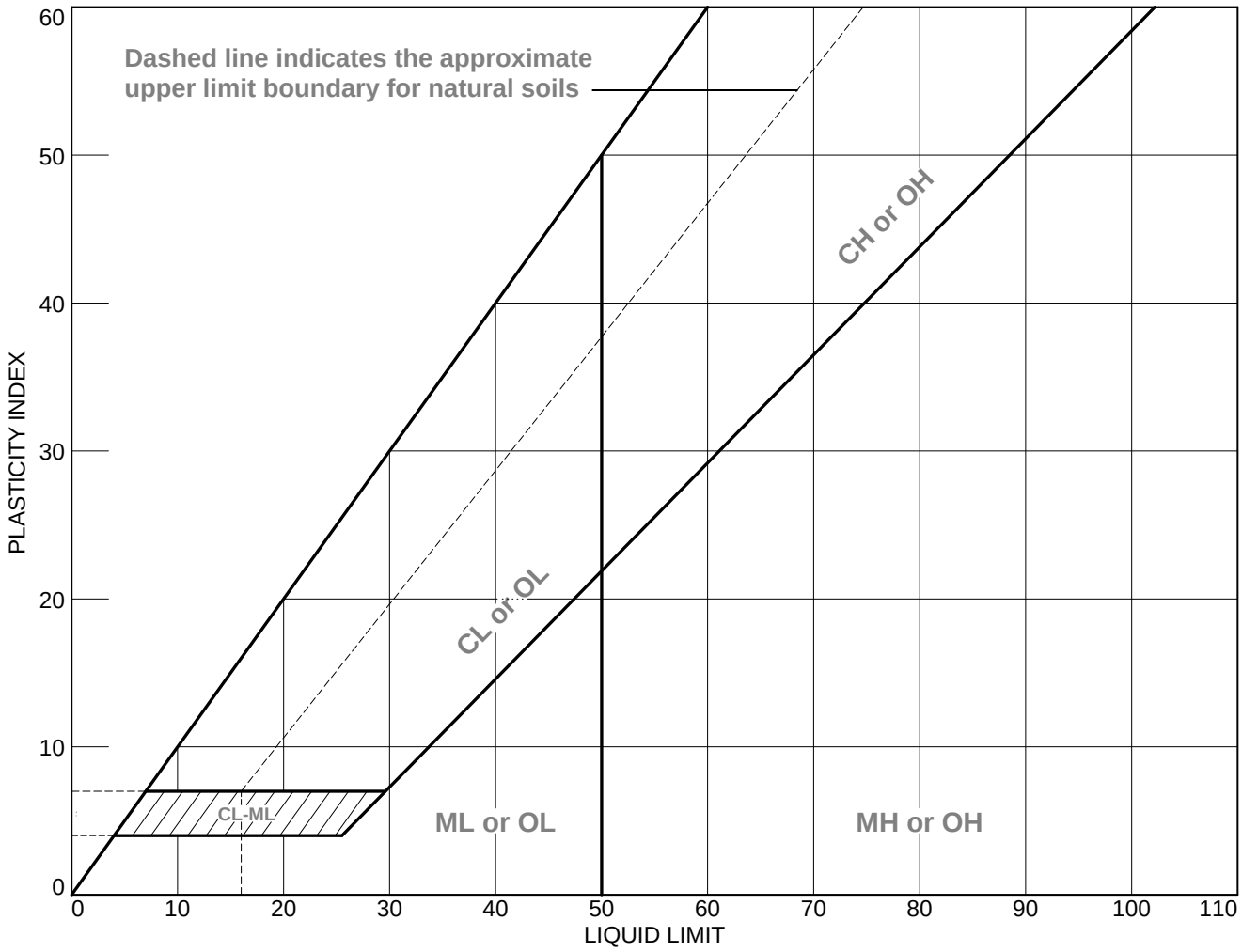
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	FD-24-RC-05	SS-09	13.7'	19.6	NP	NP	NP	ML

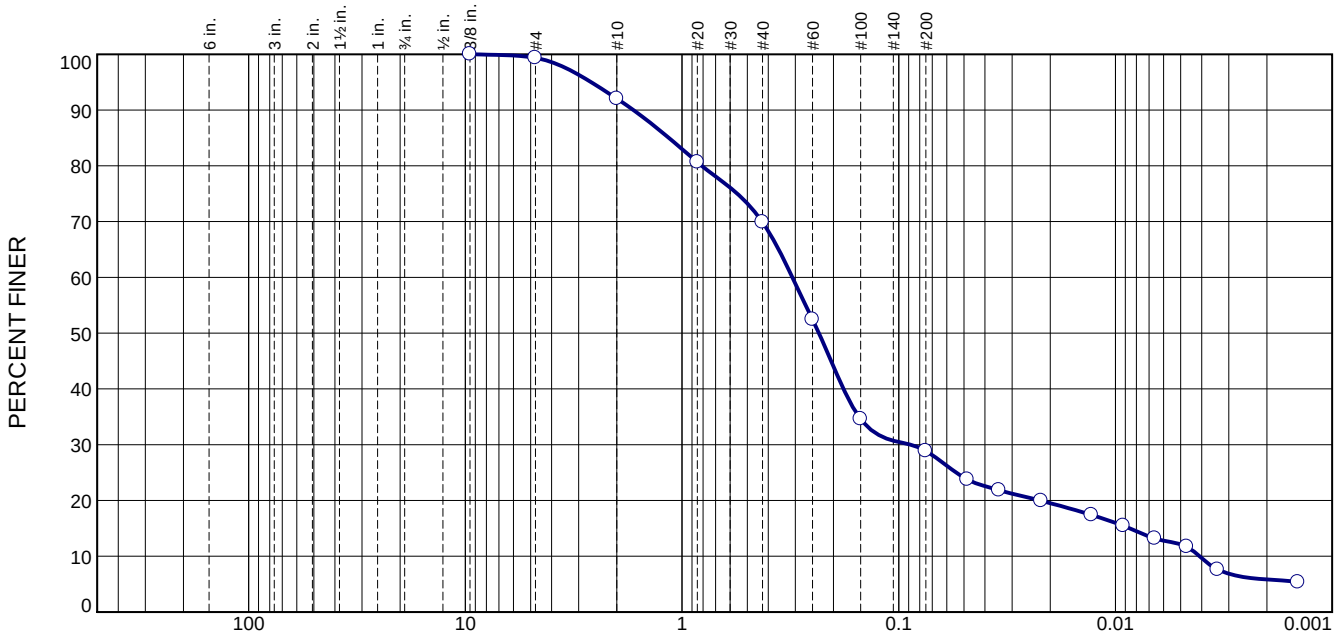
CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No.: 51115.294936

Tested By: KMS **Checked By:** MBP

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.7	7.3	22.1	41.0	23.1	5.8

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
.375	100.0		
#4	99.3		
#10	92.0		
#20	80.7		
#40	69.9		
#60	52.4		
#100	34.6		
#200	28.9		
0.0482 mm.	23.7		
0.0345 mm.	21.8		
0.0220 mm.	19.9		
0.0129 mm.	17.4		
0.0092 mm.	15.4		
0.0066 mm.	13.2		
0.0047 mm.	11.7		
0.0034 mm.	7.6		
0.0014 mm.	5.3		

* (no specification provided)

Material Description

Gray silty sand

Sieve Test (ASTM D6913 & D1140)

Test Date: _____ **Technician:** KMS

Test Notes

As Recieved Moisture Content = 33.46%

Hydrometer Test (ASTM D7928)

Test Date: 9/10/24 **Technician:** KMS

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 1.6760 D_{85}= 1.1505

D_{60}= 0.3097 D_{50}= 0.2334

D_{30}= 0.0883 D_{15}= 0.0086

D_{10}= 0.0041

C_u= 75.77 C_c= 6.16

USCS (ASTM D2487)

SM

Date Sampled: 9/1/24

Date Received: 9/9/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-RC-06 **Depth:** 2.3'

Sample Number: SS-01

CDM Smith

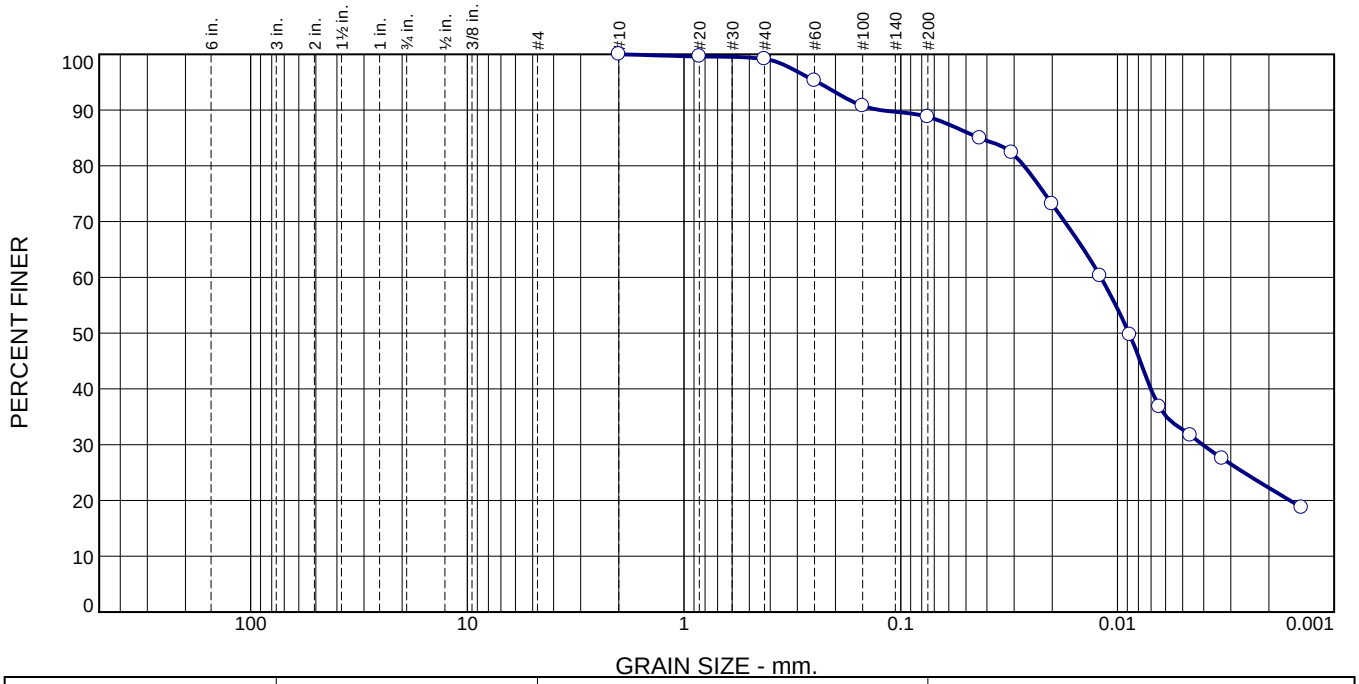
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.8	10.4	66.5	22.3

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#10	100.0		
#20	99.6		
#40	99.2		
#60	95.3		
#100	90.8		
#200	88.8		
0.0432 mm.	84.9		
0.0308 mm.	82.4		
0.0201 mm.	73.2		
0.0120 mm.	60.3		
0.0088 mm.	49.7		
0.0064 mm.	36.8		
0.0046 mm.	31.7		
0.0033 mm.	27.5		
0.0014 mm.	18.7		

· (no specification provided)

Material Description

Gray organic clay

Atterberg (ASTM D4318)

PL= 44 **LL=** 114 **PI=** 70

Coefficients

D_{90}= 0.1246 D_{85}= 0.0435

D_{60}= 0.0119 D_{50}= 0.0088

D_{30}= 0.0040 D_{15}=

D_{10}=

C_u= C_c=

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/11/24 **Technician:** KMS

Test Notes

As Recieved Moisture Content = 123.5%

Hydrometer Test (ASTM D7928)

Test Date: 9/10/24 **Technician:** KMS

USCS (ASTM D2487)

OH

Date Sampled: 8/22/24

Date Received: 9/924

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-RC-07 **Depth:** 5.5'

Sample Number: SS-02

CDM Smith

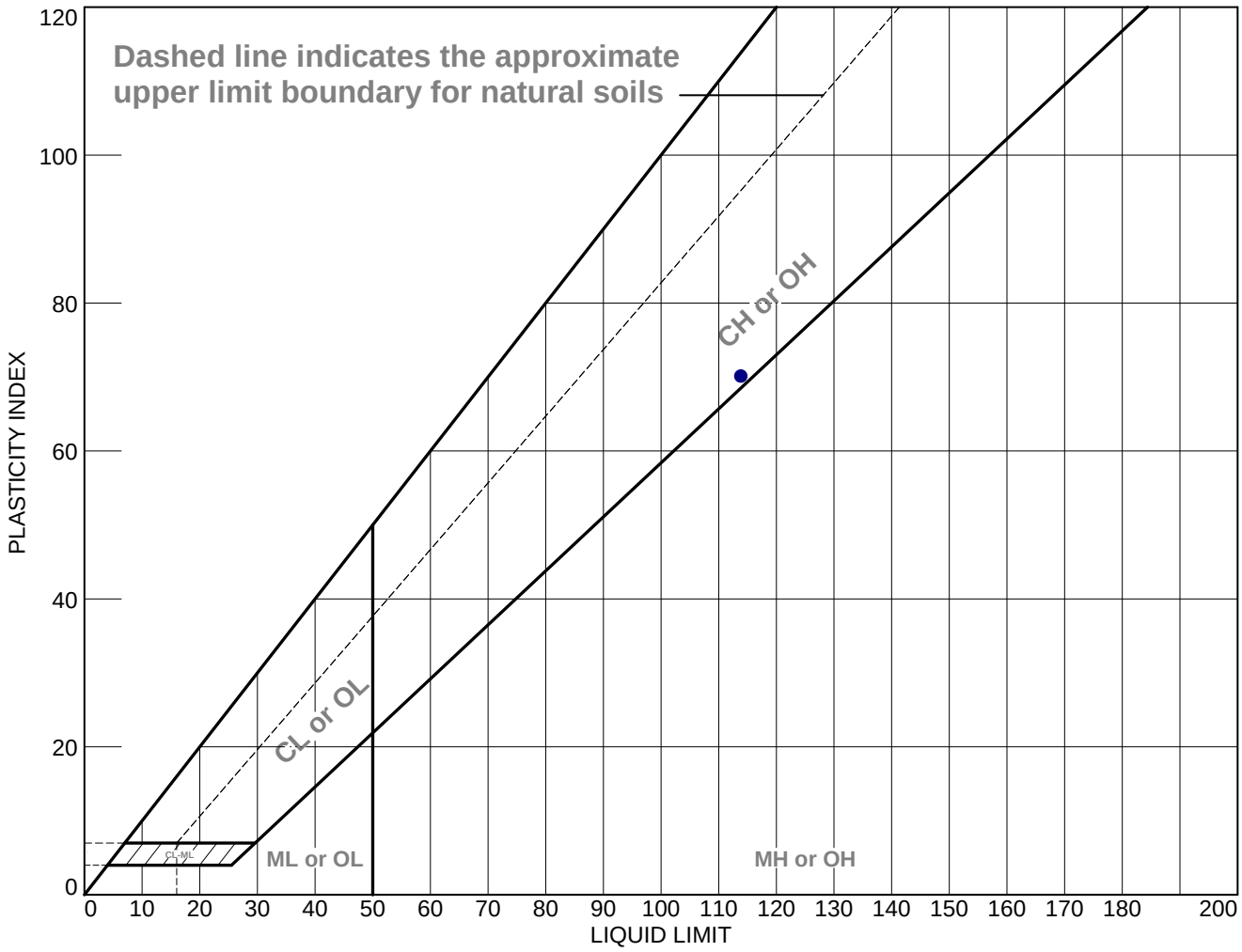
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	FD-24-RC-07	SS-02	5.5'	123.5	44	114	70	OH

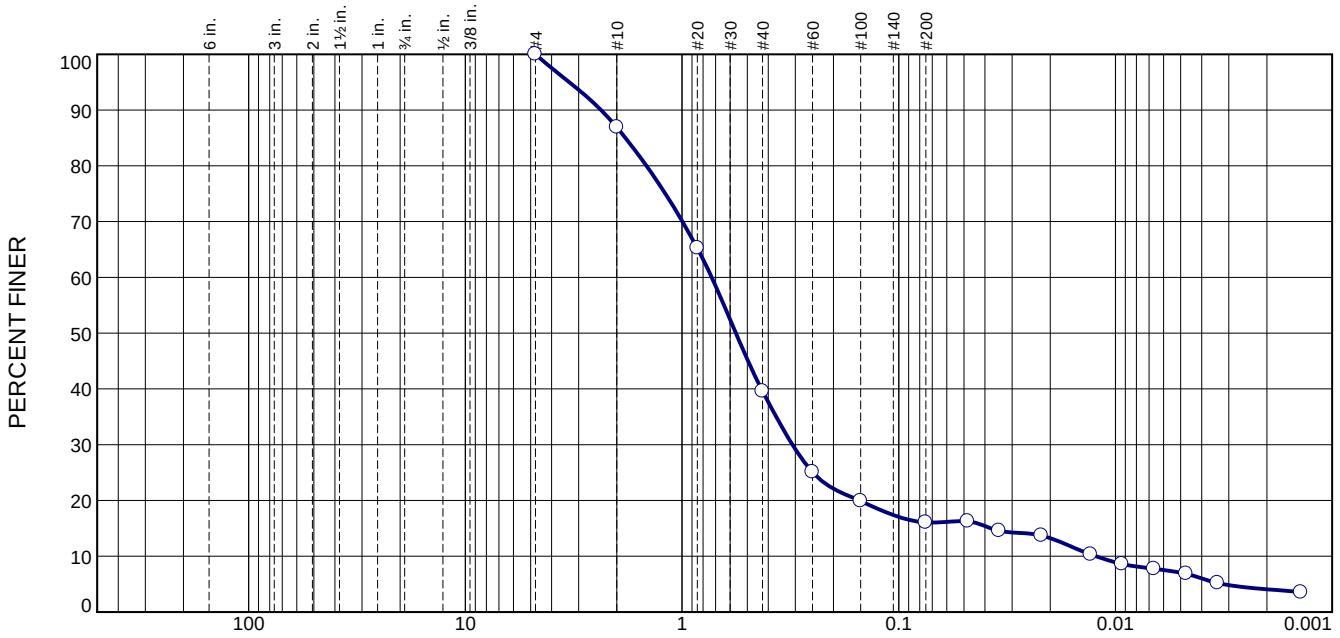
CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No.: 51115.294936

Tested By: KMS **Checked By:** MBP

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	13.1	47.3	23.5	12.0	4.1

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	86.9		
#20	65.3		
#40	39.6		
#60	25.1		
#100	19.9		
#200	16.1		
0.0481 mm.	16.3		
0.0345 mm.	14.6		
0.0219 mm.	13.7		
0.0130 mm.	10.3		
0.0093 mm.	8.6		
0.0066 mm.	7.7		
0.0047 mm.	6.9		
0.0034 mm.	5.2		
0.0014 mm.	3.5		

· (no specification provided)

Material Description

Brown silty sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/12/24 **Technician:** KMS

Test Notes

As Recieved Moisture Content = 17.78%

Hydrometer Test (ASTM D7928)

Test Date: 9/11/24 **Technician:** KMS

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 2.3659 D_{85}= 1.8244

D_{60}= 0.7295 D_{50}= 0.5645

D_{30}= 0.3094 D_{15}= 0.0376

D_{10}= 0.0123

C_u= 59.34 C_c= 10.68

USCS (ASTM D2487)

SM

Date Sampled: 8/22/24

Date Received: 9/9/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-RC-07 **Depth:** 15.5'

Sample Number: SS-04

CDM Smith

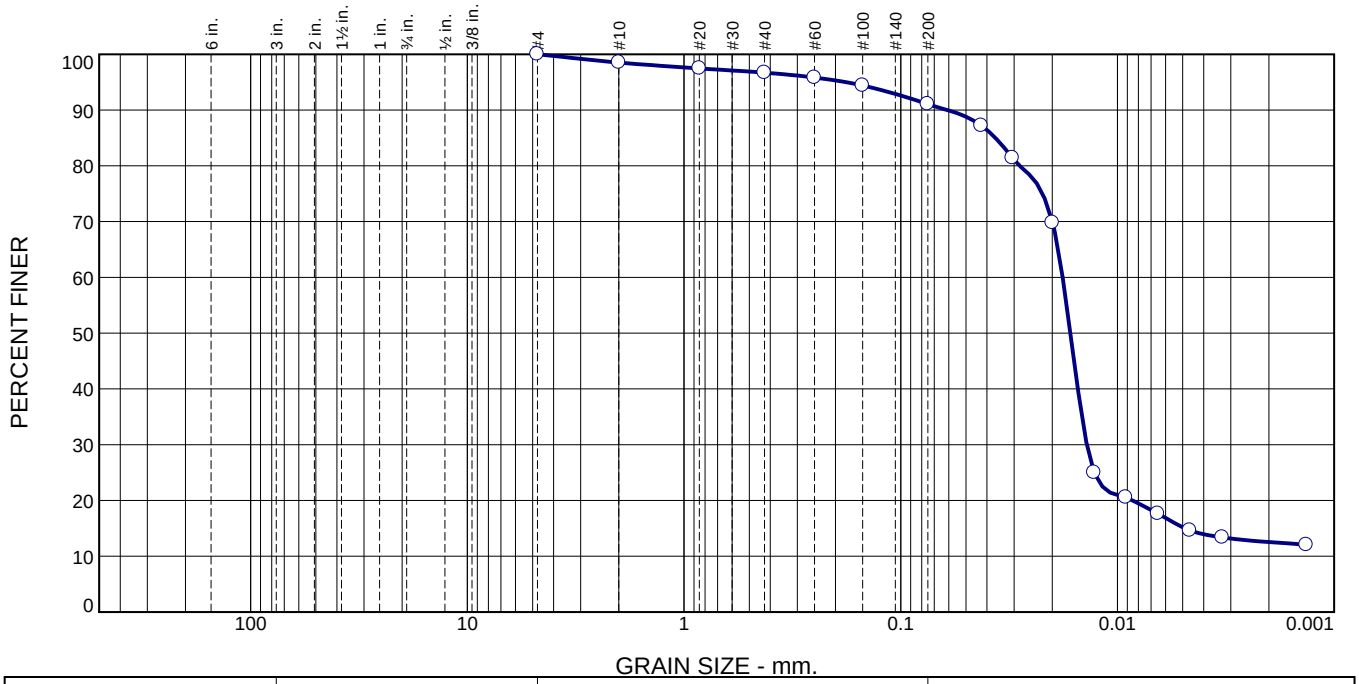
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.5	1.8	5.6	78.6	12.5

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	98.5		
#20	97.5		
#40	96.7		
#60	95.8		
#100	94.4		
#200	91.1		
0.0425 mm.	87.2		
0.0305 mm.	81.4		
0.0199 mm.	69.8		
0.0128 mm.	25.0		
0.0091 mm.	20.5		
0.0065 mm.	17.6		
0.0046 mm.	14.6		
0.0033 mm.	13.4		
0.0013 mm.	12.0		

· (no specification provided)

Material Description
Gray organic silt

Atterberg (ASTM D4318)
PL= 44 **LL=** 95 **PI=** 51

Coefficients
D_{90}= 0.0610 D_{85}= 0.0366
D_{60}= 0.0179 D_{50}= 0.0165
D_{30}= 0.0138 D_{15}= 0.0049
D_{10}=
C_u= C_c=

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/12/24 **Technician:** KMS/MBP

Test Notes
As Received Moisture Content = 155.8%

Hydrometer Test (ASTM D7928)

Test Date: 9/11/24 **Technician:** KMS

USCS (ASTM D2487)
OH

Date Sampled: 8/30/24
Date Received: 9/9/24
Checked By: MBP
Title: Lab Manager

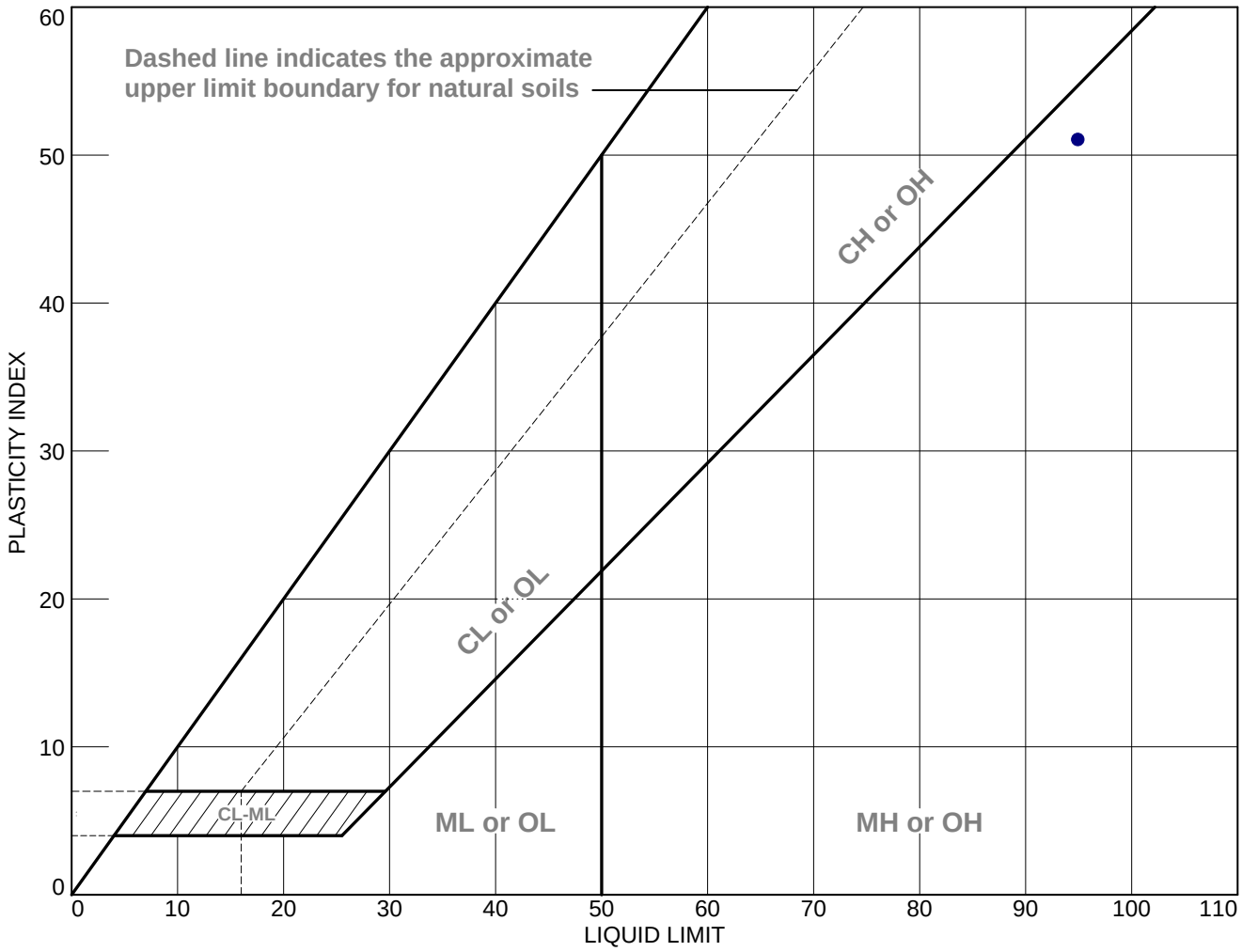
Source of Sample: FD-24-RC-09 **Depth:** 8.3'
Sample Number: SS-03

CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No: 51115.294936

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	FD-24-RC-09	SS-03	8.3'	155.8	44	95	51	OH

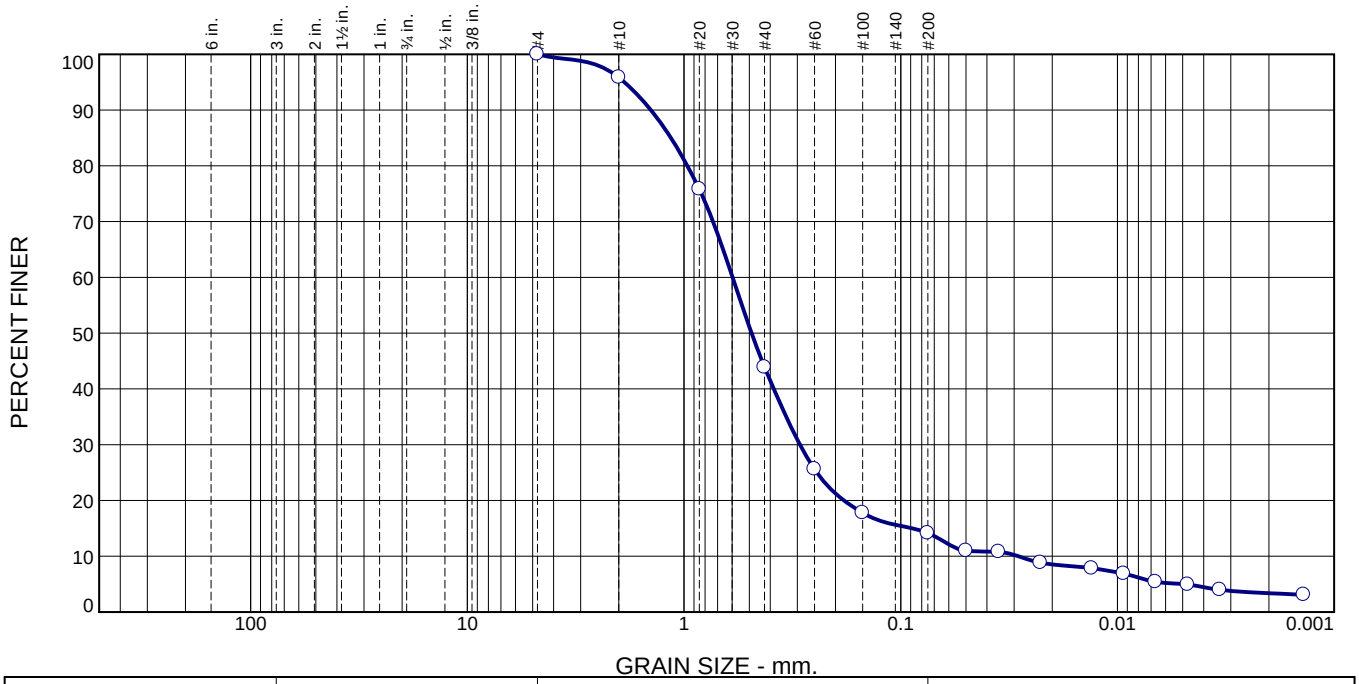
CDM Smith

Boston, Massachusetts

Client: USACE
Project: New Haven Harbor
New Haven, CT
Project No.: 51115.294936

Tested By: MBP **Checked By:** MBP

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	4.2	51.9	29.7	10.8	3.4

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	95.8		
#20	75.8		
#40	43.9		
#60	25.6		
#100	17.8		
#200	14.2		
0.0499 mm.	11.0		
0.0353 mm.	10.8		
0.0226 mm.	8.8		
0.0132 mm.	7.9		
0.0094 mm.	6.9		
0.0067 mm.	5.4		
0.0047 mm.	4.9		
0.0034 mm.	4.0		
0.0014 mm.	3.1		

* (no specification provided)

Material Description

Gray-brown silty sand

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/12/24 **Technician:** KMS/MBP

Test Notes

As Received Moisture Content = 20.4%

Hydrometer Test (ASTM D7928)

Test Date: 9/11/24 **Technician:** KMS

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 1.4229 D_{85}= 1.1499

D_{60}= 0.5971 D_{50}= 0.4882

D_{30}= 0.2918 D_{15}= 0.0886

D_{10}= 0.0287

C_u= 20.83 C_c= 4.97

USCS (ASTM D2487)

SM

Date Sampled: 8/30/24

Date Received: 9/9/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-RC-09 **Depth:** 22.3'

Sample Number: SS-06

CDM Smith

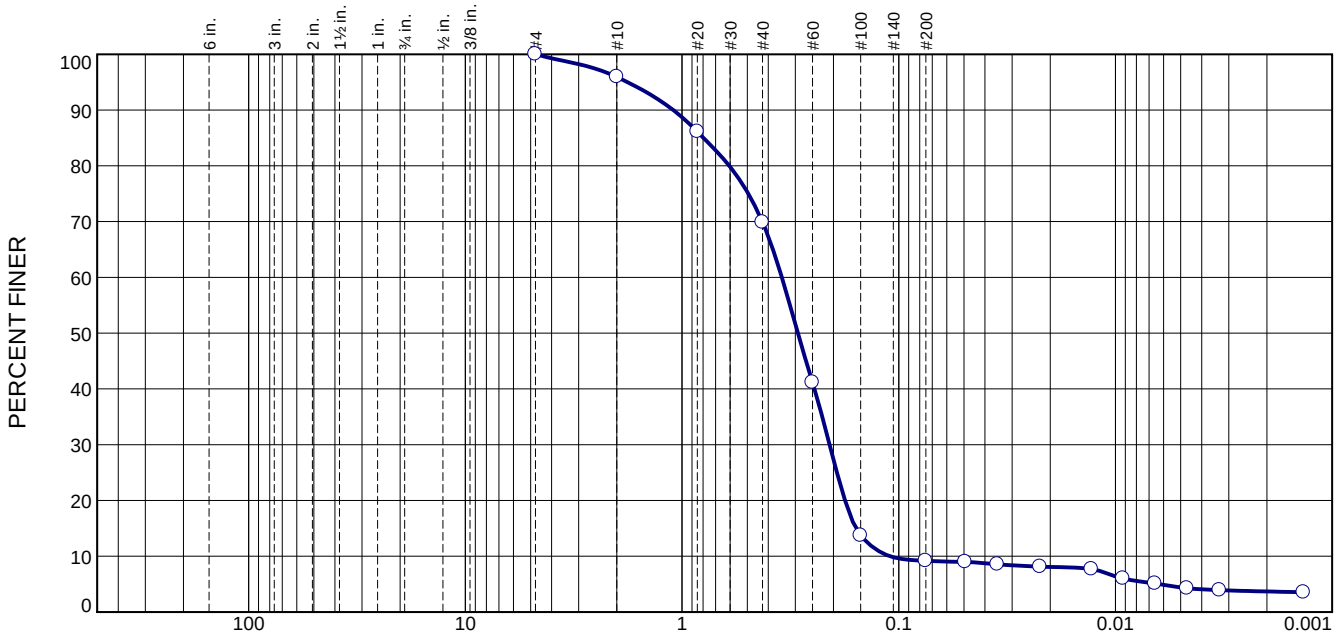
Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	4.1	26.0	60.7	5.5	3.7

Test Results (ASTM D6913 & D1140,

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
#4	100.0		
#10	95.9		
#20	86.1		
#40	69.9		
#60	41.2		
#100	13.7		
#200	9.2		
0.0494 mm.	9.0		
0.0351 mm.	8.5		
0.0222 mm.	8.1		
0.0129 mm.	7.7		
0.0092 mm.	6.0		
0.0066 mm.	5.1		
0.0047 mm.	4.3		
0.0033 mm.	3.9		
0.0014 mm.	3.5		

· (no specification provided)

Material Description

Gray poorly graded sand with silt

Sieve Test (ASTM D6913 & D1140)

Test Date: 9/12/24 **Technician:** KMS/MBP

Test Notes

As Received Moisture Content = 24.9%

Hydrometer Test (ASTM D7928)

Test Date: 9/11/24 **Technician:** KMS

Atterberg (ASTM D4318)

PL= **LL=**NV **PI=**

Coefficients

D_{90}= 1.0986 D_{85}= 0.7963

D_{60}= 0.3465 D_{50}= 0.2918

D_{30}= 0.2086 D_{15}= 0.1577

D_{10}= 0.1096

C_u= 3.16 C_c= 1.15

USCS (ASTM D2487)

SP-SM

Date Sampled: 8/21/24

Date Received: 9/9/24

Checked By: MBP

Title: Lab Manager

Source of Sample: FD-24-RC-10 **Depth:** 3.7'

Sample Number: SS-02

CDM Smith

Boston, Massachusetts

Client: USACE

Project: New Haven Harbor
New Haven, CT

Project No: 51115.294936

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D

Laboratory Test Results Summary Sheet

Client: USACE
Project Name: New Haven Harbor
Project Location: New Haven, CT
Date Tested: 9/18/2024 & 9/30/2024
Date Reviewed: 9/30/2024

Project Number: 294936
Task: 6568-F0024-TK1.08
Assigned By: J. Barker
Tested by: KMS
Reviewed By: MBP

Sample Date	Boring Number	Sample	Depth	Length (L)	Diameter (D)	Aspect Ratio (L/D)	Failure Stress	Poisson's Ratio	Poisson's Ratio	Young's Modulus Ksi	Young's Modulus Ksi	Density
			ft	in	in		Ksi	at failure	at 50%	at failure	at 50%	lb / cu. ft.
8/23/2024	RC-01	R1a	15.9-16.2	4.324	1.978	2.19	18.69	0.78	0.21	5915.9	6118.6	163.7
8/23/2024	RC-01	R1b	18.2-18.5	4.327	1.980	2.19	21.47	0.60	0.24	7144.1	7895.5	165.0
8/31/2024	RC-02	R2	35.4-35.7	4.909	1.977	2.48	15.56	0.73	0.11	5282.7	4731.0	164.0
7/15/2024	RC-03	R2	17.1-17.4	3.533	1.762	2.01	8.86	2.95	0.45	5375.7	5194.7	163.4
7/15/2024	RC-03	R3	20.8-21.0	3.653	1.763	2.07	21.04	1.69	0.26	7815.4	9365.5	163.9
8/16/2024	RC-04	R2	16.0-16.3	4.323	1.978	2.19	27.19	2.56	0.26	30472.4	9984.4	163.9
8/16/2024	RC-04	R3	20.7-21.1	4.324	1.980	2.18	12.06	3.62	0.26	8900.2	8411.8	164.0
8/11/2024	RC-05B	R2	28.7-29.0	4.313	1.978	2.18	21.27	0.29	0.19	9149.2	8134.2	164.9
8/11/2024	RC-05B	R3	31.6-31.9	4.320	1.979	2.18	24.58	0.33	0.23	6227.9	9054.5	165.1
9/1/2024	RC-06	R2a	10.0-10.3	4.315	1.982	2.18	17.12	0.71	0.15	4679.0	3896.7	163.2
9/1/2024	RC-06	R2b	14.7-15.0	4.314	1.980	2.18	22.51	0.60	0.29	7605.6	7788.0	163.2
9/1/2024	RC-06	R4a	23.7-23.9	4.317	1.982	2.18	21.24	0.68	0.23	7734.9	6914.0	164.2
9/1/2024	RC-06	R4b	24.9-25.2	4.354	1.981	2.20	19.76	2.53	0.13	10323.5	5750.4	163.2

Notes

Sample was measured and tested in a laboratory air dry condition after trimming preparation.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

The reported thickness (L) is the average of four measurements.

The reported diameter (D) is the average of three measurements.

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D

Laboratory Test Results Summary Sheet

Client: USACE
Project Name: New Haven Harbor
Project Location: New Haven, CT
Date Tested: 9/18/2024 & 9/30/2024
Date Reviewed: 9/30/2024

Project Number: 294936
Task: 6568-F0024-TK1.08
Assigned By: J. Barker
Tested by: KMS
Reviewed By: MBP

Sample Date	Boring Number	Sample	Depth	Length (L)	Diameter (D)	Aspect Ratio (L/D)	Failure Stress	Poisson's Ratio	Poisson's Ratio	Young's Modulus Ksi	Young's Modulus Ksi	Density
			ft	in	in		Ksi	at failure	at 50%	at failure	at 50%	lb / cu. ft.
8/22/2024	RC-07	R1	20.2-20.5	3.651	1.755	2.08	23.80	1.30	0.25	9036.3	8387.1	164.6
8/22/2024	RC-07	R3	29.8-30.2	4.315	1.982	2.18	21.43	0.70	0.25	8137.3	9452.2	165.0
8/15/2024	RC-08	R1	7.9-8.2	3.655	1.773	2.06	24.22	0.22	0.23	8045.8	9441.5	162.6
8/15/2024	RC-08	R2	13.3-13.6	3.671	1.769	2.08	23.14	1.05	0.39	27344.0	10636.7	163.3
8/15/2024	RC-08	R4	20.0-20.4	4.320	1.982	2.18	15.48	3.90	4.94	11339.2	12659.0	163.4
8/21/2024	RC-10	R2	16.7-17.0	4.322	1.981	2.18	20.67	1.44	0.29	9775.2	8738.7	163.8
8/21/2024	RC-10	R4	26.7-27.0	4.266	1.980	2.15	12.45	0.32	0.19	4067.1	3724.1	173.3
8/21/2024	RC-10	R5	29.6-29.9	4.315	1.981	2.18	16.55	1.37	0.24	11057.3	8857.8	162.9

Notes

Sample was measured and tested in a laboratory air dry condition after trimming preparation.
The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.
The reported thickness (L) is the average of four measurements.
The reported diameter (D) is the average of three measurements.

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/18/2024	**Tested by:**	KMS/MBP
Date Reviewed:	9/24/2024	**Reviewed By:**	MBP

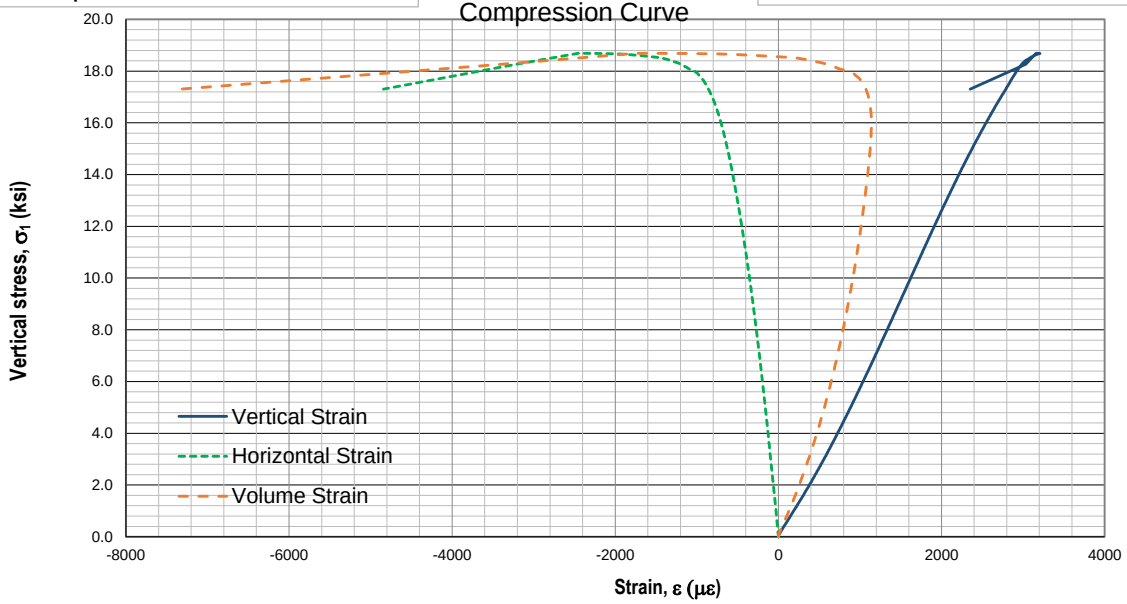
Sample Date	Boring Number	Sample	Depth	Length (L)	Diameter (D)	Aspect Ratio (L/D)	Failure Stress	Poisson's Ratio	Poisson's Ratio	Young's Modulus Ksi	Young's Modulus Ksi	Density
			ft	in	in		Ksi	at failure	at 50%	at failure	at 50%	lb / cu. ft.
8/23/2024	RC-01	R1a	15.9-16.2	4.324	1.978	2.19	18.69	0.78	0.21	5915.9	6118.6	163.7



Specimen Before Failure



Specimen After Failure



Notes

Sample was measured and tested in a laboratory air dry condition after trimming preparation.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

The reported thickness (L) is the average of five measurements.

The reported diameter (D) is the average of three measurements.

Poisson's ratio calculated at 50% peak strength and at peak strength.

Young's modulus calculated at 50% peak strength and at peak strength, and expressed in Ksi.

Failure Type: Double shear

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/18/2024	**Tested by:**	KMS/MBP
Date Reviewed:	9/24/2024	**Reviewed By:**	MBP

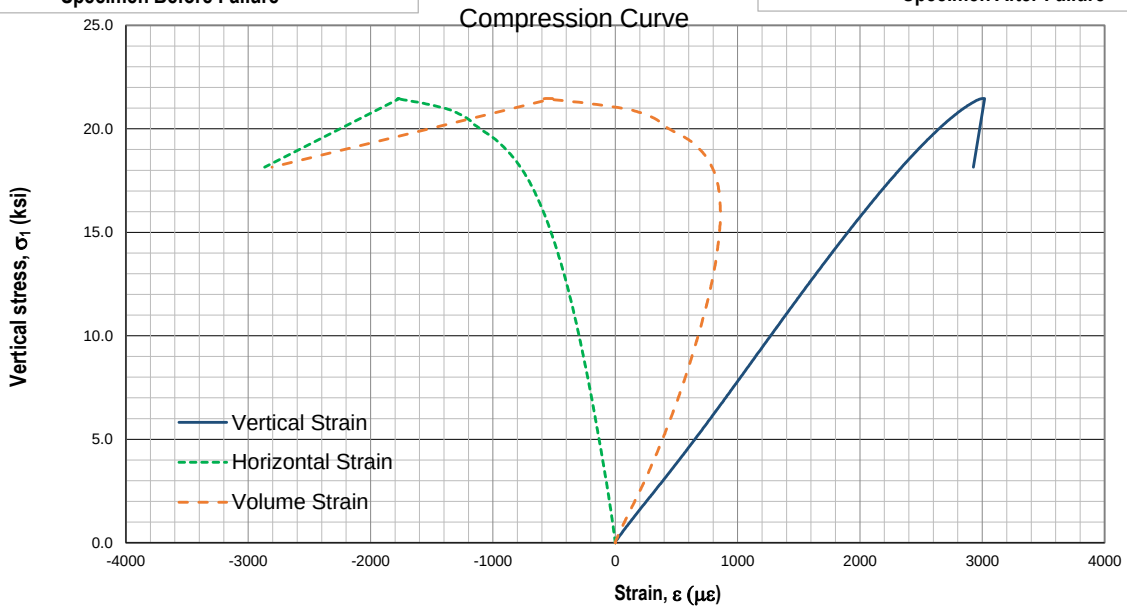
Sample Date	Boring Number	Sample	Depth	Length (L)	Diameter (D)	Aspect Ratio (L/D)	Failure Stress	Poisson's Ratio	Poisson's Ratio	Young's Modulus Ksi	Young's Modulus Ksi	Density
			ft	in	in		Ksi	at failure	at 50%	at failure	at 50%	lb / cu. ft.
8/23/2024	RC-01	R1b	18.2-18.5	4.327	1.980	2.19	21.47	0.60	0.24	7144.1	7895.5	165.0



Specimen Before Failure



Specimen After Failure



Notes

Sample was measured and tested in a laboratory air dry condition after trimming preparation.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

The reported thickness (L) is the average of five measurements.

The reported diameter (D) is the average of three measurements.

Poisson's ratio calculated at 50% peak strength and at peak strength.

Young's modulus calculated at 50% peak strength and at peak strength, and expressed in Ksi.

Failure Type: Double shear

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D
Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/30/2024	**Tested by:**	KMS/MBP
Date Reviewed:	9/30/2024	**Reviewed By:**	MBP

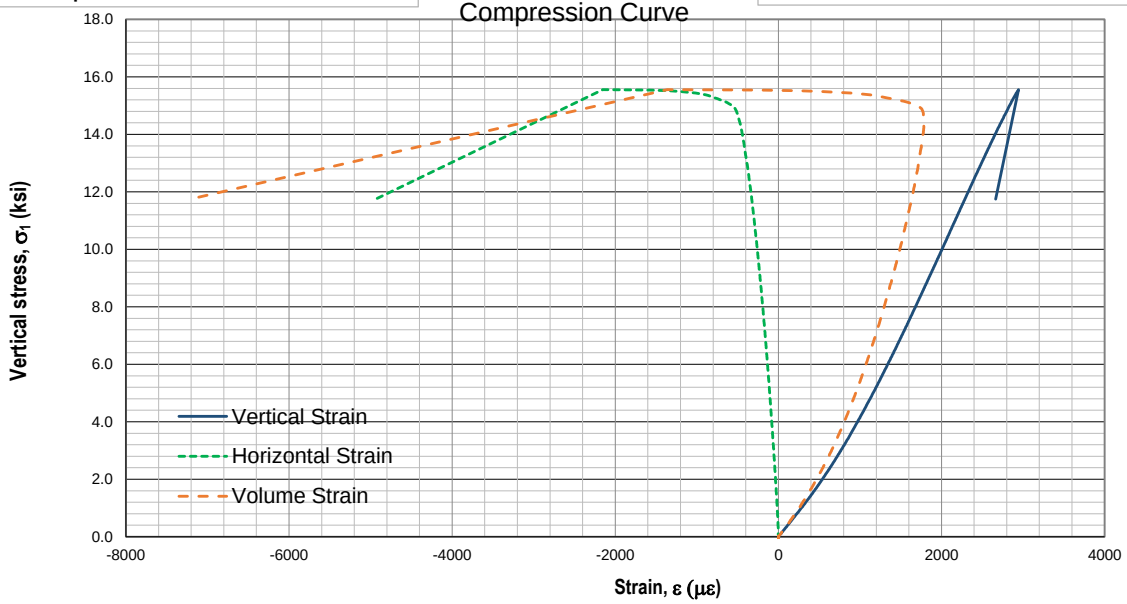
Sample Date	Boring Number	Sample	Depth	Length (L)	Diameter (D)	Aspect Ratio (L/D)	Failure Stress	Poisson's Ratio	Poisson's Ratio	Young's Modulus Ksi	Young's Modulus Ksi	Density
			ft	in	in		Ksi	at failure	at 50%	at failure	at 50%	lb / cu. ft.
8/31/2024	RC-02	R2	35.4-35.7	4.909	1.977	2.48	15.56	0.73	0.11	5282.7	4731.0	164.0



Specimen Before Failure



Specimen After Failure



Notes

Sample was measured and tested in a laboratory air dry condition after trimming preparation.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

The reported thickness (L) is the average of five measurements.

The reported diameter (D) is the average of three measurements.

Poisson's ratio calculated at 50% peak strength and at peak strength.

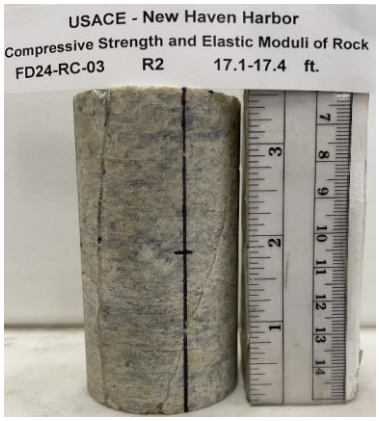
Young's modulus calculated at 50% peak strength and at peak strength, and expressed in Ksi.

