Geotechnical Rock Mechanics Testing Results from 2002 Cross Sound Cable Marine Boring Samples

New Haven Harbor
Navigation Improvement Project
Connecticut

US Army Corps
of Engineers®
New England District

May 2026

NOTES:

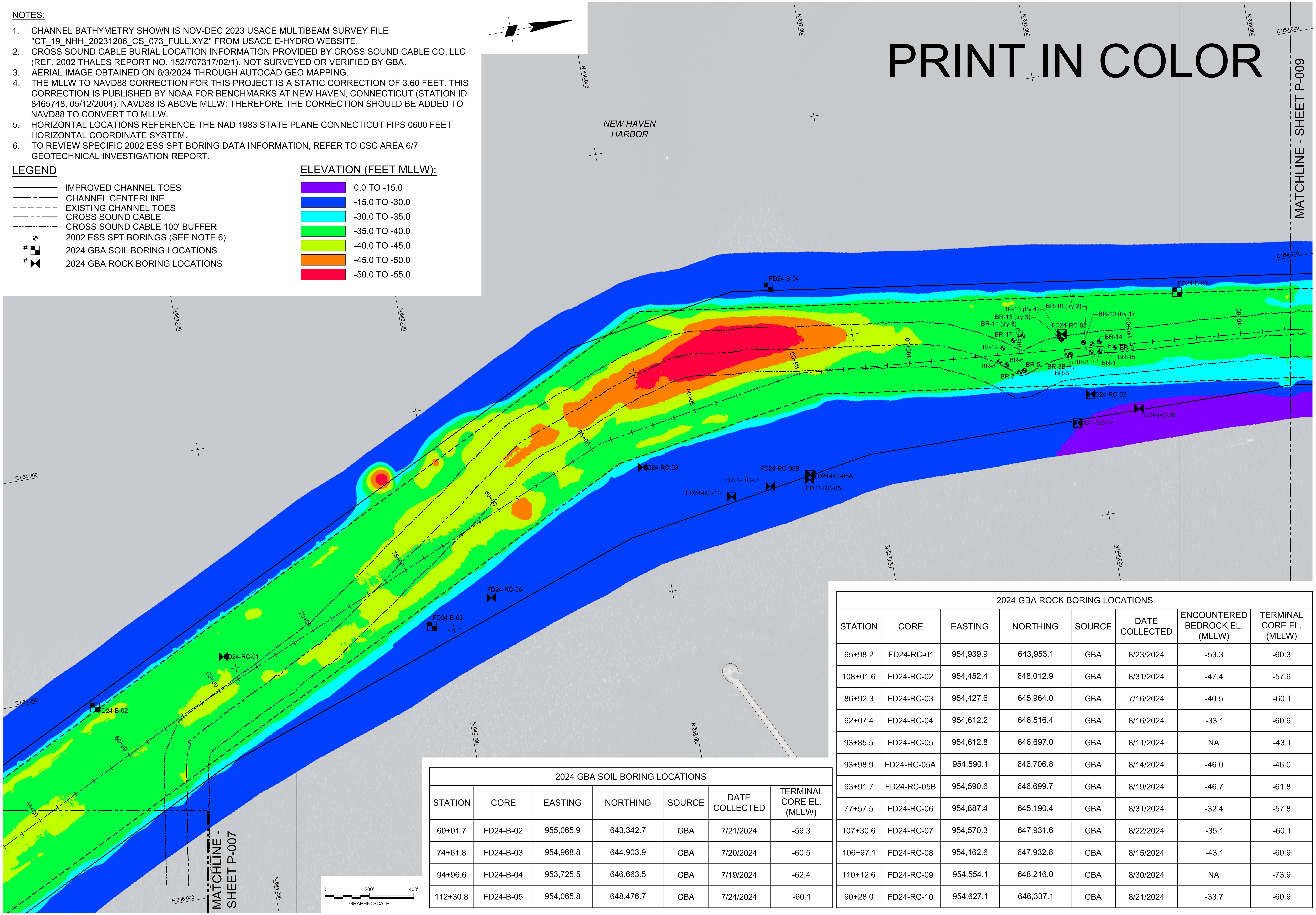
1. CHANNEL BATHYMETRY SHOWN IS NOV-DEC 2023 USACE MULTIBEAM SURVEY FILE "CT_19_NHH_20231206_CS_073_FULL.XYZ" FROM USACE E-HYDRO WEBSITE.
2. CROSS SOUND CABLE BURIAL LOCATION INFORMATION PROVIDED BY CROSS SOUND CABLE CO. LLC (REF. 2002 THALES REPORT NO. 152/707317/02/1). NOT SURVEYED OR VERIFIED BY GBA.
3. AERIAL IMAGE OBTAINED ON 6/3/2024 THROUGH AUTOCAD GEO MAPPING.
4. THE MLLW TO NAVD88 CORRECTION FOR THIS PROJECT IS A STATIC CORRECTION OF 3.60 FEET. THIS CORRECTION IS PUBLISHED BY NOAA FOR BENCHMARKS AT NEW HAVEN, CONNECTICUT (STATION ID 8465748, 05/12/2004). NAVD88 IS ABOVE MLLW; THEREFORE THE CORRECTION SHOULD BE ADDED TO NAVD88 TO CONVERT TO MLLW.
5. HORIZONTAL LOCATIONS REFERENCE THE NAD 1983 STATE PLANE CONNECTICUT FIPS 0600 FEET HORIZONTAL COORDINATE SYSTEM.
6. TO REVIEW SPECIFIC 2002 ESS SPT BORING DATA INFORMATION, REFER TO CSC AREA 6/7 GEOTECHNICAL INVESTIGATION REPORT.

LEGEND

- IMPROVED CHANNEL TOES
- CHANNEL CENTERLINE
- EXISTING CHANNEL TOES
- CROSS SOUND CABLE
- CROSS SOUND CABLE 100' BUFFER
- 2002 ESS SPT BORINGS (SEE NOTE 6)
- # 2024 GBA SOIL BORING LOCATIONS
- # 2024 GBA ROCK BORING LOCATIONS

ELEVATION (FEET MLLW):

- 0.0 TO -15.0
- -15.0 TO -30.0
- -30.0 TO -35.0
- -35.0 TO -40.0
- -40.0 TO -45.0
- -45.0 TO -50.0
- -50.0 TO -55.0



2024 GBA SOIL BORING LOCATIONS

STATION	CORE	EASTING	NORTHING	SOURCE	DATE COLLECTED	TERMINAL CORE EL. (MLLW)
60+01.7	FD24-B-02	955,065.9	643,342.7	GBA	7/21/2024	-59.3
74+61.8	FD24-B-03	954,968.8	644,903.9	GBA	7/20/2024	-60.5
94+96.6	FD24-B-04	953,725.5	646,663.5	GBA	7/19/2024	-62.4
112+30.8	FD24-B-05	954,065.8	648,476.7	GBA	7/24/2024	-60.1

2024 GBA ROCK BORING LOCATIONS

STATION	CORE	EASTING	NORTHING	SOURCE	DATE COLLECTED	ENCOUNTERED BEDROCK EL. (MLLW)	TERMINAL CORE EL. (MLLW)
65+98.2	FD24-RC-01	954,939.9	643,953.1	GBA	8/23/2024	-53.3	-60.3
108+01.6	FD24-RC-02	954,452.4	648,012.9	GBA	8/31/2024	-47.4	-57.6
86+92.3	FD24-RC-03	954,427.6	645,964.0	GBA	7/16/2024	-40.5	-60.1
92+07.4	FD24-RC-04	954,612.2	646,516.4	GBA	8/16/2024	-33.1	-60.6
93+85.5	FD24-RC-05	954,612.8	646,697.0	GBA	8/11/2024	NA	-43.1
93+98.9	FD24-RC-05A	954,590.1	646,706.8	GBA	8/14/2024	-46.0	-46.0
93+91.7	FD24-RC-05B	954,590.6	646,699.7	GBA	8/19/2024	-46.7	-61.8
77+57.5	FD24-RC-06	954,887.4	645,190.4	GBA	8/31/2024	-32.4	-57.8
107+30.6	FD24-RC-07	954,570.3	647,931.6	GBA	8/22/2024	-35.1	-60.1
106+97.1	FD24-RC-08	954,162.6	647,932.8	GBA	8/15/2024	-43.1	-60.9
110+12.6	FD24-RC-09	954,554.1	648,216.0	GBA	8/30/2024	NA	-73.9
90+28.0	FD24-RC-10	954,627.1	646,337.1	GBA	8/21/2024	-33.7	-60.9

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

ISSUE DATE: JANUARY 2025
TASK ORDER NO.: W912WJ24F0024
CONTRACT NO.: W912DS22D0017
DRAWING CODE: DCU
SHEET 10 OF 220

DESIGNED BY: USACE
DRAWN BY: ECC
CHECKED BY: BJC
SUBMITTED BY: DCU
SIZE: ANSI 'D'
SCALE: AS SHOWN

PREPARED BY: GBA ENGINEERS ★ SURVEYORS
9008 Yellow Brick Rd.
Unit P
Baltimore, MD 21237
Phone (410) 682-5595

PREPARED FOR: Coastal Partners

SUBSURFACE EXPLORATION
NEW HAVEN HARBOR
NEW HAVEN, CONNECTICUT

GEOTECHNICAL CORE LOCATIONS

SHEET ID
P-008

Hole No. BR-2

DRILLING LOG

DIVISION: NAD

INSTALLATION: New England District

SHEET: OF 1 SHEETS 1

1. PROJECT: New Haven Harbor
2. LOCATION (Coordinates or Station): New Haven Harbor
3. DRILLING AGENCY: Warren George, Inc
4. HOLE NO. (As shown on drawing title and file number): BR-2
5. NAME OF DRILLER:
6. DIRECTION OF HOLE: ☐ VERTICLE ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN:
8. DEPTH DRILLED INTO ROCK: 6.9'
9. TOTAL DEPTH OF HOLE:
10. SIZE AND TYPE OF BIT: 2"
11. DATUM FOR ELEVATION SHOWN (TBM or MSL):
12. MANUFACTURER'S DESIGNATION OF DRILL:
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED: UNDISTURBED:
14. TOTAL NUMBER CORE BOXES: 1
15. ELEVATION GROUND WATER:
16. DATE HOLE: STARTED 9/19/02 COMPLETED 9/19/02
17. ELEVATION TOP OF HOLE: -37.0' MLLW
18. TOTAL CORE RECOVERY FOR BORING: 5.1/6.9 = 74 %
19. SIGNATURE OF INSPECTOR:

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) c	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
Top= -45.1' MLLW	0.5		ALTERED GRANITE SCHIST. very strong. Pale pink, gray, yellow, black. Slightly to moderately weathered, yellow to orange staining. K-spar, quartz, plagioclase, biotite. Fine to medium grained. Slight alignment of minerals. Moderately to highly fractured, iron oxidation on joint surfaces. Near horizontal (5-15°) joints with occasional steeply dipping (75°) fractures. (Lighthouse gneiss).	94%	C1	3.3' Recovery / 3.5' Penetration = 94% RQD = .6+.55+.53+.37+.37 / 3.5 RQD = 2.42 / 3.5 = 69%
	1.0					
	2.0					
	3.0					
			slightly weathered.	27%	C2	0.4' Recovery / 1.5' Pen. = 27% RQD = 0%
	4.0					
	5.0		slightly weathered, iron oxide staining on fracture surfaces. Near-horizontal and steeply dipping (70°) fractures.	74%	C3	1.4' Rec. / 1.9' Pen = 74% RQD = 0.4+.39+ / 1.9 RQD = 42%
	6.0					
	7.0		End of exploration. ~~-52' MLLW~~			

No old boring log found

Box 1

Hole No. BR-3A

DRILLING LOG	DIVISION NAD	INSTALLATION NAE	SHEET OF 1 SHEETS 1

1. PROJECT	New Haven Harbor
2. LOCATION (Coordinates or Station)	New Haven Harbor
3. DRILLING AGENCY	
4. HOLE NO. (As shown on drawing title and file number)	BR-3
5. NAME OF DRILLER	
6. DIRECTION OF HOLE	☐ VERTICLE ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	
8. DEPTH DRILLED INTO ROCK	0.5'
9. TOTAL DEPTH OF HOLE	
10. SIZE AND TYPE OF BIT	2"
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
12. MANUFACTURER'S DESIGNATION OF DRILL	
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED: UNDISTURBED:
14. TOTAL NUMBER CORE BOXES	1
15. ELEVATION GROUND WATER	
16. DATE HOLE	STARTED: COMPLETED:
17. ELEVATION TOP OF HOLE	
18. TOTAL CORE RECOVERY FOR BORING	80 %
19. SIGNATURE OF INSPECTOR	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) c	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0.5		ALTERED GRANITE SCHIST. Very strong. Tan and gray with yellow staining. Orange iron oxide staining on fracture surfaces. Plagioclase, Quartz, K-spar, minor biotite, slight alignment of minerals. Epidote and clay mineralization on fracture surfaces. Medium grained. Intensely fractured; fractures are subhorizontal and near-vertical. Clay mineralization only along vertical fractures. Unweathered.	80%	C1	0.4' Rec / 0.5' Pen = 80%. RQD = 0%.
	1.0					

Hole No. BR-3B

DRILLING LOG

DIVISION	NAD
INSTALLATION	NAE
SHEET	OF 1 SHEETS 1
1. PROJECT	New Haven Harbor
2. LOCATION (Coordinates or Station)	New Haven Harbor
3. DRILLING AGENCY	Warren George, Inc.
4. HOLE NO. (As shown on drawing title and file number)	BR-3B
5. NAME OF DRILLER	
6. DIRECTION OF HOLE	☐ VERTICLE ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	
8. DEPTH DRILLED INTO ROCK	11.1'
9. TOTAL DEPTH OF HOLE	
10. SIZE AND TYPE OF BIT	2"
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
12. MANUFACTURER'S DESIGNATION OF DRILL	
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED: UNDISTURBED:
14. TOTAL NUMBER CORE BOXES	2
15. ELEVATION GROUND WATER	
16. DATE HOLE	STARTED 9/23/02 COMPLETED 9/23/02
17. ELEVATION TOP OF HOLE	-37.0' MLLW
18. TOTAL CORE RECOVERY FOR BORING	98 %
19. SIGNATURE OF INSPECTOR	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) c	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
TOP = -43.7' MLLW	0.5 / 1.0 / 2.0 / 3.0 / 4.0 / 5.0 / 6.0 / 7.0 / 8.0 / 9.0 / 10.0		ALTERED GRANITE SCHIST. strong to very strong. Light gray, pale yellow, green, with dark red mineralization, slightly to moderately stained, yellow-orange. Plagioclase, K-spar, quartz, minor biotite; Epidote and clay mineralization along fracture surfaces. Slight alignment of minerals. Intensely fractured, with subhorizontal to near vertical fractures. Fine to medium grained. (Lighthouse gneiss).	96%	C1 (Box 2)	3.0' Rec / 3.1' Pen = 96 RQD = 0%
			Medium to coarse. More K-spar. Fractures subhorizontal to moderately/steeply dipping (60-70°). Healed fractures.	100%	C2 (Box 3)	Core sample sent to lab, -47.1' to -48.1' MLLW. 4.0' Rec / 4.0' Pen = 100% RQD = 1+.8+.81 / 4.0 = 65%
			High epidote content along fractures.	98%	C3 (Box 3)	3.9' Rec / 4.0' Pen = 98% 0.5+.39+.77+.33+.59+.4 / 4 RQD = 75%

DRILLING LOG (Cont. Sheet)

ELEVATION TOP OF HOLE

Hole No. BR-3B

PROJECT

INSTALLATION

SHEET

OF SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) c	% CORE RECOV-ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	11.0		End of exploration -54.8' MLLW			

Hole No. BR-5

DRILLING LOG

DIVISION	NAD
INSTALLATION	NAE
SHEET	OF 1 SHEETS 1
1. PROJECT	New Haven Harbor
2. LOCATION (Coordinates or Station)	New Haven Harbor
3. DRILLING AGENCY	Warren George, Inc.
4. HOLE NO. (As shown on drawing title and file number)	BR-5
5. NAME OF DRILLER	
6. DIRECTION OF HOLE	☐ VERTICLE ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	
8. DEPTH DRILLED INTO ROCK	5.0'
9. TOTAL DEPTH OF HOLE	
10. SIZE AND TYPE OF BIT	2"
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
12. MANUFACTURER'S DESIGNATION OF DRILL	
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED: UNDISTURBED:
14. TOTAL NUMBER CORE BOXES	1
15. ELEVATION GROUND WATER	
16. DATE HOLE	STARTED 9/12/02 COMPLETED 9/12/02
17. ELEVATION TOP OF HOLE	-35.07' MLLW
18. TOTAL CORE RECOVERY FOR BORING	82'% %
19. SIGNATURE OF INSPECTOR	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) c	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
Top= -41.4' MLLW	0.5		ALTERED GRANITE SCHIST. Very strong, Tan, light gray, and black, Yellow to red staining, red staining on fracture surfaces. Plagioclase, K-spar, quartz, biotite, slight to moderate alignment of minerals. Moderately to intensely fractured. Fractures subhorizontal to moderately dipping (55°). Clay mineralization along fracture surfaces. Some healed fractures. Medium to coarse grained. Unweathered.	82%	C1	4.1' Rec / 5.0' Pen = 82% RQD = (0.41+.37+.65+.46+.36) / 5.0 RQD = 45 %
	1.0					
	2.0					
	3.0					
	4.0					Bottom 1' intensely fractured with minor clay remineralization.
	5.0		End of exploration -46.4' MLLW			

Hole No. BR-6

DRILLING LOG

DIVISION: NAD

INSTALLATION: NAE

SHEET: OF SHEETS

1. PROJECT: New Haven Harbor
2. LOCATION (Coordinates or Station): New Haven Harbor
3. DRILLING AGENCY:
4. HOLE NO. (As shown on drawing title and file number): BR-6
5. NAME OF DRILLER:
6. DIRECTION OF HOLE: ☐ VERTICLE ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN:
8. DEPTH DRILLED INTO ROCK: 1.5'
9. TOTAL DEPTH OF HOLE:
10. SIZE AND TYPE OF BIT: 2"
11. DATUM FOR ELEVATION SHOWN (TBM or MSL):
12. MANUFACTURER'S DESIGNATION OF DRILL:
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED: UNDISTURBED:
14. TOTAL NUMBER CORE BOXES: 1
15. ELEVATION GROUND WATER:
16. DATE HOLE: STARTED 9/11/02 COMPLETED 9/11/02
17. ELEVATION TOP OF HOLE: -36.7' MLLW
18. TOTAL CORE RECOVERY FOR BORING: 56 %
19. SIGNATURE OF INSPECTOR:

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) c	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
Top = -42' MLLW	0.5		Cobble – Very strong. Dark gray to black. Aphanitic.	56%	C1	0.84 Rec / 1.5' Pen = 56%. RQD = 0%.
	1.0		2002 log characterized this as a cobble – bedrock surface not reached.			
	1.5		End of exploration -43.5' MLLW			

Hole No. BR-7

DRILLING LOG

DIVISION: NAD

INSTALLATION: New England District

SHEET: OF 1 SHEETS 1

1. PROJECT: New Haven Harbor
2. LOCATION (Coordinates or Station): New Haven Harbor
3. DRILLING AGENCY: Warren George, Inc.
4. HOLE NO. (As shown on drawing title and file number): BR-7
5. NAME OF DRILLER:
6. DIRECTION OF HOLE: ☐ VERTICLE ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN:
8. DEPTH DRILLED INTO ROCK: 7.5 + (unknown)
9. TOTAL DEPTH OF HOLE:
10. SIZE AND TYPE OF BIT: 2"
11. DATUM FOR ELEVATION SHOWN (TBM or MSL):
12. MANUFACTURER'S DESIGNATION OF DRILL:
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED: UNDISTURBED:
14. TOTAL NUMBER CORE BOXES: 1
15. ELEVATION GROUND WATER:
16. DATE HOLE: STARTED 9/20/02 COMPLETED 9/20/02
17. ELEVATION TOP OF HOLE: -35.5' MLLW
18. TOTAL CORE RECOVERY FOR BORING: 98 %
19. SIGNATURE OF INSPECTOR:

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) c	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
Top = -40.7' MLLW	0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5		0.0-0.2': Cobble. 0.2-7.5': ALTERED GRANITE SCHIST Very strong. Yellow-orange, gray, and black. Moderately to highly stained orange, on rock and fracture surfaces. K-spar, quartz, plagioclase, and biotite. Medium to coarse grained. Slight alignment of minerals, slightly to moderately fractured, iron oxidation and weathering on joint surfaces. Slightly weathered, sub-horizontal (10°) and near-vertical (85°) fractures. (Lighthouse gneiss). 5.5-7.5': Near-vertical jointing. Moderately stained End of exploration -48.2' MLLW (total penetration not known)	98%	C1	7.4' Rec. / 7.5' + Pen. = 98% RQD = (.45+.6+.85+1.4+1.2+.7+.6) / 7.5 RQD = 77% 3.0-4.2': Slightly Stained. Coarse grain size. -45.5 - -46.7': 1.2' sample sent to lab.

