# Attachment F

# MIAMI RIVER CORE BORINGS AND LABORATORY ANALYSIS

Hole No.CB-MR00-2

# DRILLING LOG

DIVISION: South Atlantic

INSTALLATION: Jacksonville District

SHEET 1 OF 1

1. PROJECT: Mars River
2. LOCATION (Coordinates or Station): X=618,443 Y=525,000
3. DRILLING AGENCY: USACE Wilmington
4. HOLE NO. (As shown on drawing title and file number): CB-MR00-2
5. NAME OF DRILLER: Snell
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED
7. THICKNESS OF OVERBURDEN: 0 FT.
8. DEPTH DRILLED INTO ROCK: 2 FT.
9. TOTAL DEPTH OF HOLE: 3.7 FT.
10. SIZE AND TYPE OF BIT: 4-inch Vibracore Tube
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MLLW Horizontal Datum: FLE NAD 83
12. MANUFACTURER'S DESIGNATION OF DRILL: Vibracore
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: Disturbed: 2 Undisturbed: 0
14. TOTAL NUMBER OF CORE BOXES: 1
15. ELEVATION GROUND WATER: Tidal
16. DATE HOLE: STARTED 4/3/00 COMPLETED 4/3/00
17. ELEVATION TOP OF HOLE: -15.5 Ft.
18. TOTAL CORE RECOVERY FOR BORING: 62 %
19. SIGNATURE OF Civil Engineer: Brian Hathaway (LAW)

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS (Description) | CORE REC % | SAMPLE NUMBER | REMARKS Vibracore |
|---|---|---|---|---|---|---|
| -15.5 | 0 | | | | | -15.5 |
| -17.2 | 1.7 | | SAND, fine quartz, little silt, brown-gray (SM) | 62 | 1 | |
| -19.2 | 3.7 | | LIMESTONE, coarse sand to medium gravel; sided fragments, light tan (LS) | | 2 | -19.2 |
| | | | SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOILS CLASSIFICATION SYSTEM. NOTE: Elevation is based on predicted tide tables. | | | Vibracore tubes split and logged by Law Engineering and Environmental Services, Inc., Jacksonville, Florida. |

| SAMPLE NO. | SAMPLE DEPTH | LAB CLASSIF. * |
|---|---|---|
| 1. | 0.0 - 1.7 | SM |
| 2. | 1.7 - 3.7 | SP |

* Lab classification based on gradation curve with no Atterberg Limits.

0 2.5 5 7.5 10 12.5 15 17.5 20 22.5

ENG FORM 5836 PREVIOUS EDITIONS ARE OBSOLETE. PROJECT: Mars River HOLE NUMBER: CB-MR00-2

Hole No.CB-MR00-5

# DRILLING LOG

DIVISION: South Atlantic

INSTALLATION: Jacksonville District

SHEET 1 OF 1

1. PROJECT: Mani River
2. LOCATION (Coordinates or Station): X=606,852 Y=636,898
3. DRILLING AGENCY: USACE Wilmington
4. HOLE NO. (As shown on drawing title and file number): CB-MR00-5
5. NAME OF DRILLER: Shell
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED
7. THICKNESS OF BURDEN: 0 Ft.
8. DEPTH DRILLED INTO ROCK: 0 Ft.
9. TOTAL DEPTH OF HOLE: 5.5 Ft.
10. SIZE AND TYPE OF BIT: 4-inch Vibracore Tube
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MLLW Horizontal Datum: FLE NAD 83
12. MANUFACTURER'S DESIGNATION OF DRILL: Vibracore
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: Disturbed: 2 Undisturbed: 0
14. TOTAL NUMBER OF CORE BOXES: 1
15. ELEVATION GROUND WATER: Tide
16. DATE HOLE: STARTED 4/2/00 COMPLETED 4/2/00
17. ELEVATION TOP OF HOLE: -10.1 Ft.
18. TOTAL CORE RECOVERY FOR BORING: 60 %
19. SIGNATURE OF DAY Engineer: Brian Hathaway (LAN)

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS (Description) | CORE REC % | SAMPLE NUMBER | REMARKS Vibracore |
|---|---|---|---|---|---|---|
| -10.1 | 0 | | | | | -10.1 |
| -13.1 | 3.0 | | SAND, fine quartz, some silt, light tan-gray (SM) | 60 | 1 | |
| -16.7 | 6.6 | | LIMESTONE, fine sand to gravel sized fragments, trace silt, gray-light tan (LS) | | 2 | -16.7 |
| | | | SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOILS CLASSIFICATION SYSTEM.<br><br>NOTE: Elevation is based on predicted tide tables.<br><br>SAMPLE NO. / SAMPLE DEPTH / LAB CLASSIF. #<br>1 / 0.0 - 3.0 / SM<br>2 / 3.0 - 6.6 / SP<br><br>Mark classification based on gradation curve with no Atterberg Limits. | | | Vibracore tubes split and logged by Law Engineering and Environmental Services, Inc., Jacksonville, Florida. |

0 2.5 5 7.5 10 12.5 15 17.5 20 22.5

ENG FORM 5530 PREVIOUS EDITIONS ARE OBSOLETE. SCALE 1"

PROJECT: Mani River

HOLE NUMBER: CB-MR00-5

Hole No.CB-MR00-8

# DRILLING LOG

| | |
|---|---|
| DIVISION: South Atlantic | INSTALLATION: Jacksonville District |
| SHEET 1 OF 1 | |
| 1. PROJECT: Mars River | 10. SIZE AND TYPE OF BIT: 4-inch Vibracore Tube |
| 2. LOCATION (Coordinates or Station): X=920,20; Y=139,33 | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MLLW Horizontal Datum: FLE NAD 83 |
| 3. DRILLING AGENCY: USACO Wilmington | 12. MANUFACTURER'S DESIGNATION OF DRILL: Vibracore |
| 4. HOLE NO. (As shown on drawing title and file number): CB-MR00-8 | 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: disturbed: 3 undisturbed: 0 |
| 5. NAME OF DRILLER: Snell | 14. TOTAL NUMBER OF CORE BOXES: 1 |
| 6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED | 15. ELEVATION GROUND WATER: Tide |
| | 16. DATE HOLE: STARTED 4/2/00 COMPLETED 4/2/00 |
| 7. THICKNESS OF OVERBURDEN: 0 Ft. | 17. ELEVATION TOP OF HOLE: -3.0 Ft. |
| 8. DEPTH DRILLED INTO ROCK: 0 Ft. | 18. TOTAL CORE RECOVERY FOR BORING: 71 % |
| 9. TOTAL DEPTH OF HOLE: 7.2 Ft. | 19. SIGNATURE OF CHI Engineer: Shun Hathaway (LAN) |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS (Description) | CORE REC % | SAMPLE NUMBER | REMARKS Vibracore |
|---|---|---|---|---|---|---|
| -3.0 | 0 | | | | | -3.0 |
| -6.0 | 4.1 | | SAND, fine quartz, little silt, light tan (SP-SM) | 71 | 1 | |
| -6.6 | 4.6 | | LIMESTONE, sand sized limestone fragments, trace silt, light tan (0.5) | | 2 | |
| | | | LIMESTONE, light tan (0.5) | | 3 | |
| -10.1 | 7.2 | | SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOILS CLASSIFICATION SYSTEM. NOTE: Elevation is based on predicted tide tables. SAMPLE NO. / SAMPLE DEPTH / LAB CLASSIF. 1: 0.1 - 4.1 SP-SM; 2: 5.0 - 7.2 SP-SM. Mark classification based on gradation curve with no Atterberg Limits. | | | -10.1 Vibracore tubes sent and logged by Law Engineering and Environmental Services, Inc., Jacksonville, Florida. |

0 2.5 5 7.5 10 12.5 15 17.5 20 22.5

ENG FORM 5836 PREVIOUS EDITIONS ARE OBSOLETE. PAGE 1/1

PROJECT: Mars River

HOLE NUMBER: CB-MR00-8

Hole No.CB-MR00-6

# DRILLING LOG

DIVISION: South Atlantic

INSTALLATION: Jacksonville District

SHEET 1 OF 1

1. PROJECT: Miami River
2. LOCATION (Coordinates or Station): N=803,744 E=532,903
3. DRILLING AGENCY: USACE Wilmington
4. HOLE NO. (As shown on drawing title and file number): CB-MR00-6
5. NAME OF DRILLER: Snell
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED
7. THICKNESS OF BURDEN: 0 FT.
8. DEPTH DRILLED INTO ROCK: 0 FT.
9. TOTAL DEPTH OF HOLE: 6.4 FT.
10. SIZE AND TYPE OF BIT: 4-inch Vibracore Tube
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MLLW Horizontal Datum: FLE NAD 83
12. MANUFACTURER'S DESIGNATION OF DRILL: Vibracore
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: Disturbed: 1 Undisturbed: 0
14. TOTAL NUMBER OF CORE BOXES: 1
15. ELEVATION GROUND WATER: None
16. DATE HOLE: STARTED 4/2/03 COMPLETED 4/2/03
17. ELEVATION TOP OF HOLE: -15.4 FT.
18. TOTAL CORE RECOVERY FOR BORING: 83 %
19. SIGNATURE OF CHI Engineer: Brian Hathaway (LAW)