Failure Type: Single plane shear

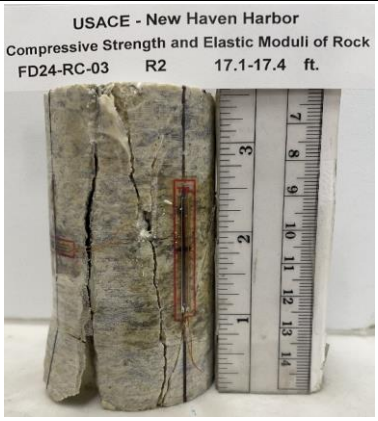
Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/18/2024	**Tested by:**	KMS/MBP
Date Reviewed:	9/24/2024	**Reviewed By:**	MBP

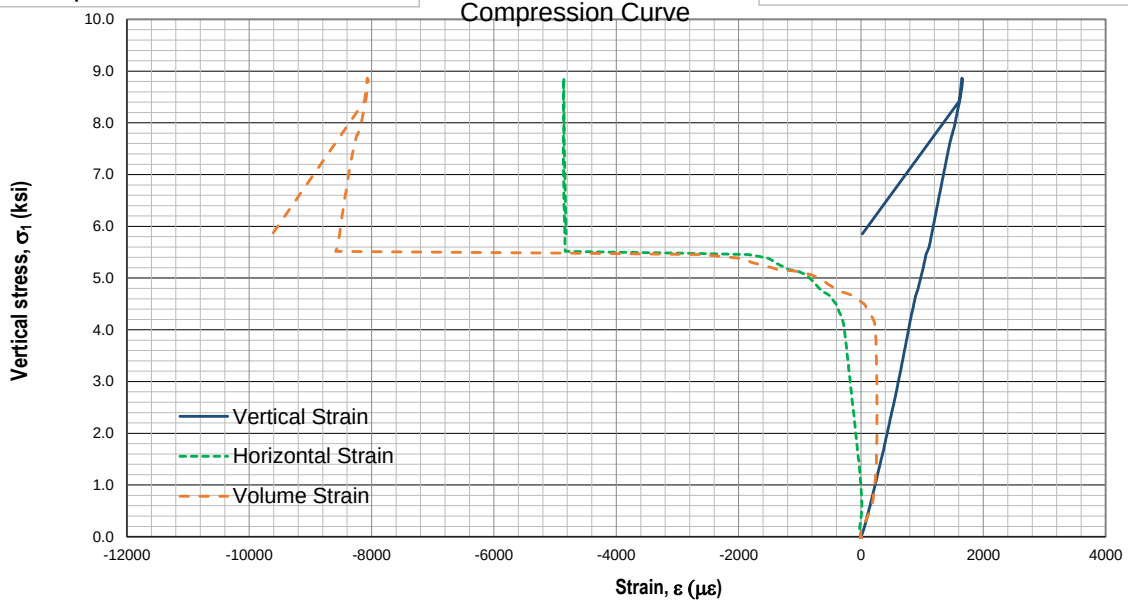
Sample Date	Boring Number	Sample	Depth	Length (L)	Diameter (D)	Aspect Ratio (L/D)	Failure Stress	Poisson's Ratio	Poisson's Ratio	Young's Modulus Ksi	Young's Modulus Ksi	Density
			ft	in	in		Ksi	at failure	at 50%	at failure	at 50%	lb / cu. ft.
7/15/2024	RC-03	R2	17.1-17.4	3.533	1.762	2.01	8.86	2.95	0.45	5375.7	5194.7	163.4



Specimen Before Failure



Specimen After Failure



Notes

Sample was measured and tested in a laboratory air dry condition after trimming preparation.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

The reported thickness (L) is the average of five measurements.

The reported diameter (D) is the average of three measurements.

Poisson's ratio calculated at 50% peak strength and at peak strength.

Young's modulus calculated at 50% peak strength and at peak strength, and expressed in Ksi.

Failure Type: Axial splitting

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/18/2024	**Tested by:**	KMS/MBP
Date Reviewed:	9/24/2024	**Reviewed By:**	MBP

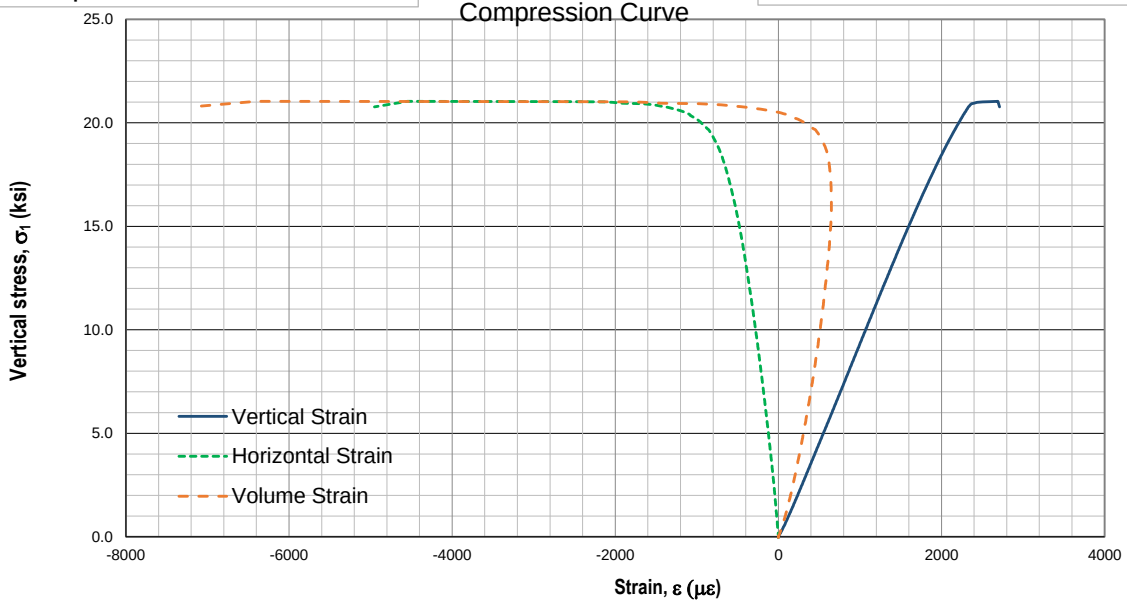
Sample Date	Boring Number	Sample	Depth	Length (L)	Diameter (D)	Aspect Ratio (L/D)	Failure Stress	Poisson's Ratio	Poisson's Ratio	Young's Modulus Ksi	Young's Modulus Ksi	Density
			ft	in	in		Ksi	at failure	at 50%	at failure	at 50%	lb / cu. ft.
7/15/2024	RC-03	R3	20.8-21.0	3.653	1.763	2.07	21.04	1.69	0.26	7815.4	9365.5	163.9



Specimen Before Failure



Specimen After Failure



Notes

Sample was measured and tested in a laboratory air dry condition after trimming preparation.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

The reported thickness (L) is the average of five measurements.

The reported diameter (D) is the average of three measurements.

Poisson's ratio calculated at 50% peak strength and at peak strength.

Young's modulus calculated at 50% peak strength and at peak strength, and expressed in Ksi.

Failure Type: Single plane shear

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/18/2024	**Tested by:**	KMS/MBP
Date Reviewed:	9/24/2024	**Reviewed By:**	MBP

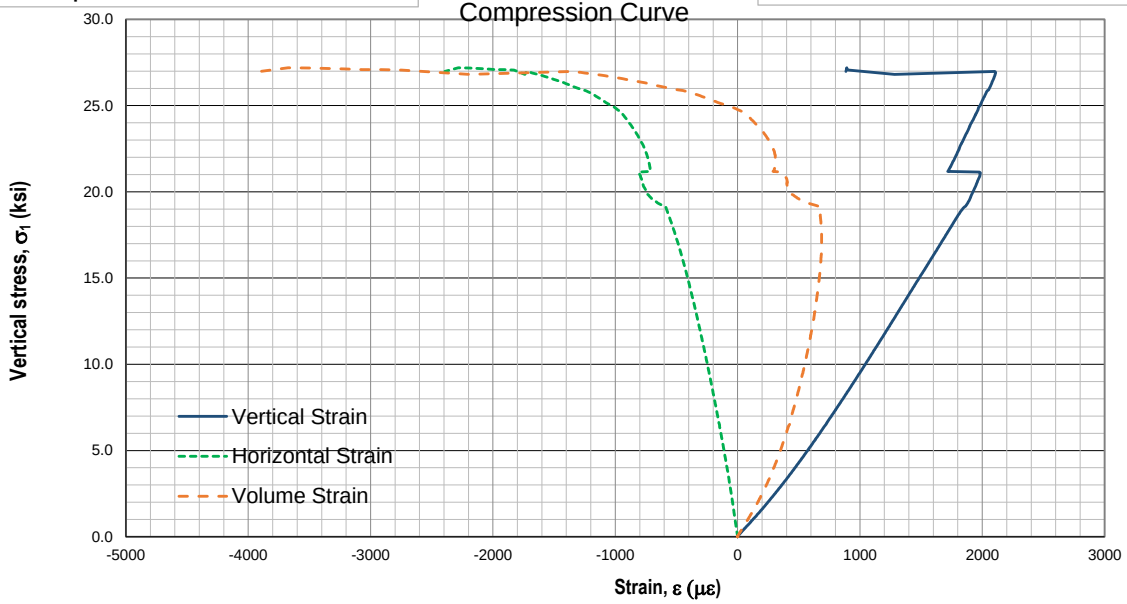
Sample Date	Boring Number	Sample	Depth	Length (L)	Diameter (D)	Aspect Ratio (L/D)	Failure Stress	Poisson's Ratio	Poisson's Ratio	Young's Modulus Ksi	Young's Modulus Ksi	Density
			ft	in	in		Ksi	at failure	at 50%	at failure	at 50%	lb / cu. ft.
8/16/2024	RC-04	R2	16.0-16.3	4.323	1.978	2.19	27.19	2.56	0.26	30472.4	9984.4	163.9



Specimen Before Failure



Specimen After Failure



Notes

Sample was measured and tested in a laboratory air dry condition after trimming preparation.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

The reported thickness (L) is the average of five measurements.

The reported diameter (D) is the average of three measurements.

Poisson's ratio calculated at 50% peak strength and at peak strength.

Young's modulus calculated at 50% peak strength and at peak strength, and expressed in Ksi.

Failure Type: Double shear

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D
Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/19/2024	**Tested by:**	KMS/MBP
Date Reviewed:	9/24/2024	**Reviewed By:**	MBP

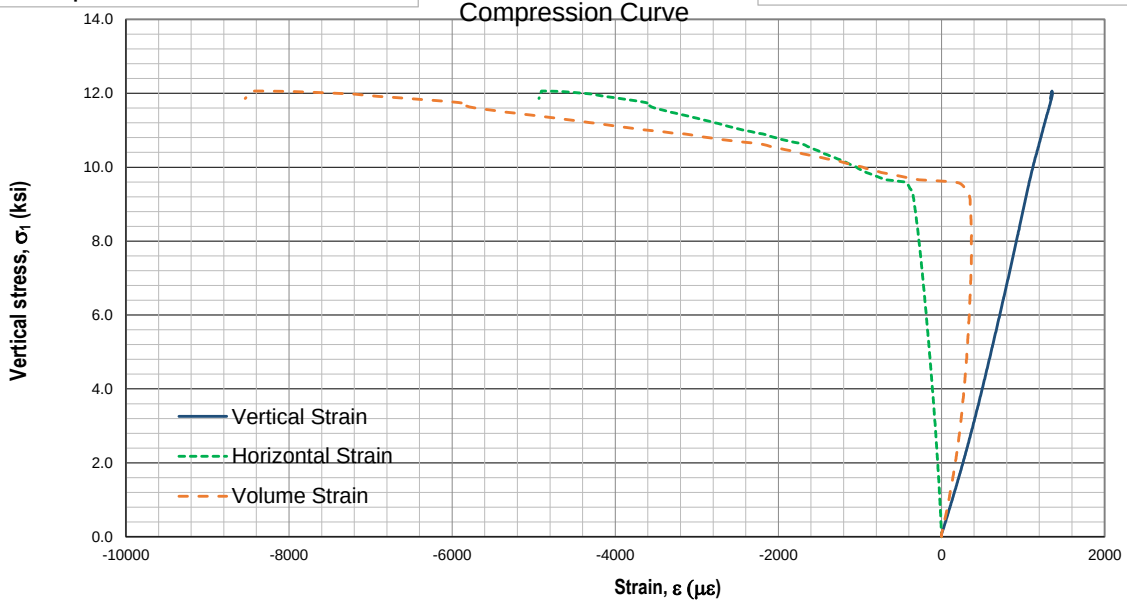
Sample Date	Boring Number	Sample	Depth	Length (L)	Diameter (D)	Aspect Ratio (L/D)	Failure Stress	Poisson's Ratio	Poisson's Ratio	Young's Modulus Ksi	Young's Modulus Ksi	Density
			ft	in	in		Ksi	at failure	at 50%	at failure	at 50%	lb / cu. ft.
8/16/2024	RC-04	R3	20.7-21.1	4.324	1.980	2.18	12.06	3.62	0.26	8900.2	8411.8	164.0



Specimen Before Failure



Specimen After Failure



Notes

Sample was measured and tested in a laboratory air dry condition after trimming preparation.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

The reported thickness (L) is the average of five measurements.

The reported diameter (D) is the average of three measurements.

Poisson's ratio calculated at 50% peak strength and at peak strength.

Young's modulus calculated at 50% peak strength and at peak strength, and expressed in Ksi.

Failure Type: Single plane shear

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/19/2024	**Tested by:**	KMS/MBP
Date Reviewed:	9/24/2024	**Reviewed By:**	MBP

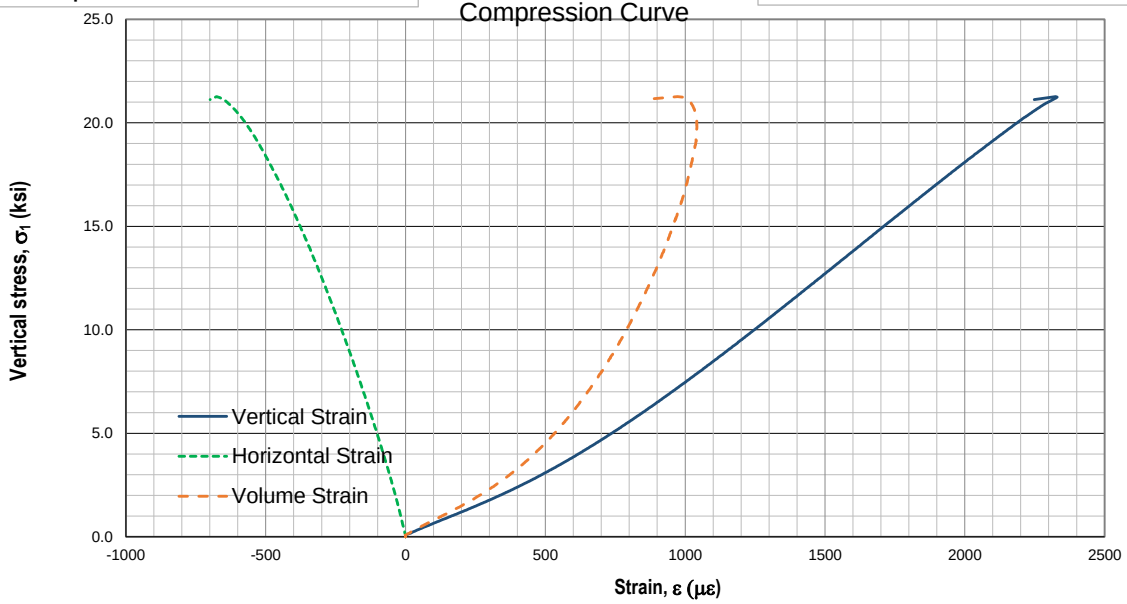
Sample Date	Boring Number	Sample	Depth	Length (L)	Diameter (D)	Aspect Ratio (L/D)	Failure Stress	Poisson's Ratio	Poisson's Ratio	Young's Modulus Ksi	Young's Modulus Ksi	Density
			ft	in	in		Ksi	at failure	at 50%	at failure	at 50%	lb / cu. ft.
8/11/2024	RC-05B	R2	28.7-29.0	4.313	1.978	2.18	21.27	0.29	0.19	9149.2	8134.2	164.9



Specimen Before Failure



Specimen After Failure



Notes

Sample was measured and tested in a laboratory air dry condition after trimming preparation.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

The reported thickness (L) is the average of five measurements.

The reported diameter (D) is the average of three measurements.

Poisson's ratio calculated at 50% peak strength and at peak strength.

Young's modulus calculated at 50% peak strength and at peak strength, and expressed in Ksi.

Failure Type: Double shear

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/19/2024	**Tested by:**	KMS/MBP
Date Reviewed:	9/24/2024	**Reviewed By:**	MBP

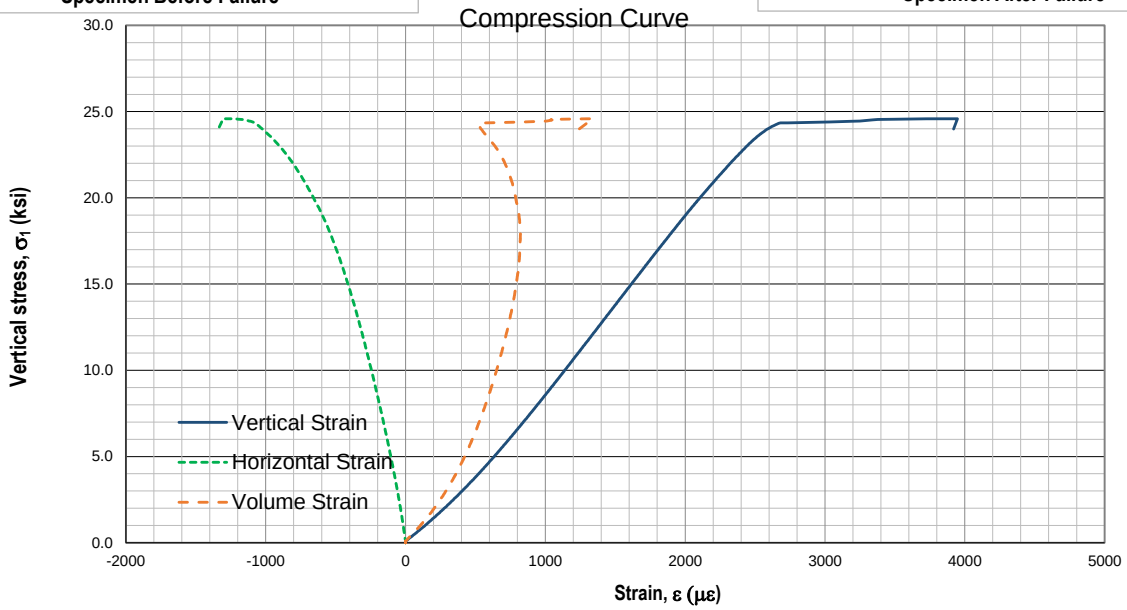
Sample Date	Boring Number	Sample	Depth	Length (L)	Diameter (D)	Aspect Ratio (L/D)	Failure Stress	Poisson's Ratio	Poisson's Ratio	Young's Modulus Ksi	Young's Modulus Ksi	Density
			ft	in	in		Ksi	at failure	at 50%	at failure	at 50%	lb / cu. ft.
8/11/2024	RC-05B	R3	31.6-31.9	4.320	1.979	2.18	24.58	0.33	0.23	6227.9	9054.5	165.1



Specimen Before Failure



Specimen After Failure



Notes

Sample was measured and tested in a laboratory air dry condition after trimming preparation.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

The reported thickness (L) is the average of five measurements.

The reported diameter (D) is the average of three measurements.

Poisson's ratio calculated at 50% peak strength and at peak strength.

Young's modulus calculated at 50% peak strength and at peak strength, and expressed in Ksi.

Failure Type: Double shear

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/19/2024	**Tested by:**	KMS/MBP
Date Reviewed:	9/24/2024	**Reviewed By:**	MBP

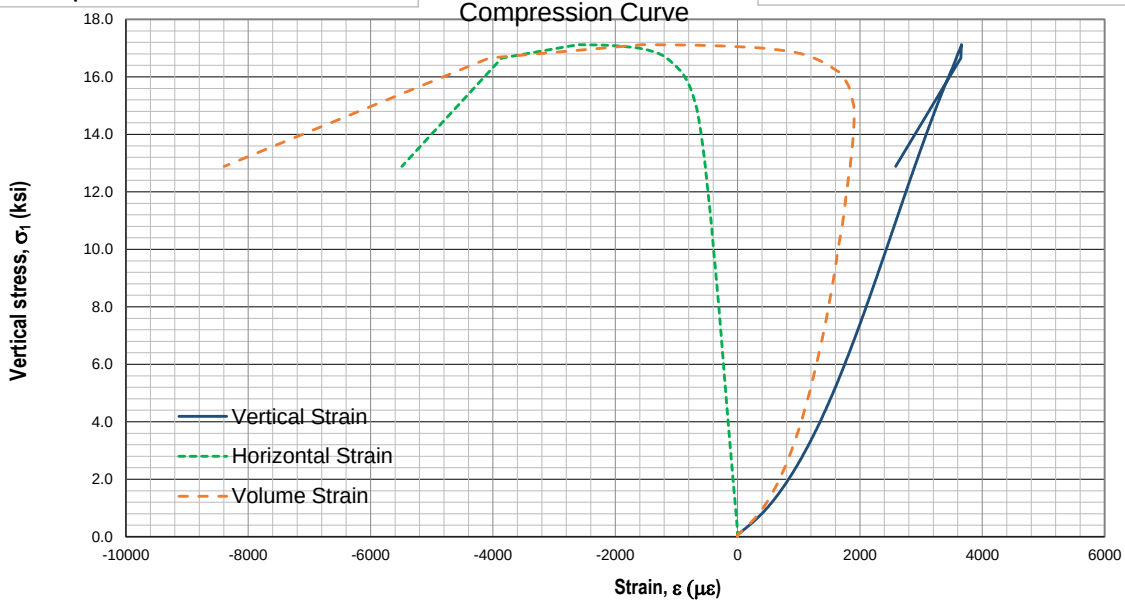
Sample Date	Boring Number	Sample	Depth	Length (L)	Diameter (D)	Aspect Ratio (L/D)	Failure Stress	Poisson's Ratio	Poisson's Ratio	Young's Modulus Ksi	Young's Modulus Ksi	Density
			ft	in	in		Ksi	at failure	at 50%	at failure	at 50%	lb / cu. ft.
9/1/2024	RC-06	R2a	10.0-10.3	4.315	1.982	2.18	17.12	0.71	0.15	4679.0	3896.7	163.2



Specimen Before Failure



Specimen After Failure



Notes

Sample was measured and tested in a laboratory air dry condition after trimming preparation.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

The reported thickness (L) is the average of five measurements.

The reported diameter (D) is the average of three measurements.

Poisson's ratio calculated at 50% peak strength and at peak strength.

Young's modulus calculated at 50% peak strength and at peak strength, and expressed in Ksi.

Failure Type: Double shear

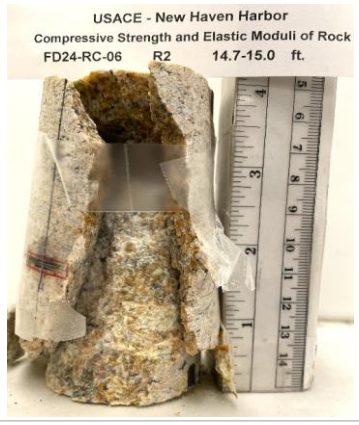
Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/30/2024	**Tested by:**	KMS/MBP
Date Reviewed:	9/30/2024	**Reviewed By:**	MBP

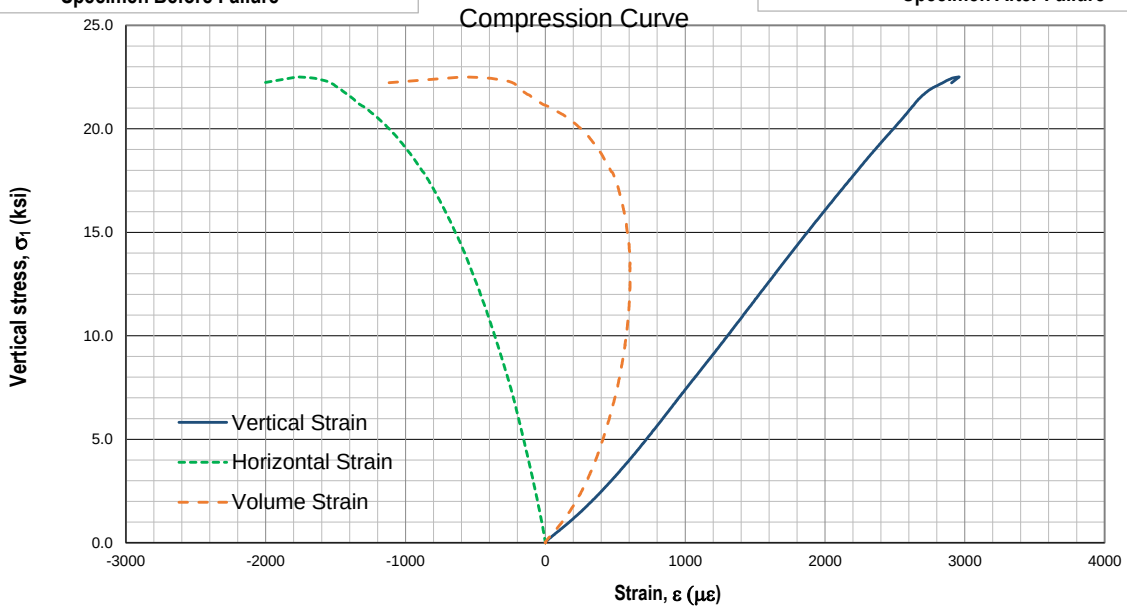
Sample Date	Boring Number	Sample	Depth	Length (L)	Diameter (D)	Aspect Ratio (L/D)	Failure Stress	Poisson's Ratio	Poisson's Ratio	Young's Modulus Ksi	Young's Modulus Ksi	Density
			ft	in	in		Ksi	at failure	at 50%	at failure	at 50%	lb / cu. ft.
9/1/2024	RC-06	R2b	14.7-15.0	4.314	1.980	2.18	22.51	0.60	0.29	7605.6	7788.0	163.2



Specimen Before Failure



Specimen After Failure



Notes

Sample was measured and tested in a laboratory air dry condition after trimming preparation.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

The reported thickness (L) is the average of five measurements.

The reported diameter (D) is the average of three measurements.

Poisson's ratio calculated at 50% peak strength and at peak strength.

Young's modulus calculated at 50% peak strength and at peak strength, and expressed in Ksi.

Failure Type: Double shear

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/30/2024	**Tested by:**	KMS/MBP
Date Reviewed:	9/30/2024	**Reviewed By:**	MBP

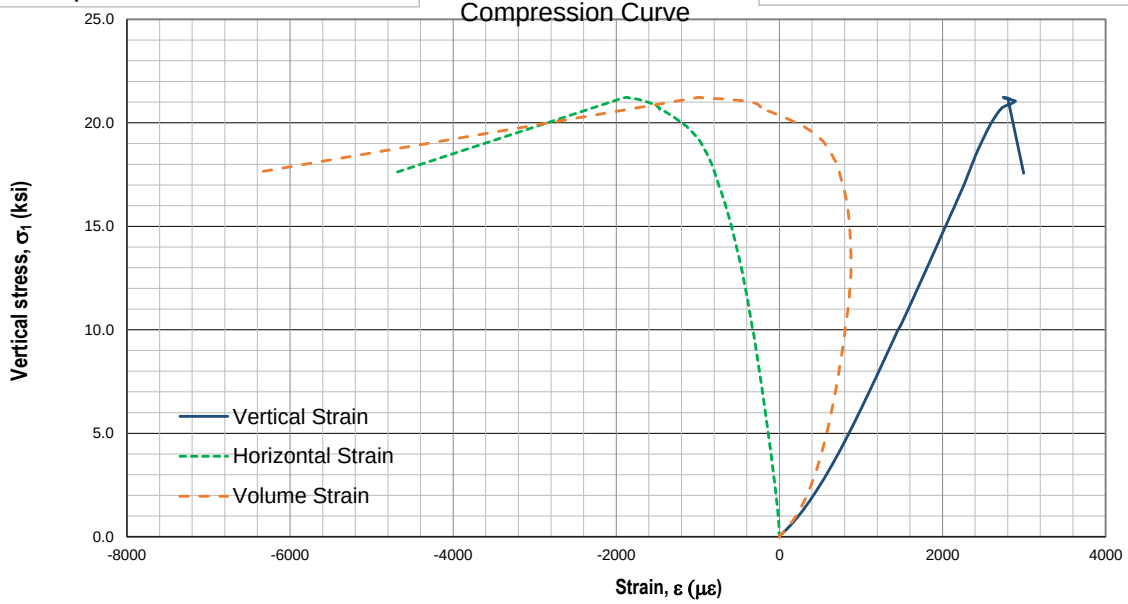
Sample Date	Boring Number	Sample	Depth	Length (L)	Diameter (D)	Aspect Ratio (L/D)	Failure Stress	Poisson's Ratio	Poisson's Ratio	Young's Modulus Ksi	Young's Modulus Ksi	Density
			ft	in	in		Ksi	at failure	at 50%	at failure	at 50%	lb / cu. ft.
9/1/2024	RC-06	R4a	23.7-23.9	4.317	1.982	2.18	21.24	0.68	0.23	7734.9	6914.0	164.2



Specimen Before Failure



Specimen After Failure



Notes

Sample was measured and tested in a laboratory air dry condition after trimming preparation.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

The reported thickness (L) is the average of five measurements.

The reported diameter (D) is the average of three measurements.

Poisson's ratio calculated at 50% peak strength and at peak strength.

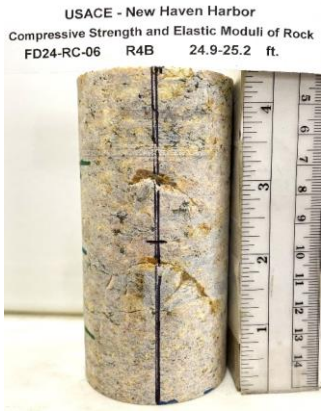
Young's modulus calculated at 50% peak strength and at peak strength, and expressed in Ksi.

Failure Type: Double shear

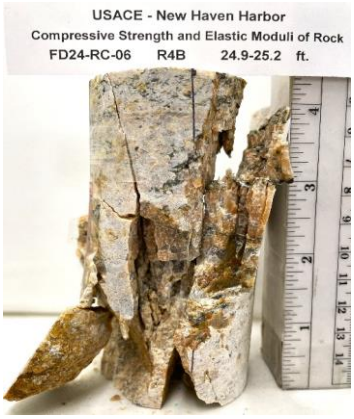
Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/30/2024	**Tested by:**	KMS/MBP
Date Reviewed:	9/30/2024	**Reviewed By:**	MBP

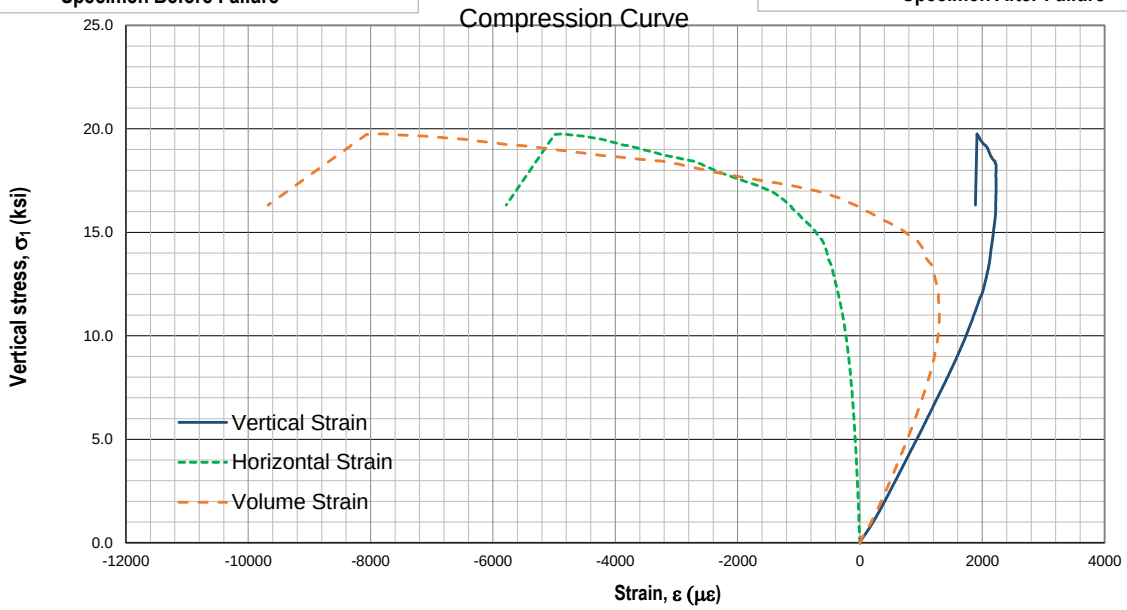
Sample Date	Boring Number	Sample	Depth	Length (L)	Diameter (D)	Aspect Ratio (L/D)	Failure Stress	Poisson's Ratio	Poisson's Ratio	Young's Modulus Ksi	Young's Modulus Ksi	Density
			ft	in	in		Ksi	at failure	at 50%	at failure	at 50%	lb / cu. ft.
9/1/2024	RC-06	R4b	24.9-25.2	4.354	1.981	2.20	19.76	2.53	0.13	10323.5	5750.4	163.2



Specimen Before Failure



Specimen After Failure



Notes

Sample was measured and tested in a laboratory air dry condition after trimming preparation.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

The reported thickness (L) is the average of five measurements.

The reported diameter (D) is the average of three measurements.

Poisson's ratio calculated at 50% peak strength and at peak strength.

Young's modulus calculated at 50% peak strength and at peak strength, and expressed in Ksi.

Failure Type: Single plane shear

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/30/2024	**Tested by:**	KMS/MBP
Date Reviewed:	9/30/2024	**Reviewed By:**	MBP

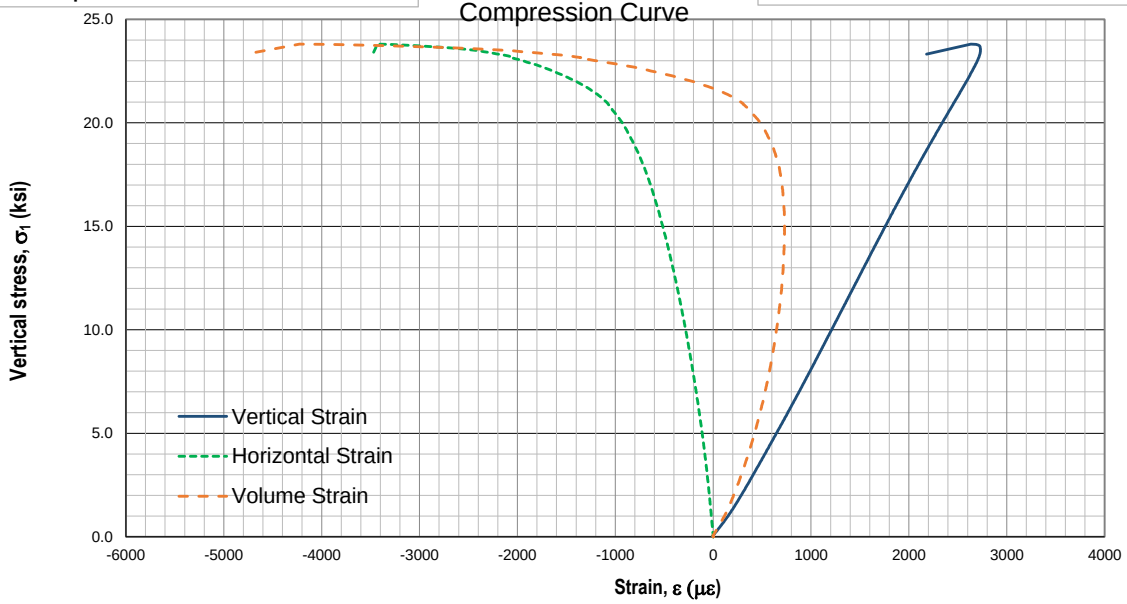
Sample Date	Boring Number	Sample	Depth	Length (L)	Diameter (D)	Aspect Ratio (L/D)	Failure Stress	Poisson's Ratio	Poisson's Ratio	Young's Modulus Ksi	Young's Modulus Ksi	Density
			ft	in	in		Ksi	at failure	at 50%	at failure	at 50%	lb / cu. ft.
8/22/2024	RC-07	R1	20.2-20.5	3.651	1.755	2.08	23.80	1.30	0.25	9036.3	8387.1	164.6



Specimen Before Failure



Specimen After Failure



Notes

Sample was measured and tested in a laboratory air dry condition after trimming preparation.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

The reported thickness (L) is the average of five measurements.

The reported diameter (D) is the average of three measurements.

Poisson's ratio calculated at 50% peak strength and at peak strength.

Young's modulus calculated at 50% peak strength and at peak strength, and expressed in Ksi.

Failure Type: Double shear

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/30/2024	**Tested by:**	KMS/MBP
Date Reviewed:	9/30/2024	**Reviewed By:**	MBP

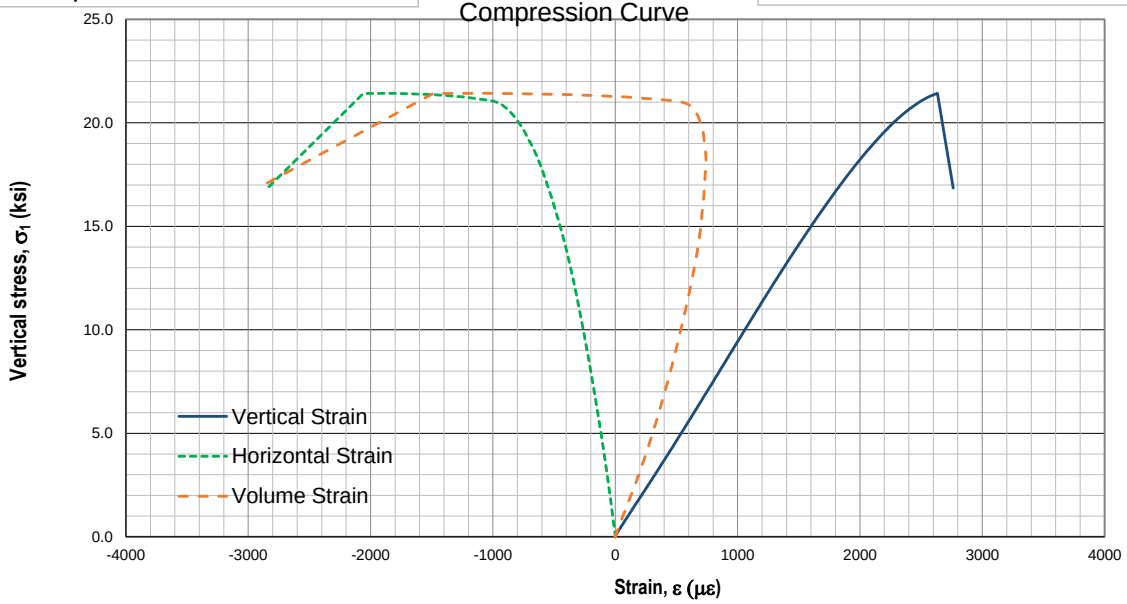
Sample Date	Boring Number	Sample	Depth	Length (L)	Diameter (D)	Aspect Ratio (L/D)	Failure Stress	Poisson's Ratio	Poisson's Ratio	Young's Modulus Ksi	Young's Modulus Ksi	Density
			ft	in	in		Ksi	at failure	at 50%	at failure	at 50%	lb / cu. ft.
8/22/2024	RC-07	R3	29.8-30.2	4.315	1.982	2.18	21.43	0.70	0.25	8137.3	9452.2	165.0



Specimen Before Failure



Specimen After Failure



Notes

Sample was measured and tested in a laboratory air dry condition after trimming preparation.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

The reported thickness (L) is the average of five measurements.

The reported diameter (D) is the average of three measurements.

Poisson's ratio calculated at 50% peak strength and at peak strength.

Young's modulus calculated at 50% peak strength and at peak strength, and expressed in Ksi.

Failure Type: Double shear

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/30/2024	**Tested by:**	KMS/MBP
Date Reviewed:	9/30/2024	**Reviewed By:**	MBP

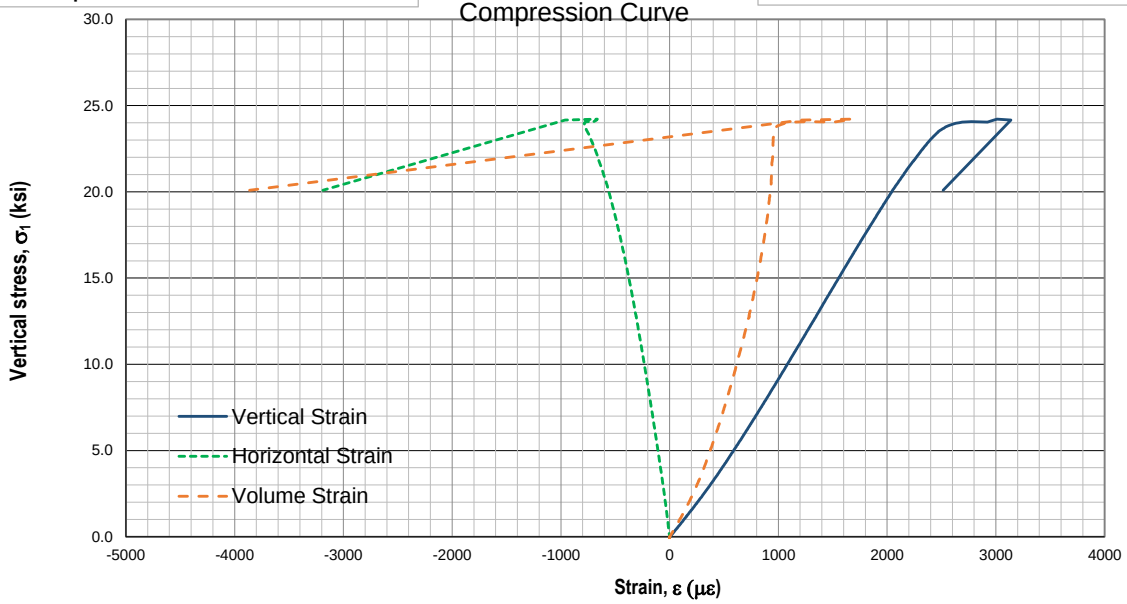
Sample Date	Boring Number	Sample	Depth	Length (L)	Diameter (D)	Aspect Ratio (L/D)	Failure Stress	Poisson's Ratio	Poisson's Ratio	Young's Modulus Ksi	Young's Modulus Ksi	Density
			ft	in	in		Ksi	at failure	at 50%	at failure	at 50%	lb / cu. ft.
8/15/2024	RC-08	R1	7.9-8.2	3.655	1.773	2.06	24.22	0.22	0.23	8045.8	9441.5	162.6



Specimen Before Failure



Specimen After Failure



Notes

Sample was measured and tested in a laboratory air dry condition after trimming preparation.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

The reported thickness (L) is the average of five measurements.

The reported diameter (D) is the average of three measurements.

Poisson's ratio calculated at 50% peak strength and at peak strength.

Young's modulus calculated at 50% peak strength and at peak strength, and expressed in Ksi.

Failure Type: Double shear

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D
Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/30/2024	**Tested by:**	KMS/MBP
Date Reviewed:	9/30/2024	**Reviewed By:**	MBP

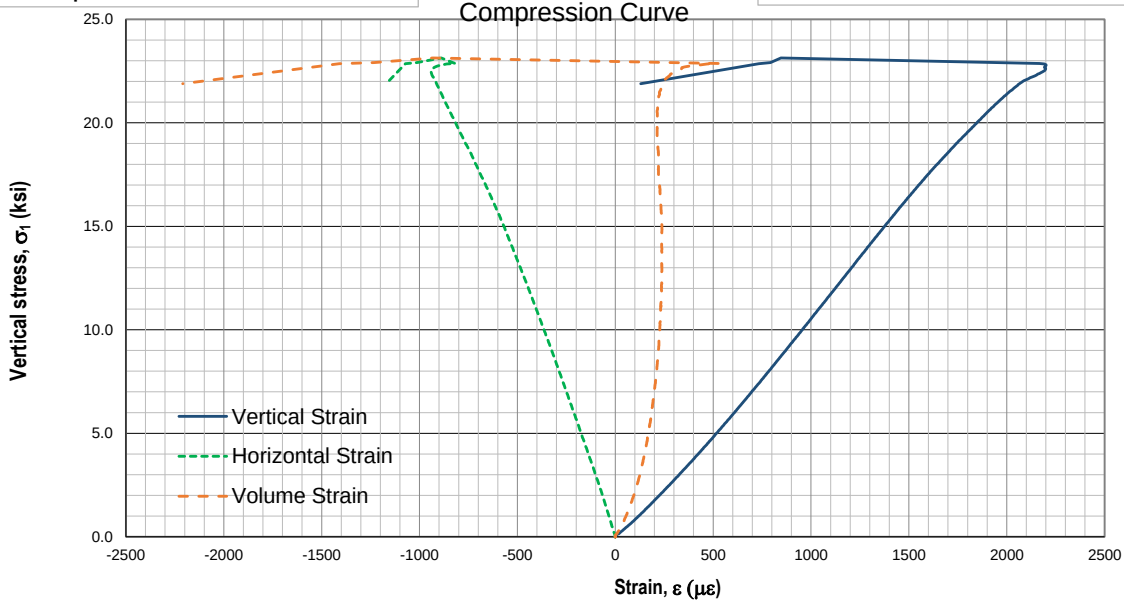
Sample Date	Boring Number	Sample	Depth	Length (L)	Diameter (D)	Aspect Ratio (L/D)	Failure Stress	Poisson's Ratio	Poisson's Ratio	Young's Modulus Ksi	Young's Modulus Ksi	Density
			ft	in	in		Ksi	at failure	at 50%	at failure	at 50%	lb / cu. ft.
8/15/2024	RC-08	R2	13.3-13.6	3.671	1.769	2.08	23.14	1.05	0.39	27344.0	10636.7	163.3

Sample Not Pictured



Specimen Before Failure

Specimen After Failure



Notes

Sample was measured and tested in a laboratory air dry condition after trimming preparation.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

The reported thickness (L) is the average of five measurements.

The reported diameter (D) is the average of three measurements.

Poisson's ratio calculated at 50% peak strength and at peak strength.

Young's modulus calculated at 50% peak strength and at peak strength, and expressed in Ksi.

Failure Type: Double shear

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/30/2024	**Tested by:**	KMS/MBP
Date Reviewed:	9/30/2024	**Reviewed By:**	MBP

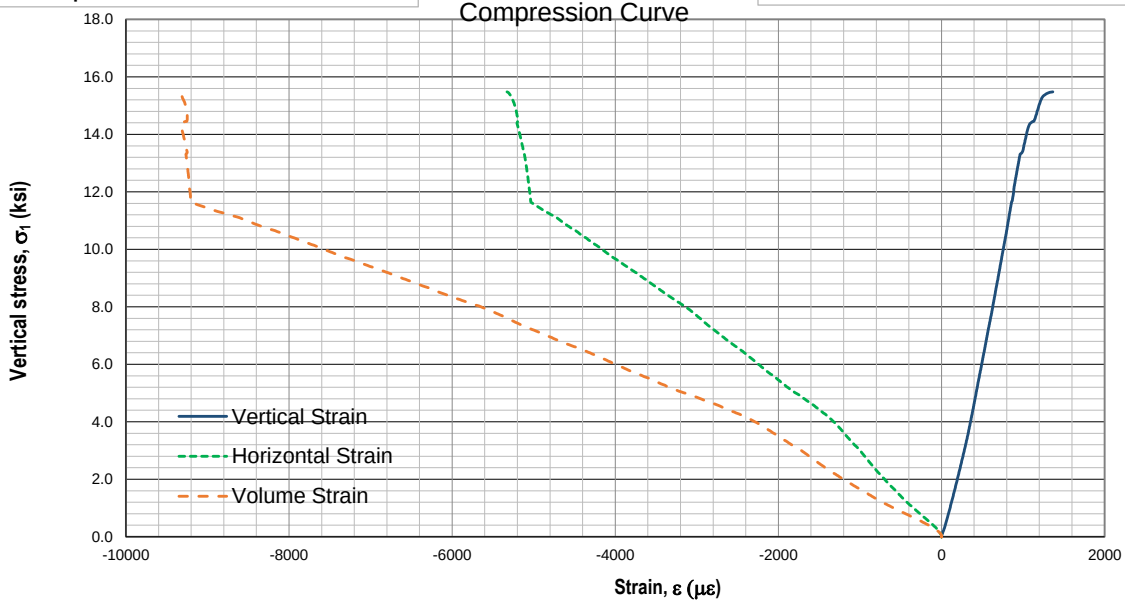
Sample Date	Boring Number	Sample	Depth	Length (L)	Diameter (D)	Aspect Ratio (L/D)	Failure Stress	Poisson's Ratio	Poisson's Ratio	Young's Modulus Ksi	Young's Modulus Ksi	Density
			ft	in	in		Ksi	at failure	at 50%	at failure	at 50%	lb / cu. ft.
8/15/2024	RC-08	R4	20.0-20.4	4.320	1.982	2.18	15.48	3.90	4.94	11339.2	12659.0	163.4



Specimen Before Failure



Specimen After Failure



Notes

Sample was measured and tested in a laboratory air dry condition after trimming preparation.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

The reported thickness (L) is the average of five measurements.

The reported diameter (D) is the average of three measurements.

Poisson's ratio calculated at 50% peak strength and at peak strength.

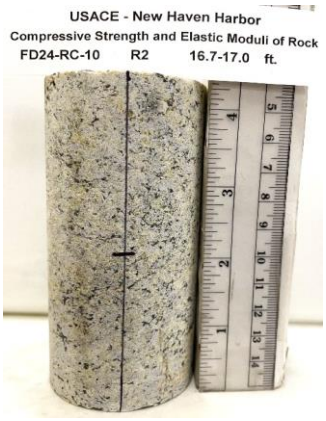
Young's modulus calculated at 50% peak strength and at peak strength, and expressed in Ksi.

Failure Type: Y-shaped shear

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/30/2024	**Tested by:**	KMS/MBP
Date Reviewed:	9/30/2024	**Reviewed By:**	MBP

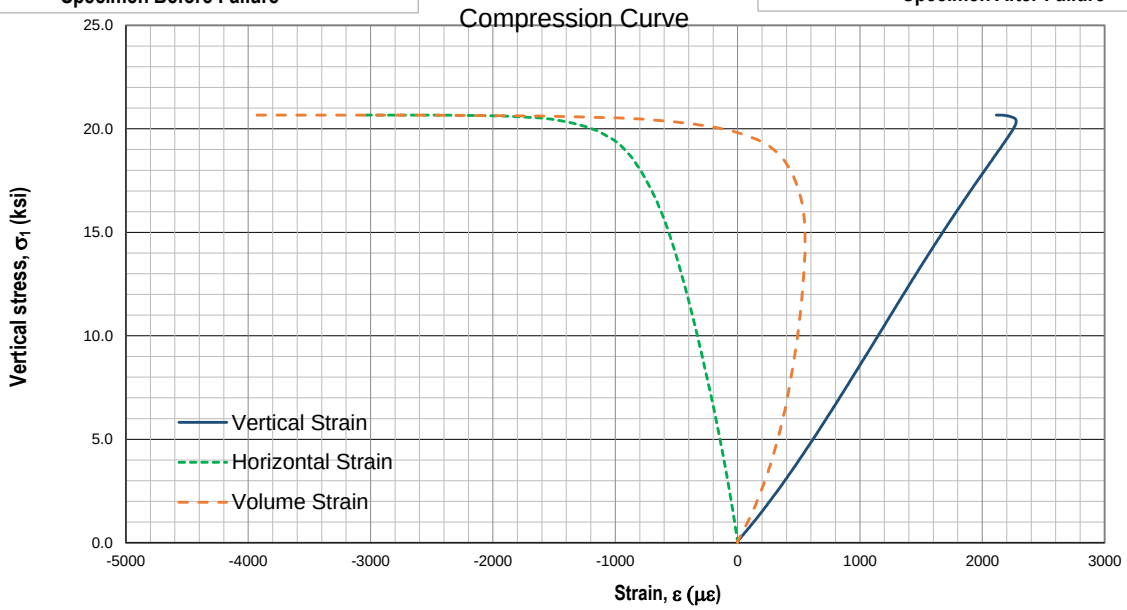
Sample Date	Boring Number	Sample	Depth	Length (L)	Diameter (D)	Aspect Ratio (L/D)	Failure Stress	Poisson's Ratio	Poisson's Ratio	Young's Modulus Ksi	Young's Modulus Ksi	Density
			ft	in	in		Ksi	at failure	at 50%	at failure	at 50%	lb / cu. ft.
8/21/2024	RC-10	R2	16.7-17.0	4.322	1.981	2.18	20.67	1.44	0.29	9775.2	8738.7	163.8



Specimen Before Failure



Specimen After Failure



Notes

Sample was measured and tested in a laboratory air dry condition after trimming preparation.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

The reported thickness (L) is the average of five measurements.

The reported diameter (D) is the average of three measurements.

Poisson's ratio calculated at 50% peak strength and at peak strength.

Young's modulus calculated at 50% peak strength and at peak strength, and expressed in Ksi.

