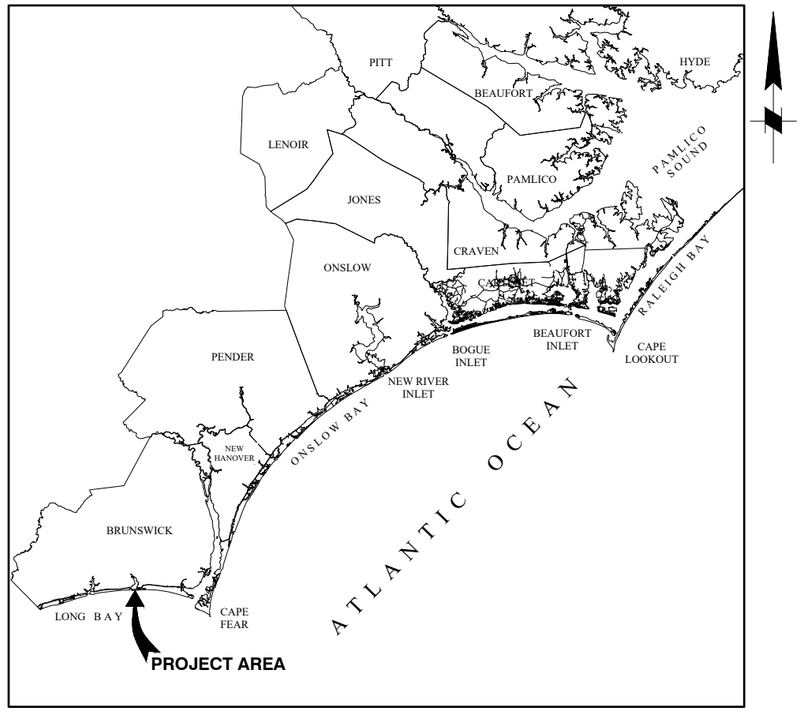
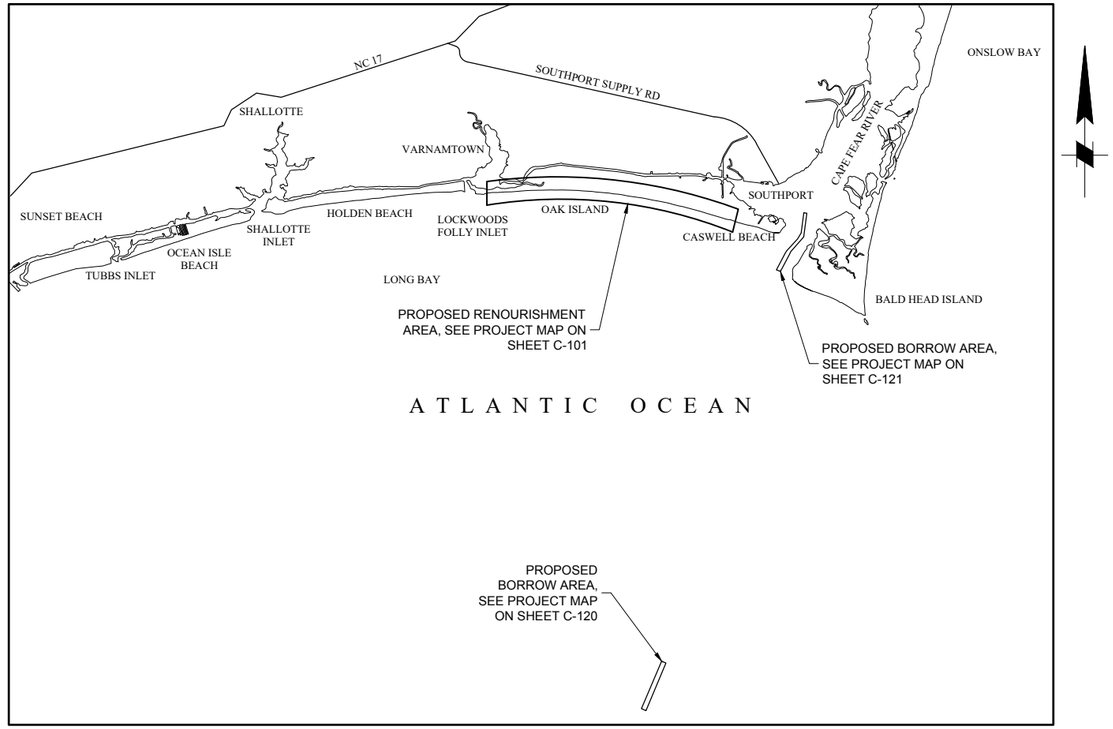
Appendix A
Permit Drawings

BRUNSWICK COUNTY
OAK ISLAND RENOURISHMENT PROJECT 2024
OAK ISLAND, NORTH CAROLINA

TOWN OF OAK ISLAND
4601 E. OAK ISLAND DRIVE
OAK ISLAND, NC 28465



VICINITY MAP
NTS



LOCATION MAP
NTS

ISSUED FOR PERMIT
ISSUED: 2024-02-02
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Mark	Description	Date	Appr
0	ISSUED FOR PERMIT	2024-02-02	BPG

BRUNSWICK COUNTY
OAK ISLAND RENOURISHMENT
PROJECT 2024

COVER SHEET

4700 FALLS OF THE NEUSE ROAD,
STE 300, RALEIGH, NC 27609
919-781-4626
NC FIRM NO. F-0105
moffatt & nichol

Designed by:	B. GRANT
Drawn by:	VNM
Checked by:	EJS
Reviewed by:	S. MORRISON
Submitted by:	MOFFATT & NICHOL
Date:	2024-02-02
M&N Project No.	10128-03A
Drawing code:	
Drawing Scale:	
Plot scale:	1:1 (0 SHEET)
Rev:	0

SEAL

Sheet
Reference No.
G-001
INDEX: 1 OF 21

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DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

INDEX OF DRAWINGS

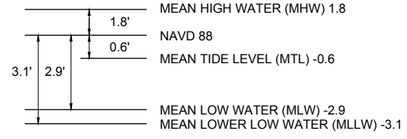
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		GENERAL
1	G-001	COVER SHEET
2	G-002	GENERAL NOTES
3	G-003	ABBREVIATIONS & LEGEND
4	G-004	KEY PLAN
5	G-005	STAGING & ACCESS AREAS
		CIVIL
6	C-101	PROJECT MAP
7	C-110	SITE PLAN 1 OF 9
8	C-111	SITE PLAN 2 OF 9
9	C-112	SITE PLAN 3 OF 9
10	C-113	SITE PLAN 4 OF 9
11	C-114	SITE PLAN 5 OF 9
12	C-115	SITE PLAN 6 OF 9
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15	C-118	SITE PLAN 9 OF 9
16	C-120	OFFSHORE OAK ISLAND BORROW AREA SITE PLAN
17	C-121	WILMINGTON HARBOR INNER OCEAN BAR BORROW AREA SITE PLAN
18	C-300	BEACH RENOURISHMENT TYPICAL SECTIONS 1 OF 2
19	C-301	BEACH RENOURISHMENT TYPICAL SECTIONS 2 OF 2
20	C-302	BORROW AREA TYPICAL SECTIONS 1 OF 2
21	C-303	BORROW AREA TYPICAL SECTIONS 2 OF 2

GENERAL NOTES:

1. ALL BEACH FILL, DREDGING AND PLANTING WORK SHALL CONFORM TO THE REQUIREMENTS OF THESE PLANS AND SPECIFICATIONS.
2. THE CONTRACTOR SHALL PLACE THE PERMIT PLACARDS ON THE JOB SITE AND SHALL COMPLY WITH ALL TERMS OF THE PERMITS PERTAINING TO THE PERFORMANCE OF THE WORK. SEE THE TECHNICAL SPECIFICATIONS.
3. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS BEFORE STARTING WORK. NOTIFY OWNER OF DISCREPANCIES.
4. ALL SAFETY REGULATIONS ARE TO BE STRICTLY FOLLOWED. METHODS OF CONSTRUCTION AND ERECTION OF STRUCTURAL MATERIAL ARE THE CONTRACTORS RESPONSIBILITY.
5. THE CONTRACTOR SHALL, ON A DAILY BASIS, REMOVE FROM THE SITE ANY EXCAVATED MATERIAL OR DEBRIS. DISPOSAL OF THE MATERIALS IS THE RESPONSIBILITY OF THE CONTRACTOR. ALL DEBRIS SHALL BE DISPOSED OF IN A PERMITTED LANDFILL.
6. THESE PLANS ARE INCOMPLETE WITHOUT THE PROJECT TECHNICAL SPECIFICATIONS. IF THERE ARE CONFLICTS BETWEEN THE PLANS AND SPECIFICATIONS, THE CONTRACTOR SHALL ALERT THE OWNER AND ENGINEER. THE TECHNICAL SPECIFICATIONS SHALL TAKE PRECEDENCE.
7. THE STAGING AND ACCESS AREAS SHOWN ON SHEET G-005 ARE OWNED BY THE TOWN OF OAK ISLAND. COORDINATION WITH THE TOWN MANAGER SHALL BE REQUIRED BEFORE USE. FOR THE STAGING AND ACCESS AREAS, THE POINT OF CONTACT IS:

   MR. DAVID KELLY
   TOWN MANAGER
   TOWN OF OAK ISLAND
   4601 EAST OAK ISLAND DRIVE
   OAK ISLAND, NC 28465
   (910) 201-8002
   dkelly@ci.oak-island.nc.us

8. STAGING AND ACCESS AREAS SHALL BE MAINTAINED BY THE CONTRACTOR. STAGING AND ACCESS AREAS SHALL BE CLEARED OF DEBRIS AND CONTRACTOR INSTALLED AMENITIES AT THE COMPLETION AND ACCEPTANCE OF WORK IN THE AREA. THE CONTRACTOR SHALL RESTORE THE STAGING AND ACCESS AREAS TO THEIR ORIGINAL CONDITION AFTER WORK IN THE AREA IS COMPLETE. THIS WORK INCLUDES REPLACEMENT OF FENCING, SIGNS, SAND FENCE, BEACH VEGETATION, WALKWAYS, DUNES, DUNE VEGETATION, PARKING FACILITIES, PAVED AREAS AND OTHER MISCELLANEOUS ITEMS. ALL REPLACEMENT MATERIALS SHALL BE APPROVED BY THE OWNER BEFORE INSTALLATION.
9. UNLESS OTHERWISE APPROVED BY THE OWNER, EXCESS EQUIPMENT MAY ONLY BE STORED IN APPROVED STORAGE/STAGING AREAS OR TEMPORARY AREAS IN THE IMMEDIATE VICINITY OF THE BEACH FILL PLACEMENT SITE. THE OWNER RESERVES THE RIGHT TO LIMIT SUCH AREAS AS DEEMED NECESSARY. OPERATION OF GRADING AND OTHER CONSTRUCTION EQUIPMENT WILL NOT BE PERMITTED OUTSIDE THE WORK AREA LIMITS EXCEPT FOR INGRESS AND EGRESS OF THE SITE AT APPROVED LOCATIONS. THE STACKING OF DISCHARGE PIPES IN LAYERS EXCEEDING TWO PIPES HIGH SHALL BE PROHIBITED IN ANY OF THE STORAGE OR STAGING AREAS INCLUDING THE TEMPORARY AREAS.
10. ANY EXISTING SIGNS, FENCES, OR OTHER STRUCTURES WITHIN THE WORK LIMITS SHALL BE PROTECTED AND/OR REMOVED AND LATER REPLACED BY THE CONTRACTOR AS DIRECTED.
11. THE PLANE COORDINATES AND BEARINGS SHOWN FOR THE DREDGING SURVEYS ARE BASED ON THE NORTH CAROLINA STATE PLANE COORDINATE SYSTEM, NORTH AMERICAN DATUM 83 (NAD 83).
12. ALL ELEVATIONS SHOWN ON THE DRAWINGS ARE REFERENCED TO NORTH AMERICAN VERTICAL DATUM 1988 (NAVD 88), UNLESS OTHERWISE NOTED.
13. THE BATHYMETRY PRESENTED ON THE OSOKI BORROW AREA SITE PLAN IS BASED ON A SURVEY COMPLETED IN JANUARY 2024 BY GEODYNAMICS AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THAT TIME.
14. ALL ELEVATIONS SHOWN ON THE WILMINGTON HARBOR INNER OCEAN BAR BORROW AREA SITE PLAN ARE REFERENCED TO MEAN LOWER LOW WATER (MLLW).
15. THE BATHYMETRY PRESENTED ON THE WILMINGTON HARBOR INNER OCEAN BAR BORROW AREA SITE PLAN IS BASED ON A SURVEY COMPLETED IN DECEMBER 2023 AND JANUARY 2024 BY USACE AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THAT TIME.
16. THE BATHYMETRY/TOPOGRAPHY PRESENTED ON THE BEACH FILL PLANS AND SECTIONS IS BASED ON A SURVEY COMPLETED IN MAY 2023 BY TI COASTAL AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THAT TIME.
17. THE MEAN HIGH WATER ELEVATION AND MEAN LOW WATER ELEVATION SHOWN ON THE BEACH FILL DRAWINGS AND BELOW ARE BASED ON NOAA TIDAL DATUMS AT THE OAK ISLAND, ATLANTIC OCEAN, NC STATION.



BID QUANTITIES

THE FOLLOWING ESTIMATE OF SAND QUANTITIES REQUIRED FOR THE PROJECT ARE:

BEACH RESTORATION	2,965,400 CY

DREDGING

1. ALL DREDGING SHALL BE PERFORMED WITHIN THE LIMITS OF THE PERMITTED DREDGING AREA AS SHOWN IN THE DRAWINGS.
2. PIPELINE CORRIDOR SHALL BE DELINEATED WITH BUOYS BY THE CONTRACTOR IN THE PRESENCE OF THE OWNER BEFORE PLACEMENT.
3. A POST-DREDGE SURVEY OF THE BORROW AREA SHALL BE COMPLETED BY AN INDEPENDENT PROFESSIONAL LAND SURVEYOR REGISTERED IN THE STATE OF NORTH CAROLINA, COORDINATED AND PAID FOR BY THE CONTRACTOR TO STANDARDS OUTLINED IN THE TECHNICAL SPECIFICATIONS.

BEACH FILL

1. ALL SAND EXCAVATED FROM THE BORROW AREAS SHALL BE TRANSPORTED TO, AND DEPOSITED ON, THE BEACH BETWEEN THE LINES, GRADES, AND CROSS-SECTIONS SHOWN ON THE DRAWINGS.
2. AFTER NOTIFICATION BY THE CONTRACTOR OF THEIR INTENT TO COMMENCE DREDGING AND SAND PLACEMENT, A CURRENT BEACH SURVEY WILL BE PERFORMED BY THE OWNER. THE CONTRACTOR SHALL NOTIFY THE OWNER AT LEAST 4 WEEKS PRIOR TO THE COMMENCEMENT OF BEACH FILL PLACEMENT. THE UPDATED BEACH SURVEY WILL BE USED TO ADJUST THE LIMITS AND GRADE LINES TO MEET THE FINAL AWARD VOLUME NOT TO EXCEED THE PERMIT VOLUME NOTED ABOVE.
3. SAND SHALL BE PLACED WITHIN THESE LIMITS AND GRADE LINES AS PRACTICALLY AS POSSIBLE. TOLERANCE SHALL BE WITHIN ±0.5 FOOT FOR BERM ELEVATION AND WIDTHS OUT TO THE MEAN TIDE LEVEL (MTL). PAYMENT WILL BE MADE FOR THE CY/FT SHOWN ON THE PLANS WITH A TOLERANCE OF ±10%. EVERY ATTEMPT WILL BE MADE BY THE CONTRACTOR TO FILL WITHIN THE PRESCRIBED TEMPLATE. SEE TECHNICAL SPECIFICATIONS. THE BEACH FILL SHALL BE PLACED BY REACH FROM EAST TO WEST.
4. THE OWNER MAY MAKE ALTERATIONS IN THE PLAN DIMENSIONS, GRADE OF SLOPES, OR VOLUME OF FILL PER FOOT OF BEACH IN ORDER TO ACCOUNT FOR CHANGED CONDITIONS SINCE THE TIME OF THE EXISTING CONDITIONS SURVEY. THE CONTRACTOR SHALL WORK CLOSELY WITH THE OWNER TO ENSURE THAT THE TOTAL QUANTITY OF SAND ALLOWED UNDER THE CONTRACT IS PLACED AS EFFECTIVELY AS POSSIBLE.
5. CONTRACTOR SHALL TAKE CARE TO GRADE THE DUNE AND BERM SO THAT PONDING LANDWARD OF THE CRESTS IS MINIMIZED.
6. EXISTING WALKWAYS SHALL REMAIN AND NOT BE DAMAGED BEYOND CURRENT CONDITIONS. ANY ADDITIONAL DAMAGE WILL BE REPAIRED OR REPLACED AT THE CONTRACTORS COST AS DIRECTED BY THE OWNER OR THE ENGINEER. FILL SHALL BE PLACED COMPLETELY UNDERNEATH AND/OR AROUND STRUCTURES.
7. CONTOURS FOR THE BEACH FILL PLANS ARE SHOWN AT 1 FT INTERVALS.
8. PRE- AND POST-CONSTRUCTION SURVEYS OF THE BEACH AREA SHALL BE COMPLETED BY AN INDEPENDENT PROFESSIONAL LAND SURVEYOR REGISTERED IN THE STATE OF NORTH CAROLINA, COORDINATED AND PAID FOR BY THE CONTRACTOR. TRANSECTS SHALL BE AT 100-FOOT INTERVALS. ADDITIONAL ELEVATIONS SHALL BE TAKEN AS NECESSARY TO ACCURATELY REPRESENT TOPOGRAPHY OF THE BEACH AREA.
9. BEACH FILL SLOPES CALLED OUT ON PLANS ARE HORIZONTAL : VERTICAL.
10. SEE TECHNICAL SPECIFICATION FOR ADDITIONAL PLACEMENT REQUIREMENTS.
11. THE CONTRACTOR SHALL PROVIDE TEMPORARY SAND RAMPS OVER THE PIPELINE FOR PEDESTRIAN AND EMERGENCY VEHICLE ACCESS ALONG THE BEACH. THE MAXIMUM DISTANCE BETWEEN THESE TEMPORARY SAND RAMPS SHALL BE 500 FEET. THESE TEMPORARY SAND RAMPS SHALL BE LEVELED ONCE THE PIPELINE HAS BEEN MOVED. THE CONTRACTOR SHALL ALSO CONSTRUCT A BARRIER TO KEEP THE PUBLIC AT LEAST 250 FEET FROM THE DISCHARGE PIPE IN BOTH DIRECTIONS UP AND DOWN THE BEACH. SEE THE TECHNICAL SPECIFICATIONS.
12. POST AND ROPE SHALL BE INSTALLED AT DUNE WALKOVERS, BEACH PUBLIC ACCESSES, AND EMERGENCY VEHICLE ACCESSES.

DUNE PLANTING

1. PLANTING SHALL OCCUR ON BACK SLOPE, DUNE CREST, 1/3 DISTANCE DOWN THE FRONTAL DUNE SLOPE FROM THE CREST OF THE CONSTRUCTED DUNE.
2. IN NO CASE SHALL THE CONTRACTOR DISTURB EXISTING STABLE AND NATURAL VEGETATION.

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ISSUED: 2024-02-02
NOT TO BE USED FOR CONSTRUCTION

Rev.	Mark	Description	Date	By
0	0	ISSUED FOR PERMIT	2024-02-02	BRG

BRUNSWICK COUNTY
OAK ISLAND RENOURISHMENT
PROJECT 2024

GENERAL NOTES

4700 FALLS OF THE NEUSE ROAD,
STE 300 RALEIGH, NC 27609
919-781-4626
NC FIRM NO. F-0105
moffatt & nichol

Designed by:	B. GRANT
Drawn by:	VNM
Cad by:	EJS
Reviewed by:	S. MORRISON
Submitted by:	MOFFATT & NICHOL
Date:	2024-02-02
M&N Project No.	10128-03A
Drawing code:	
Drawing Scale:	
Plot scale:	1:1 (0 SHEET)

SEAL

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Reference No.
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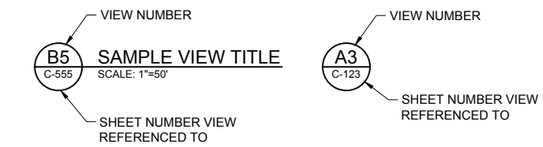
ABBREVIATIONS

BL	BASELINE	NOAA	NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
CY	CUBIC YARDS	No.	NUMBER
FT	FEET OR FOOT	NTS	NOT TO SCALE
MCY	MILLION CUBIC YARDS	TYP	TYPICAL
MHW	MEAN HIGH WATER	USACE	UNITED STATES ARMY CORPS OF ENGINEERS
MLW	MEAN LOW WATER	WP	WORK POINT
MLLW	MEAN LOWER LOW WATER	@	AT
MTL	MEAN TIDE LEVEL	~	APPROXIMATELY
NAD	NORTH AMERICAN DATUM	'	FEET
NAVD	NORTH AMERICAN VERTICAL DATUM		

LEGEND

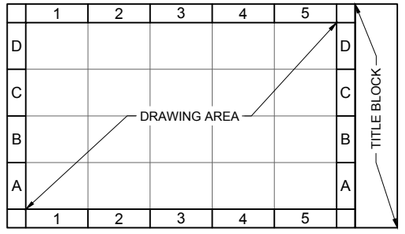
EXISTING		PROPOSED
	MEAN HIGH WATER LINE	
	MEAN LOW WATER LINE	
	MEAN TIDE LEVEL LINE	
	PROPERTY LINE	
-5	MAJOR CONTOUR	
-4	MINOR CONTOUR	
	FILL SLOPE LIMIT	
	FILL SLOPE BREAK	
	CONSTRUCTION BASELINE WORK POINT	WP-##
NAME	NGS STATION	

LEGEND



* VIEW NUMBER IS BASED ON THE (DACS) LOCATION OF THE LOWER-LEFT EXTENTS OF THE VIEW ON THE REFERENCED SHEET. WHEN REFERENCING DRAWING INFORMATION BETWEEN SHEETS, BOTH THE VIEW AND SHEET NUMBERS MUST BE QUOTED TOGETHER - EITHER IN A CALLOUT FORMAT AS SHOWN ABOVE OR IN THE FORM;
"VIEW NO./SHEET NO." (EG A1/CS-5001)

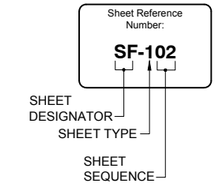
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0	GENERAL (COVER SHEET, LEGEND, NOTES)
1	PLANS (HORIZONTAL VIEWS)
2	ELEVATIONS (NOT TYPICALLY USED)
3	SECTIONS (OVERALL VIEWS)
4	LARGE-SCALE VIEWS (PLANS, SECT. OR ELEV. - NOT DETAILS)
5	DETAILS (MAY BE PLAN, SECT. OR ELEV. VIEWS)
6	SCHEDULES
7	USER DEFINED
8	USER DEFINED
9	3D ISOMETRIC



DRAWING AREA COORDINATE SYSTEM (DACS)

DISCIPLINE DESIGNATORS	
DISCIPLINE	DESIGNATOR
GENERAL	G
SURVEY/MAPPING	V
GEOTECHNICAL	B
CIVIL WORKS	W
CIVIL	C
STRUCTURAL	S
MECHANICAL	M
ELECTRICAL	E
OTHER DISCIPLINES	X

SECONDARY DESIGNATORS	
DEMOLITION	D
GENERAL	G
SUBSTRUCTURE	B
FRAMING	F
COMPONENT	C
SITE	S



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DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

TOWN OF OAK ISLAND NORTH CAROLINA

No.	Mark	Description	Date	By
0	ISSUED FOR PERMIT		2024-02-02	BRG

BRUNSWICK COUNTY
OAK ISLAND RENOURISHMENT
PROJECT 2024

ABBREVIATIONS & LEGEND

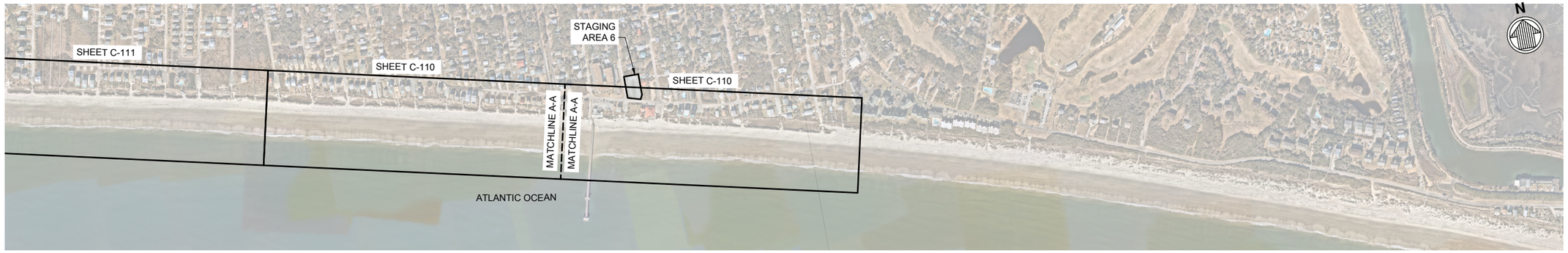
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Drawn by:	VNM
Cad by:	EJS
Reviewed by:	S. MORRISON
Submitted by:	MOFFATT & NICHOL
Date:	2024-02-02
M&N Project No.	10128-03A
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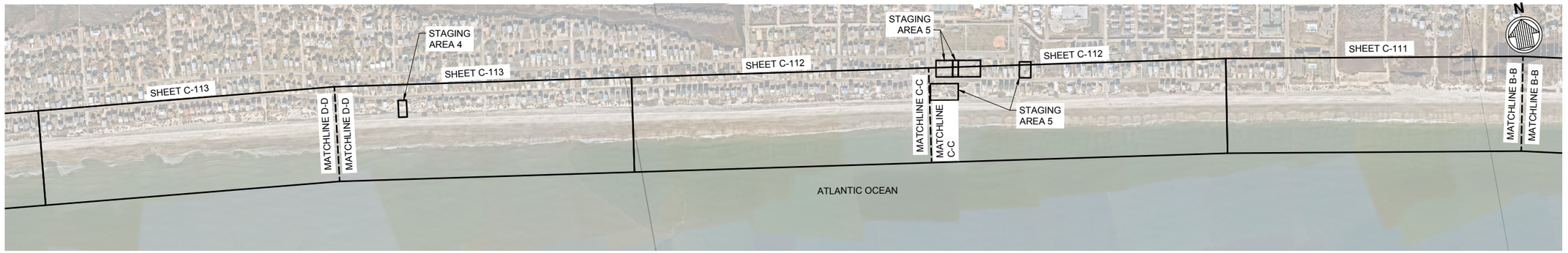
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919-781-4626
NC FIRM NO. F-0105
moffatt & nichol

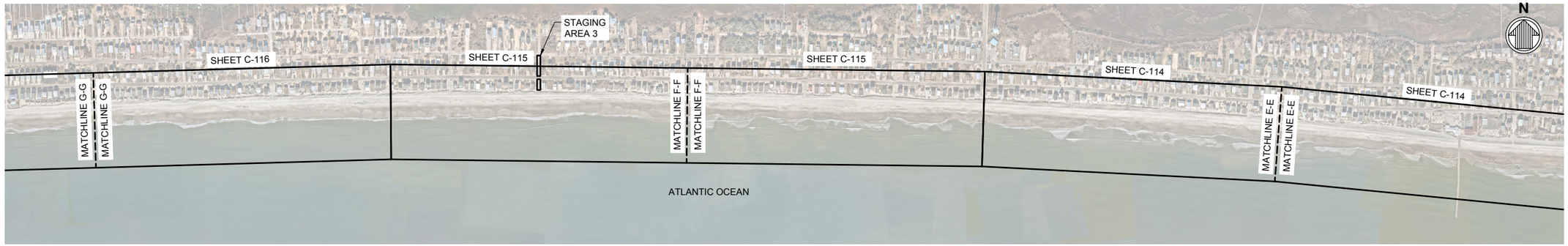
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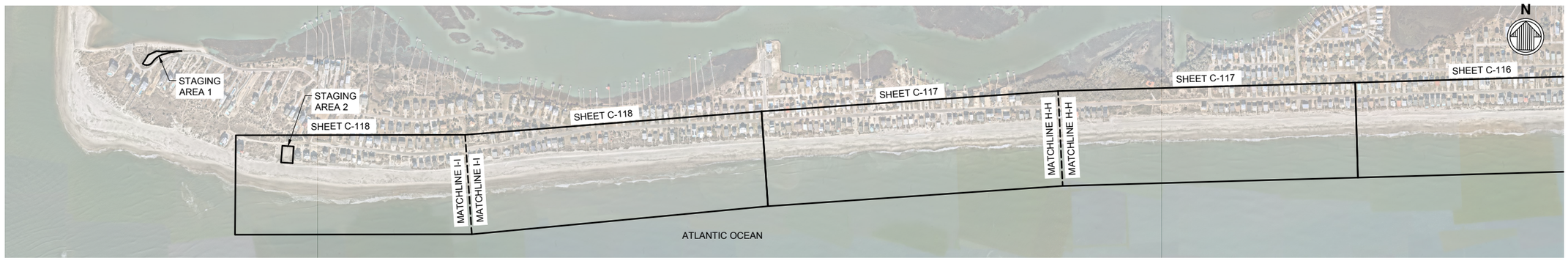
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500' 0' 500' 1000'

SCALE: 1"=1000'

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ISSUED: 2024-02-02
NOT TO BE USED FOR CONSTRUCTION

TOWN OF OAK ISLAND NORTH CAROLINA

Mark	Description	Date	Appr
0	ISSUED FOR PERMIT	2024-02-02	BPG

BRUNSWICK COUNTY
OAK ISLAND RENOURISHMENT
PROJECT 2024

KEY PLAN

4700 FALLS OF THE NEUSE ROAD,
STE 300 RALEIGH, NC 27609
919.781.4626
NC FIRM NO. F-0105
moffatt & nichol

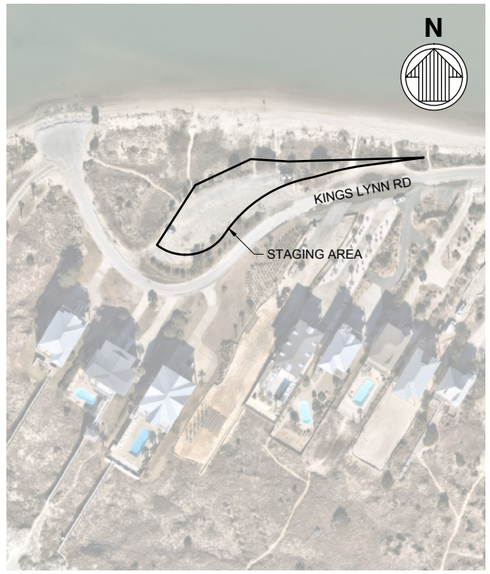
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Drawn by:	VNM
Cad by:	EJS
Reviewed by:	S. MORRISON
Submitted by:	MOFFATT & NICHOL
Date:	2024-02-02
Rev:	0
M&N Project No.	10128-03A
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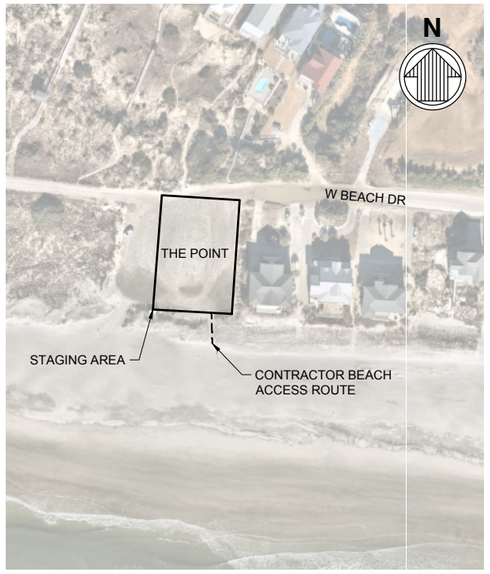
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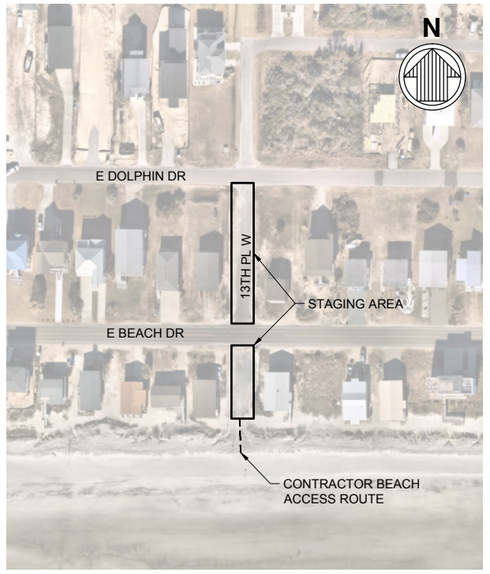
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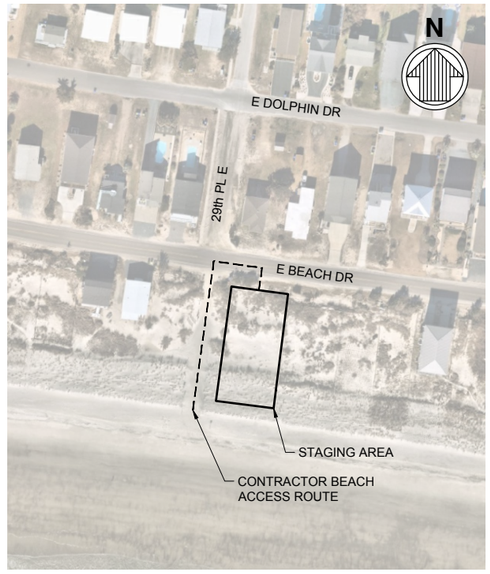
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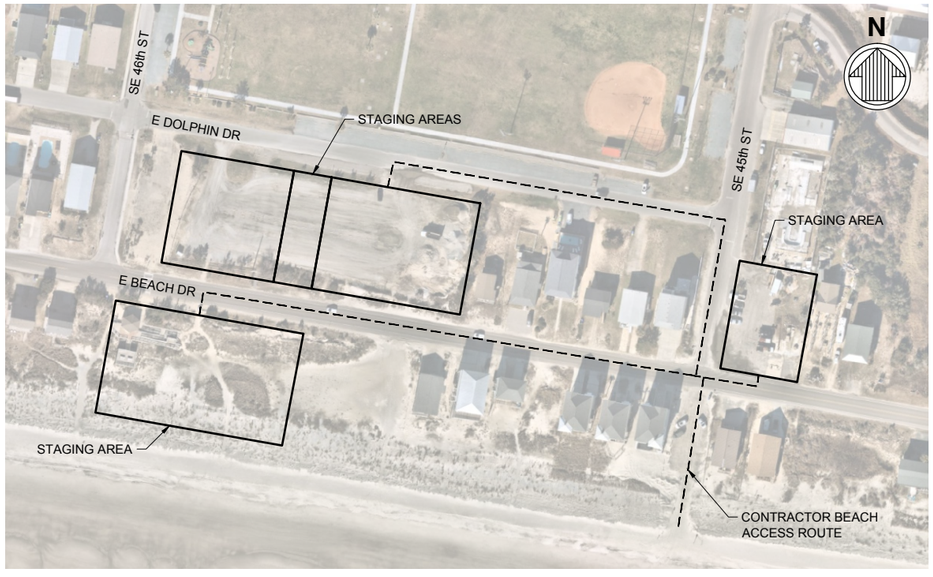
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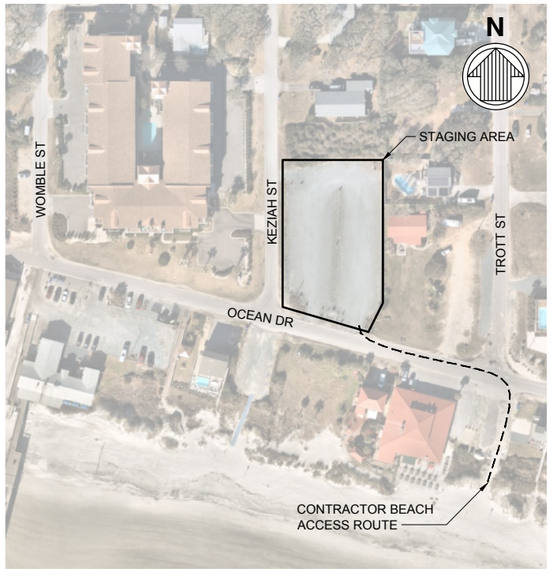
STAGING AREA 3
NOT TO SCALE



STAGING AREA 4
NOT TO SCALE



STAGING AREA 5
NOT TO SCALE



STAGING AREA 6
NOT TO SCALE

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ISSUED: 2024-02-02
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TOWN OF OAK ISLAND NORTH CAROLINA

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BRUNSWICK COUNTY
OAK ISLAND RENOURISHMENT
PROJECT 2024

STAGING & ACCESS AREAS

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919-781-4626
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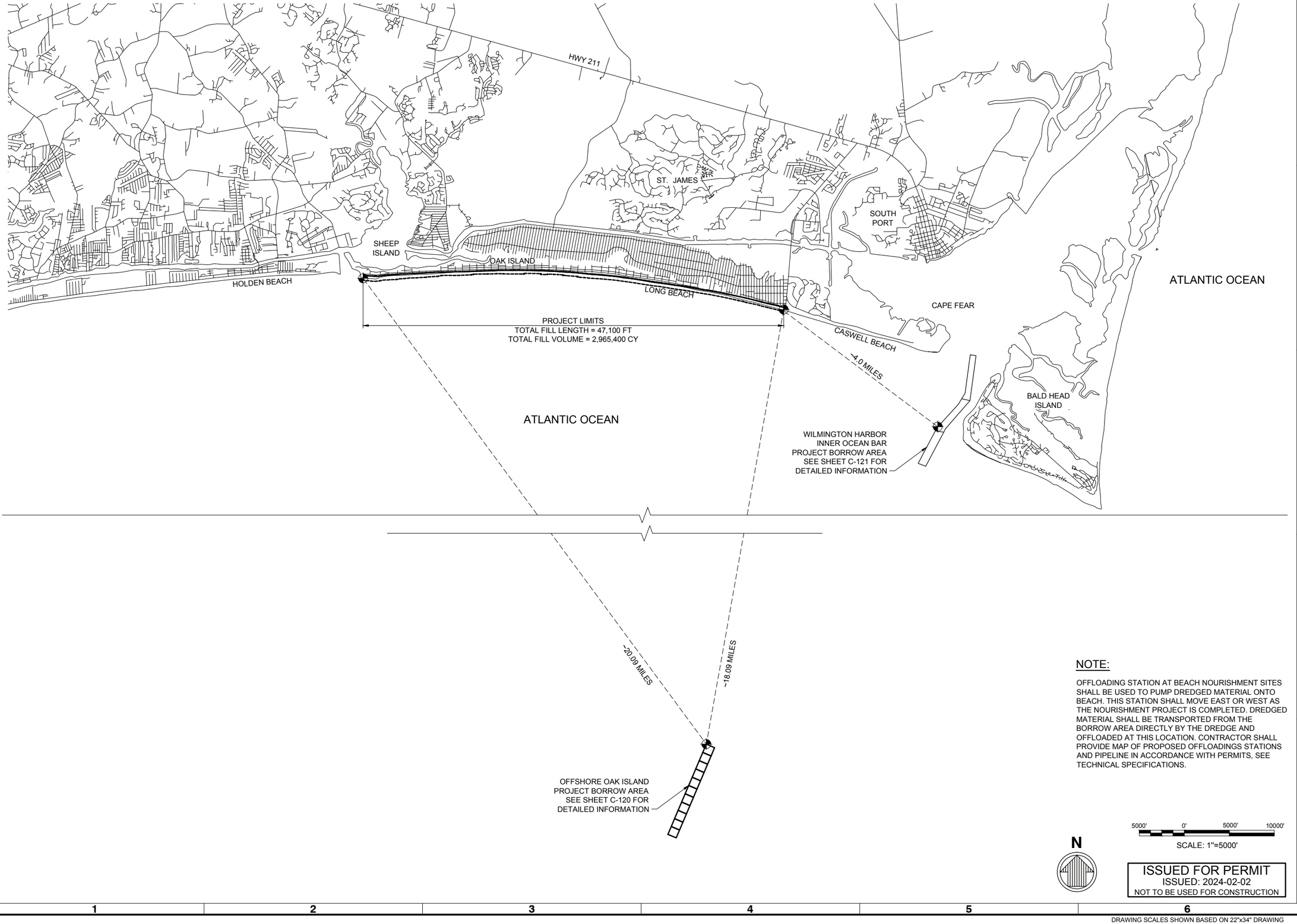
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Rev.	0

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Reference No.
G-005
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DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



NOTE:

OFFLOADING STATION AT BEACH NOURISHMENT SITES SHALL BE USED TO PUMP DREDGED MATERIAL ONTO BEACH. THIS STATION SHALL MOVE EAST OR WEST AS THE NOURISHMENT PROJECT IS COMPLETED. DREDGED MATERIAL SHALL BE TRANSPORTED FROM THE BORROW AREA DIRECTLY BY THE DREDGE AND OFFLOADED AT THIS LOCATION. CONTRACTOR SHALL PROVIDE MAP OF PROPOSED OFFLOADINGS STATIONS AND PIPELINE IN ACCORDANCE WITH PERMITS, SEE TECHNICAL SPECIFICATIONS.

N

5000' 0' 5000' 10000'

SCALE: 1"=5000'

ISSUED FOR PERMIT
ISSUED: 2024-02-02
NOT TO BE USED FOR CONSTRUCTION

Rev.	Description	Date	Appr
0	ISSUED FOR PERMIT	2024-02-02	BRG
Mark			

BRUNSWICK COUNTY
OAK ISLAND RENOURISHMENT
PROJECT 2024

PROJECT MAP

4700 FALLS OF THE NEUSE ROAD.
STE 300 RALEIGH, NC 27609
919-781-4626
NC FIRM NO. F-0105
moffatt & nichol

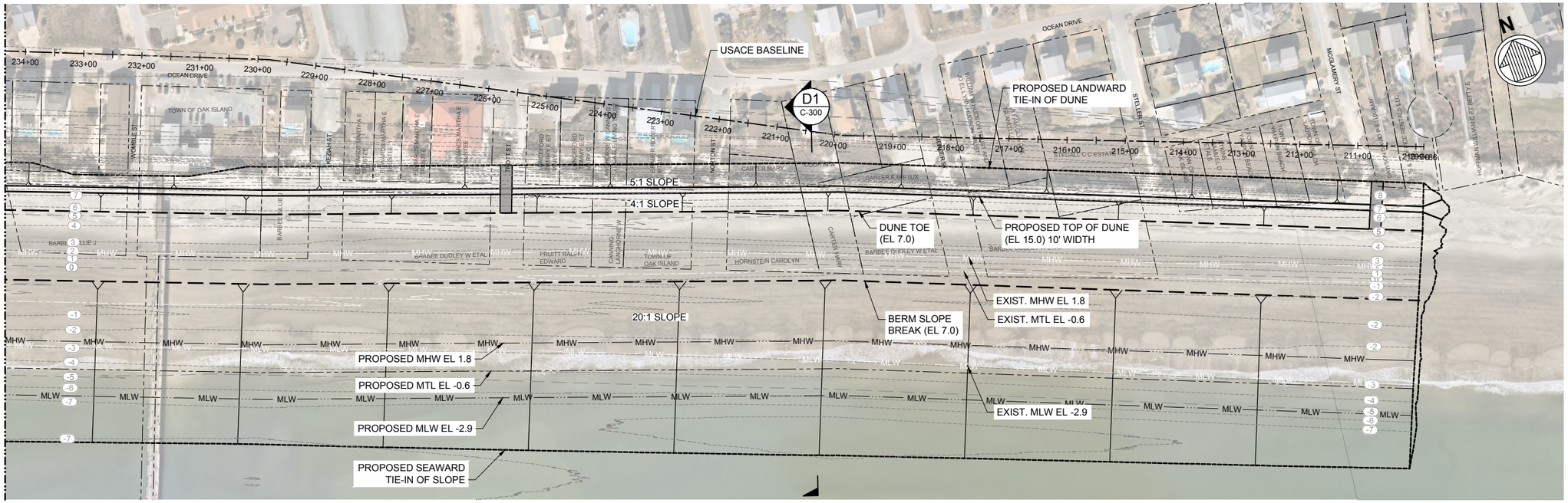
Designed by:	B. GRANT
Drwn by:	VNM
Ckd by:	EJS
Reviewed by:	S. MORRISON
Submitted by:	MOFFATT & NICHOL
Date:	2024-02-02
M&N Project No.	10128-03A
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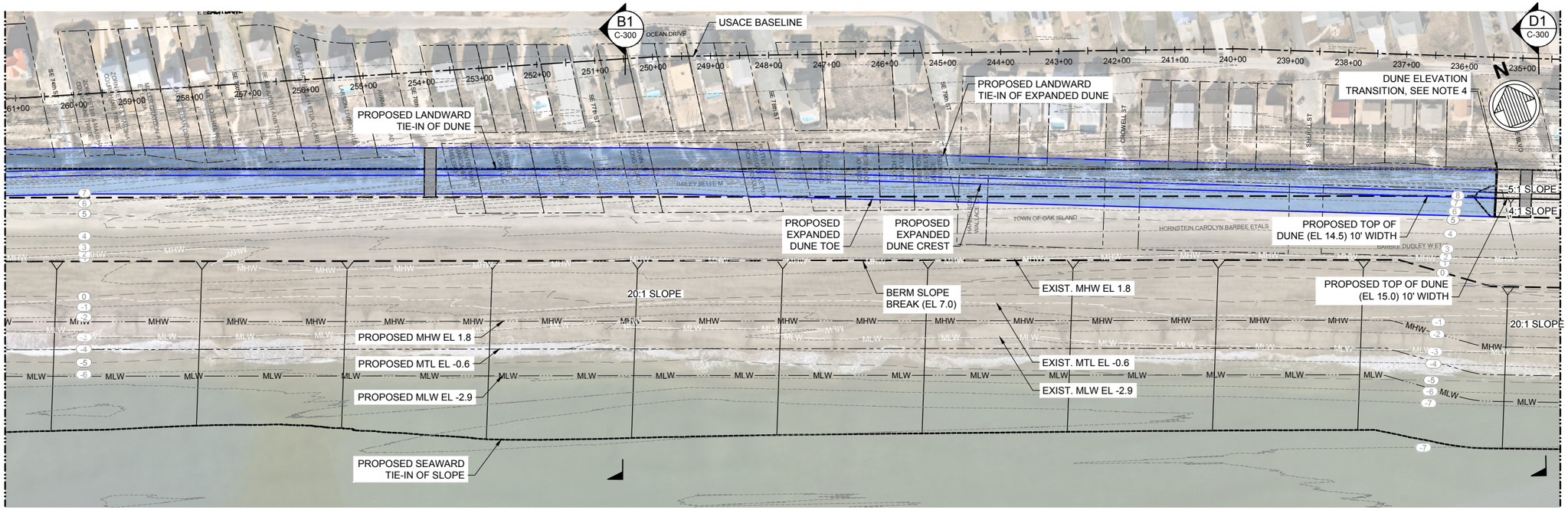
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DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING





NOTES:

1. PROPOSED DUNE TEMPLATE IS CONSISTENT WITH THE PREVIOUS AUTHORIZED TEMPLATE (CAMA PERMIT #31-20, SAW 2018-02230) WITH THE EXCEPTION OF THE PROPOSED EXPANDED DUNE AREA.
2. DUNE PLACEMENT WITHIN THE PROPOSED EXPANDED DUNE AREAS WILL ONLY OCCUR IF SIGNIFICANT EROSION OF EXISTING DUNE TAKES PLACE BETWEEN THE TIME OF PERMITTING TO THE TIME OF CONSTRUCTION.