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS (Description) | CORE REC % | SAMPLE NUMBER | REMARKS Vibracore |
|---|---|---|---|---|---|---|
| -15.4 | 0 | | | | | -15.4 |
| -21.8 | 6.4 | | SAND, fine quartz, little silt, trace fine to medium gravel sized limerock fragments, light tan (SP-SM) | 83 | 1 | -21.8 |
| | | | SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOILS CLASSIFICATION SYSTEM.<br><br>NOTE: Elevation is based on predicted tide tables.<br><br>SAMPLE NO. 1 — SAMPLE DEPTH 0.0 - 6.4 — LAB CLASSIFIC. SP-SM<br><br>Lab classification based on gradation curve with no Atterberg Limits. | | | Vibracore tubes split and logged by Law Engineering and Environmental Services, Inc., Jacksonville, Florida |

0 2.5 5 7.5 10 12.5 15 17.5 20 22.5

ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE. PROJECT: Miami River HOLE NUMBER: CB-MR00-6

Hole No.CB-MR00-7

# DRILLING LOG

DIVISION: South Atlantic

INSTALLATION: Jacksonville District

SHEET 1 OF 1

1. PROJECT: Miami River
2. LOCATION (Coordinates or Station): X=800,803 Y=635,303
3. DRILLING AGENCY: USACE Wilmington
4. HOLE NO. (As shown on drawing title and file number): CB-MR00-7
5. NAME OF DRILLER: Smith
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED
7. THICKNESS OF OVERBURDEN: 0 FT.
8. DEPTH DRILLED INTO ROCK: 0 FT.
9. TOTAL DEPTH OF HOLE: 5.8 FT.
10. SIZE AND TYPE OF BIT: 4-inch Vibracore Tube
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MLLW Horizontal Datum: FLE NAD 83
12. MANUFACTURER'S DESIGNATION OF DRILL: Vibracore
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: disturbed: 3 undisturbed: 0
14. TOTAL NUMBER OF CORE BOXES: 1
15. ELEVATION GROUND WATER: Tidal
16. DATE HOLE: STARTED 4/20/00 COMPLETED 4/2/00
17. ELEVATION TOP OF HOLE: -12.1 FT.
18. TOTAL CORE RECOVERY FOR BORING: 59 %
19. SIGNATURE OF CHIEF Engineer: Brian Hathaway (LAW)

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS (Description) | CORE REC. % | SAMPLE NUMBER | REMARKS Vibracore |
|---|---|---|---|---|---|---|
| -12.1 | 0 | | | | | -12.1 |
| -15.2 | 3.1 | | SILT, sandy fine quartz sand, little decayed organic, dark brown (ML) | 59 | 1 | |
| -17.2 | 5.1 | | SAND, fine quartz, little silt, trace fine gravel sized limestone fragments, light tan (SP-SM) | | 2 | |
| -18.0 | 5.9 | | LIMESTONE, well cemented, gravel sized rock fragments, light tan (LS) | | 3 | -18.0 |

SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOILS CLASSIFICATION SYSTEM.

NOTE: Elevation is based on predicted tide tables.

| SAMPLE No. | SAMPLE DEPTH | LAB CLASSIF. * |
|---|---|---|
| 1 | 3.4 - 3.1 | SM |
| 2 | 5.1 - 5.1 | SP-SM |
| 3 | 5.1 - 5.9 | SP |

* Lab classification based on gradation curve with no Atterberg Limits

Vibracore tubes split and logged by Law Engineering and Environmental Services, Inc., Jacksonville, Florida.

0 2.5 5 7.5 10 12.5 15 17.5 20 22.5

ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE. MAR 71

PROJECT: Miami River

HOLE NUMBER: CB-MR00-7

Hole No.CB-MR00-4

# DRILLING LOG

DIVISION: South Atlantic

INSTALLATION: Jacksonville District

SHEET 1 OF 1

1. PROJECT: Miami River
2. LOCATION (Coordinates or Station): X=807,370 Y=330,478
3. DRILLING AGENCY: USACE Wilmington
4. HOLE NO. (As shown on drawing title and file number): CB-MR00-4
5. NAME OF DRILLER: Snell
6. DIRECTION OF HOLE: ☒ Vertical ☐ Inclined
7. THICKNESS OF OVERBURDEN: 0 Ft.
8. DEPTH DRILLED INTO ROCK: 0 Ft.
9. TOTAL DEPTH OF HOLE: 7.2 Ft.
10. SIZE AND TYPE OF BIT: 4-inch Vibracore Tube
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MLLW Horizontal Datum: FLE NAD 83
12. MANUFACTURER'S DESIGNATION OF DRILL: Vibracore
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: disturbed: 2 undisturbed: 0
14. TOTAL NUMBER OF CORE BOXES: 1
15. ELEVATION GROUND WATER: Tidal
16. DATE HOLE: STARTED 4/2/08 COMPLETED 4/2/08
17. ELEVATION TOP OF HOLE: -0.8 Ft.
18. TOTAL CORE RECOVERY FOR BORING: 74 %
19. SIGNATURE OF CH Engineer: Brian Hathaway (LAW)

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS (Description) | CORE REC. % | SAMPLE NUMBER | REMARKS Vibracore |
|---|---|---|---|---|---|---|
| -0.8 | 0 | | | | | -0.8 |
| | | | SILT, little fine quartz sand, trace organics, dark brown-gray (ML) | 74 | 1 | |
| -4.7 | 4.7 | | LIMESTONE, fine sand to gravel sized fragments, light tan (LS) | | 2 | |
| -6.4 | 7.2 | | | | | -6.4 |
| | | | SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOILS CLASSIFICATION SYSTEM.<br><br>NOTE: Elevation is based on predicted tide levels. | | | Vibracore tubes split and logged by Law Engineering and Environmental Services, Inc., Jacksonville, Florida. |

| SAMPLE NO. | SAMPLE DEPTH | LAB CLASSIF. |
|---|---|---|
| 1 | 0.0 - 4.2 | SP |
| 2 | 4.2 - 7.2 | GP-GM |

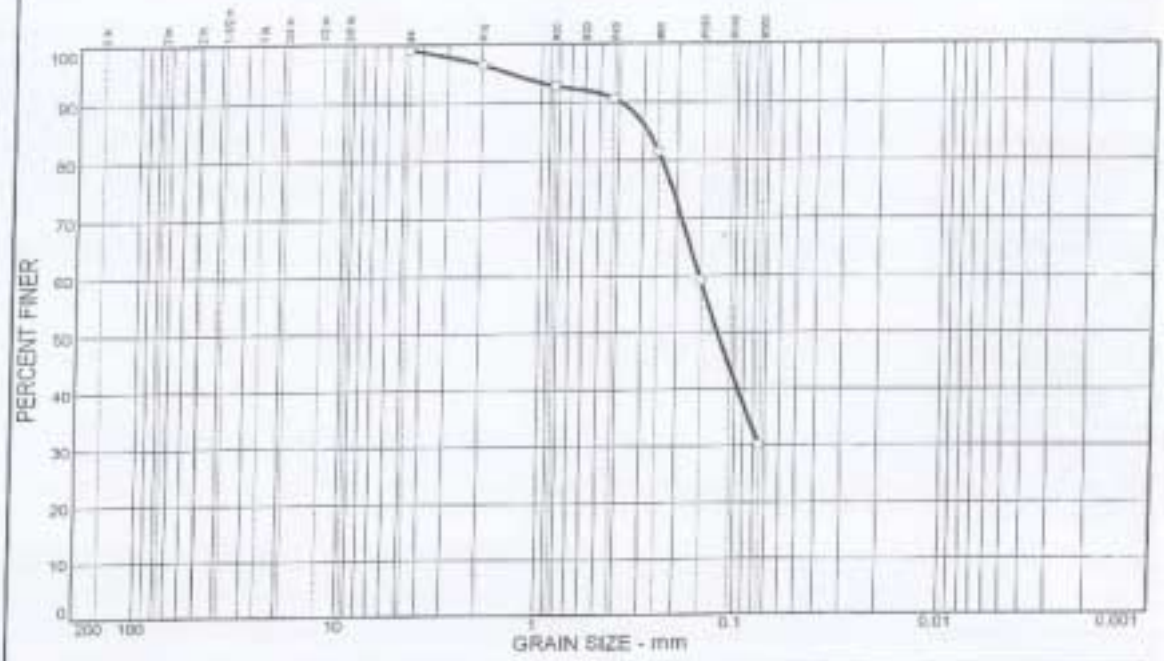
Field classification based on gradation curve with no Atterberg Limits.

ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE. SHEET 1

PROJECT: Miami River

HOLE NUMBER: CB-MR00-4

# Grain Size Distribution Report




| | % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | | | 68.9 | 30.2 | | SM | A-2-4(0) | | |
| | | | | | | | | | |
| | | | | | | | | | |

| SIEVE inches-SIEVE | PERCENT FINER ○ | | |
|---|---|---|---|
| | | | |
| | GRAIN SIZE | | |
| $D_{60}$ | 0.153 | | |
| $D_{30}$ | | | |
| $D_{10}$ | | | |
| | COEFFICIENTS | | |
| $C_c$ | | | |
| $C_u$ | | | |

| SIEVE number-size | PERCENT FINER ○ | | |
|---|---|---|---|
| #4 | 99.1 | | |
| #10 | 96.5 | | |
| #20 | 92.8 | | |
| #40 | 90.6 | | |
| #60 | 81.5 | | |
| #100 | 59.2 | | |
| #200 | 30.2 | | |

SOIL DESCRIPTION

○ SAND, fine quartz, some silt, trace decaying organics, dark brown

REMARKS:

○

○ Source: CB-MROO-7 Sample No.: 1 Elev./Depth: 0.0'-3.1'