Failure Type: Double shear

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/30/2024	**Tested by:**	KMS/MBP
Date Reviewed:	9/30/2024	**Reviewed By:**	MBP

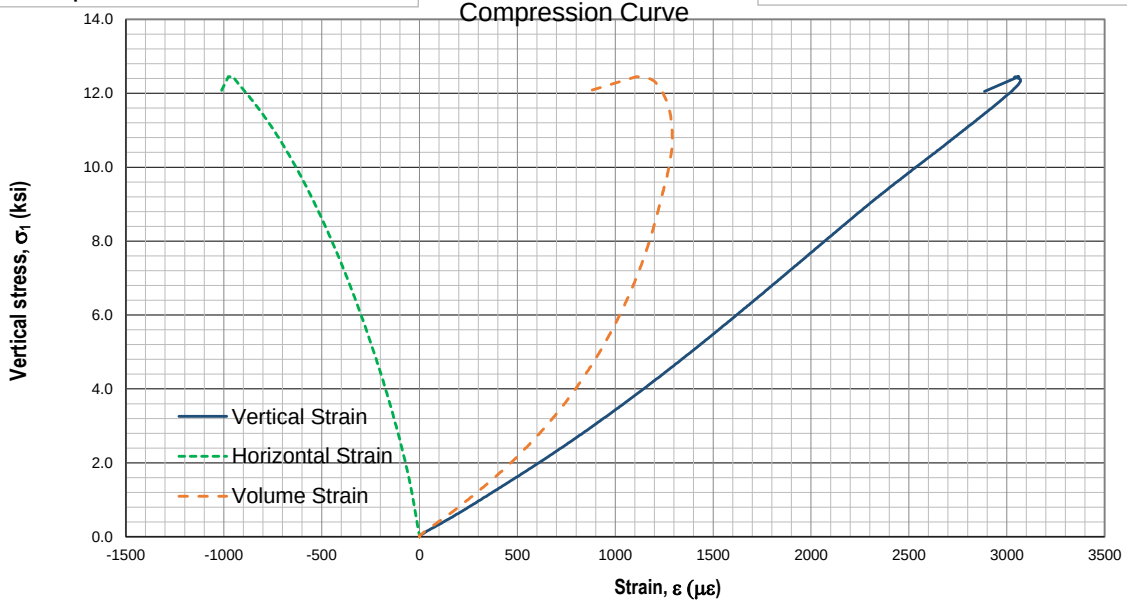
Sample Date	Boring Number	Sample	Depth	Length (L)	Diameter (D)	Aspect Ratio (L/D)	Failure Stress	Poisson's Ratio	Poisson's Ratio	Young's Modulus Ksi	Young's Modulus Ksi	Density
			ft	in	in		Ksi	at failure	at 50%	at failure	at 50%	lb / cu. ft.
8/21/2024	RC-10	R4	26.7-27.0	4.266	1.980	2.15	12.45	0.32	0.19	4067.1	3724.1	173.3



Specimen Before Failure



Specimen After Failure



Notes

Sample was measured and tested in a laboratory air dry condition after trimming preparation.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

The reported thickness (L) is the average of five measurements.

The reported diameter (D) is the average of three measurements.

Poisson's ratio calculated at 50% peak strength and at peak strength.

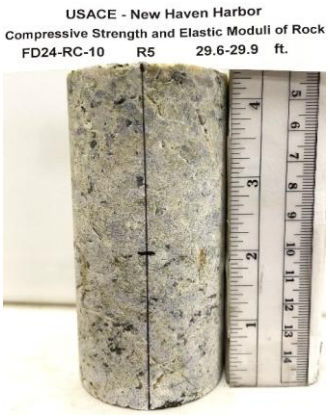
Young's modulus calculated at 50% peak strength and at peak strength, and expressed in Ksi.

Failure Type: Failed along foliation

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D
Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/30/2024	**Tested by:**	KMS/MBP
Date Reviewed:	9/30/2024	**Reviewed By:**	MBP

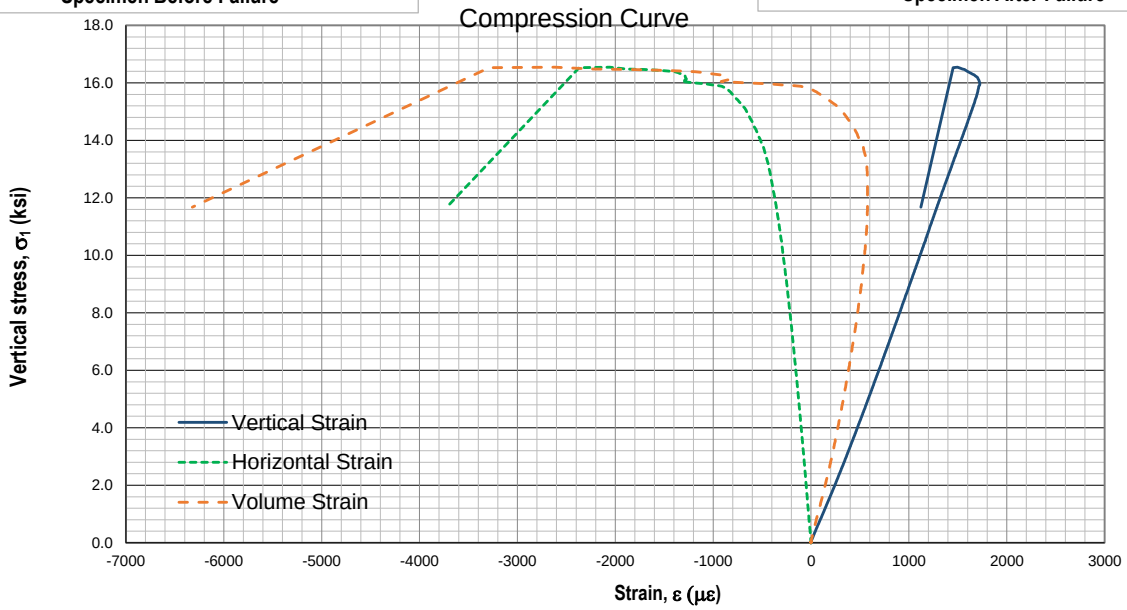
Sample Date	Boring Number	Sample	Depth	Length (L)	Diameter (D)	Aspect Ratio (L/D)	Failure Stress	Poisson's Ratio	Poisson's Ratio	Young's Modulus Ksi	Young's Modulus Ksi	Density
			ft	in	in		Ksi	at failure	at 50%	at failure	at 50%	lb / cu. ft.
8/21/2024	RC-10	R5	29.6-29.9	4.315	1.981	2.18	16.55	1.37	0.24	11057.3	8857.8	162.9



Specimen Before Failure



Specimen After Failure



Notes

Sample was measured and tested in a laboratory air dry condition after trimming preparation.

The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.

The reported thickness (L) is the average of five measurements.

The reported diameter (D) is the average of three measurements.

Poisson's ratio calculated at 50% peak strength and at peak strength.

Young's modulus calculated at 50% peak strength and at peak strength, and expressed in Ksi.

Failure Type: Y-shaped failure

Point Load Strength Index of Rock Core Specimen by ASTM D5731
Laboratory Test Results Sheet

Client: USACE
Project Name: New Haven Harbor
Project Location: New Haven , CT
Date Tested: 9/17/2024
Date Reviewed: 9/19/2024

Project Number: 51115-294936
Task: 6568-F0024-TK1.08
Assigned By: J. Barker
Tested by: KMS
Reviewed By: MBP

Boring Number	Sample	Core Size	Depth	Test Type	Diameter	Thickness	Equivalent Core Diameter Squared	Equivalent Core Diameter	Failure Load	Raw Point Load Strength Index	Size Correction Factor	Is (50)
					D	L	D_e^2	D_e	P	I_s	F	Is * F
		mm	ft		in	in	sq. in.	in	lbf	psi		psi
FD24-RC-01	R1a	50	15.5-15.6	Diametral	1.980	1.849	3.920	1.980	270.9	**69.1**	1.003	**69.3**
FD24-RC-01	R1a	50	15.7	Axial	1.979	0.918	2.313	1.521	2569.6	**1110.9**	0.890	**989.1**
FD24-RC-01	R1b	50	20.1-20.2	Diametral	1.985	1.811	3.940	1.985	3005.5	**762.8**	1.004	**765.6**
FD24-RC-01	R1b	50	20.3	Axial	1.982	0.923	2.329	1.526	2318.2	**995.3**	0.892	**887.6**
FD24-RC-02	R1	50	27.5-27.6	Diametral	1.979	1.887	3.916	1.979	1858.3	**474.5**	1.002	475.6
FD24-RC-02	R1	50	27.7	Axial	1.984	0.819	2.069	1.438	912.3	**441.0**	0.868	382.9
FD24-RC-02	R2	50	36.0-36.1	Diametral	1.981	2.326	3.924	1.981	1410.9	**359.5**	1.003	360.5
FD24-RC-02	R2	50	35.9	Axial	1.982	0.818	2.064	1.437	1938.8	**939.2**	0.868	815.1
FD24-RC-03	R2	42 (BX Core)	17.4-17.5	Diametral	1.763	1.897	3.108	1.763	1420.3	**457.0**	0.952	434.9
FD24-RC-03	R2	42 (BX Core)	17.6	Axial	1.762	0.807	1.810	1.346	851.6	**470.4**	0.843	396.3
FD24-RC-03	R3	42 (BX Core)	21.3-21.4	Diametral	1.763	1.623	3.108	1.763	2592.0	**833.9**	0.952	793.6
FD24-RC-03	R3	42 (BX Core)	21.5	Axial	1.763	0.834	1.872	1.368	1517.5	**810.6**	0.849	688.2
FD24-RC-04	R2	50	15.6-15.7	Diametral	1.976	1.991	3.905	1.976	3062.8	**784.4**	1.002	785.8
FD24-RC-04	R2	50	15.8	Axial	1.977	0.874	2.200	1.483	2160.9	**982.2**	0.880	864.7
FD24-RC-04	R3	42 (BX Core)	19.8-19.9	Diametral	1.776	1.936	3.154	1.776	332.3	**105.3**	0.955	100.6
FD24-RC-04	R3	42 (BX Core)	20	Axial	1.778	0.743	1.682	1.297	1754.6	**1043.2**	0.829	864.6
FD24-RC-05B	R2	50	28.3-28.4	Diametral	1.981	1.912	3.924	1.981	2186.0	**557.0**	1.003	558.6
FD24-RC-05B	R2	50	28.5	Axial	1.980	0.906	2.284	1.511	2870.1	**1256.6**	0.888	1115.7

Point Load Strength Index of Rock Core Specimen by ASTM D5731
Laboratory Test Results Sheet

Client: USACE
Project Name: New Haven Harbor
Project Location: New Haven , CT
Date Tested: 9/17/2024
Date Reviewed: 9/20/2024

Project Number: 51115-294936
Task: 6568-F0024-TK1.08
Assigned By: J. Barker
Tested by: KMS
Reviewed By: MBP

Boring Number	Sample	Core Size	Depth	Test Type	Diameter D	Thickness L	Equivalent Core Diameter Squared D_e^2	Equivalent Core Diameter D_e	Failure Load P	Raw Point Load Strength Index I_s	Size Correction Factor F	Is (50) Is * F
		mm	ft		in	in	sq. in.	in	lbf	psi		psi
FD24-RC-05B	R3	50	32.1-32.2	Diametral	1.980	1.954	3.920	1.980	3036.3	**774.5**	1.003	**776.5**
FD24-RC-05B	R3	50	32.3	Axial	1.976	1.086	2.732	1.653	3094.9	**1132.7**	0.924	**1047.1**
FD24-RC-06	R1	50	9.7-9.8	Diametral	1.984	1.960	3.936	1.984	2120.6	**538.7**	1.004	**540.6**
FD24-RC-06	R1	50	9.6	Axial	1.983	0.936	2.363	1.537	2368.4	**1002.2**	0.895	**896.6**
FD24-RC-06	R4	50	24.3-24.4	Diametral	1.980	1.857	3.920	1.980	1166.3	**297.5**	1.003	298.3
FD24-RC-06	R4	50	24.3	Axial	1.981	0.767	1.935	1.391	1155.3	**597.2**	0.855	510.8
FD24-RC-07	R1	50	20.5-20.6	Diametral	1.756	1.925	3.084	1.756	1993.8	**646.6**	0.950	614.2
FD24-RC-07	R1	50	20.7	Axial	1.756	0.958	2.142	1.464	2833.9	**1323.1**	0.875	1157.9
FD24-RC-07	R3	50	30.4-30.5	Diametral	1.980	1.866	3.920	1.980	3906.7	**996.5**	1.003	999.1
FD24-RC-07	R3	50	30.6	Axial	1.983	0.987	2.492	1.579	3210.3	**1288.2**	0.905	1166.4
FD24-RC-08	R1	42 (BX Core)	8.5-8.6	Diametral	1.766	1.977	3.119	1.766	2166.3	**694.6**	0.952	661.5
FD24-RC-08	R1	42 (BX Core)	8.7	Axial	1.766	0.936	2.105	1.451	2949.3	**1401.3**	0.872	1221.5
FD24-RC-08	R4	50	17.3-17.4	Diametral	1.980	1.674	3.920	1.980	2339.6	**596.8**	1.003	598.3
FD24-RC-08	R4	50	17.5	Axial	1.979	0.908	2.288	1.513	1508.7	**659.4**	0.888	585.7
FD24-RC-10	R2	50	15.6-15.8	Diametral	1.978	1.931	3.912	1.978	3085.1	**788.5**	1.002	790.2
FD24-RC-10	R2	50	15.9	Axial	1.980	1.017	2.564	1.601	679.4	**265.0**	0.911	241.5
FD24-RC-10	R4	50	27.2-27.3	Diametral	1.977	1.968	3.909	1.977	288.2	**73.7**	1.002	73.9
FD24-RC-10	R4	50	27.4	Axial	1.975	0.917	2.306	1.519	1259.4	**546.1**	0.890	485.9

Point Load Strength Index of Rock Core Specimen by ASTM D5731
Laboratory Test Results Sheet

Client:	USACE	**Project Number**	51115-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven , CT	**Assigned By:**	J. Barker
Date Tested:	9/17/2024	**Tested by:**	KMS
Date Reviewed:	9/19/2024	**Reviewed By:**	MBP

Boring Number	Sample	Core Size	Depth	Test Type	Diameter	Thickness	Equivalent Core Diameter Squared	Equivalent Core Diameter	Failure Load	Raw Point Load Strength Index	Size Correction Factor	Is (50)
					D	L	D_e^2	D_e	P	I_s	F	Is * F
		mm	ft		in	in	sq. in.	in	lbf	psi		psi
FD24-RC-01	R1a	50	15.5-15.6	Diametral	1.980	1.849	3.920	1.980	270.9	**69.1**	1.003	**69.3**
FD24-RC-01	R1a	50	15.7	Axial	1.979	0.918	2.313	1.521	2569.6	**1110.9**	0.890	**989.1**





Table 1
Generalized Index to Strength Coversion Factor K

Core Size (mm)	K
21.5 (EX Core)	18
30	19
42 (BX Core)	21
50	23
54 (NX core)	24
60	24.5

Notes

Generalized correction factor, K, used to estimate the compressive strength is correlated to core size per ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter (D) is the average of three measurements.

D_e	Equivalent Core Diameter
Axial D_e^2	$4 \bullet A / \pi$
Diametral D_e^2	D^2
I_s	(P/D_e^2)
F	$(D_e/50)^{0.45}$ - Metric; $(D_e/1.9685)^{0.45}$ - Imperial

Point Load Strength Index of Rock Core Specimen by ASTM D5731
Laboratory Test Results Sheet

Client:	USACE	**Project Number**	51115-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven , CT	**Assigned By:**	J. Barker
Date Tested:	9/17/2024	**Tested by:**	KMS
Date Reviewed:	9/19/2024	**Reviewed By:**	MBP

Boring Number	Sample	Core Size	Depth	Test Type	Diameter	Thickness	Equivalent Core Diameter Squared	Equivalent Core Diameter	Failure Load	Raw Point Load Strength Index	Size Correction Factor	Is (50)
					D	L	D_e^2	D_e	P	I_s	F	Is * F
		mm	ft		in	in	sq. in.	in	lbf	psi		psi
FD24-RC-01	R1b	50	20.1-20.2	Diametral	1.985	1.811	3.940	1.985	3005.5	**762.8**	1.004	**765.6**
FD24-RC-01	R1b	50	20.3	Axial	1.982	0.923	2.329	1.526	2318.2	**995.3**	0.892	**887.6**





Table 1
Generalized Index to Strength Coversion Factor K

Core Size (mm)	K
21.5 (EX Core)	18
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Notes

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D_e Equivalent Core Diameter

Axial D_e^2 $4 \bullet A / \pi$

Diametral D_e^2 D^2

I_s (P/D_e^2)

F $(D_e/50)^{0.45}$ - Metric; $(D_e/1.9685)^{0.45}$ - Imperial

Point Load Strength Index of Rock Core Specimen by ASTM D5731
Laboratory Test Results Sheet

Client:	USACE	**Project Number**	51115-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven , CT	**Assigned By:**	J. Barker
Date Tested:	9/17/2024	**Tested by:**	KMS
Date Reviewed:	9/19/2024	**Reviewed By:**	MBP

Boring Number	Sample	Core Size	Depth	Test Type	Diameter	Thickness	Equivalent Core Diameter Squared	Equivalent Core Diameter	Failure Load	Raw Point Load Strength Index	Size Correction Factor	Is (50)
					D	L	D_e^2	D_e	P	I_s	F	Is * F
		mm	ft		in	in	sq. in.	in	lbf	psi		psi
FD24-RC-02	R1	50	27.5-27.6	Diametral	1.979	1.887	3.916	1.979	1858.3	**474.5**	1.002	**475.6**
FD24-RC-02	R1	50	27.7	Axial	1.984	0.819	2.069	1.438	912.3	**441.0**	0.868	**382.9**





Table 1
Generalized Index to Strength Coversion Factor K

Core Size (mm)	K
21.5 (EX Core)	18
30	19
42 (BX Core)	21
50	23
54 (NX core)	24
60	24.5

Notes

Generalized correction factor, K, used to estimate the compressive strength is correlated to core size per ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter (D) is the average of three measurements.

D_e Equivalent Core Diameter

Axial D_e^2 $4 \bullet A / \pi$

Diametral D_e^2 D^2

I_s (P/D_e^2)

F $(D_e/50)^{0.45}$ - Metric; $(D_e/1.9685)^{0.45}$ - Imperial

Point Load Strength Index of Rock Core Specimen by ASTM D5731
Laboratory Test Results Sheet

Client:	USACE	**Project Number**	51115-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven , CT	**Assigned By:**	J. Barker
Date Tested:	9/17/2024	**Tested by:**	KMS
Date Reviewed:	9/19/2024	**Reviewed By:**	MBP

Boring Number	Sample	Core Size	Depth	Test Type	Diameter	Thickness	Equivalent Core Diameter Squared	Equivalent Core Diameter	Failure Load	Raw Point Load Strength Index	Size Correction Factor	Is (50)
					D	L	D_e^2	D_e	P	I_s	F	Is * F
		mm	ft		in	in	sq. in.	in	lbf	psi		psi
FD24-RC-02	R2	50	36.0-36.1	Diametral	1.981	2.326	3.924	1.981	1410.9	**359.5**	1.003	**360.5**
FD24-RC-02	R2	50	35.9	Axial	1.982	0.818	2.064	1.437	1938.8	**939.2**	0.868	**815.1**





Table 1
Generalized Index to Strength Coversion Factor K

Core Size (mm)	K
21.5 (EX Core)	18
30	19
42 (BX Core)	21
50	23
54 (NX core)	24
60	24.5

Notes

Generalized correction factor, K, used to estimate the compressive strength is correlated to core size per ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter (D) is the average of three measurements.

D_e Equivalent Core Diameter

Axial D_e^2 $4 \bullet A / \pi$

Diametral D_e^2 D^2

I_s (P/D_e^2)

F $(D_e/50)^{0.45}$ - Metric; $(D_e/1.9685)^{0.45}$ - Imperial

Point Load Strength Index of Rock Core Specimen by ASTM D5731
Laboratory Test Results Sheet

Client:	USACE	**Project Number**	51115-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven , CT	**Assigned By:**	J. Barker
Date Tested:	9/17/2024	**Tested by:**	KMS
Date Reviewed:	9/19/2024	**Reviewed By:**	MBP

Boring Number	Sample	Core Size	Depth	Test Type	Diameter	Thickness	Equivalent Core Diameter Squared	Equivalent Core Diameter	Failure Load	Raw Point Load Strength Index	Size Correction Factor	Is (50)
					D	L	D_e^2	D_e	P	I_s	F	Is * F
		mm	ft		in	in	sq. in.	in	lbf	psi		psi
FD24-RC-03	R2	42 (BX Core)	17.4-17.5	Diametral	1.763	1.897	3.108	1.763	1420.3	**457.0**	0.952	**434.9**
FD24-RC-03	R2	42 (BX Core)	17.6	Axial	1.762	0.807	1.810	1.346	851.6	**470.4**	0.843	**396.3**



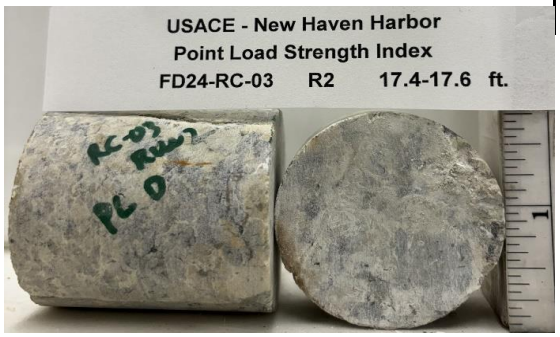


Table 1
Generalized Index to Strength Coversion Factor K

Core Size (mm)	K
21.5 (EX Core)	18
30	19
42 (BX Core)	21
50	23
54 (NX core)	24
60	24.5

Notes

Generalized correction factor, K, used to estimate the compressive strength is correlated to core size per ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter (D) is the average of three measurements.

D_e Equivalent Core Diameter

Axial D_e^2 $4 \bullet A / \pi$

Diametral D_e^2 D^2

I_s (P/D_e^2)

F $(D_e/50)^{0.45}$ - Metric; $(D_e/1.9685)^{0.45}$ - Imperial

Point Load Strength Index of Rock Core Specimen by ASTM D5731
Laboratory Test Results Sheet

Client:	USACE	**Project Number**	51115-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven , CT	**Assigned By:**	J. Barker
Date Tested:	9/17/2024	**Tested by:**	KMS
Date Reviewed:	9/19/2024	**Reviewed By:**	MBP

Boring Number	Sample	Core Size	Depth	Test Type	Diameter	Thickness	Equivalent Core Diameter Squared	Equivalent Core Diameter	Failure Load	Raw Point Load Strength Index	Size Correction Factor	Is (50)
					D	L	D_e^2	D_e	P	I_s	F	Is * F
		mm	ft		in	in	sq. in.	in	lbf	psi		psi
FD24-RC-03	R3	42 (BX Core)	21.3-21.4	Diametral	1.763	1.623	3.108	1.763	2592.0	**833.9**	0.952	**793.6**
FD24-RC-03	R3	42 (BX Core)	21.5	Axial	1.763	0.834	1.872	1.368	1517.5	**810.6**	0.849	**688.2**





Table 1
Generalized Index to Strength Coversion Factor K

Core Size (mm)	K
21.5 (EX Core)	18
30	19
42 (BX Core)	21
50	23
54 (NX core)	24
60	24.5

Notes

Generalized correction factor, K, used to estimate the compressive strength is correlated to core size per ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter (D) is the average of three measurements.

D_e	Equivalent Core Diameter
Axial D_e^2	$4 \bullet A / \pi$
Diametral D_e^2	D^2
I_s	(P/D_e^2)
F	$(D_e/50)^{0.45}$ - Metric; $(D_e/1.9685)^{0.45}$ - Imperial

Point Load Strength Index of Rock Core Specimen by ASTM D5731
Laboratory Test Results Sheet

Client:	USACE	**Project Number**	51115-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven , CT	**Assigned By:**	J. Barker
Date Tested:	9/17/2024	**Tested by:**	KMS
Date Reviewed:	9/19/2024	**Reviewed By:**	MBP

Boring Number	Sample	Core Size	Depth	Test Type	Diameter	Thickness	Equivalent Core Diameter Squared	Equivalent Core Diameter	Failure Load	Raw Point Load Strength Index	Size Correction Factor	Is (50)
					D	L	D_e^2	D_e	P	I_s	F	Is * F
		mm	ft		in	in	sq. in.	in	lbf	psi		psi
FD24-RC-04	R2	50	15.6-15.7	Diametral	1.976	1.991	3.905	1.976	3062.8	**784.4**	1.002	**785.8**
FD24-RC-04	R2	50	15.8	Axial	1.977	0.874	2.200	1.483	2160.9	**982.2**	0.880	**864.7**





Table 1
Generalized Index to Strength Coversion Factor K

Core Size (mm)	K
21.5 (EX Core)	18
30	19
42 (BX Core)	21
50	23
54 (NX core)	24
60	24.5

Notes

Generalized correction factor, K, used to estimate the compressive strength is correlated to core size per ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter (D) is the average of three measurements.

D_e	Equivalent Core Diameter
Axial D_e^2	$4 \cdot A / \pi$
Diametral D_e^2	D^2
I_s	(P/D_e^2)
F	$(D_e/50)^{0.45}$ - Metric; $(D_e/1.9685)^{0.45}$ - Imperial

Point Load Strength Index of Rock Core Specimen by ASTM D5731
Laboratory Test Results Sheet

Client:	USACE	**Project Number**	51115-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven , CT	**Assigned By:**	J. Barker
Date Tested:	9/17/2024	**Tested by:**	KMS
Date Reviewed:	9/19/2024	**Reviewed By:**	MBP

Boring Number	Sample	Core Size	Depth	Test Type	Diameter	Thickness	Equivalent Core Diameter Squared	Equivalent Core Diameter	Failure Load	Raw Point Load Strength Index	Size Correction Factor	Is (50)
					D	L	D_e^2	D_e	P	I_s	F	Is * F
		mm	ft		in	in	sq. in.	in	lbf	psi		psi
FD24-RC-04	R3	50	19.8-19.9	Diametral	1.776	1.936	3.154	1.776	332.3	**105.3**	0.955	**100.6**
FD24-RC-04	R3	50	20.0	Axial	1.778	0.743	1.682	1.297	1754.6	**1043.2**	0.829	**864.6**





Table 1
Generalized Index to Strength Coversion Factor K

Core Size (mm)	K
21.5 (EX Core)	18
30	19
42 (BX Core)	21
50	23
54 (NX core)	24
60	24.5

Notes

Generalized correction factor, K, used to estimate the compressive strength is correlated to core size per ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter (D) is the average of three measurements.

D_e Equivalent Core Diameter

Axial D_e^2 $4 \bullet A / \pi$

Diametral D_e^2 D^2

I_s (P/D_e^2)

F $(D_e/50)^{0.45}$ - Metric; $(D_e/1.9685)^{0.45}$ - Imperial

Point Load Strength Index of Rock Core Specimen by ASTM D5731
Laboratory Test Results Sheet

Client:	USACE	**Project Number**	51115-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven , CT	**Assigned By:**	J. Barker
Date Tested:	9/17/2024	**Tested by:**	KMS
Date Reviewed:	9/19/2024	**Reviewed By:**	MBP

Boring Number	Sample	Core Size	Depth	Test Type	Diameter	Thickness	Equivalent Core Diameter Squared	Equivalent Core Diameter	Failure Load	Raw Point Load Strength Index	Size Correction Factor	Is (50)
					D	L	D_e^2	D_e	P	I_s	F	Is * F
		mm	ft		in	in	sq. in.	in	lbf	psi		psi
FD24-RC-05B	R2	50	28.3-28.4	Diametral	1.981	1.912	3.924	1.981	2186.0	**557.0**	1.003	**558.6**
FD24-RC-05B	R2	50	28.5	Axial	1.980	0.906	2.284	1.511	2870.1	**1256.6**	0.888	**1115.7**





Table 1
Generalized Index to Strength Coversion Factor K

Core Size (mm)	K
21.5 (EX Core)	18
30	19
42 (BX Core)	21
50	23
54 (NX core)	24
60	24.5

Notes

Generalized correction factor, K, used to estimate the compressive strength is correlated to core size per ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter (D) is the average of three measurements.

D_e	Equivalent Core Diameter
Axial D_e^2	$4 \bullet A / \pi$
Diametral D_e^2	D^2
I_s	(P/D_e^2)
F	$(D_e/50)^{0.45}$ - Metric; $(D_e/1.9685)^{0.45}$ - Imperial

Point Load Strength Index of Rock Core Specimen by ASTM D5731
Laboratory Test Results Sheet

Client:	USACE	**Project Number**	51115-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven , CT	**Assigned By:**	J. Barker
Date Tested:	9/17/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample	Core Size	Depth	Test Type	Diameter	Thickness	Equivalent Core Diameter Squared	Equivalent Core Diameter	Failure Load	Raw Point Load Strength Index	Size Correction Factor	Is (50)
					D	L	D_e^2	D_e	P	I_s	F	Is * F
		mm	ft		in	in	sq. in.	in	lbf	psi		psi
FD24-RC-05B	R3	50	32.1-32.2	Diametral	1.980	1.954	3.920	1.980	3036.3	**774.5**	1.003	**776.5**
FD24-RC-05B	R3	50	32.3	Axial	1.976	1.086	2.732	1.653	3094.9	**1132.7**	0.924	**1047.1**





Table 1
Generalized Index to Strength Coversion Factor K

Core Size (mm)	K
21.5 (EX Core)	18
30	19
42 (BX Core)	21
50	23
54 (NX core)	24
60	24.5

Notes

Generalized correction factor, K, used to estimate the compressive strength is correlated to core size per ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter (D) is the average of three measurements.

D_e	Equivalent Core Diameter
Axial D_e^2	$4 \cdot A / \pi$
Diametral D_e^2	D^2
I_s	(P/D_e^2)
F	$(D_e/50)^{0.45}$ - Metric; $(D_e/1.9685)^{0.45}$ - Imperial

Point Load Strength Index of Rock Core Specimen by ASTM D5731
Laboratory Test Results Sheet

Client:	USACE	**Project Number**	51115-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven , CT	**Assigned By:**	J. Barker
Date Tested:	9/17/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample	Core Size	Depth	Test Type	Diameter	Thickness	Equivalent Core Diameter Squared	Equivalent Core Diameter	Failure Load	Raw Point Load Strength Index	Size Correction Factor	Is (50)
					D	L	D_e^2	D_e	P	I_s	F	Is * F
		mm	ft		in	in	sq. in.	in	lbf	psi		psi
FD24-RC-06	R1	50	9.7-9.8	Diametral	1.984	1.960	3.936	1.984	2120.6	**538.7**	1.004	**540.6**
FD24-RC-06	R1	50	9.6	Axial	1.983	0.936	2.363	1.537	2368.4	**1002.2**	0.895	**896.6**



Table 1 Generalized Index to Strength Coversion Factor K	
Core Size (mm)	K
21.5 (EX Core)	18
30	19
42 (BX Core)	21
50	23
54 (NX core)	24
60	24.5

Notes

Generalized correction factor, K, used to estimate the compressive strength is correlated to core size per ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter (D) is the average of three measurements.

D_e Equivalent Core Diameter

Axial D_e^2 $4 \cdot A / \pi$

Diametral D_e^2 D^2

I_s (P/D_e^2)

F $(D_e/50)^{0.45}$ - Metric; $(D_e/1.9685)^{0.45}$ - Imperial

Point Load Strength Index of Rock Core Specimen by ASTM D5731
Laboratory Test Results Sheet

Client:	USACE	**Project Number**	51115-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven , CT	**Assigned By:**	J. Barker
Date Tested:	9/17/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample	Core Size	Depth	Test Type	Diameter	Thickness	Equivalent Core Diameter Squared	Equivalent Core Diameter	Failure Load	Raw Point Load Strength Index	Size Correction Factor	Is (50)
					D	L	D_e^2	D_e	P	I_s	F	Is * F
		mm	ft		in	in	sq. in.	in	lbf	psi		psi
FD24-RC-06	R4	50	24.3-24.4	Diametral	1.980	1.857	3.920	1.980	1166.3	**297.5**	1.003	**298.3**
FD24-RC-06	R4	50	24.3	Axial	1.981	0.767	1.935	1.391	1155.3	**597.2**	0.855	**510.8**





Table 1
Generalized Index to Strength Coversion Factor K

Core Size (mm)	K
21.5 (EX Core)	18
30	19
42 (BX Core)	21
50	23
54 (NX core)	24
60	24.5

Notes

Generalized correction factor, K, used to estimate the compressive strength is correlated to core size per ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter (D) is the average of three measurements.

D_e Equivalent Core Diameter

Axial D_e^2 $4 \bullet A / \pi$

Diametral D_e^2 D^2

I_s (P/D_e^2)

F $(D_e/50)^{0.45}$ - Metric; $(D_e/1.9685)^{0.45}$ - Imperial

Point Load Strength Index of Rock Core Specimen by ASTM D5731
Laboratory Test Results Sheet

Client:	USACE	**Project Number**	51115-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven , CT	**Assigned By:**	J. Barker
Date Tested:	9/17/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample	Core Size	Depth	Test Type	Diameter	Thickness	Equivalent Core Diameter Squared	Equivalent Core Diameter	Failure Load	Raw Point Load Strength Index	Size Correction Factor	Is (50)
					D	L	D_e^2	D_e	P	I_s	F	Is * F
		mm	ft		in	in	sq. in.	in	lbf	psi		psi
FD24-RC-07	R1	50	20.5-20.6	Diametral	1.756	1.925	3.084	1.756	1993.8	**646.6**	0.950	**614.2**
FD24-RC-07	R1	50	20.7	Axial	1.756	0.958	2.142	1.464	2833.9	**1323.1**	0.875	**1157.9**





Table 1
Generalized Index to Strength Coversion Factor K

Core Size (mm)	K
21.5 (EX Core)	18
30	19
42 (BX Core)	21
50	23
54 (NX core)	24
60	24.5

Notes

Generalized correction factor, K, used to estimate the compressive strength is correlated to core size per ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter (D) is the average of three measurements.

D_e Equivalent Core Diameter

Axial D_e^2 $4 \bullet A / \pi$

Diametral D_e^2 D^2

I_s (P/D_e^2)

F $(D_e/50)^{0.45}$ - Metric; $(D_e/1.9685)^{0.45}$ - Imperial

Point Load Strength Index of Rock Core Specimen by ASTM D5731
Laboratory Test Results Sheet

Client:	USACE	**Project Number**	51115-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven , CT	**Assigned By:**	J. Barker
Date Tested:	9/17/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample	Core Size	Depth	Test Type	Diameter	Thickness	Equivalent Core Diameter Squared	Equivalent Core Diameter	Failure Load	Raw Point Load Strength Index	Size Correction Factor	Is (50)
					D	L	D_e^2	D_e	P	I_s	F	Is * F
		mm	ft		in	in	sq. in.	in	lbf	psi		psi
FD24-RC-07	R3	50	30.4-30.5	Diametral	1.980	1.866	3.920	1.980	3906.7	**996.5**	1.003	**999.1**
FD24-RC-07	R3	50	30.6	Axial	1.983	0.987	2.492	1.579	3210.3	**1288.2**	0.905	**1166.4**





Table 1
Generalized Index to Strength Coversion Factor K

Core Size (mm)	K
21.5 (EX Core)	18
30	19
42 (BX Core)	21
50	23
54 (NX core)	24
60	24.5

Notes

Generalized correction factor, K, used to estimate the compressive strength is correlated to core size per ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter (D) is the average of three measurements.

D_e	Equivalent Core Diameter
Axial D_e^2	$4 \bullet A / \pi$
Diametral D_e^2	D^2
I_s	(P/D_e^2)
F	$(D_e/50)^{0.45}$ - Metric; $(D_e/1.9685)^{0.45}$ - Imperial

Point Load Strength Index of Rock Core Specimen by ASTM D5731
Laboratory Test Results Sheet

Client:	USACE	**Project Number**	51115-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven , CT	**Assigned By:**	J. Barker
Date Tested:	9/17/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample	Core Size	Depth	Test Type	Diameter	Thickness	Equivalent Core Diameter Squared	Equivalent Core Diameter	Failure Load	Raw Point Load Strength Index	Size Correction Factor	Is (50)
					D	L	D_e^2	D_e	P	I_s	F	Is * F
		mm	ft		in	in	sq. in.	in	lbf	psi		psi
FD24-RC-08	R1	42 (BX Core)	8.5-8.6	Diametral	1.766	1.977	3.119	1.766	2166.3	**694.6**	0.952	**661.5**
FD24-RC-08	R1	42 (BX Core)	8.7	Axial	1.766	0.936	2.105	1.451	2949.3	**1401.3**	0.872	**1221.5**





Table 1
Generalized Index to Strength Coversion Factor K

Core Size (mm)	K
21.5 (EX Core)	18
30	19
42 (BX Core)	21
50	23
54 (NX core)	24
60	24.5

Notes

Generalized correction factor, K, used to estimate the compressive strength is correlated to core size per ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter (D) is the average of three measurements.

D_e	Equivalent Core Diameter
Axial D_e^2	$4 \bullet A / \pi$
Diametral D_e^2	D^2
I_s	(P/D_e^2)
F	$(D_e/50)^{0.45}$ - Metric; $(D_e/1.9685)^{0.45}$ - Imperial

Point Load Strength Index of Rock Core Specimen by ASTM D5731
Laboratory Test Results Sheet

Client:	USACE	**Project Number**	51115-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven , CT	**Assigned By:**	J. Barker
Date Tested:	9/17/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample	Core Size	Depth	Test Type	Diameter	Thickness	Equivalent Core Diameter Squared	Equivalent Core Diameter	Failure Load	Raw Point Load Strength Index	Size Correction Factor	Is (50)
					D	L	D_e^2	D_e	P	I_s	F	Is * F
		mm	ft		in	in	sq. in.	in	lbf	psi		psi
FD24-RC-08	R4	50	17.3-17.4	Diametral	1.980	1.674	3.920	1.980	2339.6	**596.8**	1.003	**598.3**
FD24-RC-08	R4	50	17.5	Axial	1.979	0.908	2.288	1.513	1508.7	**659.4**	0.888	**585.7**





Table 1
Generalized Index to Strength Coversion Factor K

Core Size (mm)	K
21.5 (EX Core)	18
30	19
42 (BX Core)	21
50	23
54 (NX core)	24
60	24.5

Notes

Generalized correction factor, K, used to estimate the compressive strength is correlated to core size per ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter (D) is the average of three measurements.

D_e	Equivalent Core Diameter
Axial D_e^2	$4 \bullet A / \pi$
Diametral D_e^2	D^2
I_s	(P/D_e^2)
F	$(D_e/50)^{0.45}$ - Metric; $(D_e/1.9685)^{0.45}$ - Imperial

Point Load Strength Index of Rock Core Specimen by ASTM D5731
Laboratory Test Results Sheet

Client:	USACE	**Project Number**	51115-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven , CT	**Assigned By:**	J. Barker
Date Tested:	9/17/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample	Core Size	Depth	Test Type	Diameter	Thickness	Equivalent Core Diameter Squared	Equivalent Core Diameter	Failure Load	Raw Point Load Strength Index	Size Correction Factor	Is (50)
					D	L	D_e^2	D_e	P	I_s	F	Is * F
		mm	ft		in	in	sq. in.	in	lbf	psi		psi
FD24-RC-10	R2	50	15.6-15.8	Diametral	1.978	1.931	3.912	1.978	3085.1	**788.5**	1.002	**790.2**
FD24-RC-10	R2	50	15.9	Axial	1.980	1.017	2.564	1.601	679.4	**265.0**	0.911	**241.5**





Table 1
Generalized Index to Strength Coversion Factor K

Core Size (mm)	K
21.5 (EX Core)	18
30	19
42 (BX Core)	21
50	23
54 (NX core)	24
60	24.5

Notes

Generalized correction factor, K, used to estimate the compressive strength is correlated to core size per ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter (D) is the average of three measurements.

D_e Equivalent Core Diameter

Axial D_e^2 $4 \bullet A / \pi$

Diametral D_e^2 D^2

I_s (P/D_e^2)

F $(D_e/50)^{0.45}$ - Metric; $(D_e/1.9685)^{0.45}$ - Imperial

Point Load Strength Index of Rock Core Specimen by ASTM D5731
Laboratory Test Results Sheet

Client:	USACE	**Project Number**	51115-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven , CT	**Assigned By:**	J. Barker
Date Tested:	9/17/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample	Core Size	Depth	Test Type	Diameter	Thickness	Equivalent Core Diameter Squared	Equivalent Core Diameter	Failure Load	Raw Point Load Strength Index	Size Correction Factor	Is (50)
					D	L	D_e^2	D_e	P	I_s	F	Is * F
		mm	ft		in	in	sq. in.	in	lbf	psi		psi
FD24-RC-10	R4	50	27.2-27.3	Diametral	1.977	1.968	3.909	1.977	288.2	**73.7**	1.002	**73.9**
FD24-RC-10	R4	50	27.4	Axial	1.975	0.917	2.306	1.519	1259.4	**546.1**	0.890	**485.9**





Table 1
Generalized Index to Strength Coversion Factor K

Core Size (mm)	K
21.5 (EX Core)	18
30	19
42 (BX Core)	21
50	23
54 (NX core)	24
60	24.5

Notes

Generalized correction factor, K, used to estimate the compressive strength is correlated to core size per ASTM D5731 Table 1.

The reported thickness (L) is the average of three measurements.

The reported diameter (D) is the average of three measurements.

D_e Equivalent Core Diameter

Axial D_e^2 $4 \bullet A / \pi$

Diametral D_e^2 D^2

I_s (P/D_e^2)

F $(D_e/50)^{0.45}$ - Metric; $(D_e/1.9685)^{0.45}$ - Imperial

Splitting Tensile Strength of Intact Rock Core Specimens by ASTM D3967

Laboratory Test results Summary Sheet

Client: USACE
Project Number: 294936
Project Name: New Haven Harbor
Task: 6568-F0024-TK1.08
Project Location: New Haven, CT
Assigned By: J. Barker
Date Tested: 9/13/2024 & 9/20/2024
Tested by: KMS
Date Reviewed: 9/23/2024
Reviewed By: MBP

Boring Number	Sample ID	Depth	Thickness (L)	Diameter (D)	Aspect Ratio (L/D)	Loading Rate	Failure Load	Splitting Tensile Strength	Density
		ft	in	in		psi / sec	lbf	psi	lb / cu.
FD24-RC-01	R1a	16.2	0.95	1.979	0.480	8.0	6150	**2082.40**	165.6
FD24-RC-01	R1b	19.1	0.827	1.976	0.419	14.4	2466	**960.75**	162.8
FD24-RC-02	R1	26.9	0.848	1.981	0.428	10.7	1442	**546.51**	164.6
FD24-RC-02	R1a	30.0	0.875	1.980	0.440	7.9	4020	**1477.00**	164.8
FD24-RC-02	R2	35.3	0.859	1.981	0.434	8.0	4576	**1711.81**	165.1
FD24-RC-03	R1	13.5	0.894	1.758	0.509	8.0	4626	**1873.63**	162.4
FD24-RC-03	R1a	13.6	0.756	1.758	0.430	8.1	2946	**1410.96**	165.7
FD24-RC-03	R3	21.6	0.760	1.766	0.430	8.1	2777	**1317.13**	164.3
FD24-RC-04	R2	15.2	0.902	1.982	0.455	8.0	6175	**2199.01**	162.1
FD24-RC-04	R3	20.1	0.938	1.977	0.474	8.1	3824	**1312.74**	161.4
FD24-RC-05B	R1	23.1	0.824	1.979	0.416	8.0	***Sample failed on contact***		
FD24-RC-05B	R2a	26.6	1.076	1.982	0.540	8.0	5239	**1563.97**	165.5
FD24-RC-05B	R2	29.1	1.023	1.977	0.517	8.0	6328	**1991.85**	166.2
FD24-RC-05B	R3	32.0	0.976	1.981	2.030	8.0	5744	**1808.03**	164.9

Notes

Sample was measured and tested in a laboratory air dry condition after trimming preparation.

ASTM requires the thickness-to-diameter ratio (L/D) of each test specimen to be between 0.2 and 0.75.

The reported thickness (L) is the average of three measurements.

The reported diameter (D) is the average of three measurements.

Preparation: Saw Cut

Splitting Tensile Strength of Intact Rock Core Specimens by ASTM D3967

Laboratory Test results Summary Sheet

Client: USACE
Project Number: 294936
Project Name: New Haven Harbor
Task: 6568-F0024-TK1.08
Project Location: New Haven, CT
Assigned By: J. Barker
Date Tested: 9/13/2024 & 9/20/2024
Tested by: KMS
Date Reviewed: 9/23/2024
Reviewed By: MBP

Boring Number	Sample ID	Depth	Thickness (L)	Diameter (D)	Aspect Ratio (L/D)	Loading Rate	Failure Load	Splitting Tensile Strength	Density
		ft	in	in		psi / sec	lbf	psi	lb / cu.
FD24-RC-06	R1	9.4	0.819	1.981	0.413	8.2	2347	**921.04**	162.2
FD24-RC-06	R2	14.1	0.882	1.981	0.450	8.2	3038	**1106.79**	162.7
FD24-RC-06	R4	24.5	0.904	1.987	0.455	7.8	4073	**1443.62**	162.7
FD24-RC-06	R4a	24.8	0.850	1.984	0.428	8.3	2992	**1255.96**	163.2
FD24-RC-07	R1	20.9	0.938	1.757	0.534	7.9	3878	**1497.86**	164.9
FD24-RC-07	R3	30.2	0.940	1.981	0.475	8.0	5093	**1741.32**	167.0
FD24-RC-08	R1	8.3	0.917	1.767	0.519	8.0	5162	**2028.30**	163.7
FD24-RC-08	R2	13.6	0.759	1.767	0.430	8.0	3068	**1456.48**	166.2
FD24-RC-08	R4	20.4	0.907	1.999	0.454	7.0	1546	**542.72**	159.7
FD24-RC-10	R2a	15.9	0.977	1.983	0.490	8.0	5465	**1795.94**	160.9
FD24-RC-10	R2	17.1	0.931	1.984	0.469	8.0	5055	**1742.28**	161.5
FD24-RC-10	R4a	25.4	0.988	1.981	0.500	8.0	7396	**2405.63**	171.1
FD24-RC-10	R4	27.4	0.879	1.983	0.443	7.9	6427	**2347.30**	171.9

Notes

Sample was measured and tested in a laboratory air dry condition after trimming preparation.

ASTM requires the thickness-to-diameter ratio (L/D) of each test specimen to be between 0.2 and 0.75.

The reported thickness (L) is the average of three measurements.

The reported diameter (D) is the average of three measurements.

Preparation: Saw Cut

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625

Laboratory Test Results Summary Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/17/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample ID	Depth ft	Preparation	Reading		CERCHAR Classification	Mohs Hardness
				Uncorrected	Corrected		
RC-01	R1a	17.0	Saw Cut	2.5	2.9	**High Abrasiveness**	6-7
RC-01	R1b	19.5	Saw Cut	2.4	2.8	**High Abrasiveness**	6-7
RC-02	R1	28.0	Saw Cut	3.5	3.9	**High Abrasiveness**	7-8
RC-02	R2	36.0	Saw Cut	3.2	3.7	**High Abrasiveness**	7-8
RC-03	R2	17.8	Saw Cut	2.6	3.1	**High Abrasiveness**	7-8
RC-03	R3	21.1	Saw Cut	4.1	4.5	**Extreme Abrasiveness**	7-8
RC-04	R2	17.4	Saw Cut	3.0	4.0	**High Abrasiveness**	6-7
RC-04	R3	21.1	Saw Cut	3.0	3.5	**High Abrasiveness**	6-7
RC-05B	R2	29.6	Saw Cut	3.5	3.9	**High Abrasiveness**	7-8
RC-05B	R3	32.3	Saw Cut	2.7	3.2	**High Abrasiveness**	7-8
RC-06	R1	10.4	Saw Cut	3.0	3.4	**High Abrasiveness**	7-8
RC-06	R4	22.9	Saw Cut	3.0	3.4	**High Abrasiveness**	7-8
RC-07	R1	21.0	Saw Cut	4.1	4.5	**Extreme Abrasiveness**	7-8
RC-07	R3	30.6	Saw Cut	2.4	2.9	**High Abrasiveness**	7-8
RC-08	R1	8.7	Saw Cut	3.5	3.9	**High Abrasiveness**	7-8
RC-08	R4	20.8	Saw Cut	3.1	3.6	**High Abrasiveness**	7-8
RC-10	R2	15.3	Saw Cut	3.5	4.0	**High Abrasiveness**	7-8
RC-10	R4	25.2	Saw Cut	2.0	2.5	**High Abrasiveness**	5-6

ASTM D7625 Table 1
Criteria for the CERCHAR Abrasiveness Index

Classification	Average CAI (3) HRC 55		Average CAI (2) HRC 40	
	Lower	Upper	Lower	Upper
Very Low Abrasiveness	0.3	0.5	0.32	0.66
Low Abrasiveness	0.5	1	0.66	1.51
Medium Abrasiveness	1	2	1.51	3.22
High Abrasiveness	2	4	3.22	6.62
Extreme Abrasiveness	4	6	6.62	10.03
Quartzitic	6	7	NA	NA

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625
Laboratory Test Results Sheet

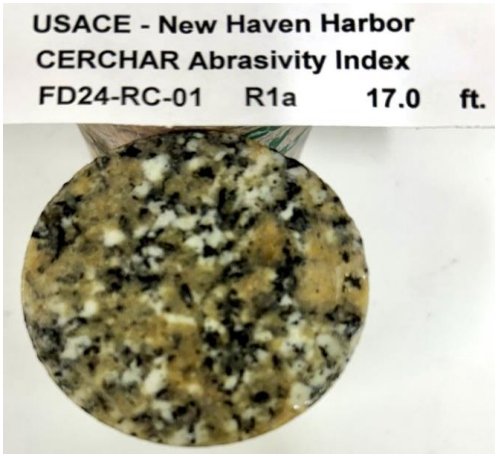
Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/17/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample ID	Depth ft	Stylus ID	Reading 1	Reading 2	Reading Average	Comments
RC-01	R1a	17.0	1	1.5	3.7	2.6	
			2	2.7	0.0	1.4	
			3	5.1	4.7	4.9	
			4	1.4	2.7	2.1	
			5	0.0	3.0	1.5	
			Average CAI_S			**2.5**	
Mohs Hardness	**6-7**		**Average CAI_N**			**2.9**	

CERCHAR Abrasivity Index Classification **High Abrasiveness**

NOTES

Test Surface:	Saw Cut
Moisture Condition:	As Received
Apparatus Type:	West CERCHAR
Stylus Hardness/HRC:	55
CAI_S	CERCHAR index for smooth (saw cut) surface
CAI	CERCHAR index for natural surface
$CAI_N = 0.99 \cdot CAI_S + 0.48$	Normalized CERCHAR index for CAI_S



ASTM D7625 Table 1
Criteria for the CERCHAR Abrasiveness Index

Classification	Average CAI (3) HRC 55 Lower	Average CAI (3) HRC 55 Upper	Average CAI (2) HRC 40 Lower	Average CAI (2) HRC 40 Upper
Very Low Abrasiveness	0.3	0.5	0.32	0.66
Low Abrasiveness	0.5	1	0.66	1.51
Medium Abrasiveness	1	2	1.51	3.22
High Abrasiveness	2	4	3.22	6.62
Extreme Abrasiveness	4	6	6.62	10.03
Quartzitic	6	7	NA	NA

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625
Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/17/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample ID	Depth ft	Stylus ID	Reading 1	Reading 2	Reading Average	Comments
RC-01	R1b	19.5	1	2.8	2.8	2.8	
			2	2.6	2.6	2.6	
			3	2.1	3.3	2.7	
			4	1.1	1.1	1.1	
			5	2.4	3.0	2.7	
			Average CAI_S			**2.4**	
Mohs Hardness	**6-7**		**Average CAI_N**			**2.8**	

CERCHAR Abrasivity Index Classification **High Abrasiveness**



NOTES	
Test Surface:	Saw Cut
Moisture Condition:	As Received
Apparatus Type:	West CERCHAR
Stylus Hardness/HRC:	55
CAI_S	CERCHAR index for smooth (saw cut) surface
CAI	CERCHAR index for natural surface
$CAI_N = 0.99 \cdot CAI_S + 0.48$	Normalized CERCHAR index for CAI_S

ASTM D7625 Table 1
Criteria for the CERCHAR Abrasiveness Index

Classification	Average CAI (3) HRC 55 Lower	Average CAI (3) HRC 55 Upper	Average CAI (2) HRC 40 Lower	Average CAI (2) HRC 40 Upper
Very Low Abrasiveness	0.3	0.5	0.32	0.66
Low Abrasiveness	0.5	1	0.66	1.51
Medium Abrasiveness	1	2	1.51	3.22
High Abrasiveness	2	4	3.22	6.62
Extreme Abrasiveness	4	6	6.62	10.03
Quartzitic	6	7	NA	NA

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625
Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/17/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample ID	Depth ft	Stylus ID	Reading 1	Reading 2	Reading Average	Comments
RC-02	R1	28.0	1	3.3	2.7	3.0	
			2	4.1	4.5	4.3	
			3	4.4	1.8	3.1	
			4	3.4	3.5	3.5	
			5	3.5	3.7	3.6	
			Average CAI_S			**3.5**	
			Average CAI_N			**3.9**	

Mohs Hardness	7-8

CERCHAR Abrasivity Index Classification **High Abrasiveness**

USACE - New Haven Harbor
CERCHAR Abrasivity Index
FD24-RC-02 R1 28.0 ft.