Hole No. BR-10 (try 1)

DRILLING LOG

DIVISION	NAD
INSTALLATION	NAE
SHEET	OF 1 SHEETS 1
1. PROJECT	New Haven Harbor
2. LOCATION (Coordinates or Station)	New Haven Harbor
3. DRILLING AGENCY	Warren George Inc.
4. HOLE NO. (As shown on drawing title and file number)	BR-10 (try 1)
5. NAME OF DRILLER	
6. DIRECTION OF HOLE	☐ VERTICLE ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	
8. DEPTH DRILLED INTO ROCK	5.9'
9. TOTAL DEPTH OF HOLE	
10. SIZE AND TYPE OF BIT	2"
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
12. MANUFACTURER'S DESIGNATION OF DRILL	
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
14. TOTAL NUMBER CORE BOXES	
15. ELEVATION GROUND WATER	
16. DATE HOLE	STARTED 9/30/2 / COMPLETED 9/30/02
17. ELEVATION TOP OF HOLE	-38.5' MLLW
18. TOTAL CORE RECOVERY FOR BORING	66 %
19. SIGNATURE OF INSPECTOR	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) c	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
Top= -42.0' MLLW	1.0		ALTERED GRANITE SCHIST. Very strong, light gray with black and pale yellow. Slightly stained yellow-orange on fracture surfaces. Quartz, biotite, plagioclase, K-spar. Slight alignment of minerals. Fine to medium grained, Moderately to intensely fractures.	100%	C1	1.9' Rec / 1.9' Pen = 100%. RQD: .62 / 1.9 = 33%.
	2.0		Sub-horizontal fractures; fractures 65°. Minor clay mineralization on some fracture surfaces few healed fractures.	80%	C2	0.8' Rec / 1.0' Pen = 80%. RQD=0%.
	3.0		C3: Slightly fractured, slightly to stained.	40%	C3	1.2' Rec / 3.0' Pen = 40%. RQD: 0.78+0.33 / 3.0 = 37%.
	4.0					
	5.0					
	6.0		End of exploration -47.9' MLLW			
	7.0					

Hole No. BR-10 (tny 2)

DRILLING LOG

DIVISION	NAD
INSTALLATION	NAE
SHEET / OF SHEETS	
1. PROJECT	New Haven Harbor
2. LOCATION (Coordinates or Station)	New Haven Harbor
3. DRILLING AGENCY	
4. HOLE NO. (As shown on drawing title and file number)	BR-10 (tny 2)
5. NAME OF DRILLER	
6. DIRECTION OF HOLE	☐ VERTICLE ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	
8. DEPTH DRILLED INTO ROCK	8.0'
9. TOTAL DEPTH OF HOLE	
10. SIZE AND TYPE OF BIT	2"
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
12. MANUFACTURER'S DESIGNATION OF DRILL	
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED: UNDISTURBED:
14. TOTAL NUMBER CORE BOXES	1
15. ELEVATION GROUND WATER	
16. DATE HOLE	STARTED 10/2/02 COMPLETED 10/2/02
17. ELEVATION TOP OF HOLE	-38.5'
18. TOTAL CORE RECOVERY FOR BORING	96 %
19. SIGNATURE OF INSPECTOR	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) c	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
Top = -47.2' MLLW	1.0 / 2.0 / 3.0 / 4.0 / 5.0 / 6.0 / 7.0 / 8.0		ALTERED GRANITE SCHIST. Very strong. Tan, dark gray and black. Quartz, K-spar, plagioclase, biotite. Slight yellow to red staining. Slight alignment of minerals. Medium to coarse grained. Clay mineralization along fractures. Fractures subhorizontal to steeply dipping (65-75). Slightly to moderately fractured. Some partially healed fractures. Rough fracture surfaces. Unweathered.	96%	C1	7.65' Rec / 8.0' Pen = 96%. RQD - 0.45+.56+1.3+.4+.35+.78+.68+.88+.8 / 8.0 = 78%. Core sample taken to lab. -48.4' to -49.7' MLLW
			6.0-7.65': More K-Spar mineralogy. Coarser grained.			
			End of exploration - MLLW			

ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE PROJECT HOLE NO.

Hole No. BR-11

DRILLING LOG

DIVISION	NAD
INSTALLATION	NAE
SHEET	OF SHEETS
1. PROJECT	New Haven Harbor
2. LOCATION (Coordinates or Station)	New Haven Harbor
3. DRILLING AGENCY	Warren George Inc
4. HOLE NO. (As shown on drawing title and file number)	BR-11
5. NAME OF DRILLER	
6. DIRECTION OF HOLE	☐ VERTICLE ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	
8. DEPTH DRILLED INTO ROCK	4.0'
9. TOTAL DEPTH OF HOLE	
10. SIZE AND TYPE OF BIT	2"
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
12. MANUFACTURER'S DESIGNATION OF DRILL	
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED: UNDISTURBED:
14. TOTAL NUMBER CORE BOXES	1
15. ELEVATION GROUND WATER	
16. DATE HOLE	STARTED 9/25/02 COMPLETED 9/25/02
17. ELEVATION TOP OF HOLE	-37.5'
18. TOTAL CORE RECOVERY FOR BORING	73% %
19. SIGNATURE OF INSPECTOR	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) c	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
Top= -51.3' MLLW	0		ALTERED GRANODIORITE SCHIST. Very strong, white, gray, and black. Quartz, biotite plagioclase, minor K-spar. slightly to moderately stained yellow. Slight alignment of minerals. Fine to medium grained. Slightly to moderately fractured, fractures subhorizontal. Clay remineralization along partially healed fractures. Fractures slighty weathered, one fracture non-horizontal (55°).	73%	C1	2.9' Rec / 4.0' Pen = 73% RQD = .82+.7 / 4.0 = 38% 2.3-2.7': Moderately to intensely fractured, highly stained orange-red, slightly weathered.
	4		End of exploration -55.3' MLLW			

ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE PROJECT HOLE NO.

Hole No. BR-12

DRILLING LOG

DIVISION: NAD
INSTALLATION: NAE
SHEET: OF 1 SHEETS 1

1. PROJECT: New Haven Harbor
2. LOCATION (Coordinates or Station): New Haven Harbor
3. DRILLING AGENCY: Warren George Inc
4. HOLE NO. (As shown on drawing title and file number): BR-12
5. NAME OF DRILLER:
6. DIRECTION OF HOLE: ☐ VERTICLE ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN:
8. DEPTH DRILLED INTO ROCK: 10'
9. TOTAL DEPTH OF HOLE:
10. SIZE AND TYPE OF BIT: 2"
11. DATUM FOR ELEVATION SHOWN (TBM or MSL):
12. MANUFACTURER'S DESIGNATION OF DRILL:
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED: UNDISTURBED:
14. TOTAL NUMBER CORE BOXES:
15. ELEVATION GROUND WATER:
16. DATE HOLE: STARTED 9/26/02 COMPLETED 9/26/02
17. ELEVATION TOP OF HOLE: -37.75' MLLW
18. TOTAL CORE RECOVERY FOR BORING: 86%, %
19. SIGNATURE OF INSPECTOR:

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) c	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
Top= -44.8' MLLW	0		ALTERED GRANODIORITE SCHIST Very strong. Black, white, and gray. Plagioclase, biotite, quartz. Slightly to moderately stained; orange staining along fractures. slight to moderate mineral alignment. Medium to coarse grained. Slightly to moderately fractured; fractures are sub-horizontal. Unweathered.	96%	C1	4.8' Rec / 5.0' Pen = RQD= .42+.9+.92+.35+.35+ 0.6+0.4 / 5.0 = 79% 0.0-0.4': Coarse grained, foliated, iron oxide staining. Minor clay mineralization on fracture surface. 0.4-1.3': Sample missing; taken for lab. 2.3-2.4': Intensely stained orange.
	5		See above. Addition of K-Spar. Coarse grained. Slightly to moderately stained.	75%	C2 (Box 4)	3.75 / 5.0 = 75%. RQD= 0.38+.75+1.55+0.95 / 5.0 = 73% Core sample sent to lab (1.55'; -51.05' to -52.6' MLLW)
	10		End of exploration - 54.8' MLLW			

No 2002 boring log found ~~~~

Hole No. BR-13 (try 2)

DRILLING LOG	DIVISION NAD	INSTALLATION NAE	SHEET OF 1 SHEETS 1

1. PROJECT	New Haven Harbor
2. LOCATION (Coordinates or Station)	New Haven Harbor
3. DRILLING AGENCY	
4. HOLE NO. (As shown on drawing title and file number)	BR-13 (try 2)
5. NAME OF DRILLER	
6. DIRECTION OF HOLE	☐ VERTICLE ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	
8. DEPTH DRILLED INTO ROCK	6.6'
9. TOTAL DEPTH OF HOLE	
10. SIZE AND TYPE OF BIT	2"
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
12. MANUFACTURER'S DESIGNATION OF DRILL	
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED / UNDISTURBED
14. TOTAL NUMBER CORE BOXES	
15. ELEVATION GROUND WATER	
16. DATE HOLE	STARTED ? COMPLETED ?
17. ELEVATION TOP OF HOLE	
18. TOTAL CORE RECOVERY FOR BORING	94 %
19. SIGNATURE OF INSPECTOR	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) c	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0.5		ALTERED GRANITE SCHIST. Very strong. Light gray, black, yellow. Moderately stained orange-yellow. Quartz, plagioclase, biotite minor K-spar. Medium-grained. Very slight alignment of minerals. Moderately fractured with staining/iron oxidation on fracture surfaces. Sub-horizontal (5°) and near-vertical (75°) fractures. Minor clay mineralization along fractures.	96%	C1	5.5' Rec / 5.7' Pen = 96% RQD (0.4+0.4+0.4+0.6+0.7)/5.7 =44%
	1.0					
	2.0					
	3.0					
	4.0					
	5.0					
	6.0			78%	C2	0.7' Rec / 0.9' Pen = 78% RQD = 0.57/0.9 = 63%

Hole No. BR-13 (Try 3) and Try 4

DRILLING LOG

DIVISION	NAD
INSTALLATION	NAE
SHEET	OF 1 SHEETS 1
1. PROJECT	New Haven Harbor
2. LOCATION (Coordinates or Station)	New Haven Harbor
3. DRILLING AGENCY	Warren George Inc
4. HOLE NO. (As shown on drawing title and file number)	BR-13 (Try 3 & 4)
5. NAME OF DRILLER	
6. DIRECTION OF HOLE	☐ VERTICLE ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	
8. DEPTH DRILLED INTO ROCK	10.9'
9. TOTAL DEPTH OF HOLE	
10. SIZE AND TYPE OF BIT	2"
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	
12. MANUFACTURER'S DESIGNATION OF DRILL	
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED: UNDISTURBED:
14. TOTAL NUMBER CORE BOXES	
15. ELEVATION GROUND WATER	
16. DATE HOLE	STARTED 10/1/02 COMPLETED 10/1/02
17. ELEVATION TOP OF HOLE	-38.44' MLLW
18. TOTAL CORE RECOVERY FOR BORING	85 %
19. SIGNATURE OF INSPECTOR	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) c	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
Top = -43.0' MLLW	0.5		ALTERED GRANITE SCHIST. Very strong. White to light gray w/ minor black. Slight yellow staining: red staining along fracture surfaces. Quartz, plagioclase, minor biotite. Slight alignment of minerals. Very coarse grained, nearly pegmatitic. Intensely fractured, horizontal to near-vertically dipping (60-70°). Minor clay remineralization along fractures	85%	C1	2.55' Rec / 3.0' Pen = 85% RQD = 0.4 / 3.0 = 13%
	1.0					
	2.0					
	3.0			78%	C2	0.7' Rec / 0.9' Pen = 78% RQD = 0.7' / 0.9' = 78%
	4.0		Same as above but fine to medium grained. Slightly to moderately stained Addition of K-spar compared to above. More biotite.	86%	Try 4 C1	6.0 Rec / 7.0 Pen = 86% RQD: .83+.4+.62+1.7+.7+1 / 7.0 = 61%
	5.0		Try 4: Same as above Fine to coarse grained; coarser in top 0.5', finer at bottom of run.			Core sample taken to lab -42.9'+0 -43.6' MLLW. Core sample taken to lab, -47.45' to -48.45' MLLW

DRILLING LOG (Cont. Sheet) | ELEVATION TOP OF HOLE | **Hole No.** BR-13 (Try 3+4)

PROJECT | INSTALLATION | SHEET OF SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) c	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	10.5					
	11.0		End of exploration -53.9' MLLW.			

No 2002 log found *

Hole No. BR-17

DRILLING LOG

DIVISION: NAD

INSTALLATION: NAE

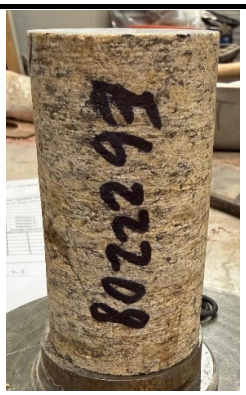
SHEET 1 OF 1 SHEETS

1. PROJECT: New Haven Harbor
2. LOCATION (Coordinates or Station): New Haven Harbor
3. DRILLING AGENCY: Warren George Inc.
4. HOLE NO. (As shown on drawing title and file number):
5. NAME OF DRILLER:
6. DIRECTION OF HOLE: ☐ VERTICLE ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN:
8. DEPTH DRILLED INTO ROCK: 1.0'
9. TOTAL DEPTH OF HOLE:
10. SIZE AND TYPE OF BIT:
11. DATUM FOR ELEVATION SHOWN (TBM or MSL):
12. MANUFACTURER'S DESIGNATION OF DRILL:
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED: UNDISTURBED:
14. TOTAL NUMBER CORE BOXES:
15. ELEVATION GROUND WATER:
16. DATE HOLE: STARTED: COMPLETED:
17. ELEVATION TOP OF HOLE:
18. TOTAL CORE RECOVERY FOR BORING: 10 %
19. SIGNATURE OF INSPECTOR:

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) c	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0.5 1.0		Quartz vein? Very strong. Gray. Predominantly quartz, very minor biotite/matics. Unweathered, slight iron oxide staining. Fine-grained.	10%	C1	0.1' Rec / 1.0' Pen = 10%. RQD = 0%.

ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE PROJECT HOLE NO.