NOTES:

3. THE EXTENT OF DUNE REPLACEMENT WILL BE DETERMINED BASED ON THE PRECONSTRUCTION SURVEY AND WILL BE COORDINATED WITH AGENCIES BEFORE CONSTRUCTION.
4. TRANSITION IN DUNE ELEVATION WILL OCCUR AT 1-FT VERTICAL OVER 50-FT HORIZONTAL.

LEGEND:

PROPOSED EXPANDED DUNE AREA, SEE NOTES

EMERGENCY VEHICLE ACCESS

100' 0' 100' 200'

SCALE: 1"=100'

ISSUED FOR PERMIT
ISSUED: 2024-02-02
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

TOWN OF OAK ISLAND
NORTH CAROLINA

Mark	Description	Date	Appr
0	ISSUED FOR PERMIT	2024-02-02	BRG

BRUNSWICK COUNTY
OAK ISLAND RENOURISHMENT
PROJECT 2024

SITE PLAN 1 OF 9

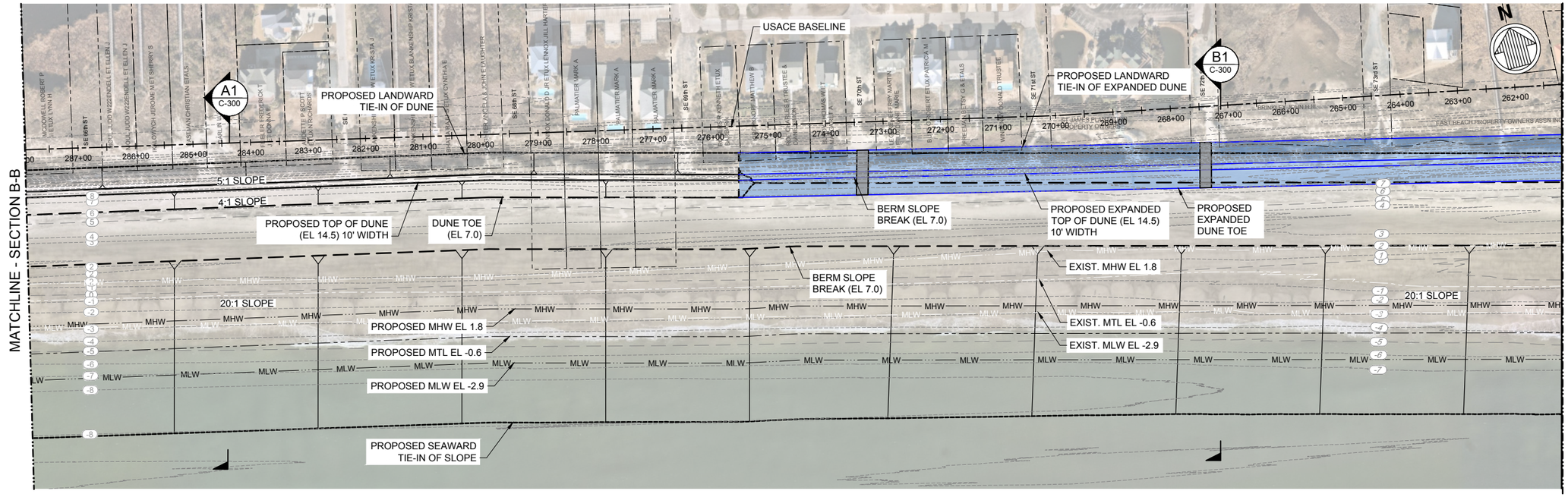
moffatt & nichol
4700 FALLS OF THE NEUSE ROAD,
STE 300 RALEIGH, NC 27609
919-781-4626
NC FIRM NO. F-0105

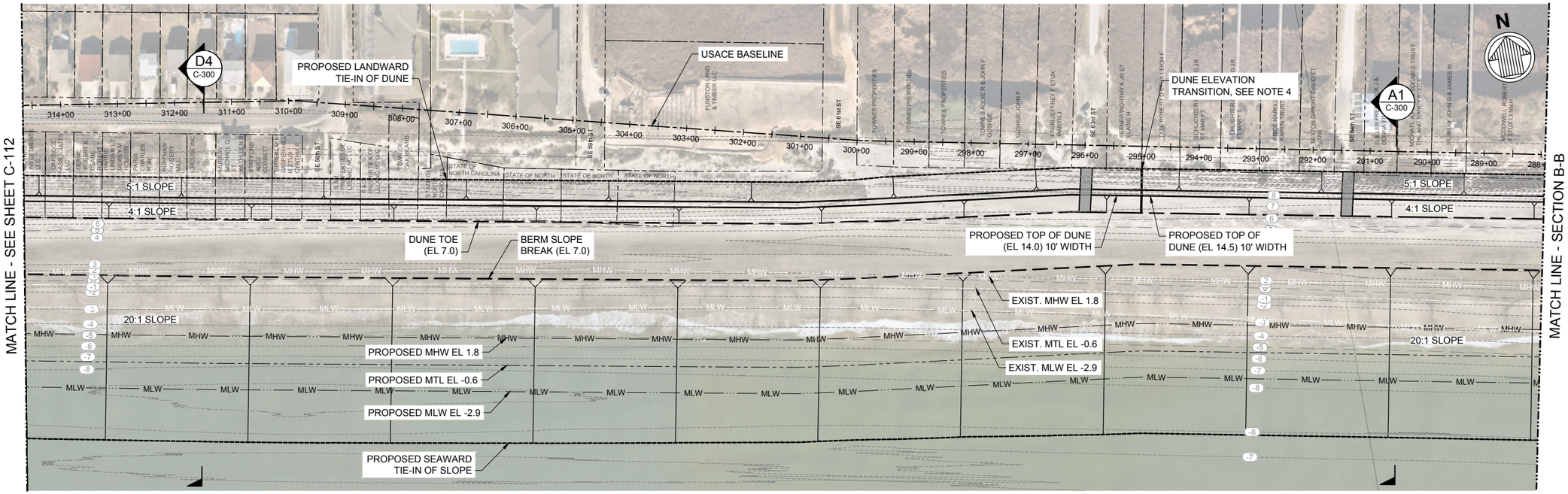
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Drawn by:	VNM
Cked by:	EJS
Reviewed by:	S. MORRISON
Submitted by:	MOFFATT & NICHOL
Date:	2024-02-02
Drawing Scale:	1:1 (D SHEET)
Plot scale:	1:1 (D SHEET)
M&N Project No.	10128-03A
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Rev:	0

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NOTES:

1. PROPOSED DUNE TEMPLATE IS CONSISTENT WITH THE PREVIOUS AUTHORIZED TEMPLATE (CAMA PERMIT #31-20, SAW 2018-02230) WITH THE EXCEPTION OF THE PROPOSED EXPANDED DUNE AREA.
2. DUNE PLACEMENT WITHIN THE PROPOSED EXPANDED DUNE AREAS WILL ONLY OCCUR IF SIGNIFICANT EROSION OF EXISTING DUNE TAKES PLACE BETWEEN THE TIME OF PERMITTING TO THE TIME OF CONSTRUCTION.

NOTES:

3. THE EXTENT OF DUNE REPLACEMENT WILL BE DETERMINED BASED ON THE PRECONSTRUCTION SURVEY AND WILL BE COORDINATED WITH AGENCIES BEFORE CONSTRUCTION.
4. TRANSITION IN DUNE ELEVATION WILL OCCUR AT 1-FT VERTICAL OVER 50-FT HORIZONTAL.

LEGEND:

PROPOSED EXPANDED DUNE AREA, SEE NOTES

EMERGENCY VEHICLE ACCESS

100' 0' 100' 200'

SCALE: 1"=100'

ISSUED FOR PERMIT
ISSUED: 2024-02-02
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

TOWN OF OAK ISLAND NORTH CAROLINA

Mark	Description	Date	By
0	ISSUED FOR PERMIT	2024-02-02	BPG

BRUNSWICK COUNTY
OAK ISLAND RENOURISHMENT
PROJECT 2024

SITE PLAN 2 OF 9

moffatt & nichol
4700 FALLS OF THE NEUSE ROAD, STE 300, RALEIGH, NC 27609
919-781-4626
NC FIRM NO. F-0105

Rev.	Date	By	Description
0	2024-02-02	BPG	ISSUED FOR PERMIT

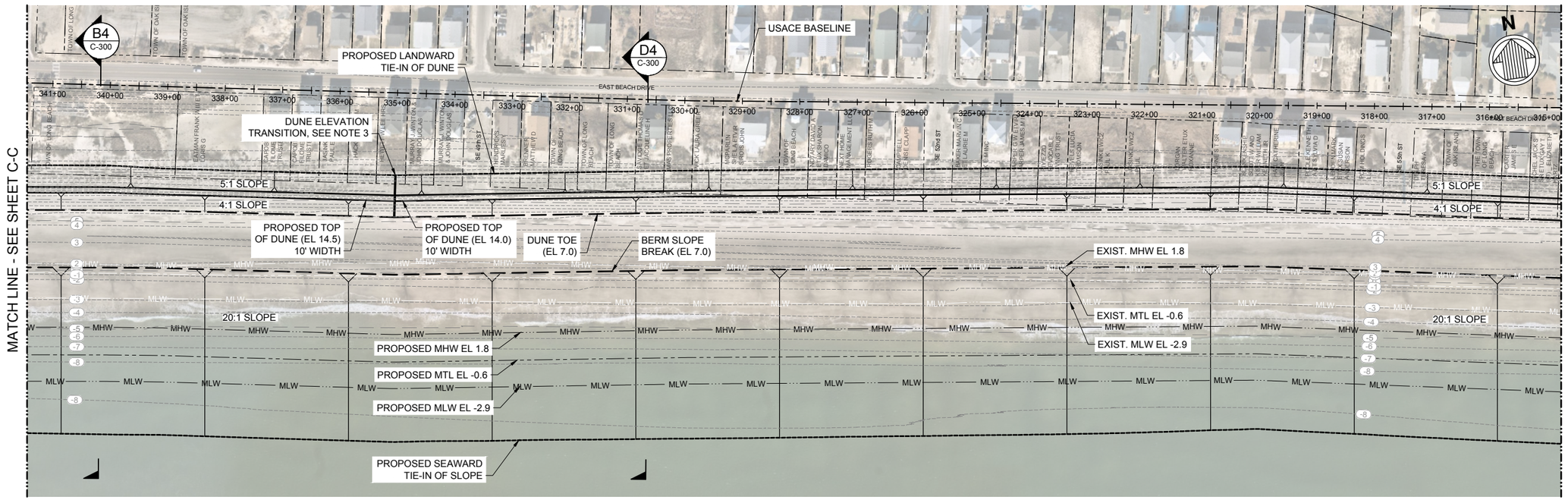
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Drawn by:	VNM
Checked by:	EJS
Reviewed by:	S. MORRISON
Submitted by:	MOFFATT & NICHOL
M&N Project No.	10128-03A
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Reference No.
C-111

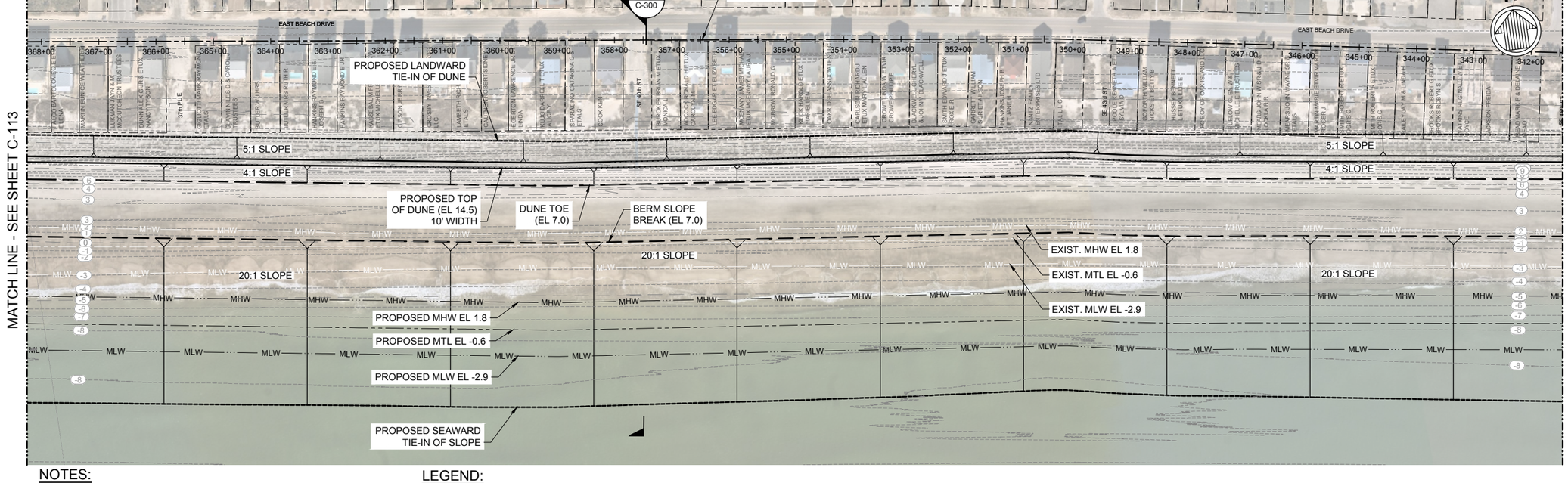
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MATCH LINE - SEE SHEET C-C

MATCH LINE - SECTION C-111



MATCH LINE - SEE SHEET C-113

MATCH LINE - SECTION C-C

NOTES:

1. PROPOSED DUNE TEMPLATE IS CONSISTENT WITH THE PREVIOUS AUTHORIZED TEMPLATE (CAMA PERMIT #31-20, SAW 2018-02230) WITH THE EXCEPTION OF THE PROPOSED EXPANDED DUNE AREA.
2. THE EXTENT OF DUNE REPLACEMENT WILL BE DETERMINED BASED ON THE PRECONSTRUCTION SURVEY AND WILL BE COORDINATED WITH AGENCIES BEFORE CONSTRUCTION.
3. TRANSITION IN DUNE ELEVATION WILL OCCUR AT 1-FT VERTICAL OVER 50-FT HORIZONTAL.

LEGEND:

EMERGENCY VEHICLE ACCESS

100' 0' 100' 200'

SCALE: 1"=100'

ISSUED FOR PERMIT
ISSUED: 2024-02-02
NOT TO BE USED FOR CONSTRUCTION

TOWN OF OAK ISLAND
NORTH CAROLINA

Mark	Description	Date	Appr
0	ISSUED FOR PERMIT	2024-02-02	BRG

BRUNSWICK COUNTY
OAK ISLAND RENOURISHMENT
PROJECT 2024

SITE PLAN 3 OF 9

4700 FALLS OF THE NEUSE ROAD, STE 300 RALEIGH, NC 27609
919-781-4626
NC FIRM NO. F-0105
moffatt & nichol

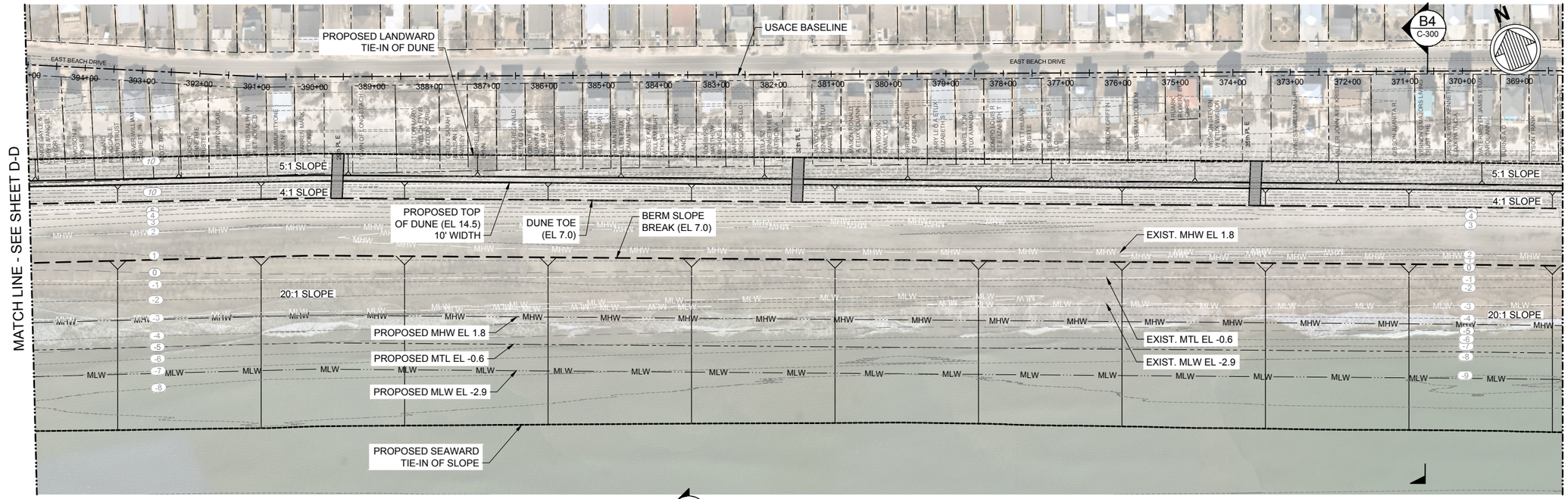
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Drawn by:	VNM
Qcd by:	EJS
Reviewed by:	S. MORRISON
Submitted by:	MOFFATT & NICHOL
Date:	2024-02-02
M&N Project No.	10128-03A
Drawing code:	
Drawing Scale:	1:1 (D SHEET)
Plot scale:	1:1 (D SHEET)
Rev.	0

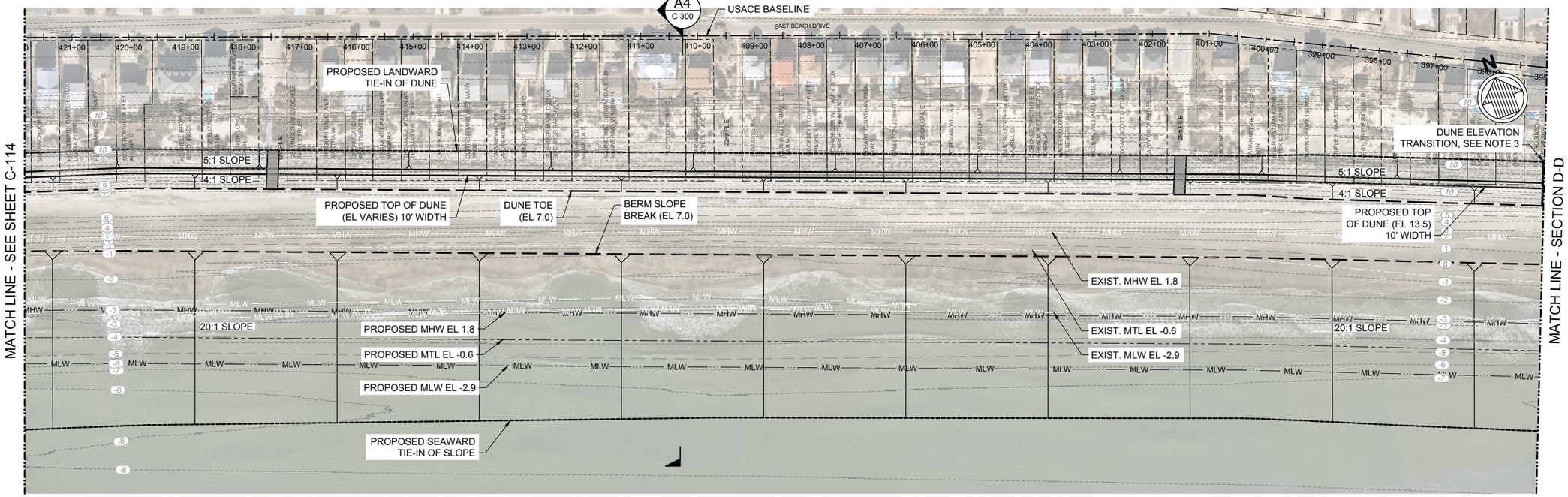
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Reference No.
C-112
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DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING





NOTES:

1. PROPOSED DUNE TEMPLATE IS CONSISTENT WITH THE PREVIOUS AUTHORIZED TEMPLATE (CAMA PERMIT #31-20, SAW 2018-02230) WITH THE EXCEPTION OF THE PROPOSED EXPANDED DUNE AREA.
2. THE EXTENT OF DUNE REPLACEMENT WILL BE DETERMINED BASED ON THE PRECONSTRUCTION SURVEY AND WILL BE COORDINATED WITH AGENCIES BEFORE CONSTRUCTION.
3. TRANSITION IN DUNE ELEVATION WILL OCCUR AT 1-FT VERTICAL OVER 50-FT HORIZONTAL.

LEGEND:

EMERGENCY VEHICLE ACCESS

100' 0' 100' 200'

SCALE: 1"=100'

ISSUED FOR PERMIT
ISSUED: 2024-02-02
NOT TO BE USED FOR CONSTRUCTION

TOWN OF OAK ISLAND NORTH CAROLINA

No.	Mark	Description	Date	By
0		ISSUED FOR PERMIT	2024-02-02	BRG

BRUNSWICK COUNTY
OAK ISLAND RENOURISHMENT
PROJECT 2024

SITE PLAN 4 OF 9

4700 FALLS OF THE NEUSE ROAD,
STE 300 RALEIGH, NC 27609
919-781-4626
NC FIRM NO. F-0105
moffatt & nichol

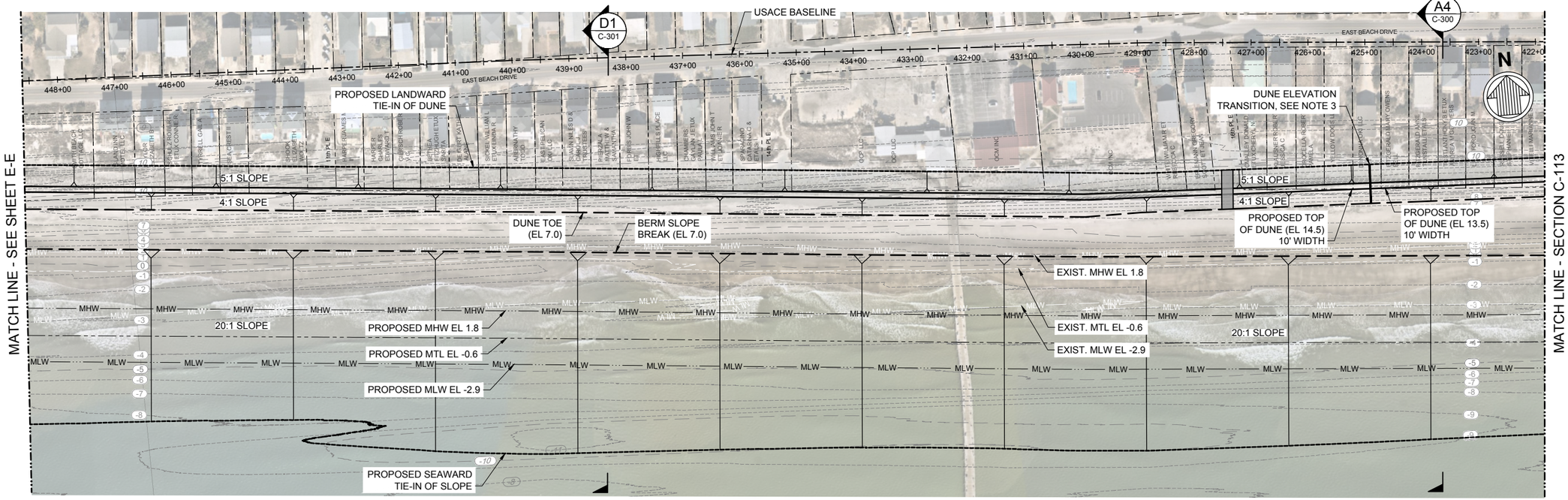
Designed by:	B. GRANT
Drawn by:	VNM
Checked by:	EJS
Reviewed by:	S. MORRISON
Submitted by:	MOFFATT & NICHOL
Date:	2024-02-02
M&N Project No.	10128-03A
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Plot scale:	1:1 (D SHEET)

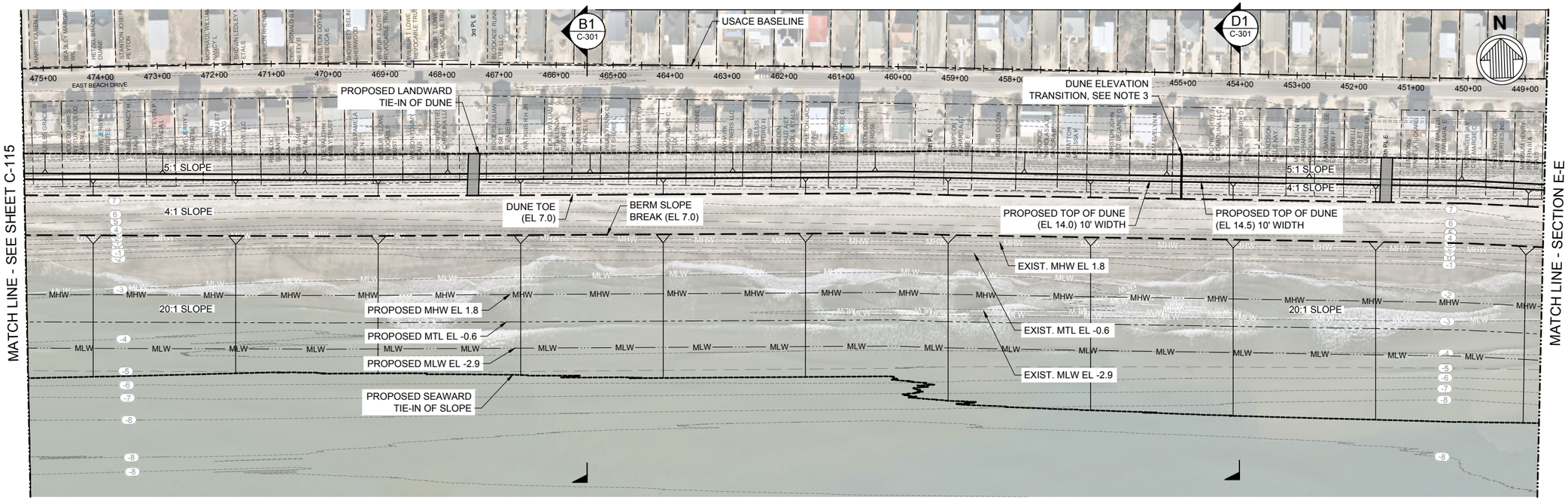
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Sheet Reference No.
C-113
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DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING





NOTES:

1. PROPOSED DUNE TEMPLATE IS CONSISTENT WITH THE PREVIOUS AUTHORIZED TEMPLATE (CAMA PERMIT #31-20, SAW 2018-02230) WITH THE EXCEPTION OF THE PROPOSED EXPANDED DUNE AREA.
2. THE EXTENT OF DUNE REPLACEMENT WILL BE DETERMINED BASED ON THE PRECONSTRUCTION SURVEY AND WILL BE COORDINATED WITH AGENCIES BEFORE CONSTRUCTION.
3. TRANSITION IN DUNE ELEVATION WILL OCCUR AT 1-FT VERTICAL OVER 50-FT HORIZONTAL.

LEGEND:

EMERGENCY VEHICLE ACCESS

100' 0' 100' 200'

SCALE: 1"=100'

ISSUED FOR PERMIT
ISSUED: 2024-02-02
NOT TO BE USED FOR CONSTRUCTION

TOWN OF OAK ISLAND NORTH CAROLINA

Mark	Description	Date	Appr
0	ISSUED FOR PERMIT	2024-02-02	BRG

BRUNSWICK COUNTY
OAK ISLAND RENOURISHMENT
PROJECT 2024

SITE PLAN 5 OF 9

moffatt & nichol
4700 FALLS OF THE NEUSE ROAD, STE 300, RALEIGH, NC 27609
919-781-4626
NC FIRM NO. F-0105

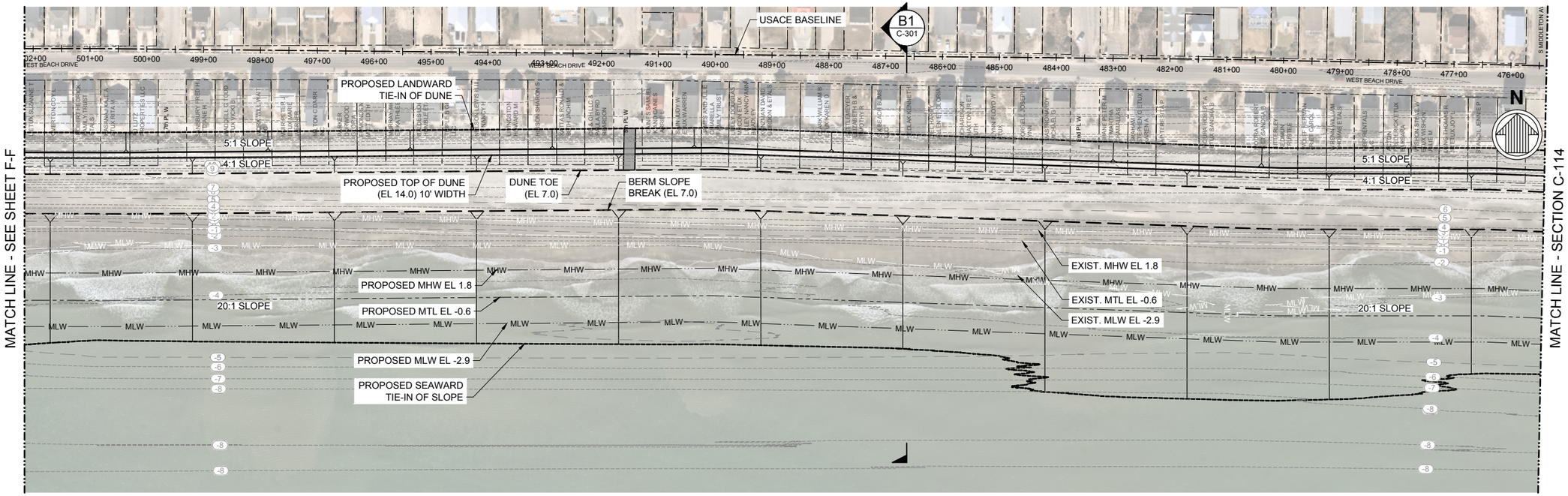
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Drawn by:	VNM
Checked by:	EJS
Reviewed by:	S. MORRISON
Submitted by:	MOFFATT & NICHOL
Date:	2024-02-02
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Rev.	0

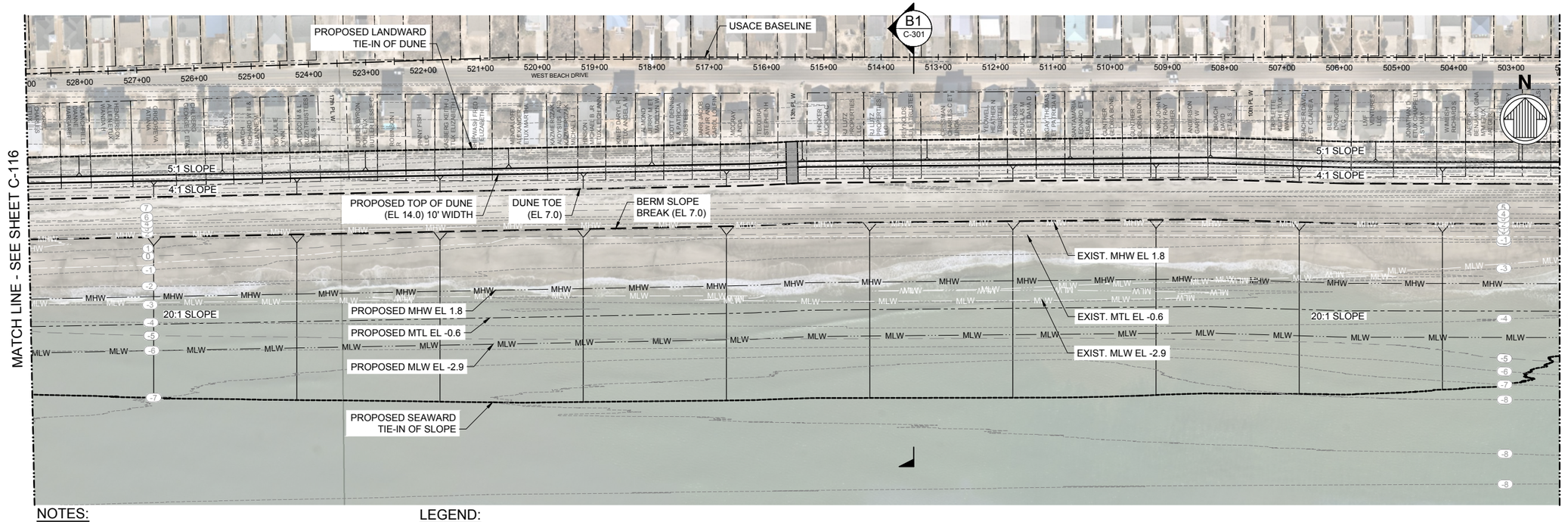
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DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING





NOTES:

1. PROPOSED DUNE TEMPLATE IS CONSISTENT WITH THE PREVIOUS AUTHORIZED TEMPLATE (CAMA PERMIT #31-20, SAW 2018-02230) WITH THE EXCEPTION OF THE PROPOSED EXPANDED DUNE AREA.
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3. TRANSITION IN DUNE ELEVATION WILL OCCUR AT 1-FT VERTICAL OVER 50-FT HORIZONTAL.

LEGEND:

EMERGENCY VEHICLE ACCESS

100' 0' 100' 200'

SCALE: 1"=100'

ISSUED FOR PERMIT
ISSUED: 2024-02-02
NOT TO BE USED FOR CONSTRUCTION

TOWN OF OAK ISLAND NORTH CAROLINA

No.	Mark	Description	Date	Appr
0		ISSUED FOR PERMIT	2024-02-02	BRG

BRUNSWICK COUNTY
OAK ISLAND RENOURISHMENT
PROJECT 2024

SITE PLAN 6 OF 9

moffatt & nichol
4700 FALLS OF THE NEUSE ROAD, STE 300, RALEIGH, NC 27609
919-781-4626
NC FIRM NO. F-0105

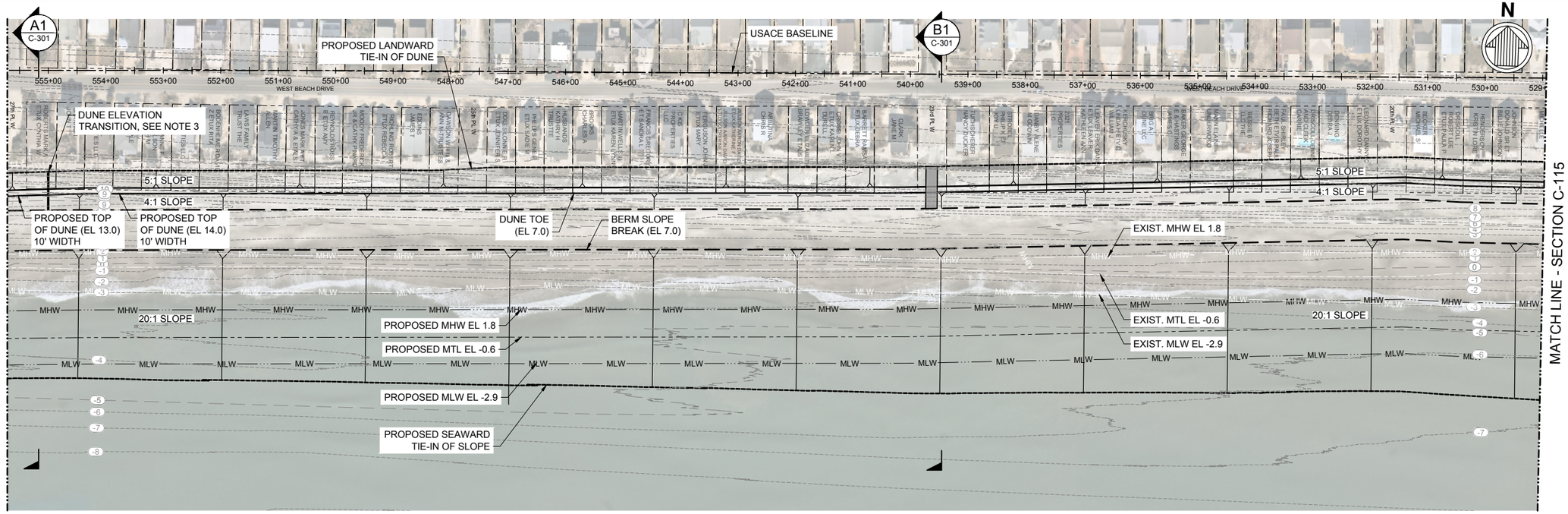
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Drawn by:	VNM
Checked by:	EJS
Reviewed by:	S. MORRISON
Submitted by:	MOFFATT & NICHOL
Date:	2024-02-02
Rev.	0
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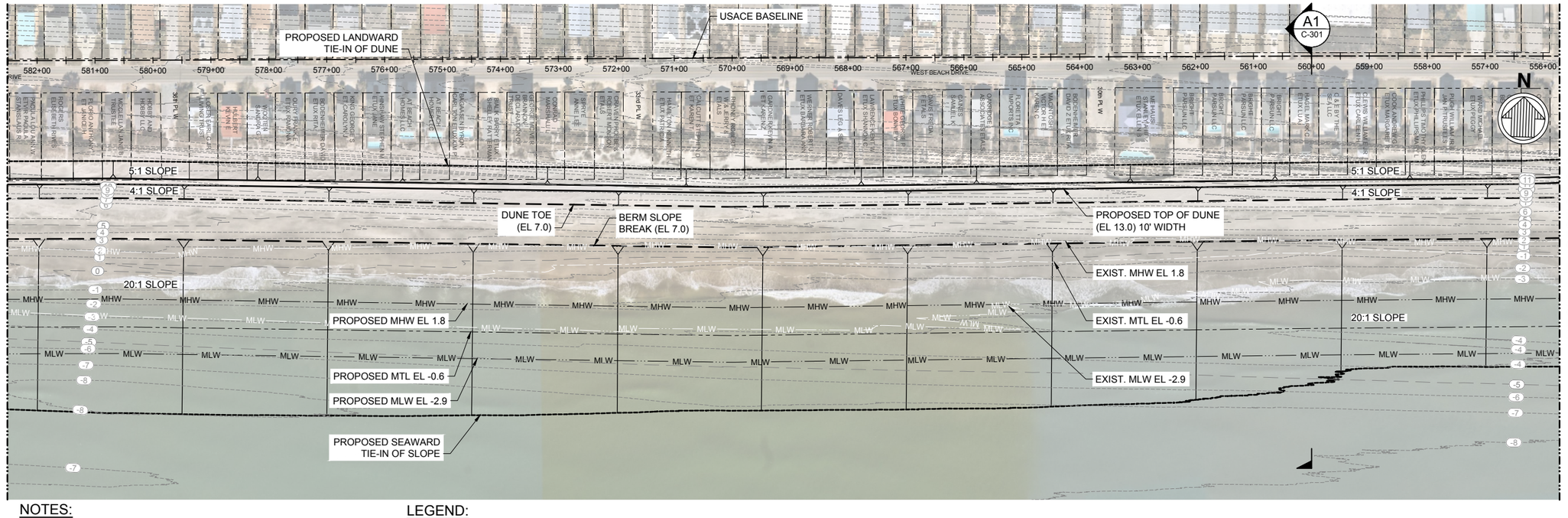
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Sheet Reference No.
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DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING





NOTES:

1. PROPOSED DUNE TEMPLATE IS CONSISTENT WITH THE PREVIOUS AUTHORIZED TEMPLATE (CAMA PERMIT #31-20, SAW 2018-02230) WITH THE EXCEPTION OF THE PROPOSED EXPANDED DUNE AREA.
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3. TRANSITION IN DUNE ELEVATION WILL OCCUR AT 1-FT VERTICAL OVER 50-FT HORIZONTAL.

LEGEND:

EMERGENCY VEHICLE ACCESS

100' 0' 100' 200'

SCALE: 1"=100'

ISSUED FOR PERMIT
ISSUED: 2024-02-02
NOT TO BE USED FOR CONSTRUCTION

TOWN OF OAK ISLAND NORTH CAROLINA

No.	Mark	Description	Date	Appr
0		ISSUED FOR PERMIT	2024-02-02	BRG

BRUNSWICK COUNTY
OAK ISLAND RENOURISHMENT
PROJECT 2024

SITE PLAN 7 OF 9

moffatt & nichol
4700 FALLS OF THE NEUSE ROAD,
STE 300 RALEIGH, NC 27609
919-781-4626
NC FIRM NO. F-0105

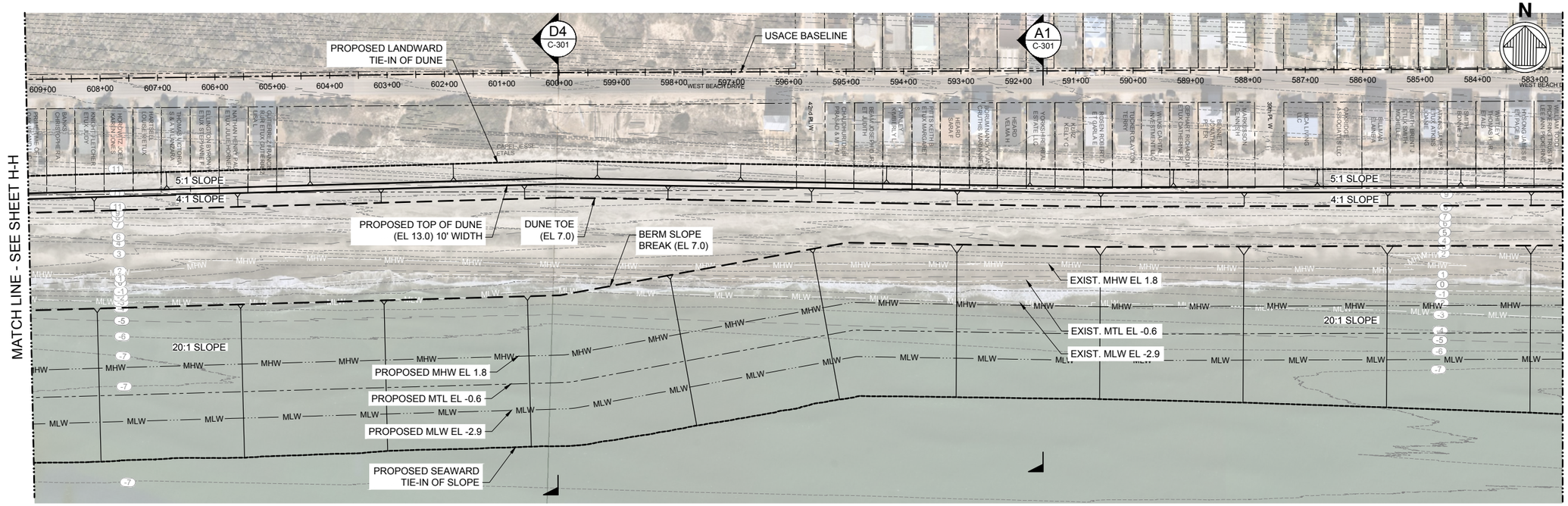
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Drawn by:	VNM
Checked by:	EJS
Reviewed by:	S. MORRISON
Submitted by:	MOFFATT & NICHOL
Date:	2024-02-02
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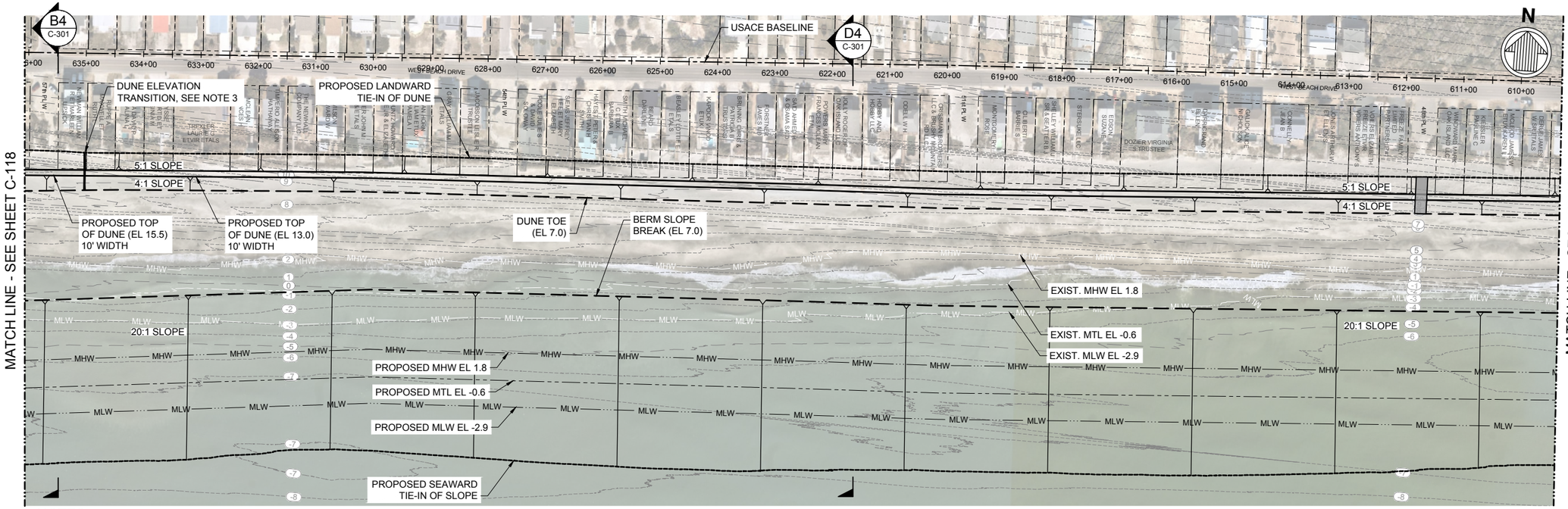
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Reference No.
C-116
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DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING





NOTES:

1. PROPOSED DUNE TEMPLATE IS CONSISTENT WITH THE PREVIOUS AUTHORIZED TEMPLATE (CAMA PERMIT #31-20, SAW 2018-02230) WITH THE EXCEPTION OF THE PROPOSED EXPANDED DUNE AREA.
2. THE EXTENT OF DUNE REPLACEMENT WILL BE DETERMINED BASED ON THE PRECONSTRUCTION SURVEY AND WILL BE COORDINATED WITH AGENCIES BEFORE CONSTRUCTION.
3. TRANSITION IN DUNE ELEVATION WILL OCCUR AT 1-FT VERTICAL OVER 50-FT HORIZONTAL.