NOTES

Test Surface:	Saw Cut
Moisture Condition:	As Received
Apparatus Type:	West CERCHAR
Stylus Hardness/HRC:	55
CAI_S	CERCHAR index for smooth (saw cut) surface
CAI	CERCHAR index for natural surface
$CAI_N = 0.99 \cdot CAI_S + 0.48$	Normalized CERCHAR index for CAI_S

ASTM D7625 Table 1
Criteria for the CERCHAR Abrasiveness Index

Classification	Average CAI (3) HRC 55		Average CAI (2) HRC 40	
	Lower	Upper	Lower	Upper
Very Low Abrasiveness	0.3	0.5	0.32	0.66
Low Abrasiveness	0.5	1	0.66	1.51
Medium Abrasiveness	1	2	1.51	3.22
High Abrasiveness	2	4	3.22	6.62
Extreme Abrasiveness	4	6	6.62	10.03
Quartzitic	6	7	NA	NA

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625
Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/17/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample ID	Depth ft	Stylus ID	Reading 1	Reading 2	Reading Average	Comments
RC-02	R2	36.0	1	2.1	3.2	2.7	
			2	2.3	4.6	3.5	
			3	4.0	3.8	3.9	
			4	3.4	2.9	3.2	
			5	3.3	2.6	3.0	
			Average CAI_S			**3.2**	
			Average CAI_N			**3.7**	

Mohs Hardness	7-8

CERCHAR Abrasivity Index Classification **High Abrasiveness**



NOTES

Test Surface:	Saw Cut
Moisture Condition:	As Received
Apparatus Type:	West CERCHAR
Stylus Hardness/HRC:	55
CAI_S	CERCHAR index for smooth (saw cut) surface
CAI	CERCHAR index for natural surface
$CAI_N = 0.99 \cdot CAI_S + 0.48$	Normalized CERCHAR index for CAI_S

ASTM D7625 Table 1
Criteria for the CERCHAR Abrasiveness Index

Classification	Average CAI (3) HRC 55 Lower	Average CAI (3) HRC 55 Upper	Average CAI (2) HRC 40 Lower	Average CAI (2) HRC 40 Upper
Very Low Abrasiveness	0.3	0.5	0.32	0.66
Low Abrasiveness	0.5	1	0.66	1.51
Medium Abrasiveness	1	2	1.51	3.22
High Abrasiveness	2	4	3.22	6.62
Extreme Abrasiveness	4	6	6.62	10.03
Quartzitic	6	7	NA	NA

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625
Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/18/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample ID	Depth ft	Stylus ID	Reading 1	Reading 2	Reading Average	Comments
RC-03	R2	17.8	1	0.8	1.8	1.3	
			2	2.6	2.9	2.8	
			3	0.0	3.6	1.8	
			4	3.4	3.2	3.3	
			5	3.9	4.1	4.0	
			Average CAI_S			**2.6**	
			Average CAI_N			**3.1**	

Mohs Hardness	7-8

CERCHAR Abrasivity Index Classification **High Abrasiveness**



NOTES

Test Surface:	Saw Cut
Moisture Condition:	As Received
Apparatus Type:	West CERCHAR
Stylus Hardness/HRC:	55
CAI_S	CERCHAR index for smooth (saw cut) surface
CAI	CERCHAR index for natural surface
$CAI_N = 0.99 \cdot CAI_S + 0.48$	Normalized CERCHAR index for CAI_S

ASTM D7625 Table 1
Criteria for the CERCHAR Abrasiveness Index

Classification	Average CAI (3) HRC 55 Lower	Average CAI (3) HRC 55 Upper	Average CAI (2) HRC 40 Lower	Average CAI (2) HRC 40 Upper
Very Low Abrasiveness	0.3	0.5	0.32	0.66
Low Abrasiveness	0.5	1	0.66	1.51
Medium Abrasiveness	1	2	1.51	3.22
High Abrasiveness	2	4	3.22	6.62
Extreme Abrasiveness	4	6	6.62	10.03
Quartzitic	6	7	NA	NA

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625
Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/18/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample ID	Depth ft	Stylus ID	Reading 1	Reading 2	Reading Average	Comments
RC-03	R3	21.1	1	2.2	5.3	3.8	
			2	4.5	3.7	4.1	
			3	3.6	5.0	4.3	
			4	4.0	4.2	4.1	
			5	4.6	4.0	4.3	
			Average CAI_S			**4.1**	
Mohs Hardness	**7-8**		**Average CAI_N**			**4.5**	

CERCHAR Abrasivity Index Classification **Extreme Abrasiveness**

NOTES	
Test Surface:	Saw Cut
Moisture Condition:	As Received
Apparatus Type:	West CERCHAR
Stylus Hardness/HRC:	55
CAI_S	CERCHAR index for smooth (saw cut) surface
CAI	CERCHAR index for natural surface
$CAI_N = 0.99 \cdot CAI_S + 0.48$	Normalized CERCHAR index for CAI_S



ASTM D7625 Table 1
Criteria for the CERCHAR Abrasiveness Index

Classification	Average CAI (3) HRC 55 Lower	Average CAI (3) HRC 55 Upper	Average CAI (2) HRC 40 Lower	Average CAI (2) HRC 40 Upper
Very Low Abrasiveness	0.3	0.5	0.32	0.66
Low Abrasiveness	0.5	1	0.66	1.51
Medium Abrasiveness	1	2	1.51	3.22
High Abrasiveness	2	4	3.22	6.62
Extreme Abrasiveness	4	6	6.62	10.03
Quartzitic	6	7	NA	NA

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625
Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/18/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample ID	Depth ft	Stylus ID	Reading 1	Reading 2	Reading Average	Comments
RC-04	R2	17.4	1	3.4	4.5	4.0	
			2	5.4	3.4	4.4	
			3	3.1	3.8	3.5	
			4	2.3	2.9	2.6	
			5	3.7	2.7	3.2	
			Average CAI_S			**3.5**	
Mohs Hardness	**6-7**		**Average CAI_N**			**4.0**	

CERCHAR Abrasivity Index Classification **High Abrasiveness**



NOTES

Test Surface:	Saw Cut
Moisture Condition:	As Received
Apparatus Type:	West CERCHAR
Stylus Hardness/HRC:	55
CAI_S	CERCHAR index for smooth (saw cut) surface
CAI	CERCHAR index for natural surface
$CAI_N = 0.99 \cdot CAI_S + 0.48$	Normalized CERCHAR index for CAI_S

ASTM D7625 Table 1
Criteria for the CERCHAR Abrasiveness Index

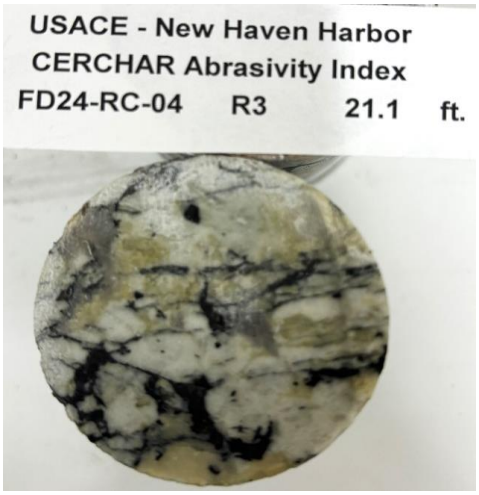
Classification	Average CAI (3) HRC 55 Lower	Average CAI (3) HRC 55 Upper	Average CAI (2) HRC 40 Lower	Average CAI (2) HRC 40 Upper
Very Low Abrasiveness	0.3	0.5	0.32	0.66
Low Abrasiveness	0.5	1	0.66	1.51
Medium Abrasiveness	1	2	1.51	3.22
High Abrasiveness	2	4	3.22	6.62
Extreme Abrasiveness	4	6	6.62	10.03
Quartzitic	6	7	NA	NA

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625
Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/18/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample ID	Depth ft	Stylus ID	Reading 1	Reading 2	Reading Average	Comments
RC-04	R3	21.1	1	2.7	5.5	4.1	
			2	3.5	2.7	3.1	
			3	2.6	2.7	2.7	
			4	2.7	2.0	2.4	
			5	1.7	4.0	2.9	
			Average CAI_S			**3.0**	
Mohs Hardness	**6-7**		**Average CAI_N**			**3.5**	

CERCHAR Abrasivity Index Classification **High Abrasiveness**



NOTES

Test Surface:	Saw Cut
Moisture Condition:	As Received
Apparatus Type:	West CERCHAR
Stylus Hardness/HRC:	55
CAI_S	CERCHAR index for smooth (saw cut) surface
CAI	CERCHAR index for natural surface
$CAI_N = 0.99 \cdot CAI_S + 0.48$	Normalized CERCHAR index for CAI_S

ASTM D7625 Table 1
Criteria for the CERCHAR Abrasiveness Index

Classification	Average CAI (3) HRC 55 Lower	Average CAI (3) HRC 55 Upper	Average CAI (2) HRC 40 Lower	Average CAI (2) HRC 40 Upper
Very Low Abrasiveness	0.3	0.5	0.32	0.66
Low Abrasiveness	0.5	1	0.66	1.51
Medium Abrasiveness	1	2	1.51	3.22
High Abrasiveness	2	4	3.22	6.62
Extreme Abrasiveness	4	6	6.62	10.03
Quartzitic	6	7	NA	NA

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625
Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/18/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample ID	Depth ft	Stylus ID	Reading 1	Reading 2	Reading Average	Comments
RC-05B	R2	29.6	1	2.5	1.7	2.1	
			2	3.2	3.8	3.5	
			3	5.1	2.5	3.8	
			4	3.8	4.6	4.2	
			5	4.2	3.2	3.7	
			Average CAI_S			**3.5**	
Mohs Hardness	**7-8**		**Average CAI_N**			**3.9**	

CERCHAR Abrasivity Index Classification **High Abrasiveness**



NOTES

Test Surface:	Saw Cut
Moisture Condition:	As Received
Apparatus Type:	West CERCHAR
Stylus Hardness/HRC:	55
CAI_S	CERCHAR index for smooth (saw cut) surface
CAI	CERCHAR index for natural surface
$CAI_N = 0.99 \cdot CAI_S + 0.48$	Normalized CERCHAR index for CAI_S

ASTM D7625 Table 1
Criteria for the CERCHAR Abrasiveness Index

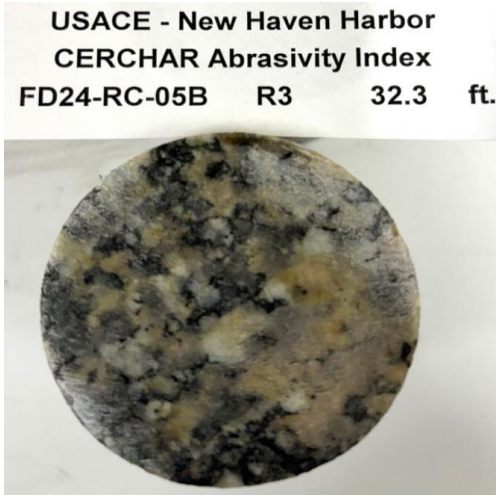
Classification	Average CAI (3) HRC 55 Lower	Average CAI (3) HRC 55 Upper	Average CAI (2) HRC 40 Lower	Average CAI (2) HRC 40 Upper
Very Low Abrasiveness	0.3	0.5	0.32	0.66
Low Abrasiveness	0.5	1	0.66	1.51
Medium Abrasiveness	1	2	1.51	3.22
High Abrasiveness	2	4	3.22	6.62
Extreme Abrasiveness	4	6	6.62	10.03
Quartzitic	6	7	NA	NA

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625
Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/18/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample ID	Depth ft	Stylus ID	Reading 1	Reading 2	Reading Average	Comments
RC-05B	R3	32.3	1	3.1	3.0	3.1	
			2	2.2	2.8	2.5	
			3	1.7	2.1	1.9	
			4	4.1	3.8	4.0	
			5	2.3	2.0	2.2	
			Average CAI_S			**2.7**	
Mohs Hardness	**7-8**		**Average CAI_N**			**3.2**	

CERCHAR Abrasivity Index Classification **High Abrasiveness**



NOTES

Test Surface:	Saw Cut
Moisture Condition:	As Received
Apparatus Type:	West CERCHAR
Stylus Hardness/HRC:	55
CAI_S	CERCHAR index for smooth (saw cut) surface
CAI	CERCHAR index for natural surface
$CAI_N = 0.99 \cdot CAI_S + 0.48$	Normalized CERCHAR index for CAI_S

ASTM D7625 Table 1
Criteria for the CERCHAR Abrasiveness Index

Classification	Average CAI (3) HRC 55 Lower	Average CAI (3) HRC 55 Upper	Average CAI (2) HRC 40 Lower	Average CAI (2) HRC 40 Upper
Very Low Abrasiveness	0.3	0.5	0.32	0.66
Low Abrasiveness	0.5	1	0.66	1.51
Medium Abrasiveness	1	2	1.51	3.22
High Abrasiveness	2	4	3.22	6.62
Extreme Abrasiveness	4	6	6.62	10.03
Quartzitic	6	7	NA	NA

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625
Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/18/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample ID	Depth ft	Stylus ID	Reading 1	Reading 2	Reading Average	Comments
RC-06	R1	10.4	1	3.3	4.6	4.0	
			2	3.9	0.0	2.0	
			3	2.8	2.4	2.6	
			4	3.2	3.2	3.2	
			5	4.3	2.1	3.2	
			Average CAI_S			**3.0**	
			Average CAI_N			**3.4**	

Mohs Hardness	7-8

CERCHAR Abrasivity Index Classification **High Abrasiveness**



NOTES

Test Surface:	Saw Cut
Moisture Condition:	As Received
Apparatus Type:	West CERCHAR
Stylus Hardness/HRC:	55
CAI_S	CERCHAR index for smooth (saw cut) surface
CAI	CERCHAR index for natural surface
$CAI_N = 0.99 \cdot CAI_S + 0.48$	Normalized CERCHAR index for CAI_S

ASTM D7625 Table 1
Criteria for the CERCHAR Abrasiveness Index

Classification	Average CAI (3) HRC 55 Lower	Average CAI (3) HRC 55 Upper	Average CAI (2) HRC 40 Lower	Average CAI (2) HRC 40 Upper
Very Low Abrasiveness	0.3	0.5	0.32	0.66
Low Abrasiveness	0.5	1	0.66	1.51
Medium Abrasiveness	1	2	1.51	3.22
High Abrasiveness	2	4	3.22	6.62
Extreme Abrasiveness	4	6	6.62	10.03
Quartzitic	6	7	NA	NA

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625
Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/18/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample ID	Depth ft	Stylus ID	Reading 1	Reading 2	Reading Average	Comments
RC-06	R4	22.9	1	3.3	4.6	4.0	
			2	3.9	0.0	2.0	
			3	2.8	2.4	2.6	
			4	3.2	3.2	3.2	
			5	4.3	2.1	3.2	
			Average CAI_S			**3.0**	
			Average CAI_N			**3.4**	

Mohs Hardness	7-8

CERCHAR Abrasivity Index Classification **High Abrasiveness**



NOTES

Test Surface:	Saw Cut
Moisture Condition:	As Received
Apparatus Type:	West CERCHAR
Stylus Hardness/HRC:	55
CAI_S	CERCHAR index for smooth (saw cut) surface
CAI	CERCHAR index for natural surface
$CAI_N = 0.99 \cdot CAI_S + 0.48$	Normalized CERCHAR index for CAI_S

ASTM D7625 Table 1
Criteria for the CERCHAR Abrasiveness Index

Classification	Average CAI (3) HRC 55 Lower	Average CAI (3) HRC 55 Upper	Average CAI (2) HRC 40 Lower	Average CAI (2) HRC 40 Upper
Very Low Abrasiveness	0.3	0.5	0.32	0.66
Low Abrasiveness	0.5	1	0.66	1.51
Medium Abrasiveness	1	2	1.51	3.22
High Abrasiveness	2	4	3.22	6.62
Extreme Abrasiveness	4	6	6.62	10.03
Quartzitic	6	7	NA	NA

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625
Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/18/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample ID	Depth ft	Stylus ID	Reading 1	Reading 2	Reading Average	Comments
RC-07	R1	21.0	1	3.1	4.8	4.0	
			2	4.2	4.3	4.3	
			3	3.6	4.2	3.9	
			4	3.6	4.2	3.9	
			5	5.2	3.7	4.5	
			Average CAI_S			**4.1**	
Mohs Hardness	**7-8**		**Average CAI_N**			**4.5**	

CERCHAR Abrasivity Index Classification **Extreme Abrasiveness**

NOTES	
Test Surface:	Saw Cut
Moisture Condition:	As Received
Apparatus Type:	West CERCHAR
Stylus Hardness/HRC:	55
CAI_S	CERCHAR index for smooth (saw cut) surface
CAI	CERCHAR index for natural surface
$CAI_N = 0.99 \cdot CAI_S + 0.48$	Normalized CERCHAR index for CAI_S



ASTM D7625 Table 1
Criteria for the CERCHAR Abrasiveness Index

Classification	Average CAI (3) HRC 55 Lower	Average CAI (3) HRC 55 Upper	Average CAI (2) HRC 40 Lower	Average CAI (2) HRC 40 Upper
Very Low Abrasiveness	0.3	0.5	0.32	0.66
Low Abrasiveness	0.5	1	0.66	1.51
Medium Abrasiveness	1	2	1.51	3.22
High Abrasiveness	2	4	3.22	6.62
Extreme Abrasiveness	4	6	6.62	10.03
Quartzitic	6	7	NA	NA

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625
Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/18/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample ID	Depth ft	Stylus ID	Reading 1	Reading 2	Reading Average	Comments
RC-07	R3	30.6	1	1.0	2.1	1.6	
			2	1.5	2.6	2.1	
			3	2.7	2.2	2.5	
			4	2.7	3.7	3.2	
			5	2.0	3.8	2.9	
			Average CAI_S			**2.4**	
Mohs Hardness	**7-8**		**Average CAI_N**			**2.9**	

CERCHAR Abrasivity Index Classification **High Abrasiveness**



NOTES

Test Surface:	Saw Cut
Moisture Condition:	As Received
Apparatus Type:	West CERCHAR
Stylus Hardness/HRC:	55
CAI_S	CERCHAR index for smooth (saw cut) surface
CAI	CERCHAR index for natural surface
$CAI_N = 0.99 \cdot CAI_S + 0.48$	Normalized CERCHAR index for CAI_S

ASTM D7625 Table 1
Criteria for the CERCHAR Abrasiveness Index

Classification	Average CAI (3) HRC 55 Lower	Average CAI (3) HRC 55 Upper	Average CAI (2) HRC 40 Lower	Average CAI (2) HRC 40 Upper
Very Low Abrasiveness	0.3	0.5	0.32	0.66
Low Abrasiveness	0.5	1	0.66	1.51
Medium Abrasiveness	1	2	1.51	3.22
High Abrasiveness	2	4	3.22	6.62
Extreme Abrasiveness	4	6	6.62	10.03
Quartzitic	6	7	NA	NA

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625
Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/18/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample ID	Depth ft	Stylus ID	Reading 1	Reading 2	Reading Average	Comments
RC-08	R1	8.7	1	3.5	4.6	4.1	
			2	4.2	2.7	3.5	
			3	2.9	3.8	3.4	
			4	3.0	3.6	3.3	
			5	2.8	3.8	3.3	
			Average CAI_S			**3.5**	
			Average CAI_N			**3.9**	

Mohs Hardness	7-8

CERCHAR Abrasivity Index Classification **High Abrasiveness**



NOTES

Test Surface:	Saw Cut
Moisture Condition:	As Received
Apparatus Type:	West CERCHAR
Stylus Hardness/HRC:	55
CAI_S	CERCHAR index for smooth (saw cut) surface
CAI	CERCHAR index for natural surface
$CAI_N = 0.99 \cdot CAI_S + 0.48$	Normalized CERCHAR index for CAI_S

ASTM D7625 Table 1
Criteria for the CERCHAR Abrasiveness Index

Classification	Average CAI (3) HRC 55 Lower	Average CAI (3) HRC 55 Upper	Average CAI (2) HRC 40 Lower	Average CAI (2) HRC 40 Upper
Very Low Abrasiveness	0.3	0.5	0.32	0.66
Low Abrasiveness	0.5	1	0.66	1.51
Medium Abrasiveness	1	2	1.51	3.22
High Abrasiveness	2	4	3.22	6.62
Extreme Abrasiveness	4	6	6.62	10.03
Quartzitic	6	7	NA	NA

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625
Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/18/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample ID	Depth ft	Stylus ID	Reading 1	Reading 2	Reading Average	Comments
RC-08	R4	20.8	1	3.0	3.7	3.4	
			2	4.2	4.1	4.2	
			3	3.3	0.0	1.7	
			4	3.6	3.1	3.4	
			5	2.7	3.7	3.2	
			Average CAI_S			**3.1**	
Mohs Hardness	**7-8**		**Average CAI_N**			**3.6**	

CERCHAR Abrasivity Index Classification **High Abrasiveness**



NOTES

Test Surface:	Saw Cut
Moisture Condition:	As Received
Apparatus Type:	West CERCHAR
Stylus Hardness/HRC:	55
CAI_S	CERCHAR index for smooth (saw cut) surface
CAI	CERCHAR index for natural surface
$CAI_N = 0.99 \cdot CAI_S + 0.48$	Normalized CERCHAR index for CAI_S

ASTM D7625 Table 1
Criteria for the CERCHAR Abrasiveness Index

Classification	Average CAI (3) HRC 55 Lower	Average CAI (3) HRC 55 Upper	Average CAI (2) HRC 40 Lower	Average CAI (2) HRC 40 Upper
Very Low Abrasiveness	0.3	0.5	0.32	0.66
Low Abrasiveness	0.5	1	0.66	1.51
Medium Abrasiveness	1	2	1.51	3.22
High Abrasiveness	2	4	3.22	6.62
Extreme Abrasiveness	4	6	6.62	10.03
Quartzitic	6	7	NA	NA

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625
Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/18/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample ID	Depth ft	Stylus ID	Reading 1	Reading 2	Reading Average	Comments
RC-10	R2	15.3	1	3.9	4.0	4.0	
			2	3.2	0.0	1.6	
			3	4.1	4.4	4.3	
			4	5.1	3.7	4.4	
			5	4.8	2.2	3.5	
			Average CAI_S			**3.5**	
			Average CAI_N			**4.0**	

Mohs Hardness	7-8

CERCHAR Abrasivity Index Classification **High Abrasiveness**



NOTES

Test Surface:	Saw Cut
Moisture Condition:	As Received
Apparatus Type:	West CERCHAR
Stylus Hardness/HRC:	55
CAI_S	CERCHAR index for smooth (saw cut) surface
CAI	CERCHAR index for natural surface
$CAI_N = 0.99 \cdot CAI_S + 0.48$	Normalized CERCHAR index for CAI_S

ASTM D7625 Table 1
Criteria for the CERCHAR Abrasiveness Index

Classification	Average CAI (3) HRC 55 Lower	Average CAI (3) HRC 55 Upper	Average CAI (2) HRC 40 Lower	Average CAI (2) HRC 40 Upper
Very Low Abrasiveness	0.3	0.5	0.32	0.66
Low Abrasiveness	0.5	1	0.66	1.51
Medium Abrasiveness	1	2	1.51	3.22
High Abrasiveness	2	4	3.22	6.62
Extreme Abrasiveness	4	6	6.62	10.03
Quartzitic	6	7	NA	NA

Abrasiveness of Rock Using the Cerchar Method by ASTM D7625
Laboratory Test Results Sheet

Client:	USACE	**Project Number:**	511150-294936
Project Name:	New Haven Harbor	**Task:**	6568-F0024-TK1.08
Project Location:	New Haven, CT	**Assigned By:**	J. Barker
Date Tested:	9/18/2024	**Tested by:**	KMS
Date Reviewed:	9/20/2024	**Reviewed By:**	MBP

Boring Number	Sample ID	Depth ft	Stylus ID	Reading 1	Reading 2	Reading Average	Comments
RC-10	R4	25.2	1	2.2	1.6	1.9	
			2	1.6	0.0	0.8	
			3	1.1	2.3	1.7	
			4	3.1	2.7	2.9	
			5	4.0	1.4	2.7	
			Average CAI_S			**2.0**	
			Average CAI_N			**2.5**	

Mohs Hardness	5-6

CERCHAR Abrasivity Index Classification **High Abrasiveness**



NOTES

Test Surface:	Saw Cut
Moisture Condition:	As Received
Apparatus Type:	West CERCHAR
Stylus Hardness/HRC:	55
CAI_S	CERCHAR index for smooth (saw cut) surface
CAI	CERCHAR index for natural surface
$CAI_N = 0.99 \cdot CAI_S + 0.48$	Normalized CERCHAR index for CAI_S

ASTM D7625 Table 1
Criteria for the CERCHAR Abrasiveness Index

Classification	Average CAI (3) HRC 55 Lower	Average CAI (3) HRC 55 Upper	Average CAI (2) HRC 40 Lower	Average CAI (2) HRC 40 Upper
Very Low Abrasiveness	0.3	0.5	0.32	0.66
Low Abrasiveness	0.5	1	0.66	1.51
Medium Abrasiveness	1	2	1.51	3.22
High Abrasiveness	2	4	3.22	6.62
Extreme Abrasiveness	4	6	6.62	10.03
Quartzitic	6	7	NA	NA

Client:	CDM Smith
Project Name:	New Haven Harbor
Project Location:	New Haven, CT
GTX #:	319800
Test Date:	10/2/24
Tested By:	tlm/jss
Checked By:	jsc

Pulse Velocities and Ultrasonic Elastic Constants of Rock by ASTM D2845 - Summary Table

Boring ID	Sample ID	Depth, ft	Bulk Density, lbs/ft^3	P-Wave Velocity, (ft/sec) (Axial)	S-Wave Velocity, (ft/sec) (Axial)	Young's Modulus, (psi) 10^6	Poisson's Ratio
FD24-RC-01	1a	16.4-16.8	163	9,971	5,805	2.95	0.24
FD24-RC-01	1b	18.6-18.9	163	10,316	5,915	3.09	0.26
FD24-RC-02	2	35.4-35.7	162	8,957	5,166	2.33	0.25
FD24-RC-03	1	13.8-14.1	158	9,261	7,238	2.56	0.28
FD24-RC-03	3	20.4-20.8	161	10,187	8,063	2.99	0.34
FD24-RC-04	2	16.5-16.9	162	9,958	5,771	2.90	0.25
FD24-RC-04	3	20.3-20.7	160	12,275	6,521	3.83	0.30
FD24-RC-05B	2	27.9-28.2	161	12,596	6,337	3.71	0.33
FD24-RC-05B	3	31.1-31.5	163	12,806	5,854	3.30	0.37
FD24-RC-06	2	11.6-12	161	4,191	3,385	0.45	0.44

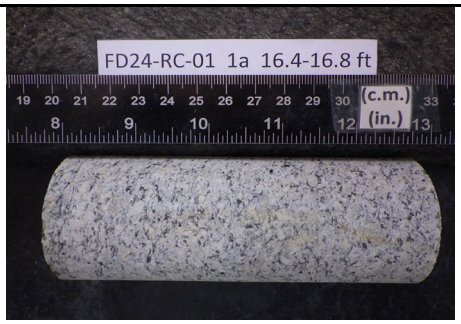
Notes: * No measureable waves could be propagated through the test specimen.

Notes: Density determined on rock core samples by measuring dimensions and weight and then calculating.
All specimens tested at the approximate as-received moisture content and at standard laboratory temperature.
No coupling medium was used.

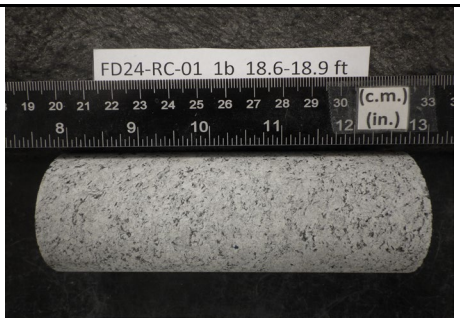
Client:	CDM Smith
Project Name:	New Haven Harbor
Project Location:	New Haven, CT
GTX #:	319800

Pulse Velocities and Ultrasonic Elastic Constants of Rock by ASTM D2845

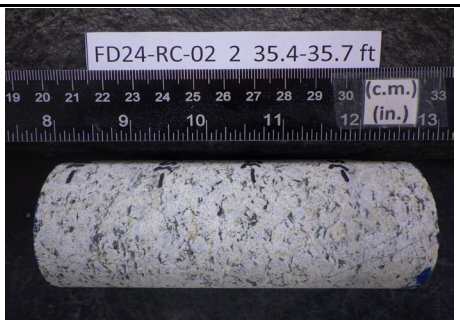
FD24-RC-01
1a
16.4-16.8 ft



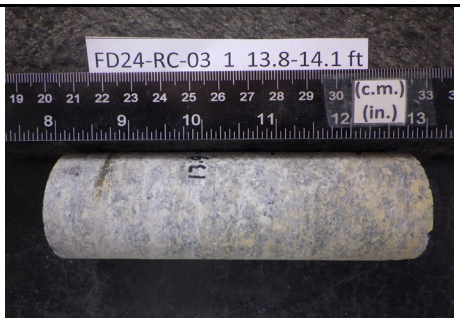
FD24-RC-01
1b
18.6-18.9 ft



FD24-RC-02
2
35.4-35.7 ft



FD24-RC-03
1
13.8-14.1 ft



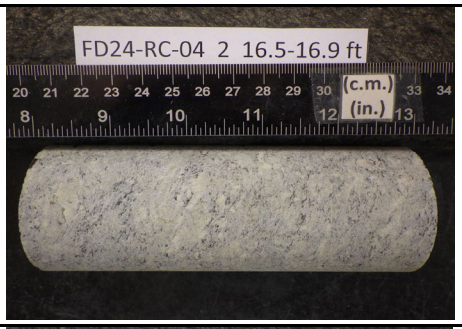
FD24-RC-03
3
20.4-20.8 ft



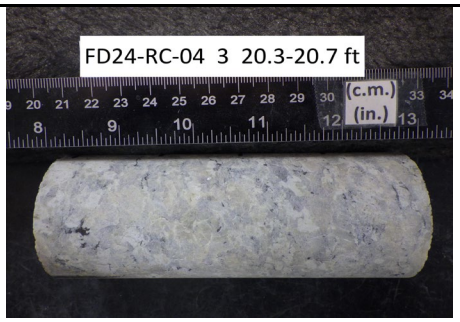
Client:	CDM Smith
Project Name:	New Haven Harbor
Project Location:	New Haven, CT
GTX #:	319800

Pulse Velocities and Ultrasonic Elastic Constants of Rock by ASTM D2845

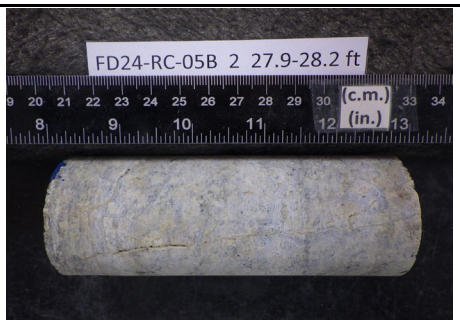
FD24-RC-04
2
16.5-16.9 ft



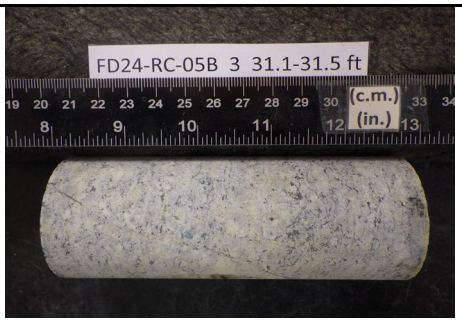
FD24-RC-04
3
20.3-20.7 ft



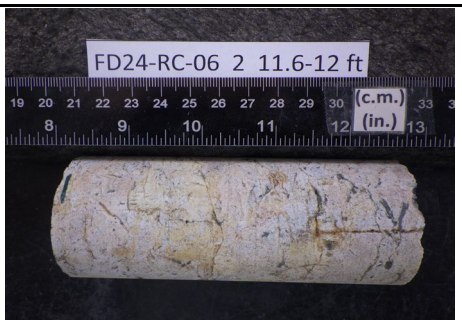
FD24-RC-05B
2
27.9-28.2 ft



FD24-RC-05B
3
31.1-31.5 ft



FD24-RC-06
2
11.6-12 ft



Client:	CDM Smith
Project Name:	New Haven Harbor
Project Location:	New Haven, CT
GTX #:	319800
Test Date:	10/2/24
Tested By:	jss
Checked By:	jsc

Pulse Velocities and Ultrasonic Elastic Constants of Rock by ASTM D2845 - Summary Table

Boring ID	Sample ID	Depth, ft	Bulk Density, lbs/ft^3	P-Wave Velocity, (ft/sec) (Axial)	S-Wave Velocity, (ft/sec) (Axial)	Young's Modulus, (psi) 10^6	Poisson's Ratio
FD24-RC-06	4	23.2-23.6	162	4,974	3,889	0.75	0.29
FD24-RC-06	4	24.9-25.2	161	9,636	5,407	2.58	0.27
FD24-RC-07	1	19.8-20.2	163	8,018	6,399	1.79	0.38
FD24-RC-07	3	29.4-29.8	164	13,591	6,862	4.42	0.33
FD24-RC-08	1	7.5-7.9	162	13,479	7,659	5.17	0.26
FD24-RC-08	4	19.4-19.8	162	13,487	7,578	5.09	0.27
FD24-RC-10	2	14.9-15.3	160	11,145	6,023	3.24	0.29
FD24-RC-10	4	26.2-26.6	172	9,498	5,081	2.49	0.30
FD24-RC-10	5	29.1-29.6	161	13,476	6,738	4.20	0.33

Notes: Density determined on rock core samples by measuring dimensions and weight and then calculating.
All specimens tested at the approximate as-received moisture content and at standard laboratory temperature.
No coupling medium was used.

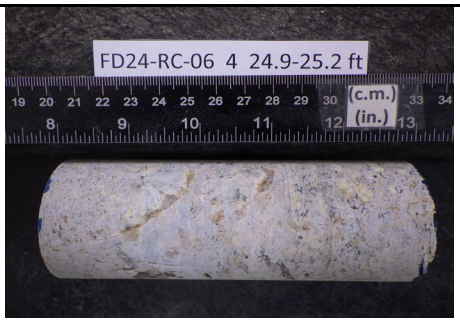
Client:	CDM Smith
Project Name:	New Haven Harbor
Project Location:	New Haven, CT
GTX #:	319800

Pulse Velocities and Ultrasonic Elastic Constants of Rock by ASTM D2845

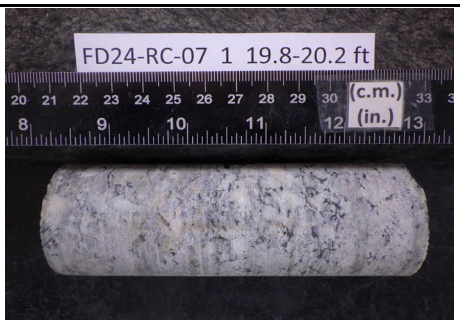
FD24-RC-06
4
23.2-23.6 ft



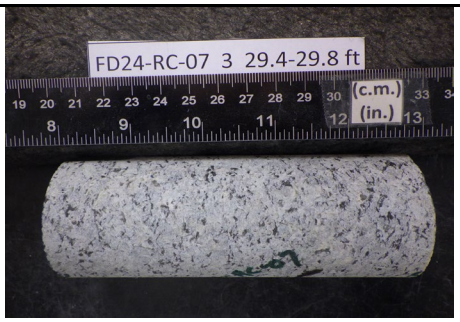
FD24-RC-06
4
24.9-25.2 ft



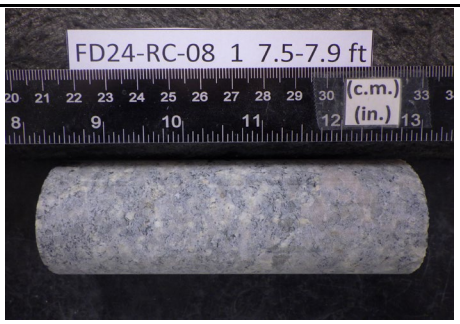
FD24-RC-07
1
19.8-20.2 ft



FD24-RC-07
3
29.4-29.8 ft

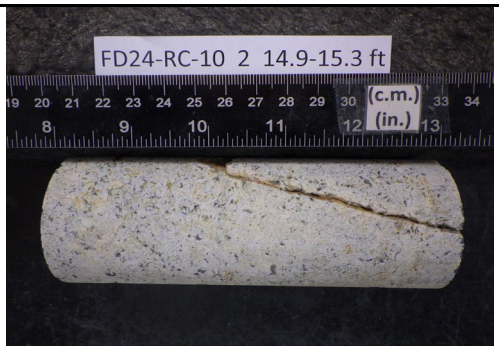
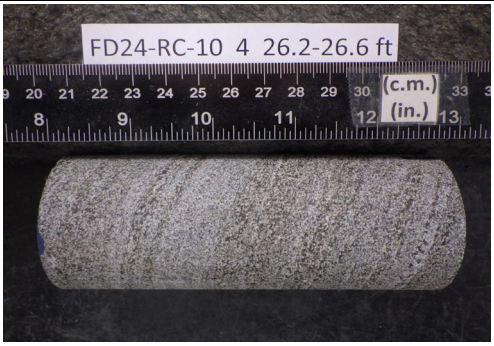
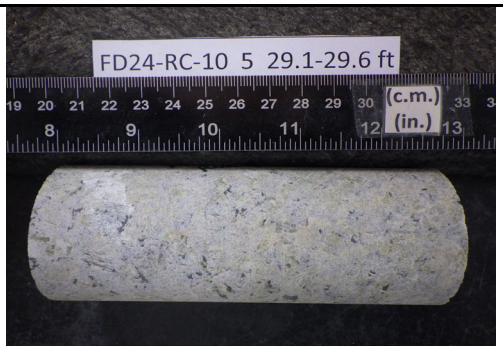


FD24-RC-08
1
7.5-7.9 ft



Client:	CDM Smith
Project Name:	New Haven Harbor
Project Location:	New Haven, CT
GTX #:	319800

Pulse Velocities and Ultrasonic Elastic Constants of Rock by ASTM D2845

FD24-RC-08 4 19.4-19.8 ft	
FD24-RC-10 2 14.9-15.3 ft	
FD24-RC-10 4 26.2-26.6 ft	
FD24-RC-10 5 29.1-29.6 ft	

Client:	CDM Smith
Project Name:	New Haven Harbor
Project Location:	New Haven, CT
GTX #:	319800
Test Date:	10/17/24
Tested By:	tlm
Checked By:	jsc

Pulse Velocities and Ultrasonic Elastic Constants of Rock by ASTM D2845 - Summary Table

Boring ID	Sample ID	Depth, ft	Bulk Density, lbs/ft^3	P-Wave Velocity, (ft/sec) (Axial)	S-Wave Velocity, (ft/sec) (Axial)	Young's Modulus, (psi) 10^6	Poisson's Ratio
FD24-RC-03	1	23.54-23.94	162	10,382	5,415	2.69	0.31
FD24-RC-10	3	23.01-23.44	161	10,385	5,482	2.73	0.31

Notes: Density determined on rock core samples by measuring dimensions and weight and then calculating.
All specimens tested at the approximate as-received moisture content and at standard laboratory temperature.
No coupling medium was used.

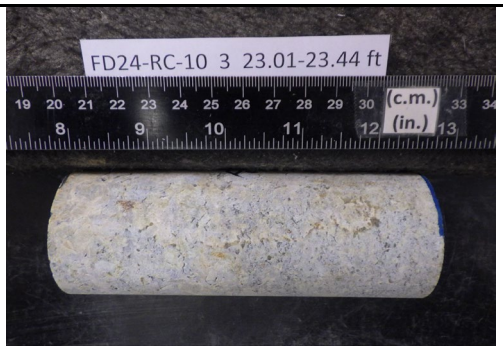
Client:	CDM Smith
Project Name:	New Haven Harbor
Project Location:	New Haven, CT
GTX #:	319800

Pulse Velocities and Ultrasonic Elastic Constants of Rock by ASTM D2845

FD24-RC-03
1
23.54-23.94 ft



FD24-RC-10
3
23.01-23.44 ft



New Haven Harbor Project

Petrographic Report # O8S

October 11, 2024

for

Matthew B. Polsky
CDM Smith
Geotechnical Laboratory
25 Industrial Ave.
Chelmsford, MA 01824

by



Michael DePangher, Ph.D.
Spectrum Petrographics, Inc.

Key to Petrographic and Photomicrographic Descriptions - v. 210324

Clay minerals common in altered rocks must often be identified by X-ray diffraction either because their optic properties are not diagnostic or because they are too fine grained to be reliably identified by optical methods. The term "clay" is used herein to denote fine grained phyllosilicates in general. Under ideal conditions, it is often possible to optically discriminate between 4 major groups: kaolinite, smectite, mica (including illite), and chlorite. This is done whenever conditions permit.

The term "sericite" is applied to fine grained colorless phyllosilicates that show upper 2nd order maximum interference colors. These could include muscovite, illite, paragonite, lepidolite, margarite, clintonite, pyrophyllite, and talc. The term "intermediate clay" is applied to fine grained very pale or colorless phyllosilicates that show upper 1st order maximum interference colors. These are probably dominated by chlorite, smectite, and mixed-layer illite/smectite.

The term "opaques" is used to refer to all materials opaque (and sometimes semi-opaque) to transmitted light. The term "FEOH" is herein used to indicate fine grained, yellowish to reddish brown, earthy materials of varying opacity in transmitted light. FEOH is probably mostly Fe oxy-hydroxides but may sometimes include sphalerite, realgar, orpiment, jarosite, a number of Mn oxy-hydroxides, and organic matter.

A question mark after a rock or mineral name in a petrographic description means that there is uncertainty about the identification of that rock or mineral.

Particle size distributions are given as (A-B μm), where A and B are the median and largest particle sizes, respectively, in microns. A question mark (?) in the position of A or B indicates that the value of A or B was indeterminate, probably because of excessively large or small particle size or statistically insignificant numbers of particles.

Mineral abundances are visual estimates for an entire slide. For multi-lithologic materials (cuttings, etc...), mineralogy, textures, and alteration are described only for the dominant lithology.

Section preparation codes are as follows: (1) Format: 27 x 46 mm; 51 x 76 mm; or 1" round; (2) Finish: standard lapping (STD); or polished (POL); (3) Stains: sodium cobaltinitrite (SCN); alizarin red S + potassium ferricyanide (ARSPF); and barium chloride + potassium rhodizonate (BCPR); and (4) Cover: none; permanent Loctite acrylic (PLA); or permanent Norland acrylic (PNA).

Photomicrograph captions contain the following items of information in consecutive order separated by forward slashes: (1) sample identifier; (2) JPG image file name composed of concatenated [job identification code + sequence number]; (3) illumination type; and (4) field of view (FOV). For illumination types: "PPL" indicates plane-polarized light; "XPL indicates cross-polarized light; "R" indicates reflected light. "550" means that a 550 nanometer wavelength plate was inserted in the light path. "C" indicates that the substage condenser was <u>in</u> (sometimes used for Fe-oxides). "O" indicates oblique incident illumination. These various illuminations can be combined. "CON" indicates conoscopic illumination. POL means that a polarizing filter was used with the lens, and DAY means the sample was photographed in diffused daylight. Unless otherwise noted, sequential images are taken in XPL and PPL of a single field of view.

Features on photomicrographs are indicated by the number of the feature in the ALTERATION section of the text or by a mineral name abbreviation, e.g., **Q**uartz, **P**lagioclase, **K**-feldspar, **ser**icite, **b**io**t**ite, **fe**rroan **c**al**c**ite, **act**inolite.

Igneous rock classifications are according to IUGS (1973; 1979); sandstones are classified according to McBride (1963); mudrocks are classified according to Picard (1971); carbonates are classified according to Folk (1959); and metamorphic rocks classified according to IUGS (Fettes and Desmons, 2011).

The term “protolith” is used for the interpreted primary lithology. The term “precursor” is used for a secondary lithology from which the current rock was derived.

SAMPLE # **RC-01-1a 16.9-17.0** October 11, 2024

ROCK NAME ALTERED GRANITE SCHIST -- probably formed by alteration (secondary quartz + plagioclase + muscovite/sericite + smectite + chlorite + sphene) and regional dynamothermal metamorphism from a granite protolith.

MINERALS K-feldspar (32%) + quartz (31%) + plagioclase (30%) + biotite (5%) + muscovite/sericite (1%) + smectite (1%) + chlorite (<1%) + sphene (<1%) + opaques (<1%) + apatite (<1%) + zircon (<1%).

TEXTURES Ductile deformation of quartz during regional dynamothermal metamorphism has produced a a weakly directed fabric. Strain conditions were below the threshold for feldspar ductile deformation.

Porphyroblasts (0%) were not observed.

Porphyroclasts (0%) were not observed.

Matrix (100%) is dominated by [K-feldspar weakly altered to myrmekitic [quartz + plagioclase]] + quartz + [plagioclase weakly altered to smectite + sericite] + [biotite weakly altered to muscovite OR chlorite].

Cement (0%) was not observed.

ALTERATION Alteration features of indeterminate relative ages: (1) regional dynamothermal metamorphism; (2) K-feldspar weakly altered to myrmekitic [quartz + plagioclase]; and opaques strongly altered to sphene.

SECTIONING Format: 27 x 46 mm Finish: STD Stains: SCN (top 2/3) + ARSPF (none) Cover: PLN

IMAGES RC-01 - 1a 16.9-17.0 O8S-001.jpg/XPL/27 x 46 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-01 - 1a 16.9-17.0 O8S-002.jpg/PPL/27 x 46 mm Same.

RC-01 - 1a 16.9-17.0 O8S-002-Kfs.jpg/PPL/27 x 46 mm Same with enhanced K-feldspar stain.

RC-01 - 1a 16.9-17.0 O8S-037.jpg/XPL/4.00 x 5.83 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-01 - 1a 16.9-17.0 O8S-038.jpg/PPL/4.00 x 5.83 mm Same with enhanced K-feldspar stain.

SAMPLE # **RC-01-1b 19.9-20.1** October 11, 2024

ROCK NAME ALTERED GRANITE SCHIST -- probably formed by alteration (secondary quartz + plagioclase + muscovite/sericite + smectite + chlorite) and regional dynamothermal metamorphism from a granite protolith.

MINERALS K-feldspar (35%) + plagioclase (31%) + quartz (29%) + biotite (3%) + muscovite/sericite (1%) + smectite (1%) + chlorite (<1%) + opaques (<1%) + apatite (<1%) + zircon (<1%).

TEXTURES Ductile deformation of quartz during regional dynamothermal metamorphism has produced a a weakly directed fabric. Strain conditions were below the threshold for feldspar ductile deformation.

Porphyroblasts (0%) were not observed.

Porphyroclasts (0%) were not observed.

Matrix (100%) is dominated by [K-feldspar weakly altered to myrmekitic [quartz + plagioclase]] + [plagioclase weakly altered to smectite + sericite] + quartz + [biotite weakly altered to muscovite OR chlorite].

Cement (0%) was not observed.

ALTERATION Alteration features of indeterminate relative ages: (1) regional dynamothermal metamorphism; and (2) K-feldspar weakly altered to myrmekitic [quartz + plagioclase]

SECTIONING Format: 27 x 46 mm Finish: STD Stains: SCN (top 2/3) + ARSPF (none) Cover: PLN

IMAGES RC-01 - 1b 19.9-20.1 O8S-003.jpg/XPL/27 x 46 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-01 - 1b 19.9-20.1 O8S-004.jpg/PPL/27 x 46 mm Same.

RC-01 - 1b 19.9-20.1 O8S-004-Kfs.jpg/PPL/27 x 46 mm Same with enhanced K-feldspar stain.

RC-01 - 1b 19.9-20.1 O8S-039.jpg/XPL/4.00 x 5.83 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-01 - 1b 19.9-20.1 O8S-040.jpg/PPL/4.00 x 5.83 mm Same with enhanced K-feldspar stain.

SAMPLE # **RC-02 - 1 27.3-27.4** October 11, 2024

ROCK NAME ALTERED GRANITE SCHIST -- probably formed by alteration (secondary quartz + plagioclase + muscovite/sericite + smectite + chlorite + sphene) and regional dynamothermal metamorphism from a granite protolith.

MINERALS K-feldspar (32%) + quartz (31%) + plagioclase (30%) + biotite (5%) + muscovite/sericite (1%) + smectite (1%) + chlorite (<1%) + sphene (<1%) + opaques (<1%) + apatite (<1%) + zircon (<1%).

TEXTURES Ductile deformation of quartz during regional dynamothermal metamorphism has produced a a weakly directed fabric. Strain conditions were below the threshold for feldspar ductile deformation.

Porphyroblasts (0%) were not observed.

Porphyroclasts (0%) were not observed.

Matrix (100%) is dominated by [K-feldspar weakly altered to myrmekitic [quartz + plagioclase]] + quartz + [plagioclase weakly altered to smectite + sericite] + [biotite weakly altered to muscovite OR chlorite].

Cement (0%) was not observed.

ALTERATION Alteration features of indeterminate relative ages: (1) regional dynamothermal metamorphism; (2) K-feldspar weakly altered to myrmekitic [quartz + plagioclase]; and opaques strongly altered to sphene.

SECTIONING Format: 27 x 46 mm Finish: STD Stains: SCN (top 2/3) + ARSPF (none) Cover: PLN

IMAGES RC-02 - 1 27.3-27.4 O8S-005.jpg/XPL/27 x 46 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-02 - 1 27.3-27.4 O8S-006.jpg/PPL/27 x 46 mm Same.

RC-02 - 1 27.3-27.4 O8S-006-Kfs.jpg/PPL/27 x 46 mm Same with enhanced K-feldspar stain.

RC-02 - 1 27.3-27.4 O8S-041.jpg/XPL/4.00 x 5.83 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-02 - 1 27.3-27.4 O8S-042.jpg/PPL/4.00 x 5.83 mm Same with enhanced K-feldspar stain.

SAMPLE # **RC-02-2 35.0-35.1** October 11, 2024

ROCK NAME ALTERED GRANITE SCHIST -- probably formed by alteration (secondary K-feldspar + quartz + plagioclase + chlorite + muscovite/sericite + smectite) and regional dynamothermal metamorphism from a granite protolith.

MINERALS K-feldspar (39%) + quartz (32%) + plagioclase (25%) + chlorite (2%) + muscovite/sericite (1%) + smectite (1%) + biotite (<1%) + opaques (<1%) + apatite (<1%) + zircon (<1%).

TEXTURES Ductile deformation of quartz during regional dynamothermal metamorphism has produced a a weakly directed fabric. Strain conditions were below the threshold for feldspar ductile deformation.

Porphyroblasts (0%) were not observed.

Porphyroclasts (0%) were not observed.

Matrix (100%) is dominated by [K-feldspar weakly altered to myrmekitic [quartz + plagioclase]] + quartz + [plagioclase weakly altered to smectite + sericite] + [biotite strongly altered to [chlorite + K-feldspar] OR [muscovite + opaques].

Cement (0%) was not observed.

ALTERATION Alteration features in relative chronological order from oldest to youngest are: (1) regional dynamothermal metamorphism; and (2) narrow cataclastic structures that crosscut ductily deformed quartz.

Alteration features of indeterminate relative ages: (1) K-feldspar weakly altered to myrmekitic [quartz + plagioclase].

SECTIONING Format: 27 x 46 mm Finish: STD Stains: SCN (top 2/3) + ARSPF (none) Cover: PLN

IMAGES RC-02 - 2 35.0-35.1 O8S-007.jpg/XPL/27 x 46 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-02 - 2 35.0-35.1 O8S-008.jpg/PPL/27 x 46 mm Same.

RC-02 - 2 35.0-35.1 O8S-008-Kfs.jpg/PPL/27 x 46 mm Same with enhanced K-feldspar stain.

RC-02 - 2 35.0-35.1 O8S-043.jpg/XPL/4.00 x 5.83 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-02 - 2 35.0-35.1 O8S-044.jpg/PPL/4.00 x 5.83 mm Same with enhanced K-feldspar stain.