U.S. ARMY CORPS OF ENGINEERS
MATERIALS TESTING REGIONAL TECHNICAL CENTER OF EXPERTISE
MARIETTA, GEORGIA



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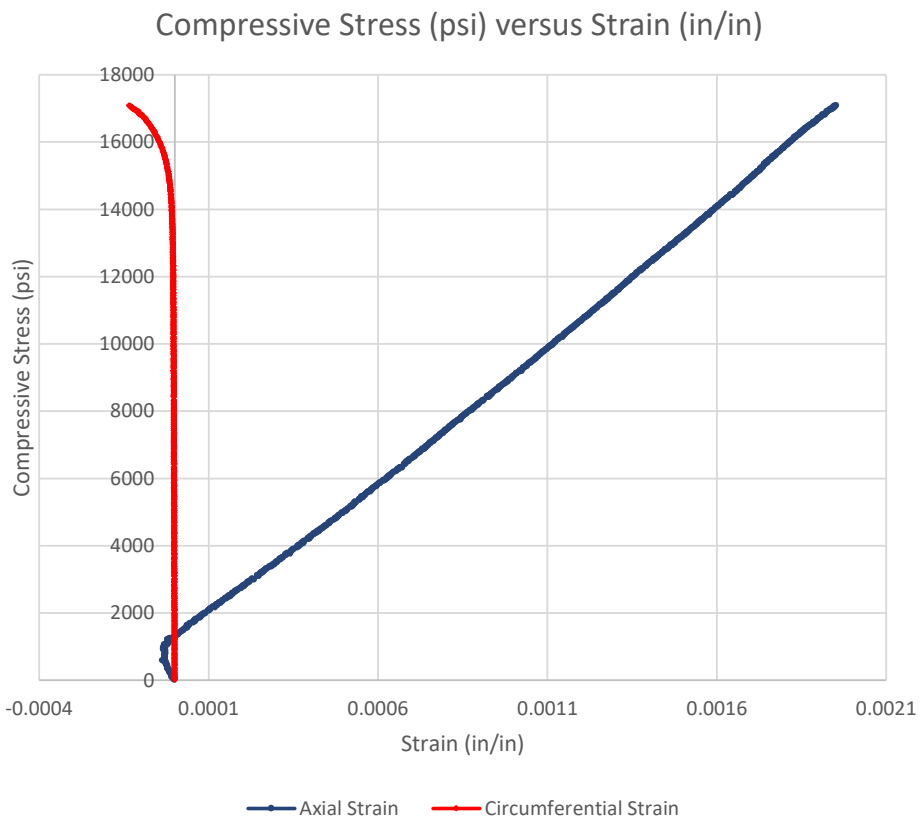
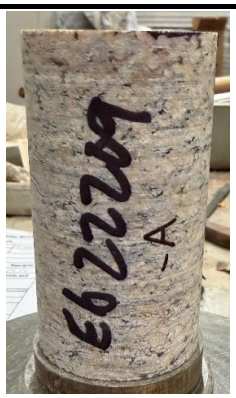


TEST ID	C	**TYPE OF SPECIMEN**	Rock Core
DIAMETER, in.	1.94	**PEAK LOAD (lbs)**	51,274
HEIGHT, in.	4.02	**COMPRESSIVE STRENGTH (psi)**	17,360
LENGTH/DIAMETER RATIO	2.08	**MODULUS of ELASTICITY (psi)**	8,134,428
DENSITY, pcf	163.2	**POISSON'S RATIO**	0.08
FAILURE SHAPE	SEE PHOTO	**FAILURE TYPE**	split
AGE of CONCRETE	0	**CURING CONDITION**	Air Dried

REMARKS	Determined the stress and strain values starting at a longitudinal strain of 50 millionths and values upon reaching 50% of the ultimate strength of the specimen. Performed linear regression calculation via the least square method of all data points between the two points described above. The slope of the best-fit line of those data points of the stress vs. strain data is the Modulus of Elasticity (MOE). The Poisson's Ratio is similar, but the slope of the transverse strain vs. longitudinal strain is calculated.
NOTES	

PROJECT	New Haven Harbor		
AREA	New England	**W.O. NO.**	60D7G8
REQUISITION NO.	W13G8660309514	**DATE RECEIVED**	
CONTRACT NO.		**BORING NO.**	BR-2
LAB NO.	E6/22208	**SAMPLE NO.**	Run 1
ASTM C7012 Modulus of Elasticity and Poisson's Ratio of Rock in Compression		**DEPTH (ft)**	8.1
		DATE REPORTED	1-May-26

U.S. ARMY CORPS OF ENGINEERS
MATERIALS TESTING REGIONAL TECHNICAL CENTER OF EXPERTISE
MARIETTA, GEORGIA



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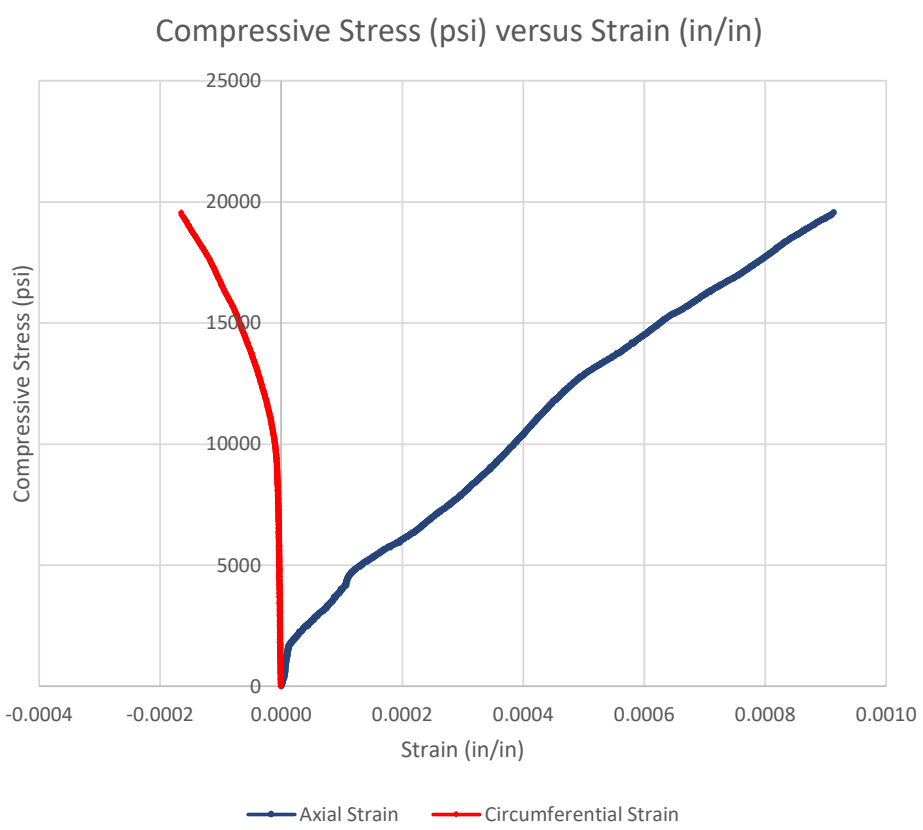
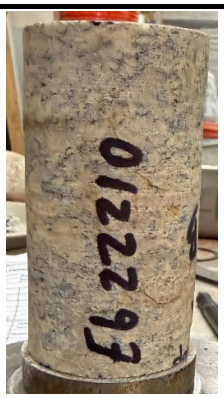


TEST ID	A	**TYPE OF SPECIMEN**	Rock Core
DIAMETER, in.	1.98	**PEAK LOAD (lbs)**	75,571
HEIGHT, in.	3.95	**COMPRESSIVE STRENGTH (psi)**	24,492
LENGTH/DIAMETER RATIO	1.99	**MODULUS of ELASTICITY (psi)**	20,218,428
DENSITY, pcf	163.8	**POISSON'S RATIO**	0.20
FAILURE SHAPE	SEE PHOTO	**FAILURE TYPE**	split
AGE of CONCRETE	0	**CURING CONDITION**	Air Dried

REMARKS	Determined the stress and strain values starting at a longitudinal strain of 50 millionths and values upon reaching 50% of the ultimate strength of the specimen. Performed linear regression calculation via the least square method of all data points between the two points described above. The slope of the best-fit line of those data points of the stress vs. strain data is the Modulus of Elasticity (MOE). The Poisson's Ratio is similar, but the slope of the transverse strain vs. longitudinal strain is calculated.
NOTES	

PROJECT	New Haven Harbor		
AREA	New England	**W.O. NO.**	60D7G8
REQUISITION NO.	W13G8660309514	**DATE RECEIVED**	
CONTRACT NO.		**BORING NO.**	BR-3B
LAB NO.	E6/22209	**SAMPLE NO.**	Run 1
ASTM C7012 Modulus of Elasticity and Poisson's Ratio of Rock in Compression		**DEPTH (ft)**	11.1
		DATE REPORTED	1-May-26

U.S. ARMY CORPS OF ENGINEERS
MATERIALS TESTING REGIONAL TECHNICAL CENTER OF EXPERTISE
MARIETTA, GEORGIA



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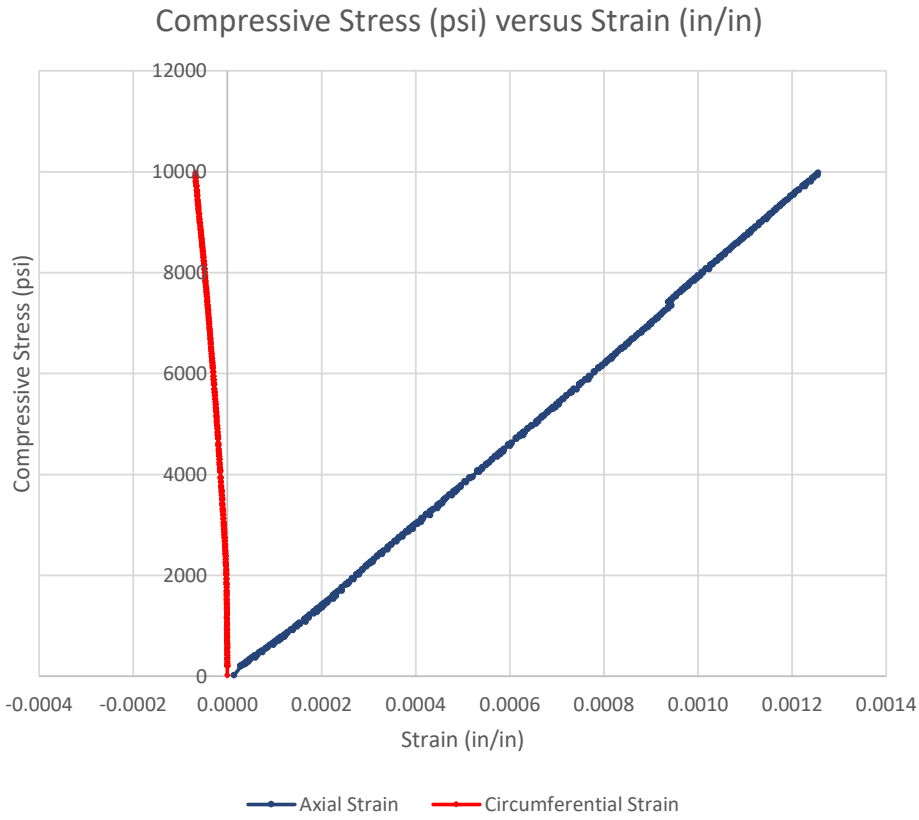
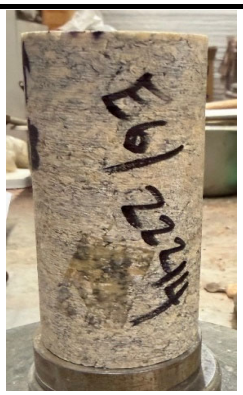


TEST ID	B	**TYPE OF SPECIMEN**	Rock Core
DIAMETER, in.	1.97	**PEAK LOAD (lbs)**	48,338
HEIGHT, in.	3.96	**COMPRESSIVE STRENGTH (psi)**	15,910
LENGTH/DIAMETER RATIO	2.01	**MODULUS of ELASTICITY (psi)**	4,522,204
DENSITY, pcf	163.2	**POISSON'S RATIO**	0.31
FAILURE SHAPE	SEE PHOTO	**FAILURE TYPE**	split
AGE of CONCRETE		**CURING CONDITION**	Air Dried

REMARKS	Determined the stress and strain values starting at a longitudinal strain of 50 millionths and values upon reaching 50% of the ultimate strength of the specimen. Performed linear regression calculation via the least square method of all data points between the two points described above. The slope of the best-fit line of those data points of the stress vs. strain data is the Modulus of Elasticity (MOE). The Poisson's Ratio is similar, but the slope of the transverse strain vs. longitudinal strain is calculated.
NOTES	

PROJECT	New Haven Harbor		
AREA	New England	**W.O. NO.**	60D7G8
REQUISITION NO.	W13G8660309514	**DATE RECEIVED**	
CONTRACT NO.		**BORING NO.**	BR-5
LAB NO.	E6/22210	**SAMPLE NO.**	Run 1
ASTM C7012 Modulus of Elasticity and Poisson's Ratio of Rock in Compression		**DEPTH (ft)**	6.5
		DATE REPORTED	1-May-26

U.S. ARMY CORPS OF ENGINEERS
MATERIALS TESTING REGIONAL TECHNICAL CENTER OF EXPERTISE
MARIETTA, GEORGIA



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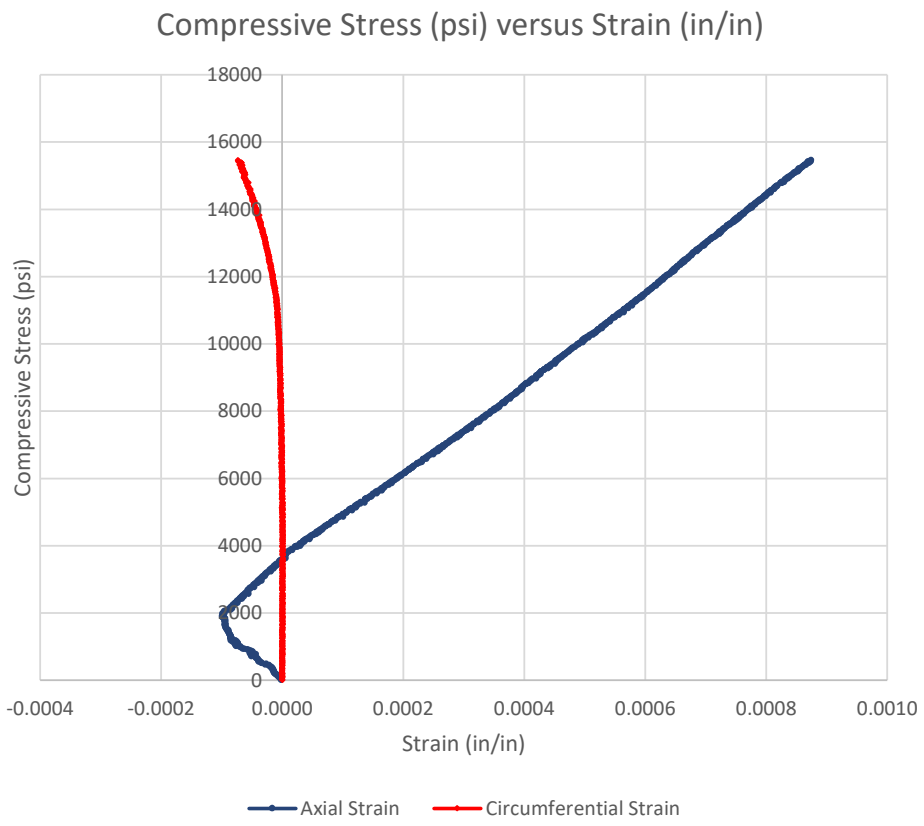
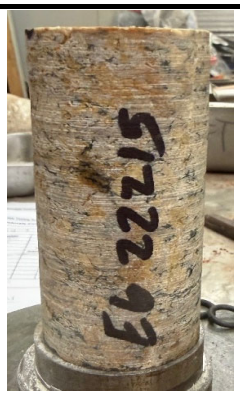


TEST ID		**TYPE OF SPECIMEN**	Rock Core
DIAMETER, in.	1.96	**PEAK LOAD (lbs)**	62,370
HEIGHT, in.	3.87	**COMPRESSIVE STRENGTH (psi)**	20,579
LENGTH/DIAMETER RATIO	1.97	**MODULUS of ELASTICITY (psi)**	13,840,533
DENSITY, pcf	160.8	**POISSON'S RATIO**	0.26
FAILURE SHAPE	SEE PHOTO	**FAILURE TYPE**	split
AGE of CONCRETE	0	**CURING CONDITION**	Air Dried

REMARKS	Determined the stress and strain values starting at a longitudinal strain of 50 millionths and values upon reaching 50% of the ultimate strength of the specimen. Performed linear regression calculation via the least square method of all data points between the two points described above. The slope of the best-fit line of those data points of the stress vs. strain data is the Modulus of Elasticity (MOE). The Poisson's Ratio is similar, but the slope of the transverse strain vs. longitudinal strain is calculated.
NOTES	

PROJECT	New Haven Harbor		
AREA	New England	**W.O. NO.**	60D7G8
REQUISITION NO.	W13G8660309514	**DATE RECEIVED**	
CONTRACT NO.		**BORING NO.**	BR-5
LAB NO.	E6/22214	**SAMPLE NO.**	Run 1
ASTM C7012 Modulus of Elasticity and Poisson's Ratio of Rock in Compression		**DEPTH (ft)**	8.5
		DATE REPORTED	1-May-26

U.S. ARMY CORPS OF ENGINEERS
MATERIALS TESTING REGIONAL TECHNICAL CENTER OF EXPERTISE
MARIETTA, GEORGIA



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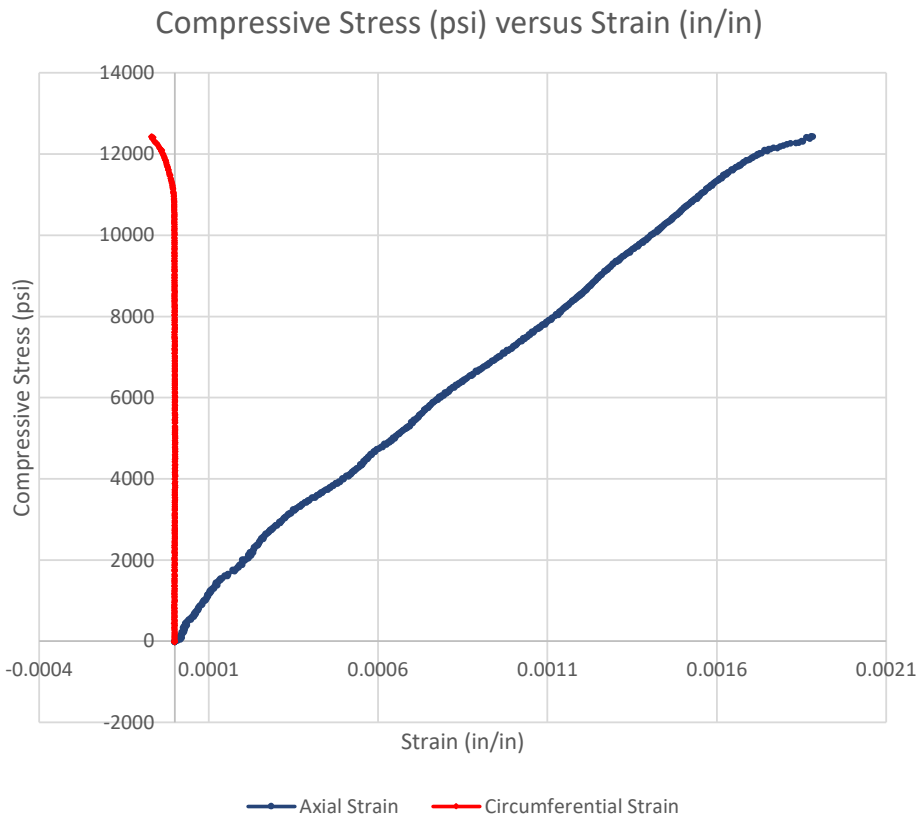
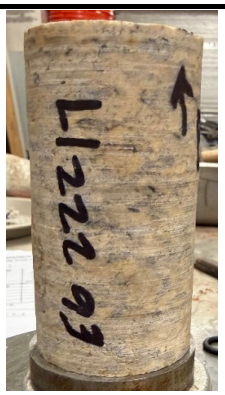