LEGEND:

EMERGENCY VEHICLE ACCESS

100' 0' 100' 200'

SCALE: 1"=100'

ISSUED FOR PERMIT
ISSUED: 2024-02-02
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

TOWN OF OAK ISLAND NORTH CAROLINA

Mark	Description	Date	By
0	ISSUED FOR PERMIT	2024-02-02	BPG

BRUNSWICK COUNTY
OAK ISLAND RENOURISHMENT
PROJECT 2024

SITE PLAN 8 OF 9

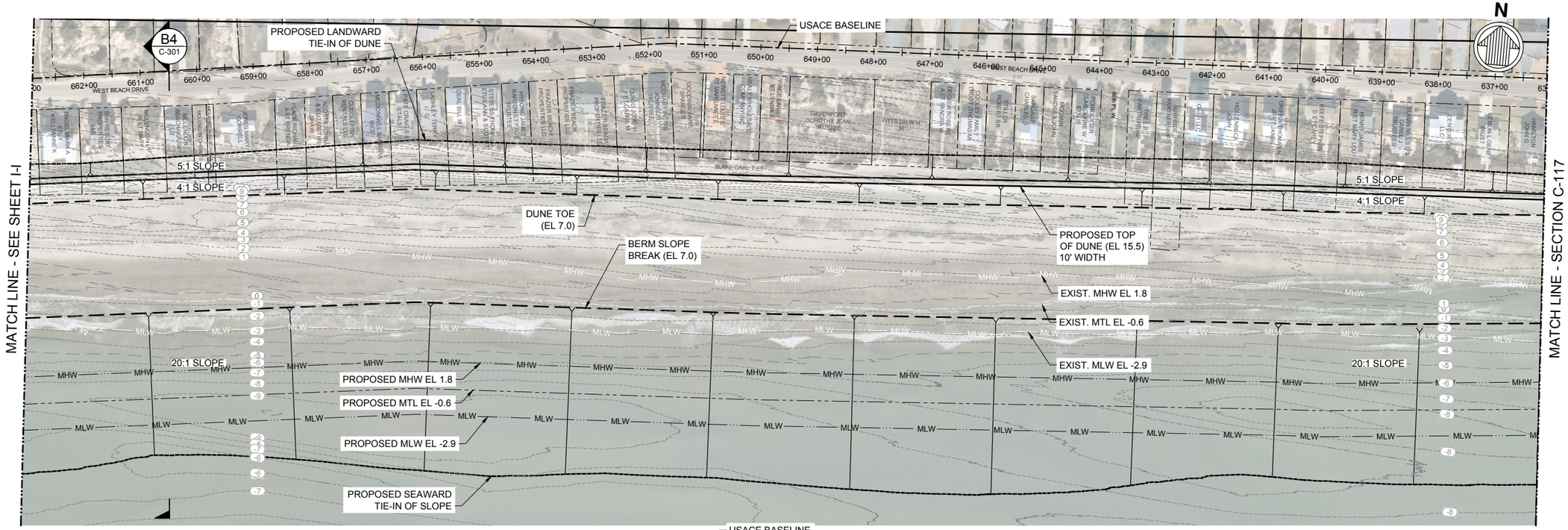
moffatt & nichol
4700 FALLS OF THE NEUSE ROAD, STE 300 RALEIGH, NC 27609
919-781-4626
NC FIRM NO. F-0105

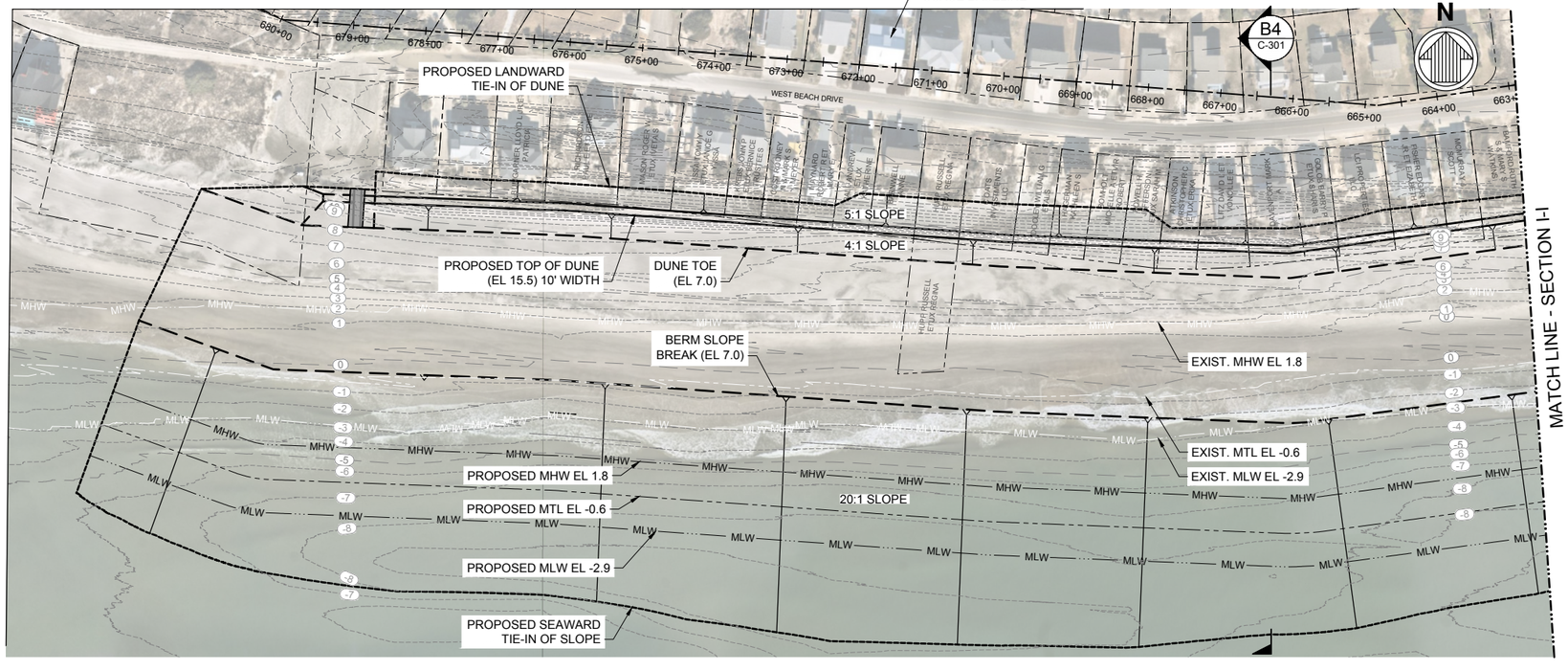
Designed by:	B. GRANT
Drawn by:	VNM
Cad by:	EJS
Reviewed by:	S. MORRISON
Submitted by:	MOFFATT & NICHOL
Date:	2024-02-02
M&N Project No:	10128-03A
Drawing code:	
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Sheet Reference No.
C-117
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NOTES:

1. PROPOSED DUNE TEMPLATE IS CONSISTENT WITH THE PREVIOUS AUTHORIZED TEMPLATE (CAMA PERMIT #31-20, SAW 2018-02230) WITH THE EXCEPTION OF THE PROPOSED EXPANDED DUNE AREA.
2. THE EXTENT OF DUNE REPLACEMENT WILL BE DETERMINED BASED ON THE PRECONSTRUCTION SURVEY AND WILL BE COORDINATED WITH AGENCIES BEFORE CONSTRUCTION.
3. TRANSITION IN DUNE ELEVATION WILL OCCUR AT 1-FT VERTICAL OVER 50-FT HORIZONTAL.

LEGEND:

EMERGENCY VEHICLE ACCESS

100' 0' 100' 200'

SCALE: 1"=100'

ISSUED FOR PERMIT
ISSUED: 2024-02-02
NOT TO BE USED FOR CONSTRUCTION

TOWN OF OAK ISLAND NORTH CAROLINA

No.	Mark	Description	Date	Appr
0		ISSUED FOR PERMIT	2024-02-02	BPG

BRUNSWICK COUNTY
OAK ISLAND RENOURISHMENT
PROJECT 2024

SITE PLAN 9 OF 9

moffatt & nichol
4700 FALLS OF THE NEUSE ROAD,
STE 300 RALEIGH, NC 27609
919-781-4626
NC FIRM NO. F-0105

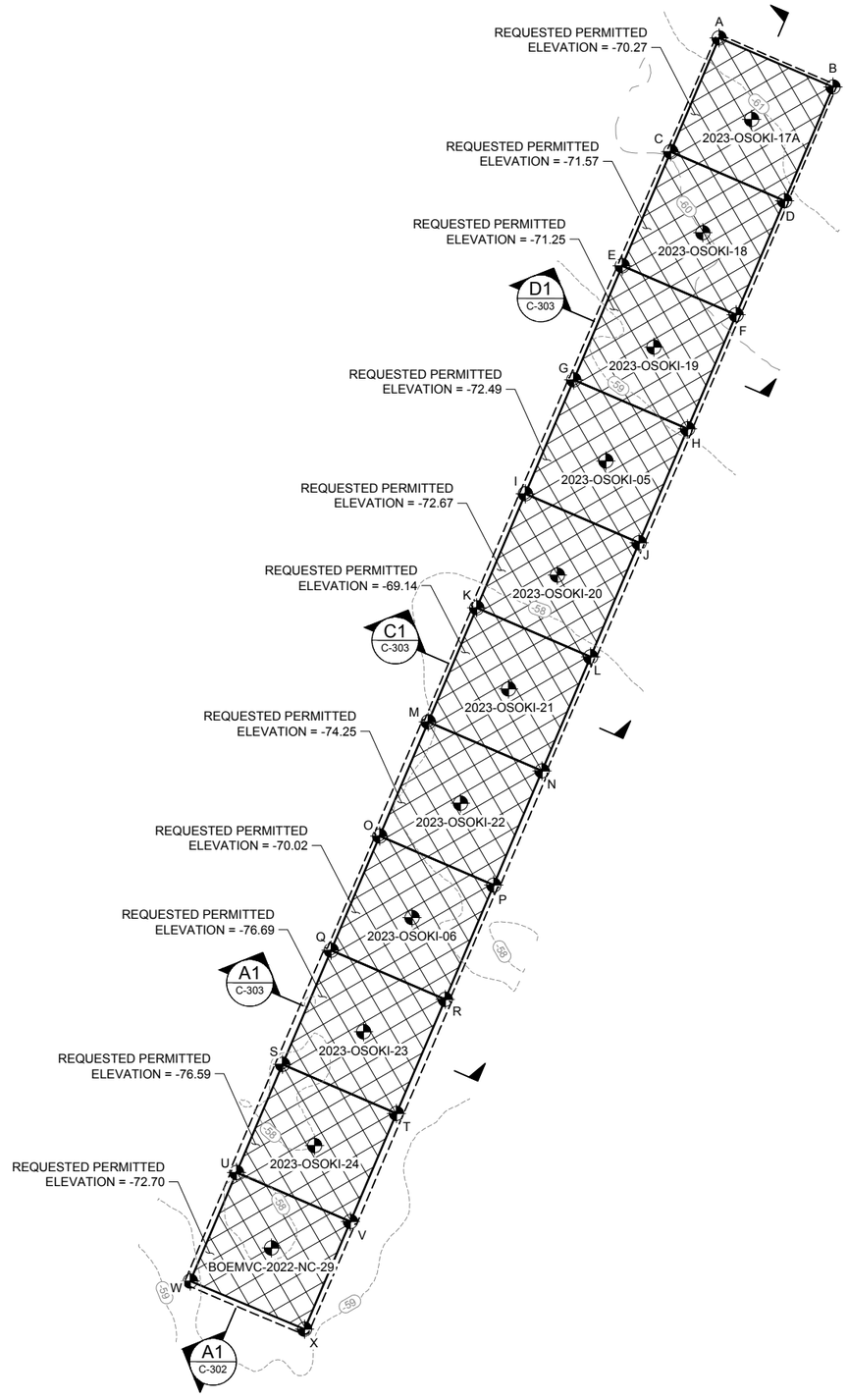
Designed by:	B. GRANT
Drawn by:	VNM
Checked by:	EJS
Reviewed by:	S. MORRISON
Submitted by:	MOFFATT & NICHOL
Date:	2024-02-02
M&N Project No.	10128-03A
Drawing code:	
Drawing Scale:	
Plot scale:	1:1 (0 SHEET)
Rev:	0

SEAL

Sheet
Reference No.
C-118
INDEX: 15 OF 21

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DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



NOTES:

1. BORROW AREA APPROXIMATELY 250 ACRES.
2. BORROW AREA CONTAINS APPROXIMATELY 5 MCY OF BEACH QUALITY MATERIAL TO THE REQUESTED PERMITTED ELEVATION.

LEGEND:

A — PROPOSED BORROW AREA CONTROL POINT

2023-OSOKI-## — OFFSHORE OAK ISLAND VIBRACORES

OFFSHORE OAK ISLAND BORROW AREA

-60 — MAJOR CONTOUR (NAVD88)

-61 — MINOR CONTOUR (NAVD88)

OFFSHORE OAK ISLAND VIBRACORE POINT TABLE

POINT ID	NORTHING	EASTING
2023-OSOKI-17A	-39323.445	2273204.987
2023-OSOKI-18	-40237.382	2272811.641
2023-OSOKI-19	-41159.705	2272416.215
2023-OSOKI-05	-42077.943	2272029.254
2023-OSOKI-20	-42998.755	2271638.942
2023-OSOKI-21	-43917.050	2271244.625
2023-OSOKI-22	-44838.923	2270856.711
2023-OSOKI-06	-45760.456	2270465.724
2023-OSOKI-23	-46681.622	2270074.405
2023-OSOKI-24	-47599.906	2269679.382
BOEMVC-2022-NC-29	-48425.650	2269331.880

OFFSHORE OAK ISLAND CONTROL POINT TABLE

POINT ID	NORTHING	EASTING
A	-38666.51	2272943.38
B	-39061.84	2273861.92
C	-39584.37	2272552.81
D	-39979.70	2273471.35
E	-40503.85	2272161.55
F	-40899.17	2273080.09
G	-41423.98	2271770.02
H	-41819.31	2272688.56
I	-42342.54	2271379.15
J	-42737.87	2272297.69
K	-43262.47	2270987.70
L	-43657.80	2271906.24
M	-44182.41	2270596.25
N	-44577.74	2271514.79
O	-45103.11	2270204.47
P	-45498.97	2271124.25
Q	-46024.13	2269812.55
R	-46420.32	2270733.10
S	-46944.52	2269420.91
T	-47340.05	2270339.93
U	-47816.60	2269049.82
V	-48212.06	2269968.67
W	-48692.56	2268677.08
X	-49080.45	2269598.79

600' 0' 600' 1200'

SCALE: 1"=600'

ISSUED FOR PERMIT
ISSUED: 2024-02-02
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

TOWN OF OAK ISLAND NORTH CAROLINA

Mark	Description	Date	By
0	ISSUED FOR PERMIT	2024-02-02	BRG

BRUNSWICK COUNTY
OAK ISLAND RENOURISHMENT
PROJECT 2024

OFFSHORE OAK ISLAND BORROW AREA SITE PLAN

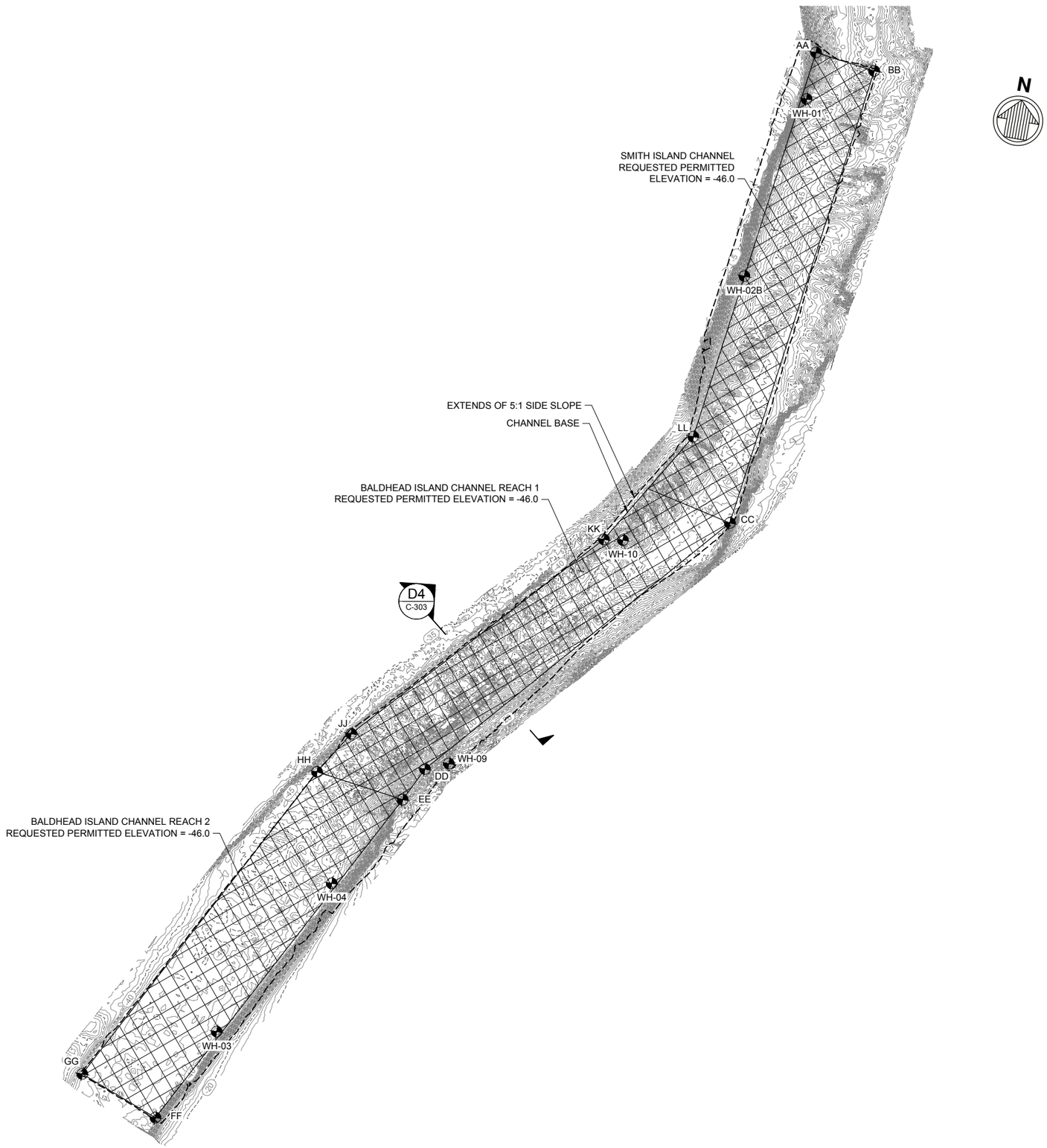
4700 FALLS OF THE NEUSE ROAD,
STE 300, RALEIGH, NC 27609
919-781-4626
NC FIRM NO. F-0105
moffatt & nichol

Designed by:	B. GRANT
Drawn by:	VNM
Cad by:	EJS
Reviewed by:	S. MORRISON
Submitted by:	MOFFATT & NICHOL
Date:	2024-02-02
M&N Project No.	10128-03A
Drawing code:	
Drawing Scale:	
Plot scale:	1:1 (1) SHEET)
Rev.	0

SEAL

Sheet Reference No.
C-120
INDEX: 16 OF 21

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NOTES:

1. SURVEY DATA OF EXISTING GROUND REFERENCE VERTICAL DATUM REFERENCES MLLW.
2. DREDGE FOOTPRINT SHOWN ON PLANS IS THE FEDERALLY AUTHORIZED FOOTPRINT FOR EACH REACH.
3. EXCAVATION WILL NOT OCCUR OUTSIDE OF THE FEDERALLY AUTHORIZED FOOTPRINT.

LEGEND:

- A — PROPOSED BORROW AREA CONTROL POINT
- 2023-OSOKI-## — OFFSHORE OAK ISLAND VIBRACORES
- OFFSHORE OAK ISLAND BORROW AREA
- -60 — MAJOR CONTOUR (MLLW)
- MINOR CONTOUR (MLLW)
- 5:1 SIDE SLOPE

WILMINGTON HARBOR VIBRACORE POINT TABLE

POINT ID	NORTHING	EASTING
WH-01	50974.265	2301361.650
WH-02B	49004.422	2301038.604
WH-03	40112.410	2296910.610
WH-04	41878.552	2297840.622
WH-09	43350.273	2298845.708
WH-10	46013.746	2300255.702

WILMINGTON HARBOR CONTROL POINT TABLE

POINT ID	NORTHING	EASTING
AA	51479.97	2301374.50
BB	51393.24	2302018.92
CC	46391.91	2301344.75
DD	43248.68	2298605.43
EE	42887.52	2298429.14
FF	39097.59	2296427.73
GG	39419.77	2295580.02
HH	43019.22	2297480.86
JJ	43481.36	2297766.63
KK	45986.26	2300054.95
LL	47227.99	2300801.63

600' 0' 600' 1200'

SCALE: 1"=600'

ISSUED FOR PERMIT
ISSUED: 2024-02-02
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

Mark	Description	Date	Appr
0	ISSUED FOR PERMIT	2024-02-02	BPG

BRUNSWICK COUNTY
OAK ISLAND RENOURISHMENT
PROJECT 2024

WILMINGTON HARBOR INNER OCEAN BAR BORROW AREA SITE PLAN

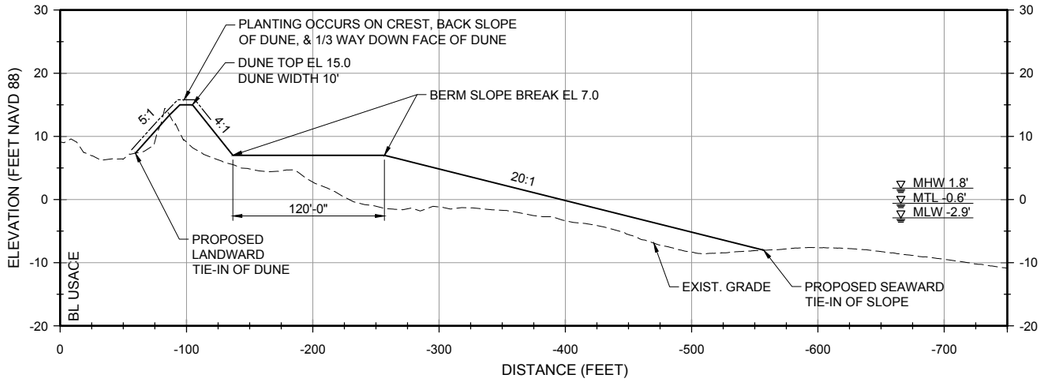
4700 FALLS OF THE NEUSE ROAD,
STE 300 RALEIGH, NC 27609
919-781-4626
NC FIRM NO. F-0105
moffatt & nichol

Designed by: B. GRANT
Drawn by: VNM
Check by: EJS
Reviewed by: S. MORRISON
Submitted by: MOFFATT & NICHOL
Date: 2024-02-02
M&N Project No. 10128-03A
Drawing date:
Drawing Scale:
Plot scale: 1:1 (D SHEET)
Rev. 0

SEAL

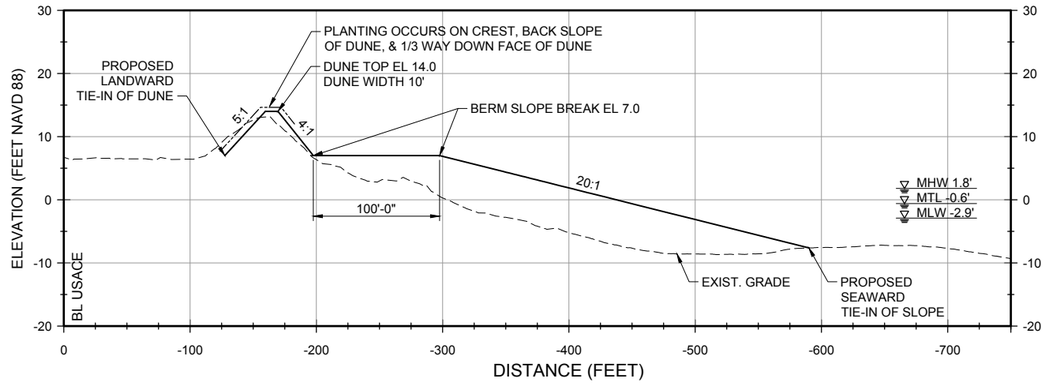
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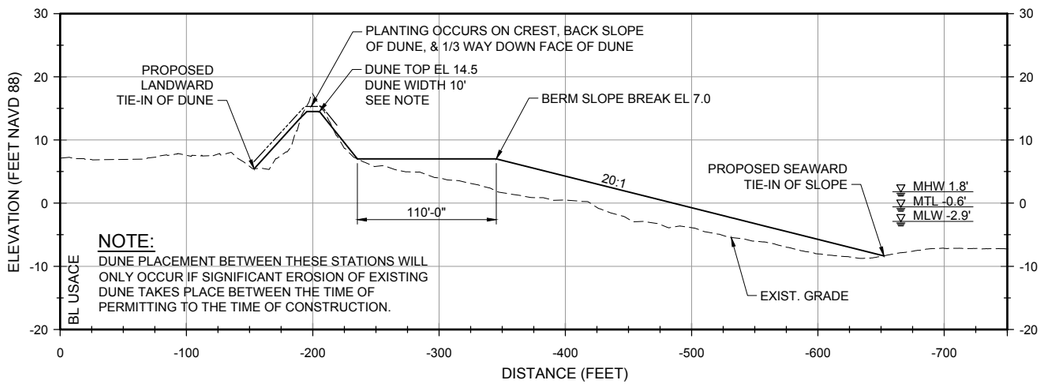
STA 210+00 THRU STA 235+00

D1 C-110 TYPICAL SECTION
SCALE: NTS



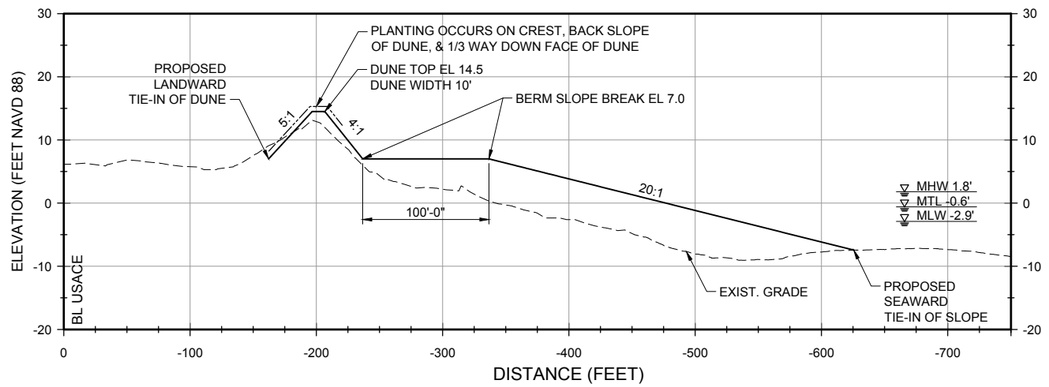
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D4 C-111 TYPICAL SECTION
SCALE: NTS
C-112



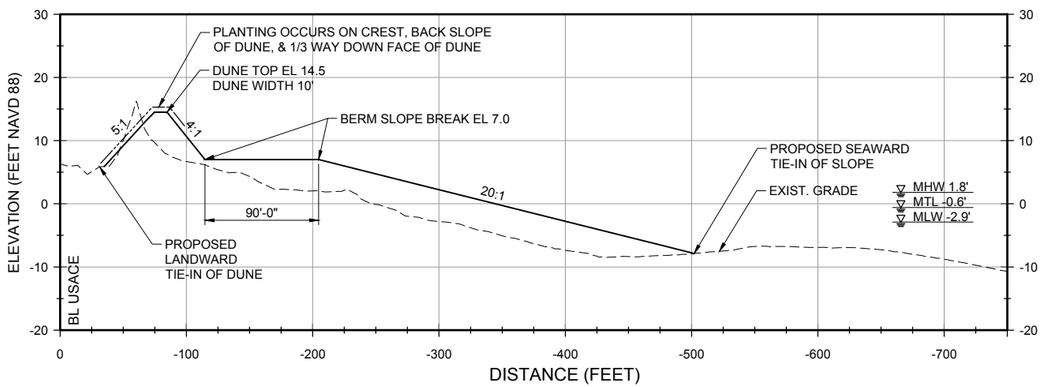
STA 235+00 THRU STA 275+00

B1 C-110 TYPICAL SECTION
SCALE: NTS
C-111



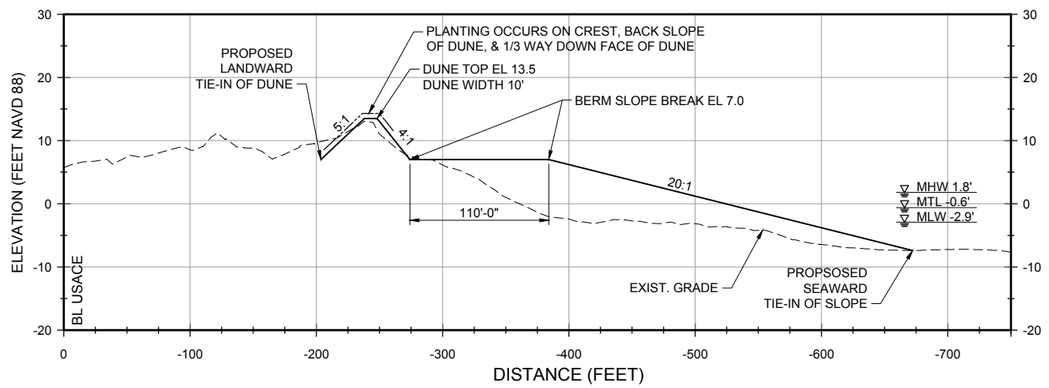
STA 335+00 THRU STA 395+00

B4 C-113 TYPICAL SECTION
SCALE: NTS



STA 275+00 THRU STA 295+00

A1 C-111 TYPICAL SECTION
SCALE: NTS



STA 395+00 THRU STA 425+00

A4 C-113 TYPICAL SECTION
SCALE: NTS
C-114

NOTES:

1. CONTRACTOR IS NOT REQUIRED TO EXCAVATE EXISTING GRADE TO TEMPLATE IN AREAS WHERE CUT IS SHOWN.
2. FULL TEMPLATE IS SHOWN TO ACCOUNT FOR CHANGE IN EXISTING GRADE FROM THE TIME OF PERMIT TO THE TIME OF CONSTRUCTION.

ISSUED FOR PERMIT
ISSUED: 2024-02-02
NOT TO BE USED FOR CONSTRUCTION

TOWN OF OAK ISLAND NORTH CAROLINA

No.	Description	Date	By
0	ISSUED FOR PERMIT	2024-02-02	BRG

BRUNSWICK COUNTY
OAK ISLAND RENOURISHMENT
PROJECT 2024

BEACH RENOURISHMENT
TYPICAL SECTIONS 1 OF 2

4700 FALLS OF THE NEUSE ROAD,
STE 300 RALEIGH, NC 27609
919-781-4626
NC FIRM NO. F-0105
moffatt & nichol

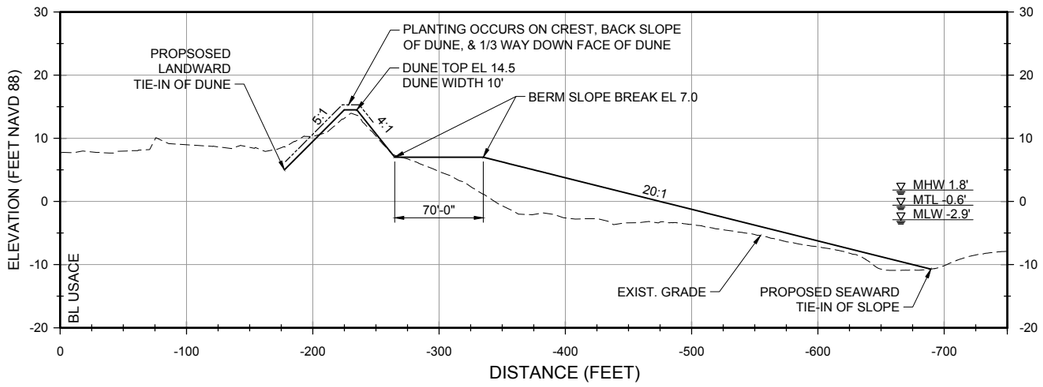
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M&N Project No.	10128-03A
Drawing code:	
Drawing Scale:	1:1 (0 SHEET)
Designed by:	B. GRANT
Drawn by:	VNM
Cad by:	EJS
Reviewed by:	S. MORRISON
Submitted by:	MOFFATT & NICHOL
Plot scale:	1:1 (0 SHEET)

SEAL

Sheet
Reference No.
C-300
INDEX: 18 OF 21

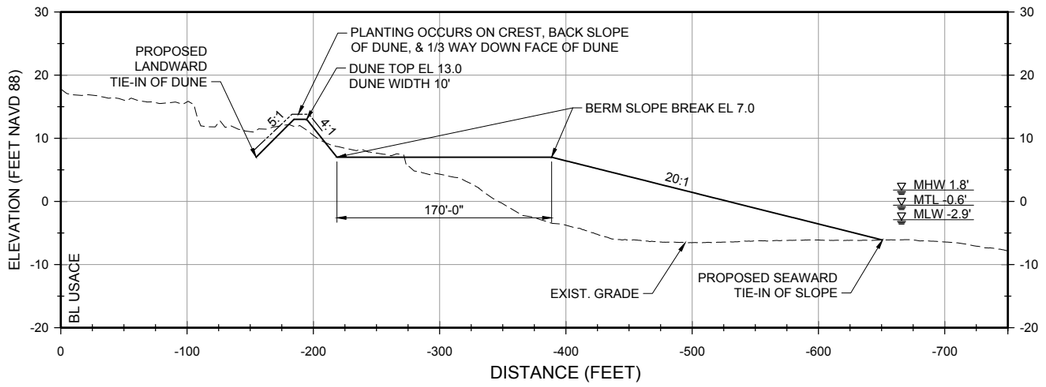
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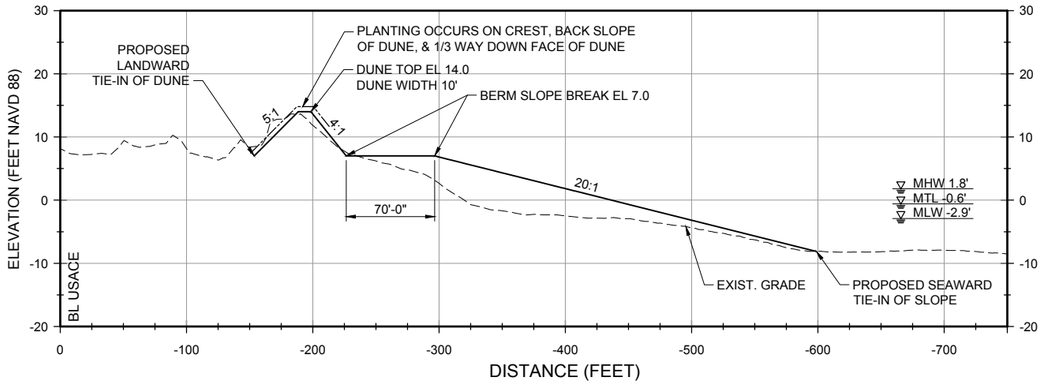
STA 425+00 THRU STA 455+00

D1 C-114 TYPICAL SECTION
SCALE: NTS



STA 595+00 THRU STA 635+00

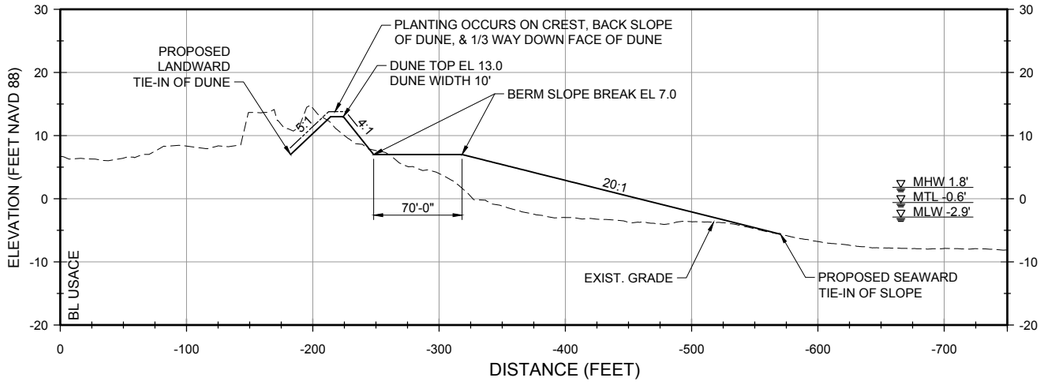
D4 C-117 TYPICAL SECTION
SCALE: NTS



STA 455+00 THRU STA 555+00

B1 C-114 TYPICAL SECTION
SCALE: NTS

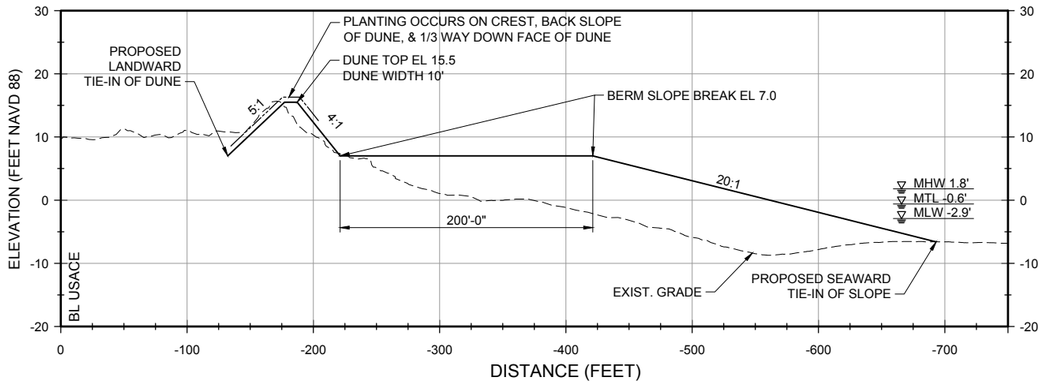
C-115,C-116



STA 555+00 THRU STA 595+00

A1 C-116 TYPICAL SECTION
SCALE: NTS

C-117



STA 635+00 THRU STA 680+00

B4 C-117 TYPICAL SECTION
SCALE: NTS

C-118

NOTES:

1. CONTRACTOR IS NOT REQUIRED TO EXCAVATE EXISTING GRADE TO TEMPLATE IN AREAS WHERE CUT IS SHOWN.
2. FULL TEMPLATE IS SHOWN TO ACCOUNT FOR CHANGE IN EXISTING GRADE FROM THE TIME OF PERMIT TO THE TIME OF CONSTRUCTION.

ISSUED FOR PERMIT
ISSUED: 2024-02-02
NOT TO BE USED FOR CONSTRUCTION

TOWN OF OAK ISLAND NORTH CAROLINA

No.	Mark	Description	Date	By
0	ISSUED FOR PERMIT		2024-02-02	BPG

BRUNSWICK COUNTY
OAK ISLAND RENOURISHMENT
PROJECT 2024

BEACH RENOURISHMENT
TYPICAL SECTIONS 2 OF 2

Date: 2024-02-02
Rev: 0
M&M Project No.: 10128-03A
Drawing code:
Drawing Scale:
Plot scale: 1:1 (D SHEET)

Designed by: B. GRANT
Drawn by: VNM
Cad by: EJS
Reviewed by: S. MORRISON
Submitted by: MOFFATT & NICHOL

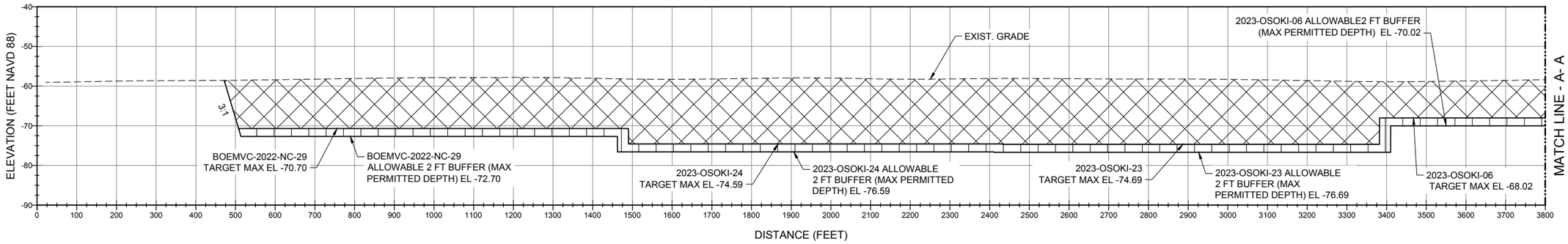
4700 FALLS OF THE NEUSE ROAD, STE 300, RALEIGH, NC 27609
919-781-4626
NC FIRM NO. F-0105
moffatt & nichol

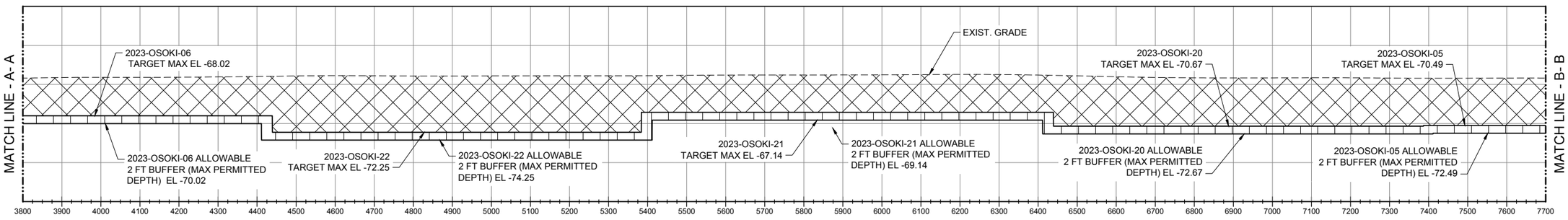
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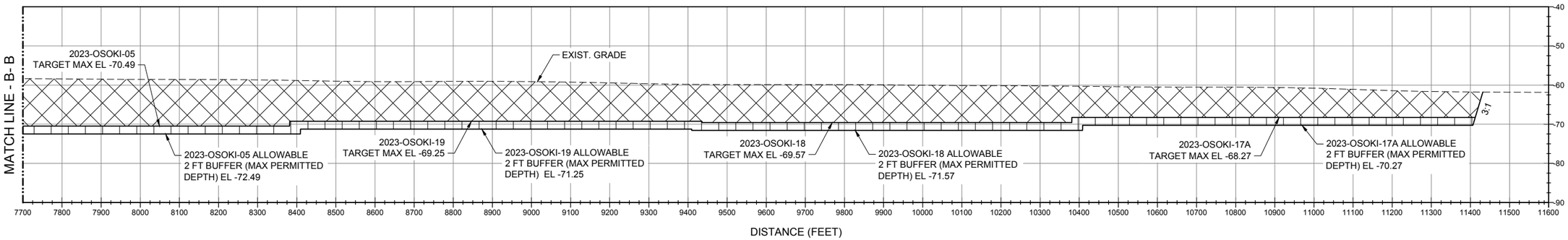
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DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING







A1 / C-120 TYPICAL SECTION
SCALE: NTS

ISSUED FOR PERMIT
ISSUED: 2024-02-02
NOT TO BE USED FOR CONSTRUCTION

TOWN OF OAK ISLAND NORTH CAROLINA

Mark	Description	Date	Appr
0	ISSUED FOR PERMIT	2024-02-02	BRG

BRUNSWICK COUNTY
OAK ISLAND RENOURISHMENT
PROJECT 2024

**BORROW AREA
TYPICAL SECTIONS
1 OF 2**

4700 FALLS OF THE NEUSE ROAD,
STE 300 RALEIGH, NC 27609
919-781-4626
NC FIRM NO. F-0105
moffatt & nichol

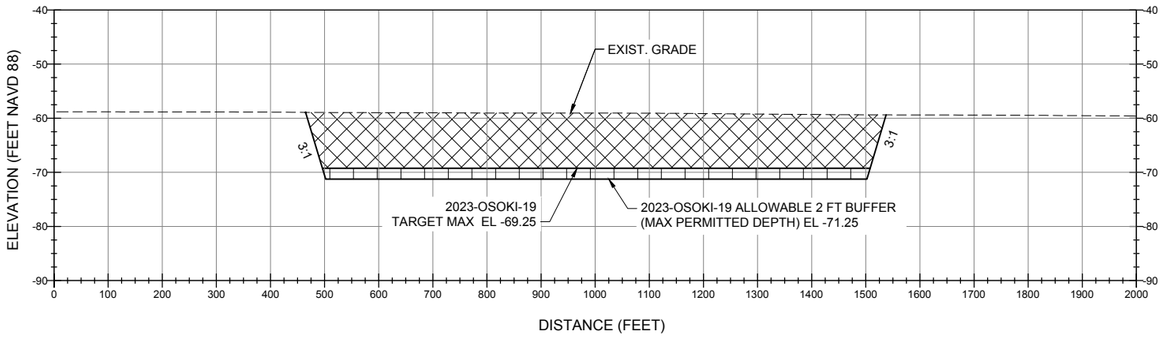
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Drawn by:	VNM
Cad by:	EJS
Reviewed by:	S. MORRISON
Submitted by:	MOFFATT & NICHOL
Date:	2024-02-02
Rev:	0
M&N Project No.	10128-03A
Drawing code:	
Drawing Scale:	
Plot scale:	1:1 (D SHEET)

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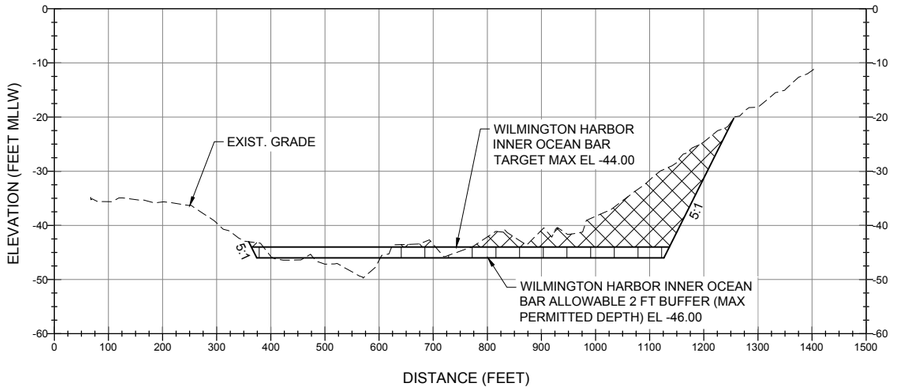
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Reference No.
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DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



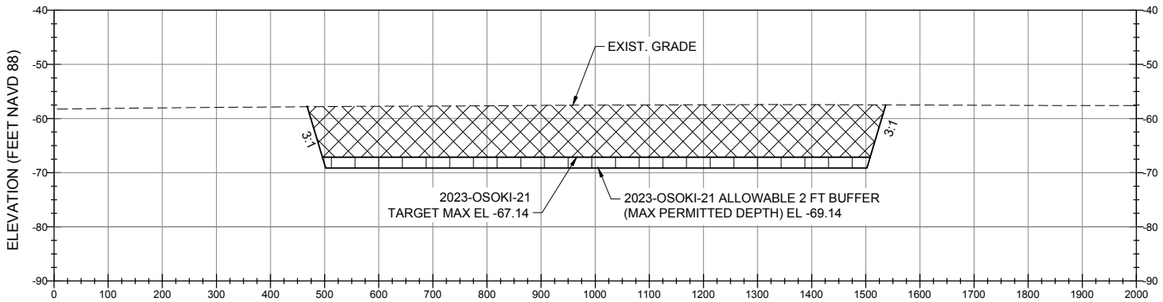
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SCALE: NTS



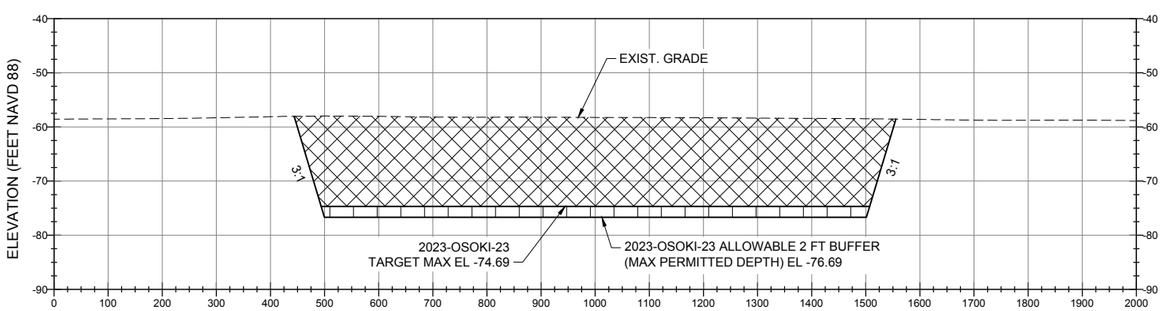
NOTE:

WILMINGTON HARBOR INNER OCEAN BAR BORROW AREA VERTICAL DATUM BASED ON MLLW.