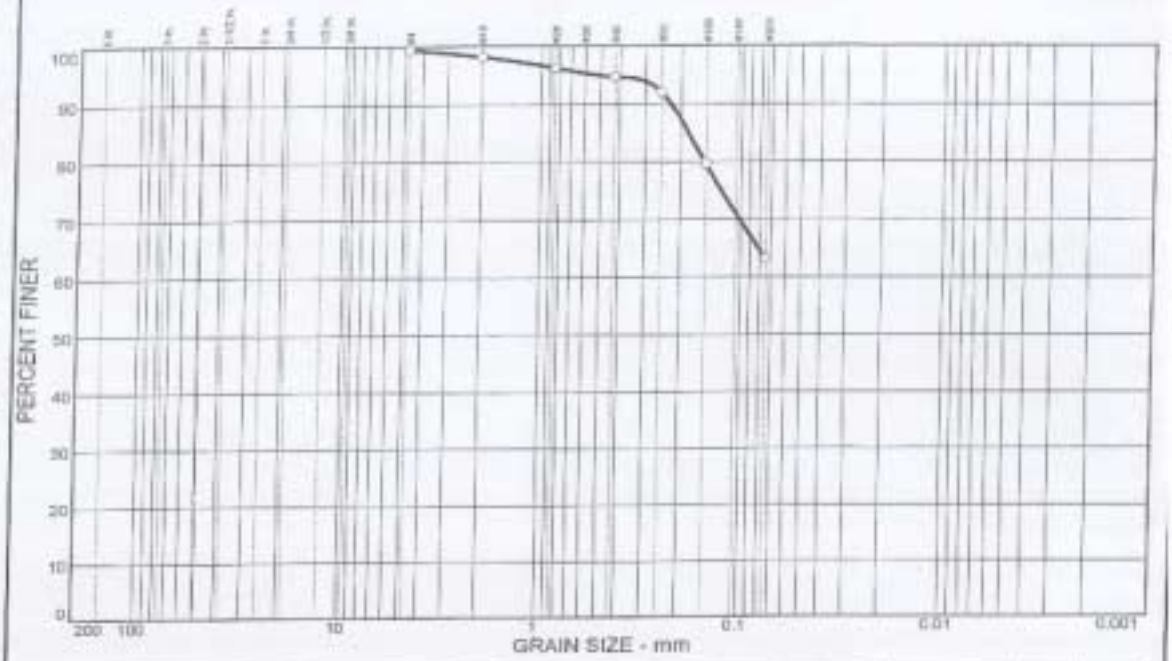
**Law Engineering and Environmental Services, Inc.**

Client: USACE, Jacksonville District

Project: Miami River

Project No.: 40521-8-8051-38

# Grain Size Distribution Report




| | % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | | | 36.2 | 63.2 | | ML | A-4(0) | | |

| SIEVE number size | PERCENT FINER ○ |
|---|---|
| #4 | 99.4 |
| #10 | 98.2 |
| #20 | 96.5 |
| #40 | 94.7 |
| #60 | 92.0 |
| #100 | 79.6 |
| #200 | 63.2 |

| GRAIN SIZE | |
|---|---|
| $D_{60}$ | |
| $D_{30}$ | |
| $D_{10}$ | |
| **COEFFICIENTS** | |
| $C_c$ | |
| $C_u$ | |

SOIL DESCRIPTION

○ SILT, some fine quartz sand, trace organics, dark brown-gray

REMARKS

○

○ Source: CB-MROO-4 Sample No.: 1 Elev./Depth: 0.0'-4.2'

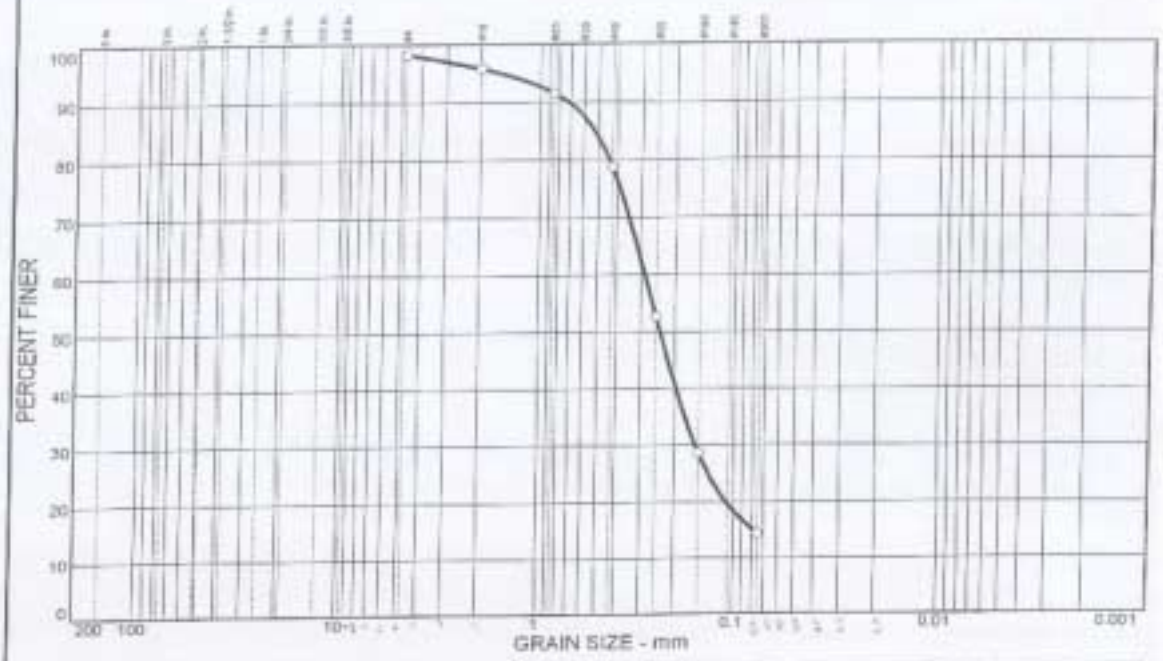
**Law Engineering and Environmental Services, Inc.**

Client: USACE, Jacksonville District

Project: Miami River

Project No.: 40521-8-8051-38

# Grain Size Distribution Report




| | % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | | | 84.1 | 14.2 | | SM | A-2-4(0) | | |

| SIEVE inches size | PERCENT FINER ○ | | |
|---|---|---|---|
| | | | |
| | GRAIN SIZE | | |
| $D_{60}$ | 0.286 | | |
| $D_{30}$ | 0.156 | | |
| $D_{10}$ | | | |
| | COEFFICIENTS | | |
| $C_c$ | | | |
| $C_u$ | | | |

| SIEVE number size | PERCENT FINER ○ | | |
|---|---|---|---|
| #4 | 98.3 | | |
| #10 | 95.8 | | |
| #20 | 91.3 | | |
| #40 | 78.7 | | |
| #60 | 52.7 | | |
| #100 | 28.6 | | |
| #200 | 14.2 | | |

SOIL DESCRIPTION
○ SAND, fine quartz, little silt, brown-gray

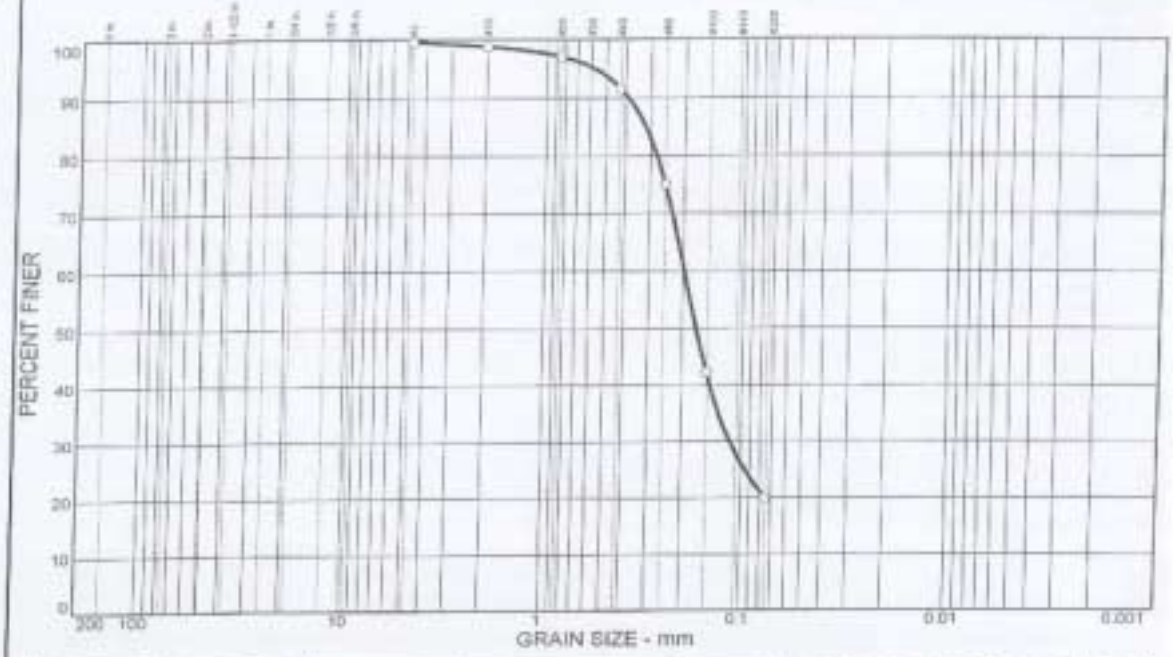
REMARKS
○

○ Source: CB-MROO-2 Sample No.: 1 Elev./Depth: 0.0'-1.7'

**Law Engineering and Environmental Services, Inc.**

Client: USACE, Jacksonville District
Project: Miami River
Project No.: 40521-8-8051-38