TEST ID	B	**TYPE OF SPECIMEN**	Rock Core
DIAMETER, in.	1.96	**PEAK LOAD (lbs)**	40,353
HEIGHT, in.	3.94	**COMPRESSIVE STRENGTH (psi)**	13,393
LENGTH/DIAMETER RATIO	2.01	**MODULUS of ELASTICITY (psi)**	6,546,763
DENSITY, pcf	162.5	**POISSON'S RATIO**	0.21
FAILURE SHAPE	SEE PHOTO	**FAILURE TYPE**	split
AGE of CONCRETE	0	**CURING CONDITION**	Air Dried

REMARKS	Determined the stress and strain values starting at a longitudinal strain of 50 millionths and values upon reaching 50% of the ultimate strength of the specimen. Performed linear regression calculation via the least square method of all data points between the two points described above. The slope of the best-fit line of those data points of the stress vs. strain data is the Modulus of Elasticity (MOE). The Poisson's Ratio is similar, but the slope of the transverse strain vs. longitudinal strain is calculated.
NOTES	

PROJECT	New Haven Harbor		
AREA	New England	**W.O. NO.**	60D7G8
REQUISITION NO.	W13G8660309514	**DATE RECEIVED**	
CONTRACT NO.		**BORING NO.**	BR-7
LAB NO.	E6/22215	**SAMPLE NO.**	Run 1
ASTM C7012 Modulus of Elasticity and Poisson's Ratio of Rock in Compression		**DEPTH (ft)**	5.0
		DATE REPORTED	1-May-26

U.S. ARMY CORPS OF ENGINEERS
MATERIALS TESTING REGIONAL TECHNICAL CENTER OF EXPERTISE
MARIETTA, GEORGIA



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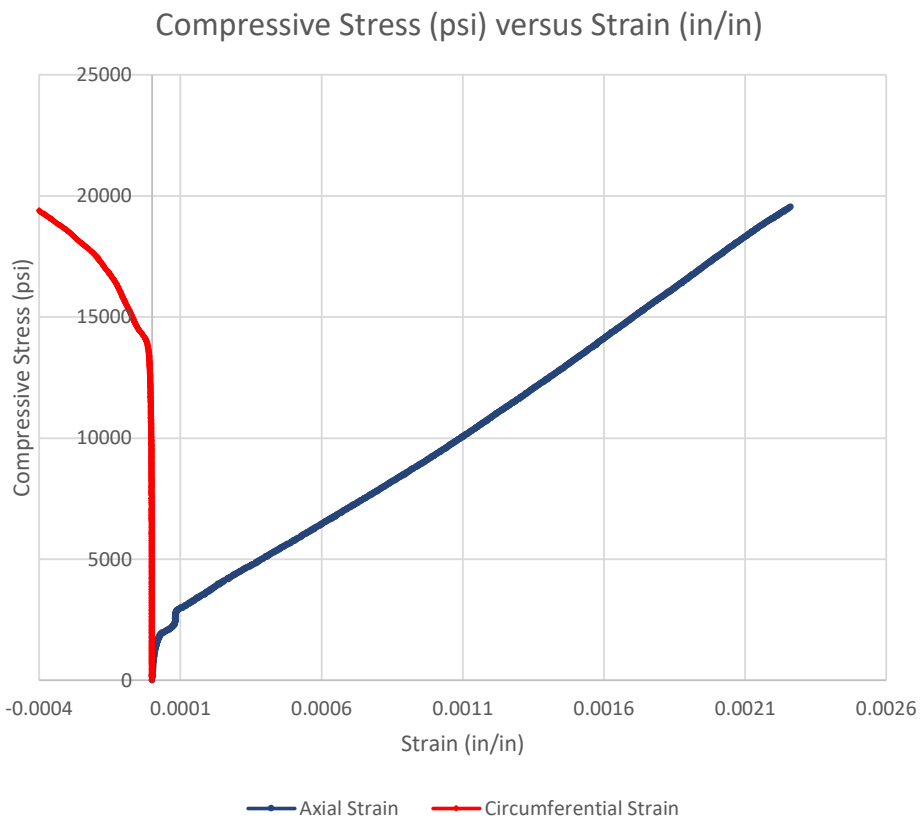
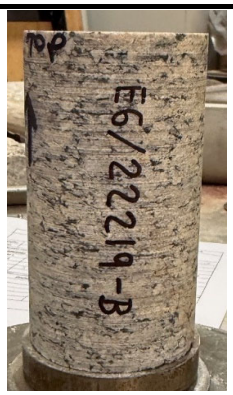


TEST ID	B	**TYPE OF SPECIMEN**	Rock Core
DIAMETER, in.	1.96	**PEAK LOAD (lbs)**	64,771
HEIGHT, in.	4.02	**COMPRESSIVE STRENGTH (psi)**	21,457
LENGTH/DIAMETER RATIO	2.05	**MODULUS of ELASTICITY (psi)**	7,740,159
DENSITY, pcf	161.5	**POISSON'S RATIO**	0.21
FAILURE SHAPE	SEE PHOTO	**FAILURE TYPE**	split
AGE of CONCRETE		**CURING CONDITION**	Air Dried

REMARKS	Determined the stress and strain values starting at a longitudinal strain of 50 millionths and values upon reaching 50% of the ultimate strength of the specimen. Performed linear regression calculation via the least square method of all data points between the two points described above. The slope of the best-fit line of those data points of the stress vs. strain data is the Modulus of Elasticity (MOE). The Poisson's Ratio is similar, but the slope of the transverse strain vs. longitudinal strain is calculated.
NOTES	

PROJECT	New Haven Harbor		
AREA	New England	**W.O. NO.**	60D7G8
REQUISITION NO.	W13G8660309514	**DATE RECEIVED**	
CONTRACT NO.		**BORING NO.**	BR-7
LAB NO.	E6/22217	**SAMPLE NO.**	Run 1
ASTM C7012 Modulus of Elasticity and Poisson's Ratio of Rock in Compression		**DEPTH (ft)**	6.3
		DATE REPORTED	1-May-26

U.S. ARMY CORPS OF ENGINEERS
MATERIALS TESTING REGIONAL TECHNICAL CENTER OF EXPERTISE
MARIETTA, GEORGIA



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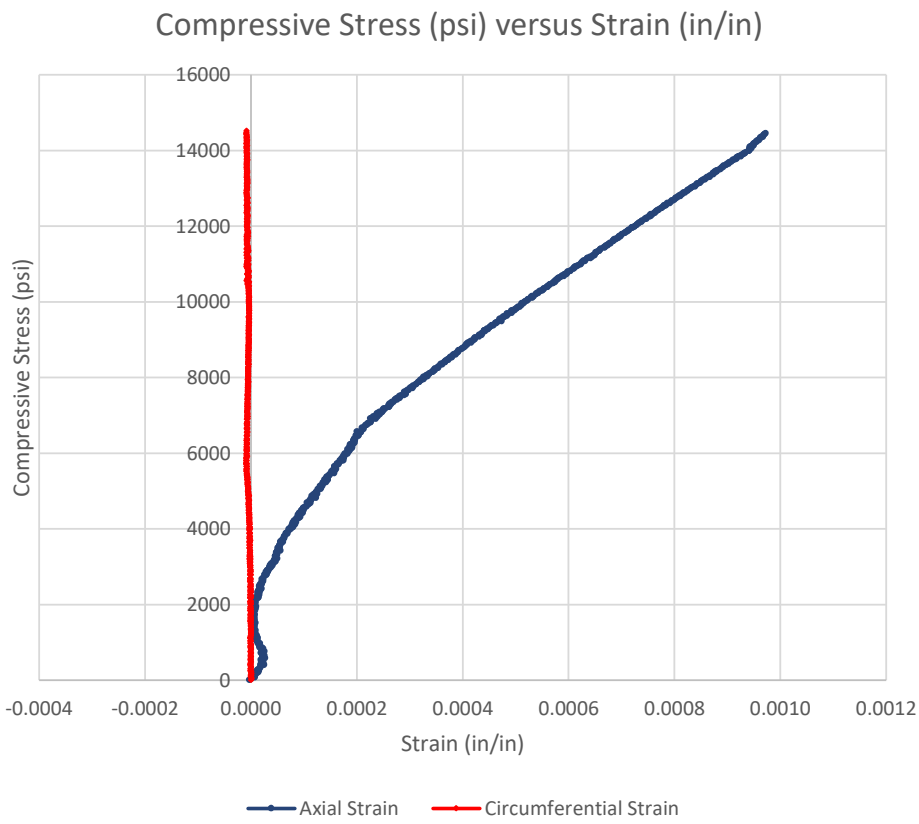
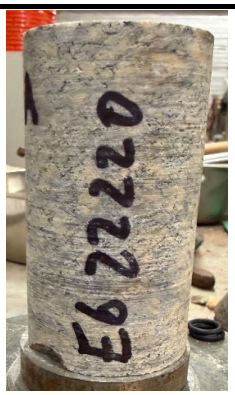


TEST ID	B	**TYPE OF SPECIMEN**	Rock Core
DIAMETER, in.	1.97	**PEAK LOAD (lbs)**	48,578
HEIGHT, in.	3.90	**COMPRESSIVE STRENGTH (psi)**	16,012
LENGTH/DIAMETER RATIO	1.98	**MODULUS of ELASTICITY (psi)**	5,573,345
DENSITY, pcf	163.7	**POISSON'S RATIO**	0.02
FAILURE SHAPE	SEE PHOTO	**FAILURE TYPE**	split
AGE of CONCRETE		**CURING CONDITION**	Air Dried

REMARKS	Determined the stress and strain values starting at a longitudinal strain of 50 millionths and values upon reaching 50% of the ultimate strength of the specimen. Performed linear regression calculation via the least square method of all data points between the two points described above. The slope of the best-fit line of those data points of the stress vs. strain data is the Modulus of Elasticity (MOE). The Poisson's Ratio is similar, but the slope of the transverse strain vs. longitudinal strain is calculated.
NOTES	

PROJECT	New Haven Harbor		
AREA	New England	**W.O. NO.**	60D7G8
REQUISITION NO.	W13G8660309514	**DATE RECEIVED**	
CONTRACT NO.		**BORING NO.**	BR-10 - TRY 1
LAB NO.	E6/22219	**SAMPLE NO.**	Run 3
ASTM C7012 Modulus of Elasticity and Poisson's Ratio of Rock in Compression		**DEPTH (ft)**	6.6
		DATE REPORTED	1-May-26

U.S. ARMY CORPS OF ENGINEERS
MATERIALS TESTING REGIONAL TECHNICAL CENTER OF EXPERTISE
MARIETTA, GEORGIA



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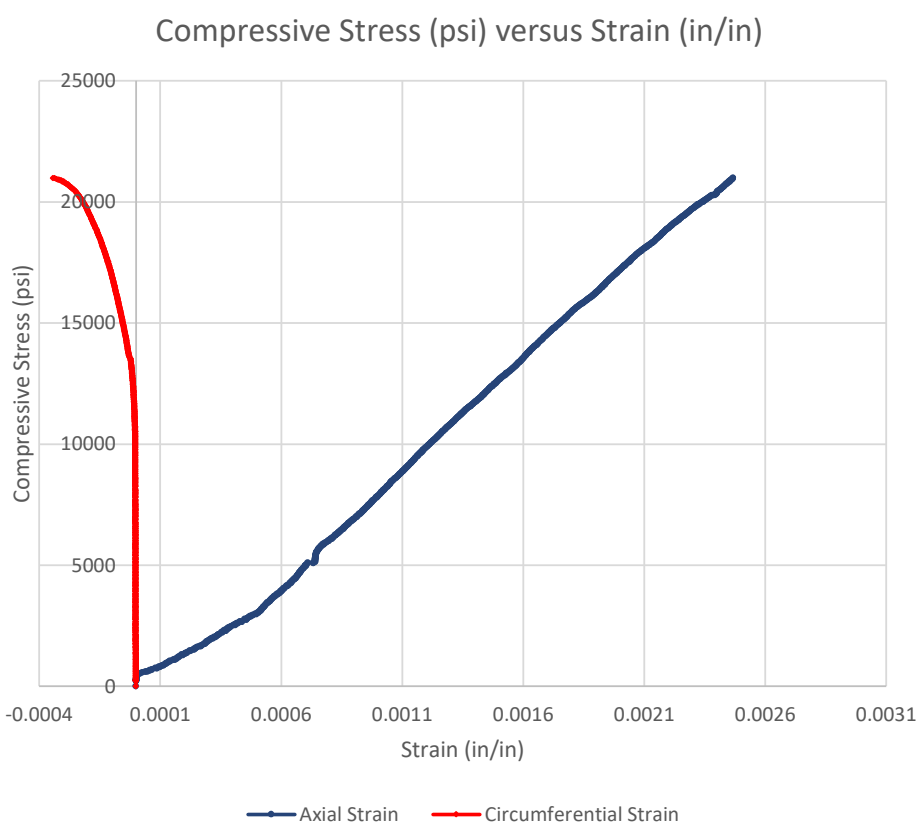

TEST ID	A	**TYPE OF SPECIMEN**	Rock Core
DIAMETER, in.	1.98	**PEAK LOAD (lbs)**	65,593
HEIGHT, in.	3.86	**COMPRESSIVE STRENGTH (psi)**	21,402
LENGTH/DIAMETER RATIO	1.95	**MODULUS of ELASTICITY (psi)**	9,245,973
DENSITY, pcf	162.4	**POISSON'S RATIO**	0.18
FAILURE SHAPE	SEE PHOTO	**FAILURE TYPE**	split
AGE of CONCRETE		**CURING CONDITION**	Air Dried

REMARKS	Determined the stress and strain values starting at a longitudinal strain of 50 millionths and values upon reaching 50% of the ultimate strength of the specimen. Performed linear regression calculation via the least square method of all data points between the two points described above. The slope of the best-fit line of those data points of the stress vs. strain data is the Modulus of Elasticity (MOE). The Poisson's Ratio is similar, but the slope of the transverse strain vs. longitudinal strain is calculated.
NOTES	

PROJECT	New Haven Harbor		
AREA	New England	**W.O. NO.**	60D7G8
REQUISITION NO.	W13G8660309514	**DATE RECEIVED**	
CONTRACT NO.		**BORING NO.**	BR-10 - TRY 2
LAB NO.	E6/22220	**SAMPLE NO.**	Run 1
ASTM C7012 Modulus of Elasticity and Poisson's Ratio of Rock in Compression		**DEPTH (ft)**	9.3
		DATE REPORTED	1-May-26

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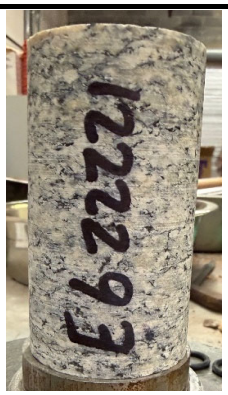
MATERIALS TESTING REGIONAL TECHNICAL CENTER OF EXPERTISE
MARIETTA, GEORGIA



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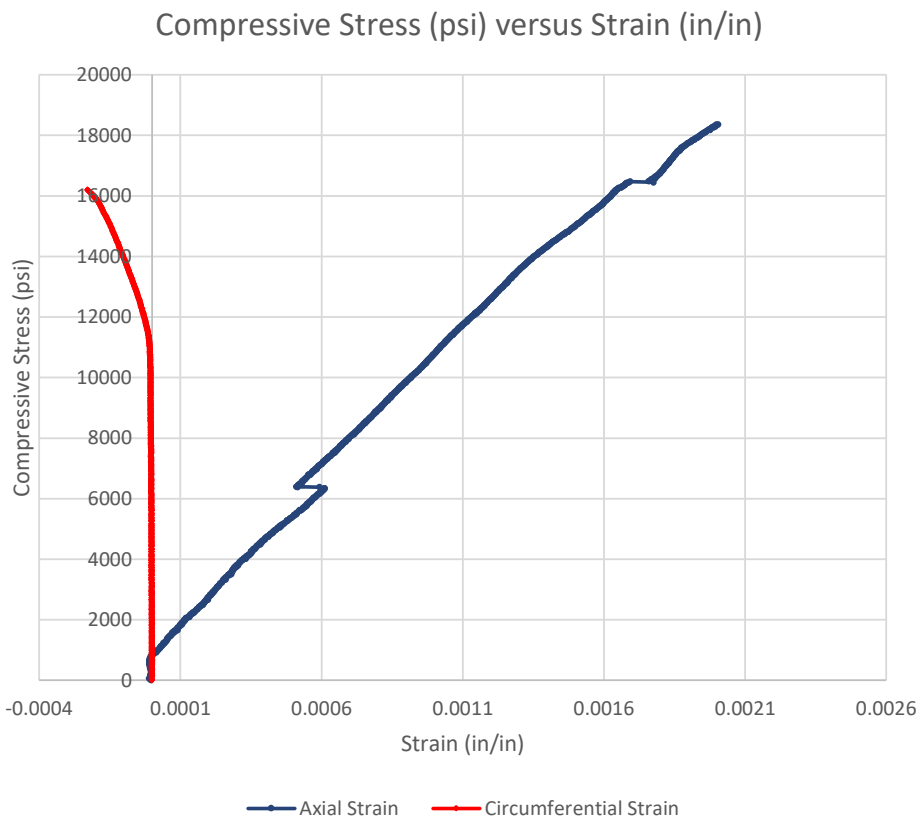

TEST ID	A	**TYPE OF SPECIMEN**	Rock Core
DIAMETER, in.	1.98	**PEAK LOAD (lbs)**	57,290
HEIGHT, in.	3.90	**COMPRESSIVE STRENGTH (psi)**	18,657
LENGTH/DIAMETER RATIO	1.97	**MODULUS of ELASTICITY (psi)**	8,809,471
DENSITY, pcf	163.8	**POISSON'S RATIO**	0.25
FAILURE SHAPE	SEE PHOTO	**FAILURE TYPE**	split
AGE of CONCRETE		**CURING CONDITION**	Air Dried

REMARKS	Determined the stress and strain values starting at a longitudinal strain of 50 millionths and values upon reaching 50% of the ultimate strength of the specimen. Performed linear regression calculation via the least square method of all data points between the two points described above. The slope of the best-fit line of those data points of the stress vs. strain data is the Modulus of Elasticity (MOE). The Poisson's Ratio is similar, but the slope of the transverse strain vs. longitudinal strain is calculated.
NOTES	

PROJECT	New Haven Harbor		
AREA	New England	**W.O. NO.**	60D7G8
REQUISITION NO.	W13G8660309514	**DATE RECEIVED**	
CONTRACT NO.		**BORING NO.**	BR-11
LAB NO.	E6/22221	**SAMPLE NO.**	Run 1
ASTM C7012 Modulus of Elasticity and Poisson's Ratio of Rock in Compression		**DEPTH (ft)**	13.9
		DATE REPORTED	1-May-26

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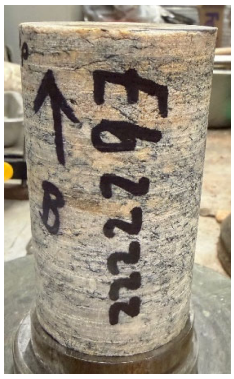
MATERIALS TESTING REGIONAL TECHNICAL CENTER OF EXPERTISE
MARIETTA, GEORGIA