D4 C-121 TYPICAL SECTION
SCALE: NTS



C1 C-120 TYPICAL SECTION
SCALE: NTS



A1 C-120 TYPICAL SECTION
SCALE: NTS

ISSUED FOR PERMIT
ISSUED: 2024-02-02
NOT TO BE USED FOR CONSTRUCTION

0	ISSUED FOR PERMIT	2024-02-02	BPG
Mark	Description	Date	Appr

BRUNSWICK COUNTY
OAK ISLAND RENOURISHMENT
PROJECT 2024

BORROW AREA
TYPICAL SECTIONS
2 OF 2

4700 FALLS OF THE NEUSE ROAD,
STE 300 RALEIGH, NC 27609
919-781-4626
NC FIRM NO. F-0105
moffatt & nichol

Designed by: B. GRANT	Rev: 0
Drawn by: VNM	Date: 2024-02-02
Qa'd by: EJS	M&N Project No. 10128-03A
Reviewed by: S. MORRISON	Drawing code:
Submitted by: MOFFATT & NICHOL	Drawing Scale: Plot scale: 1:1 (D SHEET)

SEAL

Sheet
Reference No.
C-303
INDEX: 21 OF 21

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DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

Appendix B
Offshore Oak Island Borrow Area
Sediment Report

moffatt & nichol

4700 Falls of Neuse Rd.
Ste. 300
Raleigh, NC 27609

(919) 781-4626
www.moffattnichol.com

January 22, 2024

Division of Coastal Management
North Carolina Department of Environmental Quality
127 Cardinal Drive Extension
Wilmington, NC 28405

Attn: Heather Coats, Beach & Inlet Management Project Coordinator

Subject: **Town of Oak Island 2024/2025 Nourishment Project – Offshore Oak Island (OSOKI) Borrow Area Certification**

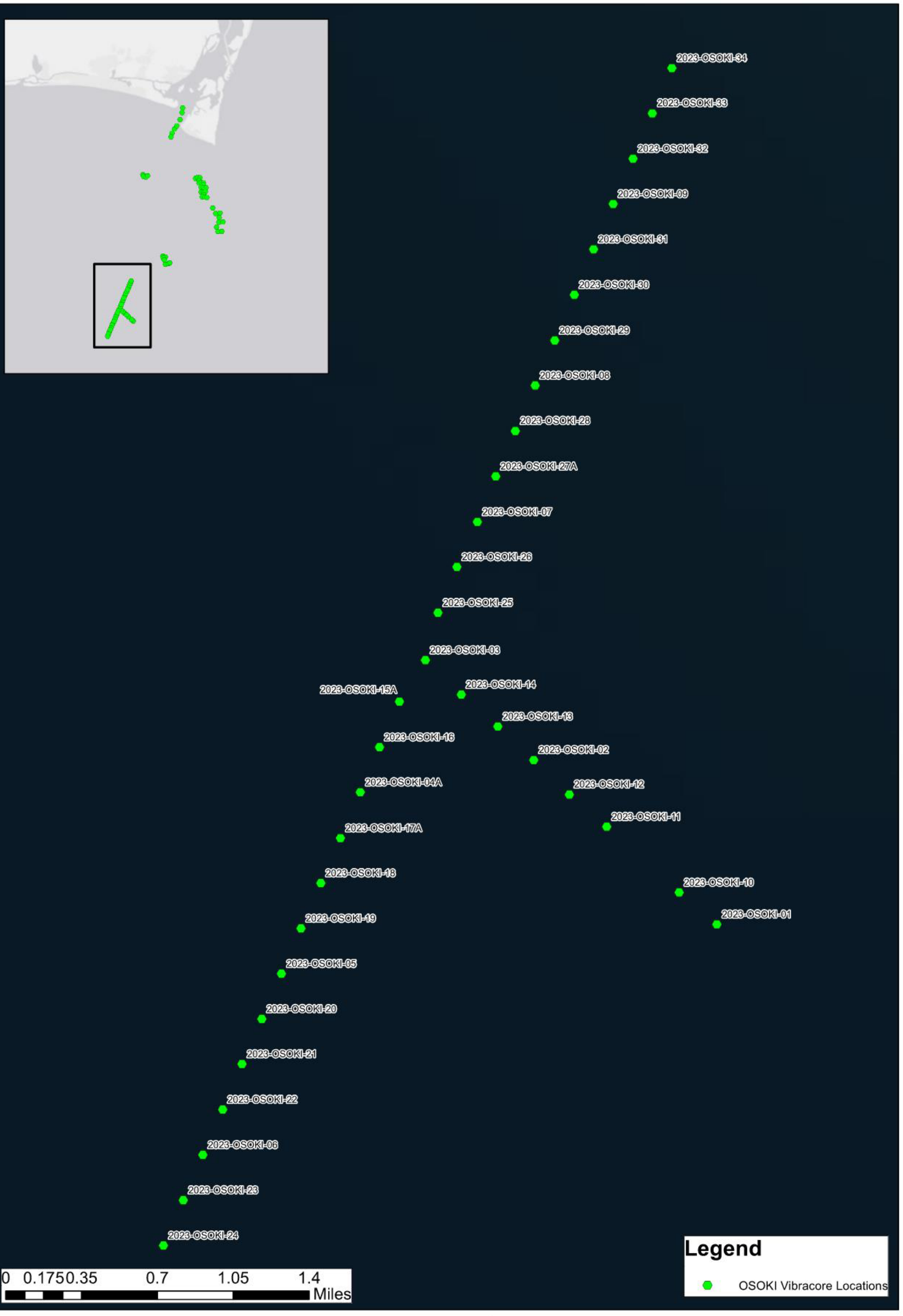
Dear Heather:

As the project engineer for the subject project, and licensed pursuant to Chapter 89C and/or 89E of North Carolina General Statutes, I hereby certify that the sediment compatibility data and analysis contained herein complies with the sediment standards found within 15A NCAC 07H.0312.



Sincerely,
MOFFATT & NICHOL

Brandon Grant, PE
Engineer of Record



AMDRILL inc.

N

Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Fig 5 - OSOKI Vibracore Locations

Coordinate System: NAD_1983_2011_State_Plane_North_Carolina_FIPS_3200_FT_US

Vibracore Summary Table
Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Vibracore	State Plane Zone 3200 North Carolina (US) Feet		Top of Core Elevation (NAVD88)	Penetration (Ft)	Recovery		Date
	Easting	Northing			(Ft)	(%)	
2023-OSOKI-02	2277124.826	-37706.506	-58.56	17.8	17.6	99	6/25/2023
2023-OSOKI-03	2274899.034	-35706.232	-57.77	12.3	8.9	72	6/25/2023
2023-OSOKI-04A	2273602.416	-38392.358	-62.06	7.7	6.8	88	6/25/2023
2023-OSOKI-05	2272029.254	-42077.943	-60.09	15.3	15.0	98	6/25/2023
2023-OSOKI-06	2270465.724	-45760.456	-59.62	14.1	10.4	74	6/25/2023
2023-OSOKI-07	2275934.655	-32899.040	-55.78	12.4	9.1	73	6/25/2023
2023-OSOKI-08	2277082.734	-30129.007	-54.20	15.7	13.4	85	6/25/2023
2023-OSOKI-09	2278634.543	-26442.655	-50.87	20.0	16.5	83	6/25/2023
2023-OSOKI-10	2280104.757	-40359.955	-59.25	15.0	11.0	73	7/6/2023
2023-OSOKI-11	2278621.398	-39046.855	-59.28	13.0	12.4	95	7/6/2023
2023-OSOKI-12	2277853.654	-38397.981	-58.84	17.9	15.0	84	7/6/2023
2023-OSOKI-13	2276387.996	-37035.108	-58.08	11.8	7.7	65	7/6/2023
2023-OSOKI-14	2275634.784	-36399.879	-57.90	16.5	11.2	68	7/6/2023
2023-OSOKI-15A	2274379.099	-36548.537	-58.87	15.2	12.0	79	7/6/2023
2023-OSOKI-16	2273983.281	-37584.816	-60.45	11.0	9.2	84	7/6/2023
2023-OSOKI-17A	2273204.987	-39323.445	-61.97	8.4	8.3	99	6/25/2023
2023-OSOKI-18	2272811.641	-40237.382	-61.57	10.0	10.0	100	7/6/2023
2023-OSOKI-19	2272416.215	-41159.705	-60.65	12.7	10.6	83	7/6/2023
2023-OSOKI-20	2271638.942	-42998.755	-59.47	20.0	13.2	66	7/6/2023
2023-OSOKI-21	2271244.625	-43917.050	-59.14	12.6	10.0	79	7/6/2023
2023-OSOKI-22	2270856.711	-44838.923	-59.25	17.6	15.0	85	7/6/2023
2023-OSOKI-23	2270074.405	-46681.622	-60.09	18.7	16.6	89	7/31/2023
2023-OSOKI-24	2269679.382	-47599.906	-59.19	17.7	17.4	98	7/31/2023
2023-OSOKI-25	2275148.466	-34747.716	-56.71	13.2	10.0	76	7/6/2023
2023-OSOKI-26	2275527.817	-33817.136	-56.22	12.8	9.5	74	7/6/2023
2023-OSOKI-27A	2276297.578	-31974.789	-54.99	12.9	10.7	83	7/31/2023
2023-OSOKI-28A	2276690.018	-31052.083	-54.74	18.0	15.0	83	7/31/2023
2023-OSOKI-29	2277471.229	-29212.881	-55.04	20.0	17.6	88	6/25/2023
2023-OSOKI-30	2277860.520	-28286.551	-57.41	17.3	15.0	87	6/25/2023
2023-OSOKI-31	2278244.963	-27365.357	-54.35	19.7	18.4	93	6/25/2023
2023-OSOKI-32	2279028.071	-25521.733	-51.34	20.0	17.1	86	6/25/2023
2023-OSOKI-33	2279416.395	-24600.126	-52.81	20.0	17.7	89	6/25/2023
2023-OSOKI-34	2279806.236	-23680.684	-53.20	20.0	18.7	94	6/25/2023
2023-WH-01	2301361.650	50974.265	-48.09	10.0	9.5	95	6/9/2023
2023-WH-02B	2301038.604	49004.422	-39.55	11.0	6.5	59	6/9/2023
2023-WH-03	2296910.610	40112.410	-47.37	10.5	8.6	82	6/9/2023
2023-WH-04	2297840.622	41878.552	-48.15	10.0	8.2	82	6/9/2023
2023-WH-08A	2296321.292	38494.509	-37.02	11.0	11.0	100	6/9/2023
2023-WH-09	2298845.708	43350.273	-19.53	10.0	9.0	90	6/9/2023
2023-WH-10	2300255.702	46013.746	-50.65	10.0	9.1	91	6/9/2023

Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Laboratory Results Summary Table

Core	Sample ID	Top Depth	Bottom Depth	USCS	Gravel	Sand	Fines (200)	Fines (230)	Mean (mm)	Percent Shell	Percent Carbonate	Munsell (Wet)	Verbal (Wet)	Munsell (Dry)	Verbal (Dry)
2023-OSOKI-05	S1	0.0	3.8	SP	0.60	96.35	3.05	2.82	0.23	0.46	6.02	10YR-5/1	gray	10YR-7/1	light gray
	S2	3.8	7.1	SW	0.51	95.87	3.62	3.31	0.21	0.51	7.33	10YR-5/1	gray	10YR-7/1	light gray
	S3	7.1	8.9	SP-SM	0.02	93.75	6.23	5.51	0.18	0.02	7.47	10YR-4/1	dark gray	10YR-6/1	gray
	S4	8.9	10.0	SW	0.28	95.14	4.58	4.39	0.63	0.18	5.33	10YR-4/1	dark gray	10YR-6/1	gray
	S5	10.0	12.4	SP-SM	0.29	89.29	10.42	10.06	0.38	0.00	17.53	10YR-7/2	light gray	10YR-8/1	white
2023-OSOKI-06	S1	0.0	1.7	SW	2.09	96.92	0.99	0.95	0.46	2.09	7.15	10YR-7/1	light gray	10YR-8/1	white
	S2	1.7	6.6	SW	0.77	94.66	4.57	4.42	0.34	0.77	10.41	10YR-5/1	gray	10YR-6/1	gray
	S3	6.6	9.6	SW	0.00	95.11	4.89	4.77	0.33	0.00	2.28	10YR-6/1	gray	10YR-7/1	light gray
	S4	9.6	10.4	SP-SM	13.48	80.53	5.99	5.58	0.74	0.00	3.33	10YR-5/2	grayish brown	10YR-7/1	light gray
2023-OSOKI-17A	S1	0.0	2.8	SW	0.60	95.46	3.94	3.68	0.30	0.60	9.01	10YR-6/1	gray	10YR-7/1	light gray
	S2	2.8	6.0	SP	0.00	96.22	3.78	3.70	0.46	0.00	2.29	10YR-5/1	gray	10YR-7/1	light gray
	S3	6.0	8.3	SP-SM	4.70	85.76	9.54	9.20	0.57	0.00	8.45	10YR-6/1	gray	10YR-7/1	light gray
2023-OSOKI-18	S1	0.0	5.0	SW	0.98	95.75	3.27	2.98	0.24	0.98	9.56	10YR-6/1	gray	10YR-7/1	light gray
	S2	5.0	8.0	SW	0.00	95.86	4.14	3.96	0.39	0.00	3.43	10YR-6/1	gray	10YR-7/1	light gray
	S3	8.0	10.0	SM	3.92	76.98	19.10	18.71	0.43	0.00	19.25	10YR-6/1	gray	10YR-7/1	light gray
2023-OSOKI-19	S1	0.0	3.0	SP	0.42	96.54	3.04	2.82	0.22	0.42	7.24	10YR-6/1	gray	10YR-7/1	light gray
	S2	3.0	7.7	SW	0.43	95.82	3.75	3.53	0.38	0.43	6.67	10YR-5/1	gray	10YR-7/1	light gray
	S3	7.7	9.0	SW	0.00	97.85	2.15	2.08	0.39	0.00	1.89	10YR-7/1	light gray	10YR-7/1	light gray
	S4	9.0	10.6	SW	0.75	95.17	4.08	3.92	0.68	0.06	6.95	10YR-5/1	gray	10YR-7/1	light gray
2023-OSOKI-20	S1	0.0	5.0	SP	0.04	98.09	1.87	1.71	0.24	0.04	5.75	10YR-7/1	light gray	10YR-7/1	light gray
	S2	5.0	8.5	SP	0.02	96.24	3.74	3.56	0.22	0.02	5.91	10YR-6/1	gray	10YR-7/1	light gray
	S3	8.5	10.0	SW	0.00	95.56	4.44	4.14	0.24	0.00	2.71	10YR-6/1	gray	10YR-7/1	light gray
	S4	10.0	11.4	SP-SM	0.00	94.27	5.73	5.05	0.45	0.00	1.60	10YR-4/1	dark gray	10YR-6/1	gray
	S5	11.4	13.2	SW	0.00	96.58	3.42	3.15	0.37	0.00	4.74	10YR-6/2	light brownish gray	10YR-7/1	light gray
2023-OSOKI-21	S1	0.0	3.0	SP	0.00	98.39	1.61	1.55	0.31	0.00	4.51	10YR-7/1	light gray	10YR-8/1	white
	S2	3.0	6.0	SP	0.11	97.83	2.06	1.99	0.30	0.11	11.75	10YR-7/1	light gray	10YR-7/1	light gray
	S3	6.0	8.4	SP-SM	0.91	91.70	7.39	6.88	0.29	0.91	4.40	10YR-4/1	dark gray	10YR-5/1	gray
	S4	8.4	10.0	SW	0.09	94.97	4.94	4.78	0.44	0.00	7.55	10YR-5/2	grayish brown	10YR-6/2	light brownish gray
2023-OSOKI-22	S1	0.0	5.0	SW	0.93	97.51	1.56	1.49	0.34	0.93	9.05	10YR-7/1	light gray	10YR-7/1	light gray
	S2	5.0	9.5	SW	0.17	96.54	3.29	3.15	0.37	0.17	5.05	10YR-6/1	gray	10YR-6/1	gray
	S3	9.5	12.0	SW	0.14	95.64	4.22	4.10	0.43	0.14	1.00	10YR-5/2	grayish brown	10YR-6/2	light brownish gray
	S4	12.0	15.0	SW	0.00	95.54	4.46	4.19	0.40	0.00	8.07	10YR-5/2	grayish brown	10YR-6/2	light brownish gray
2023-OSOKI-23	S1	0.0	5.1	SW	1.03	97.52	1.45	1.34	0.30	1.03	7.71	10YR-7/1	light gray	10YR-7/1	light gray
	S2	5.1	8.8	SP-SM	0.49	90.45	9.06	8.49	0.28	0.49	3.66	10YR-3/1	very dark gray	10YR-5/1	gray
	S3	8.8	11.0	SW	0.53	95.53	3.94	3.64	0.35	0.53	6.01	10YR-4/1	dark gray	10YR-5/1	gray
	S4	11.0	14.0	SW	2.55	94.62	2.83	2.69	0.60	2.55	2.72	10YR-4/2	dark grayish brown	10YR-5/2	grayish brown
	S5	14.0	16.6	SW	0.38	98.12	1.50	1.45	0.62	0.00	0.61	10YR-6/3	pale brown	10YR-7/2	light gray
2023-OSOKI-24	S1	0.0	4.6	SW	2.30	96.10	1.60	1.51	0.38	2.30	7.15	10YR-7/1	light gray	10YR-8/1	white
	S2	4.6	6.6	SP-SM	0.68	93.39	5.93	5.77	0.31	0.68	10.05	10YR-4/1	dark gray	10YR-6/1	gray
	S3	6.6	10.0	SW	0.00	97.50	2.50	2.43	0.54	0.00	1.05	10YR-6/1	gray	10YR-7/1	light gray
	S4	10.0	13.5	SP	0.00	98.71	1.29	1.25	0.48	0.00	1.13	10YR-7/1	light gray	10YR-7/1	light gray
	S5	13.5	17.0	SW	0.00	98.29	1.71	1.62	0.44	0.00	0.20	10YR-7/1	light gray	10YR-7/1	light gray
	S6	17.0	17.4	SM	0.88	83.25	15.87	15.25	0.34	0.00	30.00	10YR-4/1	dark gray	10YR-6/1	gray

Boring Designation 2023-OSOKI-05

DRILLING LOG

DIVISION	Moffatt & Nichol
INSTALLATION	Offshore Oak Island, North Carolina
SHEET	1 OF 1 SHEETS
1. PROJECT	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
9. SIZE AND TYPE OF BIT	4.0 In.
10. COORDINATE SYSTEM/DATUM	State Plane North Carolina FIPS 3200 Feet
HORIZONTAL	NAD 1983
VERTICAL	NAVD 88
2. BORING DESIGNATION	2023-OSOKI-05
LOCATION COORDINATES	X = 2272029.254 Y = -42077.943
11. MANUFACTURER'S DESIGNATION OF DRILL	Amdrill 80 Pneumatic Sampler
☐ AUTO HAMMER ☐ MANUAL HAMMER	
3. DRILLING AGENCY	Amdrill, Inc
PROJECT NO.	10128/02
12. TOTAL SAMPLES	DISTURBED 3 / UNDISTURBED (UD)
4. NAME OF DRILLER	Brian Simmons
13. TOTAL NUMBER CORE BOXES	3
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
14. ELEVATION GROUND WATER	
15. DATE BORING	STARTED 06-25-23 12:59 / COMPLETED 06-25-23 13:01
6. THICKNESS OF OVERBURDEN	0.0 Ft.
16. ELEVATION TOP OF BORING	-60.1 Ft.
7. DEPTH DRILLED INTO ROCK	0.0 Ft.
17. TOTAL RECOVERY FOR BORING	15 Ft.
8. TOTAL DEPTH OF BORING	15.3 Ft.
18. SIGNATURE AND TITLE OF INSPECTOR	Finn Whiting, P.G.

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	SIEVE SAMPLE	REMARKS
-60.1	0.0				
-63.9	3.8		Poorly graded sand (f), trace silt, gray (10YR-5/1), (SP).	S1	Sample #S1, Depth = 0.0' - 3.8' Mean (mm): 0.23, Phi Sorting: 0.76 Shell: 0%, Fines (200): 3.05%; (230): 2.82% (SP)
-67.2	7.1		Well graded sand (f), trace silt , trace shell fragments (up to 0.02' in size), gray (10YR-5/1), (SW).	S2	Sample #S2, Depth = 3.8' - 7.1' Mean (mm): 0.21, Phi Sorting: 0.86 Shell: 1%, Fines (200): 3.62%; (230): 3.31% (SW)
-69.0	8.9		Poorly graded silty sand (f), dark gray (10YR-4/1), (SP-SM).	S3	Sample #S3, Depth = 7.1' - 8.9' Mean (mm): 0.18, Phi Sorting: 0.83 Shell: 0%, Fines (200): 6.23%; (230): 5.51% (SP-SM)
-70.1	10.0		Well graded sand (c), trace limerock, dark gray (10YR-4/1), (SW).	S4	Sample #S4, Depth = 8.9' - 10.0' Mean (mm): 0.63, Phi Sorting: 1.18 Shell: 0%, Fines (200): 4.58%; (230): 4.39% (SW)
-72.5	12.4		Poorly graded silty sand (m), with dark gray (10YR-4/1) silty sand nodules throughout, high carbonate content, trace limerock, light gray (10YR-7/2), (SP-SM).	S5	Sample #S5, Depth = 10.0' - 12.4' Mean (mm): 0.38, Phi Sorting: 1.08 Shell: 0%, Fines (200): 10.42%; (230): 10.06% (SP-SM)
-75.1	15.0		Limerock, heavily weathered, white (10YR-8/1), (LR).		
-75.4	15.3		No recovery.		
			End of Boring		

0 5 10 15 20

FLORIDA DEP ROSS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

SAJ FORM 1836 JUN 02 **MODIFIED FOR THE FLORIDA DEP** JUN 04

Boring Designation 2023-OSOKI-06

DRILLING LOG

DIVISION	Moffatt & Nichol
INSTALLATION	Offshore Oak Island, North Carolina
SHEET	1 OF 1 SHEETS
1. PROJECT	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
9. SIZE AND TYPE OF BIT	4.0 In.
10. COORDINATE SYSTEM/DATUM	State Plane North Carolina FIPS 3200 Feet
HORIZONTAL	NAD 1983
VERTICAL	NAVD 88
2. BORING DESIGNATION	2023-OSOKI-06
LOCATION COORDINATES	X = 2270465.724 Y = -45760.456
11. MANUFACTURER'S DESIGNATION OF DRILL	Amdrill 80 Pneumatic Sampler
☐ AUTO HAMMER ☐ MANUAL HAMMER	
3. DRILLING AGENCY	Amdrill, Inc
PROJECT NO.	10128/02
12. TOTAL SAMPLES	DISTURBED 3 / UNDISTURBED (UD)
4. NAME OF DRILLER	Brian Simmons
13. TOTAL NUMBER CORE BOXES	3
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
14. ELEVATION GROUND WATER	
15. DATE BORING	STARTED 06-25-23 13:25 / COMPLETED 06-25-23 13:25
6. THICKNESS OF OVERBURDEN	0.0 Ft.
16. ELEVATION TOP OF BORING	-59.6 Ft.
7. DEPTH DRILLED INTO ROCK	0.0 Ft.
17. TOTAL RECOVERY FOR BORING	10.4 Ft.
8. TOTAL DEPTH OF BORING	14.1 Ft.
18. SIGNATURE AND TITLE OF INSPECTOR	Finn Whiting, P.G.

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	SIEVE SAMPLE	REMARKS
-59.6	0.0				
-61.3	1.7		Well graded sand (m), trace silt, trace shell fragments (up to 0.04' in size), gray (10YR-6/1) to, light gray (10YR-7/1), (SW).	S1	Sample #S1, Depth = 0.0' - 1.7' Mean (mm): 0.46, Phi Sorting: 1.08 Shell: 2%, Fines (200): 0.99%; (230): 0.95% (SW)
-66.2	6.6		Well graded sand (m), trace silt increasing with depth, dark gray (10YR-4/1) to, gray (10YR-5/1), (SW).	S2	Sample #S2, Depth = 1.7' - 6.6' Mean (mm): 0.34, Phi Sorting: 1.14 Shell: 1%, Fines (200): 4.57%; (230): 4.42% (SW)
-69.2	9.6		Well graded sand (m), trace silt decreasing with depth, gray (10YR6/1) grading into, light gray (10YR-7/1), (SW).	S3	Sample #S3, Depth = 6.6' - 9.6' Mean (mm): 0.33, Phi Sorting: 0.99 Shell: 0%, Fines (200): 4.89%; (230): 4.77% (SW)
-70.0	10.4		Poorly graded silty sand (c), with little rock (up to 0.06' in size) and large rock (0.18' in size) from 9.6' - 9.7', grayish brown (10YR-5/2), (SP-SM).	S4	Sample #S4, Depth = 9.6' - 10.4' Mean (mm): 0.74, Phi Sorting: 1.38 Shell: 0%, Fines (200): 5.99%; (230): 5.58% (SP-SM)
-73.7	14.1		No recovery.		
			End of Boring		

0 5 10 15

FLORIDA DEP ROSS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

SAJ FORM 1836 JUN 02 **MODIFIED FOR THE FLORIDA DEP** JUN 04

Boring Designation 2023-OSOKI-17A

DRILLING LOG

DIVISION: Moffatt & Nichol

INSTALLATION: Offshore Oak Island, North Carolina

SHEET 1 OF 1 SHEETS

1. PROJECT: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

9. SIZE AND TYPE OF BIT: 4.0 In.

10. COORDINATE SYSTEM/DATUM: State Plane North Carolina FIPS 3200 Feet | HORIZONTAL: NAD 1983 | VERTICAL: NAVD 88

2. BORING DESIGNATION: 2023-OSOKI-17A

LOCATION COORDINATES: X = 2273204.987 Y = -39323.445

11. MANUFACTURER'S DESIGNATION OF DRILL: Amdrill 80 Pneumatic Sampler ☐ AUTO HAMMER ☐ MANUAL HAMMER

3. DRILLING AGENCY: Amdrill, Inc

PROJECT NO.: 10128/02

12. TOTAL SAMPLES: DISTURBED 2 | UNDISTURBED (UD)

4. NAME OF DRILLER: Brian Simmons

13. TOTAL NUMBER CORE BOXES: 2

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED | DEG. FROM VERTICAL | BEARING

14. ELEVATION GROUND WATER

15. DATE BORING: STARTED 06-25-23 14:39 | COMPLETED 06-25-23 14:40

6. THICKNESS OF OVERBURDEN: 0.0 Ft.

16. ELEVATION TOP OF BORING: -62.0 Ft.

7. DEPTH DRILLED INTO ROCK: 0.0 Ft.

17. TOTAL RECOVERY FOR BORING: 8.3 Ft.

8. TOTAL DEPTH OF BORING: 8.4 Ft.

18. SIGNATURE AND TITLE OF INSPECTOR: Finn Whiting, P.G.

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	SIEVE SAMPLE	REMARKS
-62.0	0.0				
			Well graded sand (m), trace silt increasing with depth, organic inclusion from 2.3' - 2.4', trace shell fragments (up to 0.04' in size), gray (10YR-6/1) grading into, gray (10YR-6/1), (SW).	S1	Sample #S1, Depth = 0.0' - 2.8' Mean (mm): 0.30, Phi Sorting: 1.05 Shell: 1%, Fines (200): 3.94%; (230): 3.68% (SW)
-64.8	2.8				
			Poorly graded sand (m), trace silt, light gray (10YR-7/1), (SP).	S2	Sample #S2, Depth = 2.8' - 6.0' Mean (mm): 0.46, Phi Sorting: 0.79 Shell: 0%, Fines (200): 3.78%; (230): 3.70% (SP)
-68.0	6.0				
			Poorly graded silty sand (c), trace limerock (up to 0.10' in size), gray (10YR-5/1), (SP-SM).	S3	Sample #S3, Depth = 6.0' - 8.3' Mean (mm): 0.57, Phi Sorting: 0.98 Shell: 0%, Fines (200): 9.54%; (230): 9.20% (SP-SM)
-70.3	8.3				
-70.4	8.4		No recovery.		
			End of Boring		

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FLORIDA DEP ROSS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

SAJ FORM 1836 JUN 02 **MODIFIED FOR THE FLORIDA DEP** JUN 04

Boring Designation 2023-OSOKI-18

DRILLING LOG

DIVISION	Moffatt & Nichol
INSTALLATION	Offshore Oak Island, North Carolina
SHEET	1 OF 1 SHEETS
1. PROJECT	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
9. SIZE AND TYPE OF BIT	4.0 In.
10. COORDINATE SYSTEM/DATUM	State Plane North Carolina FIPS 3200 Feet
HORIZONTAL	NAD 1983
VERTICAL	NAVD 88
2. BORING DESIGNATION	2023-OSOKI-18
LOCATION COORDINATES	X = 2272811.641 Y = -40237.382
11. MANUFACTURER'S DESIGNATION OF DRILL	Amdrill 80 Pneumatic Sampler
☐ AUTO HAMMER ☐ MANUAL HAMMER	
3. DRILLING AGENCY	Amdrill, Inc
PROJECT NO.	10128/02
12. TOTAL SAMPLES	DISTURBED 2 / UNDISTURBED (UD)
4. NAME OF DRILLER	Brian Simmons
13. TOTAL NUMBER CORE BOXES	2
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
14. ELEVATION GROUND WATER	
15. DATE BORING	STARTED 07-06-23 11:32 / COMPLETED 07-06-23 11:34
6. THICKNESS OF OVERBURDEN	0.0 Ft.
16. ELEVATION TOP OF BORING	-61.6 Ft.
7. DEPTH DRILLED INTO ROCK	0.0 Ft.
17. TOTAL RECOVERY FOR BORING	10 Ft.
8. TOTAL DEPTH OF BORING	10.0 Ft.
18. SIGNATURE AND TITLE OF INSPECTOR	Finn Whiting, P.G.

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	SIEVE SAMPLE	REMARKS
-61.6	0.0				
			Well graded sand (f-m), trace silt with poorly graded silty sand (SP-SM) mottling increasing with depth,, gray (10YR-6/1), (SW).	S1	Sample #S1, Depth = 0.0' - 5.0' Mean (mm): 0.24, Phi Sorting: 0.99 Shell: 1%, Fines (200): 3.27%; (230): 2.98% (SW)
				S2	Sample #S2, Depth = 5.0' - 8.0' Mean (mm): 0.39, Phi Sorting: 1.04 Shell: 0%, Fines (200): 4.14%; (230): 3.96% (SW)
-69.6	8.0				
			Silty sand (f), highly weathered limerock pocket from 8.0' - 8.8' with rock fragments up to 0.12' in size, gray (10YR-6/1), (SM).	S3	Sample #S3, Depth = 8.0' - 10.0' Mean (mm): 0.43, Phi Sorting: 1.23 Shell: 0%, Fines (200): 19.10%; (230): 18.71% (SM)
-71.6	10.0				
			End of Boring		

0 5 10 15

FLORIDA DEP ROSS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

SAJ FORM 1836 JUN 02 MODIFIED FOR THE FLORIDA DEP JUN 04

Boring Designation 2023-OSOKI-19

DRILLING LOG

DIVISION	Moffatt & Nichol
INSTALLATION	Offshore Oak Island, North Carolina
SHEET	1 OF 1 SHEETS
1. PROJECT	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
9. SIZE AND TYPE OF BIT	4.0 In.
10. COORDINATE SYSTEM/DATUM	State Plane North Carolina FIPS 3200 Feet
HORIZONTAL	NAD 1983
VERTICAL	NAVD 88
2. BORING DESIGNATION	2023-OSOKI-19
LOCATION COORDINATES	X = 2272416.215 Y = -41159.705
11. MANUFACTURER'S DESIGNATION OF DRILL	Amdrill 80 Pneumatic Sampler
☐ AUTO HAMMER ☐ MANUAL HAMMER	
3. DRILLING AGENCY	Amdrill, Inc
PROJECT NO.	10128/02
12. TOTAL SAMPLES	DISTURBED 3 / UNDISTURBED (UD)
4. NAME OF DRILLER	Brian Simmons
13. TOTAL NUMBER CORE BOXES	3
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
14. ELEVATION GROUND WATER	
15. DATE BORING	STARTED 07-06-23 11:11 / COMPLETED 07-06-23 11:13
6. THICKNESS OF OVERBURDEN	0.0 Ft.
16. ELEVATION TOP OF BORING	-60.7 Ft.
7. DEPTH DRILLED INTO ROCK	0.0 Ft.
17. TOTAL RECOVERY FOR BORING	10.6 Ft.
8. TOTAL DEPTH OF BORING	12.7 Ft.
18. SIGNATURE AND TITLE OF INSPECTOR	Finn Whiting, P.G.

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	SIEVE SAMPLE	REMARKS
-60.7	0.0				
-63.7	3.0		Poorly graded sand (f), trace silt, gray (10YR-6/1), (SP).	S1	Sample #S1, Depth = 0.0' - 3.0' Mean (mm): 0.22, Phi Sorting: 0.74 Shell: 0%, Fines (200): 3.04%; (230): 2.82% (SP)
-68.4	7.7		Well graded sand (m), trace silt, trace shell fragments (up to 0.04' in size), gray (10YR-6/1) to, gray (10YR-5/1), (SW).	S2	Sample #S2, Depth = 3.0' - 7.7' Mean (mm): 0.38, Phi Sorting: 1.03 Shell: 0%, Fines (200): 3.75%; (230): 3.53% (SW)
-69.7	9.0		Well graded sand (m), trace dark gray (10YR-4/1) silty sand mottling, light gray (10YR-7/1), (SW).	S3	Sample #S3, Depth = 7.7' - 9.0' Mean (mm): 0.39, Phi Sorting: 0.92 Shell: 0%, Fines (200): 2.15%; (230): 2.08% (SW)
-71.3	10.6		Well graded sand (c), trace silt, trace limerock (up to 0.02' in size), gray (10YR-5/1), (SW).	S4	Sample #S4, Depth = 9.0' - 10.6' Mean (mm): 0.68, Phi Sorting: 1.21 Shell: 0%, Fines (200): 4.08%; (230): 3.92% (SW)
-73.4	12.7		No recovery.		
			End of Boring		

0 5 10 15

FLORIDA DEP ROSS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

SAJ FORM 1836 JUN 02 **MODIFIED FOR THE FLORIDA DEP** JUN 04

Boring Designation 2023-OSOKI-20

DRILLING LOG

DIVISION	Moffatt & Nichol
INSTALLATION	Offshore Oak Island, North Carolina
SHEET	1 OF 1 SHEETS
1. PROJECT	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
9. SIZE AND TYPE OF BIT	4.0 In.
10. COORDINATE SYSTEM/DATUM	State Plane North Carolina FIPS 3200 Feet
HORIZONTAL	NAD 1983
VERTICAL	NAVD 88
2. BORING DESIGNATION	2023-OSOKI-20
LOCATION COORDINATES	X = 2271638.942 Y = -42998.755
11. MANUFACTURER'S DESIGNATION OF DRILL	Amdrill 80 Pneumatic Sampler
☐ AUTO HAMMER ☐ MANUAL HAMMER	
3. DRILLING AGENCY	Amdrill, Inc
PROJECT NO.	10128/02
12. TOTAL SAMPLES	DISTURBED 3 / UNDISTURBED (UD)
4. NAME OF DRILLER	Brian Simmons
13. TOTAL NUMBER CORE BOXES	3
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
14. ELEVATION GROUND WATER	
15. DATE BORING	STARTED 07-06-23 10:42 / COMPLETED 07-06-23 10:50
6. THICKNESS OF OVERBURDEN	0.0 Ft.
16. ELEVATION TOP OF BORING	-59.5 Ft.
7. DEPTH DRILLED INTO ROCK	0.0 Ft.
17. TOTAL RECOVERY FOR BORING	13.2 Ft.
8. TOTAL DEPTH OF BORING	20.0 Ft.
18. SIGNATURE AND TITLE OF INSPECTOR	Finn Whiting, P.G.

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	SIEVE SAMPLE	REMARKS
-59.5	0.0				
			Poorly graded sand (f-m), large shell (0.12' in size) from 4.3' - 4.4', light gray (10YR-7/1), (SP).	S1	Sample #S1, Depth = 0.0' - 5.0' Mean (mm): 0.24, Phi Sorting: 0.69 Shell: 0%, Fines (200): 1.87%; (230): 1.71% (SP)
				S2	Sample #S2, Depth = 5.0' - 8.5' Mean (mm): 0.22, Phi Sorting: 0.60 Shell: 0%, Fines (200): 3.74%; (230): 3.56% (SP)
-68.0	8.5				
-69.5	10.0		Well graded sand (f), trace silt, gray (10YR-6/1), (SW).	S3	Sample #S3, Depth = 8.5' - 10.0' Mean (mm): 0.24, Phi Sorting: 0.90 Shell: 0%, Fines (200): 4.44%; (230): 4.14% (SW)
-70.9	11.4		Poorly graded silty sand (m), dark gray (10YR-4/1), (SP-SM).	S4	Sample #S4, Depth = 10.0' - 11.4' Mean (mm): 0.45, Phi Sorting: 1.02 Shell: 0%, Fines (200): 5.73%; (230): 5.05% (SP-SM)
-72.7	13.2		Well graded sand (m), trace silt, light brownish gray (10YR-6/2), (SW).	S5	Sample #S5, Depth = 11.4' - 13.2' Mean (mm): 0.37, Phi Sorting: 1.05 Shell: 0%, Fines (200): 3.42%; (230): 3.15% (SW)
			No recovery.		
-79.5	20.0				
			End of Boring		

0 5 10 15 20 25

FLORIDA DEP ROSS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

SAJ FORM 1836 JUN 02 **MODIFIED FOR THE FLORIDA DEP** JUN 04

Boring Designation 2023-OSOKI-21

DRILLING LOG

DIVISION	Moffatt & Nichol
INSTALLATION	Offshore Oak Island, North Carolina
SHEET	1 OF 1 SHEETS
1. PROJECT	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
9. SIZE AND TYPE OF BIT	4.0 In.
10. COORDINATE SYSTEM/DATUM	State Plane North Carolina FIPS 3200 Feet
HORIZONTAL	NAD 1983
VERTICAL	NAVD 88
2. BORING DESIGNATION	2023-OSOKI-21
LOCATION COORDINATES	X = 2271244.625 Y = -43917.05
11. MANUFACTURER'S DESIGNATION OF DRILL	Amdrill 80 Pneumatic Sampler
☐ AUTO HAMMER ☐ MANUAL HAMMER	
3. DRILLING AGENCY	Amdrill, Inc
PROJECT NO.	10128/02
12. TOTAL SAMPLES	DISTURBED 2 / UNDISTURBED (UD)
4. NAME OF DRILLER	Brian Simmons
13. TOTAL NUMBER CORE BOXES	2
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
14. ELEVATION GROUND WATER	
15. DATE BORING	STARTED 07-06-23 10:16 / COMPLETED 07-06-23 10:20
6. THICKNESS OF OVERBURDEN	0.0 Ft.
16. ELEVATION TOP OF BORING	-59.1 Ft.
7. DEPTH DRILLED INTO ROCK	0.0 Ft.
17. TOTAL RECOVERY FOR BORING	10 Ft.
8. TOTAL DEPTH OF BORING	12.6 Ft.
18. SIGNATURE AND TITLE OF INSPECTOR	Finn Whiting, P.G.

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	SIEVE SAMPLE	REMARKS
-59.1	0.0				
			Poorly graded sand (m), light gray (10YR-7/1), (SP).	S1	Sample #S1, Depth = 0.0' - 3.0' Mean (mm): 0.31, Phi Sorting: 0.74 Shell: 0%, Fines (200): 1.61%; (230): 1.55% (SP)
				S2	Sample #S2, Depth = 3.0' - 6.0' Mean (mm): 0.30, Phi Sorting: 0.82 Shell: 0%, Fines (200): 2.06%; (230): 1.99% (SP)
-65.1	6.0				
			Poorly graded silty sand (f), trace shell fragments (up to 0.04' in size), gray (10YR-5/1) to, dark gray (10YR-4/1), (SP-SM).	S3	Sample #S3, Depth = 6.0' - 8.4' Mean (mm): 0.29, Phi Sorting: 1.24 Shell: 1%, Fines (200): 7.39%; (230): 6.88% (SP-SM)
-67.5	8.4				
			Well graded sand (m), trace silt, grayish brown (10YR-5/2), (SW).	S4	Sample #S4, Depth = 8.4' - 10.0' Mean (mm): 0.44, Phi Sorting: 1.06 Shell: 0%, Fines (200): 4.94%; (230): 4.78% (SW)
-69.1	10.0				
			No recovery.		
-71.7	12.6				
			End of Boring		

0 5 10 15

FLORIDA DEP ROSS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

SAJ FORM 1836 JUN 02 **MODIFIED FOR THE FLORIDA DEP** JUN 04

Boring Designation 2023-OSOKI-22

DRILLING LOG

DIVISION	Moffatt & Nichol
INSTALLATION	Offshore Oak Island, North Carolina
SHEET	1 OF 1 SHEETS
1. PROJECT	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
2. BORING DESIGNATION	2023-OSOKI-22
LOCATION COORDINATES	X = 2270856.711 Y = -44838.923
3. DRILLING AGENCY	Amdrill, Inc
PROJECT NO.	10128/02
4. NAME OF DRILLER	Brian Simmons
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	0.0 Ft.
7. DEPTH DRILLED INTO ROCK	0.0 Ft.
8. TOTAL DEPTH OF BORING	17.6 Ft.
9. SIZE AND TYPE OF BIT	4.0 In.
10. COORDINATE SYSTEM/DATUM	State Plane North Carolina FIPS 3200 Feet
HORIZONTAL	NAD 1983
VERTICAL	NAVD 88
11. MANUFACTURER'S DESIGNATION OF DRILL	Amdrill 80 Pneumatic Sampler
☐ AUTO HAMMER ☐ MANUAL HAMMER	
12. TOTAL SAMPLES	DISTURBED 3 / UNDISTURBED (UD)
13. TOTAL NUMBER CORE BOXES	3
14. ELEVATION GROUND WATER	
15. DATE BORING	STARTED 07-06-23 09:45 / COMPLETED 07-06-23 09:56
16. ELEVATION TOP OF BORING	-59.3 Ft.
17. TOTAL RECOVERY FOR BORING	15 Ft.
18. SIGNATURE AND TITLE OF INSPECTOR	Finn Whiting, P.G.

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	SIEVE SAMPLE	REMARKS
-59.3	0.0				
			Well graded sand (m), trace shell fragments (up to 0.06' in size), light gray (10YR-7/1) to, gray (10YR-6/1), (SW).	S1	Sample #S1, Depth = 0.0' - 5.0' Mean (mm): 0.34, Phi Sorting: 0.95 Shell: 1%, Fines (200): 1.56%; (230): 1.49% (SW)
				S2	Sample #S2, Depth = 5.0' - 9.5' Mean (mm): 0.37, Phi Sorting: 0.97 Shell: 0%, Fines (200): 3.29%; (230): 3.15% (SW)
-68.8	9.5				
			Well graded sand (m), trace silt, grayish brown (10YR-5/2), (SW).	S3	Sample #S3, Depth = 9.5' - 12.0' Mean (mm): 0.43, Phi Sorting: 0.88 Shell: 0%, Fines (200): 4.22%; (230): 4.10% (SW)
				S4	Sample #S4, Depth = 12.0' - 15.0' Mean (mm): 0.40, Phi Sorting: 0.95 Shell: 0%, Fines (200): 4.46%; (230): 4.19% (SW)
-74.3	15.0				
			No recovery.		
-76.9	17.6				
			End of Boring		

0 5 10 15 20

FLORIDA DEP ROSS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

SAJ FORM 1836 JUN 02 **MODIFIED FOR THE FLORIDA DEP** JUN 04

Boring Designation 2023-OSOKI-23

DRILLING LOG

DIVISION	Moffatt & Nichol
INSTALLATION	Offshore Oak Island, North Carolina
SHEET	1 OF 1 SHEETS
1. PROJECT	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
9. SIZE AND TYPE OF BIT	4.0 In.
10. COORDINATE SYSTEM/DATUM	State Plane North Carolina FIPS 3200 Feet
HORIZONTAL	NAD 1983
VERTICAL	NAVD 88
2. BORING DESIGNATION	2023-OSOKI-23
LOCATION COORDINATES	X = 2270074.405 Y = -46681.622
11. MANUFACTURER'S DESIGNATION OF DRILL	Amdrill 80 Pneumatic Sampler
☐ AUTO HAMMER ☐ MANUAL HAMMER	
3. DRILLING AGENCY	Amdrill, Inc
PROJECT NO.	10128/02
12. TOTAL SAMPLES	DISTURBED 4 / UNDISTURBED (UD)
4. NAME OF DRILLER	Brian Simmons
13. TOTAL NUMBER CORE BOXES	4
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
14. ELEVATION GROUND WATER	
15. DATE BORING	STARTED 07-31-23 10:53 / COMPLETED 07-31-23 10:58
6. THICKNESS OF OVERBURDEN	0.0 Ft.
16. ELEVATION TOP OF BORING	-60.1 Ft.
7. DEPTH DRILLED INTO ROCK	0.0 Ft.
17. TOTAL RECOVERY FOR BORING	16.6 Ft.
8. TOTAL DEPTH OF BORING	18.7 Ft.
18. SIGNATURE AND TITLE OF INSPECTOR	Finn Whiting, P.G.

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	SIEVE SAMPLE	REMARKS
-60.1	0.0				
			Well graded sand (m), trace silt at depth, trace shell fragments (up to 0.06' in size), light gray (10YR-7/1), (SW).	S1	Sample #S1, Depth = 0.0' - 5.1' Mean (mm): 0.30, Phi Sorting: 1.01 Shell: 1%, Fines (200): 1.45%; (230): 1.34% (SW)
-65.2	5.1				
			Poorly graded silty sand (m), silt increasing with depth, dark gray (10YR-4/1) to, very dark gray (10YR-3/1), (SP-SM).	S2	Sample #S2, Depth = 5.1' - 8.8' Mean (mm): 0.28, Phi Sorting: 1.03 Shell: 0%, Fines (200): 9.06%; (230): 8.49% (SP-SM)
-68.9	8.8				
			Well graded sand (m), mottled with very dark gray (10YR-3/1) silty sand (SM), gray (10YR-6/1), (SW).	S3	Sample #S3, Depth = 8.8' - 11.0' Mean (mm): 0.35, Phi Sorting: 0.86 Shell: 1%, Fines (200): 3.94%; (230): 3.64% (SW)
-71.1	11.0				
			Well graded sand (c), trace silt with lense of very dark gray (10YR-3/1) silt (ML) from 11.0' - 11.1', trace rock (up to 0.02' in size), trace shell fragments (up to 0.06' in size), pale brown (10YR-6/3), (SW).	S4	Sample #S4, Depth = 11.0' - 14.0' Mean (mm): 0.60, Phi Sorting: 1.02 Shell: 3%, Fines (200): 2.83%; (230): 2.69% (SW)
				S5	Sample #S5, Depth = 14.0' - 16.6' Mean (mm): 0.62, Phi Sorting: 0.93 Shell: 0%, Fines (200): 1.50%; (230): 1.45% (SW)
-76.7	16.6				
			No recovery.		
-78.8	18.7				
			End of Boring		

0 5 10 15 20

FLORIDA DEP ROSS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

SAJ FORM 1836 JUN 02 **MODIFIED FOR THE FLORIDA DEP** JUN 04

Boring Designation 2023-OSOKI-24

DRILLING LOG

DIVISION	Moffatt & Nichol
INSTALLATION	Offshore Oak Island, North Carolina
SHEET	1 OF 1 SHEETS
1. PROJECT	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
9. SIZE AND TYPE OF BIT	4.0 In.
10. COORDINATE SYSTEM/DATUM	State Plane North Carolina FIPS 3200 Feet; HORIZONTAL: NAD 1983; VERTICAL: NAVD 88
2. BORING DESIGNATION	2023-OSOKI-24
LOCATION COORDINATES	X = 2269679.382 Y = -47599.906
11. MANUFACTURER'S DESIGNATION OF DRILL	Amdrill 80 Pneumatic Sampler; ☐ AUTO HAMMER ☐ MANUAL HAMMER
3. DRILLING AGENCY	Amdrill, Inc
PROJECT NO.	10128/02
12. TOTAL SAMPLES	DISTURBED: 5; UNDISTURBED (UD):
4. NAME OF DRILLER	Brian Simmons
13. TOTAL NUMBER CORE BOXES	4
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
14. ELEVATION GROUND WATER	
15. DATE BORING	STARTED: 07-31-23 11:17; COMPLETED: 07-31-23 11:25
6. THICKNESS OF OVERBURDEN	0.0 Ft.
16. ELEVATION TOP OF BORING	-59.2 Ft.
7. DEPTH DRILLED INTO ROCK	0.0 Ft.
17. TOTAL RECOVERY FOR BORING	17.4 Ft.
8. TOTAL DEPTH OF BORING	17.7 Ft.
18. SIGNATURE AND TITLE OF INSPECTOR	Finn Whiting, P.G.