# Grain Size Distribution Report




| | % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| O | | | 79.8 | 19.8 | | SM | A-2-4(0) | | |

| SIEVE inches size | PERCENT FINER | | |
|---|---|---|---|
| | O | | |

| | GRAIN SIZE | | |
|---|---|---|---|
| $D_{60}$ | 0.197 | | |
| $D_{30}$ | 0.114 | | |
| $D_{10}$ | | | |

| | COEFFICIENTS | | |
|---|---|---|---|
| $C_c$ | | | |
| $C_u$ | | | |

| SIEVE number size | PERCENT FINER | | |
|---|---|---|---|
| | O | | |
| #4 | 99.6 | | |
| #10 | 98.8 | | |
| #20 | 97.1 | | |
| #40 | 91.5 | | |
| #60 | 75.1 | | |
| #100 | 42.2 | | |
| #200 | 19.8 | | |

SOIL DESCRIPTION

O SAND, fine quartz, little silt, grey-light tan

REMARKS:

O

O Source: CB-MROO-5 Sample No.: 1 Elev./Depth: 0.0'-3.0'

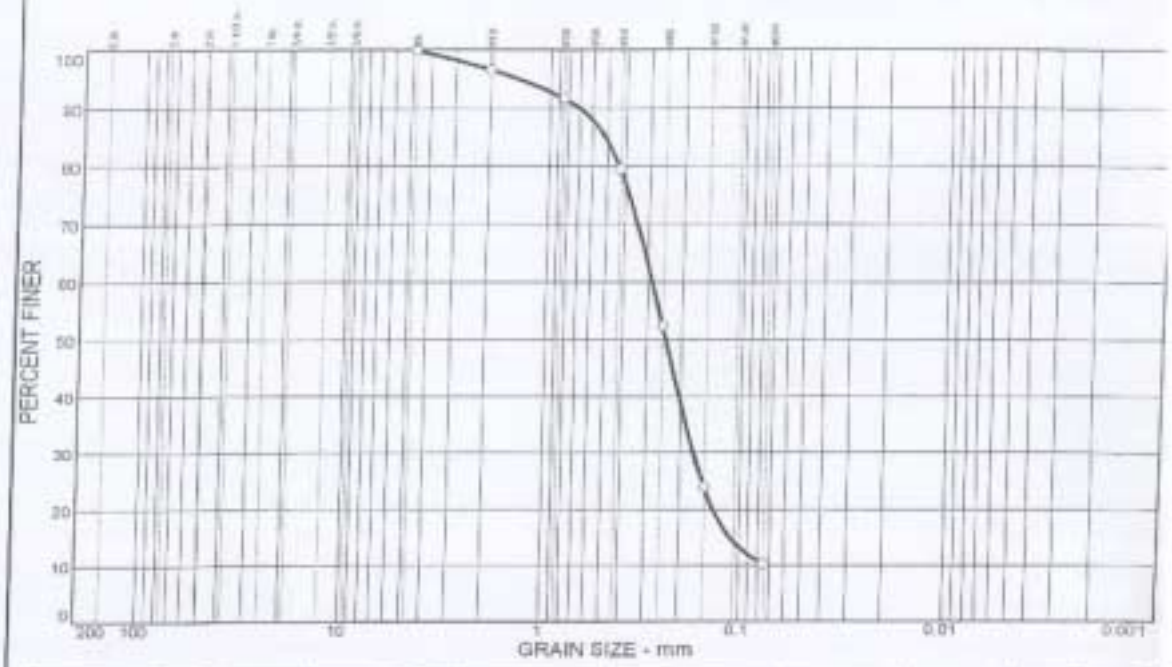
**Law Engineering and Environmental Services, Inc.**

Client: USACE, Jacksonville District

Project: Miami River

Project No.: 40521-8-8051-38

# Grain Size Distribution Report




| | % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | | | 89.7 | 10.3 | | SP-SM | A-3 | | |

| SIEVE inches size | PERCENT FINER ○ |
|---|---|
| | |
| | GRAIN SIZE |
| $D_{60}$ | 0.284 |
| $D_{30}$ | 0.171 |
| $D_{10}$ | |
| | COEFFICIENTS |
| $C_c$ | |
| $C_u$ | |

| SIEVE number size | PERCENT FINER ○ |
|---|---|
| #4 | 99.9 |
| #10 | 96.6 |
| #20 | 91.6 |
| #40 | 79.4 |
| #60 | 52.4 |
| #100 | 23.9 |
| #200 | 10.2 |

SOIL DESCRIPTION

○ SAND, fine quartz, little silt, tan

REMARKS

○

○ Source: CB-MROO-8 Sample No.: 1 Elev./Depth: 0.0'-4.1'

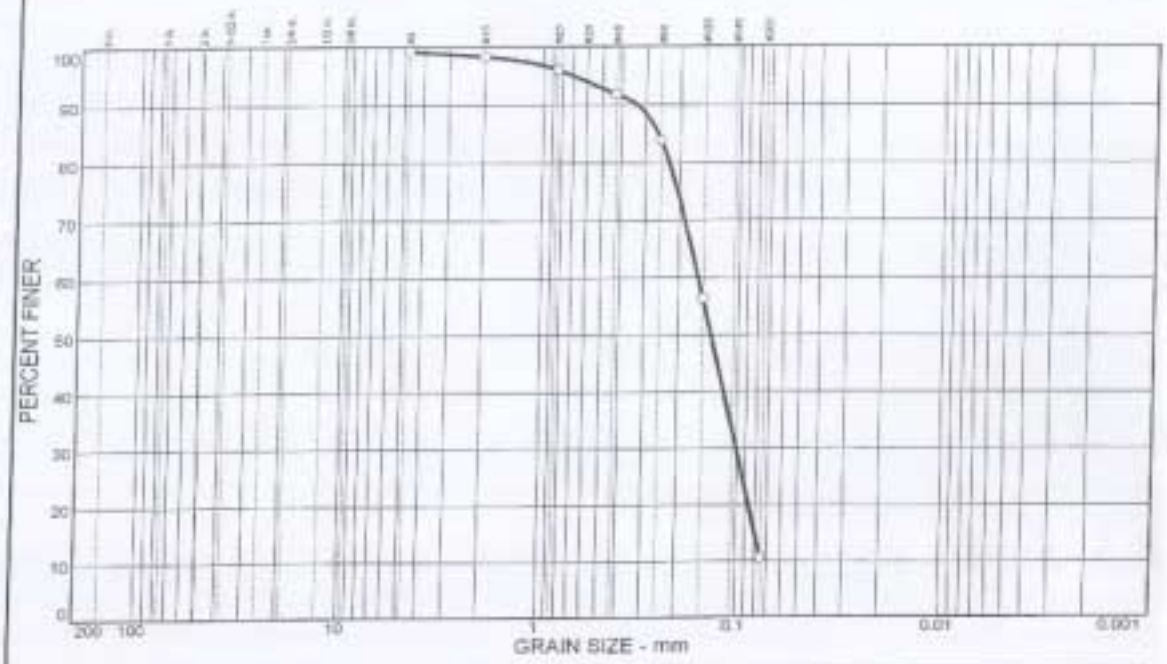
**Law Engineering and Environmental Services, Inc.**

Client: USACE, Jacksonville District

Project: Miami River

Project No.: 40521-8-8051-38

# Grain Size Distribution Report




| | % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | | | 88.7 | 10.5 | | SP-SM | A-3 | | |

| SIEVE inches mm | PERCENT FINER ○ | | |
|---|---|---|---|
| | | | |
| | GRAIN SIZE | | |
| $D_{60}$ | 0.159 | | |
| $D_{30}$ | 0.100 | | |
| $D_{10}$ | | | |
| | COEFFICIENTS | | |
| $C_c$ | | | |
| $C_u$ | | | |

| SIEVE number size | PERCENT FINER ○ | | |
|---|---|---|---|
| #4 | 99.2 | | |
| #10 | 98.3 | | |
| #20 | 96.1 | | |
| #40 | 91.8 | | |
| #60 | 83.9 | | |
| #100 | 56.4 | | |
| #200 | 10.5 | | |

SOIL DESCRIPTION
○ SAND, fine quartz, little silt, light tan

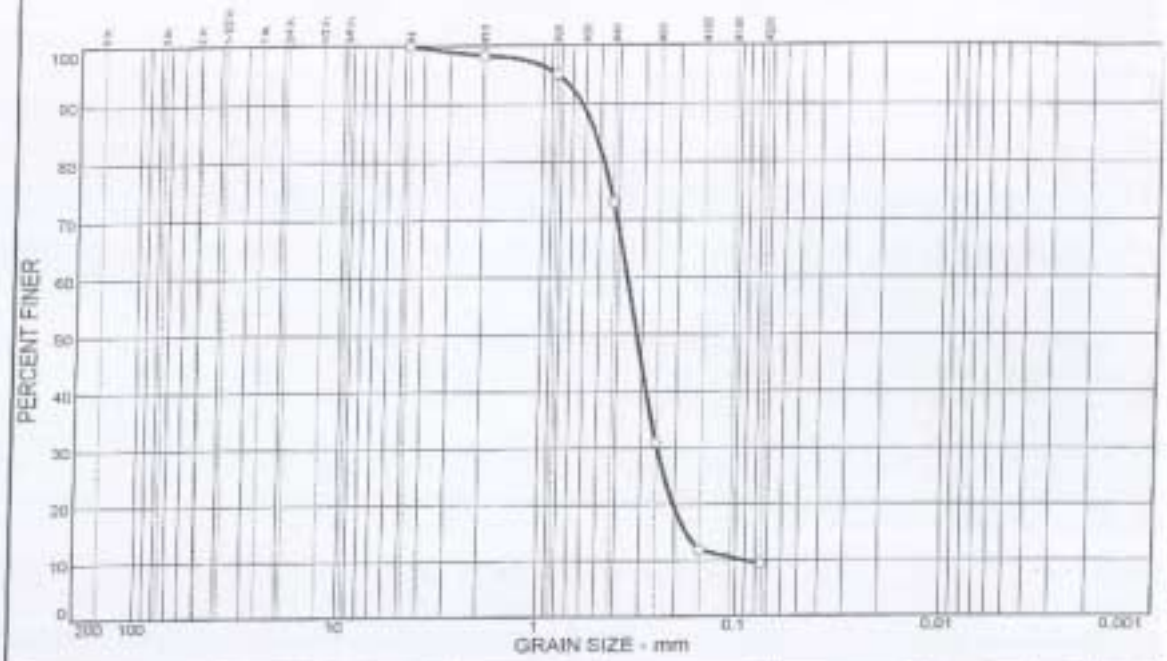
REMARKS
○

○ Source: CB-MROO-6 Sample No.: 1 Elev./Depth: 0.0'-6.4'