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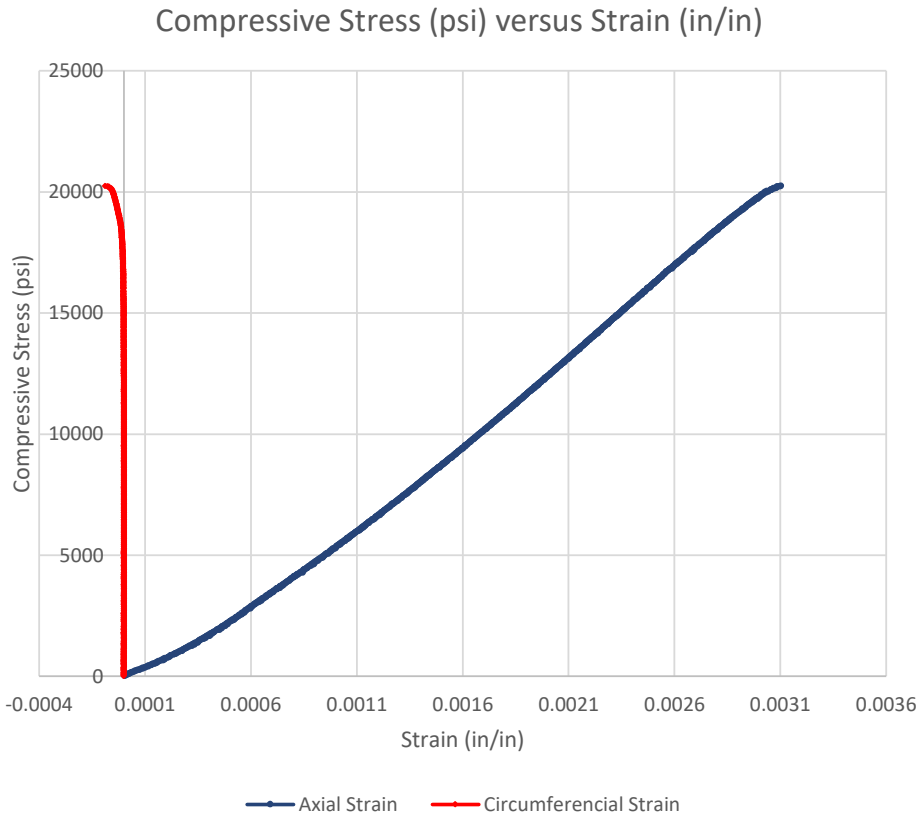

TEST ID		**TYPE OF SPECIMEN**	Rock Core
DIAMETER, in.	1.98	**PEAK LOAD (lbs)**	62,506
HEIGHT, in.	3.81	**COMPRESSIVE STRENGTH (psi)**	20,364
LENGTH/DIAMETER RATIO	1.93	**MODULUS of ELASTICITY (psi)**	7,077,584
DENSITY, pcf	162.3	**POISSON'S RATIO**	0.22
FAILURE SHAPE	SEE PHOTO	**FAILURE TYPE**	split
AGE of CONCRETE		**CURING CONDITION**	Air Dried

REMARKS	Determined the stress and strain values starting at a longitudinal strain of 50 millionths and values upon reaching 50% of the ultimate strength of the specimen. Performed linear regression calculation via the least square method of all data points between the two points described above. The slope of the best-fit line of those data points of the stress vs. strain data is the Modulus of Elasticity (MOE). The Poisson's Ratio is similar, but the slope of the transverse strain vs. longitudinal strain is calculated.
NOTES	

PROJECT	New Haven Harbor		
AREA	New England	**W.O. NO.**	60D7G8
REQUISITION NO.	W13G8660309514	**DATE RECEIVED**	
CONTRACT NO.		**BORING NO.**	BR-12
LAB NO.	E6/22222	**SAMPLE NO.**	Run 1
ASTM C7012 Modulus of Elasticity and Poisson's Ratio of Rock in Compression		**DEPTH (ft)**	7.1
		DATE REPORTED	1-May-26

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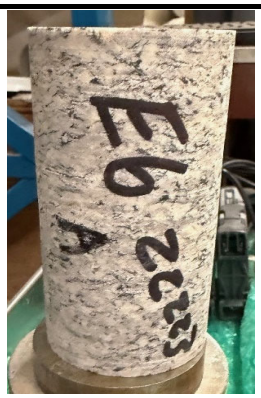
MATERIALS TESTING REGIONAL TECHNICAL CENTER OF EXPERTISE
MARIETTA, GEORGIA



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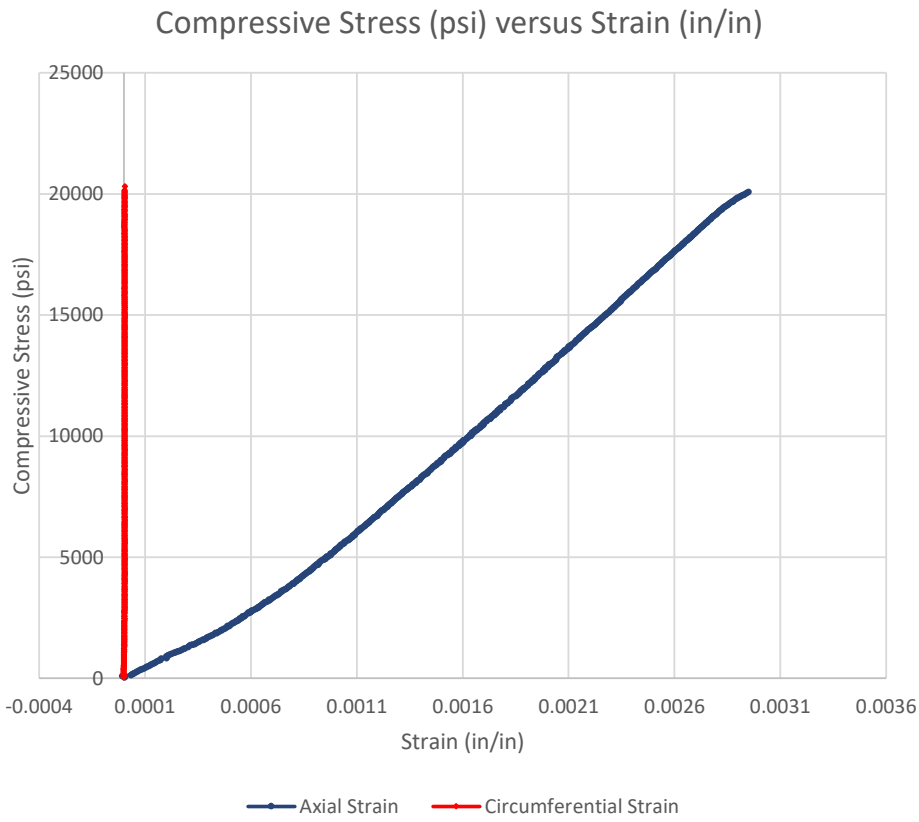

TEST ID	A	**TYPE OF SPECIMEN**	Rock Core
DIAMETER, in.	1.98	**PEAK LOAD (lbs)**	62,773
HEIGHT, in.	3.83	**COMPRESSIVE STRENGTH (psi)**	20,379
LENGTH/DIAMETER RATIO	1.93	**MODULUS of ELASTICITY (psi)**	7,271,154
DENSITY, pcf	163.5	**POISSON'S RATIO**	0.00
FAILURE SHAPE	SEE PHOTO	**FAILURE TYPE**	split
AGE of CONCRETE		**CURING CONDITION**	Air Dried

REMARKS	Determined the stress and strain values starting at a longitudinal strain of 50 millionths and values upon reaching 50% of the ultimate strength of the specimen. Performed linear regression calculation via the least square method of all data points between the two points described above. The slope of the best-fit line of those data points of the stress vs. strain data is the Modulus of Elasticity (MOE). The Poisson's Ratio is similar, but the slope of the transverse strain vs. longitudinal strain is calculated.
NOTES	

PROJECT	New Haven Harbor		
AREA	New England	**W.O. NO.**	60D7G8
REQUISITION NO.	W13G8660309514	**DATE RECEIVED**	
CONTRACT NO.		**BORING NO.**	BR-12
LAB NO.	E6/22223	**SAMPLE NO.**	Run 1
ASTM C7012 Modulus of Elasticity and Poisson's Ratio of Rock in Compression		**DEPTH (ft)**	8.5
		DATE REPORTED	1-May-26

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MATERIALS TESTING REGIONAL TECHNICAL CENTER OF EXPERTISE
MARIETTA, GEORGIA

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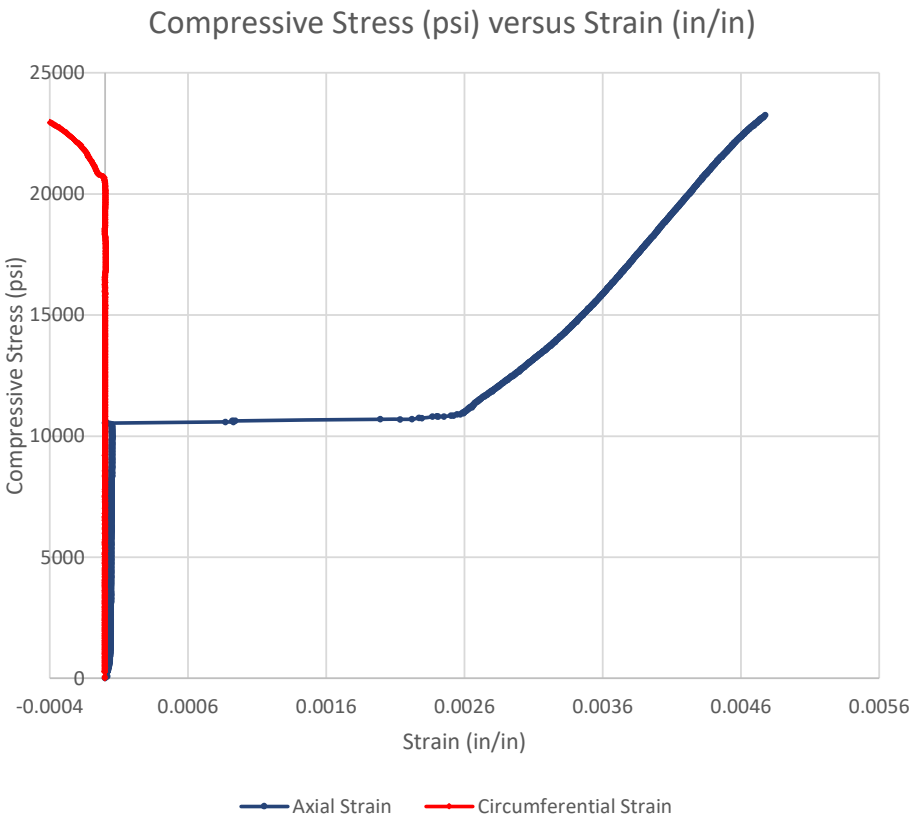

TEST ID	B	**TYPE OF SPECIMEN**	Rock Core
DIAMETER, in.	1.98	**PEAK LOAD (lbs)**	73,418
HEIGHT, in.	3.80	**COMPRESSIVE STRENGTH (psi)**	23,825
LENGTH/DIAMETER RATIO	1.92	**MODULUS of ELASTICITY (psi)**	2,704,157
DENSITY, pcf	163.5	**POISSON'S RATIO**	0.16
FAILURE SHAPE	SEE PHOTO	**FAILURE TYPE**	split
AGE of CONCRETE		**CURING CONDITION**	Air Dried

REMARKS	Determined the stress and strain values starting at a longitudinal strain of 50 millionths and values upon reaching 50% of the ultimate strength of the specimen. Performed linear regression calculation via the least square method of all data points between the two points described above. The slope of the best-fit line of those data points of the stress vs. strain data is the Modulus of Elasticity (MOE). The Poisson's Ratio is similar, but the slope of the transverse strain vs. longitudinal strain is calculated.
NOTES	

PROJECT	New Haven Harbor		
AREA	New England	**W.O. NO.**	60D7G8
REQUISITION NO.	W13G8660309514	**DATE RECEIVED**	
CONTRACT NO.		**BORING NO.**	BR-12
LAB NO.	E6/22223	**SAMPLE NO.**	Run 1
ASTM C7012 Modulus of Elasticity and Poisson's Ratio of Rock in Compression		**DEPTH (ft)**	8.5
		DATE REPORTED	1-May-26

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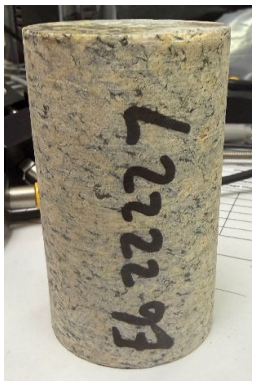
MATERIALS TESTING REGIONAL TECHNICAL CENTER OF EXPERTISE
MARIETTA, GEORGIA



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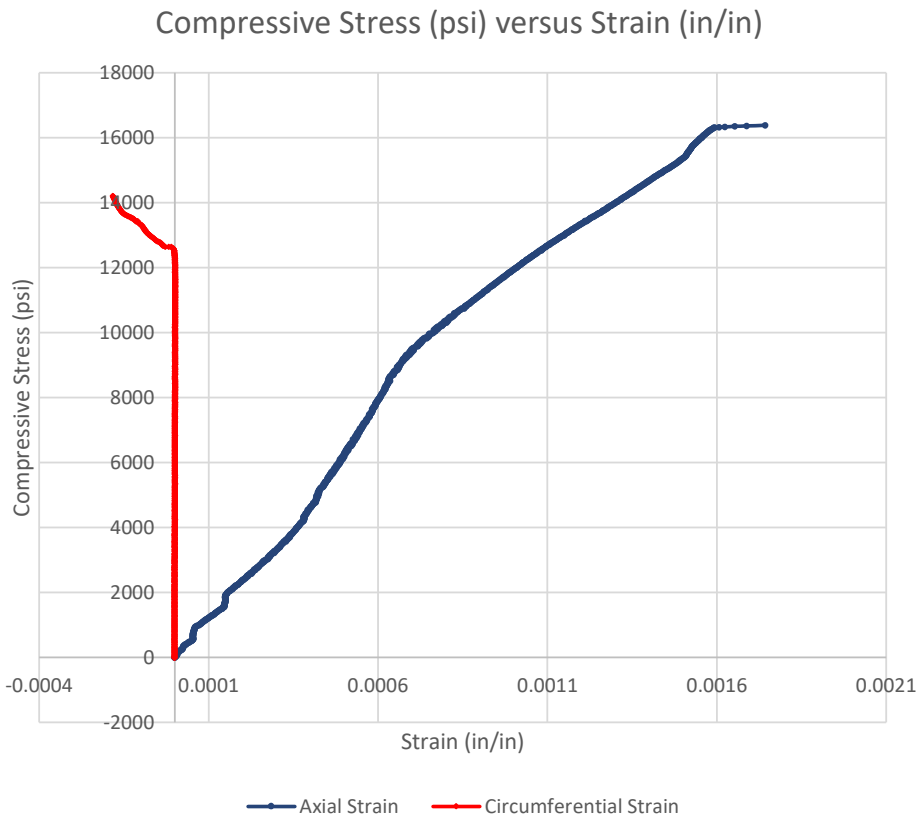

TEST ID	C	**TYPE OF SPECIMEN**	Rock Core
DIAMETER, in.	1.98	**PEAK LOAD (lbs)**	54,271
HEIGHT, in.	3.76	**COMPRESSIVE STRENGTH (psi)**	17,576
LENGTH/DIAMETER RATIO	1.90	**MODULUS of ELASTICITY (psi)**	8,231,158
DENSITY, pcf	162.7	**POISSON'S RATIO**	0.23
FAILURE SHAPE	SEE PHOTO	**FAILURE TYPE**	split
AGE of CONCRETE		**CURING CONDITION**	Air Dried

REMARKS	Determined the stress and strain values starting at a longitudinal strain of 50 millionths and values upon reaching 50% of the ultimate strength of the specimen. Performed linear regression calculation via the least square method of all data points between the two points described above. The slope of the best-fit line of those data points of the stress vs. strain data is the Modulus of Elasticity (MOE). The Poisson's Ratio is similar, but the slope of the transverse strain vs. longitudinal strain is calculated.
NOTES	

PROJECT	New Haven Harbor		
AREA	New England	**W.O. NO.**	60D7G8
REQUISITION NO.	W13G8660309514	**DATE RECEIVED**	
CONTRACT NO.		**BORING NO.**	BR-13 - TRY 4
LAB NO.	E6/22227	**SAMPLE NO.**	Run 1
ASTM C7012 Modulus of Elasticity and Poisson's Ratio of Rock in Compression		**DEPTH (ft)**	5.5
		DATE REPORTED	1-May-26

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Marietta, GA 30062

ASTM D 7625 CERCHAR Rock Abrasivity Report

Project: New Haven Harbor Rock Testing, NAE **Test Date:** 3/23/2026

Sample ID: E6/22208 **Sample Location:** BR-2, Run 1

Depth: 8.1' **Moisture Condition:** As received

Sample Description: Disk shaped pieces saw cut with diamond blade for testing

Stylus Type: Conical tip with a hardness/HRC: 55 **Test Method:** ASTM D7625-22

Stylus #	1	2	3	4	5
0° Orientation (CAI)	1.3	1.8	1.6	2.2	1.8
90° Orientation (CAI)	0.9	1.4	1.4	2.2	1.4
*Measurement were taken in CERCHAR Abrasivness Index (CAI) units. 1 CAI = 0.1 mm				Average =	**1.60**

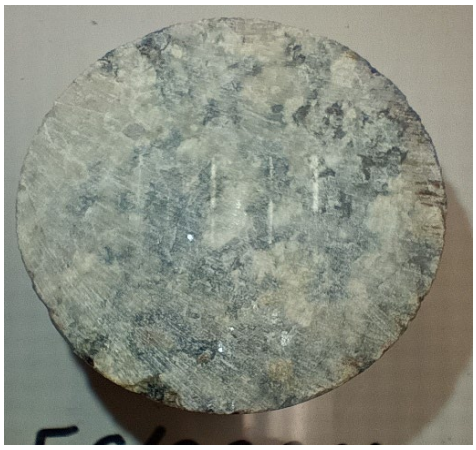
Normalized for saw cut specimens? Yes
Formula: CAI = 0.99*CAIs + 0.48
*CAIs = Uncorrected sawcut CAI