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	SIEVE SAMPLE	REMARKS
-59.2	0.0				
			Well graded sand (m), trace silt, white (10YR-8/1) to, light gray (10YR-7/1), (SW).	S1	Sample #S1, Depth = 0.0' - 4.6' Mean (mm): 0.38, Phi Sorting: 1.22 Shell: 2%, Fines (200): 1.60%; (230): 1.51% (SW)
-63.8	4.6				
			Poorly graded silty sand (m), black (10YR-2/2) organic inclusion from 6.2' - 6.4', dark gray (10YR-4/1), (SP-SM).	S2	Sample #S2, Depth = 4.6' - 6.6' Mean (mm): 0.31, Phi Sorting: 0.99 Shell: 1%, Fines (200): 5.93%; (230): 5.77% (SP-SM)
-65.8	6.6				
			Well graded sand (c), mottled with very dark gray (10YR-3/1) silt nodules, light gray (10YR-7/1), (SW).	S3	Sample #S3, Depth = 6.6' - 10.0' Mean (mm): 0.54, Phi Sorting: 0.93 Shell: 0%, Fines (200): 2.50%; (230): 2.43% (SW)
-69.2	10.0				
			Poorly graded sand (m), with lense of poorly graded silty sand from 12.4' -12.5', light gray (10YR-7/1), (SP).	S4	Sample #S4, Depth = 10.0' - 13.5' Mean (mm): 0.48, Phi Sorting: 0.82 Shell: 0%, Fines (200): 1.29%; (230): 1.25% (SP)
-72.7	13.5				
			Well graded sand (m), light gray (10YR-7/1), (SW).	S5	Sample #S5, Depth = 13.5' - 17.0' Mean (mm): 0.44, Phi Sorting: 0.97 Shell: 0%, Fines (200): 1.71%; (230): 1.62% (SW)
-76.2	17.0				
-76.6	17.4		Silty sand (f), trace limerock (up to 0.02' in size), dark gray (10YR-4/1), (SM).	S6	Sample #S6, Depth = 17.0' - 17.4' Mean (mm): 0.34, Phi Sorting: 1.24 Shell: 0%, Fines (200): 15.87%; (230): 15.25% (SM)
-76.9	17.7		No recovery.		
			End of Boring		

0 5 10 15 20

FLORIDA DEP ROSS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

SAJ FORM 1836 JUN 02 **MODIFIED FOR THE FLORIDA DEP** JUN 04

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-05 #S1

Analysis Date: 09-27-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2272029.254	-42077.943	State Plane North Carolina FIPS 3200 Feet	-60.1 NAVD 88

USCS:	Munsell:	Comments:
SP	Wet - 10YR-5/1 Dry - 10YR-7/1	Poorly graded sand (f), trace silt

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
330.37	321.56	0.50	0.00	#200 - 3.05	#230 - 2.82	6.02	0.46

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	1.52	0.46	1.52	0.46
7/16"	-3.50	11.31	0.00	0.00	1.52	0.46
5/16"	-3.00	8.00	0.00	0.00	1.52	0.46
3.5	-2.50	5.66	0.34	0.10	1.86	0.56
4	-2.25	4.76	0.11	0.03	1.97	0.60
5	-2.00	4.00	0.16	0.05	2.13	0.64
7	-1.50	2.83	0.63	0.19	2.76	0.84
10	-1.00	2.00	0.58	0.18	3.34	1.01
14	-0.50	1.41	0.89	0.27	4.23	1.28
18	0.00	1.00	1.22	0.37	5.45	1.65
25	0.50	0.71	1.92	0.58	7.37	2.23
35	1.00	0.50	5.07	1.53	12.44	3.77
45	1.50	0.35	17.26	5.22	29.70	8.99
60	2.00	0.25	68.43	20.71	98.13	29.70
80	2.50	0.18	154.61	46.80	252.74	76.50
120	3.00	0.13	53.41	16.17	306.15	92.67
170	3.50	0.09	11.97	3.62	318.12	96.29
200	3.75	0.07	2.19	0.66	320.31	96.95
230	4.00	0.06	0.75	0.23	321.06	97.18

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.32	2.73	2.48	2.22	1.89	1.67	1.12

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	2.12	0.230	0.76	-3.65	27.4

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-05 #S2

Analysis Date: 09-27-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2272029.254	-42077.943	State Plane North Carolina FIPS 3200 Feet	-63.9 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-5/1 Dry - 10YR-7/1	Well graded sand (f), trace silt , trace shell fragments

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
271.04	262.67	0.44	0.06	#200 - 3.62	#230 - 3.31	7.33	0.51

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	1.35	0.50	1.35	0.50
5/16"	-3.00	8.00	0.00	0.00	1.35	0.50
3.5	-2.50	5.66	0.00	0.00	1.35	0.50
4	-2.25	4.76	0.03	0.01	1.38	0.51
5	-2.00	4.00	0.68	0.25	2.06	0.76
7	-1.50	2.83	1.20	0.44	3.26	1.20
10	-1.00	2.00	0.94	0.35	4.20	1.55
14	-0.50	1.41	1.10	0.41	5.30	1.96
18	0.00	1.00	1.71	0.63	7.01	2.59
25	0.50	0.71	2.85	1.05	9.86	3.64
35	1.00	0.50	3.73	1.38	13.59	5.01
45	1.50	0.35	7.56	2.79	21.15	7.80
60	2.00	0.25	30.80	11.36	51.95	19.17
80	2.50	0.18	116.02	42.81	167.97	61.97
120	3.00	0.13	70.95	26.18	238.92	88.15
170	3.50	0.09	19.48	7.19	258.40	95.34
200	3.75	0.07	2.82	1.04	261.22	96.38
230	4.00	0.06	0.85	0.31	262.07	96.69

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.48	2.92	2.75	2.36	2.07	1.86	1.00

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	2.25	0.210	0.86	-3.19	19.08

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-05 #S3

Analysis Date: 09-27-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2272029.254	-42077.943	State Plane North Carolina FIPS 3200 Feet	-67.2 NAVD 88

USCS:	Munsell:	Comments:
SP-SM	Wet - 10YR-4/1 Dry - 10YR-6/1	Poorly graded silty sand (f)

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
263.71	249.99	0.73	0.03	#200 - 6.23	#230 - 5.51	7.47	0.02

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.05	0.02	0.05	0.02
5	-2.00	4.00	0.00	0.00	0.05	0.02
7	-1.50	2.83	0.46	0.17	0.51	0.19
10	-1.00	2.00	0.73	0.28	1.24	0.47
14	-0.50	1.41	1.99	0.75	3.23	1.22
18	0.00	1.00	3.80	1.44	7.03	2.67
25	0.50	0.71	5.32	2.02	12.35	4.68
35	1.00	0.50	5.74	2.18	18.09	6.86
45	1.50	0.35	6.19	2.35	24.28	9.21
60	2.00	0.25	11.62	4.41	35.90	13.61
80	2.50	0.18	56.63	21.47	92.53	35.09
120	3.00	0.13	113.53	43.05	206.06	78.14
170	3.50	0.09	35.54	13.48	241.60	91.62
200	3.75	0.07	5.69	2.16	247.29	93.77
230	4.00	0.06	1.90	0.72	249.19	94.49

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	3.22	2.96	2.67	2.27	2.06	0.57

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	2.46	0.182	0.83	-2.01	8.07

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-05 #S4

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2272029.254	-42077.943	State Plane North Carolina FIPS 3200 Feet	-69.0 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-4/1 Dry - 10YR-6/1	Well graded sand (c), trace limerock

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
263.17	252.20	0.10	0.18	#200 - 4.58	#230 - 4.39	5.33	0.18

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.48	0.18	0.48	0.18
4	-2.25	4.76	0.25	0.09	0.73	0.28
5	-2.00	4.00	2.17	0.82	2.90	1.10
7	-1.50	2.83	3.64	1.38	6.54	2.49
10	-1.00	2.00	7.64	2.90	14.18	5.39
14	-0.50	1.41	20.81	7.91	34.99	13.30
18	0.00	1.00	36.88	14.01	71.87	27.31
25	0.50	0.71	54.45	20.69	126.32	48.00
35	1.00	0.50	42.73	16.24	169.05	64.24
45	1.50	0.35	26.52	10.08	195.57	74.31
60	2.00	0.25	15.71	5.97	211.28	80.28
80	2.50	0.18	17.14	6.51	228.42	86.80
120	3.00	0.13	15.94	6.06	244.36	92.85
170	3.50	0.09	5.42	2.06	249.78	94.91
200	3.75	0.07	1.33	0.51	251.11	95.42
230	4.00	0.06	0.51	0.19	251.62	95.61

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.54	2.29	1.56	0.56	-0.08	-0.40	-1.07

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	0.66	0.633	1.18	0.29	2.87

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-05 #S5

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2272029.254	-42077.943	State Plane North Carolina FIPS 3200 Feet	-70.1 NAVD 88

USCS:	Munsell:	Comments:
SP-SM	Wet - 10YR-7/2 Dry - 10YR-8/1	Poorly graded silty sand (m), high carbonate content, trace limerock

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
297.42	268.57	0.29	0.26	#200 - 10.42	#230 - 10.06	17.53	0.00

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.54	0.18	0.54	0.18
4	-2.25	4.76	0.32	0.11	0.86	0.29
5	-2.00	4.00	0.00	0.00	0.86	0.29
7	-1.50	2.83	1.04	0.35	1.90	0.64
10	-1.00	2.00	2.61	0.88	4.51	1.52
14	-0.50	1.41	8.15	2.74	12.66	4.26
18	0.00	1.00	17.22	5.79	29.88	10.05
25	0.50	0.71	28.11	9.45	57.99	19.50
35	1.00	0.50	30.52	10.26	88.51	29.76
45	1.50	0.35	36.46	12.26	124.97	42.02
60	2.00	0.25	53.67	18.05	178.64	60.06
80	2.50	0.18	51.78	17.41	230.42	77.47
120	3.00	0.13	27.05	9.09	257.47	86.57
170	3.50	0.09	6.78	2.28	264.25	88.85
200	3.75	0.07	2.17	0.73	266.42	89.58
230	4.00	0.06	1.09	0.37	267.51	89.94

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	2.86	2.43	1.72	0.77	0.31	-0.44

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.41	0.376	1.08	-0.51	3.05

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-06 #S1

Analysis Date: 09-27-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2270465.724	-45760.456	State Plane North Carolina FIPS 3200 Feet	-59.6 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-7/1 Dry - 10YR-8/1	Well graded sand (m), trace silt, trace shell fragments

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
				#200 - 0.99	#230 - 0.95		
340.86	337.87	0.09	0.04			7.15	2.09

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	4.33	1.27	4.33	1.27
5/16"	-3.00	8.00	1.10	0.32	5.43	1.59
3.5	-2.50	5.66	0.88	0.26	6.31	1.85
4	-2.25	4.76	0.80	0.23	7.11	2.09
5	-2.00	4.00	0.29	0.09	7.40	2.17
7	-1.50	2.83	2.18	0.64	9.58	2.81
10	-1.00	2.00	2.82	0.83	12.40	3.64
14	-0.50	1.41	6.04	1.77	18.44	5.41
18	0.00	1.00	11.69	3.43	30.13	8.84
25	0.50	0.71	32.35	9.49	62.48	18.33
35	1.00	0.50	69.41	20.36	131.89	38.69
45	1.50	0.35	81.03	23.77	212.92	62.47
60	2.00	0.25	61.99	18.19	274.91	80.65
80	2.50	0.18	45.47	13.34	320.38	93.99
120	3.00	0.13	15.17	4.45	335.55	98.44
170	3.50	0.09	1.66	0.49	337.21	98.93
200	3.75	0.07	0.29	0.09	337.50	99.01
230	4.00	0.06	0.13	0.04	337.63	99.05

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.61	2.13	1.84	1.24	0.66	0.38	-0.62

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.13	0.457	1.08	-1.66	8.28

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-06 #S2

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2270465.724	-45760.456	State Plane North Carolina FIPS 3200 Feet	-61.3 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-5/1 Dry - 10YR-6/1	Well graded sand (m), trace silt

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
284.26	272.72	0.18	0.30	#200 - 4.57	#230 - 4.42	10.41	0.77

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	1.28	0.45	1.28	0.45
4	-2.25	4.76	0.91	0.32	2.19	0.77
5	-2.00	4.00	1.45	0.51	3.64	1.28
7	-1.50	2.83	2.78	0.98	6.42	2.26
10	-1.00	2.00	3.81	1.34	10.23	3.60
14	-0.50	1.41	6.79	2.39	17.02	5.99
18	0.00	1.00	9.86	3.47	26.88	9.46
25	0.50	0.71	16.34	5.75	43.22	15.20
35	1.00	0.50	23.67	8.33	66.89	23.53
45	1.50	0.35	34.21	12.03	101.10	35.57
60	2.00	0.25	51.23	18.02	152.33	53.59
80	2.50	0.18	71.79	25.26	224.12	78.84
120	3.00	0.13	38.21	13.44	262.33	92.29
170	3.50	0.09	7.73	2.72	270.06	95.00
200	3.75	0.07	1.22	0.43	271.28	95.43
230	4.00	0.06	0.41	0.14	271.69	95.58

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.50	2.69	2.42	1.90	1.06	0.55	-0.71

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.57	0.337	1.14	-1.18	4.49

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-06 #S3

Analysis Date: 09-27-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2270465.724	-45760.456	State Plane North Carolina FIPS 3200 Feet	-66.2 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-6/1 Dry - 10YR-7/1	Well graded sand (m), trace silt

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
331.83	317.12	0.27	0.26	#200 - 4.89	#230 - 4.77	2.28	0.00

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.04	0.01	0.04	0.01
7	-1.50	2.83	1.65	0.50	1.69	0.51
10	-1.00	2.00	2.77	0.83	4.46	1.34
14	-0.50	1.41	8.19	2.47	12.65	3.81
18	0.00	1.00	15.30	4.61	27.95	8.42
25	0.50	0.71	22.92	6.91	50.87	15.33
35	1.00	0.50	22.10	6.66	72.97	21.99
45	1.50	0.35	29.02	8.75	101.99	30.74
60	2.00	0.25	89.72	27.04	191.71	57.77
80	2.50	0.18	80.42	24.24	272.13	82.01
120	3.00	0.13	35.83	10.80	307.96	92.81
170	3.50	0.09	6.49	1.96	314.45	94.76
200	3.75	0.07	1.15	0.35	315.60	95.11
230	4.00	0.06	0.40	0.12	316.00	95.23

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.67	2.59	2.36	1.86	1.17	0.55	-0.37

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.6	0.330	0.99	-0.93	3.56

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-06 #S4

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2270465.724	-45760.456	State Plane North Carolina FIPS 3200 Feet	-69.2 NAVD 88

USCS:	Munsell:	Comments:
SP-SM	Wet - 10YR-5/2 Dry - 10YR-7/1	Poorly graded silty sand (c), with little rock

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
386.29	366.16	1.32	0.02	#200 - 5.99	#230 - 5.58	3.33	0.00

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	43.86	11.35	43.86	11.35
5/8"	-4.00	16.00	5.42	1.40	49.28	12.76
7/16"	-3.50	11.31	0.00	0.00	49.28	12.76
5/16"	-3.00	8.00	1.45	0.38	50.73	13.13
3.5	-2.50	5.66	0.74	0.19	51.47	13.32
4	-2.25	4.76	0.62	0.16	52.09	13.48
5	-2.00	4.00	0.67	0.17	52.76	13.66
7	-1.50	2.83	3.01	0.78	55.77	14.44
10	-1.00	2.00	5.29	1.37	61.06	15.81
14	-0.50	1.41	11.91	3.08	72.97	18.89
18	0.00	1.00	12.22	3.16	85.19	22.05
25	0.50	0.71	45.80	11.86	130.99	33.91
35	1.00	0.50	46.52	12.04	177.51	45.95
45	1.50	0.35	55.05	14.25	232.56	60.20
60	2.00	0.25	64.65	16.74	297.21	76.94
80	2.50	0.18	33.82	8.76	331.03	85.69
120	3.00	0.13	22.32	5.78	353.35	91.47
170	3.50	0.09	7.07	1.83	360.42	93.30
200	3.75	0.07	2.74	0.71	363.16	94.01
230	4.00	0.06	1.59	0.41	364.75	94.42

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	2.40	1.94	1.14	0.12	-0.97	

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	0.43	0.742	1.38	0.28	3.87

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-17A #S1

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2273204.987	-39323.445	State Plane North Carolina FIPS 3200 Feet	-62.0 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-6/1 Dry - 10YR-7/1	Well graded sand (m), trace silt, with organic inclusions, trace shell fragments

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
229.84	221.66	0.26	0.00	#200 - 3.94	#230 - 3.68	9.01	0.60

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.97	0.42	0.97	0.42
4	-2.25	4.76	0.42	0.18	1.39	0.60
5	-2.00	4.00	0.62	0.27	2.01	0.87
7	-1.50	2.83	1.08	0.47	3.09	1.34
10	-1.00	2.00	1.75	0.76	4.84	2.11
14	-0.50	1.41	3.93	1.71	8.77	3.82
18	0.00	1.00	7.10	3.09	15.87	6.90
25	0.50	0.71	11.28	4.91	27.15	11.81
35	1.00	0.50	13.62	5.93	40.77	17.74
45	1.50	0.35	26.05	11.33	66.82	29.07
60	2.00	0.25	49.63	21.59	116.45	50.67
80	2.50	0.18	54.76	23.83	171.21	74.49
120	3.00	0.13	38.67	16.82	209.88	91.32
170	3.50	0.09	9.18	3.99	219.06	95.31
200	3.75	0.07	1.73	0.75	220.79	96.06
230	4.00	0.06	0.60	0.26	221.39	96.32

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.46	2.78	2.52	1.98	1.32	0.85	-0.31

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.75	0.297	1.05	-1.26	5.22

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-17A #S2

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2273204.987	-39323.445	State Plane North Carolina FIPS 3200 Feet	-64.8 NAVD 88

USCS:	Munsell:	Comments:
SP	Wet - 10YR-5/1 Dry - 10YR-7/1	Poorly graded sand (m), trace silt

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
298.55	287.91	0.05	0.12	#200 - 3.78	#230 - 3.70	2.29	0.00

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.00	0.00	0.00	0.00
7	-1.50	2.83	0.48	0.16	0.48	0.16
10	-1.00	2.00	1.60	0.54	2.08	0.70
14	-0.50	1.41	6.34	2.12	8.42	2.82
18	0.00	1.00	16.70	5.59	25.12	8.41
25	0.50	0.71	36.10	12.09	61.22	20.51
35	1.00	0.50	49.75	16.66	110.97	37.17
45	1.50	0.35	78.15	26.18	189.12	63.35
60	2.00	0.25	71.73	24.03	260.85	87.37
80	2.50	0.18	18.80	6.30	279.65	93.67
120	3.00	0.13	5.64	1.89	285.29	95.56
170	3.50	0.09	1.45	0.49	286.74	96.04
200	3.75	0.07	0.52	0.17	287.26	96.22
230	4.00	0.06	0.25	0.08	287.51	96.30

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.85	1.93	1.74	1.25	0.63	0.31	-0.31

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.12	0.460	0.79	-0.34	3.4

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-17A #S3

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2273204.987	-39323.445	State Plane North Carolina FIPS 3200 Feet	-68.0 NAVD 88

USCS:	Munsell:	Comments:
SP-SM	Wet - 10YR-6/1 Dry - 10YR-7/1	Poorly graded silty sand (c), trace limerock

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
318.62	290.14	0.39	0.14	#200 - 9.54	#230 - 9.20	8.45	0.00

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	14.74	4.63	14.74	4.63
5/8"	-4.00	16.00	0.00	0.00	14.74	4.63
7/16"	-3.50	11.31	0.00	0.00	14.74	4.63
5/16"	-3.00	8.00	0.00	0.00	14.74	4.63
3.5	-2.50	5.66	0.22	0.07	14.96	4.70
4	-2.25	4.76	0.00	0.00	14.96	4.70
5	-2.00	4.00	1.03	0.32	15.99	5.02
7	-1.50	2.83	1.09	0.34	17.08	5.36
10	-1.00	2.00	2.70	0.85	19.78	6.21
14	-0.50	1.41	8.07	2.53	27.85	8.74
18	0.00	1.00	19.74	6.20	47.59	14.94
25	0.50	0.71	37.53	11.78	85.12	26.72
35	1.00	0.50	50.83	15.95	135.95	42.67
45	1.50	0.35	59.02	18.52	194.97	61.19
60	2.00	0.25	56.03	17.59	251.00	78.78
80	2.50	0.18	21.22	6.66	272.22	85.44
120	3.00	0.13	10.07	3.16	282.29	88.60
170	3.50	0.09	3.98	1.25	286.27	89.85
200	3.75	0.07	1.94	0.61	288.21	90.46
230	4.00	0.06	1.09	0.34	289.30	90.80

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	2.39	1.89	1.20	0.43	0.04	-2.03

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	0.81	0.570	0.98	0.67	3.5

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-18 #S1

Analysis Date: 09-27-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2272811.641	-40237.382	State Plane North Carolina FIPS 3200 Feet	-61.6 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-6/1 Dry - 10YR-7/1	Well graded sand (f), trace silt with poorly graded silty sand mottling

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
303.92	295.92	0.39	0.22	#200 - 3.27	#230 - 2.98	9.56	0.98

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	1.75	0.58	1.75	0.58
7/16"	-3.50	11.31	0.88	0.29	2.63	0.87
5/16"	-3.00	8.00	0.00	0.00	2.63	0.87
3.5	-2.50	5.66	0.27	0.09	2.90	0.95
4	-2.25	4.76	0.08	0.03	2.98	0.98
5	-2.00	4.00	0.38	0.13	3.36	1.11
7	-1.50	2.83	0.81	0.27	4.17	1.37
10	-1.00	2.00	1.42	0.47	5.59	1.84
14	-0.50	1.41	1.80	0.59	7.39	2.43
18	0.00	1.00	3.22	1.06	10.61	3.49
25	0.50	0.71	6.36	2.09	16.97	5.58
35	1.00	0.50	10.06	3.31	27.03	8.89
45	1.50	0.35	18.27	6.01	45.30	14.91
60	2.00	0.25	44.84	14.75	90.14	29.66
80	2.50	0.18	119.69	39.38	209.83	69.04
120	3.00	0.13	65.68	21.61	275.51	90.65
170	3.50	0.09	15.98	5.26	291.49	95.91
200	3.75	0.07	2.48	0.82	293.97	96.73
230	4.00	0.06	0.88	0.29	294.85	97.02

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.41	2.85	2.64	2.26	1.84	1.54	0.36

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	2.06	0.240	0.99	-2.88	15.88

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-18 #S2

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2272811.641	-40237.382	State Plane North Carolina FIPS 3200 Feet	-66.6 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-6/1 Dry - 10YR-7/1	Well graded sand (m), trace silt with poorly graded silty sand mottling

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
274.34	263.66	0.09	0.03	#200 - 4.14	#230 - 3.96	3.43	0.00

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.07	0.03	0.07	0.03
7	-1.50	2.83	0.10	0.04	0.17	0.06
10	-1.00	2.00	1.15	0.42	1.32	0.48
14	-0.50	1.41	6.59	2.40	7.91	2.88
18	0.00	1.00	19.01	6.93	26.92	9.81
25	0.50	0.71	35.56	12.96	62.48	22.77
35	1.00	0.50	36.03	13.13	98.51	35.91
45	1.50	0.35	38.68	14.10	137.19	50.01
60	2.00	0.25	46.53	16.96	183.72	66.97
80	2.50	0.18	39.12	14.26	222.84	81.23
120	3.00	0.13	29.31	10.68	252.15	91.91
170	3.50	0.09	9.18	3.35	261.33	95.26
200	3.75	0.07	1.64	0.60	262.97	95.86
230	4.00	0.06	0.51	0.19	263.48	96.04

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.46	2.63	2.28	1.50	0.58	0.24	-0.35

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.37	0.387	1.04	-0.11	2.29

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-18 #S3

Analysis Date: 09-27-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2272811.641	-40237.382	State Plane North Carolina FIPS 3200 Feet	-69.6 NAVD 88

USCS:	Munsell:	Comments:
SM	Wet - 10YR-6/1 Dry - 10YR-7/1	Silty sand (f), trace rock fragments

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
416.18	339.21	0.61	0.07	#200 - 19.10	#230 - 18.71	19.25	0.00

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	10.07	2.42	10.07	2.42
5/8"	-4.00	16.00	0.00	0.00	10.07	2.42
7/16"	-3.50	11.31	0.00	0.00	10.07	2.42
5/16"	-3.00	8.00	0.00	0.00	10.07	2.42
3.5	-2.50	5.66	3.70	0.89	13.77	3.31
4	-2.25	4.76	2.56	0.62	16.33	3.92
5	-2.00	4.00	1.46	0.35	17.79	4.27
7	-1.50	2.83	1.92	0.46	19.71	4.74
10	-1.00	2.00	3.47	0.83	23.18	5.57
14	-0.50	1.41	9.90	2.38	33.08	7.95
18	0.00	1.00	20.69	4.97	53.77	12.92
25	0.50	0.71	32.20	7.74	85.97	20.66
35	1.00	0.50	30.37	7.30	116.34	27.95
45	1.50	0.35	28.91	6.95	145.25	34.90
60	2.00	0.25	65.90	15.83	211.15	50.74
80	2.50	0.18	80.21	19.27	291.36	70.01
120	3.00	0.13	33.95	8.16	325.31	78.17
170	3.50	0.09	8.54	2.05	333.85	80.22
200	3.75	0.07	2.84	0.68	336.69	80.90
230	4.00	0.06	1.62	0.39	338.31	81.29

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
		2.81	1.98	0.80	0.20	-1.34

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.23	0.426	1.23	-0.54	3.5

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-19 #S1

Analysis Date: 09-27-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2272416.215	-41159.705	State Plane North Carolina FIPS 3200 Feet	-60.7 NAVD 88

USCS:	Munsell:	Comments:
SP	Wet - 10YR-6/1 Dry - 10YR-7/1	Poorly graded sand (f), trace silt

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
299.34	291.21	0.26	0.02	#200 - 3.04	#230 - 2.82	7.24	0.42

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.62	0.21	0.62	0.21
3.5	-2.50	5.66	0.57	0.19	1.19	0.40
4	-2.25	4.76	0.08	0.03	1.27	0.42
5	-2.00	4.00	0.25	0.08	1.52	0.51
7	-1.50	2.83	0.65	0.22	2.17	0.72
10	-1.00	2.00	0.83	0.28	3.00	1.00
14	-0.50	1.41	1.39	0.46	4.39	1.47
18	0.00	1.00	1.36	0.45	5.75	1.92
25	0.50	0.71	2.46	0.82	8.21	2.74
35	1.00	0.50	4.34	1.45	12.55	4.19
45	1.50	0.35	13.27	4.43	25.82	8.63
60	2.00	0.25	53.27	17.80	79.09	26.42
80	2.50	0.18	132.46	44.25	211.55	70.67
120	3.00	0.13	64.41	21.52	275.96	92.19
170	3.50	0.09	12.37	4.13	288.33	96.32
200	3.75	0.07	1.92	0.64	290.25	96.96
230	4.00	0.06	0.64	0.21	290.89	97.18

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.34	2.81	2.60	2.27	1.96	1.71	1.09

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	2.17	0.222	0.74	-2.77	17.24

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-19 #S2

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2272416.215	-41159.705	State Plane North Carolina FIPS 3200 Feet	-63.7 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-5/1 Dry - 10YR-7/1	Well graded sand (m), trace silt, trace shell fragments

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
				#200 - 3.75	#230 - 3.53		
286.66	276.95	0.28	0.04			6.67	0.43

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.79	0.28	0.79	0.28
5/16"	-3.00	8.00	0.19	0.07	0.98	0.34
3.5	-2.50	5.66	0.08	0.03	1.06	0.37
4	-2.25	4.76	0.16	0.06	1.22	0.43
5	-2.00	4.00	0.65	0.23	1.87	0.65
7	-1.50	2.83	1.67	0.58	3.54	1.23
10	-1.00	2.00	4.36	1.52	7.90	2.76
14	-0.50	1.41	9.03	3.15	16.93	5.91
18	0.00	1.00	15.43	5.38	32.36	11.29
25	0.50	0.71	16.87	5.89	49.23	17.17
35	1.00	0.50	20.99	7.32	70.22	24.50
45	1.50	0.35	40.68	14.19	110.90	38.69
60	2.00	0.25	86.97	30.34	197.87	69.03
80	2.50	0.18	61.35	21.40	259.22	90.43
120	3.00	0.13	14.64	5.11	273.86	95.53
170	3.50	0.09	0.00	0.00	273.86	95.53
200	3.75	0.07	2.06	0.72	275.92	96.25
230	4.00	0.06	0.63	0.22	276.55	96.47

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.40	2.35	2.14	1.69	1.02	0.40	-0.64

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.4	0.379	1.03	-1.25	5.3

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-19 #S3

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2272416.215	-41159.705	State Plane North Carolina FIPS 3200 Feet	-68.4 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-7/1 Dry - 10YR-7/1	Well graded sand (m), with trace silty sand mottling

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
312.88	307.35	0.12	0.27	#200 - 2.15	#230 - 2.08	1.89	0.00

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.00	0.00	0.00	0.00
7	-1.50	2.83	0.50	0.16	0.50	0.16
10	-1.00	2.00	1.41	0.45	1.91	0.61
14	-0.50	1.41	8.02	2.56	9.93	3.17
18	0.00	1.00	18.07	5.78	28.00	8.95
25	0.50	0.71	32.17	10.28	60.17	19.23
35	1.00	0.50	35.96	11.49	96.13	30.72
45	1.50	0.35	58.80	18.79	154.93	49.52
60	2.00	0.25	75.94	24.27	230.87	73.79
80	2.50	0.18	51.89	16.58	282.76	90.37
120	3.00	0.13	18.79	6.01	301.55	96.38
170	3.50	0.09	3.99	1.28	305.54	97.65
200	3.75	0.07	0.61	0.19	306.15	97.85
230	4.00	0.06	0.23	0.07	306.38	97.92

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.89	2.31	2.04	1.51	0.75	0.34	-0.34

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.35	0.392	0.92	-0.44	2.85

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-19 #S4

Analysis Date: 09-27-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2272416.215	-41159.705	State Plane North Carolina FIPS 3200 Feet	-69.7 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-5/1 Dry - 10YR-7/1	Well graded sand (c), trace silt, trace limerock

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
277.86	267.25	0.09	0.07	#200 - 4.08	#230 - 3.92	6.95	0.06

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.31	0.11	0.31	0.11
4	-2.25	4.76	1.77	0.64	2.08	0.75
5	-2.00	4.00	1.16	0.42	3.24	1.17
7	-1.50	2.83	6.99	2.52	10.23	3.68
10	-1.00	2.00	13.56	4.88	23.79	8.56
14	-0.50	1.41	30.58	11.01	54.37	19.57
18	0.00	1.00	41.02	14.76	95.39	34.33
25	0.50	0.71	40.36	14.53	135.75	48.86
35	1.00	0.50	30.34	10.92	166.09	59.77
45	1.50	0.35	34.30	12.34	200.39	72.12
60	2.00	0.25	34.73	12.50	235.12	84.62
80	2.50	0.18	18.44	6.64	253.56	91.25
120	3.00	0.13	9.46	3.40	263.02	94.66
170	3.50	0.09	2.70	0.97	265.72	95.63
200	3.75	0.07	0.81	0.29	266.53	95.92
230	4.00	0.06	0.43	0.15	266.96	96.08

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.18	1.98	1.62	0.55	-0.32	-0.66	-1.36

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	0.55	0.683	1.21	0.05	2.46

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-20 #S1

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2271638.942	-42998.755	State Plane North Carolina FIPS 3200 Feet	-59.5 NAVD 88

USCS:	Munsell:	Comments:
SP	Wet - 10YR-7/1 Dry - 10YR-7/1	Poorly graded sand (f-m)

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
339.57	334.20	0.29	0.04	#200 - 1.87	#230 - 1.71	5.75	0.04

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.07	0.02	0.07	0.02
4	-2.25	4.76	0.07	0.02	0.14	0.04
5	-2.00	4.00	0.35	0.10	0.49	0.14
7	-1.50	2.83	0.59	0.17	1.08	0.32
10	-1.00	2.00	0.56	0.16	1.64	0.48
14	-0.50	1.41	1.20	0.35	2.84	0.84
18	0.00	1.00	1.69	0.50	4.53	1.33
25	0.50	0.71	3.47	1.02	8.00	2.36
35	1.00	0.50	10.15	2.99	18.15	5.34
45	1.50	0.35	35.53	10.46	53.68	15.81
60	2.00	0.25	79.34	23.36	133.02	39.17
80	2.50	0.18	130.45	38.42	263.47	77.59
120	3.00	0.13	55.38	16.31	318.85	93.90
170	3.50	0.09	12.47	3.67	331.32	97.57
200	3.75	0.07	1.89	0.56	333.21	98.13
230	4.00	0.06	0.55	0.16	333.76	98.29

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.15	2.70	2.47	2.14	1.70	1.50	0.94

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	2.05	0.241	0.69	-1.37	8.33

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-20 #S2

Analysis Date: 09-27-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2271638.942	-42998.755	State Plane North Carolina FIPS 3200 Feet	-64.5 NAVD 88

USCS:	Munsell:	Comments:
SP	Wet - 10YR-6/1 Dry - 10YR-7/1	Poorly graded sand (f-m)

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
273.91	264.53	0.30	0.02	#200 - 3.74	#230 - 3.56	5.91	0.02

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.06	0.02	0.06	0.02
4	-2.25	4.76	0.00	0.00	0.06	0.02
5	-2.00	4.00	0.00	0.00	0.06	0.02
7	-1.50	2.83	0.14	0.05	0.20	0.07
10	-1.00	2.00	0.55	0.20	0.75	0.27
14	-0.50	1.41	0.69	0.25	1.44	0.53
18	0.00	1.00	1.16	0.42	2.60	0.95
25	0.50	0.71	2.09	0.76	4.69	1.71
35	1.00	0.50	3.57	1.30	8.26	3.02
45	1.50	0.35	9.35	3.41	17.61	6.43
60	2.00	0.25	57.74	21.08	75.35	27.51
80	2.50	0.18	120.10	43.85	195.45	71.36
120	3.00	0.13	54.42	19.87	249.87	91.22
170	3.50	0.09	12.14	4.43	262.01	95.66
200	3.75	0.07	1.66	0.61	263.67	96.26
230	4.00	0.06	0.50	0.18	264.17	96.44

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.43	2.82	2.59	2.26	1.94	1.73	1.29

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	2.2	0.218	0.6	-1.48	9.9

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-20 #S3

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2271638.942	-42998.755	State Plane North Carolina FIPS 3200 Feet	-68.0 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-6/1 Dry - 10YR-7/1	Well graded sand (f), trace silt

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
				#200 - 4.44	#230 - 4.14		
279.01	268.13	0.34	0.11			2.71	0.00

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.36	0.13	0.36	0.13
7	-1.50	2.83	0.86	0.31	1.22	0.44
10	-1.00	2.00	1.21	0.43	2.43	0.87
14	-0.50	1.41	3.23	1.16	5.66	2.03
18	0.00	1.00	5.79	2.08	11.45	4.10
25	0.50	0.71	10.19	3.65	21.64	7.76
35	1.00	0.50	11.48	4.11	33.12	11.87
45	1.50	0.35	14.05	5.04	47.17	16.91
60	2.00	0.25	36.78	13.18	83.95	30.09
80	2.50	0.18	104.08	37.30	188.03	67.39
120	3.00	0.13	60.01	21.51	248.04	88.90
170	3.50	0.09	15.76	5.65	263.80	94.55
200	3.75	0.07	2.82	1.01	266.62	95.56
230	4.00	0.06	0.85	0.30	267.47	95.86

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.61	2.89	2.68	2.27	1.81	1.41	0.12

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	2.05	0.241	0.9	-1.46	5.69

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-20 #S4

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2271638.942	-42998.755	State Plane North Carolina FIPS 3200 Feet	-69.5 NAVD 88

USCS:	Munsell:	Comments:
SP-SM	Wet - 10YR-4/1 Dry - 10YR-6/1	Poorly graded silty sand (m)

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
228.61	217.59	0.37	0.07	#200 - 5.73	#230 - 5.05	1.60	0.00

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.29	0.13	0.29	0.13
7	-1.50	2.83	1.27	0.56	1.56	0.68
10	-1.00	2.00	1.88	0.82	3.44	1.50
14	-0.50	1.41	5.43	2.38	8.87	3.88
18	0.00	1.00	13.82	6.05	22.69	9.93
25	0.50	0.71	29.51	12.91	52.20	22.83
35	1.00	0.50	46.52	20.35	98.72	43.18
45	1.50	0.35	46.63	20.40	145.35	63.58
60	2.00	0.25	33.47	14.64	178.82	78.22
80	2.50	0.18	14.78	6.47	193.60	84.69
120	3.00	0.13	11.40	4.99	205.00	89.67
170	3.50	0.09	7.16	3.13	212.16	92.80
200	3.75	0.07	3.36	1.47	215.52	94.27
230	4.00	0.06	1.54	0.67	217.06	94.95

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	2.45	1.89	1.17	0.55	0.24	-0.41

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.16	0.448	1.02	0.2	3.31

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-20 #S5

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2271638.942	-42998.755	State Plane North Carolina FIPS 3200 Feet	-70.9 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-6/2 Dry - 10YR-7/1	Well graded sand (m), trace silt

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
307.15	298.53	0.19	0.28	#200 - 3.42	#230 - 3.15	4.74	0.00

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.90	0.29	0.90	0.29
7	-1.50	2.83	1.25	0.41	2.15	0.70
10	-1.00	2.00	2.12	0.69	4.27	1.39
14	-0.50	1.41	6.17	2.01	10.44	3.40
18	0.00	1.00	14.59	4.75	25.03	8.15
25	0.50	0.71	29.08	9.47	54.11	17.62
35	1.00	0.50	45.17	14.71	99.28	32.32
45	1.50	0.35	54.73	17.82	154.01	50.14
60	2.00	0.25	46.11	15.01	200.12	65.15
80	2.50	0.18	43.96	14.31	244.08	79.47
120	3.00	0.13	40.04	13.04	284.12	92.50
170	3.50	0.09	10.24	3.33	294.36	95.84
200	3.75	0.07	2.28	0.74	296.64	96.58
230	4.00	0.06	0.84	0.27	297.48	96.85

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.37	2.67	2.34	1.50	0.75	0.41	-0.33

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.44	0.369	1.05	-0.33	2.91

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-21 #S1

Analysis Date: 09-27-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2271244.625	-43917.05	State Plane North Carolina FIPS 3200 Feet	-59.1 NAVD 88

USCS:	Munsell:	Comments:
SP	Wet - 10YR-7/1 Dry - 10YR-8/1	Poorly graded sand (m)

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
278.26	273.96	0.02	0.00	#200 - 1.61	#230 - 1.55	4.74	0.00

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.20	0.07	0.20	0.07
7	-1.50	2.83	0.57	0.20	0.77	0.28
10	-1.00	2.00	0.65	0.23	1.42	0.51
14	-0.50	1.41	1.60	0.58	3.02	1.09
18	0.00	1.00	3.55	1.28	6.57	2.36
25	0.50	0.71	9.26	3.33	15.83	5.69
35	1.00	0.50	21.30	7.65	37.13	13.34
45	1.50	0.35	55.26	19.86	92.39	33.20
60	2.00	0.25	83.99	30.18	176.38	63.39
80	2.50	0.18	68.22	24.52	244.60	87.90
120	3.00	0.13	24.75	8.89	269.35	96.80
170	3.50	0.09	3.90	1.40	273.25	98.20
200	3.75	0.07	0.53	0.19	273.78	98.39
230	4.00	0.06	0.16	0.06	273.94	98.45

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.90	2.42	2.24	1.78	1.29	1.07	0.40

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.7	0.308	0.74	-0.86	5.13

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-21 #S2

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2271244.625	-43917.05	State Plane North Carolina FIPS 3200 Feet	-62.1 NAVD 88

USCS:	Munsell:	Comments:
SP	Wet - 10YR-7/1 Dry - 10YR-7/1	Poorly graded sand (m)

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
				#200 - 2.06	#230 - 1.99		
321.47	315.64	0.06	0.16			4.51	0.11

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.12	0.04	0.12	0.04
4	-2.25	4.76	0.24	0.07	0.36	0.11
5	-2.00	4.00	0.33	0.10	0.69	0.21
7	-1.50	2.83	0.63	0.20	1.32	0.41
10	-1.00	2.00	1.27	0.40	2.59	0.81
14	-0.50	1.41	3.42	1.06	6.01	1.87
18	0.00	1.00	6.89	2.14	12.90	4.01
25	0.50	0.71	12.17	3.79	25.07	7.80
35	1.00	0.50	19.95	6.21	45.02	14.00
45	1.50	0.35	52.65	16.38	97.67	30.38
60	2.00	0.25	92.93	28.91	190.60	59.29
80	2.50	0.18	85.33	26.54	275.93	85.83
120	3.00	0.13	32.25	10.03	308.18	95.87
170	3.50	0.09	5.86	1.82	314.04	97.69
200	3.75	0.07	0.82	0.26	314.86	97.94
230	4.00	0.06	0.20	0.06	315.06	98.01

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.96	2.47	2.30	1.84	1.34	1.06	0.13

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.72	0.304	0.82	-1.13	5.52

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-21 #S3

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2271244.625	-43917.05	State Plane North Carolina FIPS 3200 Feet	-65.1 NAVD 88

USCS:	Munsell:	Comments:
SP-SM	Wet - 10YR-4/1 Dry - 10YR-5/1	Poorly graded silty sand (f), trace shell fragments

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
258.40	241.27	0.39	0.10	#200 - 7.39	#230 - 6.88	11.75	0.91

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	1.05	0.41	1.05	0.41
3.5	-2.50	5.66	0.93	0.36	1.98	0.77
4	-2.25	4.76	0.36	0.14	2.34	0.91
5	-2.00	4.00	0.29	0.11	2.63	1.02
7	-1.50	2.83	1.71	0.66	4.34	1.68
10	-1.00	2.00	2.61	1.01	6.95	2.69
14	-0.50	1.41	6.84	2.65	13.79	5.34
18	0.00	1.00	10.57	4.09	24.36	9.43
25	0.50	0.71	15.01	5.81	39.37	15.24
35	1.00	0.50	14.47	5.60	53.84	20.84
45	1.50	0.35	18.18	7.04	72.02	27.87
60	2.00	0.25	32.55	12.60	104.57	40.47
80	2.50	0.18	51.44	19.91	156.01	60.38
120	3.00	0.13	61.78	23.91	217.79	84.28
170	3.50	0.09	17.84	6.90	235.63	91.19
200	3.75	0.07	3.67	1.42	239.30	92.61
230	4.00	0.06	1.31	0.51	240.61	93.12

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	2.99	2.81	2.24	1.30	0.57	-0.56

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.81	0.285	1.24	-1.22	4.47

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-21 #S4

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2271244.625	-43917.05	State Plane North Carolina FIPS 3200 Feet	-67.5 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-5/2 Dry - 10YR-6/2	Well graded sand (m), trace silt

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
305.88	291.61	0.15	0.06	#200 - 4.94	#230 - 4.78	4.40	0.00

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.28	0.09	0.28	0.09
4	-2.25	4.76	0.00	0.00	0.28	0.09
5	-2.00	4.00	1.08	0.35	1.36	0.44
7	-1.50	2.83	0.93	0.30	2.29	0.75
10	-1.00	2.00	3.99	1.30	6.28	2.05
14	-0.50	1.41	10.06	3.29	16.34	5.34
18	0.00	1.00	21.17	6.92	37.51	12.26
25	0.50	0.71	39.06	12.77	76.57	25.03
35	1.00	0.50	49.05	16.04	125.62	41.07
45	1.50	0.35	43.95	14.37	169.57	55.44
60	2.00	0.25	52.40	17.13	221.97	72.57
80	2.50	0.18	39.84	13.02	261.81	85.59
120	3.00	0.13	21.32	6.97	283.13	92.56
170	3.50	0.09	6.33	2.07	289.46	94.63
200	3.75	0.07	1.32	0.43	290.78	95.06
230	4.00	0.06	0.49	0.16	291.27	95.22

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.72	2.44	2.09	1.31	0.50	0.15	-0.55

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.19	0.438	1.06	-0.26	2.87

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-22 #S1

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2270856.711	-44838.923	State Plane North Carolina FIPS 3200 Feet	-59.3 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-7/1 Dry - 10YR-7/1	Well graded sand (m), trace shell fragments

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
278.69	274.88	0.12	0.08	#200 - 1.56	#230 - 1.49	7.55	0.93

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	1.59	0.57	1.59	0.57
5/16"	-3.00	8.00	0.00	0.00	1.59	0.57
3.5	-2.50	5.66	0.86	0.31	2.45	0.88
4	-2.25	4.76	0.15	0.05	2.60	0.93
5	-2.00	4.00	0.69	0.25	3.29	1.18
7	-1.50	2.83	1.02	0.37	4.31	1.55
10	-1.00	2.00	1.65	0.59	5.96	2.14
14	-0.50	1.41	2.95	1.06	8.91	3.20
18	0.00	1.00	5.01	1.80	13.92	4.99
25	0.50	0.71	11.56	4.15	25.48	9.14
35	1.00	0.50	25.56	9.17	51.04	18.31
45	1.50	0.35	56.62	20.32	107.66	38.63
60	2.00	0.25	75.20	26.98	182.86	65.61
80	2.50	0.18	64.61	23.18	247.47	88.80
120	3.00	0.13	22.77	8.17	270.24	96.97
170	3.50	0.09	3.51	1.26	273.75	98.23
200	3.75	0.07	0.59	0.21	274.34	98.44
230	4.00	0.06	0.20	0.07	274.54	98.51

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.88	2.40	2.20	1.71	1.16	0.87	0.00

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.56	0.339	0.95	-1.88	9.84

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-22 #S2

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2270856.711	-44838.923	State Plane North Carolina FIPS 3200 Feet	-64.3 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-6/1 Dry - 10YR-6/1	Well graded sand (m)

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
235.54	228.60	0.06	0.18	#200 - 3.29	#230 - 3.15	9.05	0.17