**Law Engineering and Environmental Services, Inc.**

Client: USACE, Jacksonville District
Project: Miami River
Project No.: 40521-8-8031-38

# Grain Size Distribution Report




| | % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | | | 90.7 | 9.3 | | SP-SM | A-3 | | |

| SIEVE (inches / mm) | PERCENT FINER ○ |
|---|---|
| GRAIN SIZE | |
| $D_{60}$ | 0.358 |
| $D_{30}$ | 0.246 |
| $D_{10}$ | 0.0904 |
| COEFFICIENTS | |
| $C_c$ | 1.87 |
| $C_u$ | 3.97 |

| SIEVE (number / size) | PERCENT FINER ○ |
|---|---|
| #4 | 100.0 |
| #10 | 98.3 |
| #20 | 95.1 |
| #40 | 73.0 |
| #60 | 51.0 |
| #100 | 11.9 |
| #200 | 9.3 |

SOIL DESCRIPTION

○ SAND, fine quartz, little sand sized limestone fragments, trace silt, tan

REMARKS

○

○ Source: CB-MROO-7 Sample No.: 2 Elev./Depth: 3.1'-5.1'

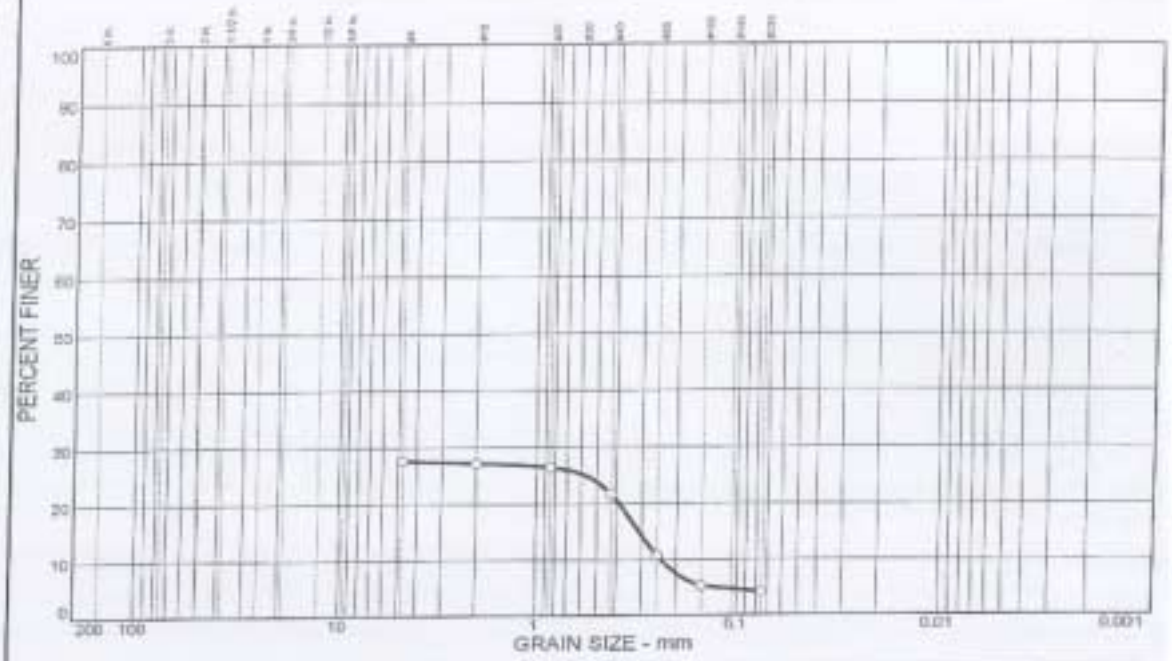
**Law Engineering and Environmental Services, Inc.**

Client: USACE, Jacksonville District

Project: Miami River

Project No.: 40521-8-8051-38

# Grain Size Distribution Report




| | % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | | | 23.5 | 4.1 | | GP | A-1-a | | |

| SIEVE (inches size) | PERCENT FINER ○ | | |
|---|---|---|---|
| | | | |
| | GRAIN SIZE | | |
| $D_{60}$ | | | |
| $D_{30}$ | | | |
| $D_{10}$ | 0.240 | | |
| | COEFFICIENTS | | |
| $C_c$ | | | |
| $C_u$ | | | |

| SIEVE (number size) | PERCENT FINER ○ | | |
|---|---|---|---|
| #4 | 27.6 | | |
| #10 | 27.2 | | |
| #20 | 26.4 | | |
| #40 | 21.6 | | |
| #60 | 10.7 | | |
| #100 | 5.2 | | |
| #200 | 4.1 | | |

SOIL DESCRIPTION
○ LIMESTONE, hard, trace silt, light tan

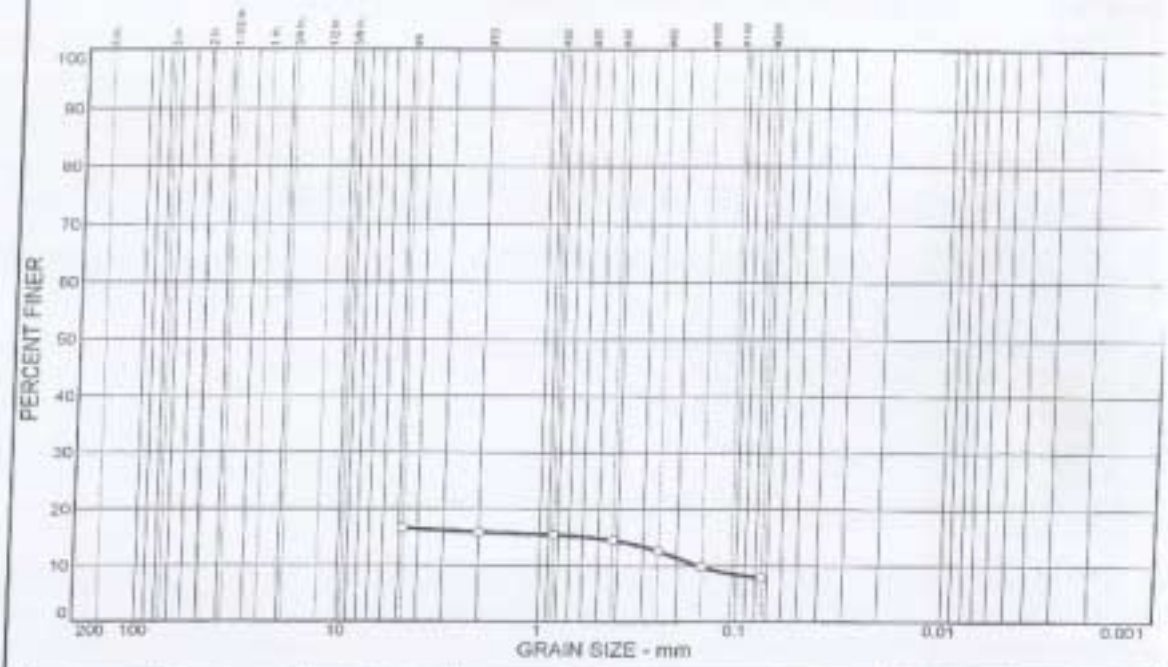
REMARKS
○

○ Source: CB-MROO-7 Sample No.: 3 Elev./Depth: 3.1'-5.9'

**Law Engineering and Environmental Services, Inc.**

Client: USACE, Jacksonville District
Project: Miami River
Project No.: 40523-8-8051-38

# Grain Size Distribution Report




| | % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | | | 8.8 | 7.8 | | GP-GM | A-1-a | | |
| | | | | | | | | | |
| | | | | | | | | | |

| SIEVE inches size | PERCENT FINER ○ | | |
|---|---|---|---|
| | | | |
| | GRAIN SIZE | | |
| $D_{60}$ | | | |
| $D_{30}$ | | | |
| $D_{10}$ | 0.156 | | |
| | COEFFICIENTS | | |
| $C_c$ | | | |
| $C_u$ | | | |

| SIEVE number size | PERCENT FINER ○ | | |
|---|---|---|---|
| #4 | 16.6 | | |
| #10 | 15.9 | | |
| #20 | 15.4 | | |
| #40 | 14.5 | | |
| #60 | 12.6 | | |
| #100 | 9.8 | | |
| #200 | 7.8 | | |

SOIL DESCRIPTION

○ LIMESTONE, hard, trace silt, tan

REMARKS

○

○ Source: CB-MROO-8 Sample No.: 3 Elev./Depth: 5.0'-7.2'