CAI =	**2.1**
Abrasiveness =	**High**

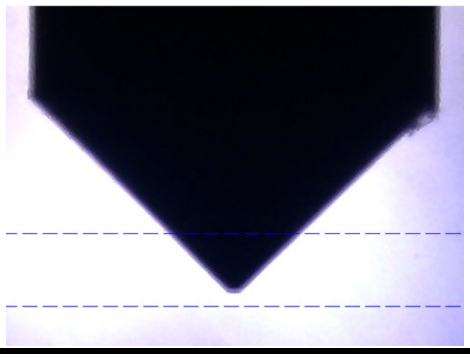
Classification	HRC=55	HRC=40
Very low	0.30-0.50	0.32-0.66
Low	0.50-1.00	0.66-1.51
Medium	1.00-2.00	1.51-3.22
High	2.00-4.00	3.22-6.62
Extreme	4.00-6.00	6.62-10.03
Quartzitic	6.00-7.00	N/A

Before Testing

After Testing



Stylus Under Microscope



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ASTM D 7625 CERCHAR Rock Abrasivity Report

Project: New Haven Harbor Rock Testing, NAE **Test Date:** 3/23/2026

Sample ID: E6/22209 **Sample Location:** BR-3B, Run 2

Depth: 11.1' **Moisture Condition:** As received

Sample Description: Disk shaped pieces saw cut with diamond blade for testing

Stylus Type: Conical tip with a hardness/HRC: 55 **Test Method:** ASTM D7625-22

Stylus #	1	2	3	4	5
0° Orientation (CAI)	1.8	1.5	2.4	2.4	1.9
90° Orientation (CAI)	1.8	1.3	3.0	1.7	1.3
*Measurement were taken in CERCHAR Abrasivness Index (CAI) units. 1 CAI = 0.1 mm				Average =	**1.91**

Normalized for saw cut specimens? Yes

Formula: CAI = 0.99*CAIs + 0.48

*CAIs = Uncorrected sawcut CAI

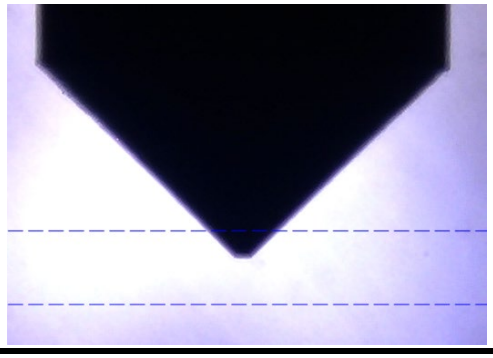
CAI =	**2.4**
Abrasiveness =	**High**

Classification	HRC=55	HRC=40
Very low	0.30-0.50	0.32-0.66
Low	0.50-1.00	0.66-1.51
Medium	1.00-2.00	1.51-3.22
High	2.00-4.00	3.22-6.62
Extreme	4.00-6.00	6.62-10.03
Quartzitic	6.00-7.00	N/A

Before Testing

After Testing

Stylus Under Microscope



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ASTM D 7625 CERCHAR Rock Abrasivity Report

Project: New Haven Harbor Rock Testing, NAE **Test Date:** 3/23/2026

Sample ID: E6/22210 **Sample Location:** BR-5, Run 1

Depth: 6.5' **Moisture Condition:** As received

Sample Description: Disk shaped pieces saw cut with diamond blade for testing

Stylus Type: Conical tip with a hardness/HRC: 55 **Test Method:** ASTM D7625-22

Stylus #	1	2	3	4	5
0° Orientation (CAI)	2.1	3.7	2.0	2.2	2.4
90° Orientation (CAI)	2.0	3.1	1.8	2.2	2.9
				Average =	**2.44**

*Measurement were taken in CERCHAR Abrasivness Index (CAI) units. 1 CAI = 0.1 mm

Normalized for saw cut specimens? Yes

Formula: CAI = 0.99*CAIs + 0.48

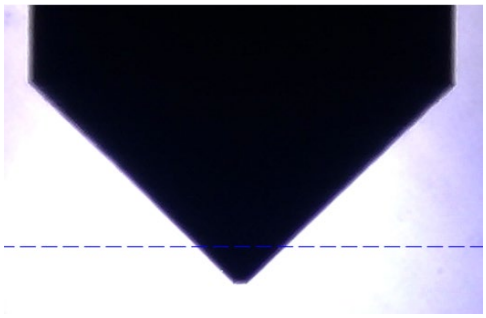
*CAIs = Uncorrected sawcut CAI

CAI =	**2.9**
Abrasiveness =	**High**

Classification	HRC=55	HRC=40
Very low	0.30-0.50	0.32-0.66
Low	0.50-1.00	0.66-1.51
Medium	1.00-2.00	1.51-3.22
High	2.00-4.00	3.22-6.62
Extreme	4.00-6.00	6.62-10.03
Quartzitic	6.00-7.00	N/A

Before Testing

Stylus Under Microscope



After Testing

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ASTM D 7625 CERCHAR Rock Abrasivity Report

Project: New Haven Harbor Rock Testing, NAE **Test Date:** 3/23/2026

Sample ID: E6/22211 **Sample Location:** BR-5, Run 1

Depth: 6.9' **Moisture Condition:** As received

Sample Description: Disk shaped pieces saw cut with diamond blade for testing

Stylus Type: Conical tip with a hardness/HRC: 55 **Test Method:** ASTM D7625-22

Stylus #	1	2	3	4	5
0° Orientation (CAI)	3.1	2.9	2.2	2.8	3.2
90° Orientation (CAI)	3.2	2.9	2.1	2.7	3.2
*Measurement were taken in CERCHAR Abrasivness Index (CAI) units. 1 CAI = 0.1 mm				Average =	**2.83**

Normalized for saw cut specimens? Yes

Formula: CAI = 0.99*CAIs + 0.48

*CAIs = Uncorrected sawcut CAI

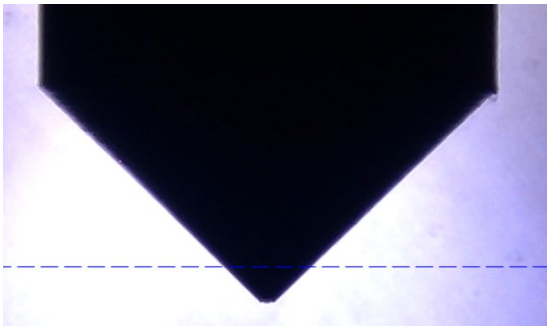
CAI =	**3.3**
Abrasiveness =	**High**

Classification	HRC=55	HRC=40
Very low	0.30-0.50	0.32-0.66
Low	0.50-1.00	0.66-1.51
Medium	1.00-2.00	1.51-3.22
High	2.00-4.00	3.22-6.62
Extreme	4.00-6.00	6.62-10.03
Quartzitic	6.00-7.00	N/A

Before Testing

After Testing

Stylus Under Microscope



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ASTM D 7625 CERCHAR Rock Abrasivity Report

Project: New Haven Harbor Rock Testing, NAE **Test Date:** 3/23/2026

Sample ID: E6/22212 **Sample Location:** BR-5, Run 1

Depth: 7.2' **Moisture Condition:** As received

Sample Description: Disk shaped pieces saw cut with diamond blade for testing

Stylus Type: Conical tip with a hardness/HRC: 55 **Test Method:** ASTM D7625-22

Stylus #	1	2	3	4	5
0° Orientation (CAI)	3.2	2.1	2.5	2.5	2.5
90° Orientation (CAI)	3.5	1.9	2.9	2.5	2.3
*Measurement were taken in CERCHAR Abrasivness Index (CAI) units. 1 CAI = 0.1 mm				Average =	**2.59**

Normalized for saw cut specimens? Yes
Formula: CAI = 0.99*CAIs + 0.48
*CAIs = Uncorrected sawcut CAI

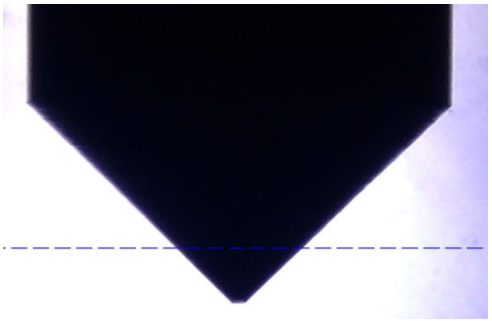
CAI =	**3.0**
Abrasiveness =	**High**

Classification	HRC=55	HRC=40
Very low	0.30-0.50	0.32-0.66
Low	0.50-1.00	0.66-1.51
Medium	1.00-2.00	1.51-3.22
High	2.00-4.00	3.22-6.62
Extreme	4.00-6.00	6.62-10.03
Quartzitic	6.00-7.00	N/A

Before Testing

After Testing

Stylus Under Microscope



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ASTM D 7625 CERCHAR Rock Abrasivity Report

Project: New Haven Harbor Rock Testing, NAE **Test Date:** 3/23/2026

Sample ID: E6/22213 **Sample Location:** BR-5, Run 1

Depth: 7.4' **Moisture Condition:** As received

Sample Description: Disk shaped pieces saw cut with diamond blade for testing

Stylus Type: Conical tip with a hardness/HRC: 55 **Test Method:** ASTM D7625-22

Stylus #	1	2	3	4	5
0° Orientation (CAI)	2.9	3.2	3.4	3.9	2.9
90° Orientation (CAI)	3.1	2.9	3.5	3.6	2.8
*Measurement were taken in CERCHAR Abrasivness Index (CAI) units. 1 CAI = 0.1 mm				Average =	**3.22**

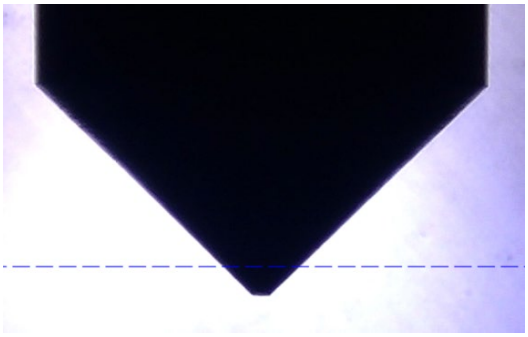
Normalized for saw cut specimens? Yes
Formula: CAI = 0.99*CAIs + 0.48
*CAIs = Uncorrected sawcut CAI

CAI =	**3.7**
Abrasiveness =	**High**

Classification	HRC=55	HRC=40
Very low	0.30-0.50	0.32-0.66
Low	0.50-1.00	0.66-1.51
Medium	1.00-2.00	1.51-3.22
High	2.00-4.00	3.22-6.62
Extreme	4.00-6.00	6.62-10.03
Quartzitic	6.00-7.00	N/A

Before Testing

Stylus Under Microscope



After Testing

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Marietta, GA 30062

ASTM D 7625 CERCHAR Rock Abrasivity Report

Project: New Haven Harbor Rock Testing, NAE **Test Date:** 3/23/2026

Sample ID: E6/22214 **Sample Location:** BR-5, Run 1

Depth: 8.5' **Moisture Condition:** As received

Sample Description: Disk shaped pieces saw cut with diamond blade for testing

Stylus Type: Conical tip with a hardness/HRC: 55 **Test Method:** ASTM D7625-22

Stylus #	1	2	3	4	5
0° Orientation (CAI)	3.3	3.5	2.5	2.9	2.5
90° Orientation (CAI)	3.6	3.4	3.2	3.1	2.2
*Measurement were taken in CERCHAR Abrasivness Index (CAI) units. 1 CAI = 0.1 mm				Average =	**3.02**

Normalized for saw cut specimens? Yes
Formula: CAI = 0.99*CAIs + 0.48
*CAIs = Uncorrected sawcut CAI

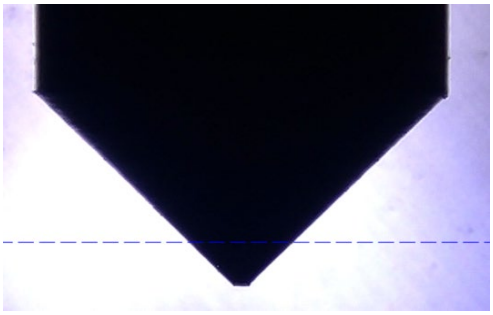
CAI =	**3.5**
Abrasiveness =	**High**

Classification	HRC=55	HRC=40
Very low	0.30-0.50	0.32-0.66
Low	0.50-1.00	0.66-1.51
Medium	1.00-2.00	1.51-3.22
High	2.00-4.00	3.22-6.62
Extreme	4.00-6.00	6.62-10.03
Quartzitic	6.00-7.00	N/A

Before Testing

After Testing

Stylus Under Microscope



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ASTM D 7625 CERCHAR Rock Abrasivity Report

Project: New Haven Harbor Rock Testing, NAE **Test Date:** 3/23/2026

Sample ID: E6/22215 **Sample Location:** BR-7, Run 1

Depth: 5.0' **Moisture Condition:** As received

Sample Description: Disk shaped pieces saw cut with diamond blade for testing

Stylus Type: Conical tip with a hardness/HRC: 55 **Test Method:** ASTM D7625-22

Stylus #	1	2	3	4	5
0° Orientation (CAI)	3.8	4.0	3.7	3.1	2.8
90° Orientation (CAI)	4.0	3.8	3.7	2.9	2.9
*Measurement were taken in CERCHAR Abrasivness Index (CAI) units. 1 CAI = 0.1 mm				Average =	**3.47**

Normalized for saw cut specimens? Yes
Formula: CAI = 0.99*CAIs + 0.48
*CAIs = Uncorrected sawcut CAI

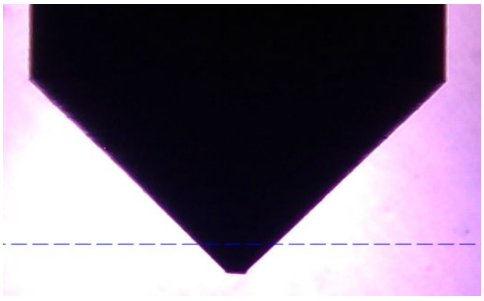
CAI =	**3.9**
Abrasiveness =	**High**

Classification	HRC=55	HRC=40
Very low	0.30-0.50	0.32-0.66
Low	0.50-1.00	0.66-1.51
Medium	1.00-2.00	1.51-3.22
High	2.00-4.00	3.22-6.62
Extreme	4.00-6.00	6.62-10.03
Quartzitic	6.00-7.00	N/A

Before Testing

After Testing

Stylus Under Microscope



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ASTM D 7625 CERCHAR Rock Abrasivity Report

Project: New Haven Harbor Rock Testing, NAE **Test Date:** 3/23/2026

Sample ID: E6/22216 **Sample Location:** BR-7, Run 1

Depth: 5.5' **Moisture Condition:** As received

Sample Description: Disk shaped pieces saw cut with diamond blade for testing

Stylus Type: Conical tip with a hardness/HRC: 55 **Test Method:** ASTM D7625-22

Stylus #	1	2	3	4	5
0° Orientation (CAI)	3.3	4.2	2.5	3.9	3.1
90° Orientation (CAI)	2.9	3.5	2.5	4.2	2.5
*Measurement were taken in CERCHAR Abrasivness Index (CAI) units. 1 CAI = 0.1 mm				Average =	**3.26**

Normalized for saw cut specimens? Yes
Formula: CAI = 0.99*CAIs + 0.48
*CAIs = Uncorrected sawcut CAI

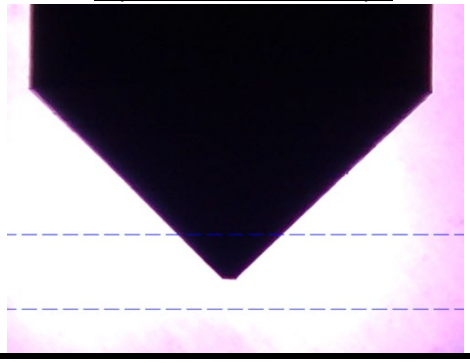
CAI =	**3.7**
Abrasiveness =	**High**

Classification	HRC=55	HRC=40
Very low	0.30-0.50	0.32-0.66
Low	0.50-1.00	0.66-1.51
Medium	1.00-2.00	1.51-3.22
High	2.00-4.00	3.22-6.62
Extreme	4.00-6.00	6.62-10.03
Quartzitic	6.00-7.00	N/A

Before Testing

After Testing

Stylus Under Microscope



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ASTM D 7625 CERCHAR Rock Abrasivity Report

Project: New Haven Harbor Rock Testing, NAE **Test Date:** 3/23/2026

Sample ID: E6/22217 **Sample Location:** BR-7, Run 1

Depth: 6.3' **Moisture Condition:** As received

Sample Description: Disk shaped pieces saw cut with diamond blade for testing

Stylus Type: Conical tip with a hardness/HRC: 55 **Test Method:** ASTM D7625-22

Stylus #	1	2	3	4	5
0° Orientation (CAI)	4.1	3.1	3.6	4.0	2.5
90° Orientation (CAI)	4.3	3.2	3.2	3.8	2.3
*Measurement were taken in CERCHAR Abrasivness Index (CAI) units. 1 CAI = 0.1 mm				Average =	**3.41**

Normalized for saw cut specimens? Yes
Formula: CAI = 0.99*CAIs + 0.48
*CAIs = Uncorrected sawcut CAI

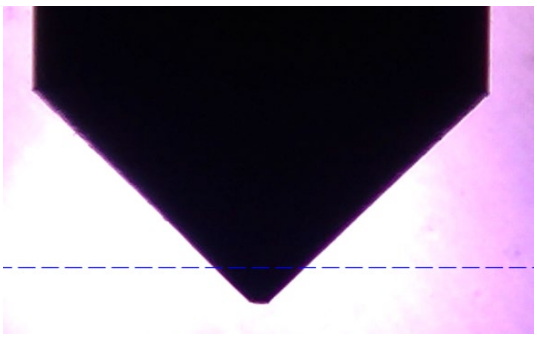
CAI =	**3.9**
Abrasiveness =	**High**

Classification	HRC=55	HRC=40
Very low	0.30-0.50	0.32-0.66
Low	0.50-1.00	0.66-1.51
Medium	1.00-2.00	1.51-3.22
High	2.00-4.00	3.22-6.62
Extreme	4.00-6.00	6.62-10.03
Quartzitic	6.00-7.00	N/A

Before Testing

After Testing

Stylus Under Microscope



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ASTM D 7625 CERCHAR Rock Abrasivity Report