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.28	0.12	0.28	0.12
4	-2.25	4.76	0.11	0.05	0.39	0.17
5	-2.00	4.00	0.11	0.05	0.50	0.21
7	-1.50	2.83	0.79	0.34	1.29	0.55
10	-1.00	2.00	2.03	0.86	3.32	1.41
14	-0.50	1.41	5.48	2.33	8.80	3.74
18	0.00	1.00	10.59	4.50	19.39	8.23
25	0.50	0.71	16.88	7.17	36.27	15.40
35	1.00	0.50	25.55	10.85	61.82	26.25
45	1.50	0.35	45.34	19.25	107.16	45.50
60	2.00	0.25	52.40	22.25	159.56	67.74
80	2.50	0.18	41.90	17.79	201.46	85.53
120	3.00	0.13	20.47	8.69	221.93	94.22
170	3.50	0.09	4.86	2.06	226.79	96.29
200	3.75	0.07	0.99	0.42	227.78	96.71
230	4.00	0.06	0.33	0.14	228.11	96.85

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.19	2.46	2.20	1.60	0.94	0.53	-0.36

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.45	0.366	0.97	-0.65	3.64

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-22 #S3

Analysis Date: 09-27-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2270856.711	-44838.923	State Plane North Carolina FIPS 3200 Feet	-68.8 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-5/2 Dry - 10YR-6/2	Well graded sand (m), trace silt

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
290.44	278.87	0.20	0.05	#200 - 4.22	#230 - 4.10	5.05	0.14

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.41	0.14	0.41	0.14
4	-2.25	4.76	0.00	0.00	0.41	0.14
5	-2.00	4.00	0.85	0.29	1.26	0.43
7	-1.50	2.83	0.72	0.25	1.98	0.68
10	-1.00	2.00	1.94	0.67	3.92	1.35
14	-0.50	1.41	4.97	1.71	8.89	3.06
18	0.00	1.00	12.08	4.16	20.97	7.22
25	0.50	0.71	29.29	10.08	50.26	17.30
35	1.00	0.50	48.69	16.76	98.95	34.07
45	1.50	0.35	71.18	24.51	170.13	58.58
60	2.00	0.25	64.70	22.28	234.83	80.85
80	2.50	0.18	27.74	9.55	262.57	90.40
120	3.00	0.13	11.38	3.92	273.95	94.32
170	3.50	0.09	3.38	1.16	277.33	95.49
200	3.75	0.07	0.86	0.30	278.19	95.78
230	4.00	0.06	0.33	0.11	278.52	95.90

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.29	2.16	1.87	1.32	0.73	0.44	-0.27

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.23	0.426	0.88	-0.49	4.28

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-22 #S4

Analysis Date: 09-27-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2270856.711	-44838.923	State Plane North Carolina FIPS 3200 Feet	-71.3 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-5/2 Dry - 10YR-6/2	Well graded sand (m), trace silt

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
338.54	325.03	0.39	0.09	#200 - 4.46	#230 - 4.19	1.00	0.00

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.11	0.03	0.11	0.03
7	-1.50	2.83	0.51	0.15	0.62	0.18
10	-1.00	2.00	2.10	0.62	2.72	0.80
14	-0.50	1.41	5.86	1.73	8.58	2.53
18	0.00	1.00	16.95	5.01	25.53	7.54
25	0.50	0.71	38.76	11.45	64.29	18.99
35	1.00	0.50	56.59	16.72	120.88	35.71
45	1.50	0.35	54.67	16.15	175.55	51.86
60	2.00	0.25	57.39	16.95	232.94	68.81
80	2.50	0.18	60.63	17.91	293.57	86.72
120	3.00	0.13	23.28	6.88	316.85	93.59
170	3.50	0.09	4.76	1.41	321.61	95.00
200	3.75	0.07	1.83	0.54	323.44	95.54
230	4.00	0.06	0.91	0.27	324.35	95.81

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.50	2.42	2.17	1.44	0.68	0.37	-0.25

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.34	0.395	0.95	-0.2	2.72

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-23 #S1

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2270074.405	-46681.622	State Plane North Carolina FIPS 3200 Feet	-60.1 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-7/1 Dry - 10YR-7/1	Well graded sand (m), trace silt, trace shell fragments

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
312.09	308.12	0.17	0.01	#200 - 1.45	#230 - 1.34	8.07	1.03

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	1.62	0.52	1.62	0.52
5/16"	-3.00	8.00	0.46	0.15	2.08	0.67
3.5	-2.50	5.66	0.77	0.25	2.85	0.91
4	-2.25	4.76	0.36	0.12	3.21	1.03
5	-2.00	4.00	0.89	0.29	4.10	1.31
7	-1.50	2.83	1.58	0.51	5.68	1.82
10	-1.00	2.00	2.29	0.73	7.97	2.55
14	-0.50	1.41	3.62	1.16	11.59	3.71
18	0.00	1.00	4.86	1.56	16.45	5.27
25	0.50	0.71	10.79	3.46	27.24	8.73
35	1.00	0.50	21.11	6.76	48.35	15.49
45	1.50	0.35	41.97	13.45	90.32	28.94
60	2.00	0.25	71.40	22.88	161.72	51.82
80	2.50	0.18	103.55	33.18	265.27	85.00
120	3.00	0.13	35.58	11.40	300.85	96.40
170	3.50	0.09	5.73	1.84	306.58	98.23
200	3.75	0.07	0.98	0.31	307.56	98.55
230	4.00	0.06	0.36	0.12	307.92	98.66

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.94	2.48	2.35	1.96	1.35	1.02	-0.09

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.72	0.304	1.01	-2.07	9.8

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-23 #S2

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2270074.405	-46681.622	State Plane North Carolina FIPS 3200 Feet	-65.2 NAVD 88

USCS:	Munsell:	Comments:
SP-SM	Wet - 10YR-3/1 Dry - 10YR-5/1	Poorly graded silty sand (m)

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
254.29	233.53	0.66	0.07	#200 - 9.06	#230 - 8.49	7.71	0.49

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.53	0.21	0.53	0.21
3.5	-2.50	5.66	0.38	0.15	0.91	0.36
4	-2.25	4.76	0.33	0.13	1.24	0.49
5	-2.00	4.00	0.74	0.29	1.98	0.78
7	-1.50	2.83	1.09	0.43	3.07	1.21
10	-1.00	2.00	1.81	0.71	4.88	1.92
14	-0.50	1.41	3.18	1.25	8.06	3.17
18	0.00	1.00	4.60	1.81	12.66	4.98
25	0.50	0.71	8.31	3.27	20.97	8.25
35	1.00	0.50	12.97	5.10	33.94	13.35
45	1.50	0.35	28.45	11.19	62.39	24.53
60	2.00	0.25	65.93	25.93	128.32	50.46
80	2.50	0.18	47.23	18.57	175.55	69.04
120	3.00	0.13	35.12	13.81	210.67	82.85
170	3.50	0.09	16.48	6.48	227.15	89.33
200	3.75	0.07	4.11	1.62	231.26	90.94
230	4.00	0.06	1.43	0.56	232.69	91.51

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	3.09	2.72	1.99	1.51	1.12	0.00

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.83	0.281	1.03	-1.25	6.12

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-23 #S3

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2270074.405	-46681.622	State Plane North Carolina FIPS 3200 Feet	-68.9 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-4/1 Dry - 10YR-5/1	Well graded sand (m), mottled with silty sand

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
299.52	289.00	0.30	0.03	#200 - 3.94	#230 - 3.64	3.66	0.53

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.18	0.06	0.18	0.06
3.5	-2.50	5.66	0.79	0.26	0.97	0.32
4	-2.25	4.76	0.63	0.21	1.60	0.53
5	-2.00	4.00	0.60	0.20	2.20	0.73
7	-1.50	2.83	1.19	0.40	3.39	1.13
10	-1.00	2.00	1.98	0.66	5.37	1.79
14	-0.50	1.41	4.06	1.36	9.43	3.15
18	0.00	1.00	4.61	1.54	14.04	4.69
25	0.50	0.71	6.85	2.29	20.89	6.97
35	1.00	0.50	18.27	6.10	39.16	13.07
45	1.50	0.35	90.11	30.08	129.27	43.16
60	2.00	0.25	107.80	35.99	237.07	79.15
80	2.50	0.18	22.79	7.61	259.86	86.76
120	3.00	0.13	15.97	5.33	275.83	92.09
170	3.50	0.09	9.20	3.07	285.03	95.16
200	3.75	0.07	2.69	0.90	287.72	96.06
230	4.00	0.06	0.90	0.30	288.62	96.36

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.47	2.32	1.94	1.60	1.20	1.05	0.07

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.53	0.346	0.86	-1.13	7.86

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-23 #S4

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2270074.405	-46681.622	State Plane North Carolina FIPS 3200 Feet	-71.1 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-4/2 Dry - 10YR-5/2	Well graded sand (c), trace silt, trace rock , trace shell fragment

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
351.01	341.89	0.21	0.03	#200 - 2.83	#230 - 2.69	6.01	2.55

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	3.28	0.93	3.28	0.93
5/8"	-4.00	16.00	0.76	0.22	4.04	1.15
7/16"	-3.50	11.31	0.87	0.25	4.91	1.40
5/16"	-3.00	8.00	1.44	0.41	6.35	1.81
3.5	-2.50	5.66	1.83	0.52	8.18	2.33
4	-2.25	4.76	0.76	0.22	8.94	2.55
5	-2.00	4.00	0.71	0.20	9.65	2.75
7	-1.50	2.83	2.35	0.67	12.00	3.42
10	-1.00	2.00	3.29	0.94	15.29	4.36
14	-0.50	1.41	9.87	2.81	25.16	7.17
18	0.00	1.00	29.16	8.31	54.32	15.48
25	0.50	0.71	72.15	20.55	126.47	36.03
35	1.00	0.50	79.17	22.55	205.64	58.59
45	1.50	0.35	66.10	18.83	271.74	77.42
60	2.00	0.25	41.32	11.77	313.06	89.19
80	2.50	0.18	14.63	4.17	327.69	93.36
120	3.00	0.13	7.83	2.23	335.52	95.59
170	3.50	0.09	4.15	1.18	339.67	96.77
200	3.75	0.07	1.40	0.40	341.07	97.17
230	4.00	0.06	0.50	0.14	341.57	97.31

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.87	1.78	1.44	0.81	0.23	0.01	-0.89

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	0.73	0.603	1.02	-0.6	6.21

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-23 #S5

Analysis Date: 09-27-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2270074.405	-46681.622	State Plane North Carolina FIPS 3200 Feet	-74.1 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-6/3 Dry - 10YR-7/2	Well graded sand (c), trace silt, trace rock

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
295.87	292.83	0.09	0.39	#200 - 1.50	#230 - 1.45	2.72	0.00

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.61	0.21	0.61	0.21
4	-2.25	4.76	0.50	0.17	1.11	0.38
5	-2.00	4.00	0.49	0.17	1.60	0.54
7	-1.50	2.83	2.87	0.97	4.47	1.51
10	-1.00	2.00	6.14	2.08	10.61	3.59
14	-0.50	1.41	17.28	5.84	27.89	9.43
18	0.00	1.00	31.85	10.76	59.74	20.19
25	0.50	0.71	56.70	19.16	116.44	39.36
35	1.00	0.50	66.01	22.31	182.45	61.67
45	1.50	0.35	51.96	17.56	234.41	79.23
60	2.00	0.25	37.28	12.60	271.69	91.83
80	2.50	0.18	13.87	4.69	285.56	96.52
120	3.00	0.13	4.73	1.60	290.29	98.11
170	3.50	0.09	0.84	0.28	291.13	98.40
200	3.75	0.07	0.31	0.10	291.44	98.50
230	4.00	0.06	0.15	0.05	291.59	98.55

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.34	1.69	1.38	0.74	0.13	-0.19	-0.88

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	0.7	0.616	0.93	-0.23	3.41

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-24 #S1

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2269679.382	-47599.906	State Plane North Carolina FIPS 3200 Feet	-59.2 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-7/1 Dry - 10YR-8/1	Well graded sand (m), trace silt

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
305.05	300.63	0.09	0.03	#200 - 1.60	#230 - 1.51	7.15	2.30

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	2.77	0.91	2.77	0.91
5/16"	-3.00	8.00	1.75	0.57	4.52	1.48
3.5	-2.50	5.66	1.51	0.50	6.03	1.98
4	-2.25	4.76	0.98	0.32	7.01	2.30
5	-2.00	4.00	1.13	0.37	8.14	2.67
7	-1.50	2.83	2.30	0.75	10.44	3.42
10	-1.00	2.00	3.95	1.29	14.39	4.72
14	-0.50	1.41	5.28	1.73	19.67	6.45
18	0.00	1.00	8.68	2.85	28.35	9.29
25	0.50	0.71	22.41	7.35	50.76	16.64
35	1.00	0.50	36.69	12.03	87.45	28.67
45	1.50	0.35	55.31	18.13	142.76	46.80
60	2.00	0.25	53.07	17.40	195.83	64.20
80	2.50	0.18	65.58	21.50	261.41	85.69
120	3.00	0.13	32.44	10.63	293.85	96.33
170	3.50	0.09	5.39	1.77	299.24	98.10
200	3.75	0.07	0.94	0.31	300.18	98.40
230	4.00	0.06	0.26	0.09	300.44	98.49

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.94	2.46	2.25	1.59	0.85	0.46	-0.92

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.38	0.384	1.22	-1.54	6.58

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-24 #S2

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2269679.382	-47599.906	State Plane North Carolina FIPS 3200 Feet	-63.8 NAVD 88

USCS:	Munsell:	Comments:
SP-SM	Wet - 10YR-4/1 Dry - 10YR-6/1	Poorly graded silty sand (m), with organic inclusions

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
326.39	308.59	0.33	0.21	#200 - 5.93	#230 - 5.77	10.05	0.68

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.89	0.27	0.89	0.27
5/16"	-3.00	8.00	0.11	0.03	1.00	0.31
3.5	-2.50	5.66	0.87	0.27	1.87	0.57
4	-2.25	4.76	0.35	0.11	2.22	0.68
5	-2.00	4.00	0.70	0.21	2.92	0.89
7	-1.50	2.83	2.14	0.66	5.06	1.55
10	-1.00	2.00	2.89	0.89	7.95	2.44
14	-0.50	1.41	4.83	1.48	12.78	3.92
18	0.00	1.00	6.98	2.14	19.76	6.05
25	0.50	0.71	12.35	3.78	32.11	9.84
35	1.00	0.50	19.78	6.06	51.89	15.90
45	1.50	0.35	38.37	11.76	90.26	27.65
60	2.00	0.25	85.21	26.11	175.47	53.76
80	2.50	0.18	94.92	29.08	270.39	82.84
120	3.00	0.13	30.17	9.24	300.56	92.09
170	3.50	0.09	5.33	1.63	305.89	93.72
200	3.75	0.07	1.14	0.35	307.03	94.07
230	4.00	0.06	0.53	0.16	307.56	94.23

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	2.56	2.37	1.93	1.39	1.00	-0.25

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.67	0.314	0.99	-1.77	7.94

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-24 #S3

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2269679.382	-47599.906	State Plane North Carolina FIPS 3200 Feet	-65.8 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-6/1 Dry - 10YR-7/1	Well graded sand (c), mottled with silt

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
				#200 - 2.50	#230 - 2.43		
286.22	279.75	0.18	0.11			1.05	0.00

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.23	0.08	0.23	0.08
7	-1.50	2.83	1.39	0.49	1.62	0.57
10	-1.00	2.00	4.22	1.47	5.84	2.04
14	-0.50	1.41	14.38	5.02	20.22	7.06
18	0.00	1.00	28.44	9.94	48.66	17.00
25	0.50	0.71	47.40	16.56	96.06	33.56
35	1.00	0.50	54.26	18.96	150.32	52.52
45	1.50	0.35	55.27	19.31	205.59	71.83
60	2.00	0.25	44.55	15.56	250.14	87.39
80	2.50	0.18	20.03	7.00	270.17	94.39
120	3.00	0.13	7.48	2.61	277.65	97.01
170	3.50	0.09	1.05	0.37	278.70	97.37
200	3.75	0.07	0.36	0.13	279.06	97.50
230	4.00	0.06	0.20	0.07	279.26	97.57

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.62	1.89	1.60	0.93	0.24	-0.05	-0.71

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	0.88	0.543	0.93	-0.11	2.83

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-24 #S4

Analysis Date: 09-27-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2269679.382	-47599.906	State Plane North Carolina FIPS 3200 Feet	-69.2 NAVD 88

USCS:	Munsell:	Comments:
SP	Wet - 10YR-7/1 Dry - 10YR-7/1	Poorly graded sand (m), with lense of poorly graded silty

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
297.90	294.63	0.09	0.12	#200 - 1.29	#230 - 1.25	1.13	0.00

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.09	0.03	0.09	0.03
7	-1.50	2.83	0.99	0.33	1.08	0.36
10	-1.00	2.00	2.20	0.74	3.28	1.10
14	-0.50	1.41	8.06	2.71	11.34	3.81
18	0.00	1.00	19.52	6.55	30.86	10.36
25	0.50	0.71	39.07	13.12	69.93	23.47
35	1.00	0.50	50.05	16.80	119.98	40.28
45	1.50	0.35	77.77	26.11	197.75	66.38
60	2.00	0.25	67.89	22.79	265.64	89.17
80	2.50	0.18	21.97	7.37	287.61	96.55
120	3.00	0.13	5.23	1.76	292.84	98.30
170	3.50	0.09	0.94	0.32	293.78	98.62
200	3.75	0.07	0.28	0.09	294.06	98.71
230	4.00	0.06	0.12	0.04	294.18	98.75

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.39	1.89	1.69	1.19	0.55	0.22	-0.41

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.07	0.476	0.82	-0.44	3.28

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-24 #S5

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2269679.382	-47599.906	State Plane North Carolina FIPS 3200 Feet	-72.7 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-7/1 Dry - 10YR-7/1	Well graded sand (m)

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
296.85	292.52	0.24	0.08	#200 - 1.71	#230 - 1.62	0.20	0.00

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.15	0.05	0.15	0.05
7	-1.50	2.83	1.76	0.59	1.91	0.64
10	-1.00	2.00	4.95	1.67	6.86	2.31
14	-0.50	1.41	10.97	3.70	17.83	6.01
18	0.00	1.00	19.48	6.56	37.31	12.57
25	0.50	0.71	32.65	11.00	69.96	23.57
35	1.00	0.50	40.80	13.74	110.76	37.31
45	1.50	0.35	50.59	17.04	161.35	54.35
60	2.00	0.25	74.55	25.11	235.90	79.47
80	2.50	0.18	41.37	13.94	277.27	93.40
120	3.00	0.13	12.11	4.08	289.38	97.48
170	3.50	0.09	1.88	0.63	291.26	98.12
200	3.75	0.07	0.52	0.18	291.78	98.29
230	4.00	0.06	0.27	0.09	292.05	98.38

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.70	2.16	1.91	1.37	0.55	0.16	-0.64

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.18	0.441	0.97	-0.54	2.98

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-OSOKI-24 #S6

Analysis Date: 09-28-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2269679.382	-47599.906	State Plane North Carolina FIPS 3200 Feet	-76.2 NAVD 88

USCS:	Munsell:	Comments:
SM	Wet - 10YR-4/1 Dry - 10YR-6/1	Silty sand (f), trace limerock

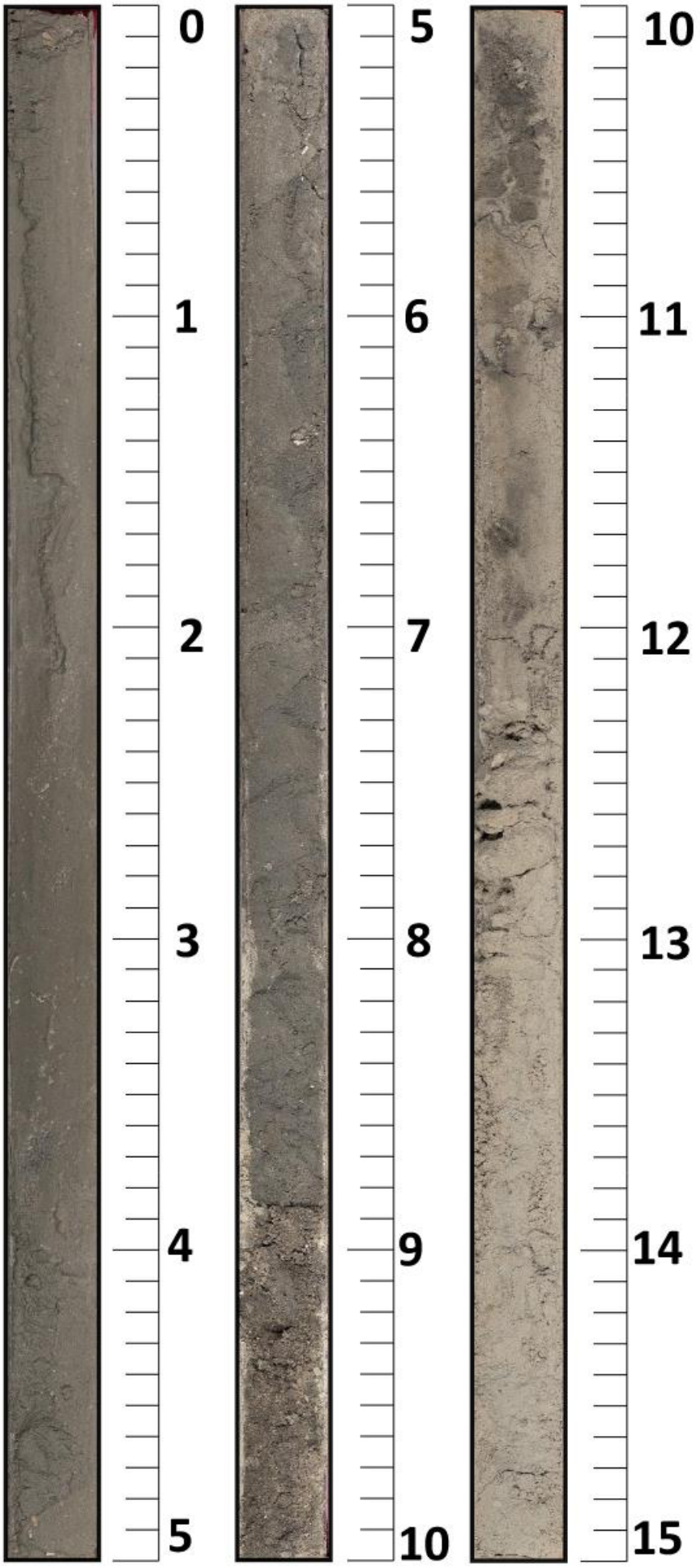
Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
268.41	228.50	0.61	0.16	#200 - 15.87	#230 - 15.25	30.00	0.00

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	1.86	0.69	1.86	0.69
4	-2.25	4.76	0.49	0.18	2.35	0.88
5	-2.00	4.00	0.73	0.27	3.08	1.15
7	-1.50	2.83	1.43	0.53	4.51	1.68
10	-1.00	2.00	2.51	0.94	7.02	2.62
14	-0.50	1.41	8.94	3.33	15.96	5.95
18	0.00	1.00	13.42	5.00	29.38	10.95
25	0.50	0.71	14.74	5.49	44.12	16.44
35	1.00	0.50	21.05	7.84	65.17	24.28
45	1.50	0.35	25.54	9.52	90.71	33.80
60	2.00	0.25	27.27	10.16	117.98	43.96
80	2.50	0.18	58.99	21.98	176.97	65.93
120	3.00	0.13	35.66	13.29	212.63	79.22
170	3.50	0.09	9.87	3.68	222.50	82.90
200	3.75	0.07	3.31	1.23	225.81	84.13
230	4.00	0.06	1.66	0.62	227.47	84.75

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	3.72	2.84	2.14	1.04	0.46	-0.64

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.57	0.337	1.24	-0.89	3.61

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23



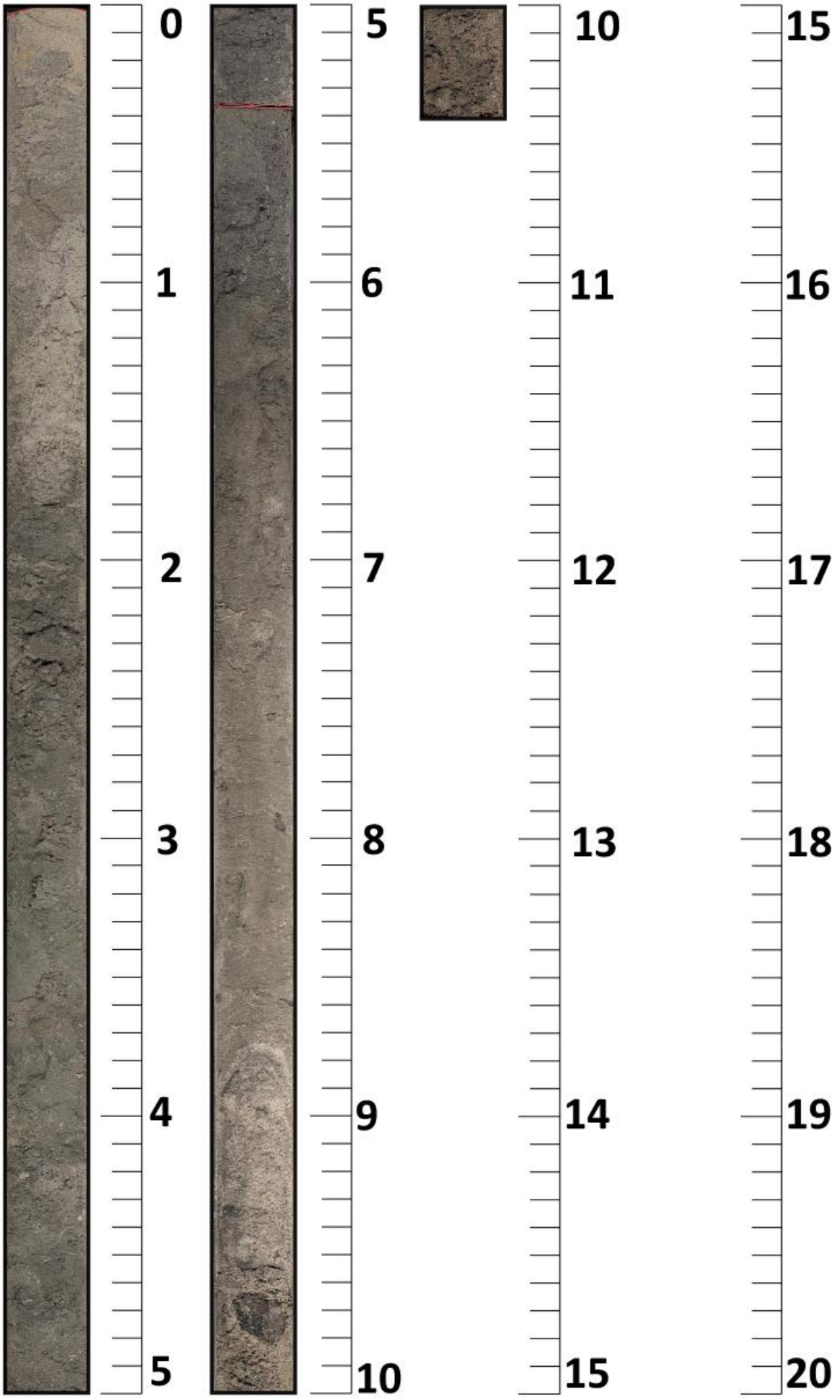
AMDRILL inc.

Stage 2
Oak Island Beach
Management Plan
–
Town of Oak
Island

2023-OSOKI-05
0.0’ – 15.0’

Scale in Feet

-60.09 NAVD 88
Top of Core
Elevation



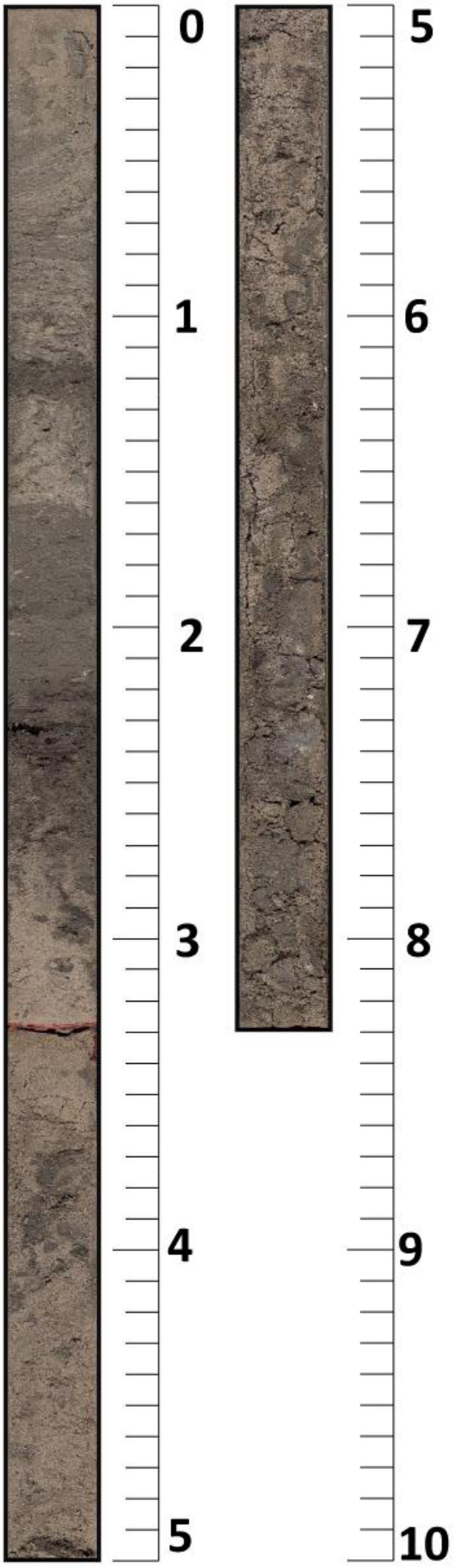
AMDRILL inc.

Stage 2
Oak Island Beach
Management Plan
–
Town of Oak
Island

2023-OSOKI-06
0.0’ – 10.4’

Scale in Feet

-59.62 NAVD 88
Top of Core
Elevation



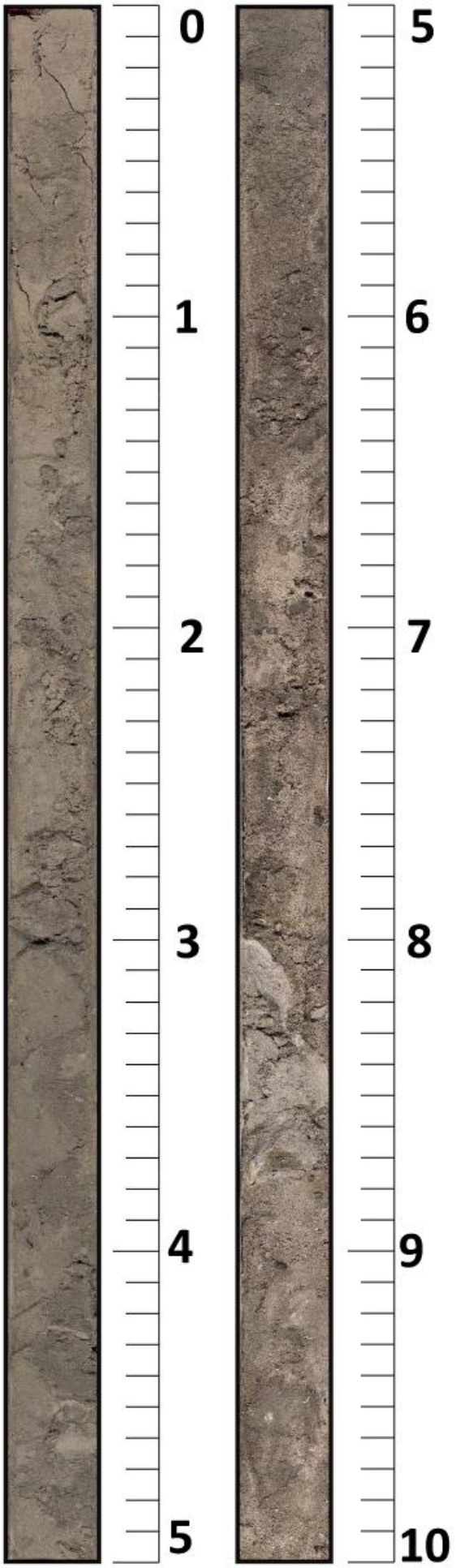
AMDRILL inc.

Stage 2
Oak Island Beach
Management Plan
–
Town of Oak
Island

2023-OSOKI-17A
0.0’ – 8.3’

Scale in Feet

-61.97 NAVD 88
Top of Core
Elevation



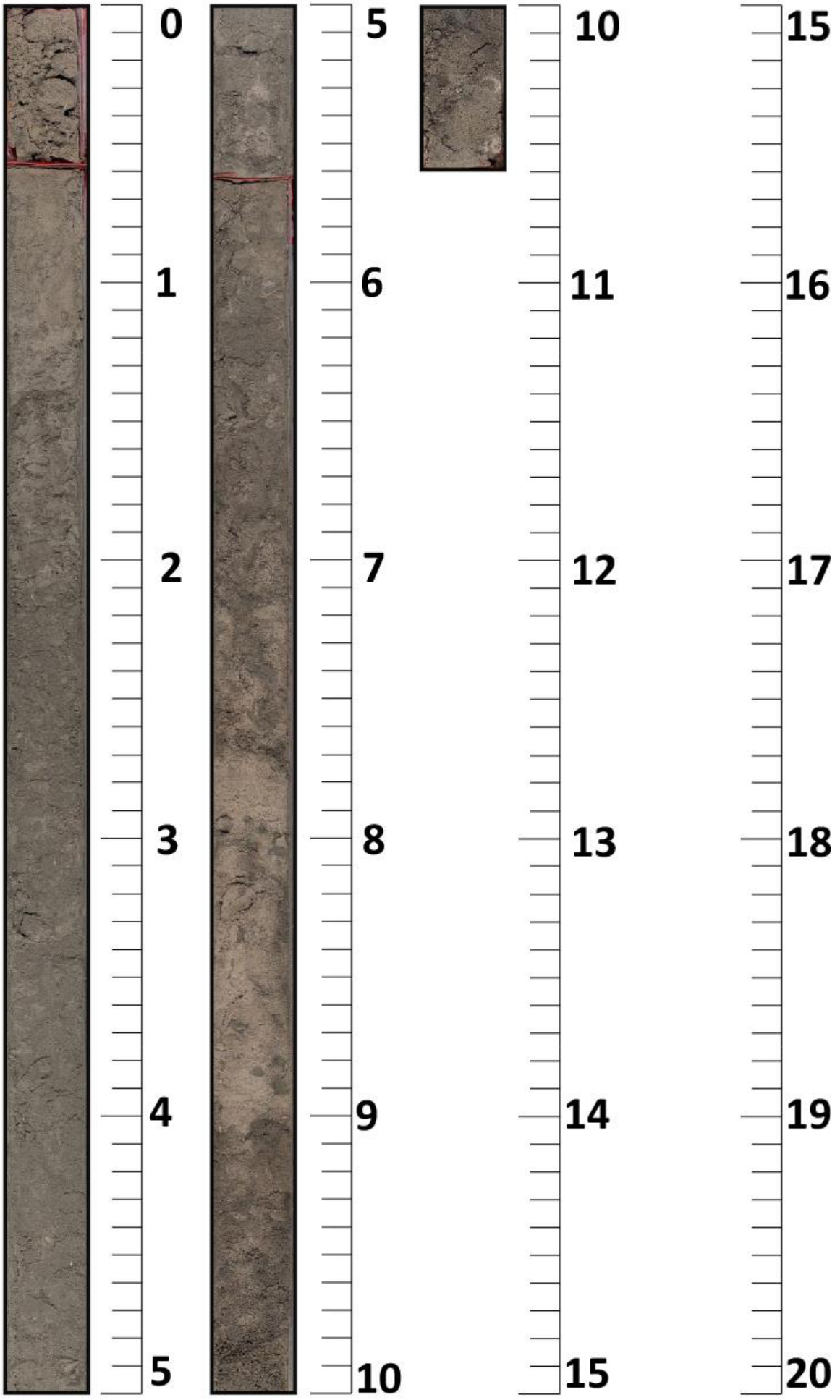
AMDRILL inc.

Stage 2
Oak Island Beach
Management Plan
–
Town of Oak
Island

2023-OSOKI-18
0.0’ – 10.0’

Scale in Feet

-61.57 NAVD 88
Top of Core
Elevation



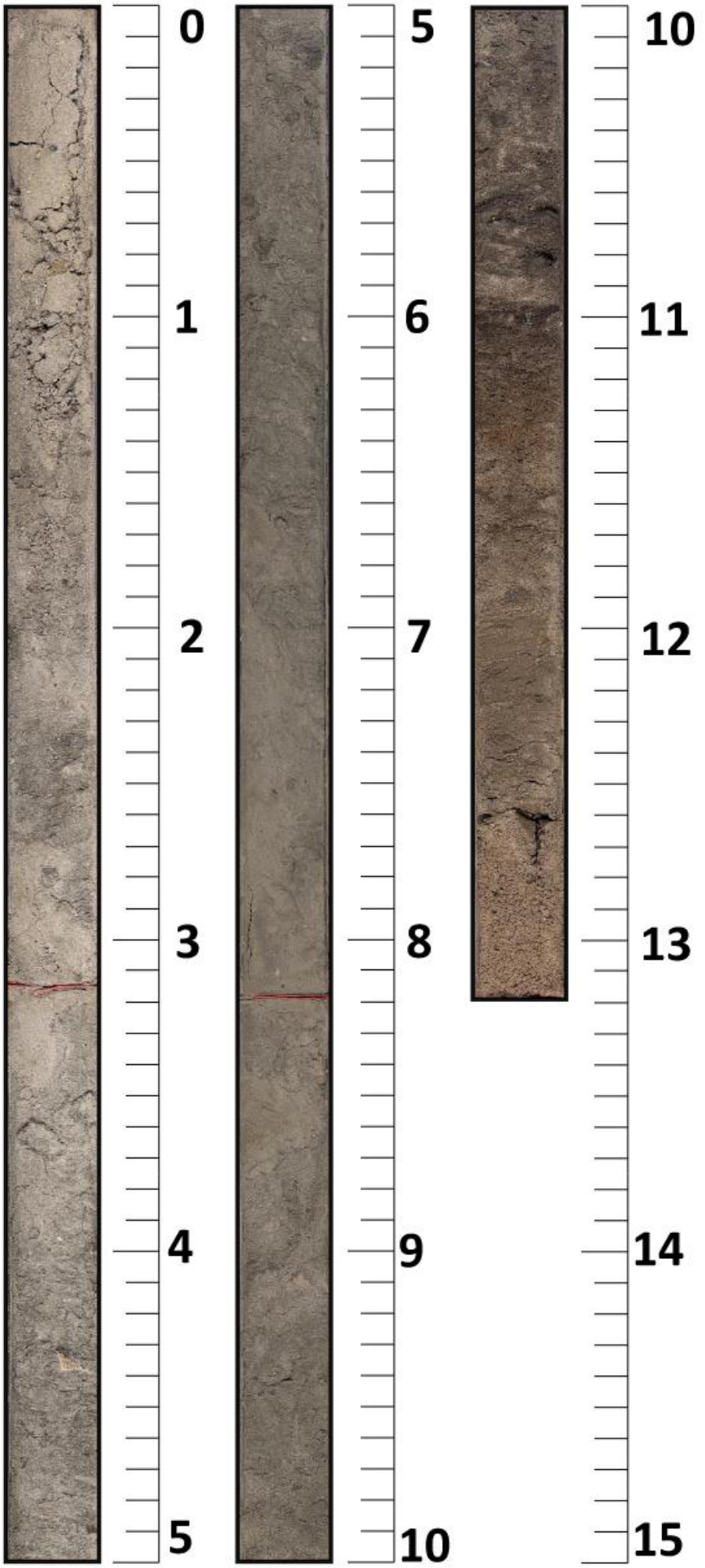
AMDRILL inc.

Stage 2
Oak Island Beach
Management Plan
–
Town of Oak
Island

2023-OSOKI-19
0.0’ – 10.6’

Scale in Feet

-60.65 NAVD 88
Top of Core
Elevation



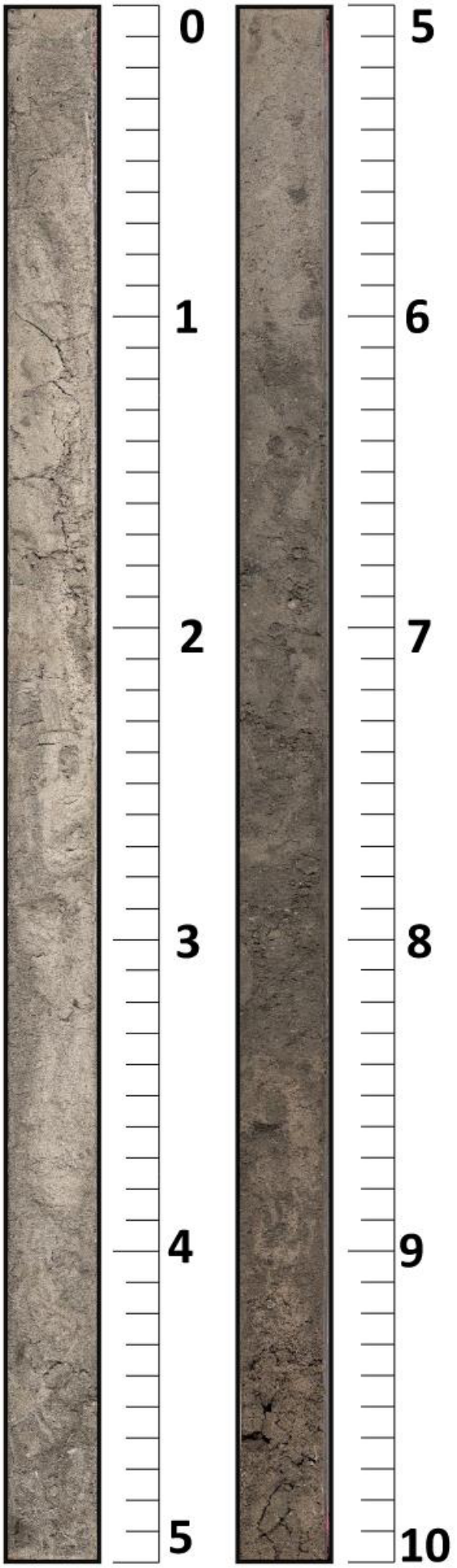
AMDRILL inc.

Stage 2
Oak Island Beach
Management Plan
–
Town of Oak
Island

2023-OSOKI-20
0.0’ – 13.2’

Scale in Feet

-59.47 NAVD 88
Top of Core
Elevation



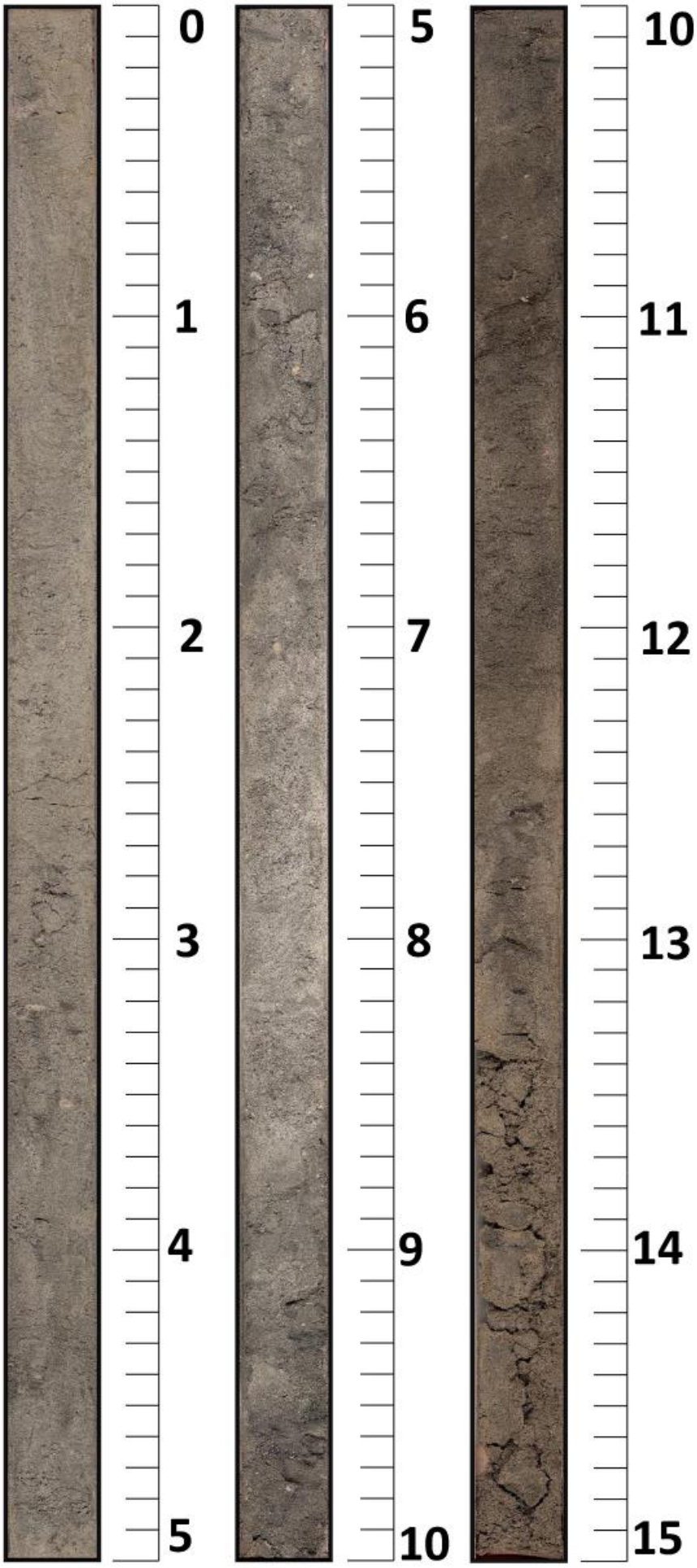
AMDRILL inc.

Stage 2
Oak Island Beach
Management Plan
–
Town of Oak
Island

2023-OSOKI-21
0.0’ – 10.0’

Scale in Feet

-59.14 NAVD 88
Top of Core
Elevation



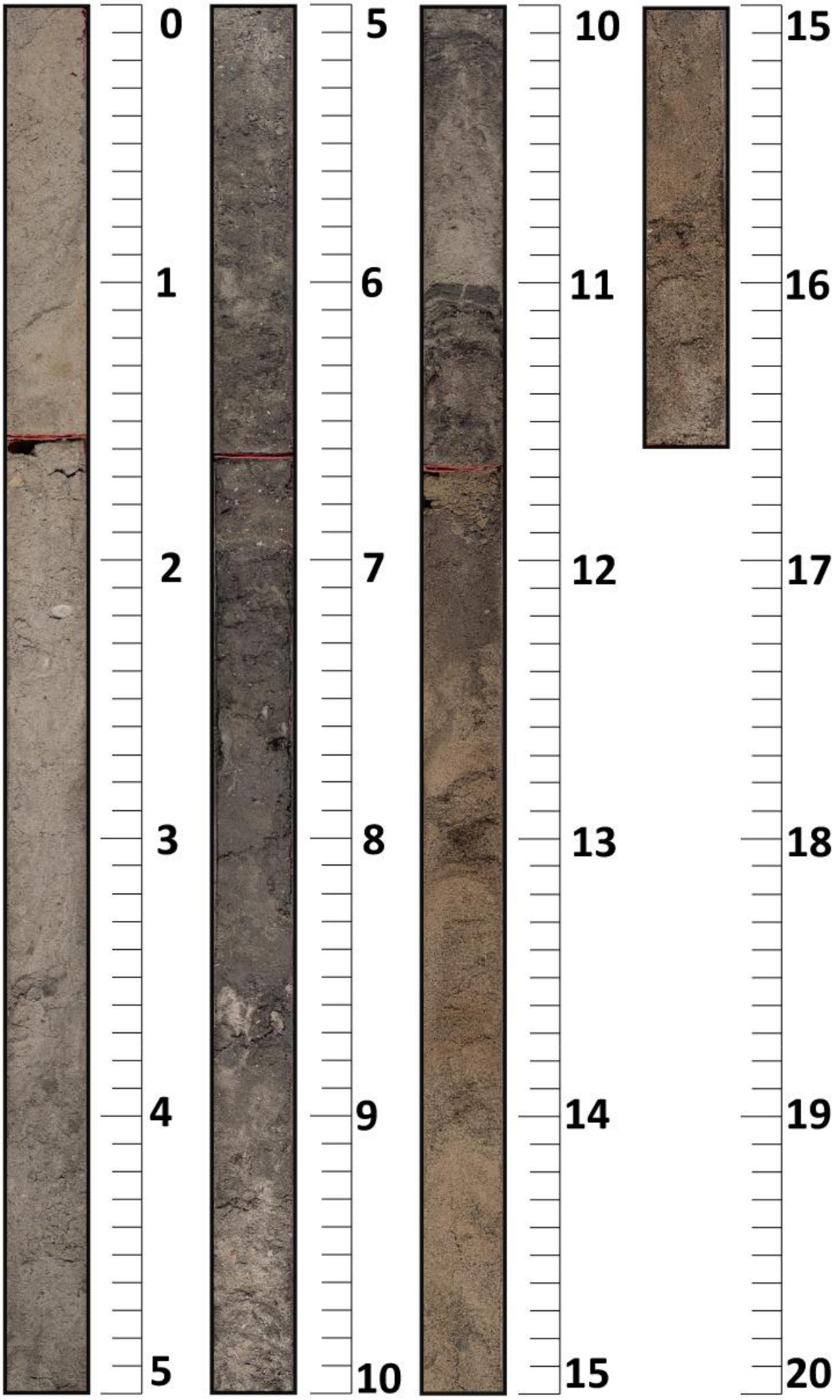
AMDRILL inc.