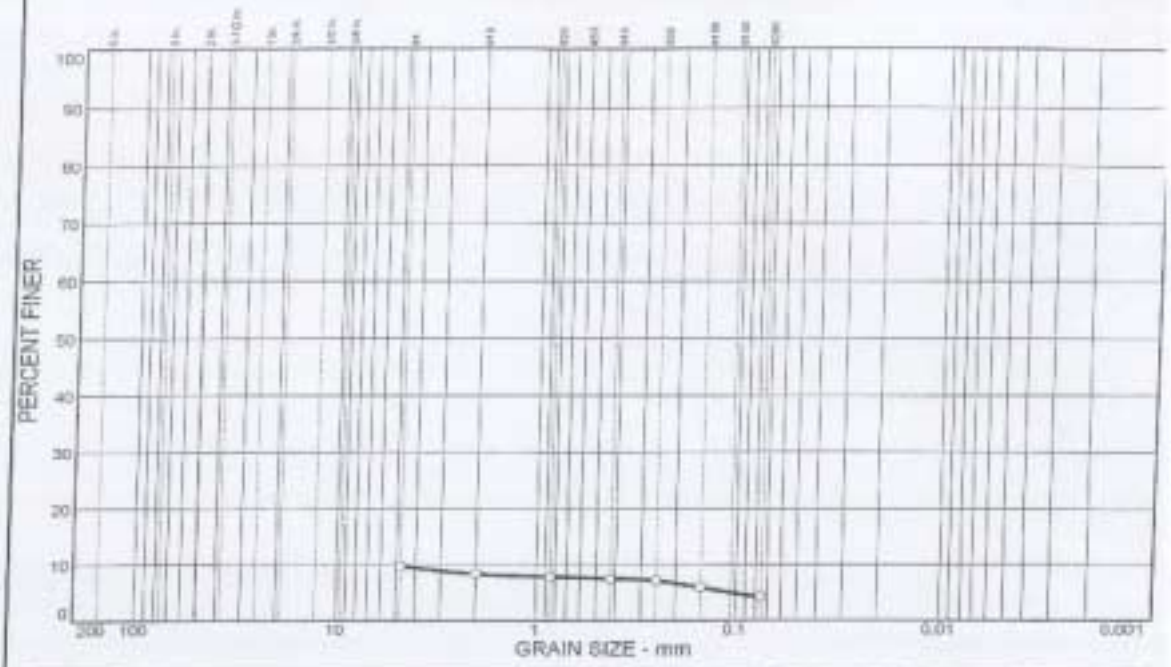
**Law Engineering and Environmental Services, Inc.**

Client: USACE, Jacksonville District

Project: Miami River

Project No.: 40521-8-8051-38

# Grain Size Distribution Report




| | % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | | | 5.6 | 4.1 | | GP | A-1-a | | |

| SIEVE (inches size) | PERCENT FINER ○ |
|---|---|
| GRAIN SIZE | |
| $D_{60}$ | |
| $D_{30}$ | |
| $D_{10}$ | |
| COEFFICIENTS | |
| $C_c$ | |
| $C_u$ | |

| SIEVE (number size) | PERCENT FINER ○ |
|---|---|
| #4 | 9.7 |
| #10 | 8.3 |
| #20 | 7.8 |
| #40 | 7.5 |
| #60 | 7.1 |
| #100 | 5.9 |
| #200 | 4.1 |

SOIL DESCRIPTION
○ LIMESTONE, hard, trace silt, light tan

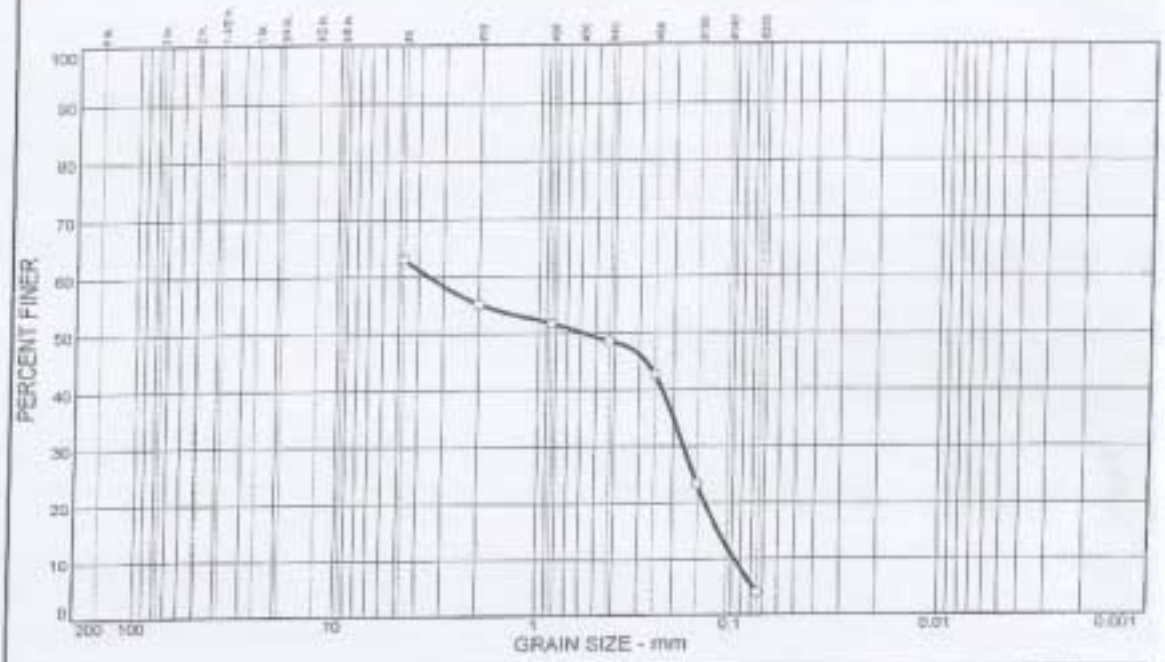
REMARKS:
○

○ Source: CB-MROO-5 Sample No.: 2 Elev./Depth: 3.0'-5.6'

**Law Engineering and Environmental Services, Inc.**

Client: USACE, Jacksonville District
Project: Miami River
Project No.: 40521-8-8051-38

# Grain Size Distribution Report




| | % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | | | 59.1 | 3.9 | | SP | A-1-b | | |

| SIEVE inches mm | PERCENT FINER ○ |
|---|---|
| | |

| GRAIN SIZE | |
|---|---|
| $D_{60}$ | 3.55 |
| $D_{30}$ | 0.177 |
| $D_{10}$ | 0.0971 |

| COEFFICIENTS | |
|---|---|
| $C_c$ | 0.09 |
| $C_u$ | 36.56 |

| SIEVE number size | PERCENT FINER ○ |
|---|---|
| #4 | 63.0 |
| #10 | 55.2 |
| #20 | 51.8 |
| #40 | 48.6 |
| #60 | 42.7 |
| #100 | 23.3 |
| #200 | 3.9 |

SOIL DESCRIPTION
○ LIMESTONE, hard, light tan

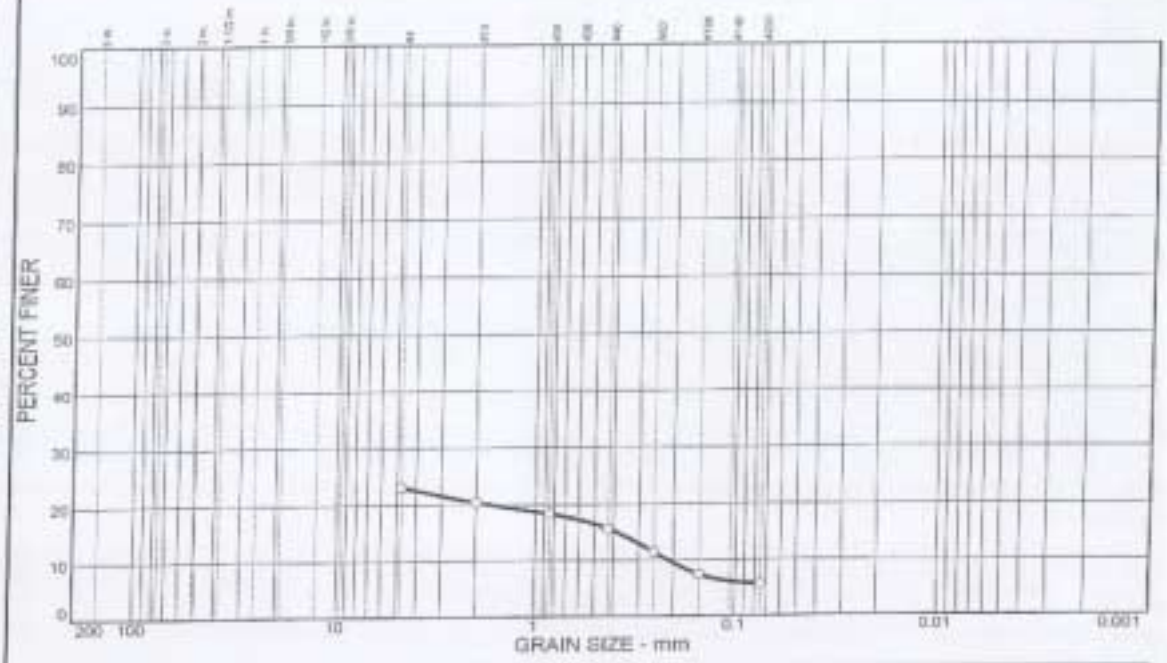
REMARKS:
○

○ Source: CB-MROO-2 Sample No.: 2 Elev./Depth: 1.7'-3.7'

**Law Engineering and Environmental Services, Inc.**

Client: USACE, Jacksonville District
Project: Miami River
Project No.: 40521-8-8051-38