SAMPLE # **RC-03-2 16.0-16.1** October 11, 2024

ROCK NAME ALTERED GRANITE SCHIST -- probably formed by alteration (secondary K-feldspar + quartz + plagioclase + chlorite + muscovite/sericite + smectite + opaques) and regional dynamothermal metamorphism from a granite protolith.

MINERALS K-feldspar (41%) + quartz (35%) + plagioclase (20%) + biotite (1%) + chlorite (1%) + muscovite/sericite (1%) + smectite (1%) + opaques (<1%) + apatite (<1%) + zircon (<1%).

TEXTURES Ductile deformation of quartz during regional dynamothermal metamorphism has produced a a weakly directed fabric. Strain conditions were below the threshold for feldspar ductile deformation.

Porphyroblasts (0%) were not observed.

Porphyroclasts (0%) were not observed.

Matrix (100%) is dominated by [K-feldspar weakly altered to myrmekitic [quartz + plagioclase]] + quartz + [plagioclase weakly altered to smectite + sericite] + [biotite moderately altered to chlorite + muscovite + opaques ± K-feldspar].

Cement (0%) was not observed.

ALTERATION Alteration features of indeterminate relative ages:(1) regional dynamothermal metamorphism; and (2) K-feldspar weakly altered to myrmekitic [quartz + plagioclase].

SECTIONING Format: 27 x 46 mm Finish: STD Stains: SCN (top 2/3) + ARSPF (none) Cover: PLN

IMAGES RC-03 - 2 16.0-16.1 O8S-009.jpg/XPL/27 x 46 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-03 - 2 16.0-16.1 O8S-010.jpg/PPL/27 x 46 mm Same.

RC-03 - 2 16.0-16.1 O8S-010-Kfs.jpg/PPL/27 x 46 mm Same with enhanced K-feldspar stain.

RC-03 - 2 16.0-16.1 O8S-045.jpg/XPL/4.00 x 5.83 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-03 - 2 16.0-16.1 O8S-046.jpg/PPL/4.00 x 5.83 mm Same with enhanced K-feldspar stain.

SAMPLE # **RC-03-3 19.9-20.2** October 11, 2024

ROCK NAME ALTERED GRANITE SCHIST -- probably formed by alteration (secondary quartz + plagioclase + chlorite + muscovite/sericite + smectite + opaques) and regional dynamothermal metamorphism from a granite protolith.

MINERALS K-feldspar (32%) + quartz (32%) + plagioclase (32%) + chlorite (2%) + muscovite/sericite (1%) + smectite (1%) + biotite (<1%) + opaques (<1%) + apatite (<1%) + zircon (<1%).

TEXTURES Ductile deformation of quartz during regional dynamothermal metamorphism has produced a a weakly directed fabric. Strain conditions were below the threshold for feldspar ductile deformation.

Porphyroblasts (0%) were not observed.

Porphyroclasts (0%) were not observed.

Matrix (100%) is dominated by [K-feldspar weakly altered to myrmekitic [quartz + plagioclase]] + quartz + [plagioclase weakly altered to smectite + sericite] + [biotite strongly altered to chlorite + muscovite + opaques.

Cement (0%) was not observed.

ALTERATION Alteration features of indeterminate relative ages:(1) regional dynamothermal metamorphism; and (2) K-feldspar weakly altered to myrmekitic [quartz + plagioclase].

SECTIONING Format: 27 x 46 mm Finish: STD Stains: SCN (top 2/3) + ARSPF (none) Cover: PLN

IMAGES RC-03 - 3 19.9-20.2 O8S-011.jpg/XPL/27 x 46 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-03 - 3 19.9-20.2 O8S-012.jpg/PPL/27 x 46 mm Same.

RC-03 - 3 19.9-20.2 O8S-012-Kfs.jpg/PPL/27 x 46 mm Same with enhanced K-feldspar stain.

RC-03 - 3 19.9-20.2 O8S-047.jpg/XPL/4.00 x 5.83 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-03 - 3 19.9-20.2 O8S-048.jpg/PPL/4.00 x 5.83 mm Same with enhanced K-feldspar stain.

SAMPLE # **RC-04-2 16.9-17.0** October 11, 2024

ROCK NAME ALTERED GRANITE SCHIST -- probably formed by alteration (secondary quartz + plagioclase + chlorite + muscovite/sericite + smectite + opaques) and regional dynamothermal metamorphism from a granite protolith.

MINERALS K-feldspar (41%) + quartz (41%) + plagioclase (17%) + biotite (1%) + chlorite (<1%) + muscovite/sericite (<1%) + smectite (<1%) + opaques (<1%) + apatite (<1%) + zircon (<1%).

TEXTURES Ductile deformation of quartz during regional dynamothermal metamorphism has produced a a weakly directed fabric. Strain conditions were below the threshold for feldspar ductile deformation.

Porphyroblasts (0%) were not observed.

Porphyroclasts (0%) were not observed.

Matrix (100%) is dominated by [K-feldspar weakly altered to myrmekitic [quartz + plagioclase]] + quartz + [plagioclase weakly altered to smectite + sericite] + [biotite weakly altered to chlorite + muscovite + opaques.

Cement (0%) was not observed.

ALTERATION Alteration features of indeterminate relative ages:(1) regional dynamothermal metamorphism; and (2) K-feldspar weakly altered to myrmekitic [quartz + plagioclase].

SECTIONING Format: 27 x 46 mm Finish: STD Stains: SCN (top 2/3) + ARSPF (none) Cover: PLN

IMAGES RC-04 - 2 16.9-17.0 O8S-013.jpg/XPL/27 x 46 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-04 - 2 16.9-17.0 O8S-014.jpg/PPL/27 x 46 mm Same.

RC-04 - 2 16.9-17.0 O8S-014-Kfs.jpg/PPL/27 x 46 mm Same with enhanced K-feldspar stain.

RC-04 - 2 16.9-17.0 O8S-049.jpg/XPL/4.00 x 5.83 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-04 - 2 16.9-17.0 O8S-050.jpg/PPL/4.00 x 5.83 mm Same with enhanced K-feldspar stain.

SAMPLE # **RC-04-3 21.4-21.5** October 11, 2024

ROCK NAME ALTERED GRANITE SCHIST -- probably formed by alteration (secondary quartz + plagioclase + chlorite + muscovite/sericite + smectite + opaques) and regional dynamothermal metamorphism from a granite protolith.

MINERALS K-feldspar (37%) + quartz (31%) + plagioclase (24%) + biotite (5%) + smectite (2%) + muscovite/sericite (1%) + chlorite (<1%) + opaques (<1%) + apatite (<1%) + zircon (<1%).

TEXTURES Ductile deformation of quartz during regional dynamothermal metamorphism has produced a a weakly directed fabric. Strain conditions were below the threshold for feldspar ductile deformation.

Porphyroblasts (0%) were not observed.

Porphyroclasts (0%) were not observed.

Matrix (100%) is dominated by [K-feldspar weakly altered to myrmekitic [quartz + plagioclase]] + quartz + [plagioclase weakly altered to smectite + sericite] + [biotite weakly altered to muscovite + opaques ± chlorite].

Cement (0%) was not observed.

ALTERATION Alteration features of indeterminate relative ages:(1) regional dynamothermal metamorphism; and (2) K-feldspar weakly altered to myrmekitic [quartz + plagioclase].

SECTIONING Format: 27 x 46 mm Finish: STD Stains: SCN (top 2/3) + ARSPF (none) Cover: PLN

IMAGES RC-04 - 3 21.4-21.5 O8S-015.jpg/XPL/27 x 46 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-04 - 3 21.4-21.5 O8S-016.jpg/PPL/27 x 46 mm Same.

RC-04 - 3 21.4-21.5 O8S-016-Kfs.jpg/PPL/27 x 46 mm Same with enhanced K-feldspar stain.

RC-04 - 3 21.4-21.5 O8S-051.jpg/XPL/4.00 x 5.83 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-04 - 3 21.4-21.5 O8S-052.jpg/PPL/4.00 x 5.83 mm Same with enhanced K-feldspar stain.

SAMPLE # **RC-05B-2 29.8-30.0** October 11, 2024

ROCK NAME ALTERED GRANITE SCHIST -- probably formed by alteration (secondary quartz + plagioclase + chlorite + muscovite/sericite + smectite + opaques) and regional dynamothermal metamorphism from a granite protolith.

MINERALS K-feldspar (43%) + quartz (29%) + plagioclase (22%) + biotite (4%) + smectite (1%) + muscovite/sericite (1%) + chlorite (<1%) + sphene (<1%) + opaques (<1%) + apatite (<1%) + zircon (<1%).

TEXTURES Ductile deformation of quartz during regional dynamothermal metamorphism has produced a a weakly directed fabric. Strain conditions were below the threshold for feldspar ductile deformation.

Porphyroblasts (0%) were not observed.

Porphyroclasts (0%) were not observed.

Matrix (100%) is dominated by [K-feldspar weakly altered to myrmekitic [quartz + plagioclase]] + quartz + [plagioclase weakly altered to smectite + sericite] + [biotite weakly altered to muscovite + opaques ± chlorite].

Cement (0%) was not observed.

ALTERATION Alteration features of indeterminate relative ages:(1) regional dynamothermal metamorphism; and (2) K-feldspar weakly altered to myrmekitic [quartz + plagioclase].

SECTIONING Format: 27 x 46 mm Finish: STD Stains: SCN (top 2/3) + ARSPF (none) Cover: PLN

IMAGES RC-05B - 2 29.8-30.0 O8S-017.jpg/XPL/27 x 46 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-05B - 2 29.8-30.0 O8S-018.jpg/PPL/27 x 46 mm Same.

RC-05B - 2 29.8-30.0 O8S-018-Kfs.jpg/PPL/27 x 46 mm Same with enhanced K-feldspar stain.

RC-05B - 2 29.8-30.0 O8S-053.jpg/XPL/4.00 x 5.83 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-05B - 2 29.8-30.0 O8S-054.jpg/PPL/4.00 x 5.83 mm Same with enhanced K-feldspar stain.

SAMPLE # **RC-05B-3 32.5-32.6** October 11, 2024

ROCK NAME ALTERED GRANITE SCHIST -- probably formed by alteration (secondary quartz + plagioclase + muscovite/sericite + chlorite + smectite + opaques) and regional dynamothermal metamorphism from a granite protolith.

MINERALS K-feldspar (32%) + quartz (32%) + plagioclase (27%) + biotite (7%) + muscovite/sericite (2%) + chlorite (<1%) + smectite (<1%) + opaques (<1%) + apatite (<1%) + zircon (<1%).

TEXTURES Ductile deformation of quartz during regional dynamothermal metamorphism has produced a a weakly directed fabric. Strain conditions were below the threshold for feldspar ductile deformation.

Porphyroblasts (0%) were not observed.

Porphyroclasts (0%) were not observed.

Matrix (100%) is dominated by [K-feldspar weakly altered to myrmekitic [quartz + plagioclase]] + quartz + [plagioclase weakly altered to smectite + sericite] + [biotite weakly altered to muscovite + opaques ± chlorite].

Cement (0%) was not observed.

ALTERATION Alteration features of indeterminate relative ages:(1) regional dynamothermal metamorphism; and (2) K-feldspar weakly altered to myrmekitic [quartz + plagioclase].

SECTIONING Format: 27 x 46 mm Finish: STD Stains: SCN (top 2/3) + ARSPF (none) Cover: PLN

IMAGES RC-05B - 3 32.5-32.6 O8S-019.jpg/XPL/27 x 46 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-05B - 3 32.5-32.6 O8S-020.jpg/PPL/27 x 46 mm Same.

RC-05B - 3 32.5-32.6 O8S-020-Kfs.jpg/PPL/27 x 46 mm Same with enhanced K-feldspar stain.

RC-05B - 3 32.5-32.6 O8S-055.jpg/XPL/4.00 x 5.83 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-05B - 3 32.5-32.6 O8S-056.jpg/PPL/4.00 x 5.83 mm Same with enhanced K-feldspar stain.

SAMPLE # **RC-06-1 9.2-9.3** October 11, 2024

ROCK NAME ALTERED GRANITE SCHIST -- probably formed by alteration (secondary K-feldspar + quartz + plagioclase + muscovite/sericite + carbonate) and regional dynamothermal metamorphism from a granite protolith.

MINERALS K-feldspar (33%) + quartz (33%) + plagioclase (33%) + muscovite/sericite (1%) + carbonate (<1%).

TEXTURES Ductile deformation of quartz during regional dynamothermal metamorphism has produced a a weakly directed fabric. Strain conditions were below the threshold for feldspar ductile deformation.

Porphyroblasts (0%) were not observed.

Porphyroclasts (0%) were not observed.

Matrix (100%) is dominated by [K-feldspar weakly altered to myrmekitic [quartz + plagioclase]] + quartz + [plagioclase weakly altered to K-feldspar + sericite].

Cement (0%) was not observed.

ALTERATION Alteration features in relative chronological order from oldest to youngest are: (1) regional dynamothermal metamorphism; and (2) veins of carbonate + sericite with diffuse selvages in which plagioclase is moderately altered to K-feldspar + sericite.

Alteration features of indeterminate relative ages:(1) K-feldspar weakly altered to myrmekitic [quartz + plagioclase].

SECTIONING Format: 27 x 46 mm Finish: STD Stains: SCN (top 2/3) + ARSPF (none) Cover: PLN

IMAGES RC-06 - 1 9.2-9.3 O8S-021.jpg/XPL/27 x 46 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-06 - 1 9.2-9.3 O8S-022.jpg/PPL/27 x 46 mm Same.

RC-06 - 1 9.2-9.3 O8S-022-Kfs.jpg/PPL/27 x 46 mm Same with enhanced K-feldspar stain.

RC-06 - 1 9.2-9.3 O8S-057.jpg/XPL/4.00 x 5.83 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-06 - 1 9.2-9.3 O8S-058.jpg/PPL/4.00 x 5.83 mm Same with enhanced K-feldspar stain.

SAMPLE # **RC-06-4 24.6-24.7** October 11, 2024

ROCK NAME ALTERED GRANITE SCHIST -- probably formed by alteration (secondary K-feldspar + quartz + plagioclase + chlorite + muscovite/sericite + leucoxene) and regional dynamothermal metamorphism from a granite protolith.

MINERALS K-feldspar (44%) + quartz (44%) + plagioclase (9%) + biotite (1%) + chlorite (1%) + muscovite/sericite (1%) + leucoxene (<1%) + opaques (<1%) + apatite (<1%) + zircon (<1%).

TEXTURES Ductile deformation of quartz during regional dynamothermal metamorphism has produced a a weakly directed fabric. Strain conditions were below the threshold for feldspar ductile deformation.

Porphyroblasts (0%) were not observed.

Porphyroclasts (0%) were not observed.

Matrix (100%) is dominated by [K-feldspar weakly altered to myrmekitic [quartz + plagioclase]] + quartz + [plagioclase weakly altered to K-feldspar + sericite].

Cement (0%) was not observed.

ALTERATION Alteration features in relative chronological order from oldest to youngest are: (1) regional dynamothermal metamorphism; and (2) veins of K-feldspar + sericite.

Alteration features of indeterminate relative ages:(1) K-feldspar weakly altered to myrmekitic [quartz + plagioclase].

SECTIONING Format: 27 x 46 mm Finish: STD Stains: SCN (top 2/3) + ARSPF (none) Cover: PLN

IMAGES RC-06 - 4 24.6-24.7 O8S-023.jpg/XPL/27 x 46 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-06 - 4 24.6-24.7 O8S-024.jpg/PPL/27 x 46 mm Same.

RC-06 - 4 24.6-24.7 O8S-024-Kfs.jpg/PPL/27 x 46 mm Same with enhanced K-feldspar stain.

RC-06 - 4 24.6-24.7 O8S-059.jpg/XPL/4.00 x 5.83 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-06 - 4 24.6-24.7 O8S-060.jpg/PPL/4.00 x 5.83 mm Same with enhanced K-feldspar stain.

SAMPLE # **RC-07-1 21.1-21.2** October 11, 2024

ROCK NAME ALTERED GRANITE SCHIST -- probably formed by alteration (secondary quartz + plagioclase + muscovite/sericite + chlorite + smectite + opaques) and regional dynamothermal metamorphism from a granite protolith.

MINERALS K-feldspar (31%) + quartz (30%) + plagioclase (30%) + biotite (8%) + muscovite/sericite (1%) + chlorite (<1%) + smectite (<1%) + opaques (<1%) + apatite (<1%) + zircon (<1%).

TEXTURES Ductile deformation of quartz during regional dynamothermal metamorphism has produced a a weakly directed fabric. Strain conditions were below the threshold for feldspar ductile deformation.

Porphyroblasts (0%) were not observed.

Porphyroclasts (0%) were not observed.

Matrix (100%) is dominated by [K-feldspar weakly altered to myrmekitic [quartz + plagioclase]] + quartz + [plagioclase weakly altered to smectite + sericite] + [biotite weakly altered to muscovite + opaques ± chlorite].

Cement (0%) was not observed.

ALTERATION Alteration features of indeterminate relative ages:(1) regional dynamothermal metamorphism; and (2) K-feldspar weakly altered to myrmekitic [quartz + plagioclase].

SECTIONING Format: 27 x 46 mm Finish: STD Stains: SCN (top 2/3) + ARSPF (none) Cover: PLN

IMAGES RC-07- 1 21.1-21.2 O8S-025.jpg/XPL/27 x 46 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-07- 1 21.1-21.2 O8S-026.jpg/PPL/27 x 46 mm Same.

RC-07- 1 21.1-21.2 O8S-026-Kfs.jpg/PPL/27 x 46 mm Same with enhanced K-feldspar stain.

RC-07- 1 21.1-21.2 O8S-061.jpg/XPL/4.00 x 5.83 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-07- 1 21.1-21.2 O8S-062.jpg/PPL/4.00 x 5.83 mm Same with enhanced K-feldspar stain.

SAMPLE # **RC-07-3 29.1-29.3** October 11, 2024

ROCK NAME ALTERED GRANITE SCHIST -- probably formed by alteration (secondary K-feldspar+ quartz + plagioclase + muscovite/sericite + chlorite + smectite + leucoxene + opaques) and regional dynamothermal metamorphism from a granite protolith.

MINERALS K-feldspar (56%) + quartz (28%) + plagioclase (9%) + biotite (6%) + muscovite/sericite (1%) + chlorite (<1%) + smectite (<1%) + leucoxene (<1%) + opaques (<1%) + apatite (<1%) + zircon (<1%).

TEXTURES Ductile deformation of quartz during regional dynamothermal metamorphism has produced a a weakly directed fabric. Strain conditions were below the threshold for feldspar ductile deformation.

Porphyroblasts (0%) were not observed.

Porphyroclasts (0%) were not observed.

Matrix (100%) is dominated by [K-feldspar weakly altered to myrmekitic [quartz + plagioclase]] + quartz + [plagioclase weakly altered to smectite + sericite] + [biotite weakly altered to muscovite + opaques OR chlorite + leucoxene ± K-feldspar].

Cement (0%) was not observed.

ALTERATION Alteration features of indeterminate relative ages:(1) regional dynamothermal metamorphism; and (2) K-feldspar weakly altered to myrmekitic [quartz + plagioclase].

SECTIONING Format: 27 x 46 mm Finish: STD Stains: SCN (top 2/3) + ARSPF (none) Cover: PLN

IMAGES RC-07 - 3 29.1-29.3 O8S-027.jpg/XPL/27 x 46 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-07 - 3 29.1-29.3 O8S-028.jpg/PPL/27 x 46 mm Same.

RC-07 - 3 29.1-29.3 O8S-028-Kfs.jpg/PPL/27 x 46 mm Same with enhanced K-feldspar stain.

RC-07 - 3 29.1-29.3 O8S-063.jpg/XPL/4.00 x 5.83 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-07 - 3 29.1-29.3 O8S-064.jpg/PPL/4.00 x 5.83 mm Same with enhanced K-feldspar stain.

SAMPLE # **RC-08-1 8.9-9.0** October 11, 2024

ROCK NAME ALTERED GRANITE SCHIST -- probably formed by alteration (secondary K-feldspar + quartz + plagioclase + muscovite/sericite + chlorite + smectite + leucoxene + opaques) and regional dynamothermal metamorphism from a granite protolith.

MINERALS K-feldspar (53%) + quartz (26%) + plagioclase (18%) + biotite (3%) + muscovite/sericite (<1%) + chlorite (<1%) + smectite (<1%) + leucoxene (<1%) + opaques (<1%) + apatite (<1%) + zircon (<1%).

TEXTURES Ductile deformation of quartz during regional dynamothermal metamorphism has produced a a weakly directed fabric. Strain conditions were below the threshold for feldspar ductile deformation.

Porphyroblasts (0%) were not observed.

Porphyroclasts (0%) were not observed.

Matrix (100%) is dominated by [K-feldspar weakly altered to myrmekitic [quartz + plagioclase]] + quartz + [plagioclase weakly altered to smectite + sericite] + [biotite weakly altered to muscovite + opaques OR chlorite + leucoxene ± K-feldspar].
].

Cement (0%) was not observed.

ALTERATION Alteration features of indeterminate relative ages:(1) regional dynamothermal metamorphism; and (2) K-feldspar weakly altered to myrmekitic [quartz + plagioclase].

SECTIONING Format: 27 x 46 mm Finish: STD Stains: SCN (top 2/3) + ARSPF (none) Cover: PLN

IMAGES RC-08 - 1 8.9-9.0 O8S-029.jpg/XPL/27 x 46 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-08 - 1 8.9-9.0 O8S-030.jpg/PPL/27 x 46 mm Same.

RC-08 - 1 8.9-9.0 O8S-030-Kfs.jpg/PPL/27 x 46 mm Same with enhanced K-feldspar stain.

RC-08 - 1 8.9-9.0 O8S-065.jpg/XPL/4.00 x 5.83 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-08 - 1 8.9-9.0 O8S-066.jpg/PPL/4.00 x 5.83 mm Same with enhanced K-feldspar stain.

SAMPLE # **RC-08-4 21.1-21.2** October 21, 2024

ROCK NAME ALTERED GRANITE SCHIST -- probably formed by alteration (secondary quartz + plagioclase + muscovite/sericite + chlorite + smectite + leucoxene + opaques) and regional dynamothermal metamorphism from a granite protolith.

MINERALS K-feldspar (55%) + quartz (34%) + plagioclase (7%) + biotite (3%) + muscovite/sericite (1%) + chlorite (<1%) + smectite (<1%) + leucoxene (<1%) + opaques (<1%) + apatite (<1%) + zircon (<1%).

TEXTURES Ductile deformation of quartz during regional dynamothermal metamorphism has produced a a weakly directed fabric. Strain conditions were below the threshold for feldspar ductile deformation.

Porphyroblasts (0%) were not observed.

Porphyroclasts (0%) were not observed.

Matrix (100%) is dominated by [K-feldspar weakly altered to myrmekitic [quartz + plagioclase]] + quartz + [plagioclase weakly altered to smectite + sericite] + [biotite weakly altered to muscovite + opaques OR chlorite + leucoxene].

Cement (0%) was not observed.

ALTERATION Alteration features of indeterminate relative ages:(1) regional dynamothermal metamorphism; and (2) K-feldspar weakly altered to myrmekitic [quartz + plagioclase].

SECTIONING Format: 27 x 46 mm Finish: STD Stains: SCN (top 2/3) + ARSPF (none) Cover: PLN

IMAGES RC-08 - 4 21.1-21.2 O8S-031.jpg/XPL/27 x 46 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-08 - 4 21.1-21.2 O8S-032.jpg/PPL/27 x 46 mm Same.

RC-08 - 4 21.1-21.2 O8S-032-Kfs.jpg/PPL/27 x 46 mm Same with enhanced K-feldspar stain.

RC-08 - 4 21.1-21.2 O8S-067.jpg/XPL/4.00 x 5.83 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-08 - 4 21.1-21.2 O8S-068.jpg/PPL/4.00 x 5.83 mm Same with enhanced K-feldspar stain.

SAMPLE # **RC-10-2 17.4-17.6** October 11, 2024

ROCK NAME ALTERED GRANITE SCHIST -- probably formed by alteration (secondary quartz + plagioclase + muscovite/sericite + chlorite + smectite + leucoxene + opaques) and regional dynamothermal metamorphism from a granite protolith.

MINERALS K-feldspar (44%) + quartz (44%) + plagioclase (7%) + biotite (5%) + muscovite/sericite (<1%) + chlorite (<1%) + smectite (<1%) + leucoxene (<1%) + opaques (<1%) + apatite (<1%) + zircon (<1%).

TEXTURES Ductile deformation of quartz during regional dynamothermal metamorphism has produced a a weakly directed fabric. Strain conditions were below the threshold for feldspar ductile deformation.

Porphyroblasts (0%) were not observed.

Porphyroclasts (0%) were not observed.

Matrix (100%) is dominated by [K-feldspar weakly altered to myrmekitic [quartz + plagioclase]] + quartz + [plagioclase weakly altered to smectite + sericite] + [biotite weakly altered to muscovite + opaques OR chlorite + leucoxene].

Cement (0%) was not observed.

ALTERATION Alteration features of indeterminate relative ages:(1) regional dynamothermal metamorphism; and (2) K-feldspar weakly altered to myrmekitic [quartz + plagioclase].

SECTIONING Format: 27 x 46 mm Finish: STD Stains: SCN (top 2/3) + ARSPF (none) Cover: PLN

IMAGES RC-10 - 2 17.4-17.6 O8S-033.jpg/XPL/27 x 46 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-10 - 2 17.4-17.6 O8S-034.jpg/PPL/27 x 46 mm Same.

RC-10 - 2 17.4-17.6 O8S-034-Kfs.jpg/PPL/27 x 46 mm Same with enhanced K-feldspar stain.

RC-10 - 2 17.4-17.6 O8S-069.jpg/XPL/4.00 x 5.83 mm ALTERED GRANITE SCHIST showing typical appearance.

RC-10 - 2 17.4-17.6 O8S-070.jpg/PPL/4.00 x 5.83 mm Same with enhanced K-feldspar stain.

SAMPLE # **RC-10-4 26.0-26.1** October 11, 2024

ROCK NAME QUARTZ-BIOTITE-PLAGIOCLASE SCHIST -- probably formed by regional dynamothermal metamorphism from a clay-rich sedimentary protolith.

MINERALS Plagioclase (60%) + biotite (20%) + quartz (20%) + sericite (<1%) + smectite (<1%) + carbonate (<1%) + opaques (<1%) + apatite (<1%) + zircon (<1%).

TEXTURES Regional dynamothermal metamorphism has produced a a moderately directed fabric.

Porphyroblasts (0%) were not observed.

Porphyroclasts (0%) were not observed.

Matrix (100%) is dominated by [plagioclase weakly altered to smectite + sericite] + biotite + quartz.

Cement (0%) was not observed.

ALTERATION Alteration features of indeterminate relative ages:(1) regional dynamothermal metamorphism.

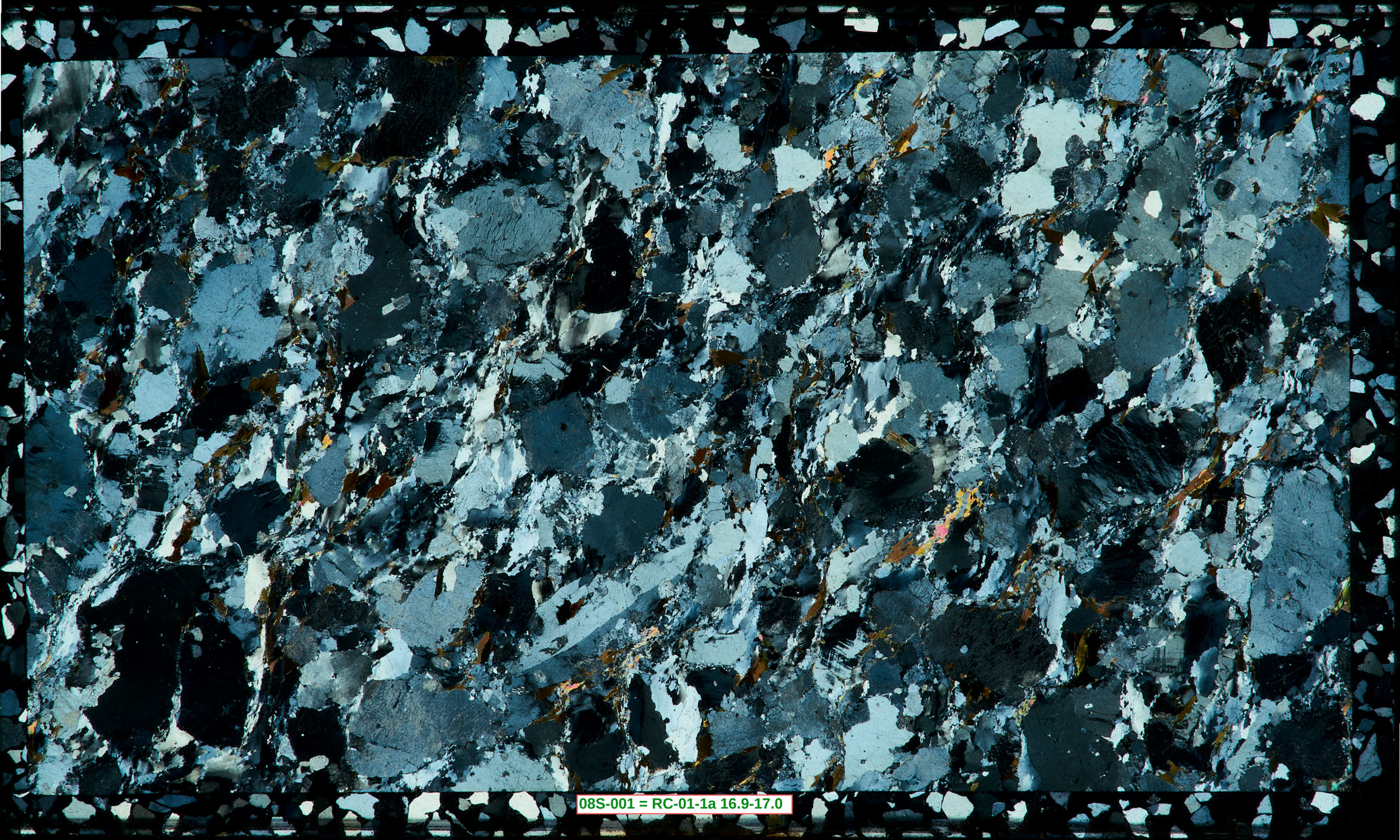
SECTIONING Format: 27 x 46 mm Finish: STD Stains: SCN (top 2/3) + ARSPF (none) Cover: PLN

IMAGES RC-10 - 4 26.0-26.1 O8S-035.jpg/XPL/27 x 46 mm QUARTZ-BIOTITE-PLAGIOCLASE SCHIST showing typical appearance.

RC-10 - 4 26.0-26.1 O8S-036.jpg/PPL/27 x 46 mm Same.

RC-10 - 4 26.0-26.1 O8S-071.jpg/XPL/4.00 x 5.83 mm QUARTZ-BIOTITE-PLAGIOCLASE SCHIST showing typical appearance.

RC-10 - 4 26.0-26.1 O8S-072.jpg/PPL/4.00 x 5.83 mm Same.