Stage 2
Oak Island Beach
Management Plan
–
Town of Oak
Island

2023-OSOKI-22
0.0’ – 15.0’

Scale in Feet

-59.25 NAVD 88
Top of Core
Elevation



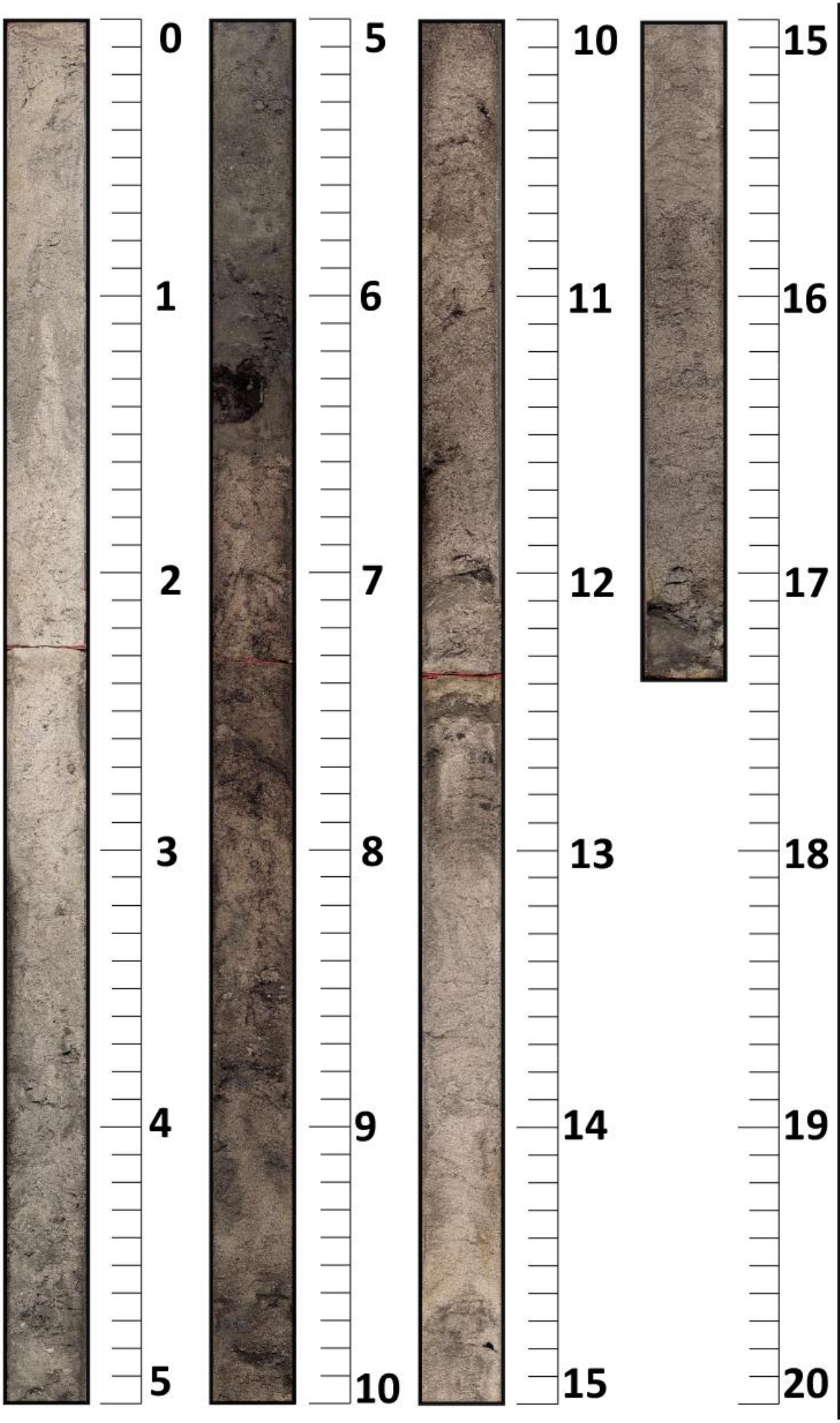
AMDRILL inc.

Stage 2
Oak Island Beach
Management Plan
–
Town of Oak
Island

2023-OSOKI-23
0.0’ – 16.6’

Scale in Feet

-60.09 NAVD 88
Top of Core
Elevation



AMDRILL inc.

Stage 2
Oak Island Beach
Management Plan
–
Town of Oak
Island

2023-OSOKI-24
0.0’ – 17.4’

Scale in Feet

-59.19 NAVD 88
Top of Core
Elevation

Project Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Amdrill
VIBRACORE
S E R V I C E S

Core Identifier 2023-OSOKI-05

Coordinate System
State Plane Coordinates (SPC)

Zone 3200

X 2272029.254

Y -42077.943

Date 06/25/2023

Start Time 12:59:00

End Time 13:01:24

Total Time 00:02:24

Time to Penetrate Last Foot 00:00:14

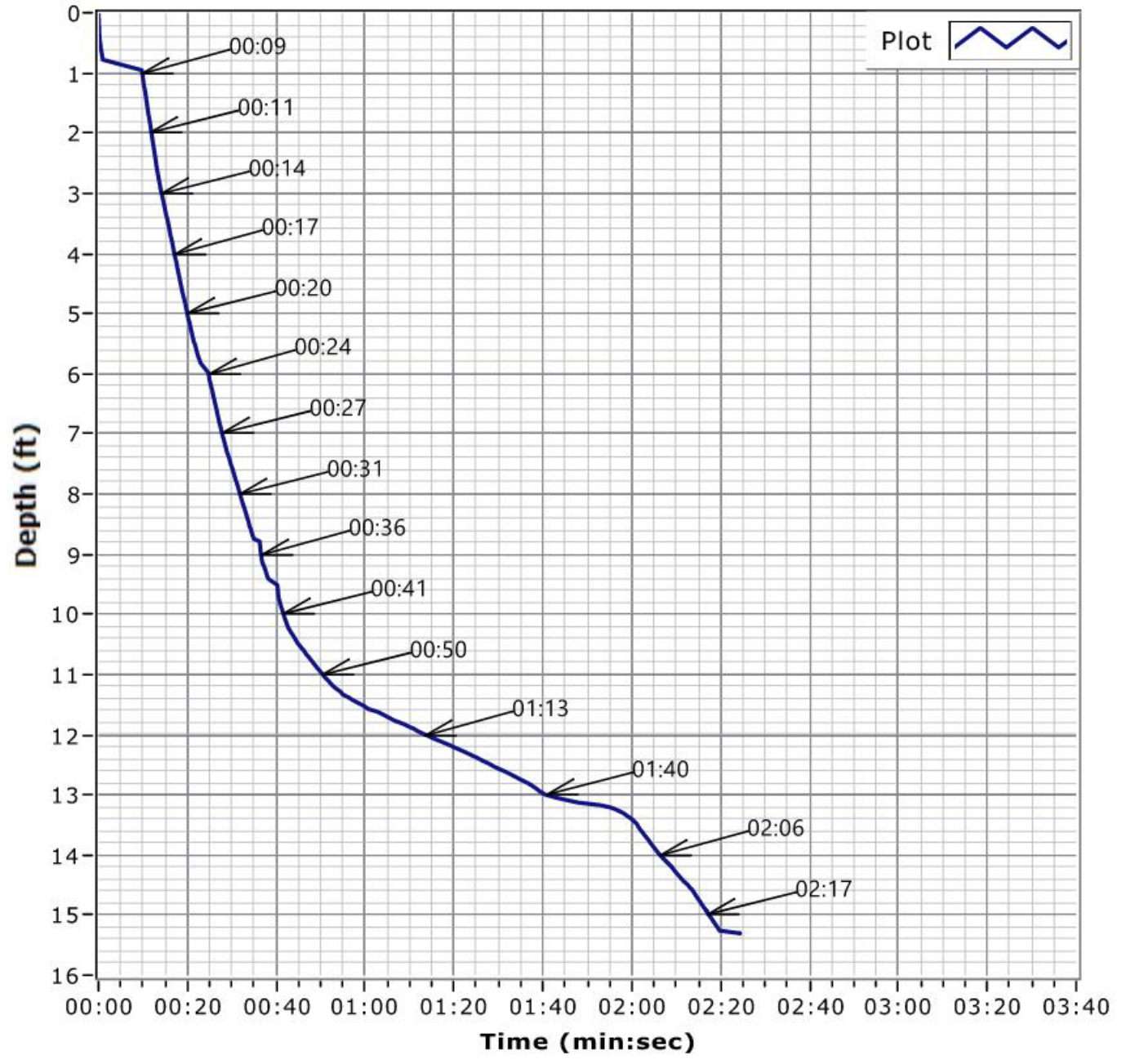
Top of Hole Elevation -60.1'

Penetration 15.3'

Recovery 15.0'

Recovery % 98.0%

Comments



Project Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Amdrill
VIBRACORE
S E R V I C E S

Core Identifier 2023-OSOKI-06

Coordinate System
State Plane Coordinates (SPC)

Zone 3200

X 2270465.724

Y -45760.456

Date 06/25/2023

Start Time 13:25:17

End Time 13:35:21

Total Time 00:10:04

Time to Penetrate Last Foot 00:03:31

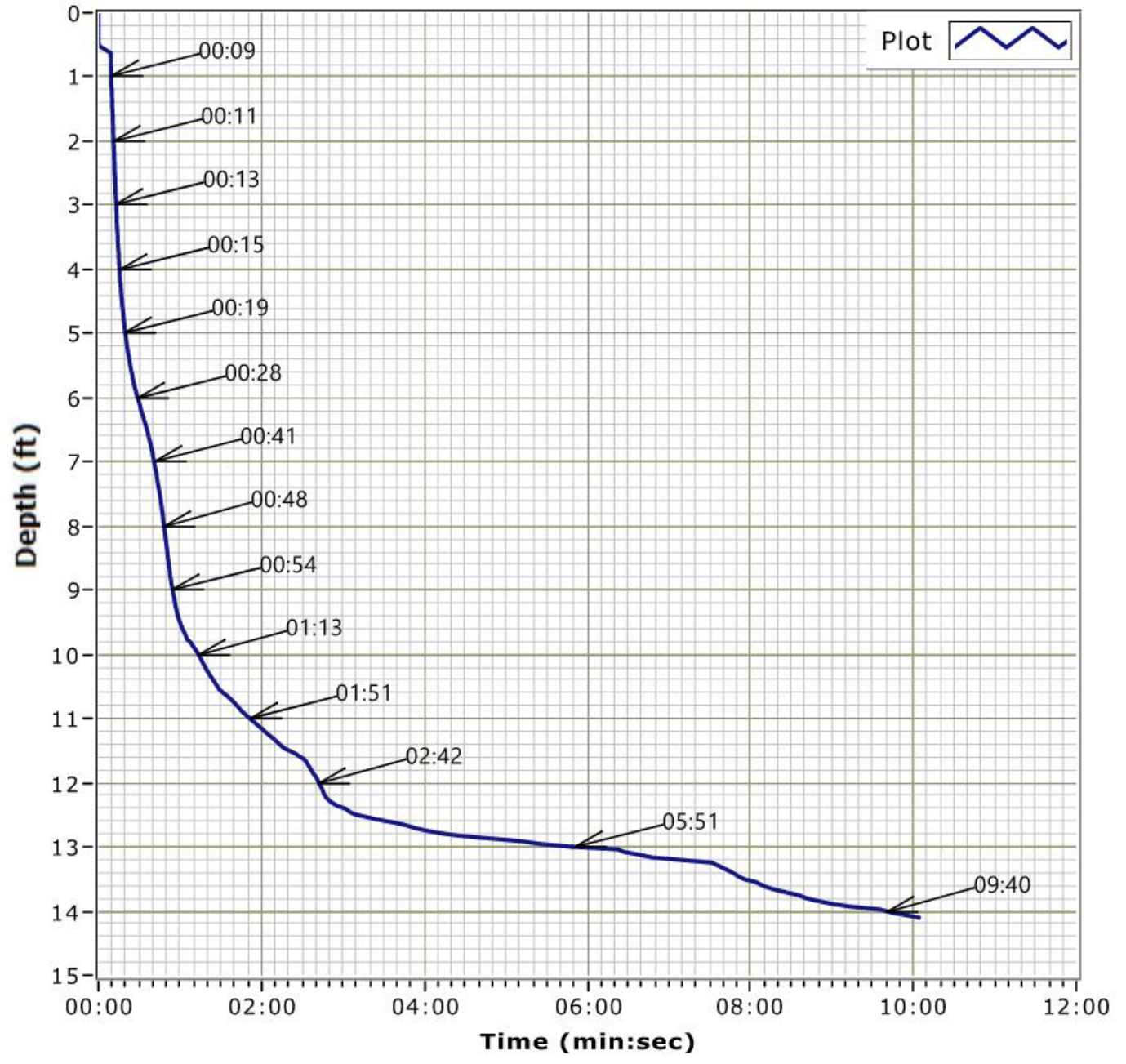
Top of Hole Elevation -59.6'

Penetration 14.1'

Recovery 10.4'

Recovery % 73.8%

Comments



Project Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Amdrill
VIBRACORE
S E R V I C E S

Core Identifier 2023-OSOKI-17A

Coordinate System
State Plane Coordinates (SPC)

Zone 3200

X 2273204.987

Y -39323.445

Date 06/25/2023

Start Time 14:39:07

End Time 14:40:26

Total Time 00:01:18

Time to Penetrate Last Foot 00:00:39

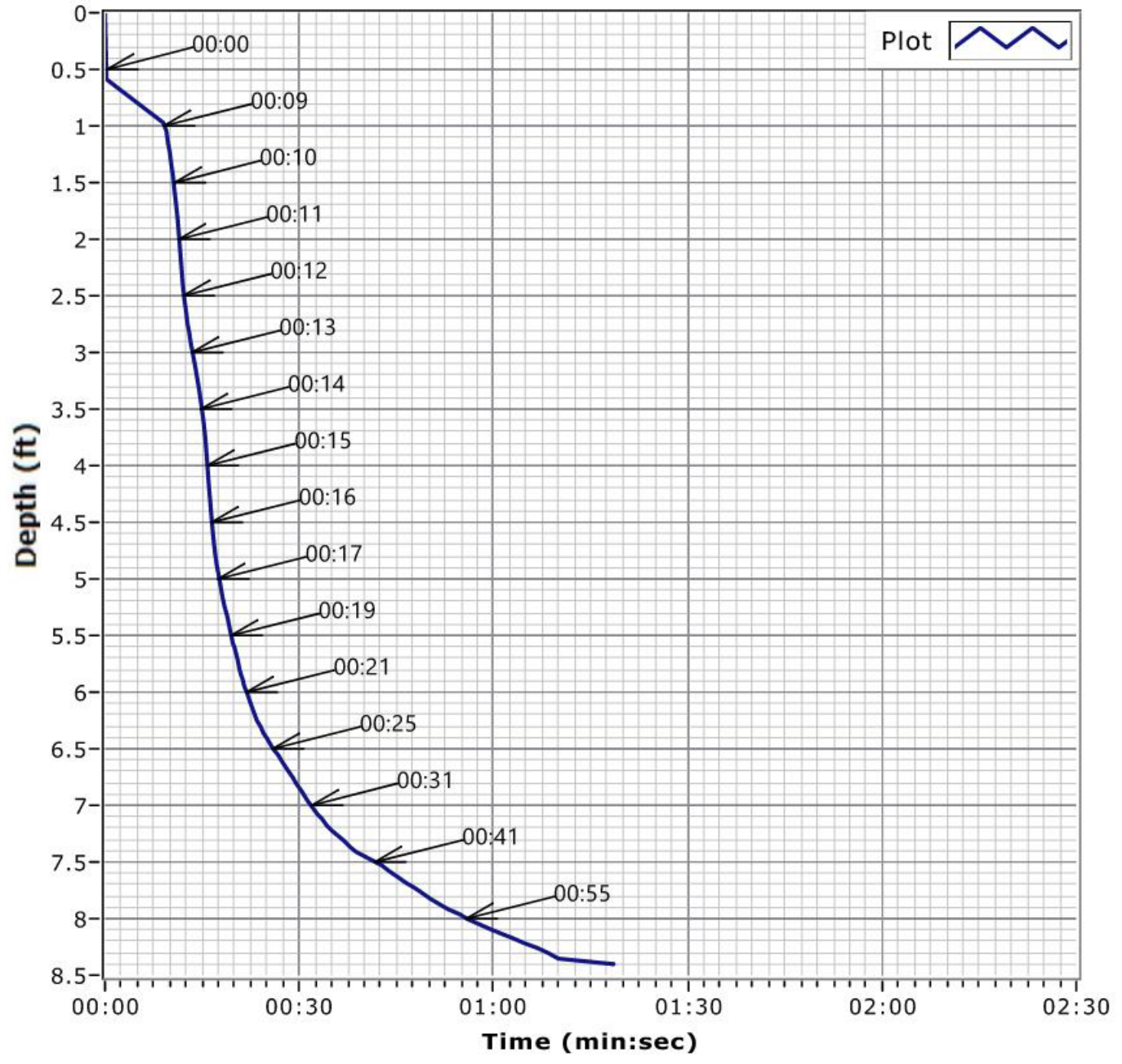
Top of Hole Elevation -61.97'

Penetration 8.4'

Recovery 8.3'

Recovery % 98.8%

Comments



Project Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Amdrill
VIBRACORE
S E R V I C E S

Core Identifier 2023-OSOKI-18

Coordinate System
State Plane Coordinates (SPC)

Zone -40237.382

X 2272811.641

Y 78.103956

Date 07/06/2023

Start Time 11:32:41

End Time 11:34:23

Total Time 00:01:42

Time to Penetrate Last Foot 00:01:13

Top of Hole Elevation -61.57'

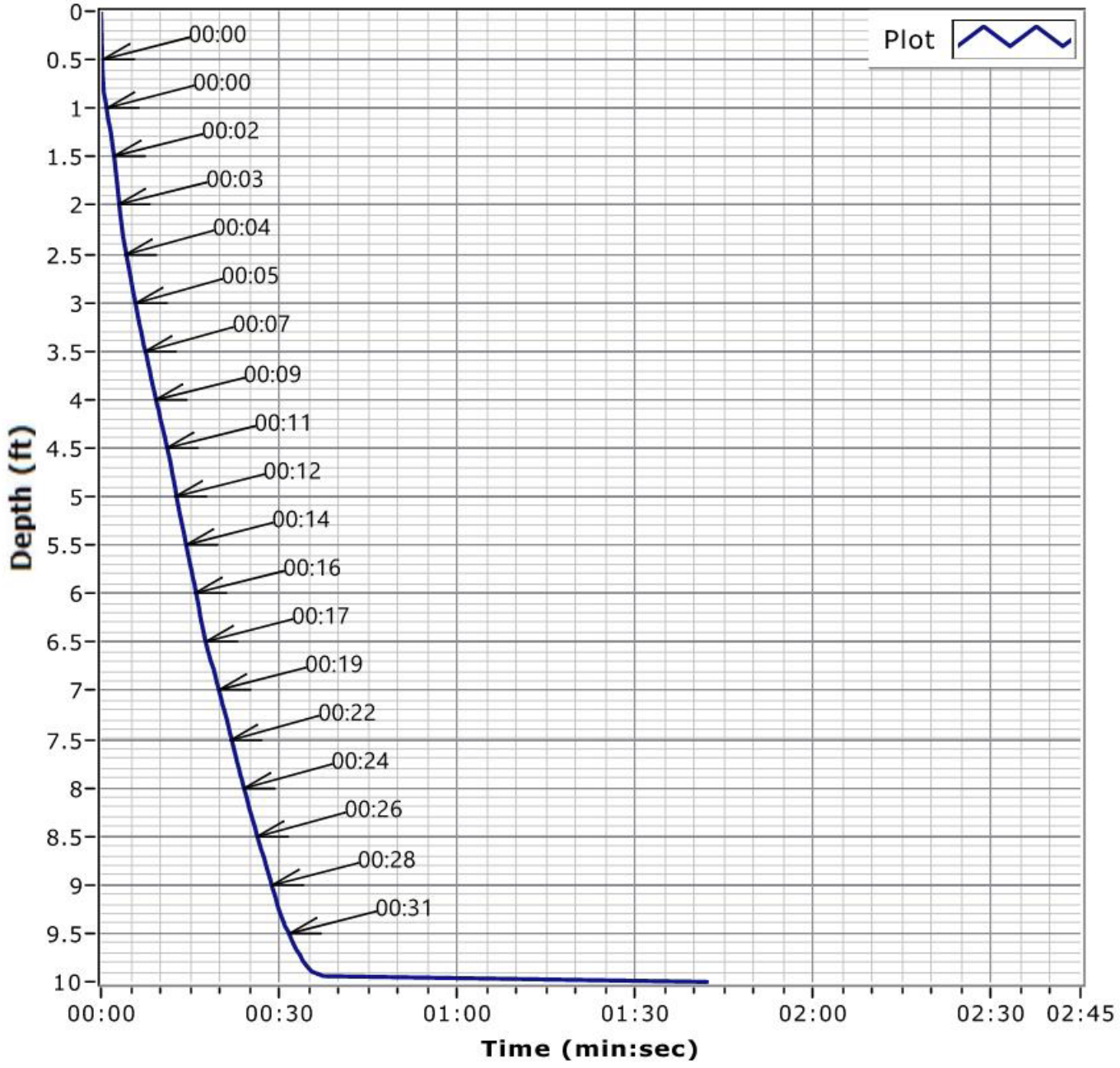
Penetration 10.0'

Recovery 10.0'

Recovery % 100.0%

Comments

REFUSAL 2 MINUTES



Project Stage 2 Oak Island Beach Management Plan - Town of Oak Island

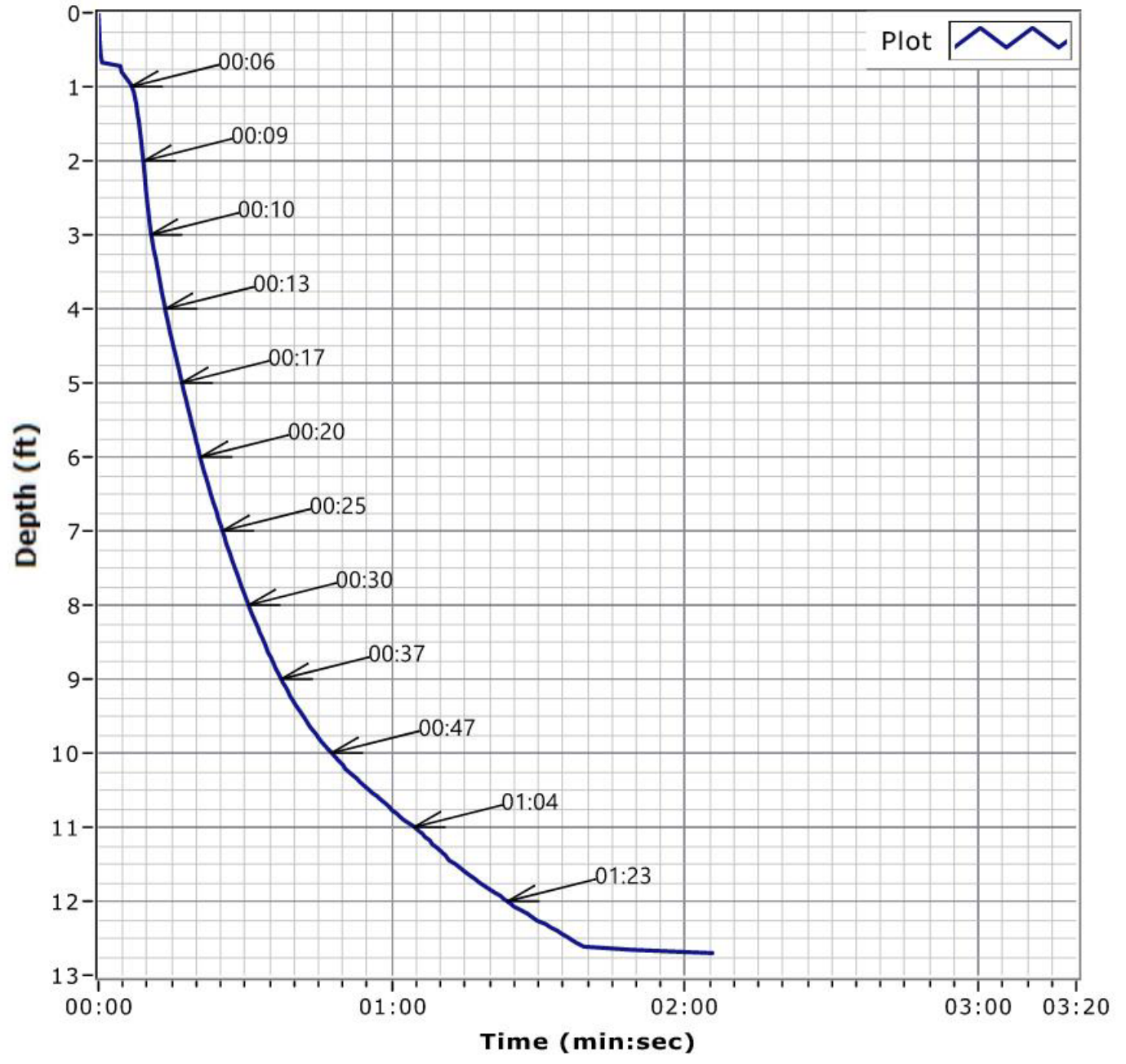
Amdrill
VIBRACORE
S E R V I C E S

Core Identifier 2023-OSOKI-19
Coordinate System
State Plane Coordinates (SPC)
Zone 3200
X 2272416.215
Y -41159.705

Date 07/06/2023
Start Time 11:11:15
End Time 11:13:20
Total Time 00:02:05
Time to Penetrate Last Foot 00:00:48

Top of Hole Elevation -60.65'
Penetration 12.7'
Recovery 10.6'
Recovery % 83.5%

Comments



Project Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Amdrill
VIBRACORE
S E R V I C E S

Core Identifier 2023-OSOKI-20

Coordinate System
State Plane Coordinates (SPC)

Zone 3200

X 2271638.942

Y -42998.755

Date 07/06/2023

Start Time 10:42:21

End Time 10:50:40

Total Time 00:08:18

Time to Penetrate Last Foot 00:01:32

Top of Hole Elevation -59.47'

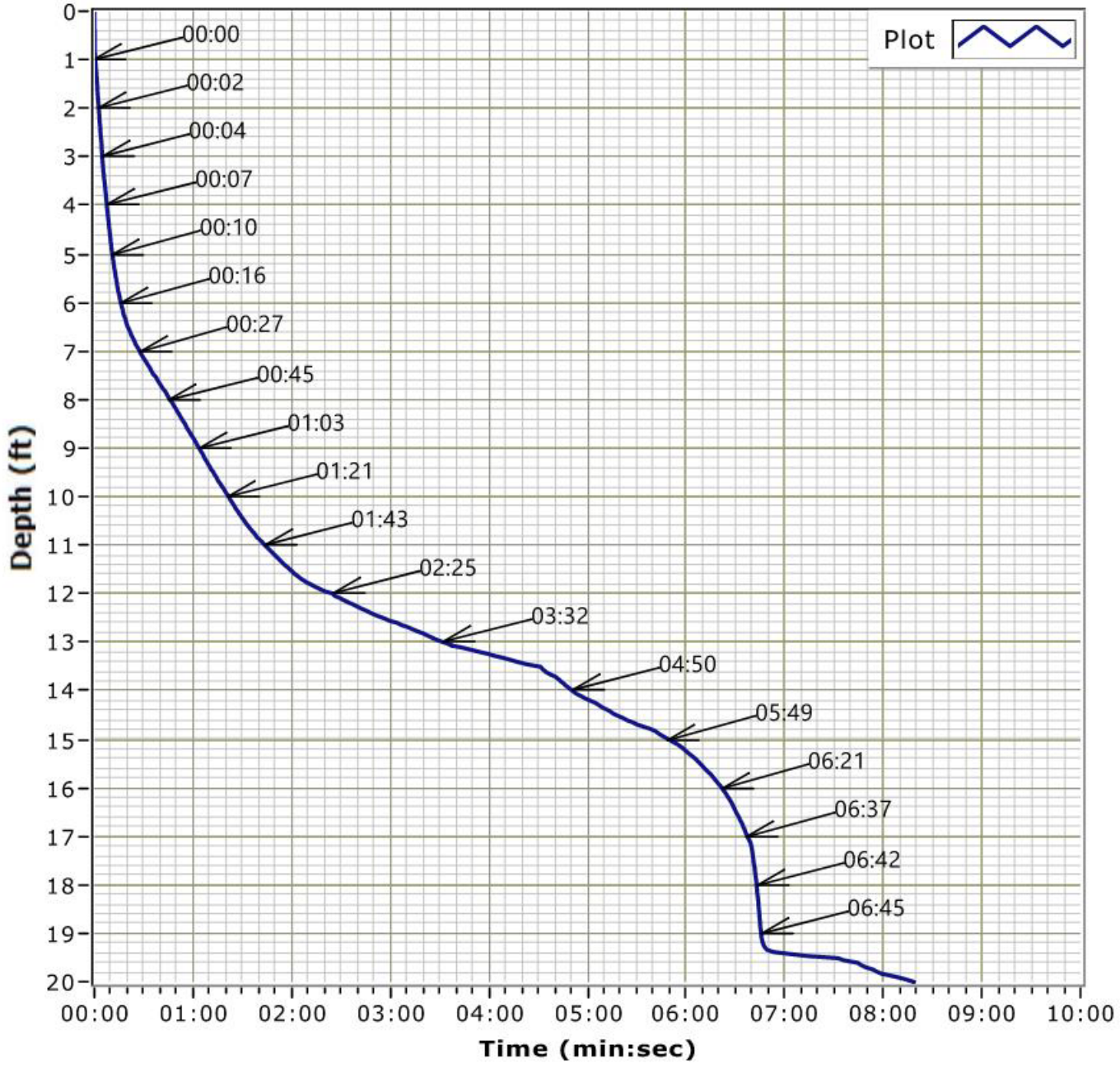
Penetration 20.0'

Recovery 13.2'

Recovery % 66.0%

Comments

ROCK



Project Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Amdrill
VIBRACORE
S E R V I C E S

Core Identifier 2023-OSOKI-21

Coordinate System
State Plane Coordinates (SPC)

Zone 3200

X 2271244.625

Y -43917.05

Date 07/06/2023

Start Time 10:16:52

End Time 10:20:55

Total Time 00:04:02

Time to Penetrate Last Foot 00:02:26

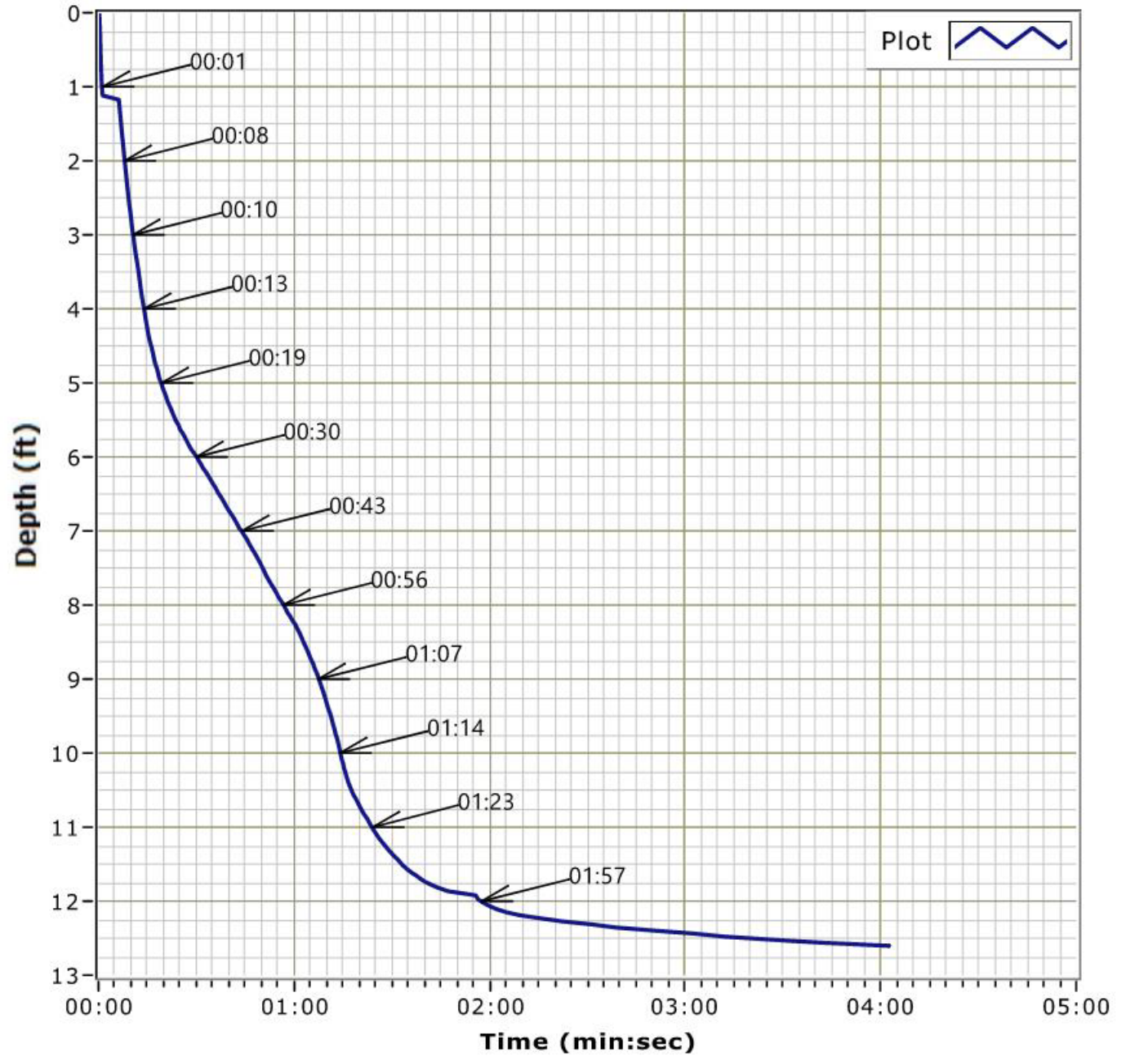
Top of Hole Elevation -59.14'

Penetration 12.6'

Recovery 10.0'

Recovery % 79.4%

Comments



Project Stage 2 Oak Island Beach Management Plan - Town of Oak Island

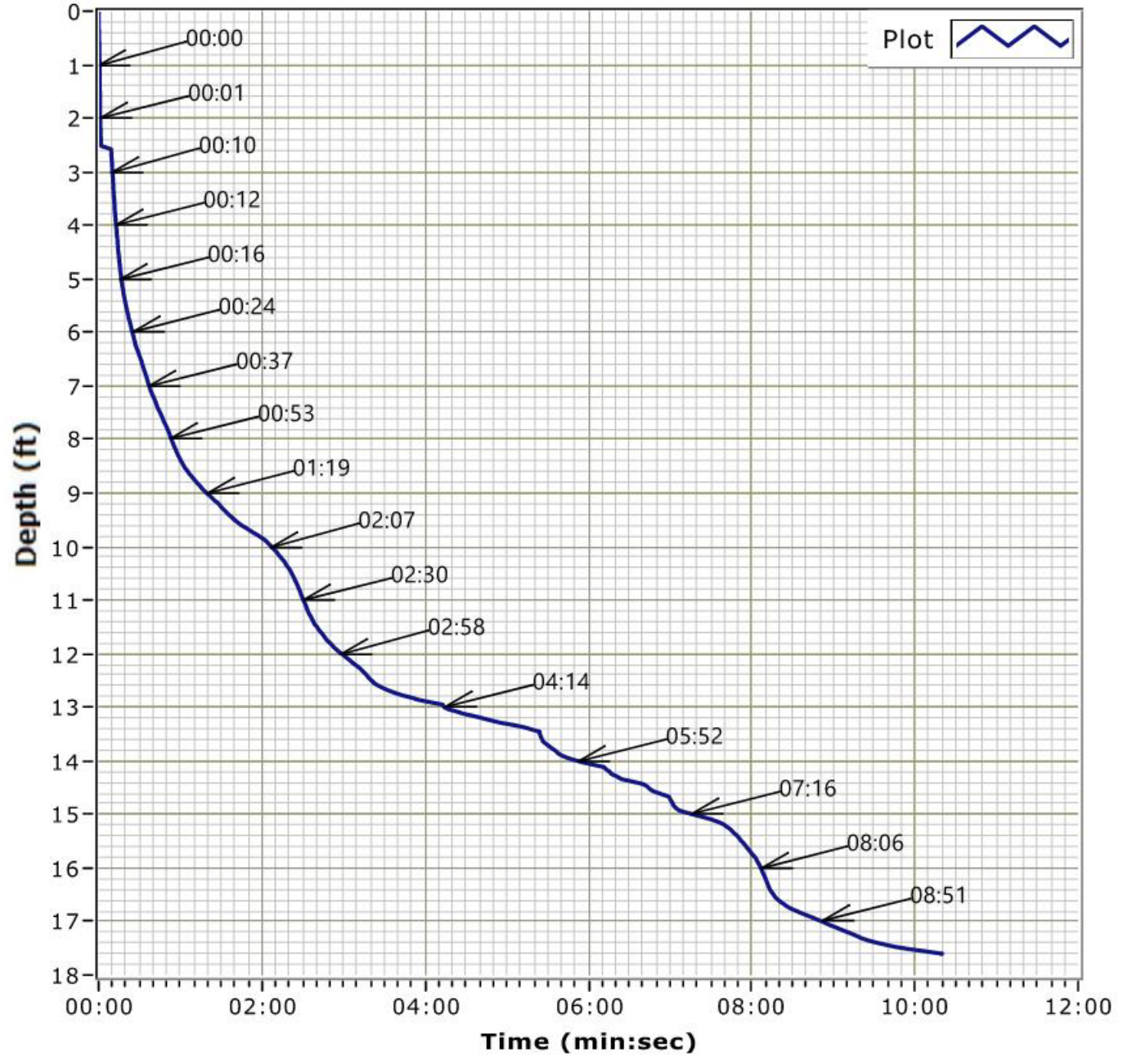
Amdrill
VIBRACORE
S E R V I C E S

Core Identifier 2023-OSOKI-22
Coordinate System
State Plane Coordinates (SPC)
Zone 3200
X 2270856.711
Y -44838.923

Date 07/06/2023
Start Time 09:45:52
End Time 09:56:12
Total Time 00:10:19
Time to Penetrate Last Foot 00:01:59

Top of Hole Elevation -59.25'
Penetration 17.6'
Recovery 15.0'
Recovery % 85.2%

Comments



Project Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Amdrill
VIBRACORE
S E R V I C E S

Core Identifier 2023-OSOKI-23

Coordinate System
State Plane Coordinates (SPC)

Zone 3200

X 2270074.405

Y -46681.622

Date 07/31/2023

Start Time 10:53:09

End Time 10:58:56

Total Time 00:05:46

Time to Penetrate Last Foot 00:02:17

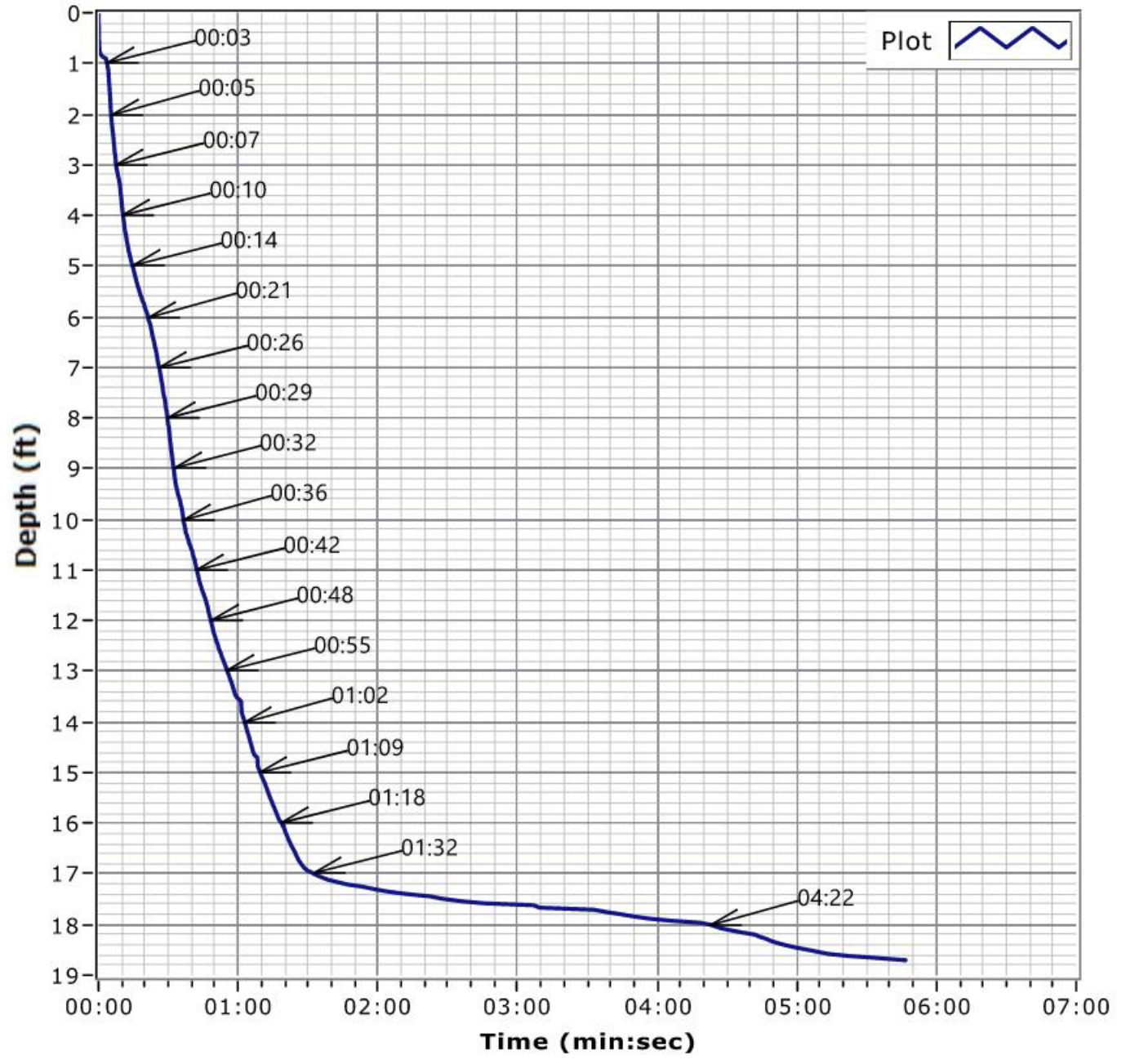
Top of Hole Elevation -60.09'

Penetration 18.7'

Recovery 16.6'

Recovery % 88.8%

Comments



Project Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Amdrill
VIBRACORE
S E R V I C E S

Core Identifier 2023-OSOKI-24

Coordinate System
State Plane Coordinates (SPC)

Zone 3200

X 2269679.382

Y -47599.906

Date 07/31/2023

Start Time 11:17:33

End Time 11:25:29

Total Time 00:07:56

Time to Penetrate Last Foot 00:03:14

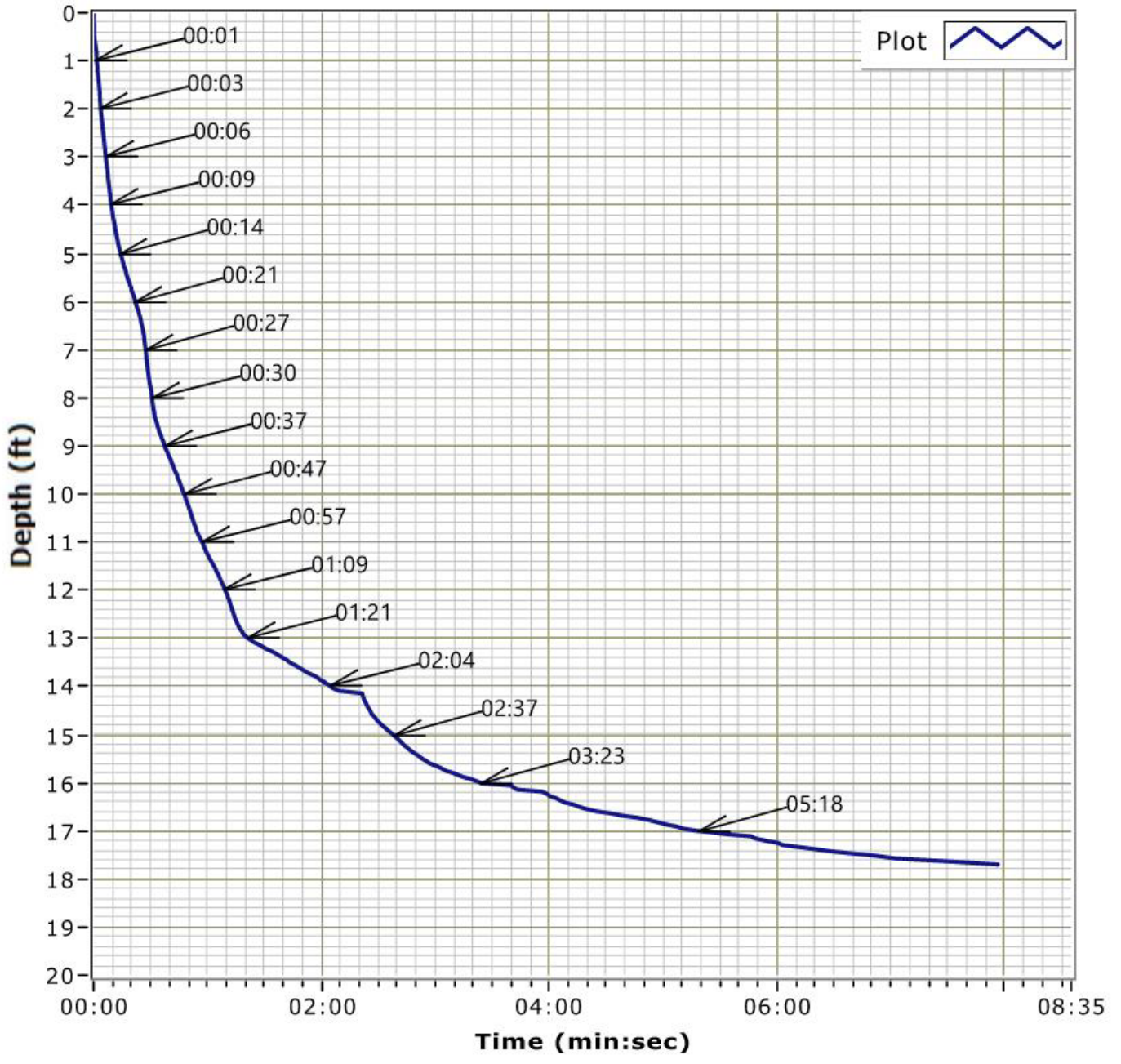
Top of Hole Elevation -59.19'