Project: New Haven Harbor Rock Testing, NAE **Test Date:** 3/23/2026

Sample ID: E6/22218 **Sample Location:** BR-10, TRY 1, Run 1

Depth: 3.5' **Moisture Condition:** As received

Sample Description: Disk shaped pieces saw cut with diamond blade for testing

Stylus Type: Conical tip with a hardness/HRC: 55 **Test Method:** ASTM D7625-22

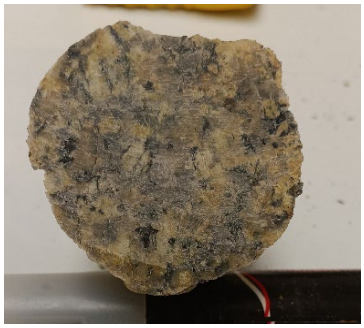
Stylus #	1	2	3	4	5
0° Orientation (CAI)	2.5	1.7	2.0	2.3	1.3
90° Orientation (CAI)	1.6	1.1	1.9	2.3	0.7
*Measurement were taken in CERCHAR Abrasivness Index (CAI) units. 1 CAI = 0.1 mm				Average =	**1.74**

Normalized for saw cut specimens? Yes
Formula: CAI = 0.99*CAIs + 0.48
*CAIs = Uncorrected sawcut CAI

CAI =	**2.2**
Abrasiveness =	**High**

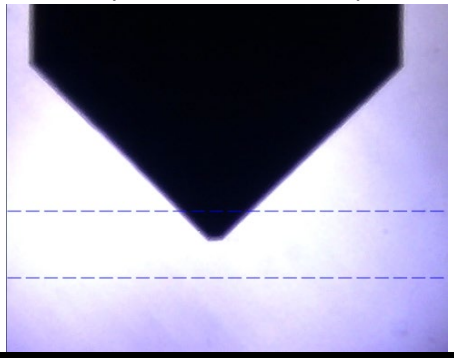
Classification	HRC=55	HRC=40
Very low	0.30-0.50	0.32-0.66
Low	0.50-1.00	0.66-1.51
Medium	1.00-2.00	1.51-3.22
High	2.00-4.00	3.22-6.62
Extreme	4.00-6.00	6.62-10.03
Quartzitic	6.00-7.00	N/A

Before Testing



After Testing

Stylus Under Microscope



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ASTM D 7625 CERCHAR Rock Abrasivity Report

Project: New Haven Harbor Rock Testing, NAE **Test Date:** 3/23/2026

Sample ID: E6/22219 **Sample Location:** BR-10, TRY 1, Run 3

Depth: 6.6' **Moisture Condition:** As received

Sample Description: Disk shaped pieces saw cut with diamond blade for testing

Stylus Type: Conical tip with a hardness/HRC: 55 **Test Method:** ASTM D7625-22

Stylus #	1	2	3	4	5
0° Orientation (CAI)	2.0	2.3	0.8	2.7	1.5
90° Orientation (CAI)	1.7	2.1	0.0	2.1	1.6
*Measurement were taken in CERCHAR Abrasivness Index (CAI) units. 1 CAI = 0.1 mm				Average =	**1.68**

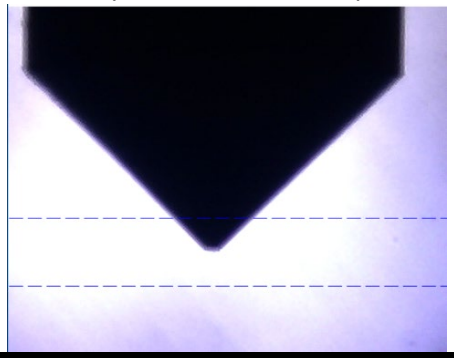
Normalized for saw cut specimens? Yes
Formula: CAI = 0.99*CAIs + 0.48
*CAIs = Uncorrected sawcut CAI

CAI =	**2.1**
Abrasiveness =	**High**

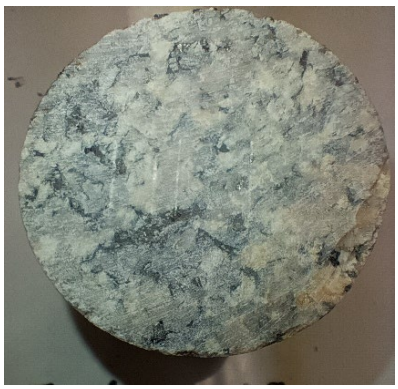
Classification	HRC=55	HRC=40
Very low	0.30-0.50	0.32-0.66
Low	0.50-1.00	0.66-1.51
Medium	1.00-2.00	1.51-3.22
High	2.00-4.00	3.22-6.62
Extreme	4.00-6.00	6.62-10.03
Quartzitic	6.00-7.00	N/A

Before Testing

Stylus Under Microscope



After Testing



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ASTM D 7625 CERCHAR Rock Abrasivity Report

Project: New Haven Harbor Rock Testing, NAE **Test Date:** 3/23/2026

Sample ID: E6/22220 **Sample Location:** BR-10, TRY 2, Run 1

Depth: 9.3' **Moisture Condition:** As received

Sample Description: Disk shaped pieces saw cut with diamond blade for testing

Stylus Type: Conical tip with a hardness/HRC: 55 **Test Method:** ASTM D7625-22

Stylus #	1	2	3	4	5
0° Orientation (CAI)	2.0	1.6	2.8	1.8	2.0
90° Orientation (CAI)	1.2	1.5	2.1	1.6	1.6
				Average =	**1.82**

*Measurement were taken in CERCHAR Abrasivness Index (CAI) units. 1 CAI = 0.1 mm

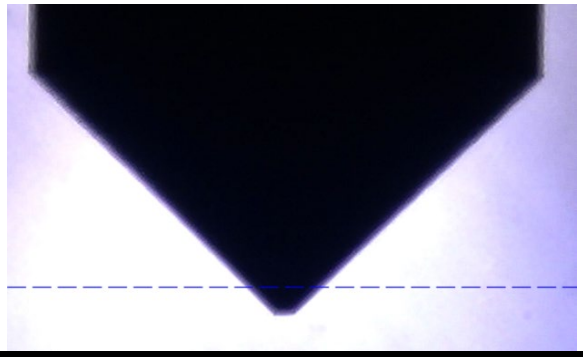
Normalized for saw cut specimens? Yes
Formula: CAI = 0.99*CAIs + 0.48
*CAIs = Uncorrected sawcut CAI

CAI =	**2.3**
Abrasiveness =	**High**

Classification	HRC=55	HRC=40
Very low	0.30-0.50	0.32-0.66
Low	0.50-1.00	0.66-1.51
Medium	1.00-2.00	1.51-3.22
High	2.00-4.00	3.22-6.62
Extreme	4.00-6.00	6.62-10.03
Quartzitic	6.00-7.00	N/A

Before Testing

Stylus Under Microscope



After Testing

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ASTM D 7625 CERCHAR Rock Abrasivity Report

Project: New Haven Harbor Rock Testing, NAE **Test Date:** 3/23/2026

Sample ID: E6/22221 **Sample Location:** BR-11, Run 1

Depth: 13.9' **Moisture Condition:** As received

Sample Description: Disk shaped pieces saw cut with diamond blade for testing

Stylus Type: Conical tip with a hardness/HRC: 55 **Test Method:** ASTM D7625-22

Stylus #	1	2	3	4	5
0° Orientation (CAI)	3.7	3.3	3.2	3.0	3.3
90° Orientation (CAI)	3.6	3.1	2.8	2.9	3.1
*Measurement were taken in CERCHAR Abrasivness Index (CAI) units. 1 CAI = 0.1 mm				Average =	**3.20**

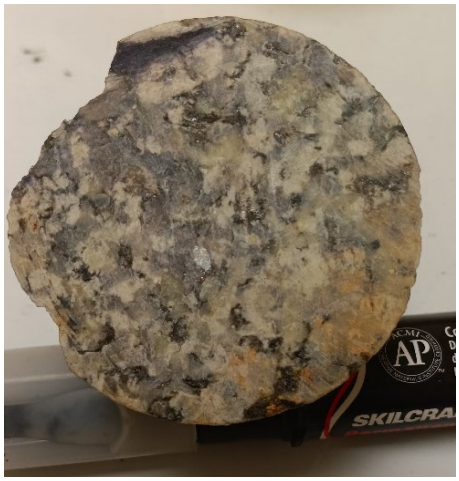
Normalized for saw cut specimens? Yes
Formula: CAI = 0.99*CAIs + 0.48
*CAIs = Uncorrected sawcut CAI

CAI =	**3.6**
Abrasiveness =	**High**

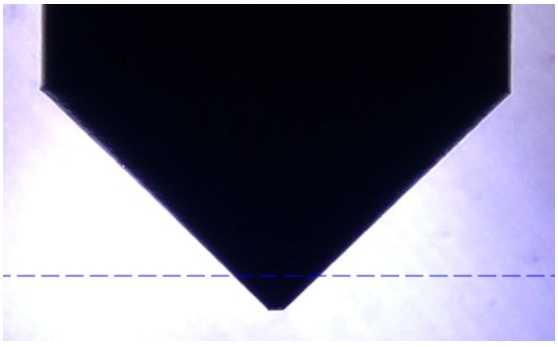
Classification	HRC=55	HRC=40
Very low	0.30-0.50	0.32-0.66
Low	0.50-1.00	0.66-1.51
Medium	1.00-2.00	1.51-3.22
High	2.00-4.00	3.22-6.62
Extreme	4.00-6.00	6.62-10.03
Quartzitic	6.00-7.00	N/A

Before Testing

After Testing



Stylus Under Microscope



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ASTM D 7625 CERCHAR Rock Abrasivity Report

Project: New Haven Harbor Rock Testing, NAE **Test Date:** 3/23/2026

Sample ID: E6/22222 **Sample Location:** BR-12, Run 1

Depth: 7.1' **Moisture Condition:** As received

Sample Description: Disk shaped pieces saw cut with diamond blade for testing

Stylus Type: Conical tip with a hardness/HRC: 55 **Test Method:** ASTM D7625-22

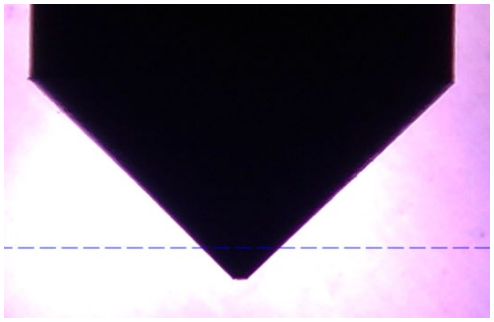
Stylus #	1	2	3	4	5
0° Orientation (CAI)	3.8	2.8	3.3	3.5	3.4
90° Orientation (CAI)	3.5	2.9	2.8	2.9	3.9
*Measurement were taken in CERCHAR Abrasivness Index (CAI) units. 1 CAI = 0.1 mm				Average =	**3.28**

Normalized for saw cut specimens? Yes
Formula: CAI = 0.99*CAIs + 0.48
*CAIs = Uncorrected sawcut CAI

CAI =	**3.7**
Abrasiveness =	**High**

Classification	HRC=55	HRC=40
Very low	0.30-0.50	0.32-0.66
Low	0.50-1.00	0.66-1.51
Medium	1.00-2.00	1.51-3.22
High	2.00-4.00	3.22-6.62
Extreme	4.00-6.00	6.62-10.03
Quartzitic	6.00-7.00	N/A

Stylus Under Microscope



Before Testing

After Testing

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ASTM D 7625 CERCHAR Rock Abrasivity Report

Project: New Haven Harbor Rock Testing, NAE **Test Date:** 3/23/2026

Sample ID: E6/22223 **Sample Location:** BR-12, Run 1

Depth: 8.5' **Moisture Condition:** As received

Sample Description: Disk shaped pieces saw cut with diamond blade for testing

Stylus Type: Conical tip with a hardness/HRC: 55 **Test Method:** ASTM D7625-22

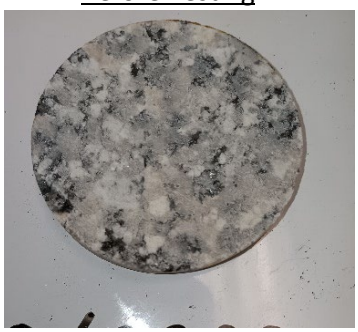
Stylus #	1	2	3	4	5
0° Orientation (CAI)	3.9	2.7	3.5	3.0	3.1
90° Orientation (CAI)	3.9	2.7	3.0	2.9	3.0
*Measurement were taken in CERCHAR Abrasivness Index (CAI) units. 1 CAI = 0.1 mm				Average =	**3.17**

Normalized for saw cut specimens? Yes
Formula: CAI = 0.99*CAIs + 0.48
*CAIs = Uncorrected sawcut CAI

CAI =	**3.6**
Abrasiveness =	**High**

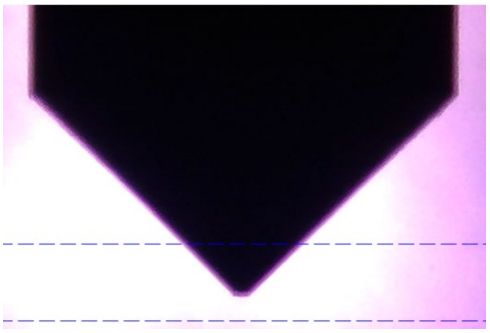
Classification	HRC=55	HRC=40
Very low	0.30-0.50	0.32-0.66
Low	0.50-1.00	0.66-1.51
Medium	1.00-2.00	1.51-3.22
High	2.00-4.00	3.22-6.62
Extreme	4.00-6.00	6.62-10.03
Quartzitic	6.00-7.00	N/A

Before Testing



After Testing

Stylus Under Microscope



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ASTM D 7625 CERCHAR Rock Abrasivity Report

Project: New Haven Harbor Rock Testing, NAE **Test Date:** 3/23/2026

Sample ID: E6/22224 **Sample Location:** BR-13, TRY 3, Run 1

Depth: 5.1' **Moisture Condition:** As received

Sample Description: Disk shaped pieces saw cut with diamond blade for testing

Stylus Type: Conical tip with a hardness/HRC: 55 **Test Method:** ASTM D7625-22

Stylus #	1	2	3	4	5
0° Orientation (CAI)	1.7	1.8	1.2	1.8	2.3
90° Orientation (CAI)	1.7	1.5	0.7	1.0	1.7
*Measurement were taken in CERCHAR Abrasivness Index (CAI) units. 1 CAI = 0.1 mm				Average =	**1.54**

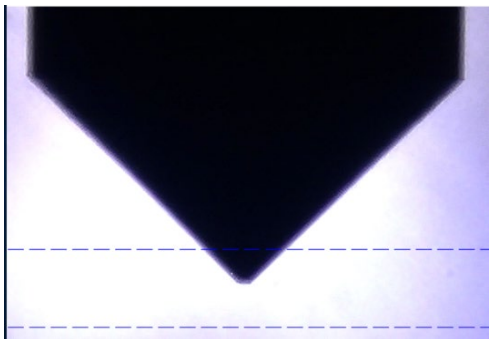
Normalized for saw cut specimens? Yes
Formula: CAI = 0.99*CAIs + 0.48
*CAIs = Uncorrected sawcut CAI

CAI =	**2.0**
Abrasiveness =	**High**

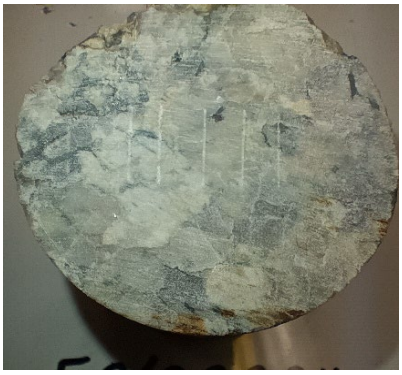
Classification	HRC=55	HRC=40
Very low	0.30-0.50	0.32-0.66
Low	0.50-1.00	0.66-1.51
Medium	1.00-2.00	1.51-3.22
High	2.00-4.00	3.22-6.62
Extreme	4.00-6.00	6.62-10.03
Quartzitic	6.00-7.00	N/A

Before Testing

Stylus Under Microscope



After Testing



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ASTM D 7625 CERCHAR Rock Abrasivity Report

Project: New Haven Harbor Rock Testing, NAE **Test Date:** 3/23/2026

Sample ID: E6/22225 **Sample Location:** BR-13, TRY 3, Run 1

Depth: 5.4' **Moisture Condition:** As received

Sample Description: Disk shaped pieces saw cut with diamond blade for testing

Stylus Type: Conical tip with a hardness/HRC: 55 **Test Method:** ASTM D7625-22

Stylus #	1	2	3	4	5
0° Orientation (CAI)	2.4	3.4	3.2	2.8	2.7
90° Orientation (CAI)	2.7	3.7	3.0	3.3	2.1
*Measurement were taken in CERCHAR Abrasivness Index (CAI) units. 1 CAI = 0.1 mm				Average =	**2.93**

Normalized for saw cut specimens? Yes
Formula: CAI = 0.99*CAIs + 0.48
*CAIs = Uncorrected sawcut CAI

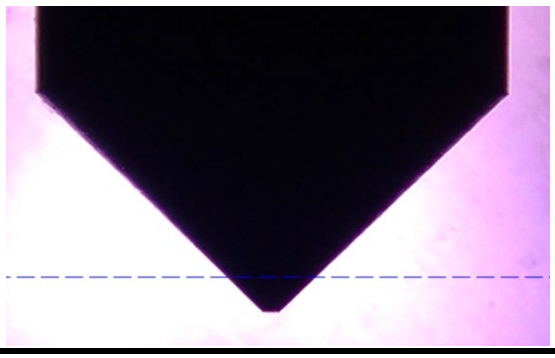
CAI =	**3.4**
Abrasiveness =	**High**

Classification	HRC=55	HRC=40
Very low	0.30-0.50	0.32-0.66
Low	0.50-1.00	0.66-1.51
Medium	1.00-2.00	1.51-3.22
High	2.00-4.00	3.22-6.62
Extreme	4.00-6.00	6.62-10.03
Quartzitic	6.00-7.00	N/A

Before Testing

After Testing

Stylus Under Microscope



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ASTM D 7625 CERCHAR Rock Abrasivity Report

Project: New Haven Harbor Rock Testing, NAE **Test Date:** 3/23/2026

Sample ID: E6/22226 **Sample Location:** BR-13, TRY 4, Run 1

Depth: 5.3' **Moisture Condition:** As received

Sample Description: Disk shaped pieces saw cut with diamond blade for testing

Stylus Type: Conical tip with a hardness/HRC: 55 **Test Method:** ASTM D7625-22

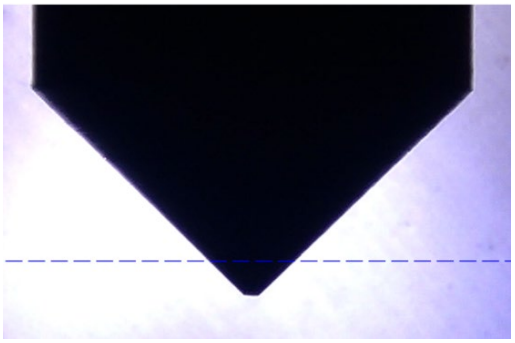
Stylus #	1	2	3	4	5
0° Orientation (CAI)	2.6	3.5	3.0	2.7	2.8
90° Orientation (CAI)	2.4	3.4	3.2	2.9	2.9
*Measurement were taken in CERCHAR Abrasivness Index (CAI) units. 1 CAI = 0.1 mm				Average =	**2.94**