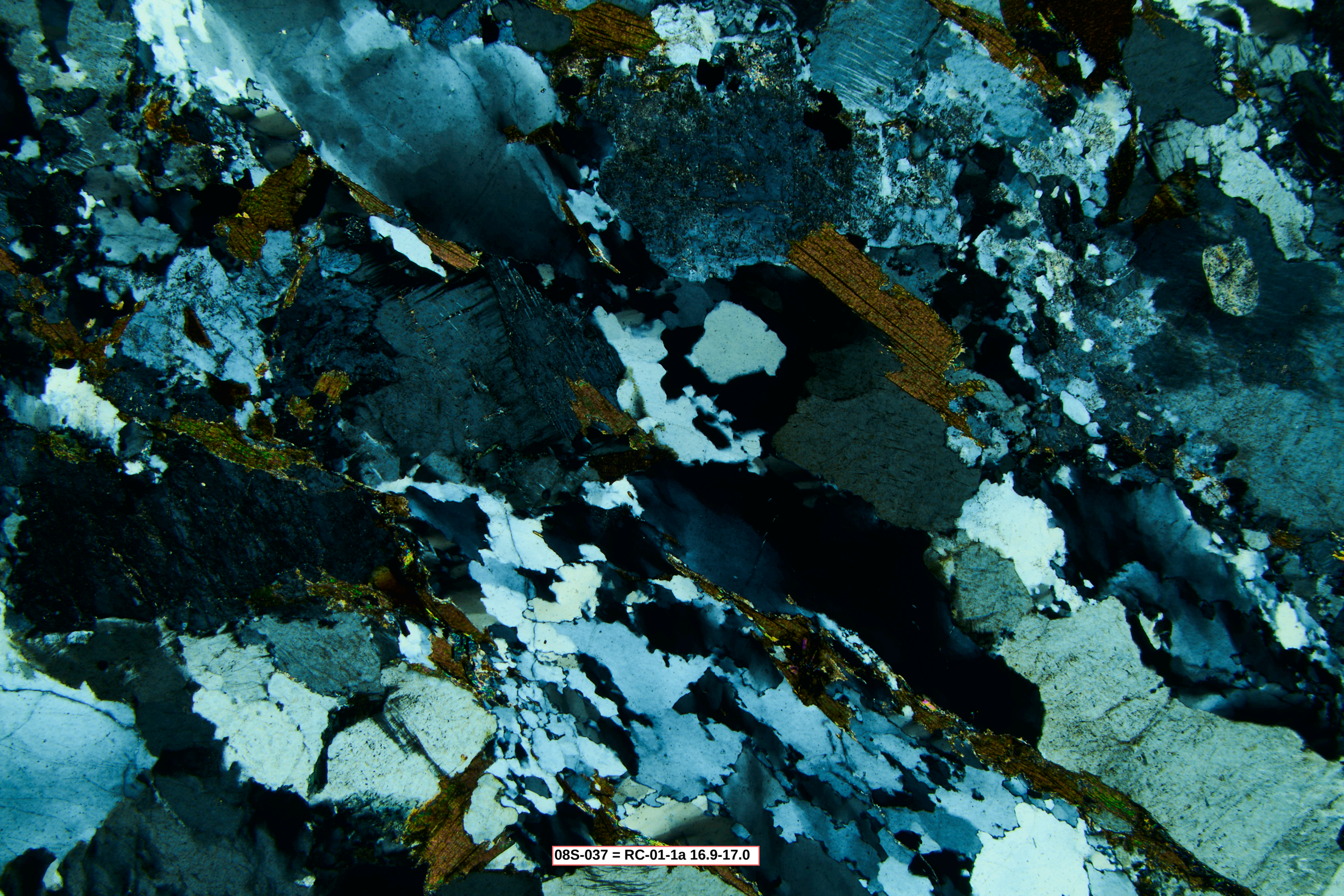

08S-001 = RC-01-1a 16.9-17.0



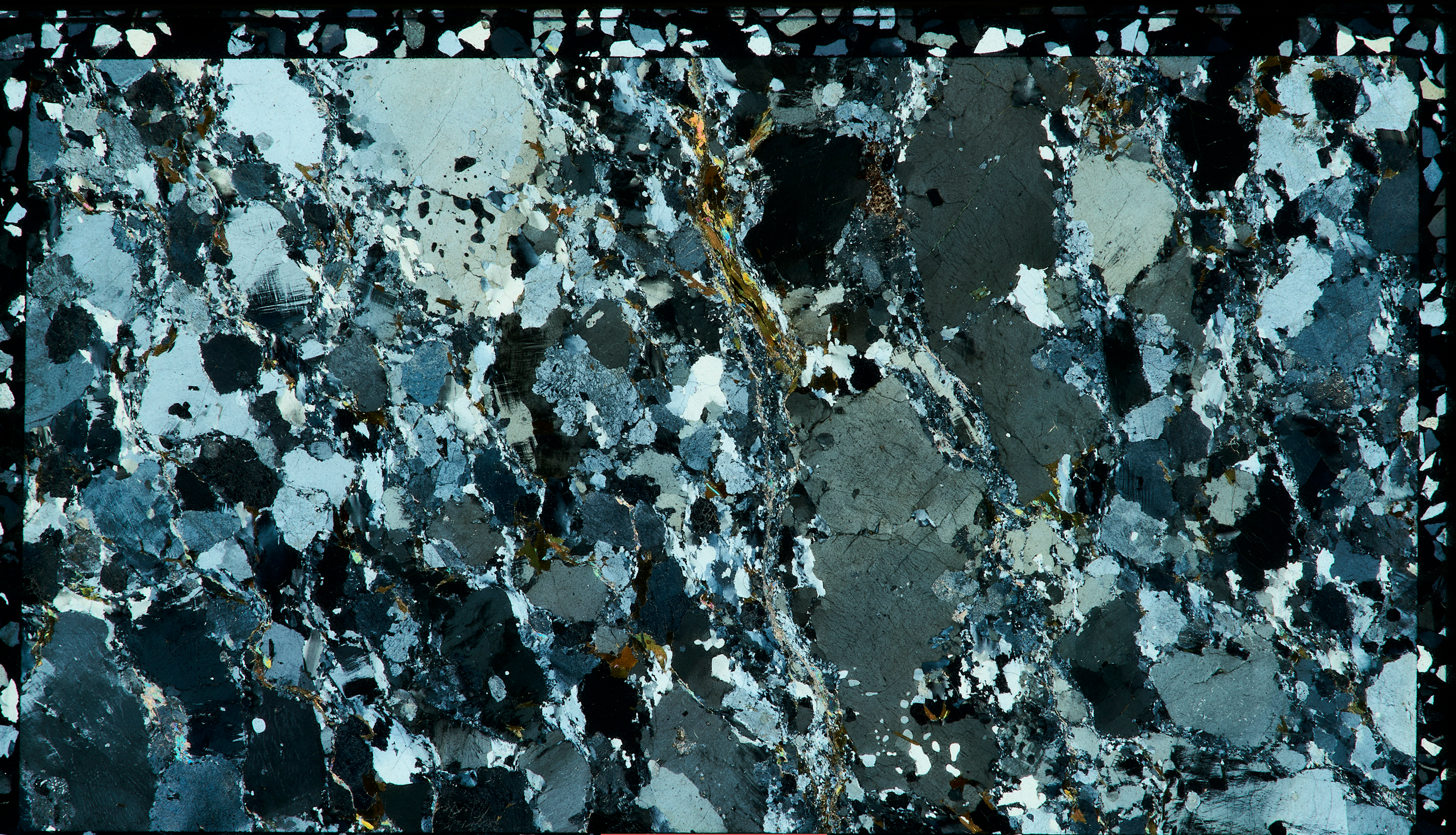
08S-002 = RC-01-1a 16.9-17.0

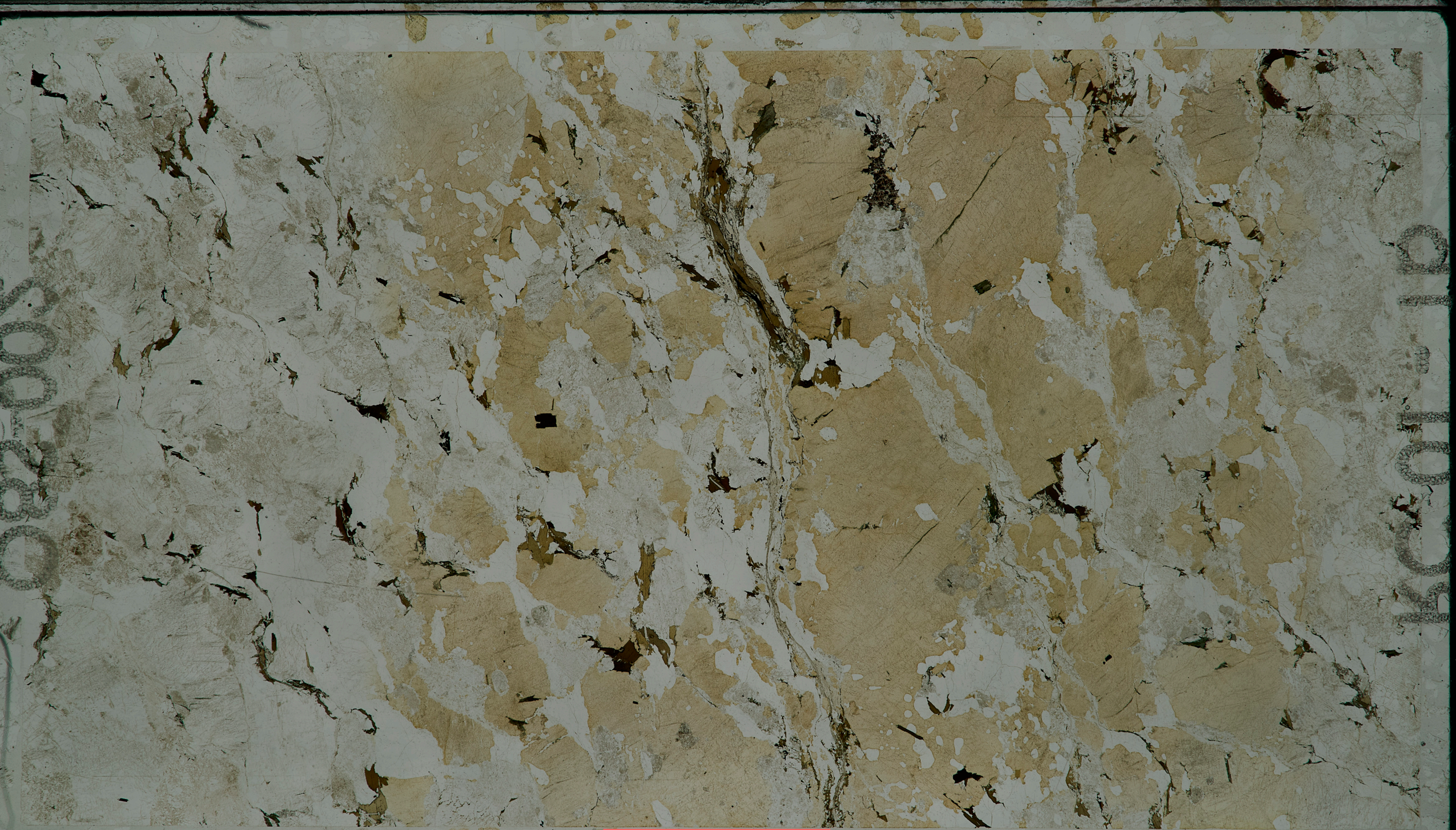


08S-002-KFS = RC-01-1a 16.9-17.0


08S-037 = RC-01-1a 16.9-17.0

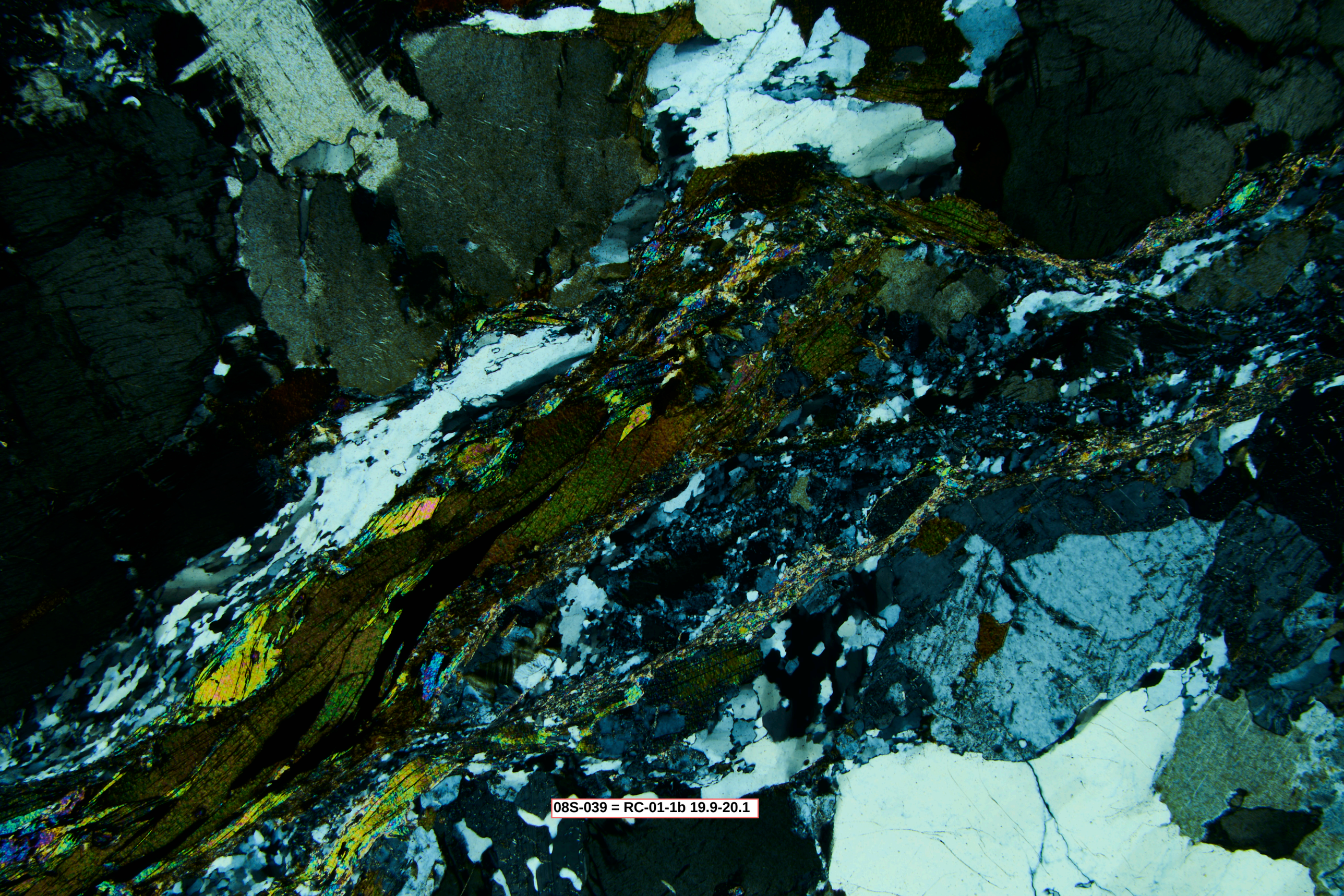
08S-038 = RC-01-1a 16.9-17.0


08S-003 = RC-01-1b 19.9-20.1

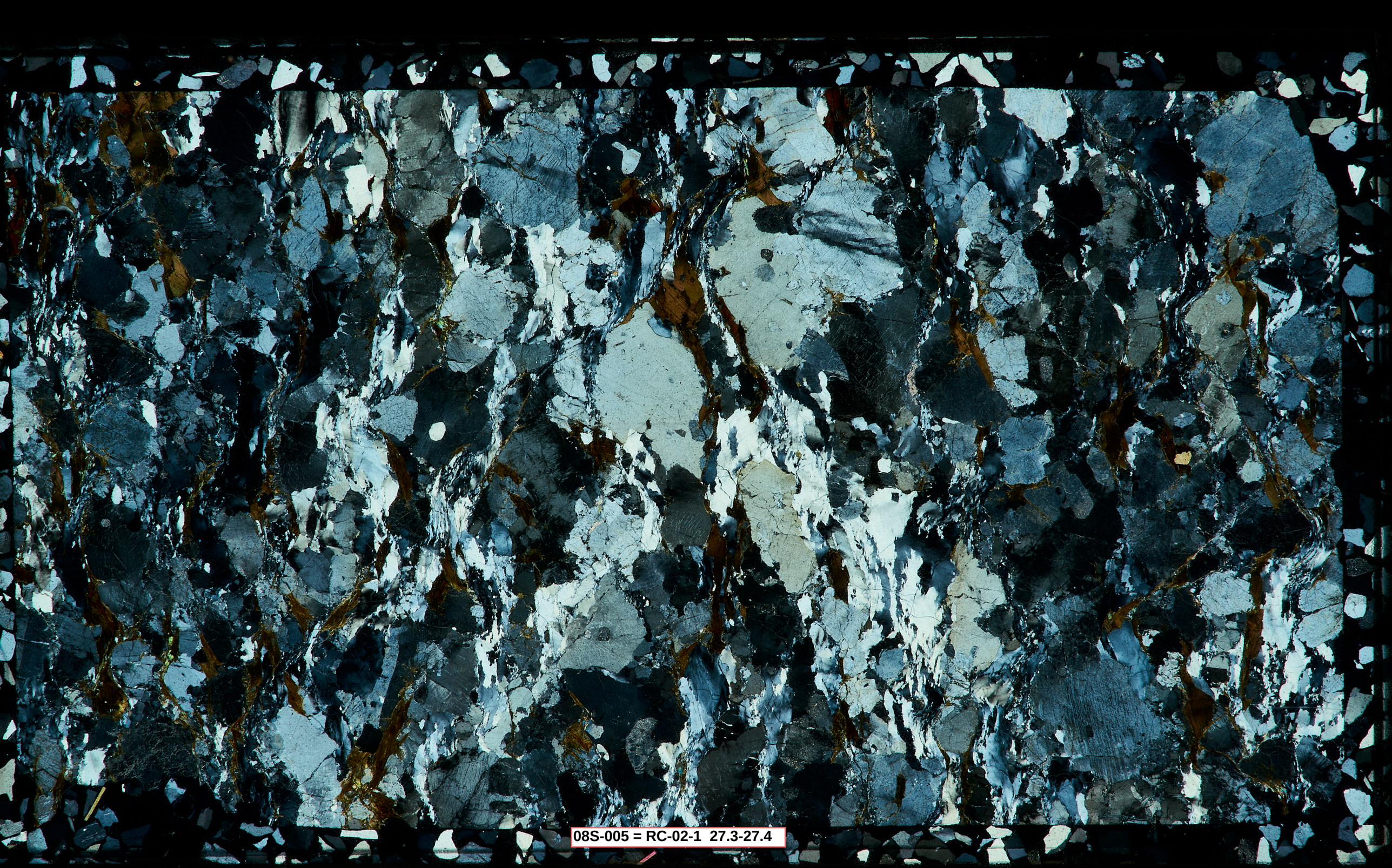


08S-004 = RC-01-1b 19.9-20.1

08S-004.kfs = RC-01-1b 19.9-20.1

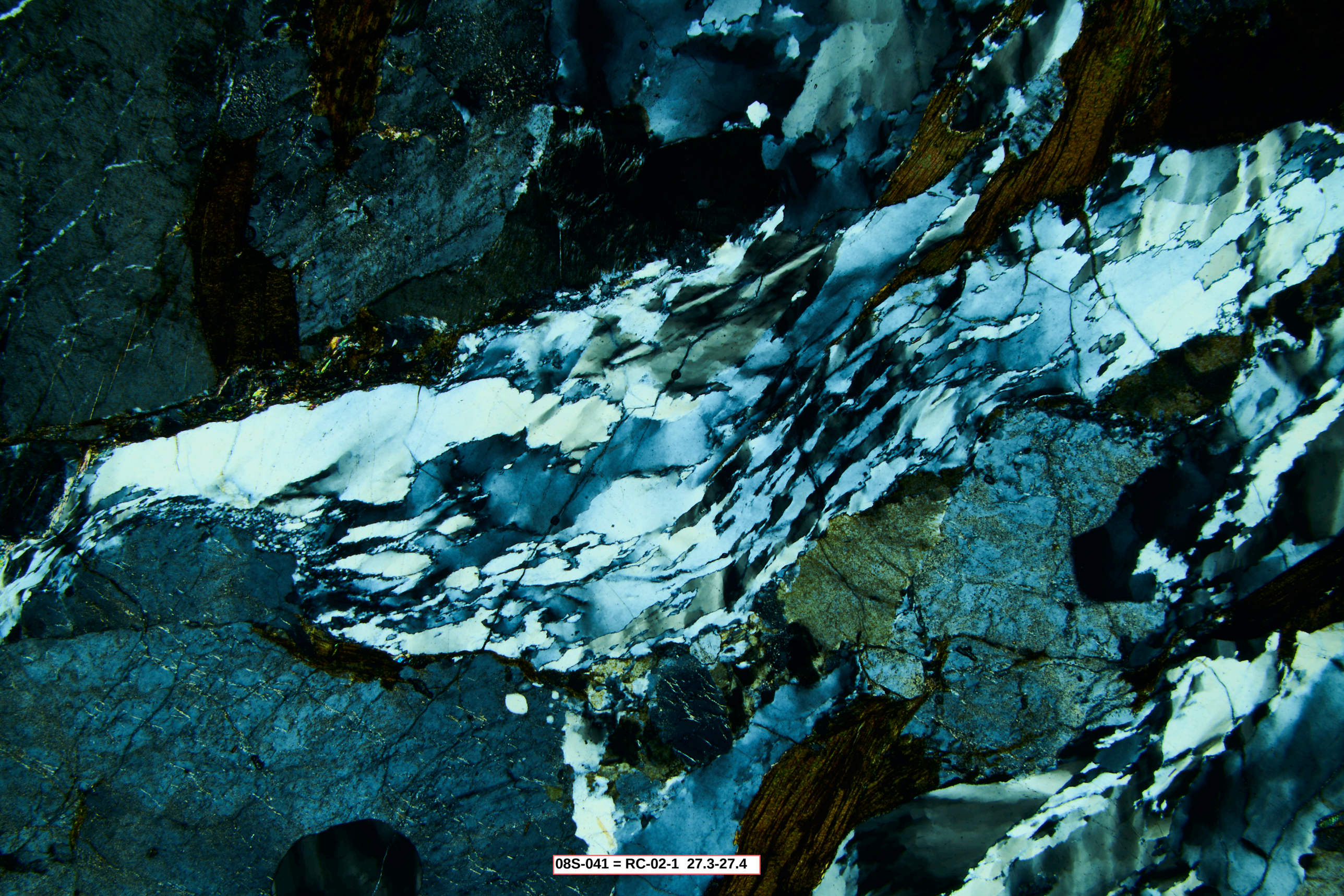

08S-039 = RC-01-1b 19.9-20.1

08S-040 = RC-01-1b 19.9-20.1

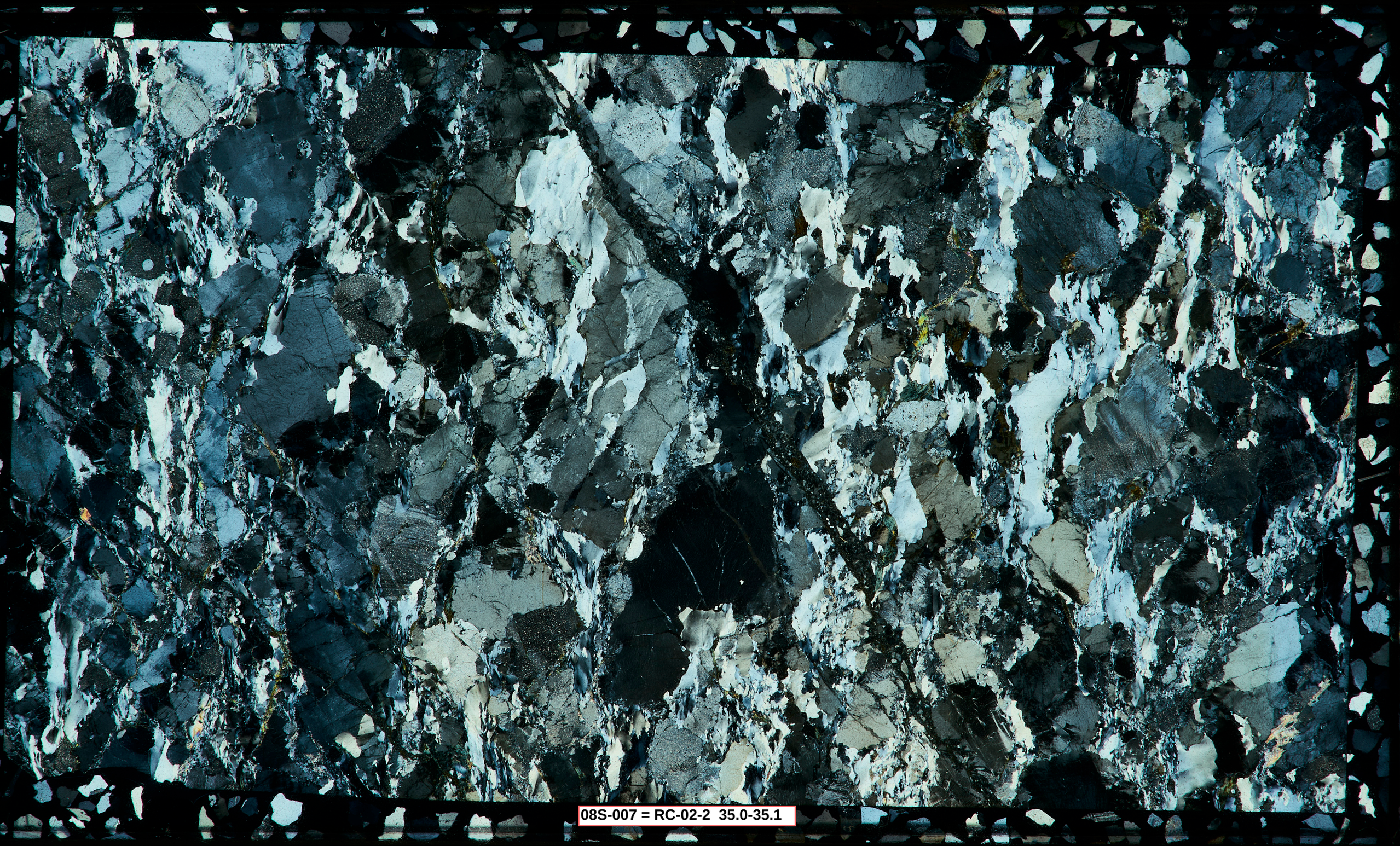

08S-005 = RC-02-1 27.3-27.4

08S-006 = RC-02-1 27.3-27.4

08S-006-Kfs = RC-02-1 27.3-27.4


08S-041 = RC-02-1 27.3-27.4

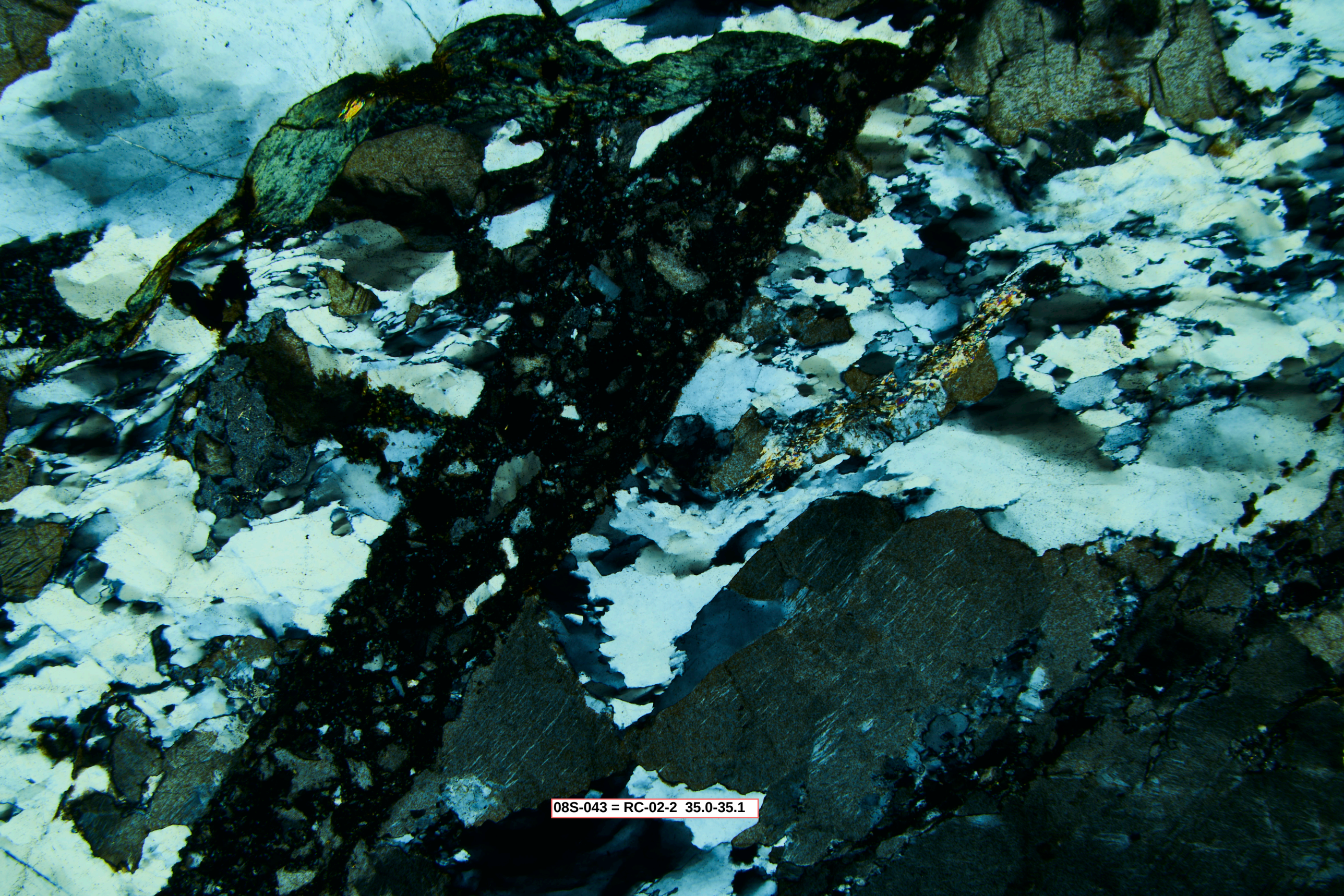
08S-042 = RC-02-1 27.3-27.4

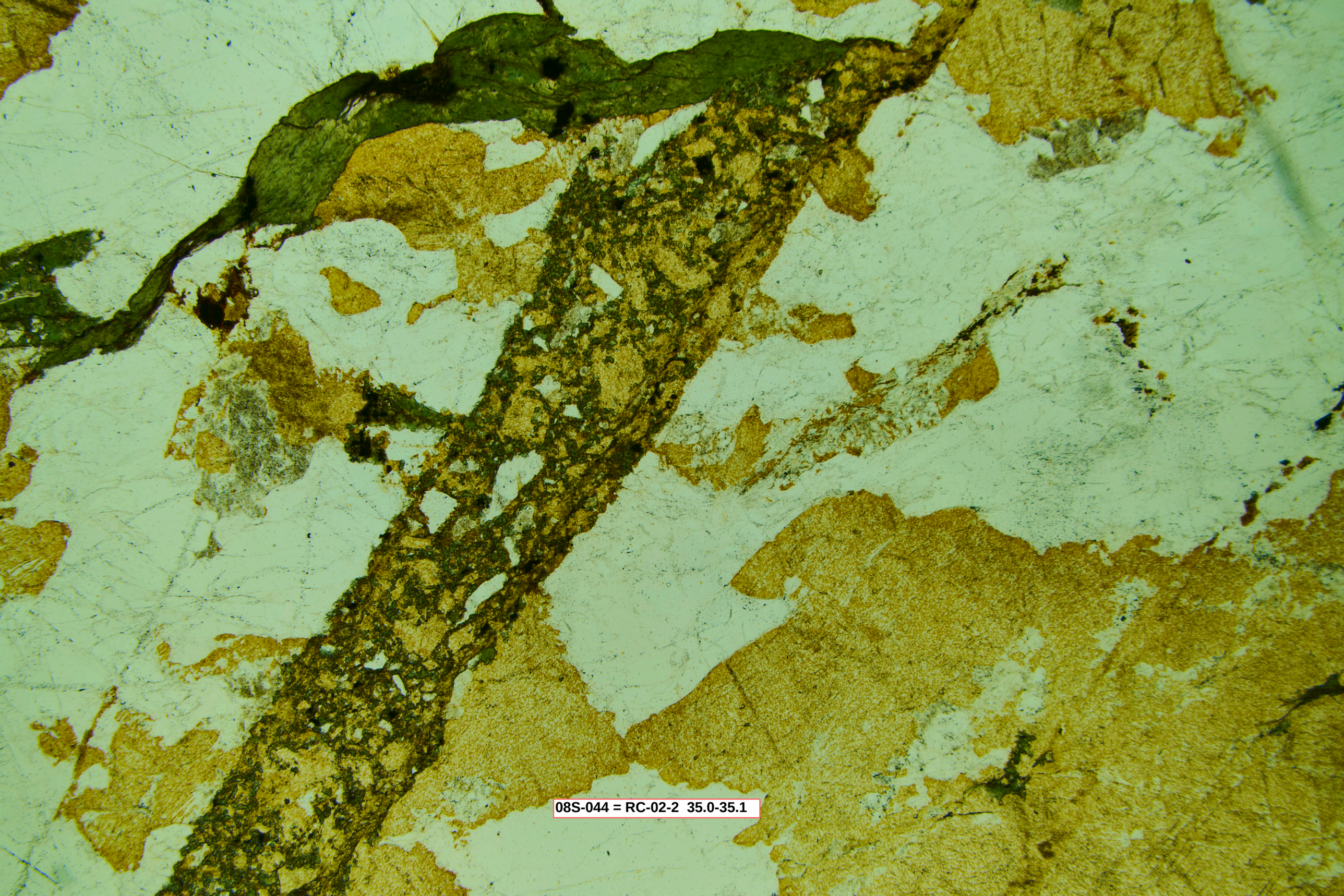

08S-007 = RC-02-2 35.0-35.1

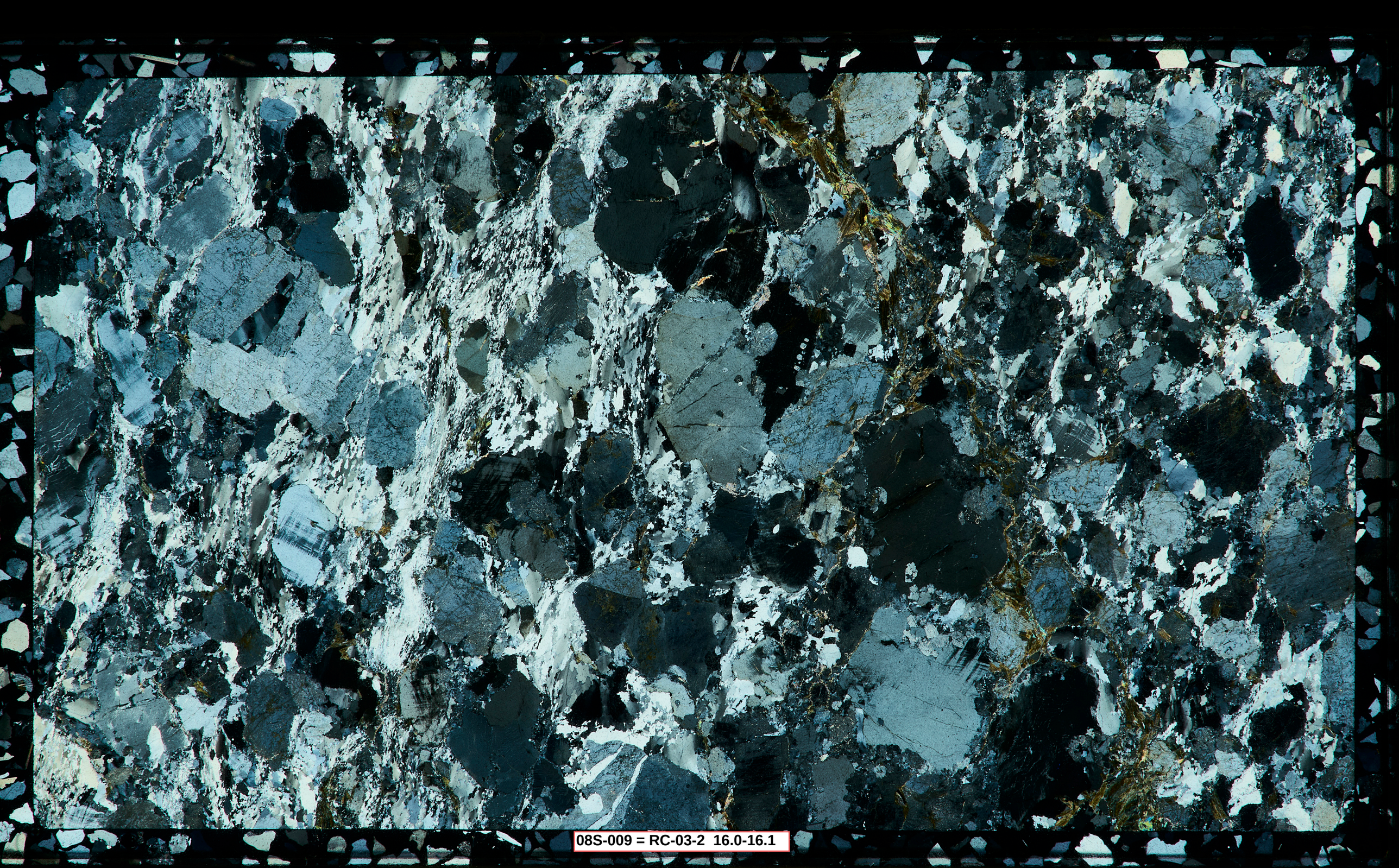
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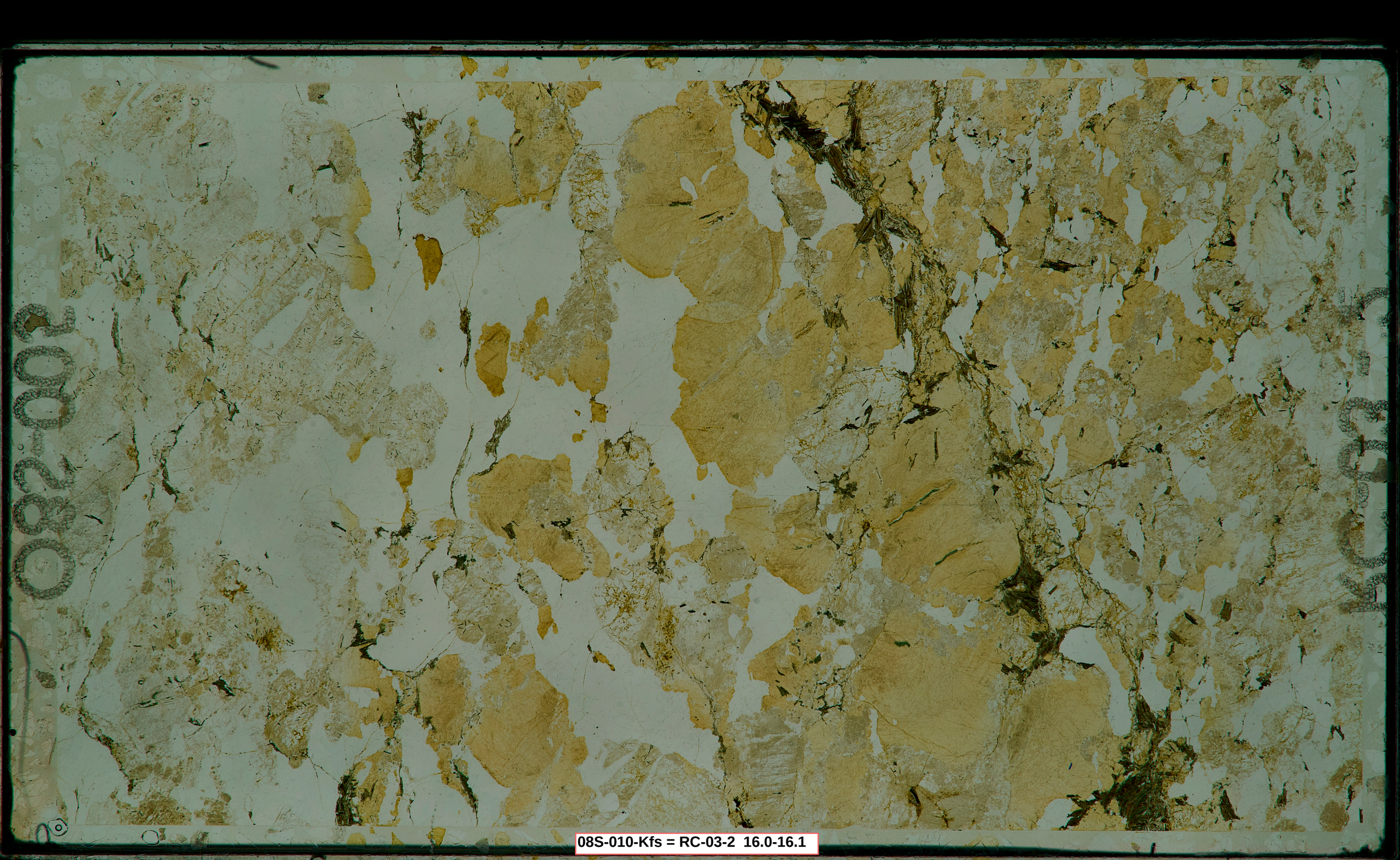
08S-008.Kfs = RC-02-2 35.0-35.1