# Grain Size Distribution Report




| | % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY | USCS | AASHTO | PL | LL |
|---|---|---|---|---|---|---|---|---|---|
| ○ | | | 17.5 | 5.6 | | GP-GM | A-1-a | | |

| SIEVE inches mm | PERCENT FINER ○ | | |
|---|---|---|---|
| | | | |
| | GRAIN SIZE | | |
| $D_{60}$ | | | |
| $D_{30}$ | | | |
| $D_{10}$ | 0.217 | | |
| | COEFFICIENTS | | |
| $C_c$ | | | |
| $C_u$ | | | |

| SIEVE number mm | PERCENT FINER ○ | | |
|---|---|---|---|
| #4 | 23.1 | | |
| #10 | 20.4 | | |
| #20 | 18.3 | | |
| #40 | 15.6 | | |
| #60 | 11.4 | | |
| #100 | 7.4 | | |
| #200 | 5.6 | | |

SOIL DESCRIPTION
○ LIMESTONE, sand, trace silt, light tan

REMARKS:
○

○ Source: CB-MROO-4 Sample No.: 2 Elev./Depth: 4.2'-7.2'

**Law Engineering and Environmental Services, Inc.**

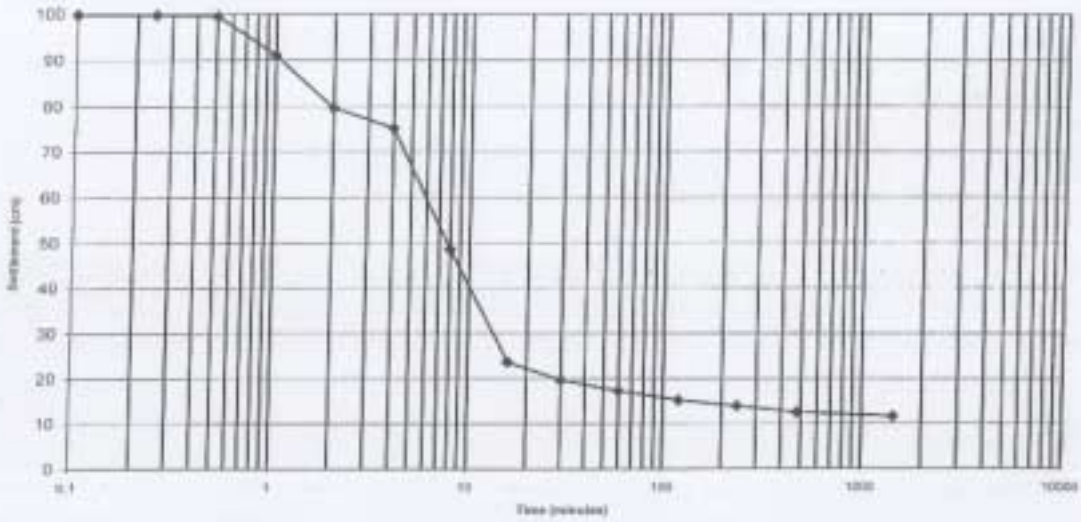
Client: USACE, Jacksonville District
Project: Miami River
Project No.: 40521-8-8051-38

LAW
ENGINEERING AND ENVIRONMENTAL SERVICES
3907 CARMICHAEL AVENUE
JACKSONVILLE, FLORIDA 32207
(904)396-5173

## REPORT OF SETTLING RATE TESTING

LAW PROJECT NO: 40521-8-8051-38
PROJECT: Miami River
CLIENT: USACE, Jacksonville District

SAMPLE NO 1
STATION CB-MROO-4
CONCENTRATION: 100 g/L




| TIME | INTERFACE (cm) | TIME | INTERFACE (cm) |
|---|---|---|---|
| 0.1 | 99.9 | 16 | 23.7 |
| 0.25 | 99.8 | 30 | 19.7 |
| 0.5 | 99.5 | 60 | 17.2 |
| 1 | 91 | 120 | 15.1 |
| 2 | 79.6 | 240 | 13.8 |
| 4 | 75.2 | 480 | 12.4 |
| 8 | 48.6 | 1440 | 11.5 |

Final Concentration: 669.57 g/L

Salinity: 11 ppt

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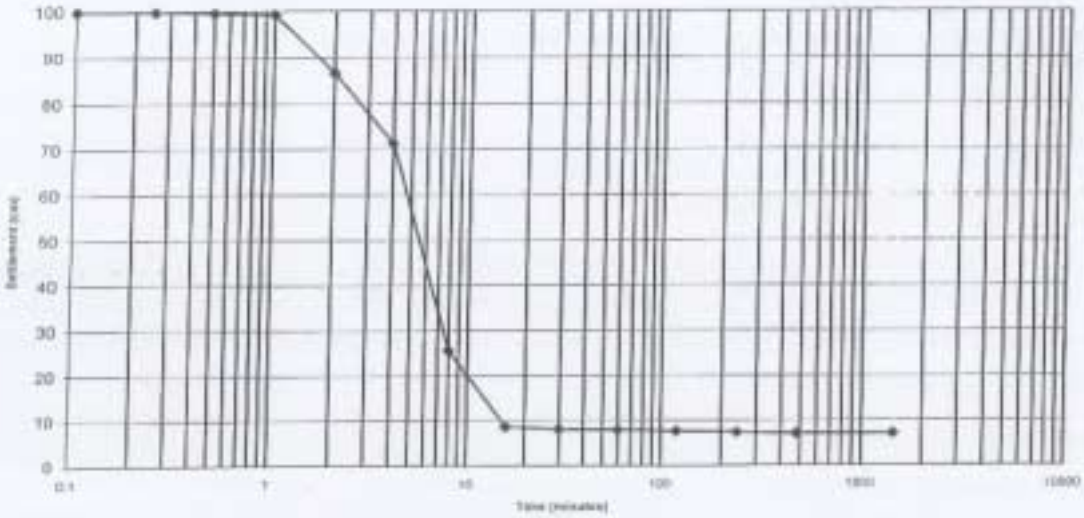
ENGINEERING AND ENVIRONMENTAL SERVICES
3801 CARMICHAEL AVENUE
JACKSONVILLE, FLORIDA 32207
(904)398-5173

## REPORT OF SETTLING RATE TESTING

LAW PROJECT NO: 40521-8-8051-38
PROJECT: Miami River
CLIENT: USACE, Jacksonville District

SAMPLE NO 1
STATION CB-MROO-5
CONCENTRATION 100 g/L




| TIME | INTERFACE (cm) | TIME | INTERFACE (cm) |
|---|---|---|---|
| 0.1 | 99.9 | 16 | 8.6 |
| 0.25 | 99.8 | 30 | 8.1 |
| 0.5 | 99.6 | 60 | 7.9 |
| 1 | 99.2 | 120 | 7.6 |
| 2 | 86.6 | 240 | 7.3 |
| 4 | 71.2 | 480 | 7 |
| 8 | 25.6 | 1440 | 7 |

Final Concentration: 1428.6 g/L

Salinity: 11 ppt

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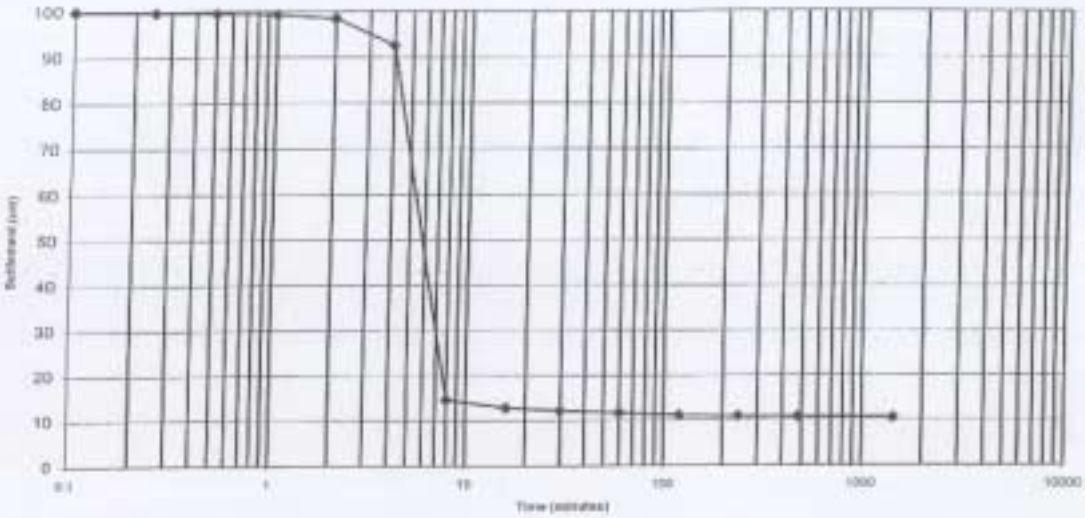
ENGINEERING AND ENVIRONMENTAL SERVICES
3001 CARMICHAEL AVENUE
JACKSONVILLE, FLORIDA 32207
(904)396-5173

## REPORT OF SETTLING RATE TESTING

LAW PROJECT NO: 40521-8-6051-38
PROJECT: Miami River
CLIENT: USACE, Jacksonville District

SAMPLE NO 1
STATION CB-MROO-7
CONCENTRATION: 100 g/L




| TIME | INTERFACE (cm) | TIME | INTERFACE (cm) |
|---|---|---|---|
| 0.1 | 99.9 | 16 | 12.7 |
| 0.25 | 99.7 | 30 | 12.1 |
| 0.5 | 99.5 | 60 | 11.6 |
| 1 | 99.2 | 120 | 11.1 |
| 2 | 98.4 | 240 | 10.8 |
| 4 | 92.5 | 480 | 10.7 |
| 8 | 14.5 | 1440 | 10.5 |