Normalized for saw cut specimens? Yes
Formula: CAI = 0.99*CAIs + 0.48
*CAIs = Uncorrected sawcut CAI

CAI =	**3.4**
Abrasiveness =	**High**

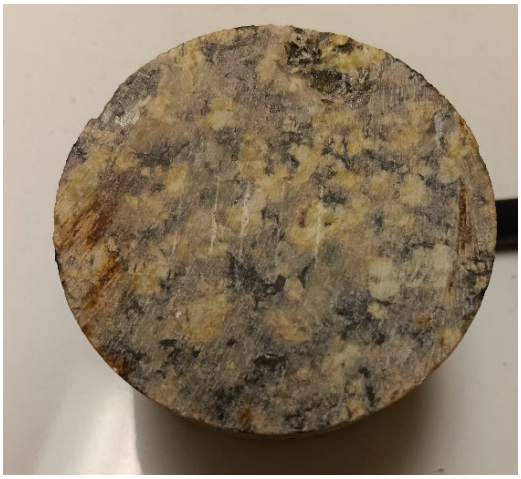
Classification	HRC=55	HRC=40
Very low	0.30-0.50	0.32-0.66
Low	0.50-1.00	0.66-1.51
Medium	1.00-2.00	1.51-3.22
High	2.00-4.00	3.22-6.62
Extreme	4.00-6.00	6.62-10.03
Quartzitic	6.00-7.00	N/A

Stylus Under Microscope



Before Testing

After Testing



U.S. Army Corps of Engineers
Savannah District

Materials Testing
Regional Technical Center of Expertise
200 N. Cobb Pkwy Suite 404
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ASTM D 7625 CERCHAR Rock Abrasivity Report

Project: New Haven Harbor Rock Testing, NAE **Test Date:** 3/23/2026

Sample ID: E6/22227 **Sample Location:** BR-13, TRY 4, Run 1

Depth: 5.5' **Moisture Condition:** As received

Sample Description: Disk shaped pieces saw cut with diamond blade for testing

Stylus Type: Conical tip with a hardness/HRC: 55 **Test Method:** ASTM D7625-22

Stylus #	1	2	3	4	5
0° Orientation (CAI)	2.9	2.7	3.1	2.3	2.2
90° Orientation (CAI)	3.4	2.3	2.8	2.1	2.0
*Measurement were taken in CERCHAR Abrasivness Index (CAI) units. 1 CAI = 0.1 mm				Average =	**2.58**

Normalized for saw cut specimens? Yes
Formula: CAI = 0.99*CAIs + 0.48
*CAIs = Uncorrected sawcut CAI

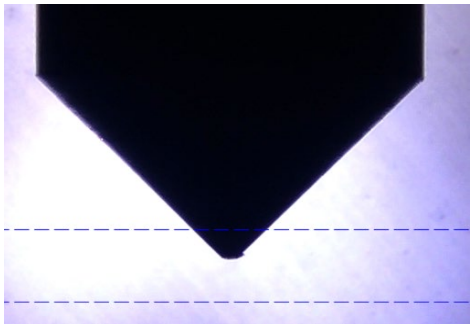
CAI =	**3.0**
Abrasiveness =	**High**

Classification	HRC=55	HRC=40
Very low	0.30-0.50	0.32-0.66
Low	0.50-1.00	0.66-1.51
Medium	1.00-2.00	1.51-3.22
High	2.00-4.00	3.22-6.62
Extreme	4.00-6.00	6.62-10.03
Quartzitic	6.00-7.00	N/A

Before Testing

After Testing

Stylus Under Microscope



U.S. Army Corps of Engineers
Materials Testing Regional Technical Center of Expertise
Marietta, Georgia

29-Apr-26

Rock Core - ASTM D5731 Point Load Determinations

Lab #	Boring #	Depth (ft)	Test Type	Dimension A (in)	Dimension B (in)	Load (lbs)	I_s (psi)	F	I_{s50} (psi)
E6/22208	BR-2, Run 1	8.1	Fragment	0.92	1.71	3409.9	1966.2	0.83	1641
E6/22209	BR-3B, Run 2	11.1	Fragment	1.03	1.73	4807.4	2531.9	0.85	2156
E6/22210	BR-5, Run 1	6.5	Fragment	0.62	1.58	3465.8	2864.3	0.77	2204
E6/22211	BR-5, Run 1	6.9	Fragment	0.86	1.98	7267.0	3599.6	0.86	3108
E6/22212	BR-5, Run 1	7.2	Fragment	0.90	1.98	5534.1	2663.9	0.87	2315
E6/22213	BR-5, Run 1	7.4	Fragment	0.58	1.74	2683.2	1985.2	0.79	1566
E6/22214	BR-5, Run 1	8.5	Fragment	0.71	1.98	5590.0	3089.7	0.84	2603
E6/22215	BR-7, Run 1	5.0	Fragment	0.89	1.69	5031.0	3038.3	0.83	2509
E6/22216	BR-7, Run 1	5.5	Fragment	1.45	1.97	6596.2	2256.7	0.94	2118
E6/22217	BR-7, Run 1	6.3	Fragment	1.28	1.80	6059.6	2554.5	0.90	2287
E6/22218	BR-10, TRY 1, Run 1	3.5	Fragment	0.73	1.98	5142.8	2785.2	0.85	2357
E6/22219	BR-10, TRY 1, Run 3	6.6	Fragment	1.15	1.58	4136.6	2217.7	0.85	1881
E6/22220	BR-10, TRY 2, Run 1	9.3	Fragment	1.33	1.69	7434.7	3263.9	0.89	2896
E6/22221	BR-11, Run 1	13.9	Fragment	0.99	1.63	3913.0	2287.6	0.83	1903
E6/22222	BR-12, Run 1	7.1	Fragment	0.53	1.62	3074.5	2664.4	0.76	2029
E6/22223	BR-12, Run 1	8.5	Fragment	1.01	1.66	4975.1	2788.9	0.84	2342
E6/22224	BR-13, TRY 3, Run 1	5.1	Fragment	1.00	1.64	3465.8	1985.3	0.84	1659
E6/22225	BR-13, TRY 3, Run 1	5.4	Fragment	1.01	1.64	4080.7	2323.7	0.84	1945
E6/22226	BR-13, TRY 4, Run 1	5.3	Fragment	0.98	1.66	5813.6	3338.1	0.84	2788
E6/22227	BR-13, TRY 4, Run 1	5.5	Fragment	1.02	1.60	5590.0	3244.5	0.83	2704

Note: Size correction factor is identified in the column "F". I_{s50} is the point load corrected to equivalent 50 mm or 2 inch diameter core. Samples were in an air dried condition.

U.S. Army Corps of Engineers
Materials Testing Regional Technical Center of Expertise
Marietta, Georgia

29-Apr-26

Rock Core - ASTM D2845 Pulse Velocity Determinations

Lab #	Boring #	Depth (ft)	Test Type	Length (in)	Pulse Time (sec)	Pulse Velocity (m/sec)	Density, pcf
E6/22208	BR-2, Run 1	8.1	Core with 2 inch diameter	4.02	23.8	6657	163.21
E6/22209	BR-3B, Run 2	11.1	Core with 2 inch diameter	3.95	21.1	7378	163.78
E6/22210	BR-5, Run 1	6.5	Core with 2 inch diameter	3.96	21.9	7120	163.16
E6/22211	BR-5, Run 1	6.9	Core with 2 inch diameter	0.90	13.0	2710	162.14
E6/22212	BR-5, Run 1	7.2	Core with 2 inch diameter	0.83	13.5	2432	162.19
E6/22213	BR-5, Run 1	7.4	Core with 2 inch diameter	2.70	16.7	6377	161.79
E6/22214	BR-5, Run 1	8.5	Core with 2 inch diameter	3.87	22.1	6892	160.83
E6/22215	BR-7, Run 1	5.0	Core with 2 inch diameter	3.94	20.1	7709	162.51
E6/22216	BR-7, Run 1	5.5	Core with 2 inch diameter	0.93	16.7	2181	162.02
E6/22217	BR-7, Run 1	6.3	Core with 2 inch diameter	4.02	27.6	5738	161.53
E6/22218	BR-10, TRY 1, Run 1	3.5	Core with 2 inch diameter	2.96	22.1	5273	162.40
E6/22219	BR-10, TRY 1, Run 3	6.6	Core with 2 inch diameter	3.90	23.3	6589	163.68
E6/22220	BR-10, TRY 2, Run 1	9.3	Core with 2 inch diameter	3.86	22.0	6902	162.42
E6/22221	BR-11, Run 1	13.9	Core with 2 inch diameter	3.90	25.2	6087	163.83
E6/22222	BR-12, Run 1	7.1	Core with 2 inch diameter	3.81	23.1	6490	162.26
E6/22223	BR-12, Run 1	8.5	Core with 2 inch diameter	3.83	27.6	5466	163.51
E6/22223	BR-12, Run 1	8.5	Core with 2 inch diameter	3.80	25.3	5914	163.47
E6/22224	BR-13, TRY 3, Run 1	5.1	Core with 2 inch diameter	1.00	10.6	3714	156.61
E6/22225	BR-13, TRY 3, Run 1	5.4	Core with 2 inch diameter	1.01	7.7	5154	159.21
E6/22226	BR-13, TRY 4, Run 1	5.3	Core with 2 inch diameter				
E6/22227	BR-13, TRY 4, Run 1	5.5	Core with 2 inch diameter	3.76	18.9	7832	162.73

Note: Core pieces were tested in an air dried condition, from saw cut ends of rock core. The pulse velocity meter was a Model number C-4899 James Instrument. Density was determined from linear measurements and weights in an air-dried condition.

U.S. Army Corps of Engineers
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Marietta, Georgia

29-Apr-26

Rock Core - ASTM D5873 Rebound Hammer Determinations

Lab #	Boring #	Depth (ft)	Test Type	Rebound Number	Corresponding Strength (psi)	Orientation of Hammer
E6/22208	BR-2, Run 1	8.1	Core with 2 inch diameter	44	6422	perpendicular
E6/22209	BR-3B, Run 2	11.1	Core with 2 inch diameter	50	7628	perpendicular
E6/22210	BR-5, Run 1	6.5	Core with 2 inch diameter			
E6/22211	BR-5, Run 1	6.9	Core with 2 inch diameter	46	6824	perpendicular
E6/22212	BR-5, Run 1	7.2	Core with 2 inch diameter	45	6623	perpendicular
E6/22213	BR-5, Run 1	7.4	Core with 2 inch diameter	67	11043	perpendicular
E6/22214	BR-5, Run 1	8.5	Core with 2 inch diameter	45	6623	perpendicular
E6/22215	BR-7, Run 1	5.0	Core with 2 inch diameter			
E6/22216	BR-7, Run 1	5.5	Core with 2 inch diameter	44	6422	perpendicular
E6/22217	BR-7, Run 1	6.3	Core with 2 inch diameter	40	5619	perpendicular
E6/22218	BR-10, TRY 1, Run 1	3.5	Core with 2 inch diameter	66	10842	perpendicular
E6/22219	BR-10, TRY 1, Run 3	6.6	Core with 2 inch diameter	43	6221	perpendicular
E6/22220	BR-10, TRY 2, Run 1	9.3	Core with 2 inch diameter	64	10441	perpendicular
E6/22221	BR-11, Run 1	13.9	Core with 2 inch diameter	62	10039	perpendicular
E6/22222	BR-12, Run 1	7.1	Core with 2 inch diameter			
E6/22223	BR-12, Run 1	8.5	Core with 2 inch diameter	40	5619	perpendicular
E6/22224	BR-13, TRY 3, Run 1	5.1	Core with 2 inch diameter	41	5820	perpendicular
E6/22225	BR-13, TRY 3, Run 1	5.4	Core with 2 inch diameter	64	10441	perpendicular
E6/22226	BR-13, TRY 4, Run 1	5.3	Core with 2 inch diameter	62	10039	perpendicular
E6/22227	BR-13, TRY 4, Run 1	5.5	Core with 2 inch diameter	40	5619	perpendicular

Note: Core fragments were testing in an air dried condition, within a rock core cradle or on a steel V-block. The rebound hammer was held perpendicular to the test face of the rock core. The rebound hammer was Model number H-2987. Rebound hammer testing on a steel anvil resulted in a reading of 80.

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29-Apr-26

Rock Core - ASTM D7012 UC Strength with and without Strain Measures

Lab #	Boring #	Depth (ft)	Test Type	Peak Strength (psi)	Modulus of Elasticity (psi)	Poisson's Ratio	Density, pcf
E6/22208	BR-2, Run 1	8.1	Core with 2 inch diameter	17,360	8,134,428	0.08	163.21
E6/22209	BR-3B, Run 2	11.1	Core with 2 inch diameter	24,492	20,218,428	0.20	163.78
E6/22210	BR-5, Run 1	6.5	Core with 2 inch diameter	15,910	4,522,204	0.31	163.16
E6/22211	BR-5, Run 1	6.9	Core with 2 inch diameter				162.14
E6/22212	BR-5, Run 1	7.2	Core with 2 inch diameter				162.19
E6/22213	BR-5, Run 1	7.4	Core with 2 inch diameter	2,033			161.79
E6/22214	BR-5, Run 1	8.5	Core with 2 inch diameter	20,579	13,840,533	0.26	160.83
E6/22215	BR-7, Run 1	5.0	Core with 2 inch diameter	13,393	6,546,763	0.21	162.51
E6/22216	BR-7, Run 1	5.5	Core with 2 inch diameter				162.02
E6/22217	BR-7, Run 1	6.3	Core with 2 inch diameter	21,457	7,740,159	0.21	161.53
E6/22218	BR-10, TRY 1, Run 1	3.5	Core with 2 inch diameter	13,758			162.40
E6/22219	BR-10, TRY 1, Run 3	6.6	Core with 2 inch diameter	16,012	5,573,345	0.02	163.68
E6/22220	BR-10, TRY 2, Run 1	9.3	Core with 2 inch diameter	21,402	9,245,973	0.18	162.42
E6/22221	BR-11, Run 1	13.9	Core with 2 inch diameter	18,657	8,809,471	0.25	163.83
E6/22222	BR-12, Run 1	7.1	Core with 2 inch diameter	20,364	7,077,584	0.22	162.26
E6/22223A	BR-12, Run 1	8.5	Core with 2 inch diameter	20,379	7,271,154	0.00	163.51
E6/22223B	BR-12, Run 1	8.5	Core with 2 inch diameter	23,825	2,704,157	0.16	163.47
E6/22224	BR-13, TRY 3, Run 1	5.1	Core with 2 inch diameter				156.61
E6/22225	BR-13, TRY 3, Run 1	5.4	Core with 2 inch diameter				159.21
E6/22226	BR-13, TRY 4, Run 1	5.3	Core with 2 inch diameter				
E6/22227	BR-13, TRY 4, Run 1	5.5	Core with 2 inch diameter	17,576	8,231,158	0.23	162.73

Note: Core pieces were tested in an air dried condition, from saw cut and ground ends of rock core. For samples 22213 and 22218, UC without strain measures were performed due to short specimen height. Poisson's ratios for 22208, 22210, 22219 & 2223A are not considered usable numbers due to circumferential gage readings likely being inaccurate. Density was determined from linear measurements and weights in an air-dried condition.

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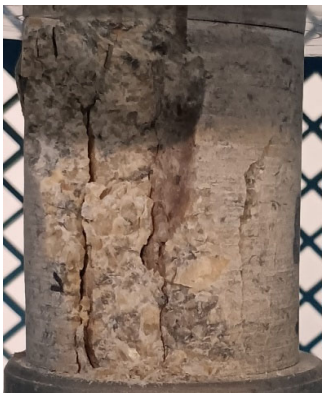
MARIETTA, GEORGIA

BEFORE



AFTER

TEST ID	B	**TYPE OF SPECIMEN**	Rock Core
DIAMETER, in.	1.98	**PEAK LOAD (lbs)**	6693
HEIGHT, in.	2.71	**COMPRESSIVE STRENGTH (psi)**	2033
LENGTH/DIAMETER RATIO	1.37	**MODULUS of ELASTICITY (psi)**	
DENSITY, pcf	161.8	**POISSON'S RATIO**	
FAILURE SHAPE	SEE PHOTO	**FAILURE TYPE**	split
AGE of CONCRETE		**CURING CONDITION**	Air Dried
REMARKS	Specimen tested in an air dried condition. Compressive Strength was corrected for Length/Diameter < 1.75.		
NOTES			
PROJECT	New Haven Harbor		
AREA	New England	**W.O. NO.**	60D7G8
REQUISITION NO.	W13G8660309514	**DATE RECEIVED**	
CONTRACT NO.		**BORING NO.**	BR-5
LAB NO.	E6/22213	**SAMPLE NO.**	Run 1
ASTM C7012 Unconfined Compression of Rock		**DEPTH (ft)**	7.4
		DATE REPORTED	1-May-26

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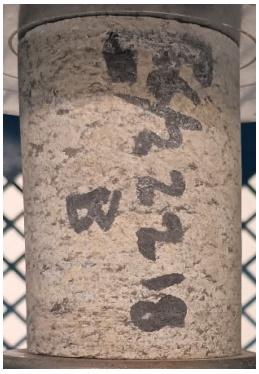

BEFORE

AFTER

TEST ID	B	**TYPE OF SPECIMEN**	Rock Core
DIAMETER, in.	1.96	**PEAK LOAD (lbs)**	43628
HEIGHT, in.	2.97	**COMPRESSIVE STRENGTH (psi)**	13758
LENGTH/DIAMETER RATIO	1.51	**MODULUS of ELASTICITY (psi)**	
DENSITY, pcf	162.4	**POISSON'S RATIO**	
FAILURE SHAPE	SEE PHOTO	**FAILURE TYPE**	split
AGE of CONCRETE		**CURING CONDITION**	Air Dried
REMARKS	Specimen tested in an air dried condition. Compressive Strength was corrected for Length/Diameter < 1.75.		
NOTES			
PROJECT	New Haven Harbor		
AREA	New England	**W.O. NO.**	60D7G8
REQUISITION NO.	W13G8660309514	**DATE RECEIVED**	
CONTRACT NO.		**BORING NO.**	BR-10, TRY 1
LAB NO.	E6/22218	**SAMPLE NO.**	Run 1
ASTM C7012 Unconfined Compression of Rock		**DEPTH (ft)**	7.4
		DATE REPORTED	1-May-26