08S-043 = RC-02-2 35.0-35.1

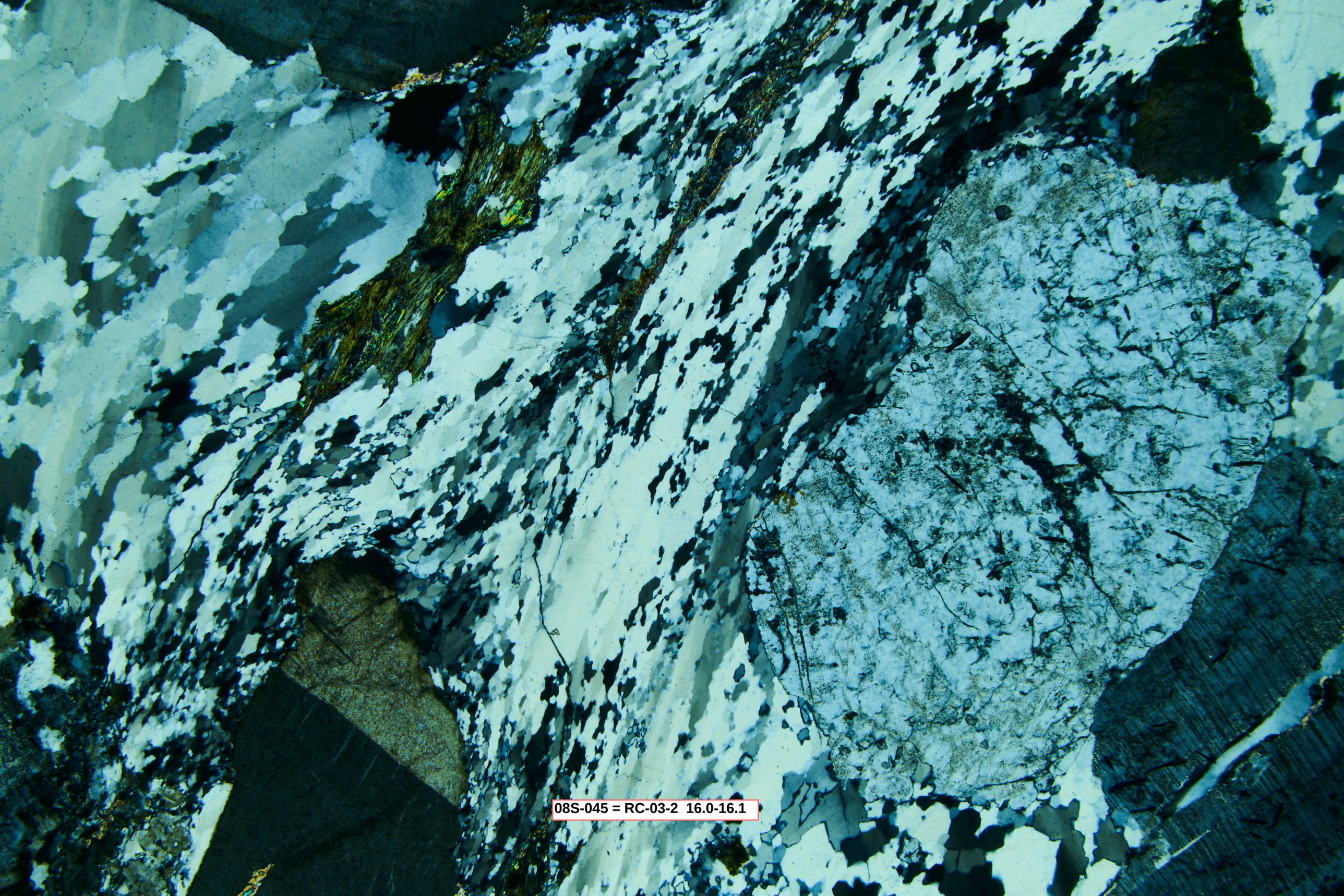

08S-044 = RC-02-2 35.0-35.1


08S-009 = RC-03-2 16.0-16.1

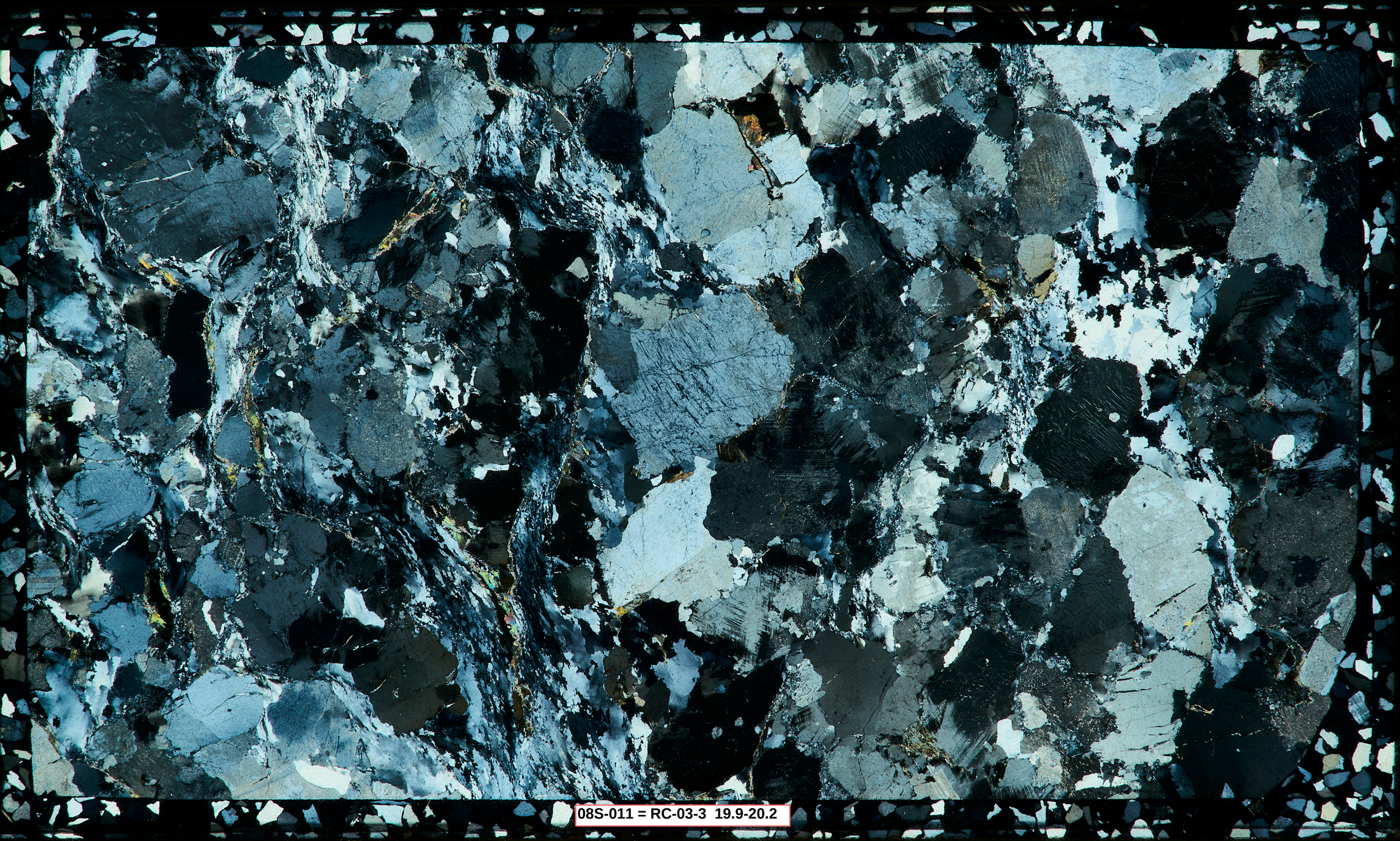
08S-010 = RC-03-2 16.0-16.1



08S-010-Kfs = RC-03-2 16.0-16.1


08S-045 = RC-03-2 16.0-16.1

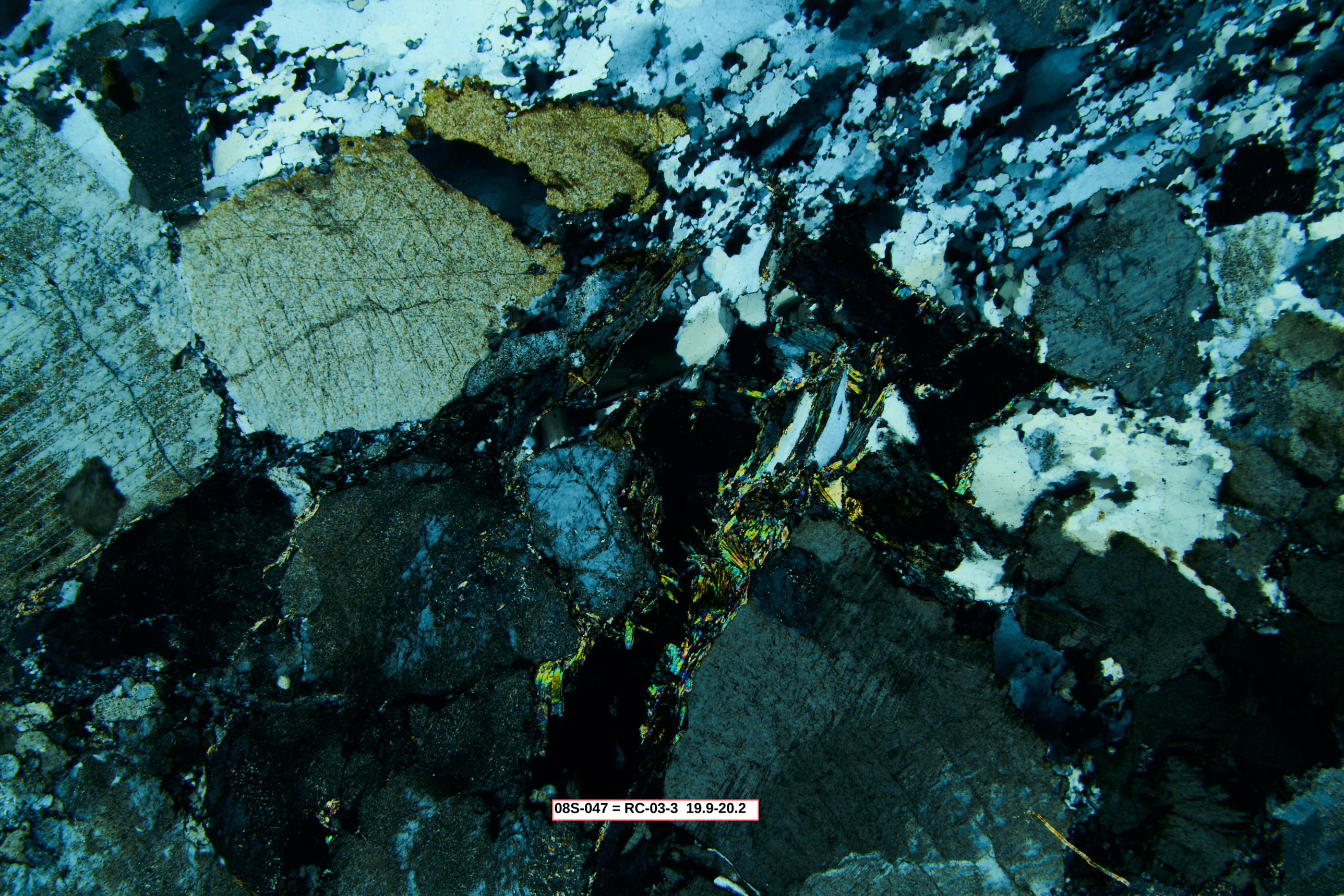
08S-046 = RC-03-2 16.0-16.1



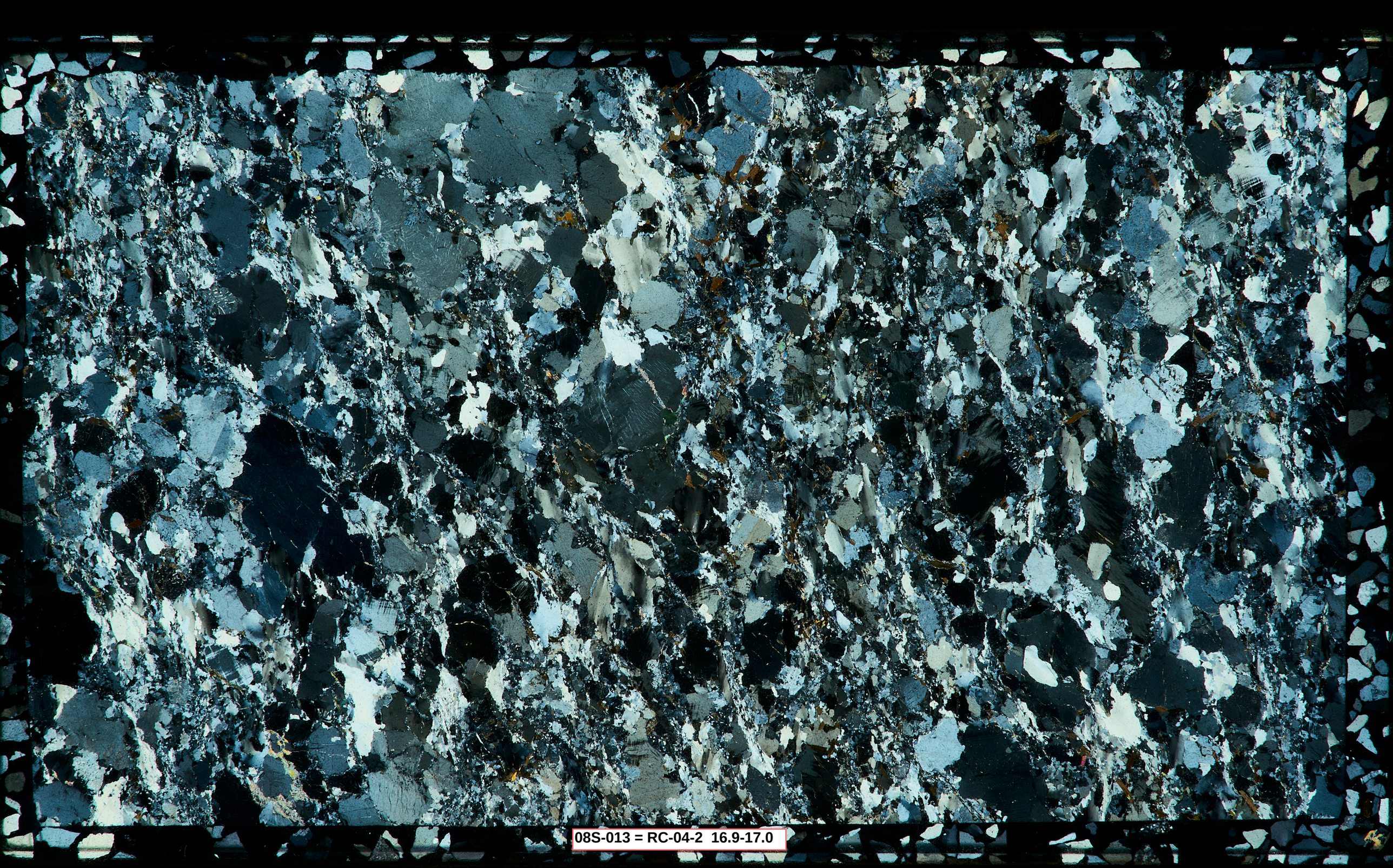
08S-011 = RC-03-3 19.9-20.2

08S-012 = RC-03-3 19.9-20.2

08S-012-Kfs = RC-03-3 19.9-20.2

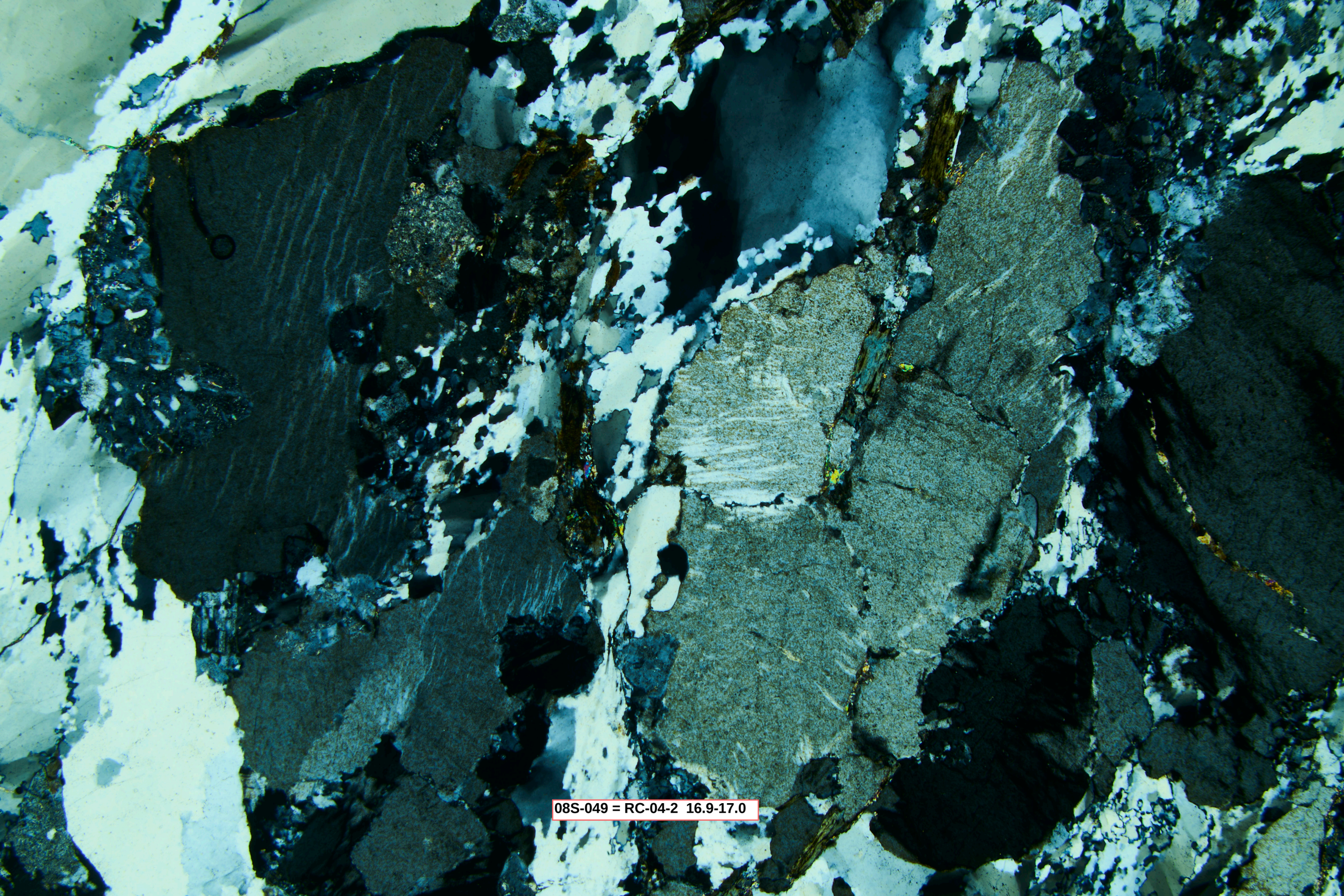

08S-047 = RC-03-3 19.9-20.2

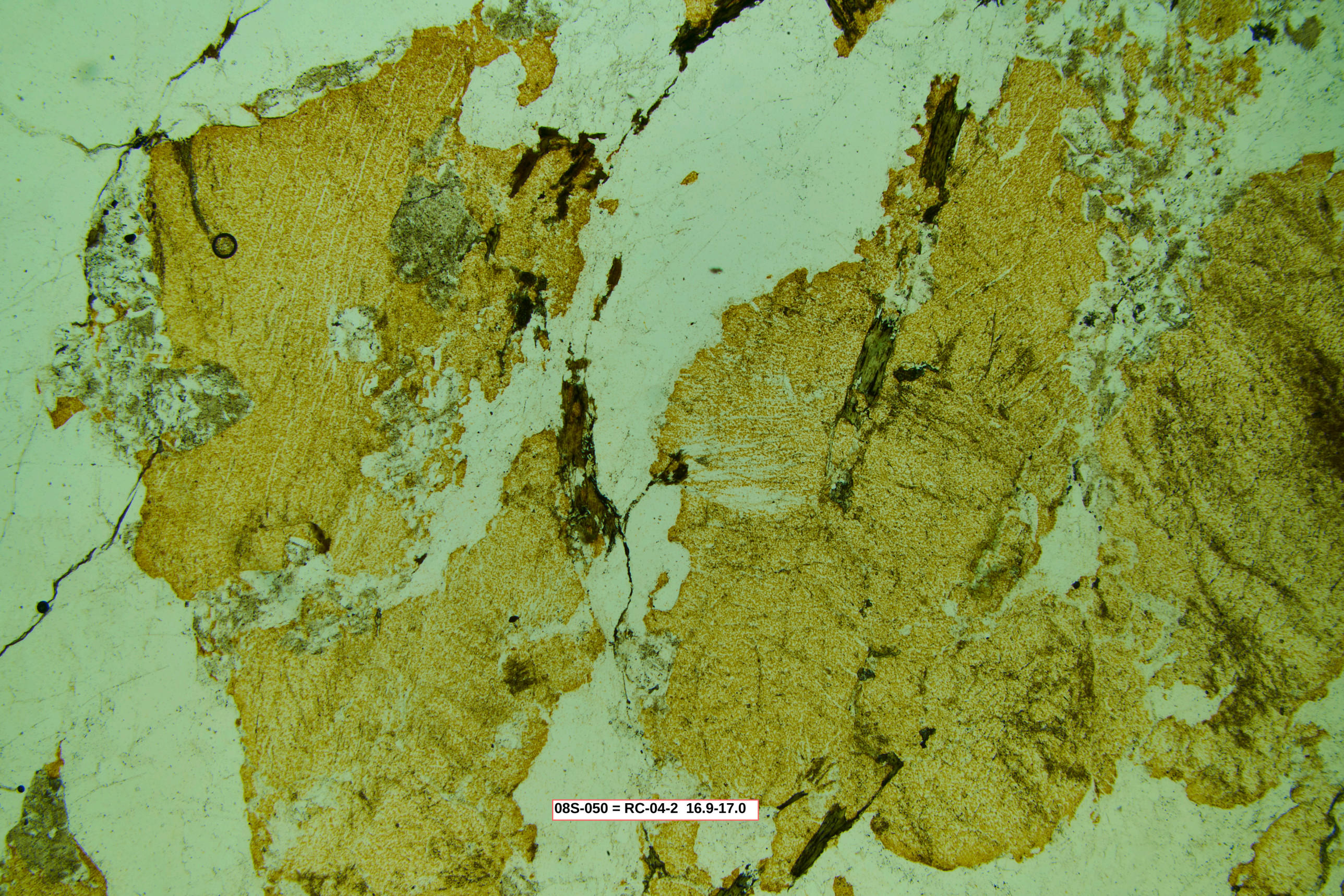

08S-048 = RC-03-3 19.9-20.2

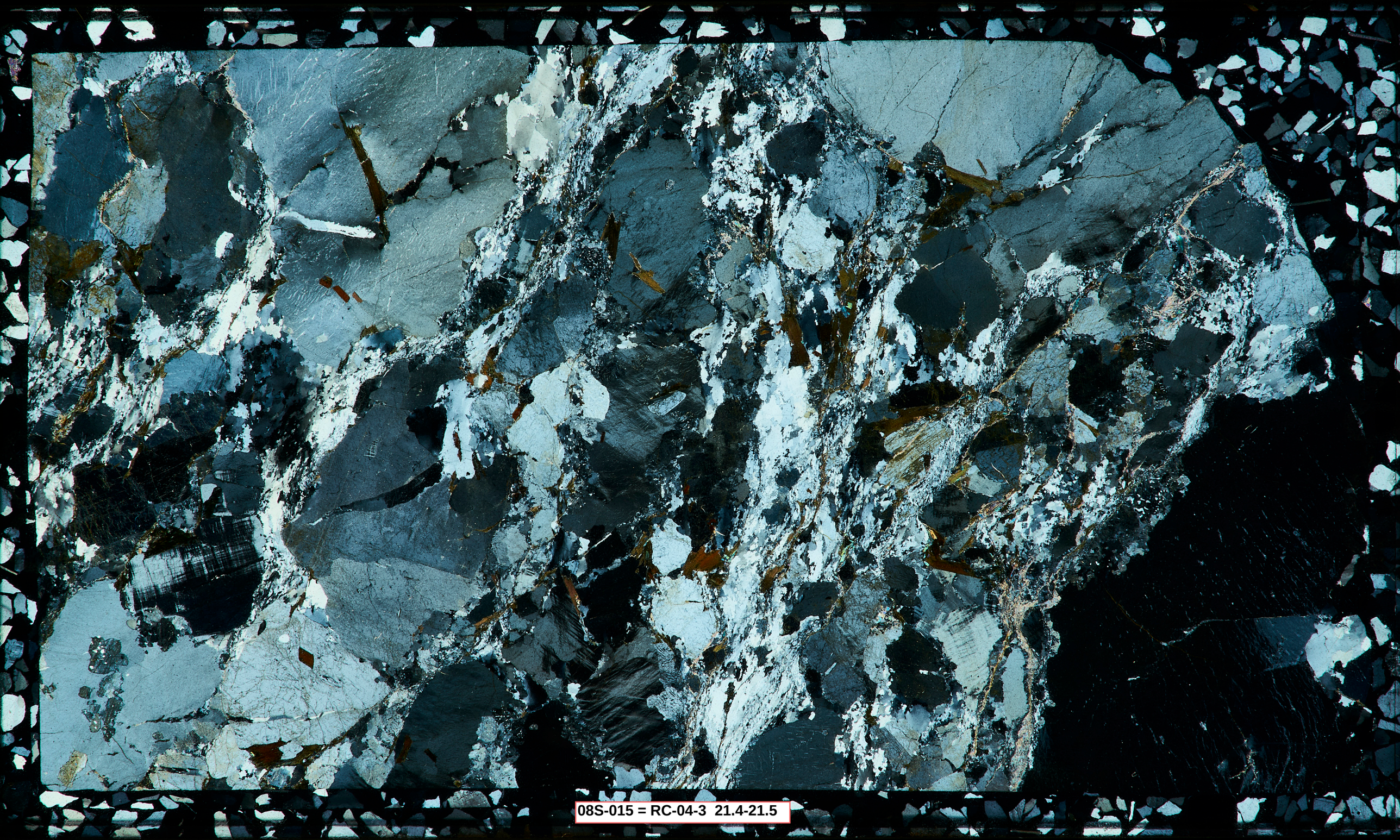

08S-013 = RC-04-2 16.9-17.0

08S-014 = RC-04-2 16.9-17.0

08S-014-Kfs = RC-04-2 16.9-17.0

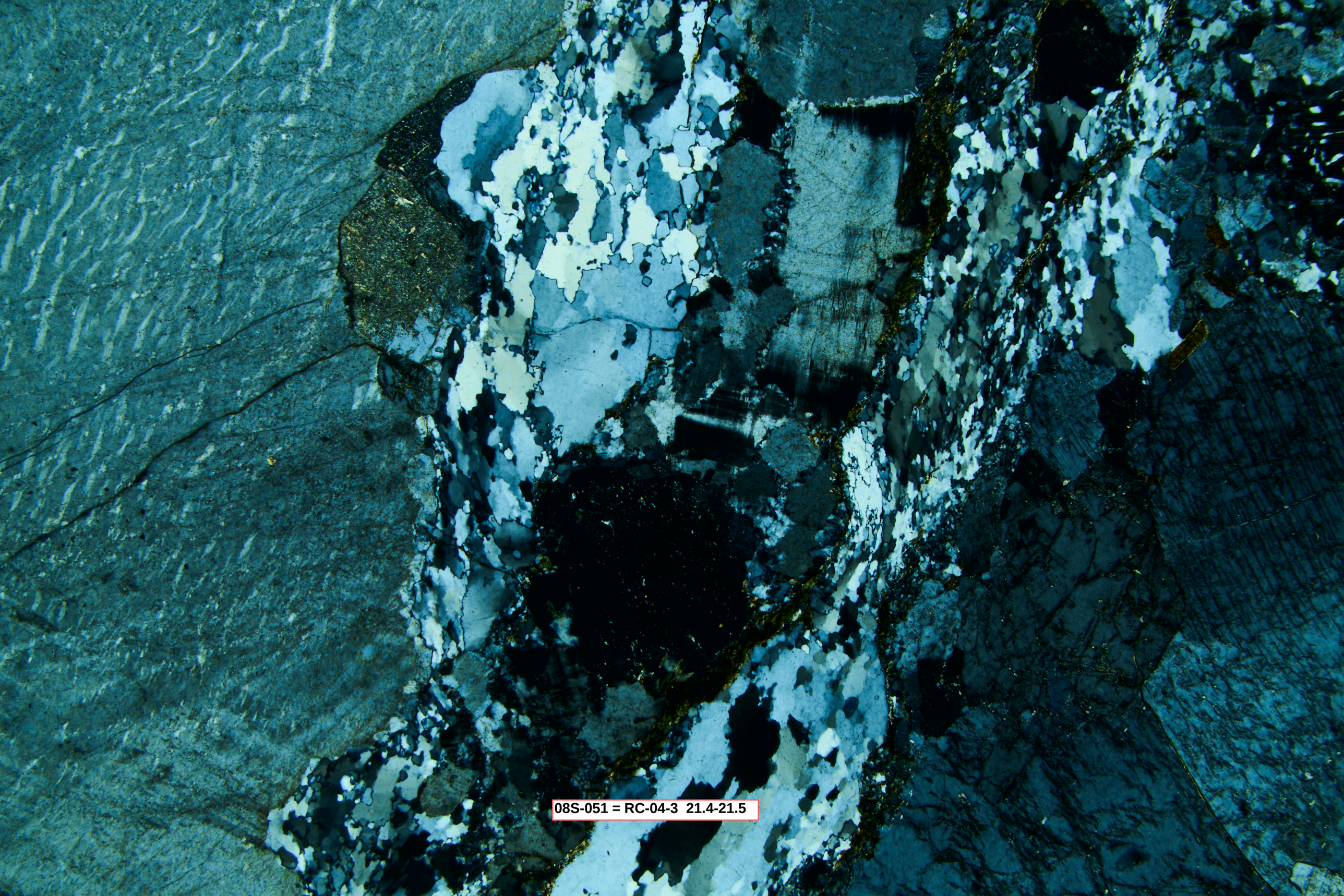

08S-049 = RC-04-2 16.9-17.0

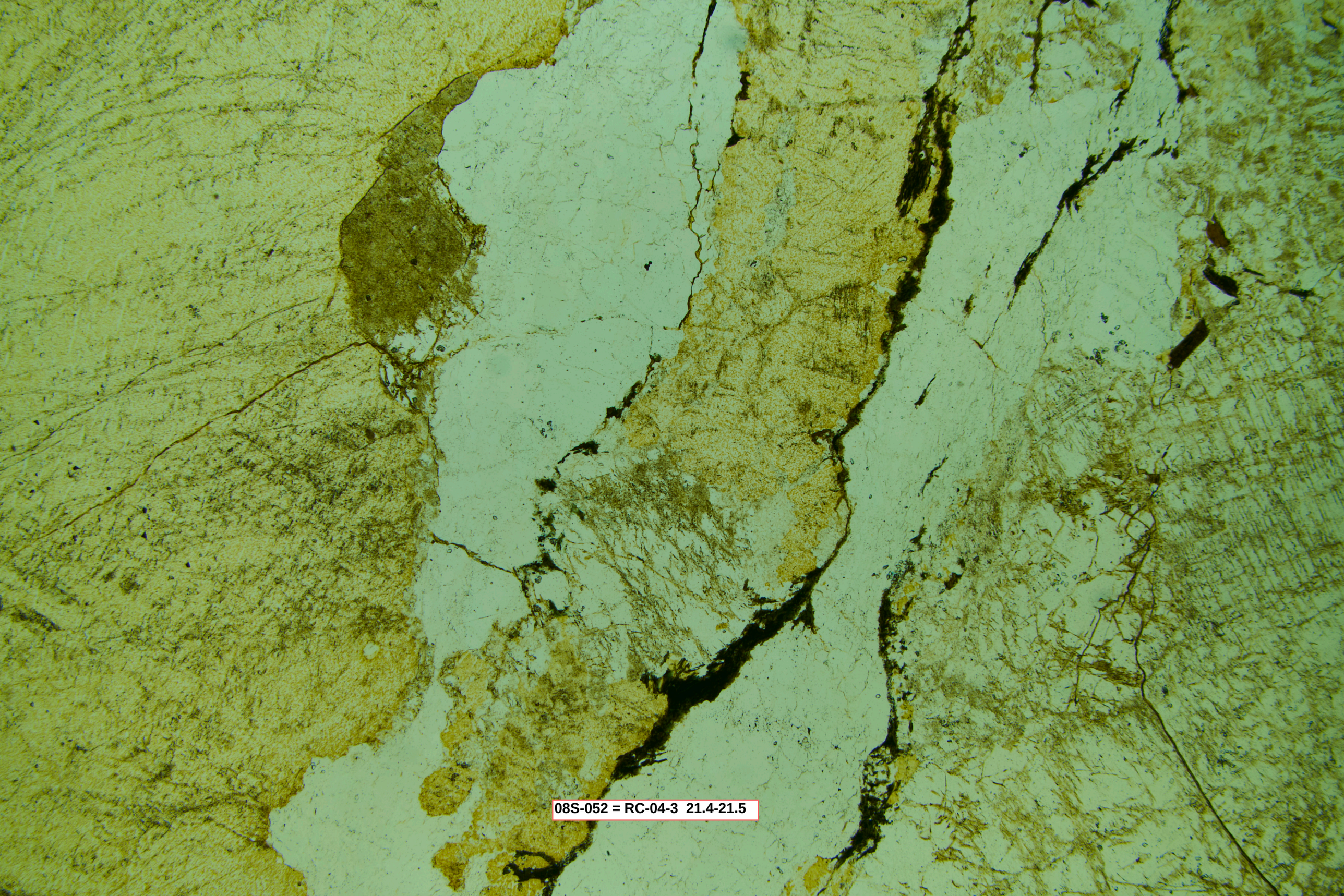

08S-050 = RC-04-2 16.9-17.0

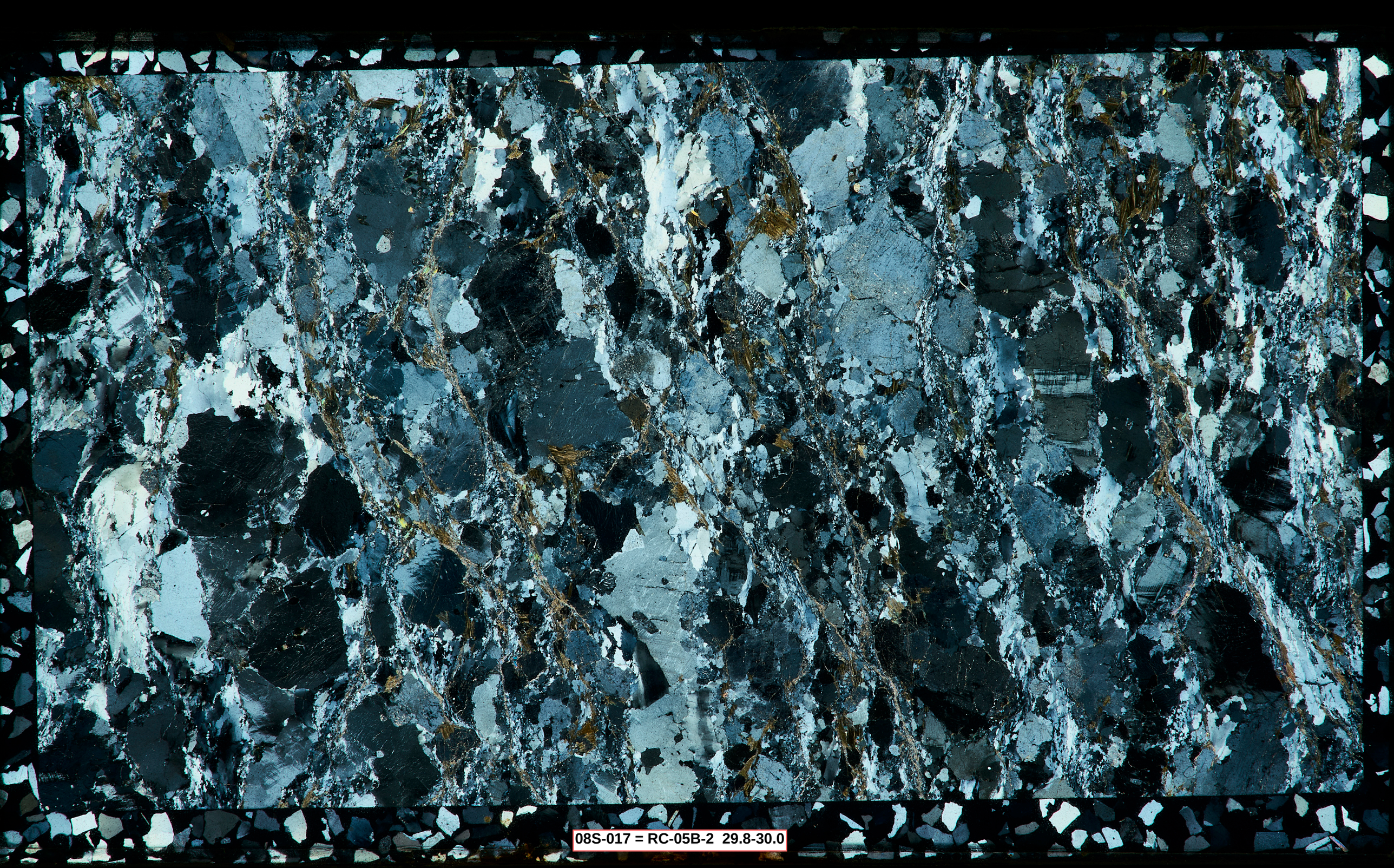

08S-015 = RC-04-3 21.4-21.5

08S-016 = RC-04-3 21.4-21.5

08S-016-Kfs = RC-04-3 21.4-21.5

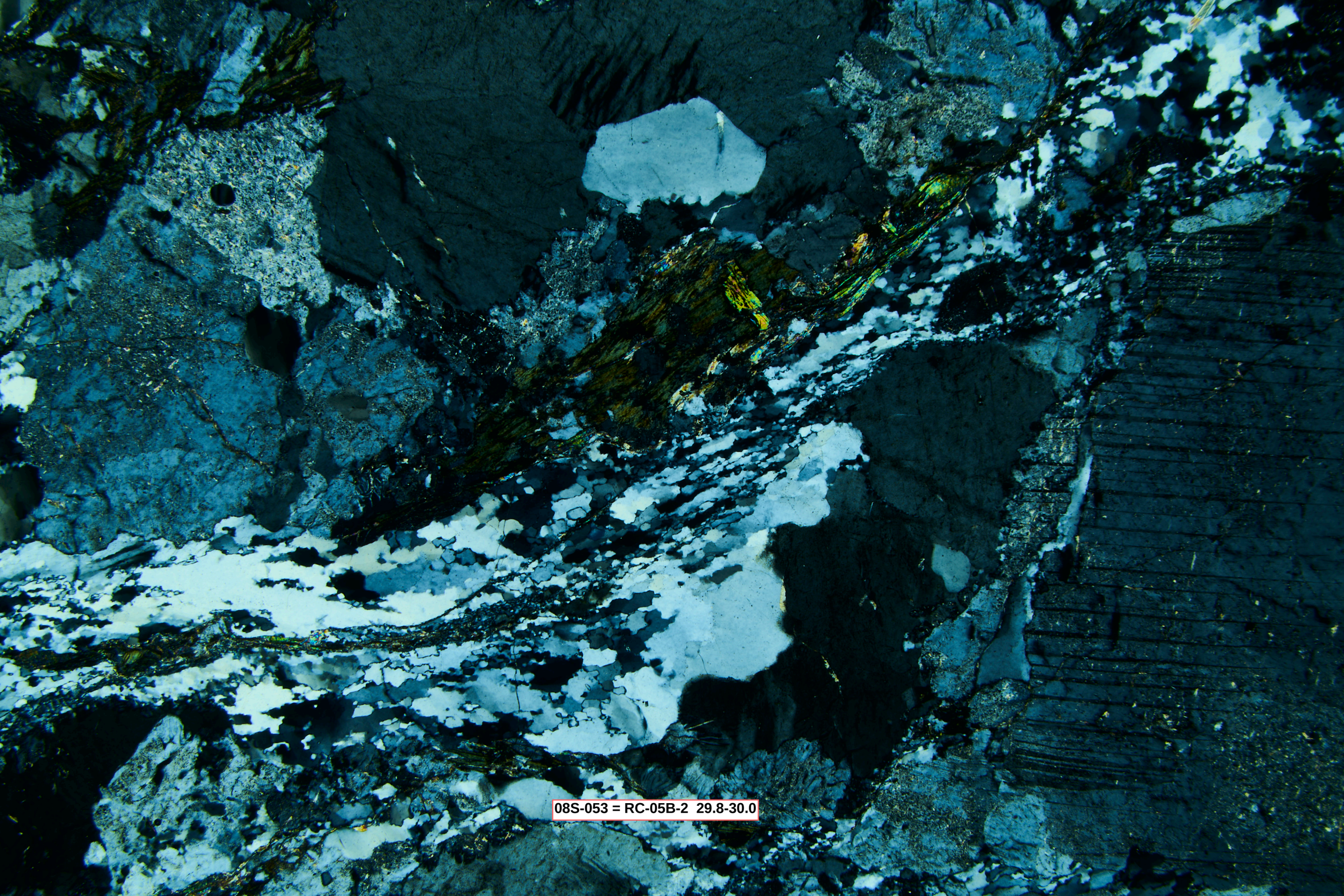

08S-051 = RC-04-3 21.4-21.5

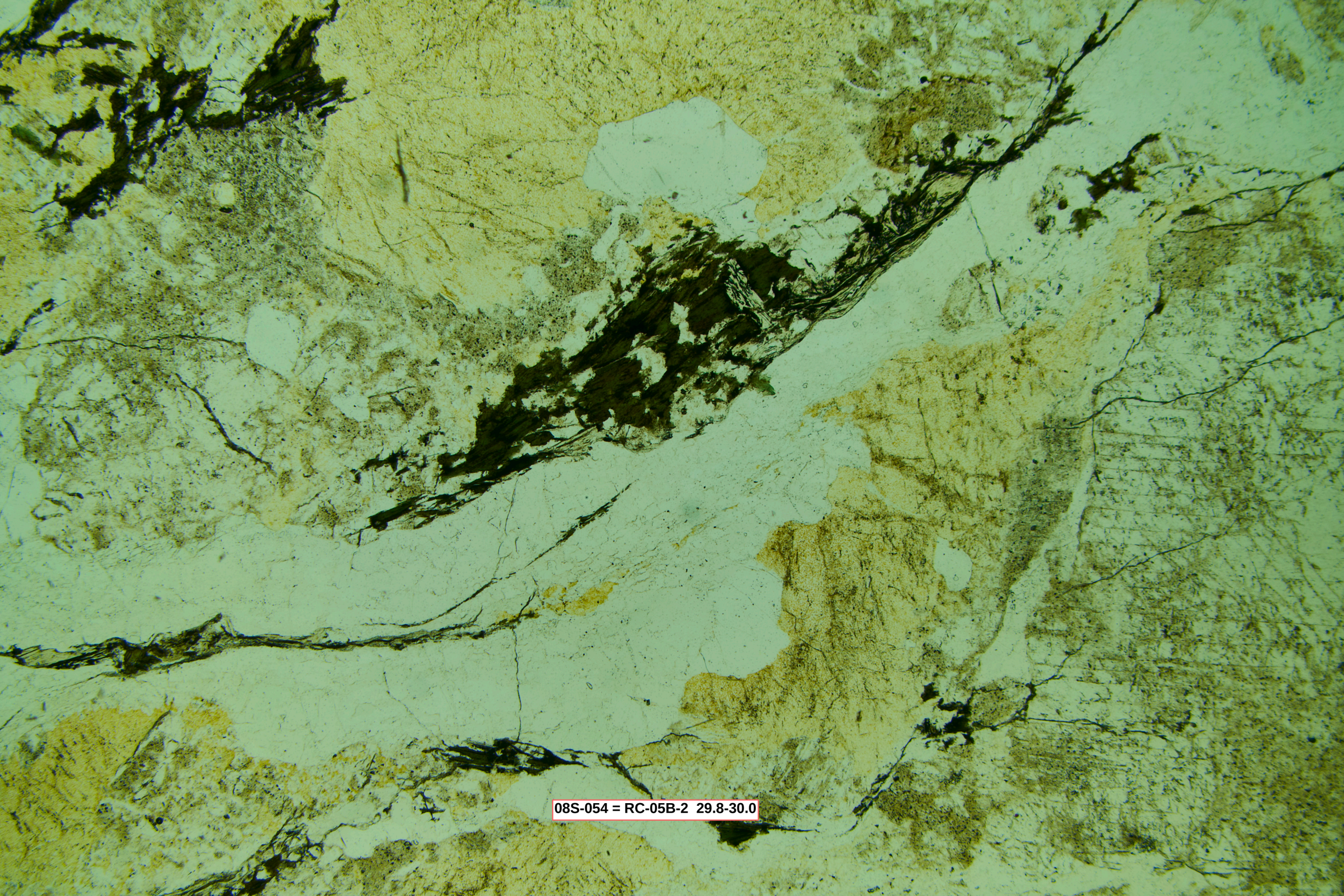

08S-052 = RC-04-3 21.4-21.5

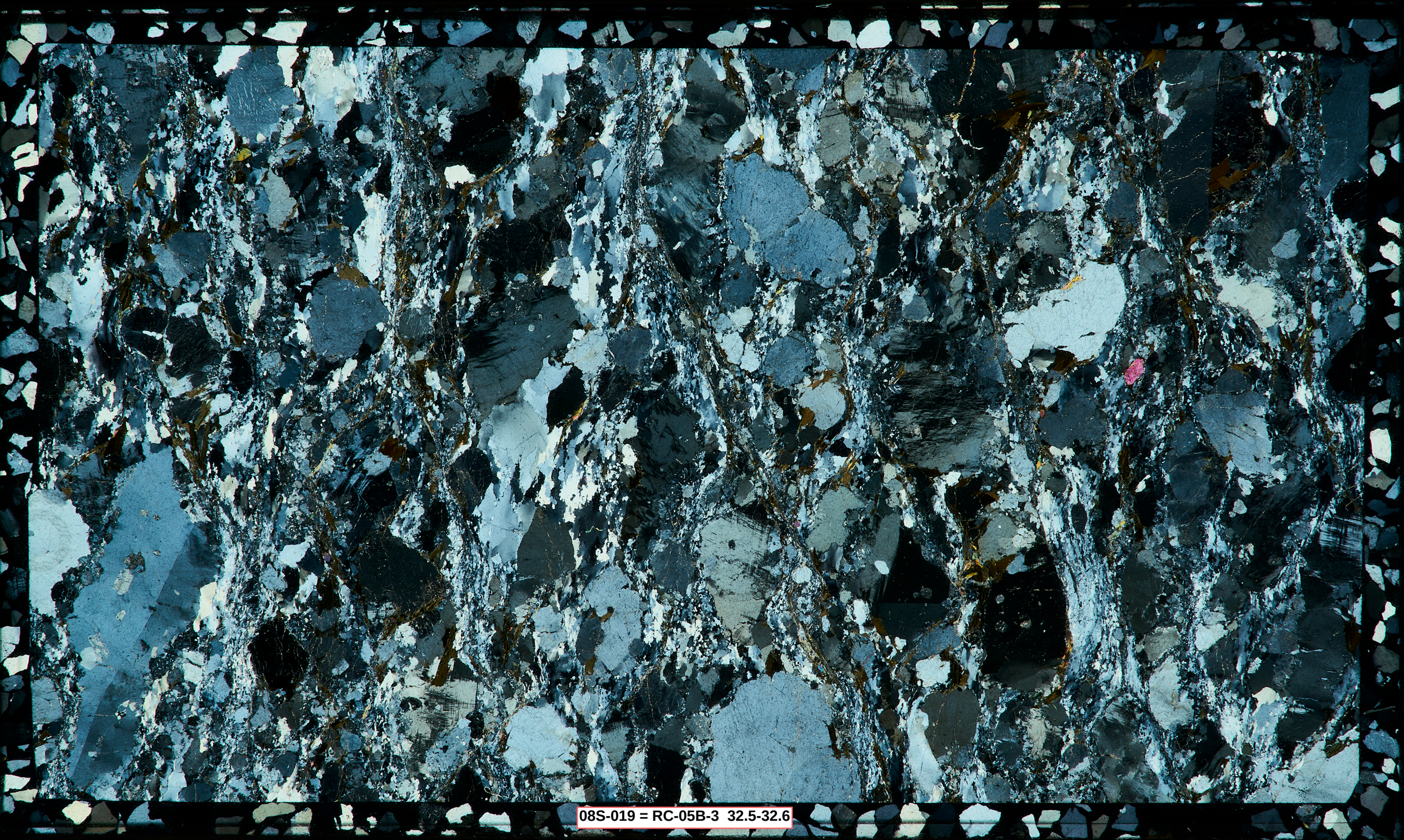

08S-017 = RC-05B-2 29.8-30.0

08S-018 = RC-05B-2 29.8-30.0

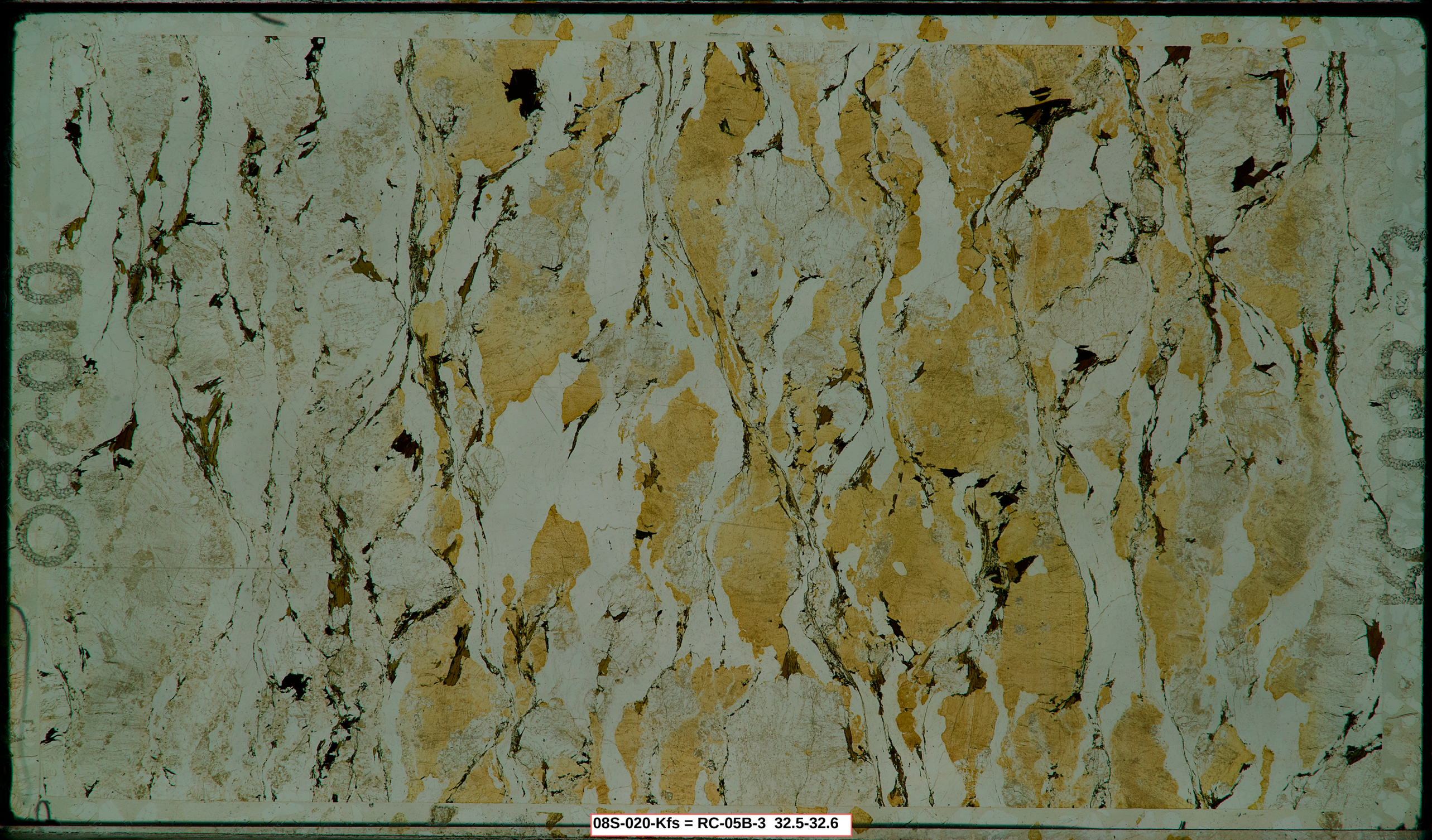
08S-018-Kfs = RC-05B-2 29.8-30.0


08S-053 = RC-05B-2 29.8-30.0


08S-054 = RC-05B-2 29.8-30.0


08S-019 = RC-05B-3 32.5-32.6

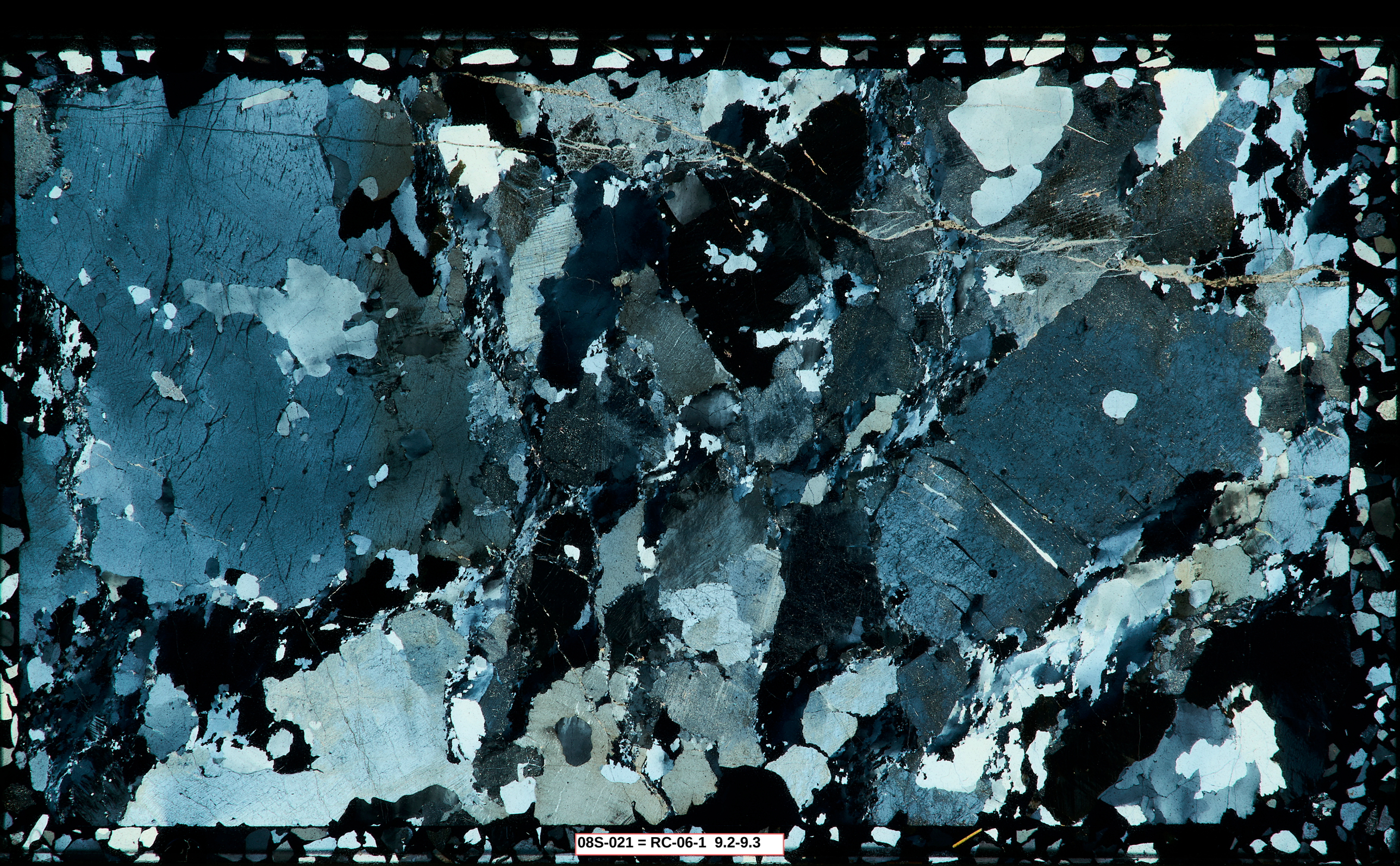
08S-020 = RC-05B-3 32.5-32.6



08S-020-Kfs = RC-05B-3 32.5-32.6


08S-055 = RC-05B-3 32.5-32.6

08S-056 = RC-05B-3 32.5-32.6

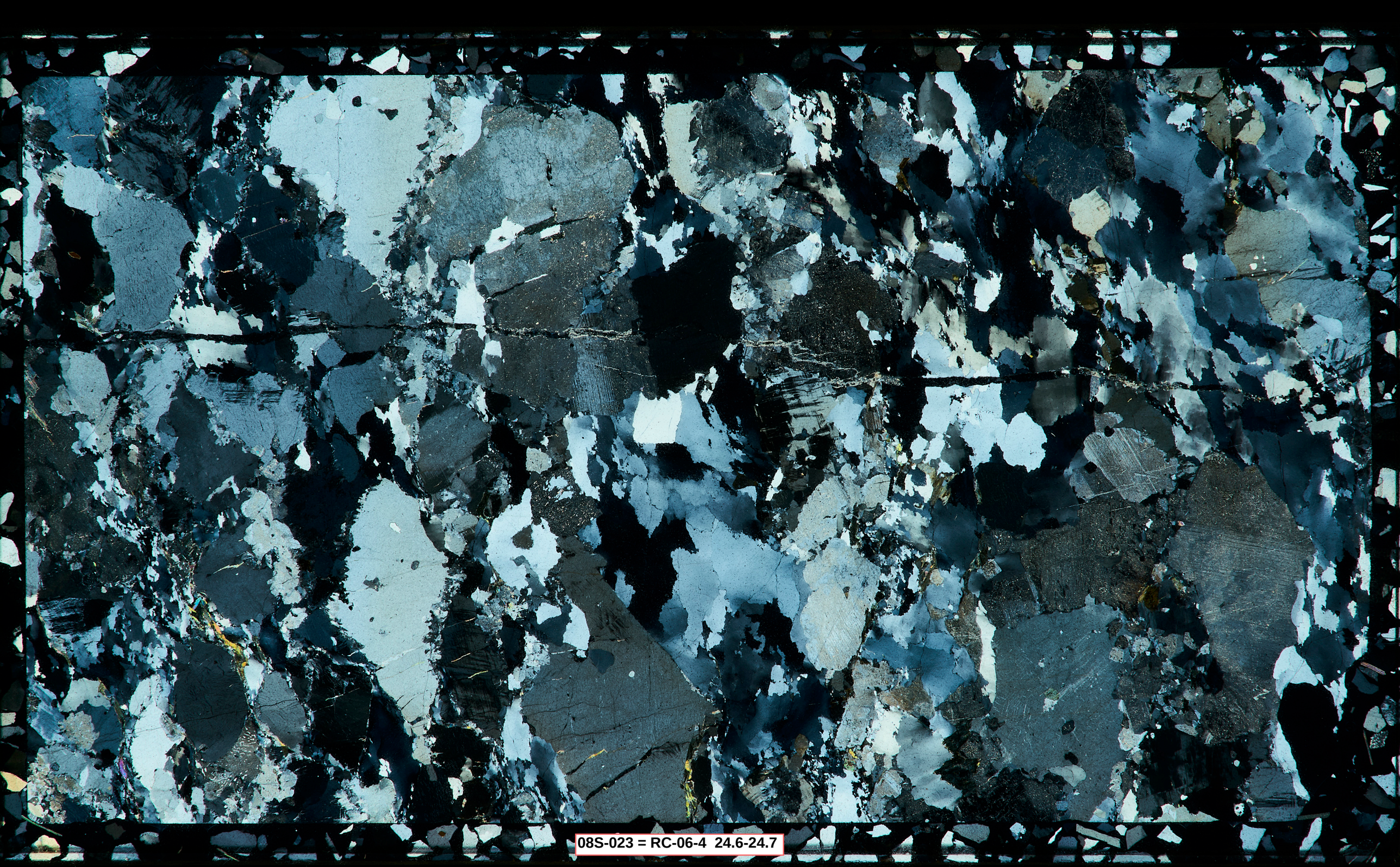

08S-021 = RC-06-1 9.2-9.3

08S-022 = RC-06-1 9.2-9.3

08S-022-Kfs = RC-06-1 9.2-9.3


08S-057 = RC-06-1 9.2-9.3

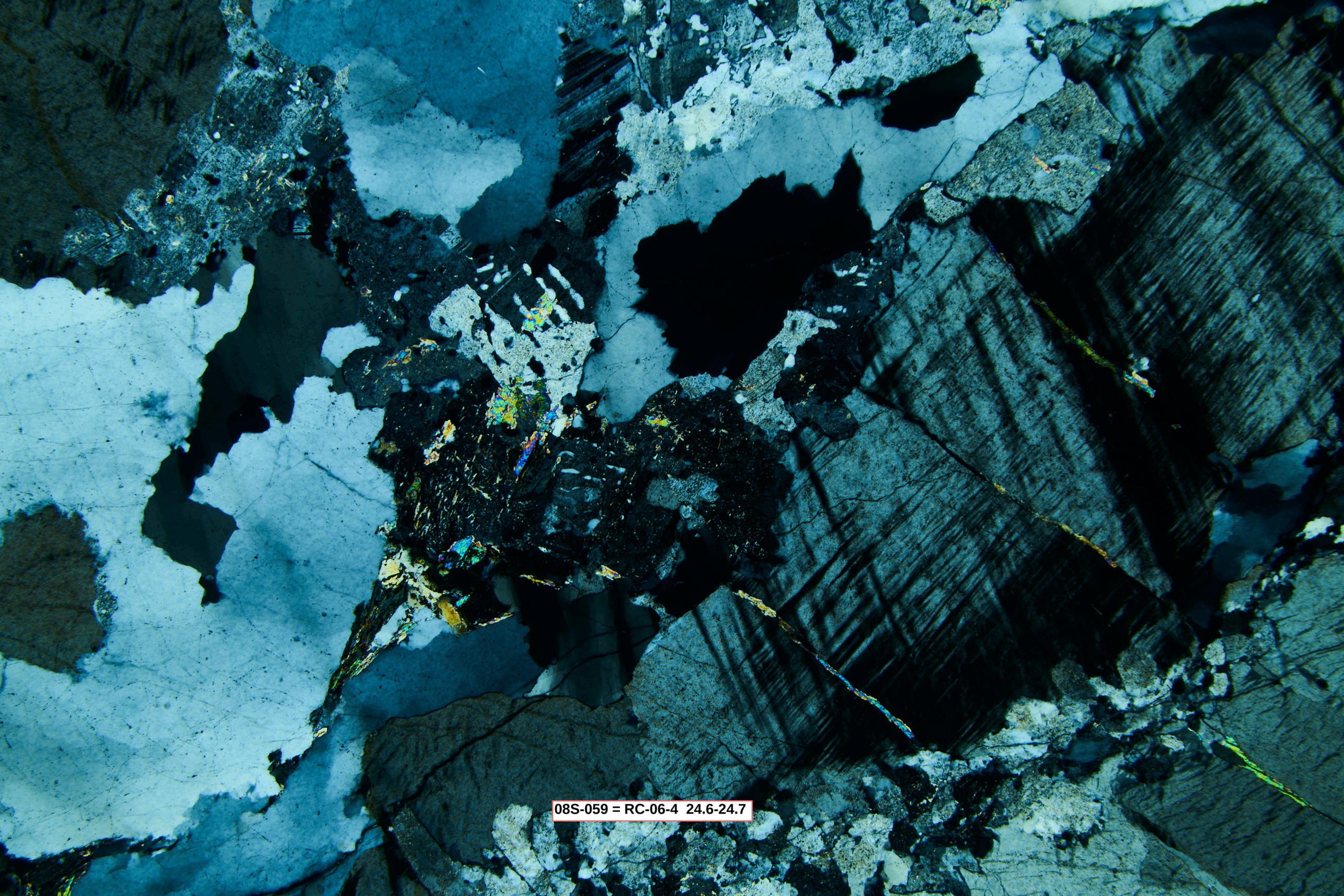
08S-058 = RC-06-1 9.2-9.3