Final Concentration: 952.38 g/L

Salinity: 11 ppt

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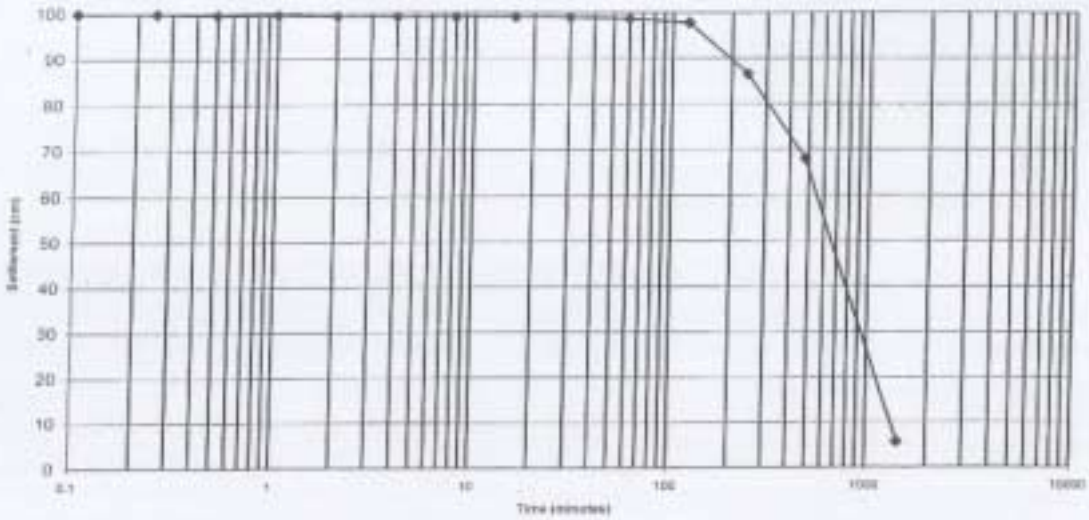
3801 CARMICHAEL AVENUE
JACKSONVILLE, FLORIDA 32207
(904)396-5173

## REPORT OF SETTLING RATE TESTING

LAW PROJECT NO: 40521-6-6051-38
PROJECT: Miami River
CLIENT: USACE, Jacksonville District

SAMPLE NO 2
STATION CB-MROO-7
CONCENTRATION: 100 g/L




| TIME | INTERFACE (cm) | TIME | INTERFACE (cm) |
|---|---|---|---|
| 0.1 | 99.9 | 16 | 99.1 |
| 0.25 | 99.8 | 30 | 99 |
| 0.5 | 99.6 | 60 | 98.7 |
| 1 | 99.5 | 120 | 97.8 |
| 2 | 99.3 | 240 | 86.6 |
| 4 | 99.2 | 480 | 68 |
| 8 | 99.1 | 1440 | 5.6 |

Final Concentration: 1785.7 g/L

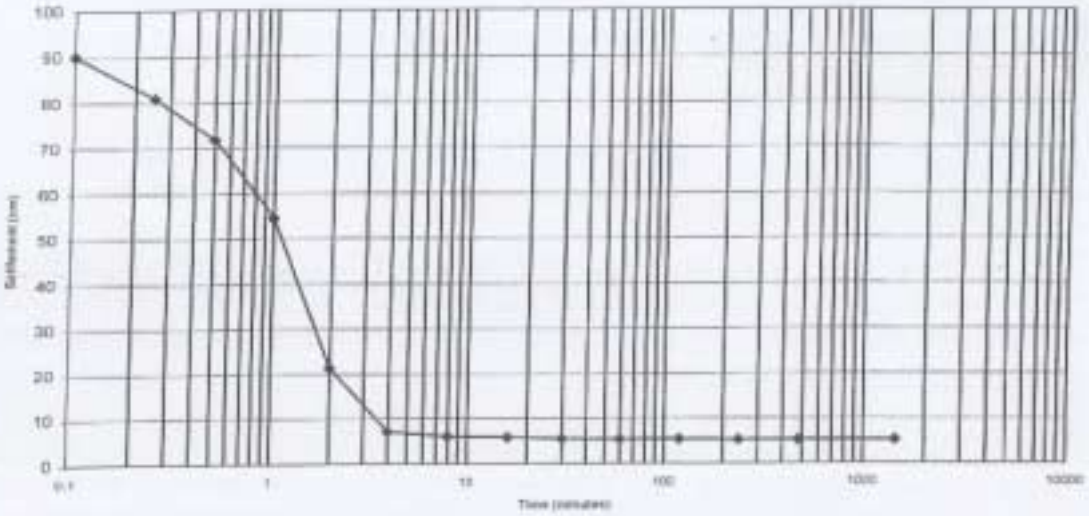
Salinity: 11 ppt

LAW
ENGINEERING AND ENVIRONMENTAL SERVICES
3901 CARMICHAEL AVENUE
JACKSONVILLE, FLORIDA 32207
(904)398-5173

## REPORT OF SETTLING RATE TESTING

LAW PROJECT NO: 40521-8-8051-38
PROJECT: Miami River
CLIENT: USACE, Jacksonville District

SAMPLE NO 1
STATION CB-MROO-8
CONCENTRATION: 100 g/L




| TIME | INTERFACE (cm) | TIME | INTERFACE (cm) |
|---|---|---|---|
| 0.1 | 90 | 16 | 5.8 |
| 0.25 | 80.9 | 30 | 5.5 |
| 0.5 | 71.8 | 60 | 5.4 |
| 1 | 54.5 | 120 | 5.4 |
| 2 | 21.4 | 240 | 5.2 |
| 4 | 7.1 | 480 | 5.2 |
| 8 | 6 | 1440 | 5.2 |

Final Concentration: 1923.1 g/L

Salinity: 11 ppt

SUMMARY OF LABORATORY TESTING

Miami River
LAW Project No. 40521-8-8051-38

| Boring No. | Sample No. | Laboratory Testing USACE Contract Designators | | |
|---|---|---|---|---|
| | | 3027 (GS) | 3032 (SG) | 3035(SR) |
| CB-MR00-2 | 1 | SM | 2.63 | * |
| | 2 | SP | 2.59 | |
| CB-MR00-4 | 1 | ML | | * |
| | 2 | GP-GM | | |
| CB-MR00-5 | 1 | SM | 2.69 | * |
| | 2 | GP | | |
| CB-MR00-6 | 1 | SP-SM | 2.66 | |
| CB-MR00-7 | 1 | SM | | * |
| | 2 | SP-SM | 2.66 | * |
| | 3 | GP | | |
| CB-MR00-8 | 1 | SP-SM | 2.64 | * |
| | 3 | GP-GM | | |

Note: * See attached "Report of Settling Rate Testing" sheet for results.

LAW
ENGINEERING AND ENVIRONMENTAL SERVICES
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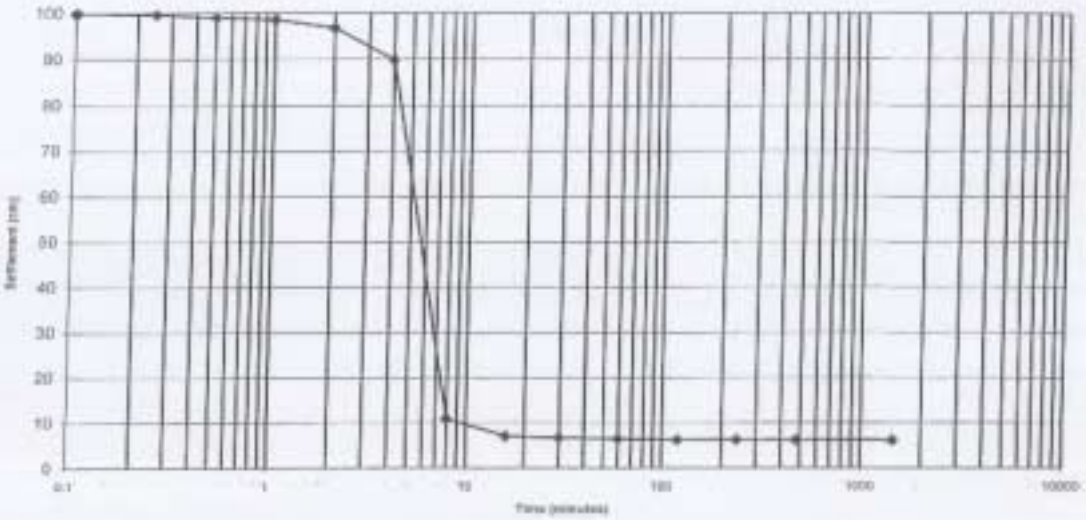
JACKSONVILLE, FLORIDA 32207
(904)396-5173

## REPORT OF SETTLING RATE TESTING

LAW PROJECT NO: 40521-6-6051-38
PROJECT: Miami River
CLIENT: USACE, Jacksonville District

SAMPLE NO 1
STATION CB-MROO-2
CONCENTRATION: 100 g/L




| TIME | INTERFACE (cm) | TIME | INTERFACE (cm) |
|---|---|---|---|
| 0.1 | 99.9 | 16 | 7.1 |
| 0.25 | 99.6 | 30 | 6.7 |
| 0.5 | 99 | 60 | 6.5 |
| 1 | 98.5 | 120 | 6.3 |
| 2 | 96.8 | 240 | 6.3 |
| 4 | 89.8 | 480 | 6.2 |
| 8 | 10.9 | 1440 | 6.2 |

Final Concentration: 1612.9 g/L

Salinity: 11 ppt