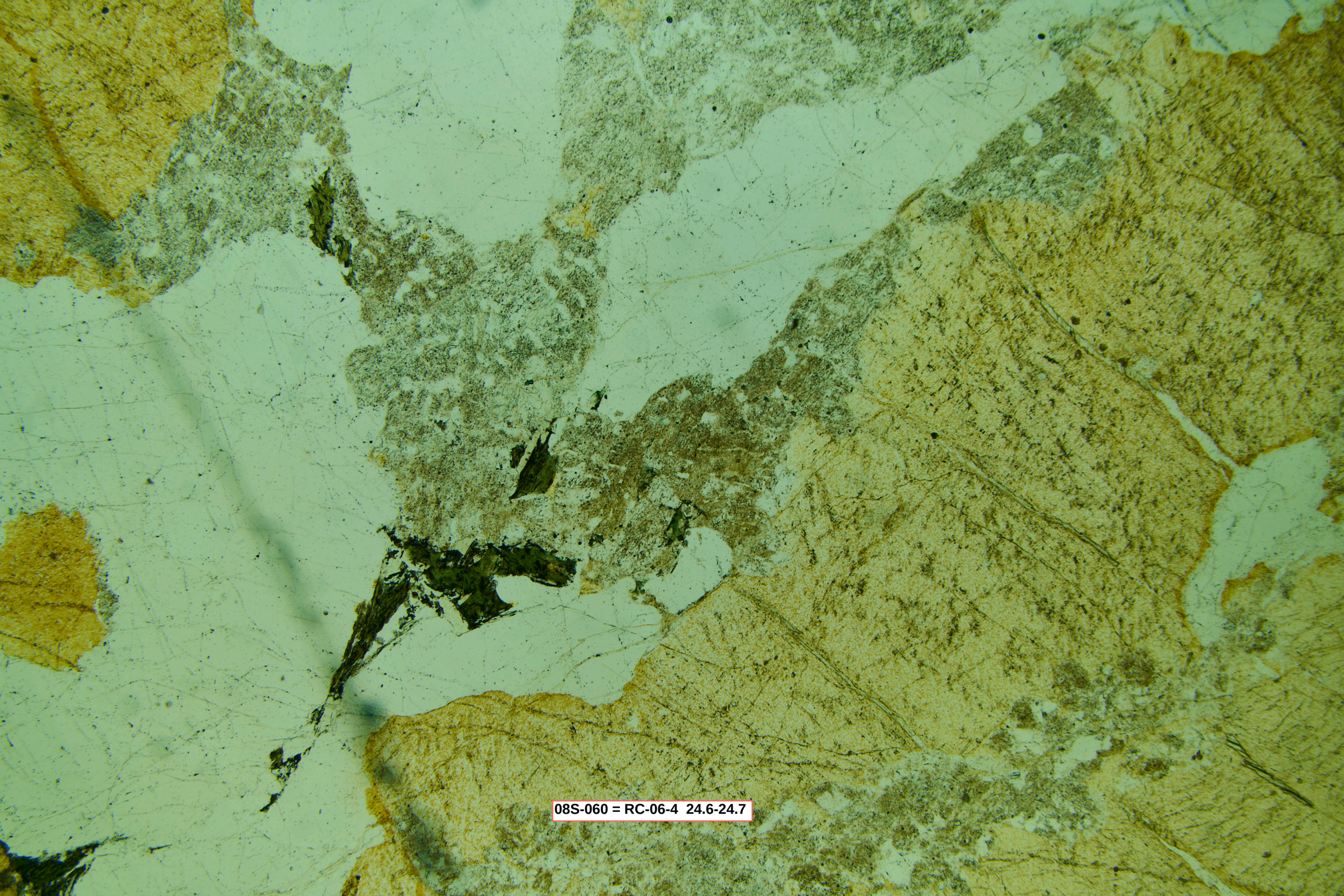


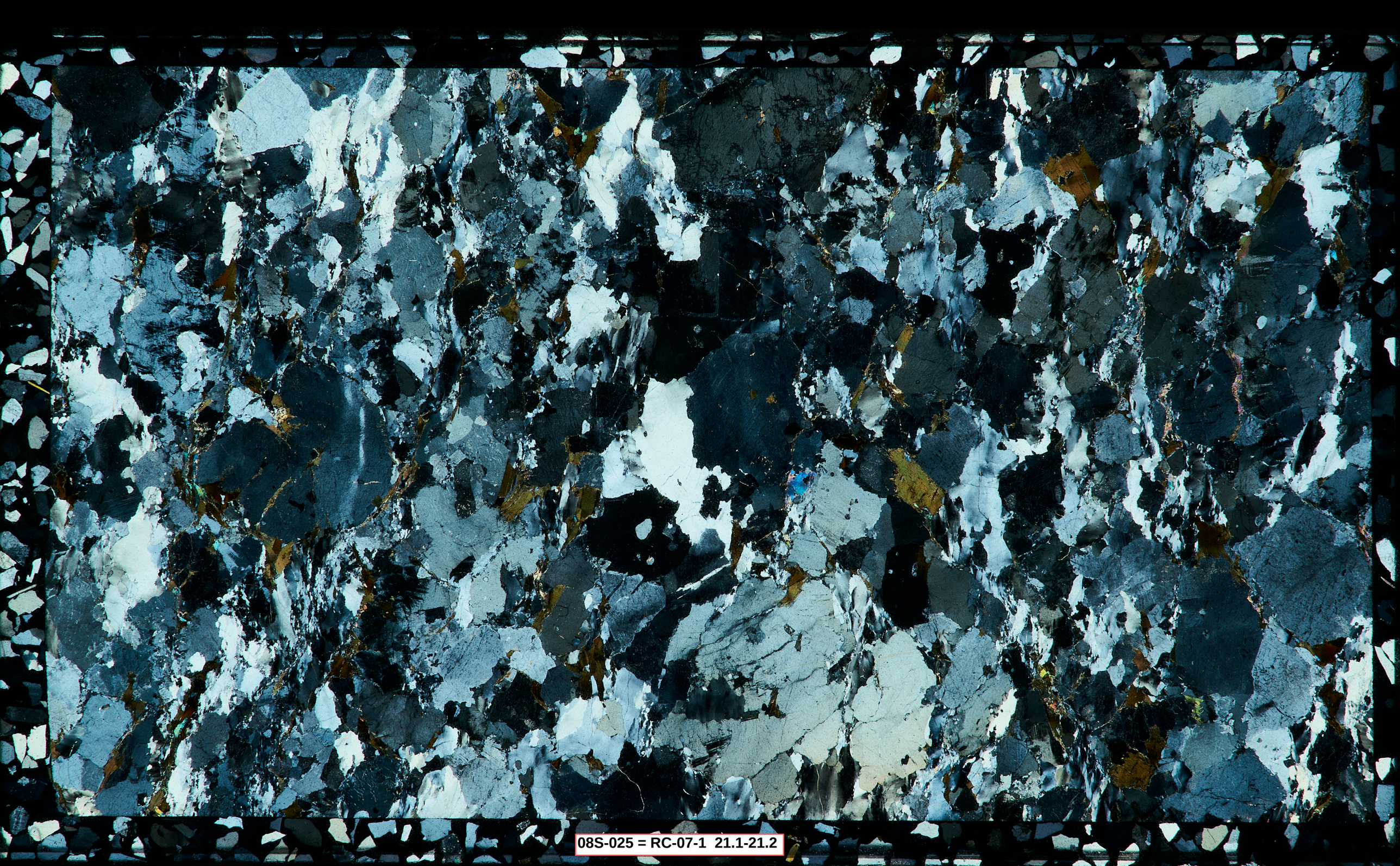
08S-023 = RC-06-4 24.6-24.7

08S-024 = RC-06-4 24.6-24.7

08S-024-Kfs = RC-06-4 24.6-24.7

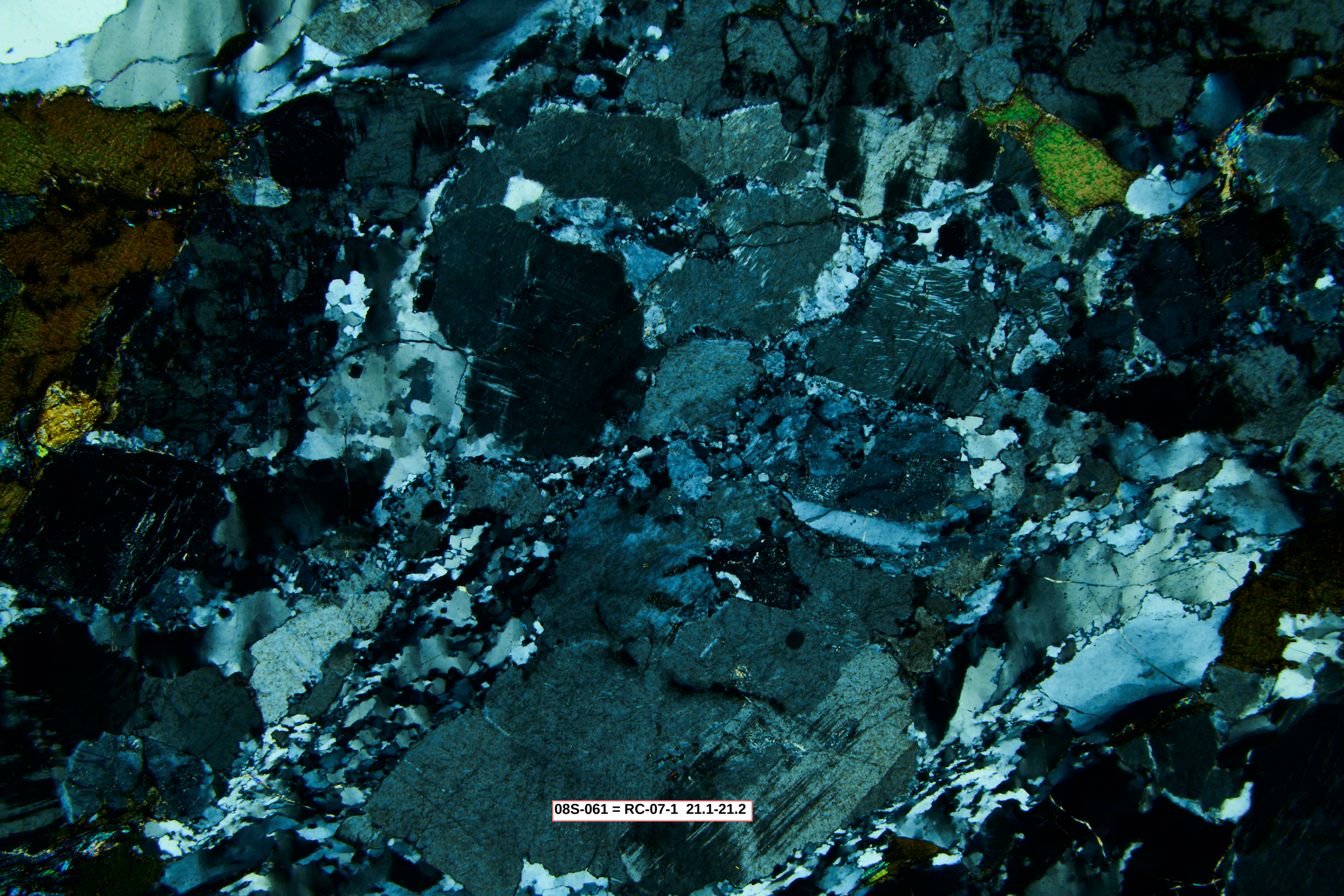

08S-059 = RC-06-4 24.6-24.7

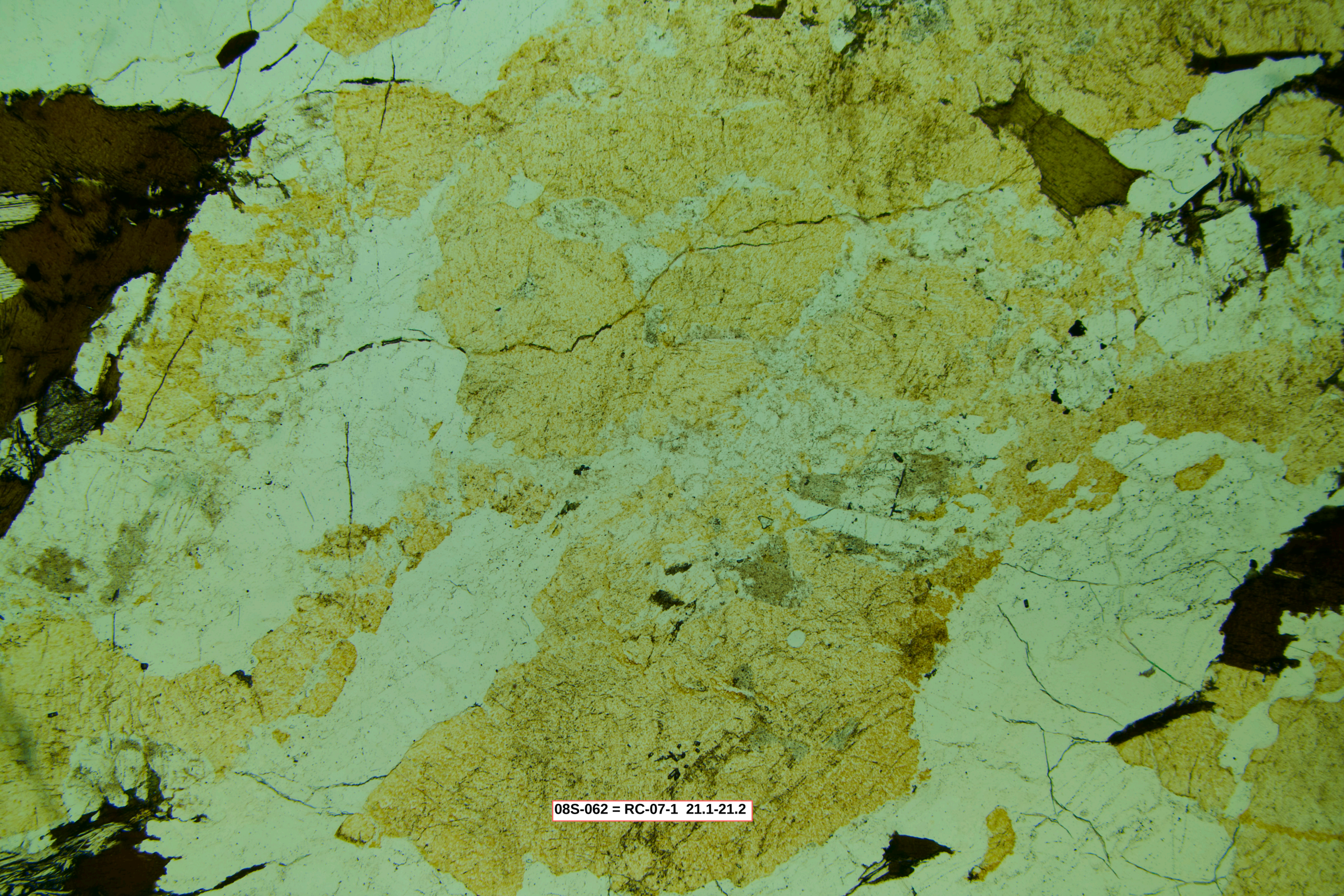

08S-060 = RC-06-4 24.6-24.7

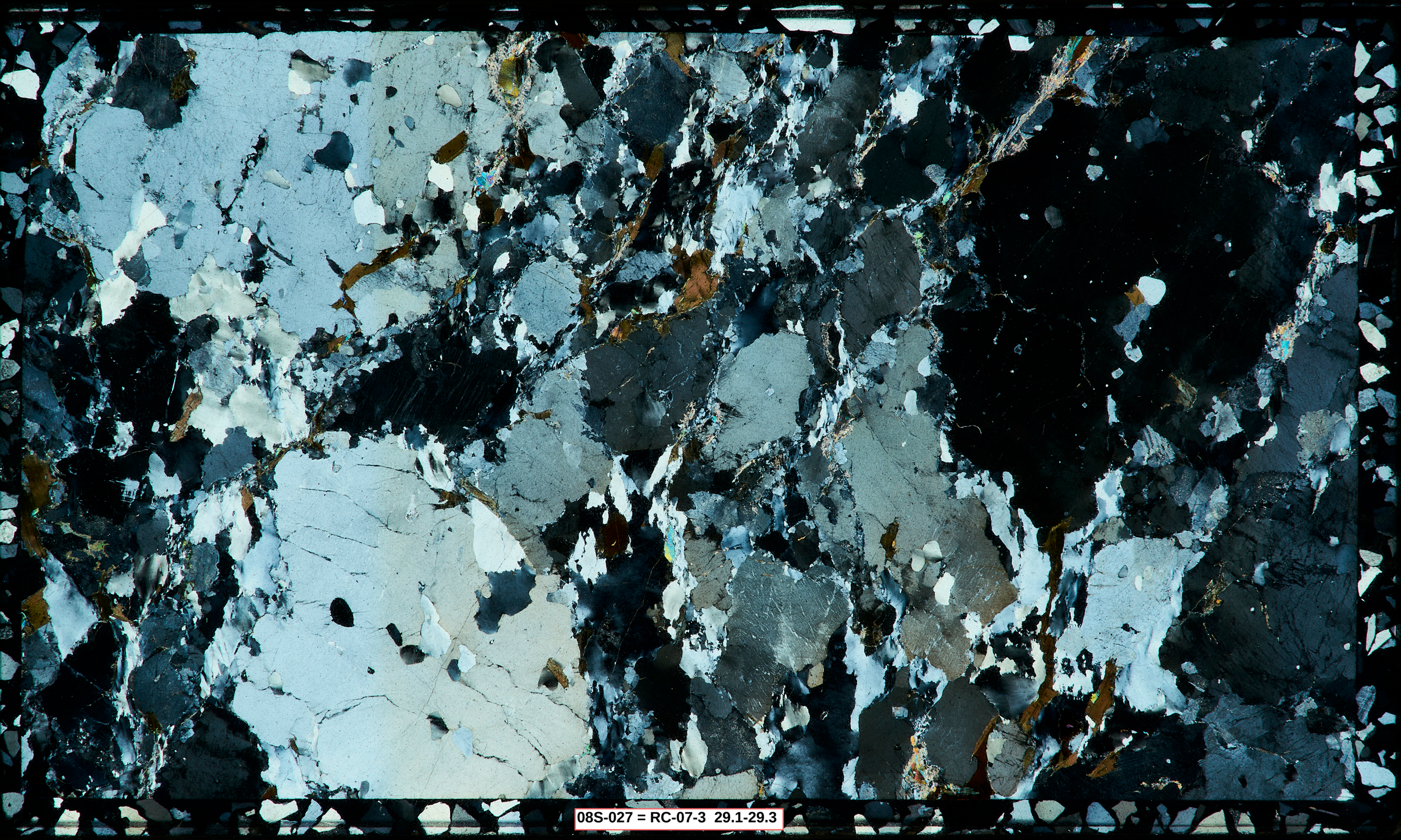

08S-025 = RC-07-1 21.1-21.2

08S-026 = RC-07-1 21.1-21.2

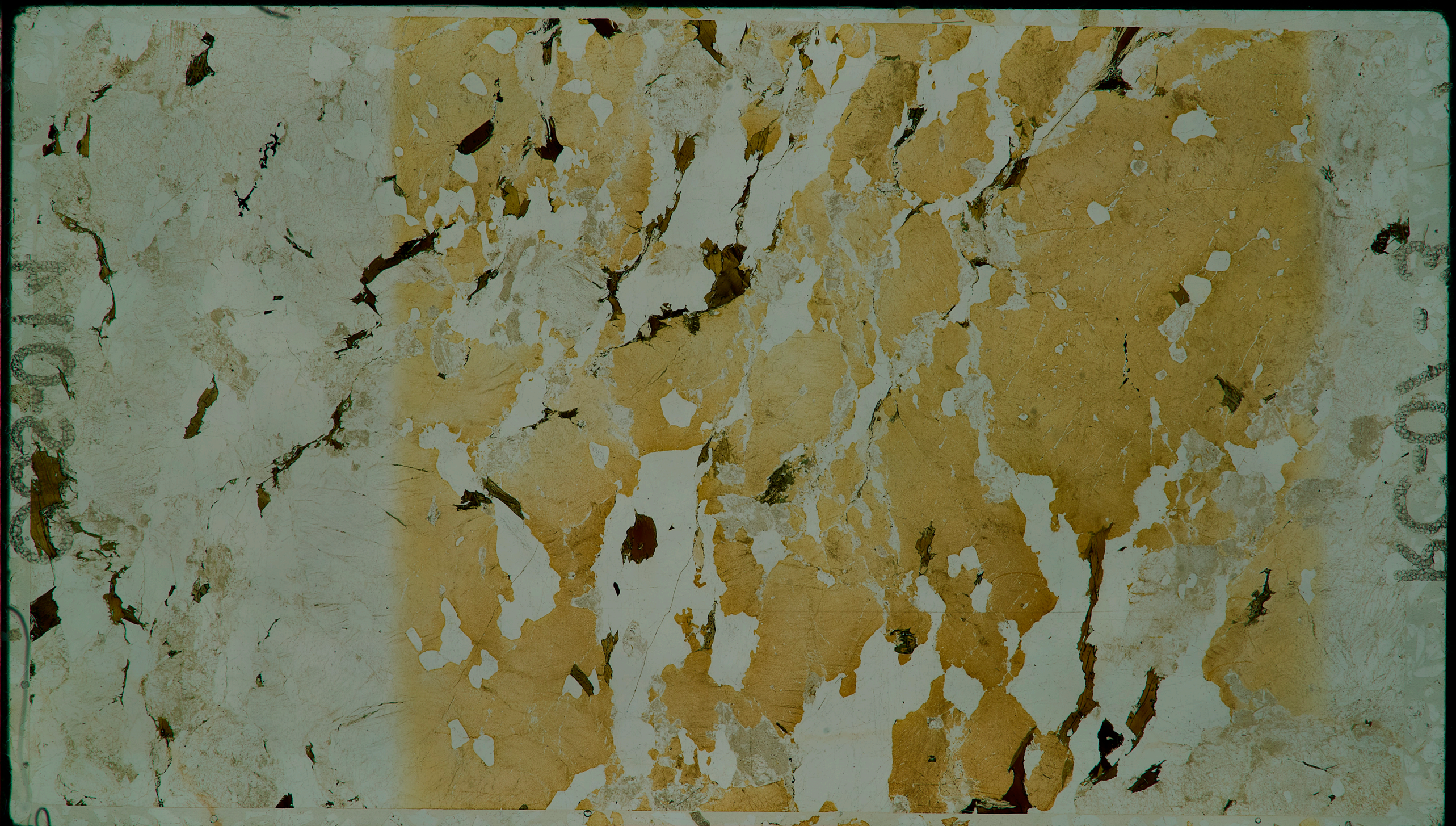
08S-026-Kfs = RC-07-1 21.1-21.2


08S-061 = RC-07-1 21.1-21.2

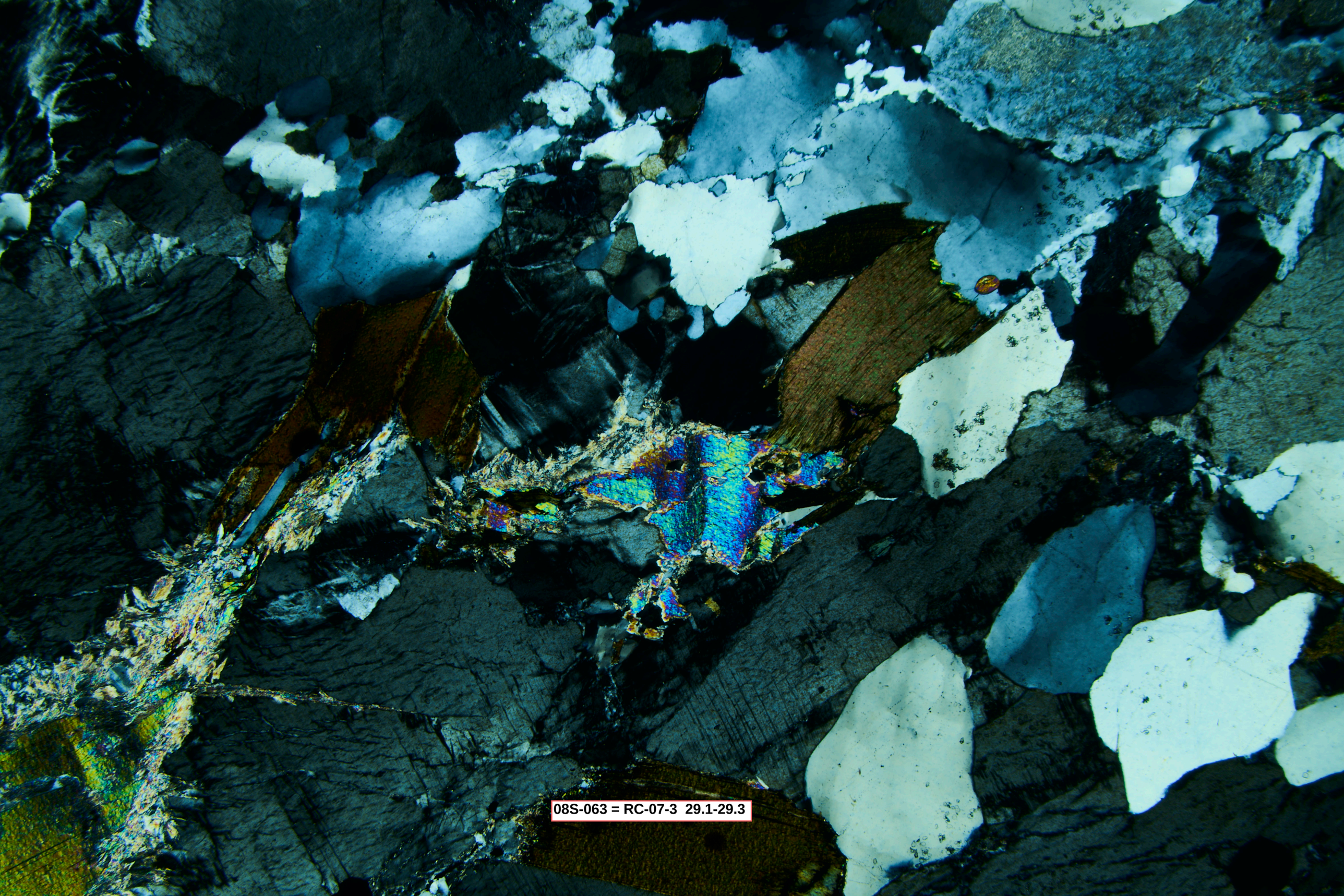

08S-062 = RC-07-1 21.1-21.2

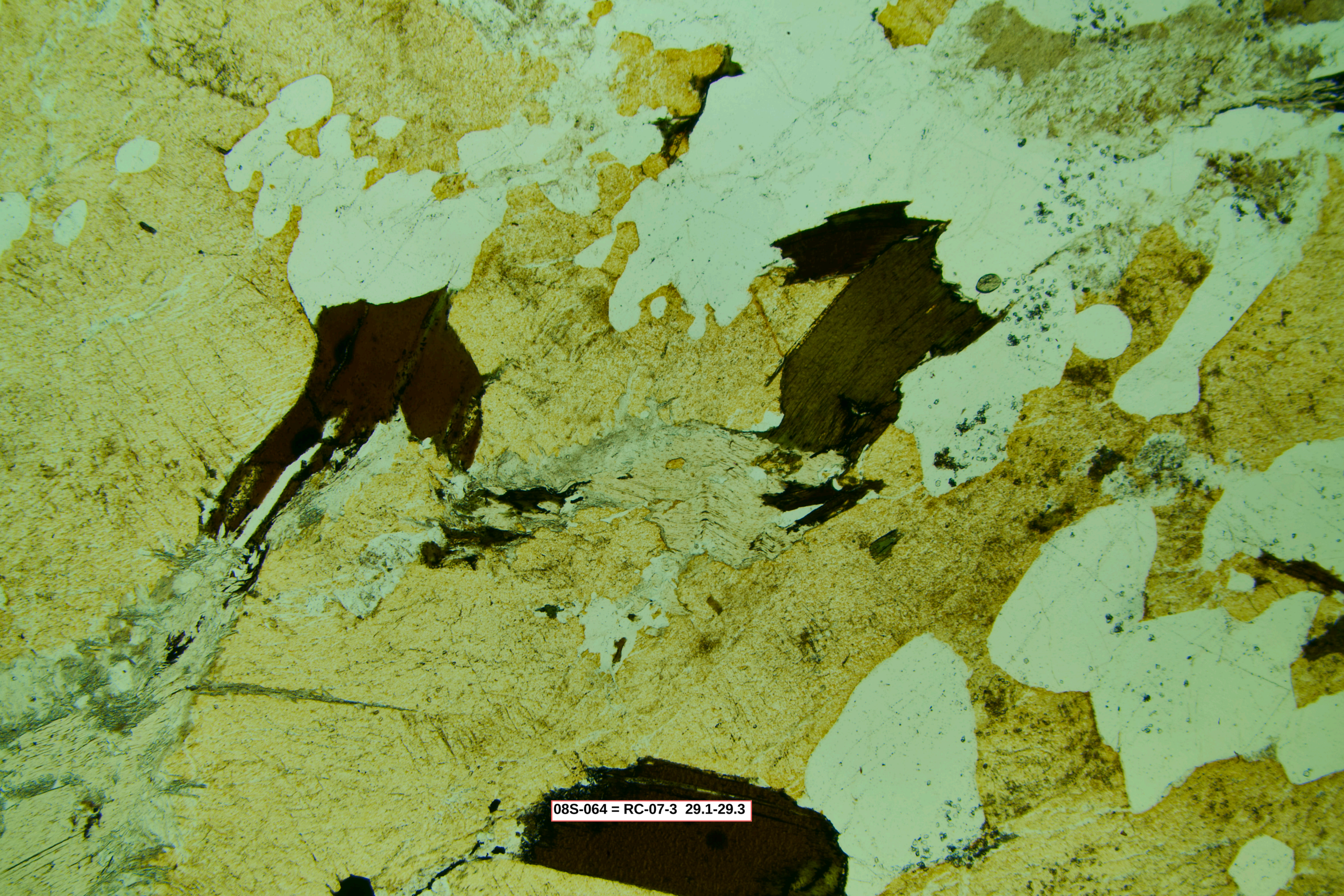

08S-027 = RC-07-3 29.1-29.3

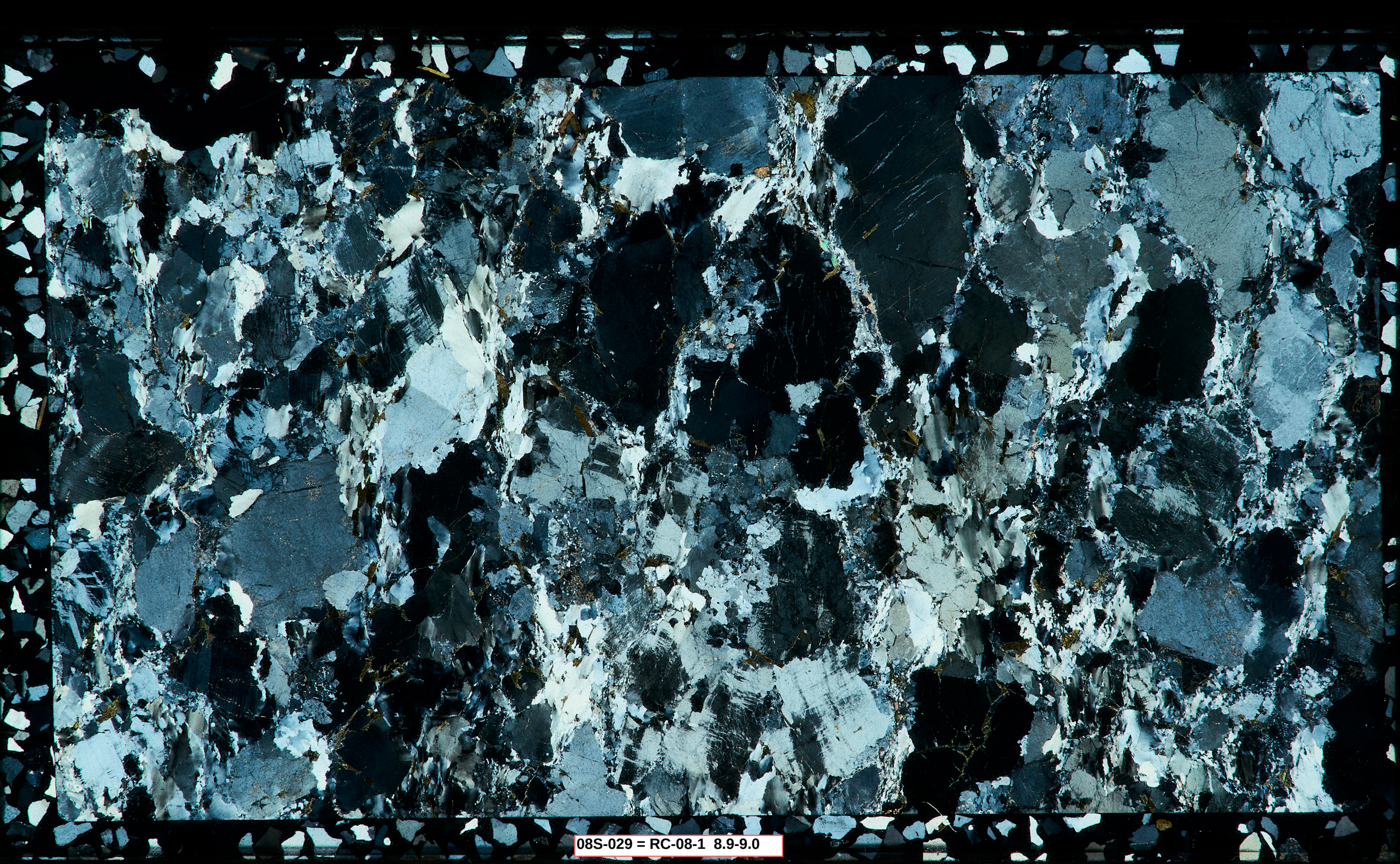
08S-028 = RC-07-3 29.1-29.3



08S-028-Kfs = RC-07-3 29.1-29.3

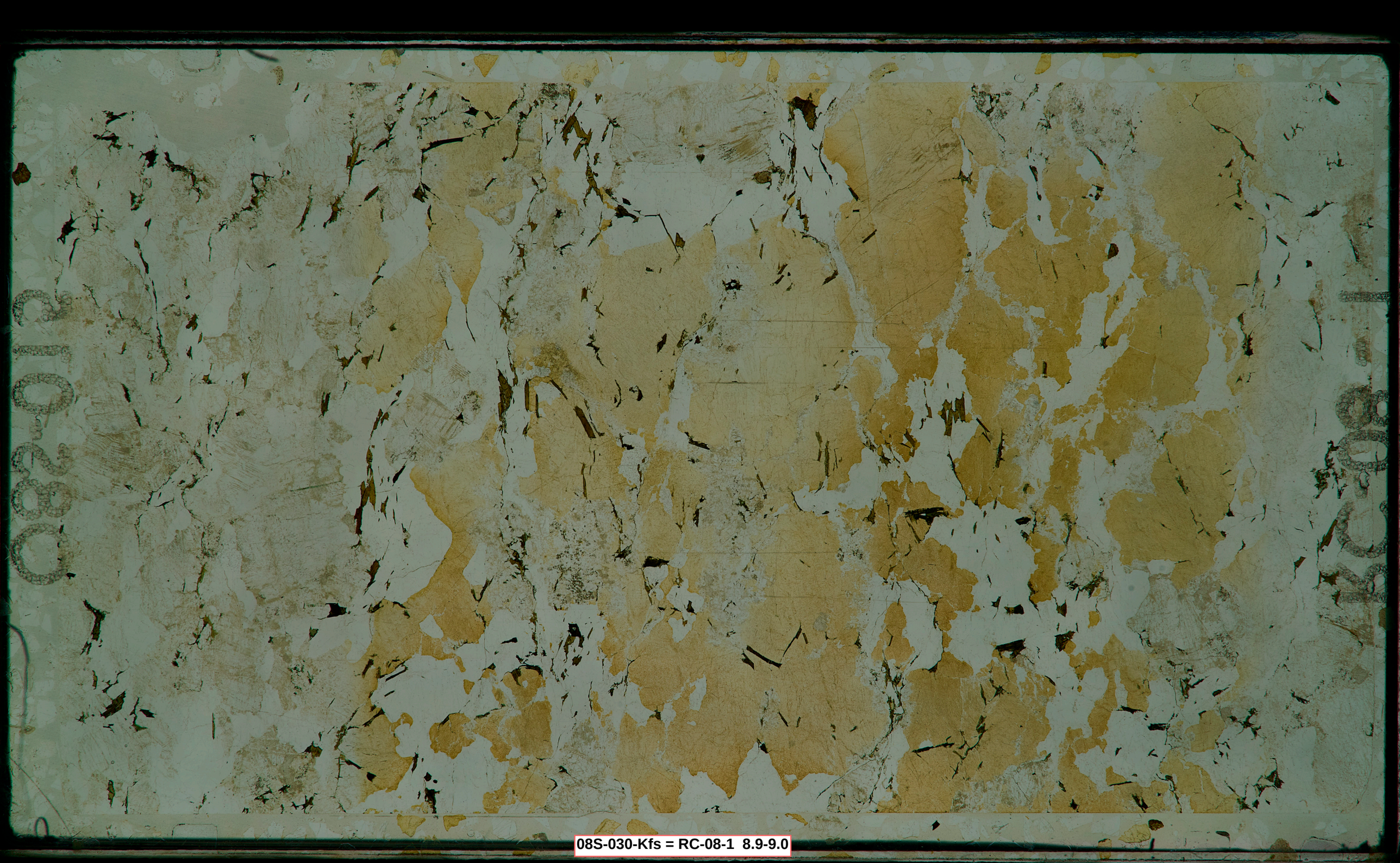

08S-063 = RC-07-3 29.1-29.3


08S-064 = RC-07-3 29.1-29.3



08S-029 = RC-08-1 8.9-9.0

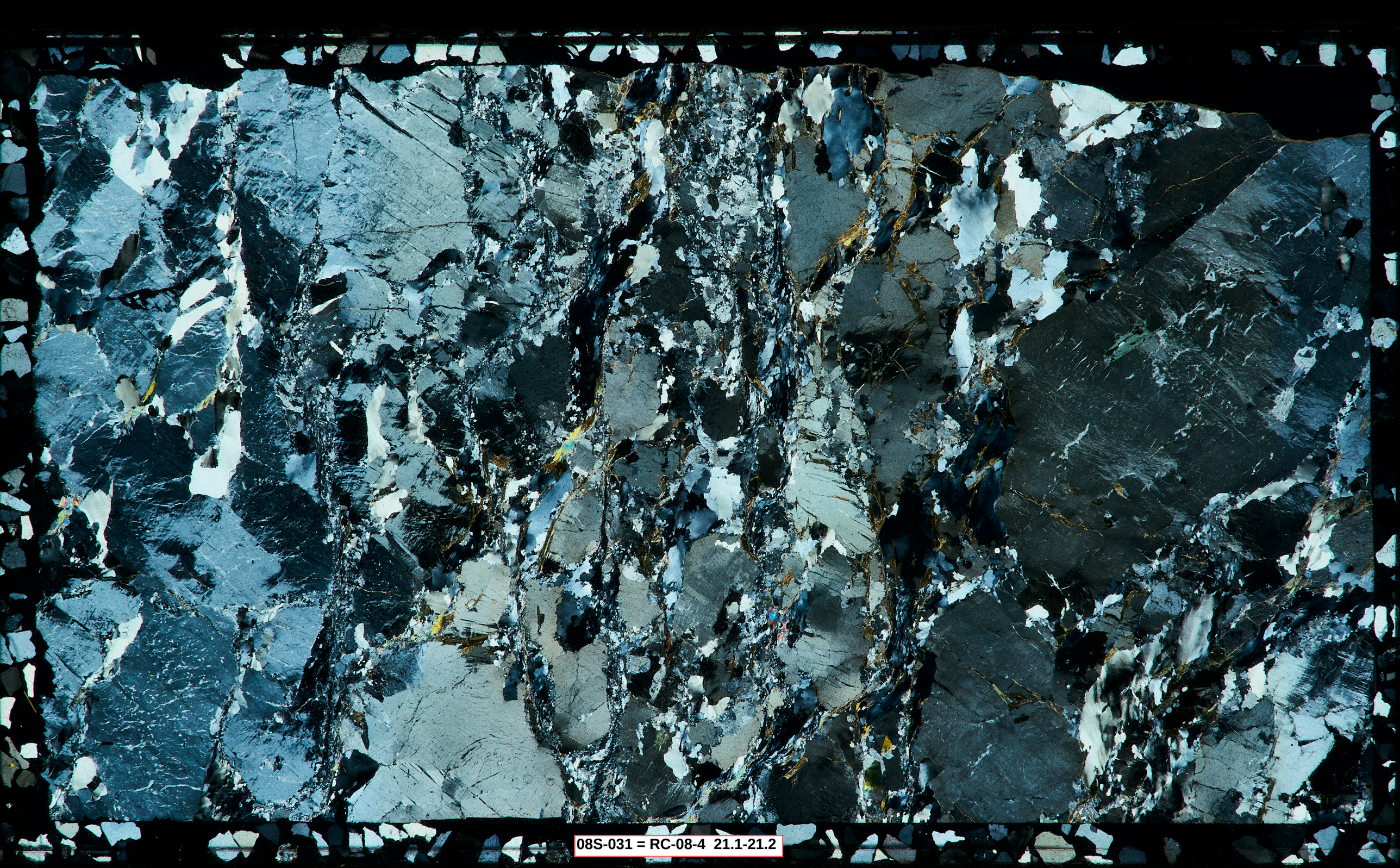
08S-030 = RC-08-1 8.9-9.0



08S-030-Kfs = RC-08-1 8.9-9.0


08S-065 = RC-08-1 8.9-9.0

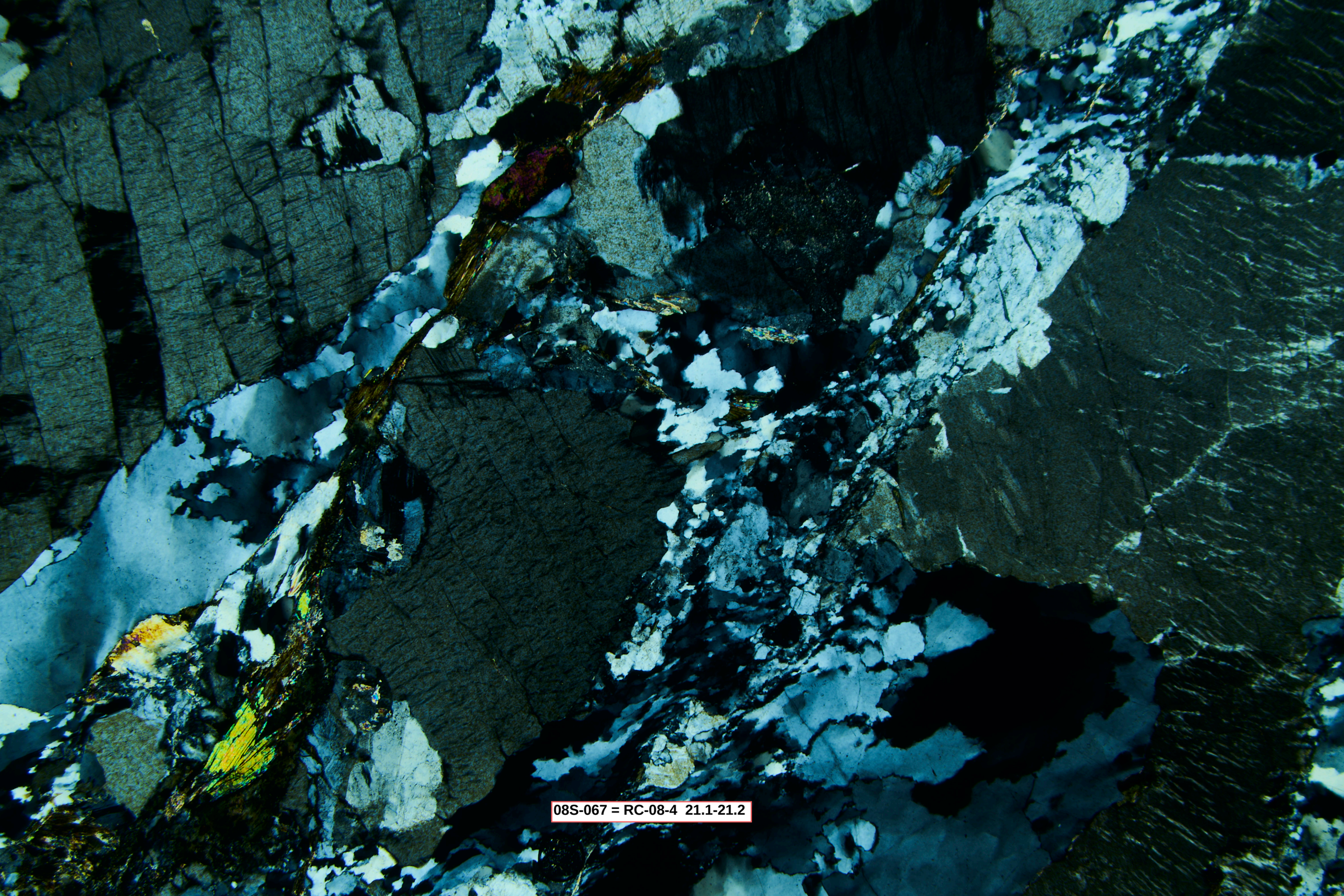
08S-066 = RC-08-1 8.9-9.0

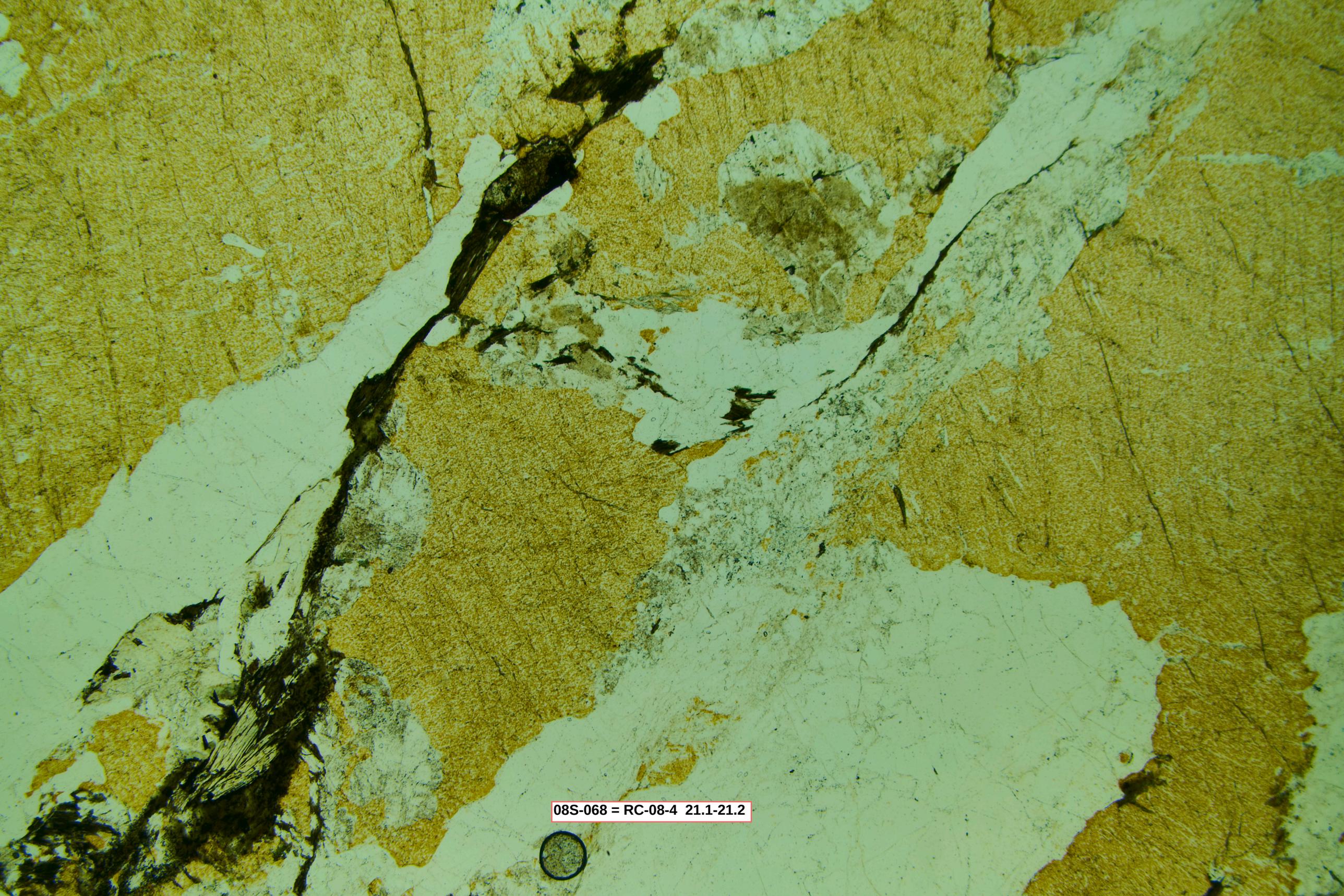


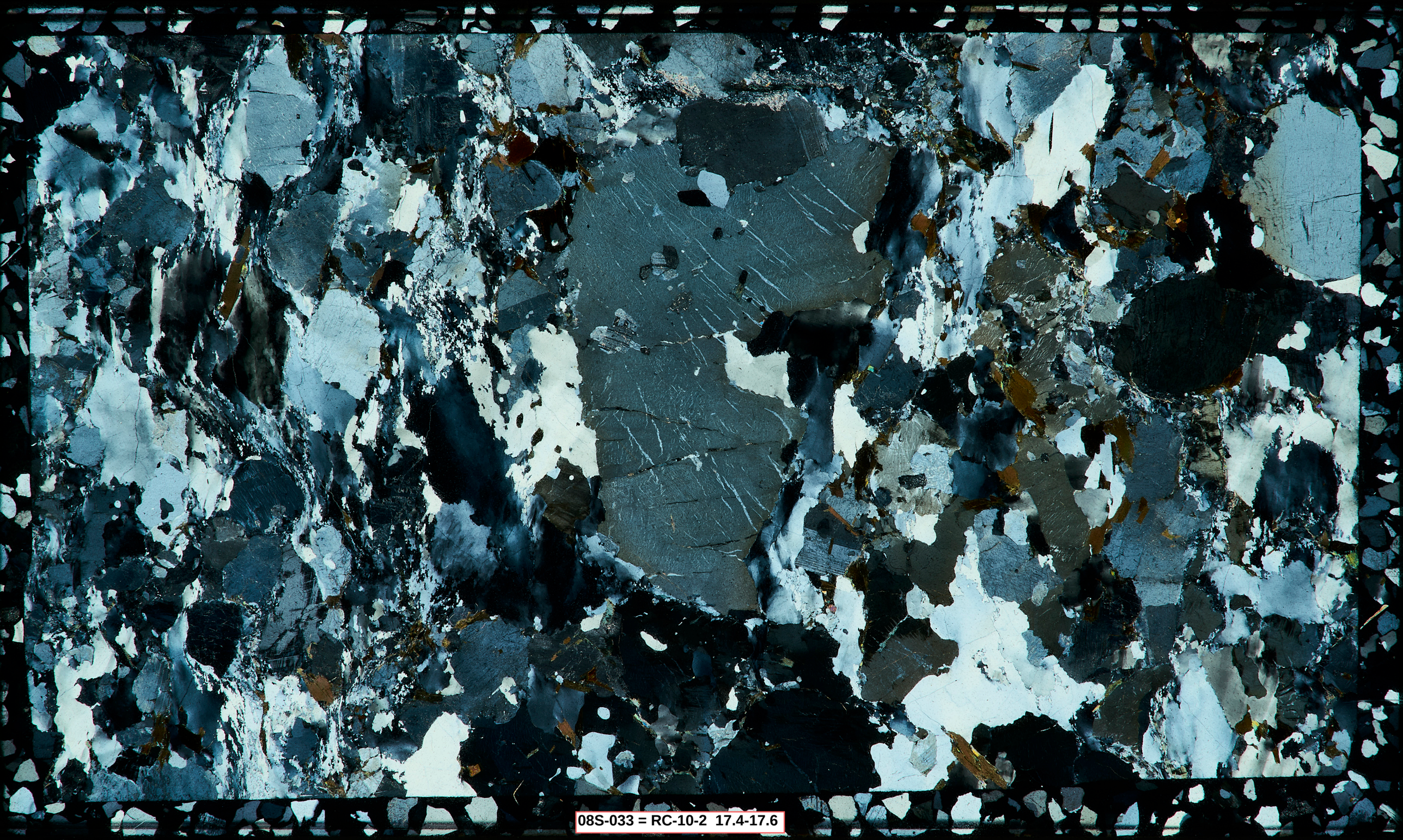
08S-031 = RC-08-4 21.1-21.2

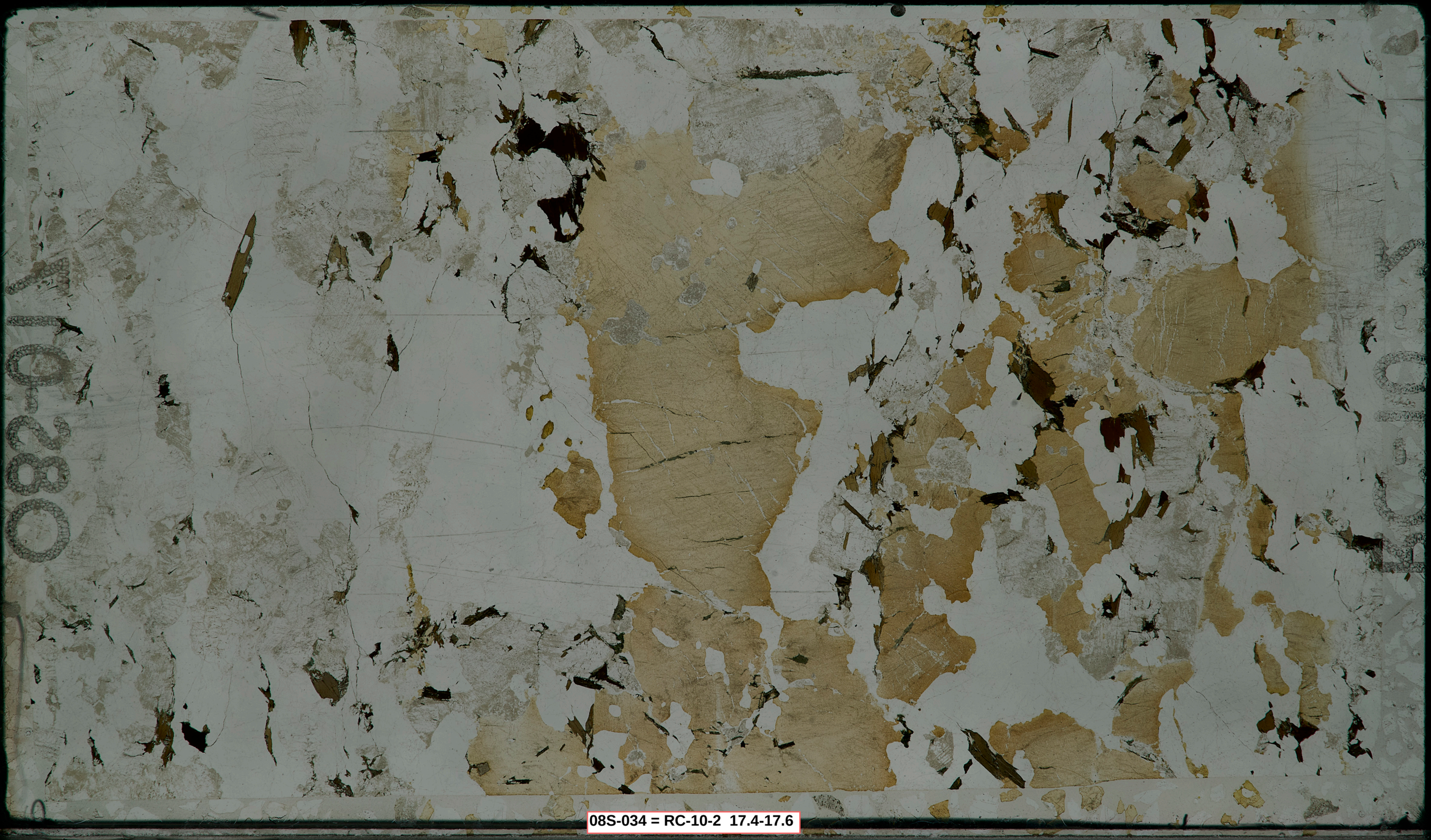
08S-032 = RC-08-4 21.1-21.2

08S-032-Kfs = RC-08-4 21.1-21.2


08S-067 = RC-08-4 21.1-21.2


08S-068 = RC-08-4 21.1-21.2

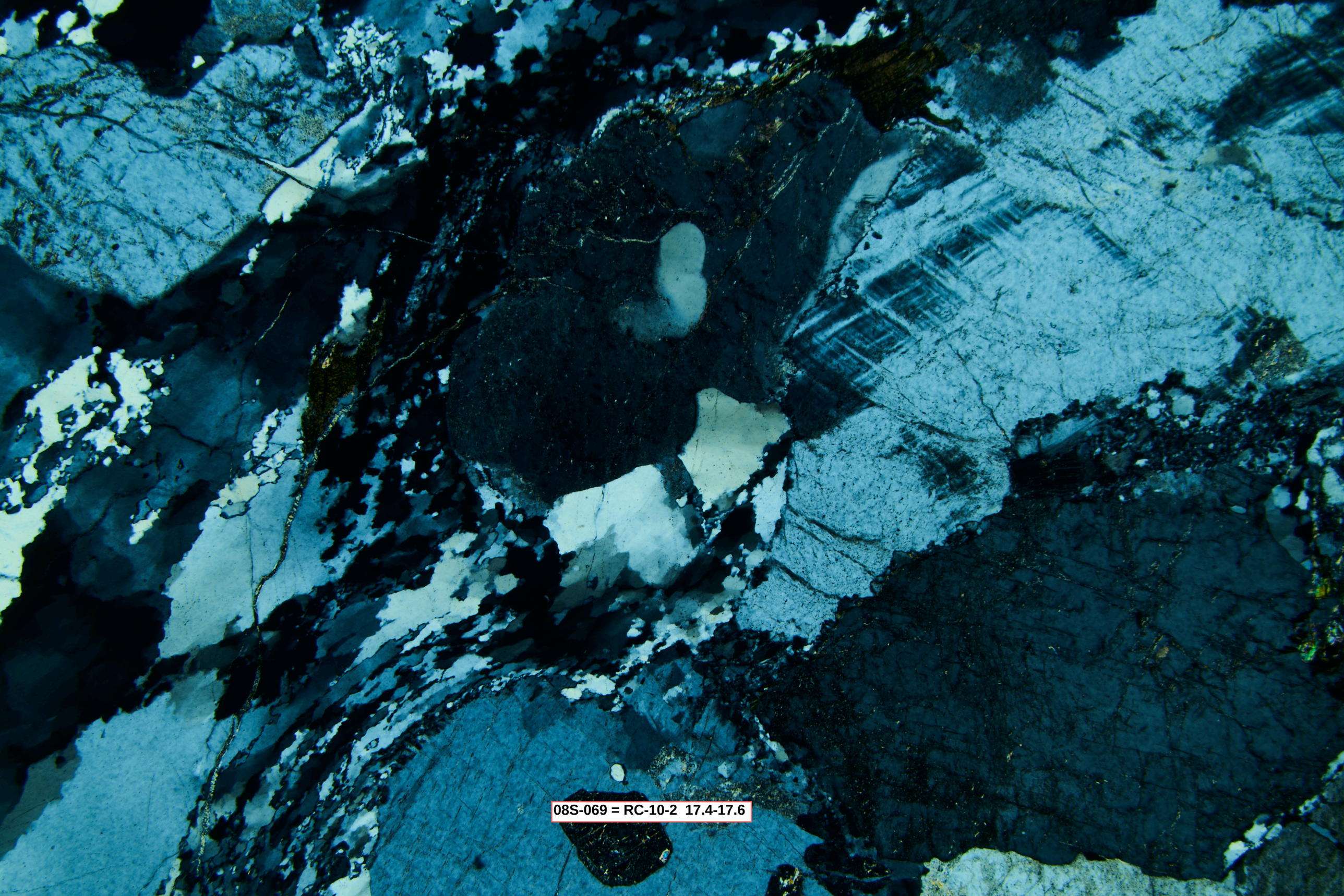

08S-033 = RC-10-2 17.4-17.6

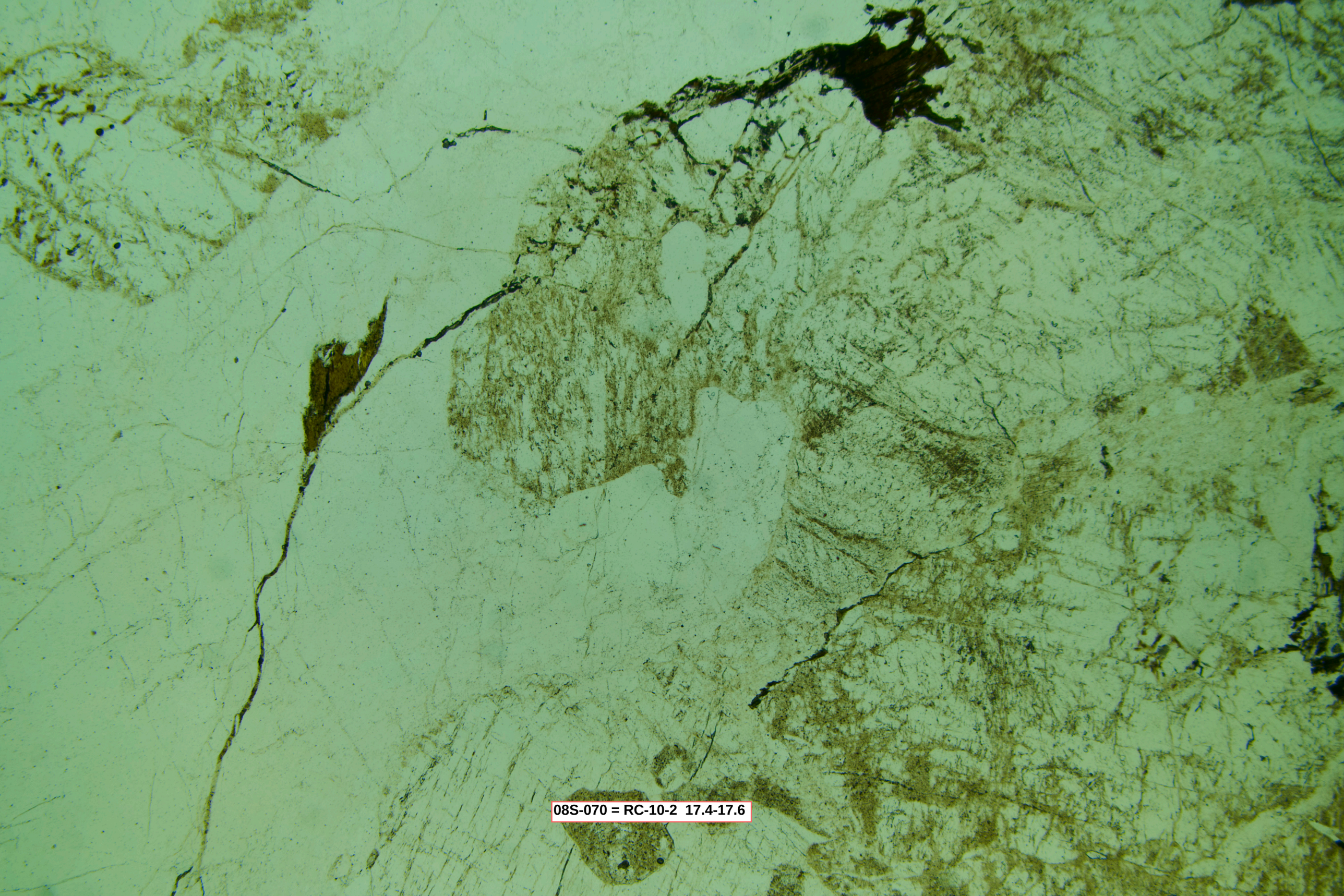


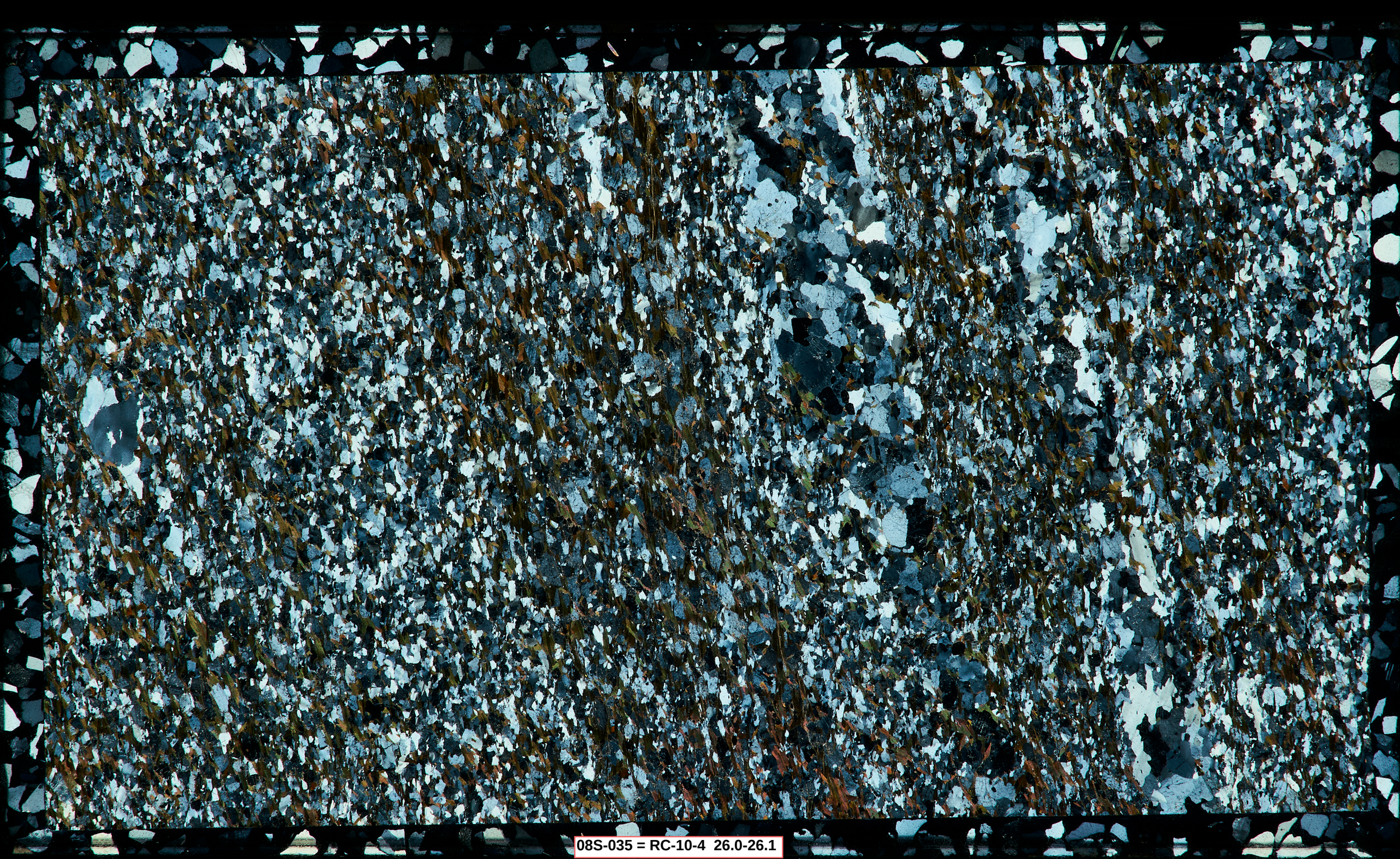
08S-034 = RC-10-2 17.4-17.6



08S-034-Kfs = RC-10-2 17.4-17.6


08S-069 = RC-10-2 17.4-17.6

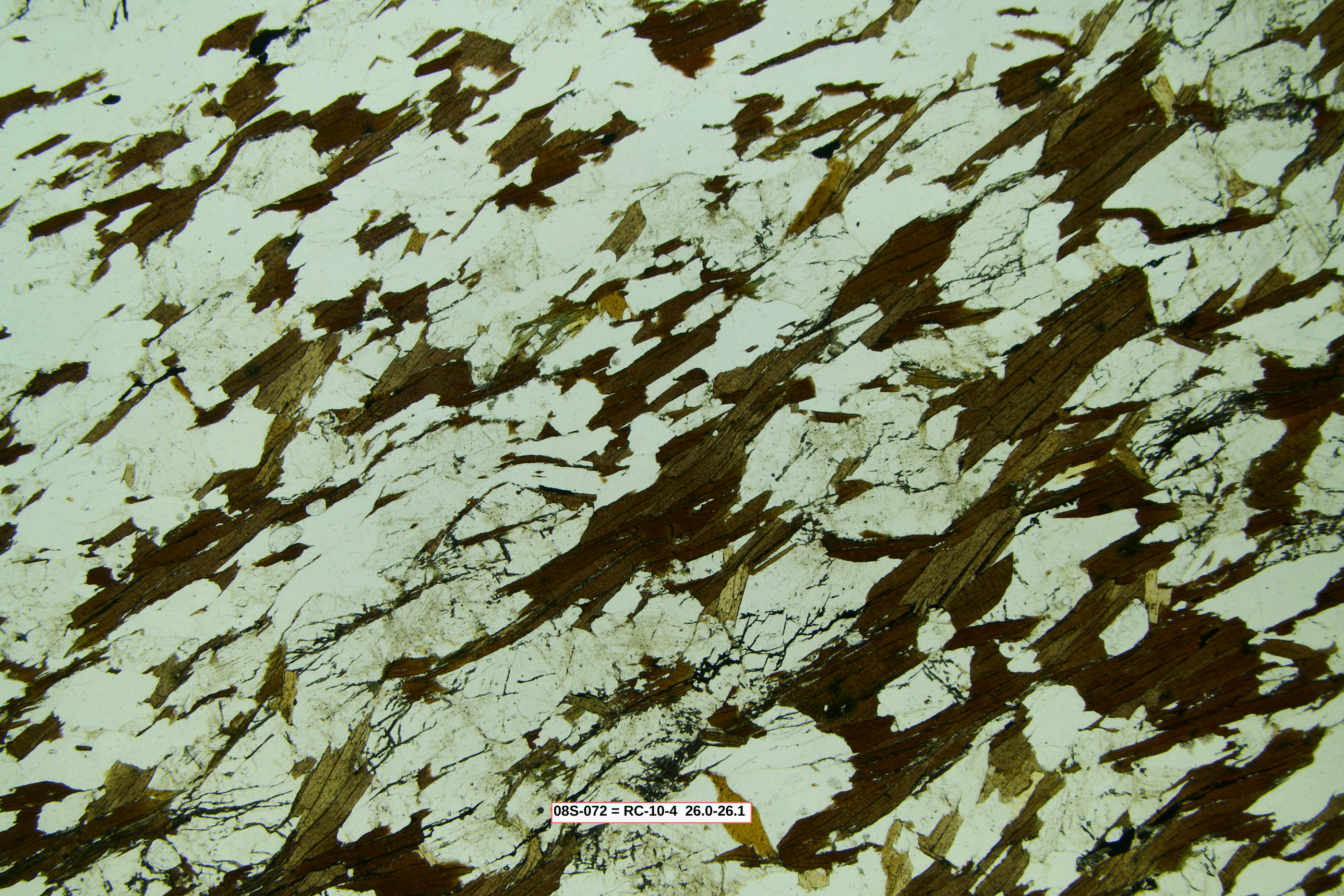

08S-070 = RC-10-2 17.4-17.6



08S-035 = RC-10-4 26.0-26.1

08S-036 = RC-10-4 26.0-26.1

08S-071 = RC-10-4 26.0-26.1


08S-072 = RC-10-4 26.0-26.1