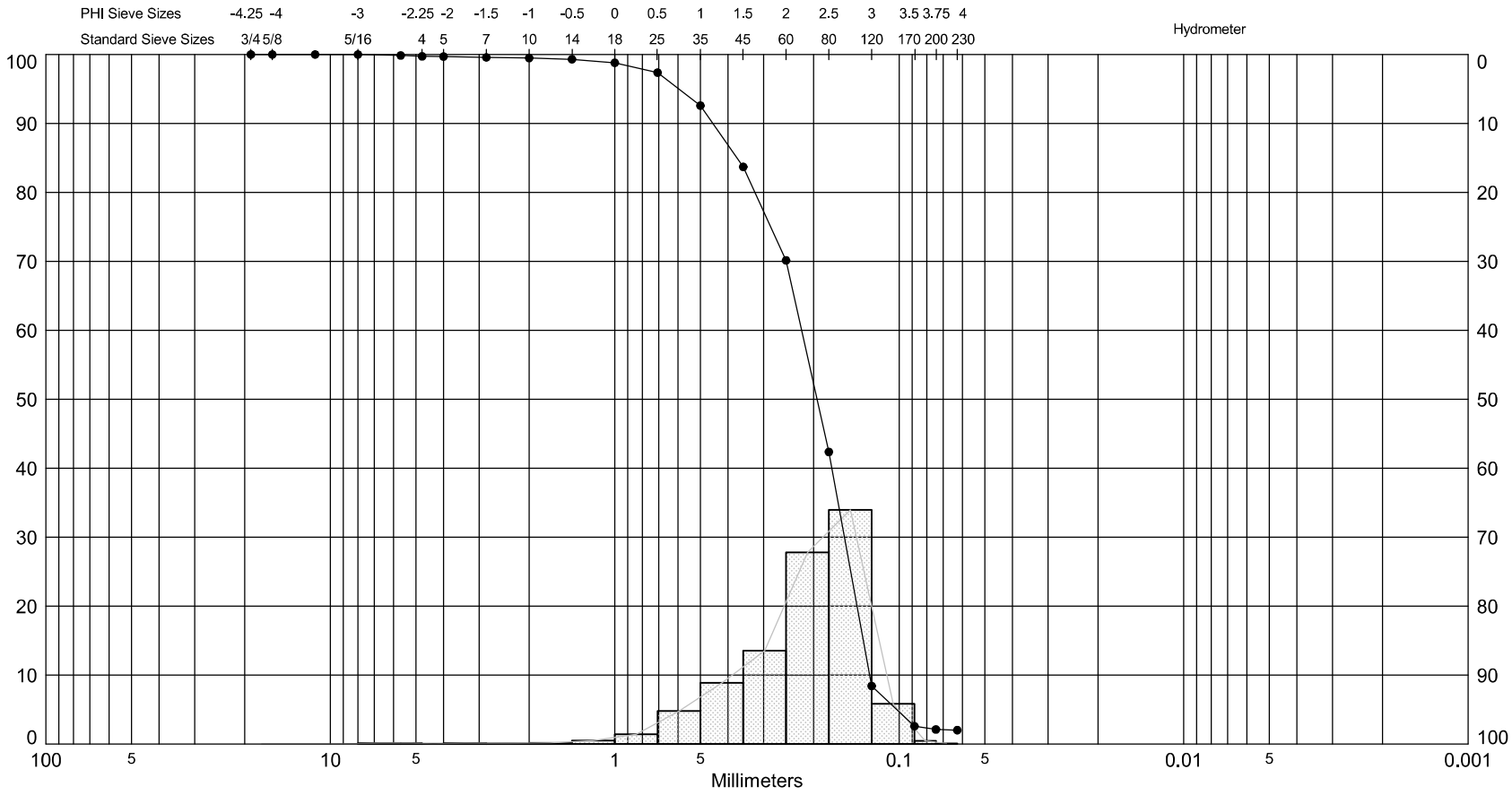
Penetration 17.7'

Recovery 17.4'

Recovery % 98.3%

Comments





Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort
BOEMVC-2022-NC-29 #1	—●—	-60.4	SP	#200 - 2.11 #230 - 2.01		4	2.36	2.19	-1.61	8.14	0.77

Comments:

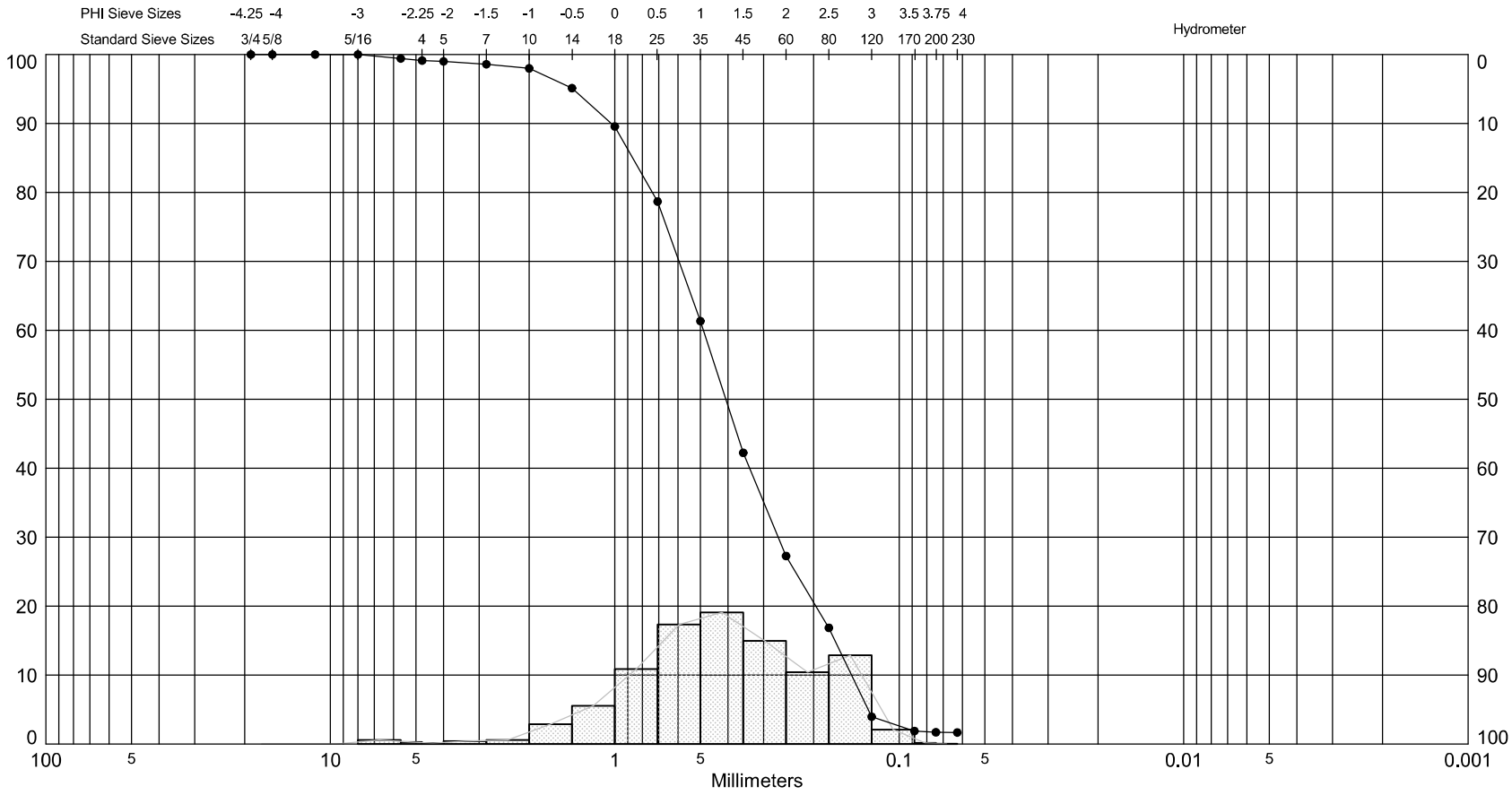
Depths and elevations based on measured values

Sample Information	
Project Name:	BOEM 2022 Onslow and Long Bays, NC/SC
Analysis Date:	12-21-22
Analyzed By:	SP
Easting (X, ft):	2,269,332
Northing (Y, ft):	-48,426
Horizontal Datum:	NAD 1983
Vertical Datum:	NAVD 88

APTIM

APTIM
6401 Congress Avenue, Suite 140
Boca Raton, FL 33487
ph (561) 391-8102

BOEM_TO1_ONSLOW_AND_LONG_BAYS-NC STATE PLANE.GPJ 1/31/23



Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort
BOEMVC-2022-NC-29 #2	—●—	-61.4	SW	#200 - 1.70 #230 - 1.67		5	1.3	1.27	-0.5	3.64	1.08

Comments:

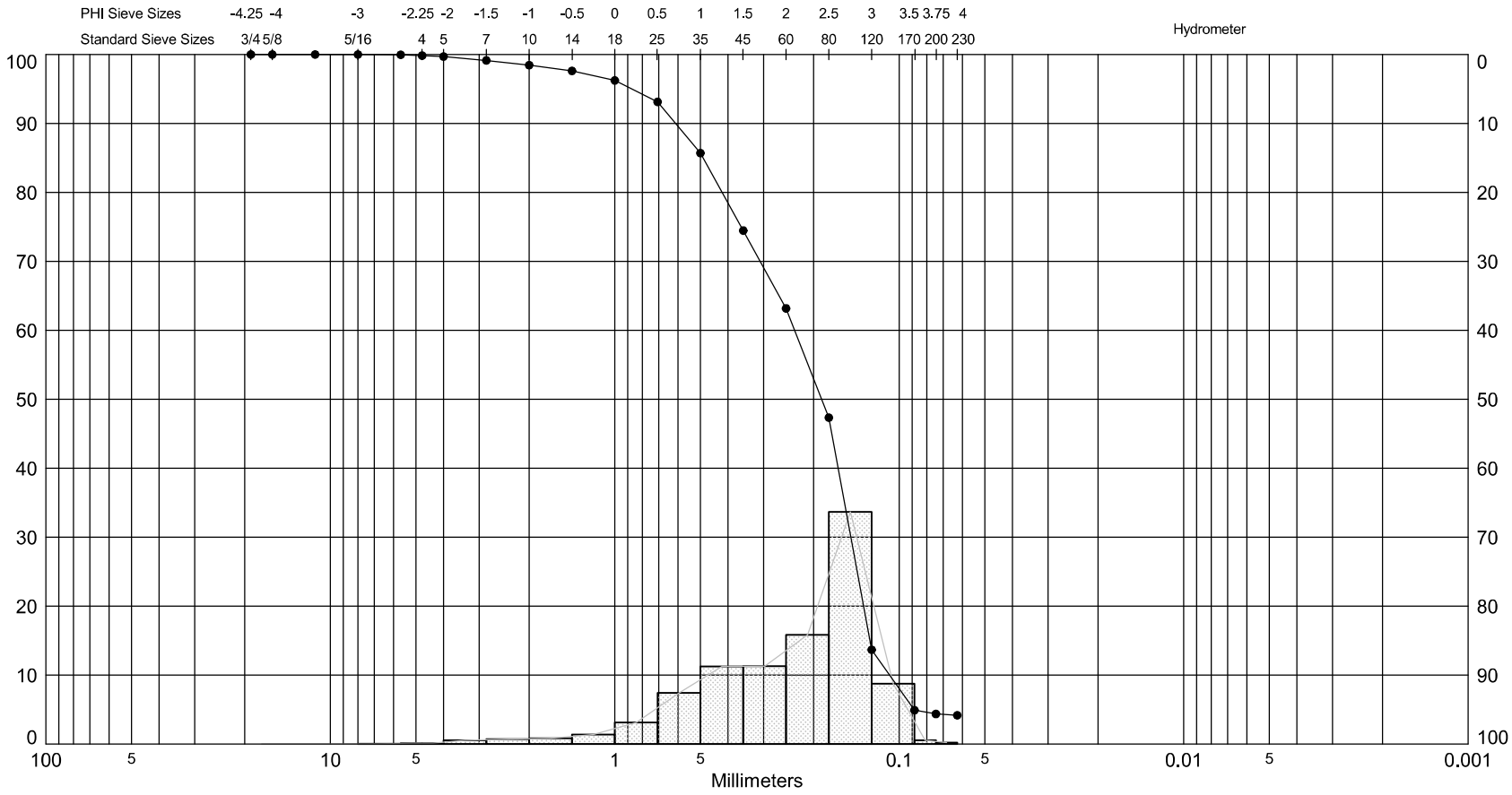
Depths and elevations based on measured values

Sample Information	
Project Name:	BOEM 2022 Onslow and Long Bays, NC/SC
Analysis Date:	12-22-22
Analyzed By:	SP
Easting (X, ft):	2,269,332
Northing (Y, ft):	-48,426
Horizontal Datum:	NAD 1983
Vertical Datum:	NAVD 88

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BOEM_TO1_ONSLOW_AND_LONG_BAYS-NC STATE PLANE.GPJ 1/31/23



Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort
BOEMVC-2022-NC-29 #3	—●—	-63.0	SW	#200 - 4.36 #230 - 4.17		7	2.42	2.05	-1.26	4.87	1.01

Comments:

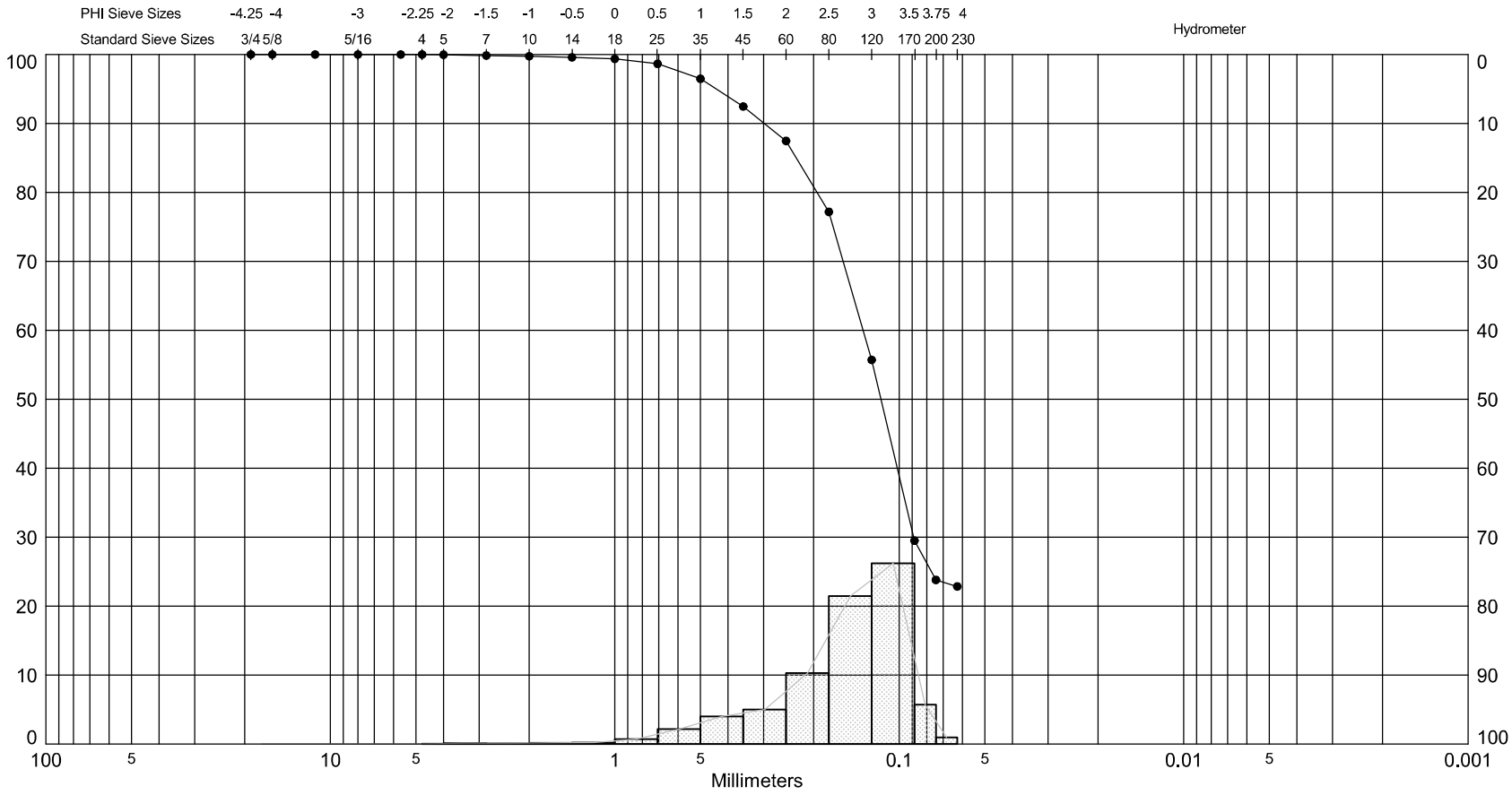
Depths and elevations based on measured values

Sample Information	
Project Name:	BOEM 2022 Onslow and Long Bays, NC/SC
Analysis Date:	12-22-22
Analyzed By:	SF
Easting (X, ft):	2,269,332
Northing (Y, ft):	-48,426
Horizontal Datum:	NAD 1983
Vertical Datum:	NAVD 88

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BOEM_TO1_ONSLOW_AND_LONG_BAYS-NC STATE PLANE.GPJ 1/31/23



Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort
BOEMVC-2022-NC-29 #4	—●—	-65.1	SM	#200 - 23.80 #230 - 22.85			3.11	2.68	-1.57	6.49	0.81

Comments:

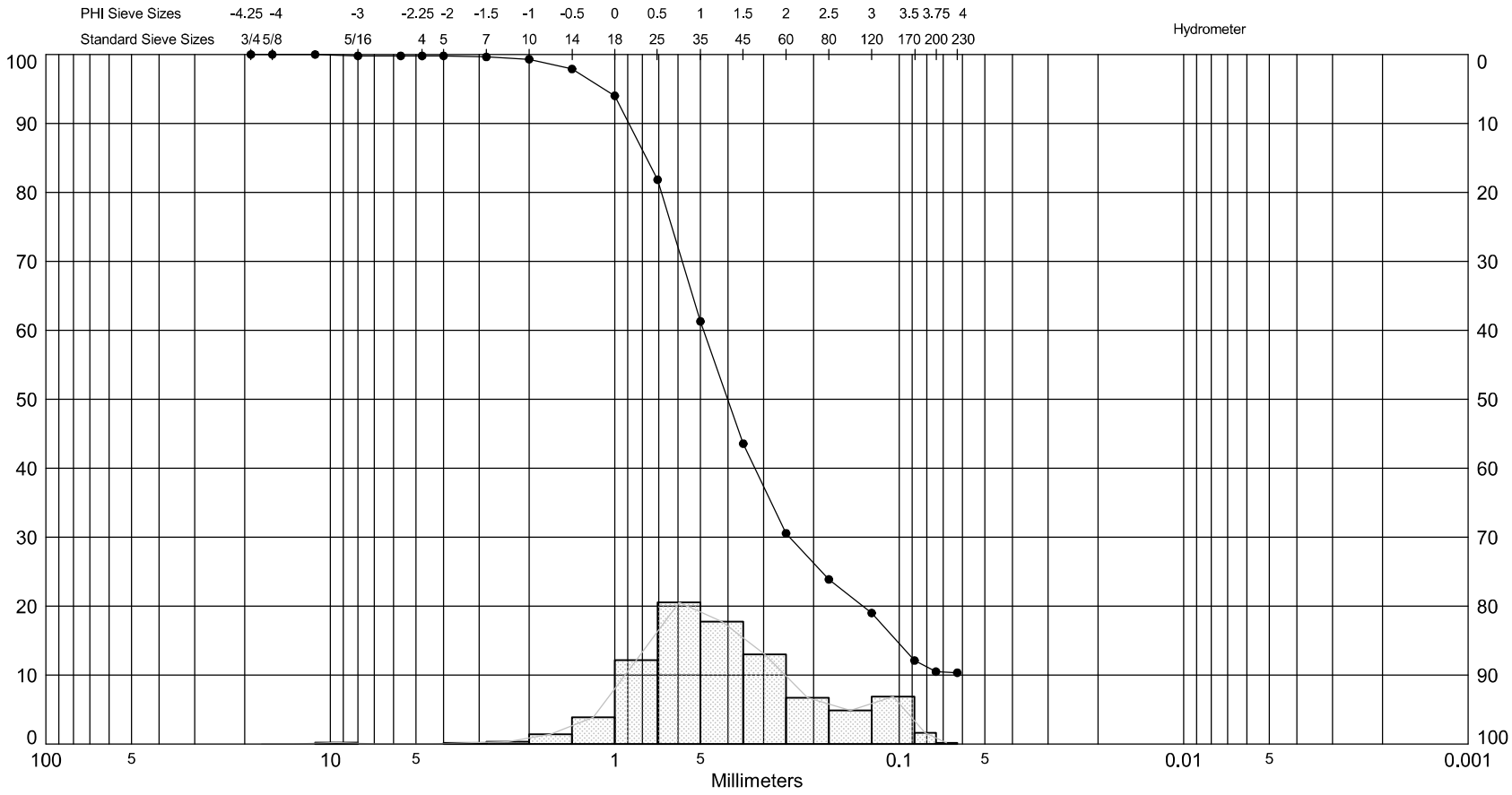
Depths and elevations based on measured values

Sample Information	
Project Name:	BOEM 2022 Onslow and Long Bays, NC/SC
Analysis Date:	12-19-22
Analyzed By:	SP
Easting (X, ft):	2,269,332
Northing (Y, ft):	-48,426
Horizontal Datum:	NAD 1983
Vertical Datum:	NAVD 88

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BOEM_TO1_ONSLOW_AND_LONG_BAYS-NC STATE PLANE.GPJ 1/31/23



Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort
BOEMVC-2022-NC-29 #5	—●—	-66.6	SW-SM	#200 - 10.50 #230 - 10.34			1.32	1.31	0.2	3.36	1.04

Comments:

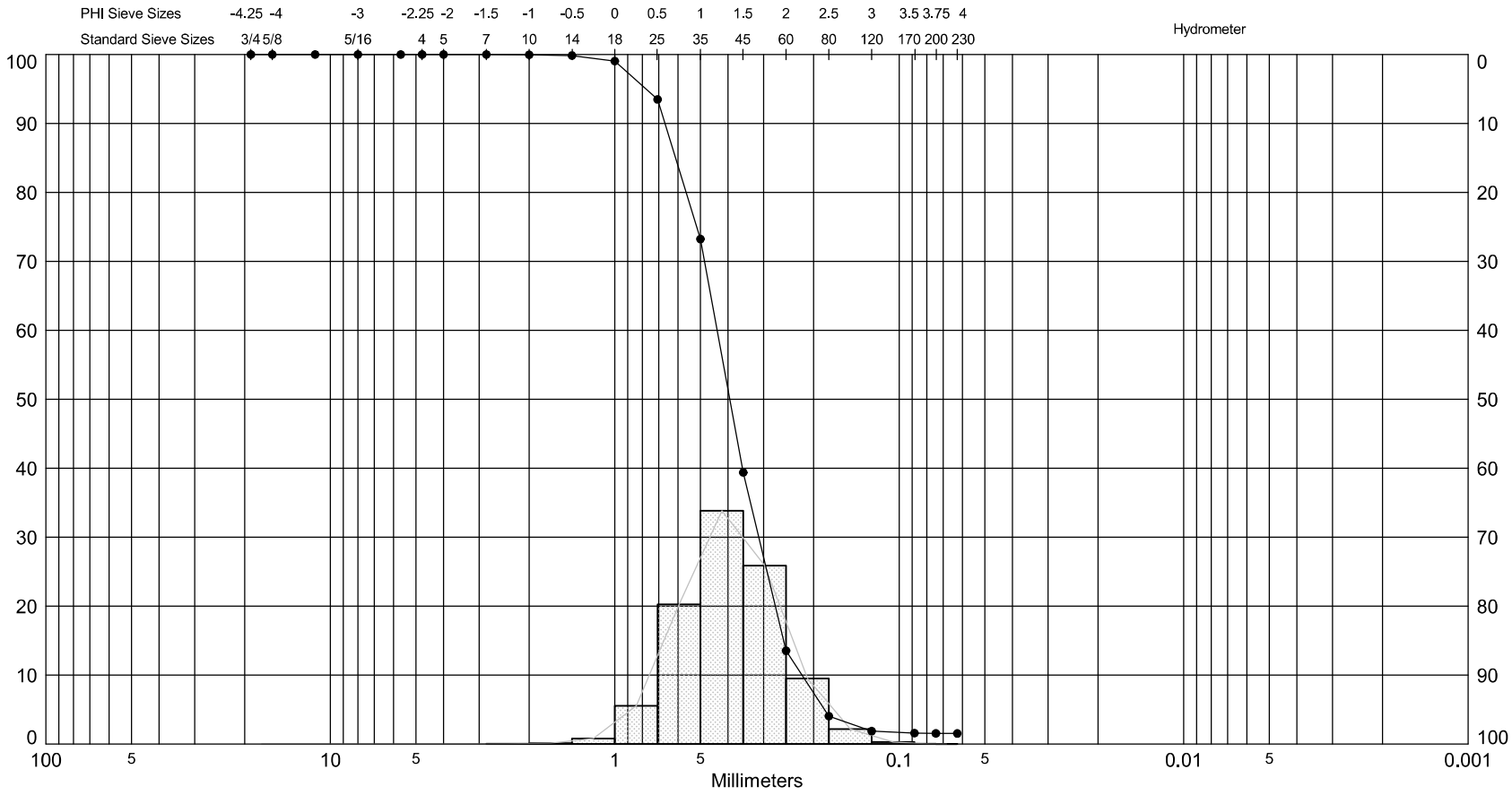
Depths and elevations based on measured values

Sample Information	
Project Name:	BOEM 2022 Onslow and Long Bays, NC/SC
Analysis Date:	12-20-22
Analyzed By:	SP
Easting (X, ft):	2,269,332
Northing (Y, ft):	-48,426
Horizontal Datum:	NAD 1983
Vertical Datum:	NAVD 88

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BOEM_TO1_ONSLOW_AND_LONG_BAYS-NC STATE PLANE.GPJ 1/31/23



Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort
BOEMVC-2022-NC-29 #6	—●—	-70.7	SP	#200 - 1.54 #230 - 1.53			1.34	1.34	0.05	3.32	0.59

Comments:

Depths and elevations based on measured values

Sample Information	
Project Name:	BOEM 2022 Onslow and Long Bays, NC/SC
Analysis Date:	12-20-22
Analyzed By:	SF
Easting (X, ft):	2,269,332
Northing (Y, ft):	-48,426
Horizontal Datum:	NAD 1983
Vertical Datum:	NAVD 88

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BOEM_TO1_ONSLOW_AND_LONG_BAYS-NC STATE PLANE.GPJ 1/31/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: BOEM 2022 Onslow and Long Bays, NC/SC

Sample Name: BOEMVC-2022-NC-29 #1

Analysis Date: 12-21-22

Analyzed By: SP

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6401 Congress Avenue, Suite 140
Boca Raton, FL 33487
ph (561) 391-8102

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2,269,332	-48,426	North Carolina State Plane	-60.4 NAVD 88

USCS:	Munsell:	Comments:
SP	Wet - 5Y-5/1 Dry - 5Y-6/1 Washed - 5Y-7/1	

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):	Organics (%):	Carbonates (%):	Shell Hash (%):
117.66	115.44	0.01	0.11	#200 - 2.11 #230 - 2.01		4	2

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.17	0.14	0.17	0.14
4	-2.25	4.76	0.15	0.13	0.32	0.27
5	-2.00	4.00	0.03	0.03	0.35	0.30
7	-1.50	2.83	0.14	0.12	0.49	0.42
10	-1.00	2.00	0.11	0.09	0.60	0.51
14	-0.50	1.41	0.21	0.18	0.81	0.69
18	0.00	1.00	0.60	0.51	1.41	1.20
25	0.50	0.71	1.68	1.43	3.09	2.63
35	1.00	0.50	5.63	4.78	8.72	7.41
45	1.50	0.35	10.46	8.89	19.18	16.30
60	2.00	0.25	15.95	13.56	35.13	29.86
80	2.50	0.18	32.69	27.78	67.82	57.64
120	3.00	0.13	39.95	33.95	107.77	91.59
170	3.50	0.09	6.86	5.83	114.63	97.42
200	3.75	0.07	0.55	0.47	115.18	97.89
230	4.00	0.06	0.12	0.10	115.30	97.99

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.29	2.89	2.76	2.36	1.82	1.48	0.75

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	2.19	0.22	0.77	-1.61	8.14

BOEM_TO1_ONSLOW_AND_LONG_BAYS-NC STATE PLANE.GPJ 1/31/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: BOEM 2022 Onslow and Long Bays, NC/SC

Sample Name: BOEMVC-2022-NC-29 #2

Analysis Date: 12-22-22

Analyzed By: SP

APTIM
6401 Congress Avenue, Suite 140
Boca Raton, FL 33487
ph (561) 391-8102

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2,269,332	-48,426	North Carolina State Plane	-61.4 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 5Y-6/1 Dry - 5Y-6/1 Washed - 5Y-7/1	

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):	Organics (%):	Carbonates (%):	Shell Hash (%):
108.91	107.19	0.01	0.08	#200 - 1.70 #230 - 1.67		5	1

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.63	0.58	0.63	0.58
4	-2.25	4.76	0.33	0.30	0.96	0.88
5	-2.00	4.00	0.13	0.12	1.09	1.00
7	-1.50	2.83	0.45	0.41	1.54	1.41
10	-1.00	2.00	0.65	0.60	2.19	2.01
14	-0.50	1.41	3.13	2.87	5.32	4.88
18	0.00	1.00	6.05	5.56	11.37	10.44
25	0.50	0.71	11.85	10.88	23.22	21.32
35	1.00	0.50	18.90	17.35	42.12	38.67
45	1.50	0.35	20.80	19.10	62.92	57.77
60	2.00	0.25	16.29	14.96	79.21	72.73
80	2.50	0.18	11.35	10.42	90.56	83.15
120	3.00	0.13	14.04	12.89	104.60	96.04
170	3.50	0.09	2.26	2.08	106.86	98.12
200	3.75	0.07	0.20	0.18	107.06	98.30
230	4.00	0.06	0.03	0.03	107.09	98.33

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.96	2.53	2.11	1.30	0.61	0.26	-0.49

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.27	0.41	1.08	-0.5	3.64

BOEM_TO1_ONSLOW_AND_LONG_BAYS-NC STATE PLANE.GPJ 1/31/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: BOEM 2022 Onslow and Long Bays, NC/SC

Sample Name: BOEMVC-2022-NC-29 #3

Analysis Date: 12-22-22

Analyzed By: SF

APTIM
6401 Congress Avenue, Suite 140
Boca Raton, FL 33487
ph (561) 391-8102

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2,269,332	-48,426	North Carolina State Plane	-63.0 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 5Y-5/1 Dry - 5Y-5/2 Washed - 5Y-7/1	

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):	Organics (%):	Carbonates (%):	Shell Hash (%):
109.07	104.56	0.02	0.03	#200 - 4.36 #230 - 4.17		7	5

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.04	0.04	0.04	0.04
4	-2.25	4.76	0.13	0.12	0.17	0.16
5	-2.00	4.00	0.15	0.14	0.32	0.30
7	-1.50	2.83	0.61	0.56	0.93	0.86
10	-1.00	2.00	0.75	0.69	1.68	1.55
14	-0.50	1.41	0.91	0.83	2.59	2.38
18	0.00	1.00	1.51	1.38	4.10	3.76
25	0.50	0.71	3.39	3.11	7.49	6.87
35	1.00	0.50	8.10	7.43	15.59	14.30
45	1.50	0.35	12.25	11.23	27.84	25.53
60	2.00	0.25	12.31	11.29	40.15	36.82
80	2.50	0.18	17.29	15.85	57.44	52.67
120	3.00	0.13	36.71	33.66	94.15	86.33
170	3.50	0.09	9.56	8.77	103.71	95.10
200	3.75	0.07	0.59	0.54	104.30	95.64
230	4.00	0.06	0.21	0.19	104.51	95.83

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.49	2.97	2.83	2.42	1.48	1.08	0.20

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	2.05	0.24	1.01	-1.26	4.87

BOEM_TO1_ONSLOW_AND_LONG_BAYS-NC STATE PLANE.GPJ 1/31/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: BOEM 2022 Onslow and Long Bays, NC/SC

Sample Name: BOEMVC-2022-NC-29 #4

Analysis Date: 12-19-22

Analyzed By: SP

APTIM
6401 Congress Avenue, Suite 140
Boca Raton, FL 33487
ph (561) 391-8102

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2,269,332	-48,426	North Carolina State Plane	-65.1 NAVD 88

USCS:	Munsell:	Comments:
SM	Wet - N-3/0 Dry - 5Y-4/1 Washed - 5Y-7/1	

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):	Organics (%):	Carbonates (%):	Shell Hash (%):
115.54	89.33	0.03	0.13	#200 - 23.80 #230 - 22.85			2

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.04	0.03	0.04	0.03
7	-1.50	2.83	0.14	0.12	0.18	0.15
10	-1.00	2.00	0.12	0.10	0.30	0.25
14	-0.50	1.41	0.19	0.16	0.49	0.41
18	0.00	1.00	0.25	0.22	0.74	0.63
25	0.50	0.71	0.83	0.72	1.57	1.35
35	1.00	0.50	2.51	2.17	4.08	3.52
45	1.50	0.35	4.64	4.02	8.72	7.54
60	2.00	0.25	5.76	4.99	14.48	12.53
80	2.50	0.18	11.89	10.29	26.37	22.82
120	3.00	0.13	24.81	21.47	51.18	44.29
170	3.50	0.09	30.30	26.22	81.48	70.51
200	3.75	0.07	6.57	5.69	88.05	76.20
230	4.00	0.06	1.10	0.95	89.15	77.15

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
		3.70	3.11	2.55	2.17	1.18

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	2.68	0.16	0.81	-1.57	6.49

BOEM_TO1_ONSLOW_AND_LONG_BAYS-NC STATE PLANE.GPJ 1/31/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: BOEM 2022 Onslow and Long Bays, NC/SC

Sample Name: BOEMVC-2022-NC-29 #5

Analysis Date: 12-20-22

Analyzed By: SP

APTIM
6401 Congress Avenue, Suite 140
Boca Raton, FL 33487
ph (561) 391-8102

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2,269,332	-48,426	North Carolina State Plane	-66.6 NAVD 88

USCS:	Munsell:	Comments:
SW-SM	Wet - N-3/0 Dry - 2.5Y-4/1 Washed - 2.5Y-7/1	

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):	Organics (%):	Carbonates (%):	Shell Hash (%):
116.47	104.53	0.01	0.09	#200 - 10.50 #230 - 10.34			2

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.23	0.20	0.23	0.20
3.5	-2.50	5.66	0.00	0.00	0.23	0.20
4	-2.25	4.76	0.00	0.00	0.23	0.20
5	-2.00	4.00	0.00	0.00	0.23	0.20
7	-1.50	2.83	0.17	0.15	0.40	0.35
10	-1.00	2.00	0.40	0.34	0.80	0.69
14	-0.50	1.41	1.64	1.41	2.44	2.10
18	0.00	1.00	4.53	3.89	6.97	5.99
25	0.50	0.71	14.17	12.17	21.14	18.16
35	1.00	0.50	23.92	20.54	45.06	38.70
45	1.50	0.35	20.66	17.74	65.72	56.44
60	2.00	0.25	15.14	13.00	80.86	69.44
80	2.50	0.18	7.79	6.69	88.65	76.13
120	3.00	0.13	5.67	4.87	94.32	81.00
170	3.50	0.09	8.02	6.89	102.34	87.89
200	3.75	0.07	1.88	1.61	104.22	89.50
230	4.00	0.06	0.19	0.16	104.41	89.66

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	3.22	2.42	1.32	0.67	0.41	-0.13

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.31	0.40	1.04	0.2	3.36

BOEM_TO1_ONSLOW_AND_LONG_BAYS-NC STATE PLANE.GPJ 1/31/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: BOEM 2022 Onslow and Long Bays, NC/SC

Sample Name: BOEMVC-2022-NC-29 #6

Analysis Date: 12-20-22

Analyzed By: SF

APTIM
6401 Congress Avenue, Suite 140
Boca Raton, FL 33487
ph (561) 391-8102

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2,269,332	-48,426	North Carolina State Plane	-70.7 NAVD 88

USCS:	Munsell:	Comments:
SP	Wet - 2.5Y-5/1 Dry - 2.5Y-5/1 Washed - 2.5Y-7/1	

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):	Organics (%):	Carbonates (%):	Shell Hash (%):
112.93	111.21	0.01	0.00	#200 - 1.54 #230 - 1.53			1

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.00	0.00	0.00	0.00
7	-1.50	2.83	0.00	0.00	0.00	0.00
10	-1.00	2.00	0.04	0.04	0.04	0.04
14	-0.50	1.41	0.12	0.11	0.16	0.15
18	0.00	1.00	0.92	0.81	1.08	0.96
25	0.50	0.71	6.28	5.56	7.36	6.52
35	1.00	0.50	22.86	20.24	30.22	26.76
45	1.50	0.35	38.23	33.85	68.45	60.61
60	2.00	0.25	29.20	25.86	97.65	86.47
80	2.50	0.18	10.72	9.49	108.37	95.96
120	3.00	0.13	2.45	2.17	110.82	98.13
170	3.50	0.09	0.33	0.29	111.15	98.42
200	3.75	0.07	0.04	0.04	111.19	98.46
230	4.00	0.06	0.01	0.01	111.20	98.47

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.45	1.95	1.78	1.34	0.96	0.73	0.36

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.34	0.40	0.59	0.05	3.32

BOEM_TO1_ONSLOW_AND_LONG_BAYS-NC STATE PLANE.GPJ 1/31/23

APTIM

BOEM 2022
ONSLOW & LONG BAYS NC/SC
BOEMVC-2022-NC29
0.0'- 2.0'



APTIM

BOEM 2022
ONSLOW & LONG BAYS NC/SC
BOEMVC-2022-NC29
2.0'- 4.0'



APTIM

BOEM 2022
ONSLOW & LONG BAYS NC/SC
BOEMVC-2022-NC29
4.0'- 6.0'



APTIM

BOEM 2022
ONSLOW & LONG BAYS NC/SC
BOEMVC-2022-NC29
6.0'- 8.0'




APTIM
BOEM 2022
ONSLOW & LONG BAYS NC/SC
BOEMVC-2022-NC29
8.0'-10.0'


APTIM
BOEM 2022
ONSLOW & LONG BAYS NC/SC
BOEMVC-2022-NC29
10.0'-12.0'


APTIM
BOEM 2022
ONSLOW & LONG BAYS NC/SC
BOEMVC-2022-NC29
12.0'-13.4'

Boring Designation BOEMVC-2022-NC-29

DRILLING LOG

DIVISION

INSTALLATION

SHEET 1 OF 1 SHEETS

1. PROJECT: BOEM 2022 Onslow and Long Bays, NC/SC

APTIM

2. BORING DESIGNATION: BOEMVC-2022-NC-29
LOCATION COORDINATES (ft): X = 2,269,332 Y = -48,426

3. DRILLING AGENCY: APTIM
CONTRACTOR FILE NO.:

4. NAME OF DRILLER: Patrick Bryce, P. G.

5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL:
BEARING:

6. THICKNESS OF OVERBURDEN: 0.0 Ft.

7. DEPTH DRILLED INTO ROCK: 0.0 Ft.

8. TOTAL DEPTH OF BORING: 14.5 Ft.

9. SIZE AND TYPE OF BIT: 3.0 In.

10. COORDINATE SYSTEM/DATUM: North Carolina State Plane
HORIZONTAL: NAD 1983
VERTICAL: NAVD 88

11. MANUFACTURER'S DESIGNATION OF DRILL: APTIM SEAS VC-700 Vibracore
☐ AUTO HAMMER ☐ MANUAL HAMMER

12. TOTAL SAMPLES: DISTURBED 6 UNDISTURBED (UD) 0

13. TOTAL NUMBER CORE BOXES:

14. ELEVATION GROUND WATER:

15. DATE BORING: STARTED 10-16-22 COMPLETED 10-16-22

16. ELEVATION TOP OF BORING: -59.3 Ft.

17. TOTAL RECOVERY FOR BORING: 13.4 Ft.

18. SIGNATURE AND TITLE OF INSPECTOR: SP

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	% REC.	BOX OR SAMPLE	REMARKS
-59.3	0.0					
-61.1	1.8		SAND, fine grained, quartz, trace shell fragments, trace shell hash, trace silt, trace whole shell, (0.75" x 0.5") shell fragment @ 0.7', (0.5" x 0.25") shell fragment @ 1.3', 0.25" whole shell @ 1.4', (0.5" x 0.25") shell fragment @ 1.5', (1.25" x 0.75") shell fragment @ 1.6', gray (5Y-5/1), (SP).		1	Sample #1, Depth = 1.0' Mean (mm): 0.22, Phi Sorting: 0.77 Fines (230): 2.01% (SP) Fines (200): 2.11%
-61.6	2.3				2	Sample #2, Depth = 2.0' Mean (mm): 0.41, Phi Sorting: 1.08 Fines (230): 1.68% (SW) Fines (200): 1.71%
-64.0	4.7		SAND, medium grained, quartz, trace shell fragments, trace shell hash, trace silt, trace whole shell, shell fragments typically up to 1.0", (1.25" x 0.5") shell fragment @ 2.2', (2.5" x 1.5") shell fragment @ 2.2', (1.25" x 0.5") whole shell @ 2.2', gray (5Y-6/1), (SW).		3	Sample #3, Depth = 3.6' Mean (mm): 0.24, Phi Sorting: 1.01 Fines (230): 4.17% (SW) Fines (200): 4.36%
-66.0	6.7		SAND, fine grained, quartz, little shell hash, trace shell fragments, trace silt, trace whole shell, shell fragments and whole shells typically up to 0.5", (1.0" x 0.25") shell fragment @ 3.9', 0.75" shell fragment @ 4.6', gray (5Y-5/1), (SW).		4	Sample #4, Depth = 5.7' Mean (mm): 0.16, Phi Sorting: 0.81 Fines (230): 22.85% (SM) Fines (200): 23.80%
-67.2	7.9		SAND, fine grained, quartz, some silt, trace clay, trace organics, trace shell hash, clay and organics distributed in laminae and throughout layer, organic lamina @ 5.2' and 6.1', clay lamina @ 5.5' and 5.8', very dark gray (N-3/0), (SM).		5	Sample #5, Depth = 7.2' Mean (mm): 0.40, Phi Sorting: 1.04 Fines (230): 10.34% (SW-SM) Fines (200): 10.50%
-72.7	13.4		SAND, fine to medium grained, quartz, little silt, trace clay, trace organics, trace shell hash, alternating layers of organics and clay betwen 7.4' and 7.9', very dark gray (N-3/0), (SW-SM). SAND, fine to medium grained, quartz, trace clay, trace organics, trace shell fragments, trace shell hash, trace silt, clay increases with depth in core, (1.0" x 0.75") shell fragment @ 8.1', organic lamna @ 8.1', clay laminae @ 8.8', 9.7', 10.0' and 13.0', (1.5" x 1.0") clay pocket @ 10.8', (2.75" x 1.0") clayey pocket @ 13.3', gray (2.5Y-5/1), (SP).		6	Sample #6, Depth = 11.3' Mean (mm): 0.40, Phi Sorting: 0.59 Fines (230): 1.52% (SP) Fines (200): 1.53%
-73.8	14.5		No Recovery.			
			End of Boring			

0 5 10 15 20 25

DRAFT

BOEM_TO1_ONSLOW_AND_LONG_BAYS-NC STATE PLANE.GPJ 1/6/23

SAJ FORM 1836
JUN 04

Appendix C
Inner Ocean Bar Borrow Area
Sediment Report

moffatt & nichol

4700 Falls of Neuse Rd.
Ste. 300
Raleigh, NC 27609

(919) 781-4626
www.moffattnichol.com

January 22, 2024

Division of Coastal Management
North Carolina Department of Environmental Quality
127 Cardinal Drive Extension
Wilmington, NC 28405

Attn: Heather Coats, Beach & Inlet Management Project Coordinator

Subject: **Town of Oak Island 2024/2025 Nourishment Project – Inner Ocean Bar Borrow Area Certification**

Dear Heather:

As the project engineer for the subject project, and licensed pursuant to Chapter 89C and/or 89E of North Carolina General Statutes, I hereby certify that the sediment compatibility data and analysis contained herein complies with the sediment standards found within 15A NCAC 07H.0312.



Sincerely,
MOFFATT & NICHOL

Brandon Grant, PE
Engineer of Record

Hole No. OBAR-08-V-2

DRILLING LOG	DIVISION: SOUTH ATLANTIC	INSTALLATION: WILMINGTON DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT: WILMINGTON HARBOR OCEAN BAR
2. LOCATION (Coordinates or Station): NC COORD N51646 E2301431 NAD83
3. DRILLING AGENCY: WILMINGTON DISTRICT
4. HOLE NO. (As shown on drawing title and file number): OBAR-08-V-2
5. NAME OF DRILLER: LESTER GAUGHF CRANE OPERATOR
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: N/A (41.9' of Water)
8. DEPTH DRILLED INTO ROCK: 0.0'
9. TOTAL DEPTH OF HOLE: 51.9'
10. SIZE AND TYPE OF BIT: 4" Dia. Vibracore
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MLLW
12. MANUFACTURER'S DESIGNATION OF DRILL: VIBRACORE SNELL
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 5; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: N/A
15. ELEVATION GROUND WATER: N/A
16. DATE HOLE: STARTED 7/24/08; COMPLETED 7/24/08
17. ELEVATION TOP OF HOLE: 0.0' MLLW
18. TOTAL CORE RECOVERY FOR BORING: N/A %
19. SIGNATURE OF INSPECTOR: ROBERT MCGHEE

ELEVATION MLLW	DEPTH feet	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
0.0	0		0.0' TO 41.9' WATER			Time begin vibracoring: 1157 hrs. Soils described by Larry Benjamin, Civil Engr. Tech.
	41.0					
-41.9	41.9		RIVER BOTTOM @ 41.9'		41.9'	NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the actual tide such that top of Hole is 0.0 EL MLLW.
			SP-Tan, coarse, poorly graded sand with shell fragments		1	
					42.4'	
	43.0					
					44.0'	VIBRACORE BORING From 0.0' to 10.0' Ran 10.0' Rec: 8.1'
					2	
					44.5'	Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
	45.0					
					46.0'	
					3	
					46.5'	
	47.0					
					48.0'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
					4	
					48.5'	LAB CLASSIFICATION
	49.0					Jar Number / Classification: 1 SP; 2 SP; 3 SP
			49.6'		49.6'	
			MH Dark gray, elastic silt		5	
			ASSUMED NOT RECOVERED		50.0'	
	51.0					
-51.9	51.9		BOTTOM OF HOLE AT 51.9' SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: HOLE TERMINATED AT PREDETERMINED DEPTH AT 10.0'.

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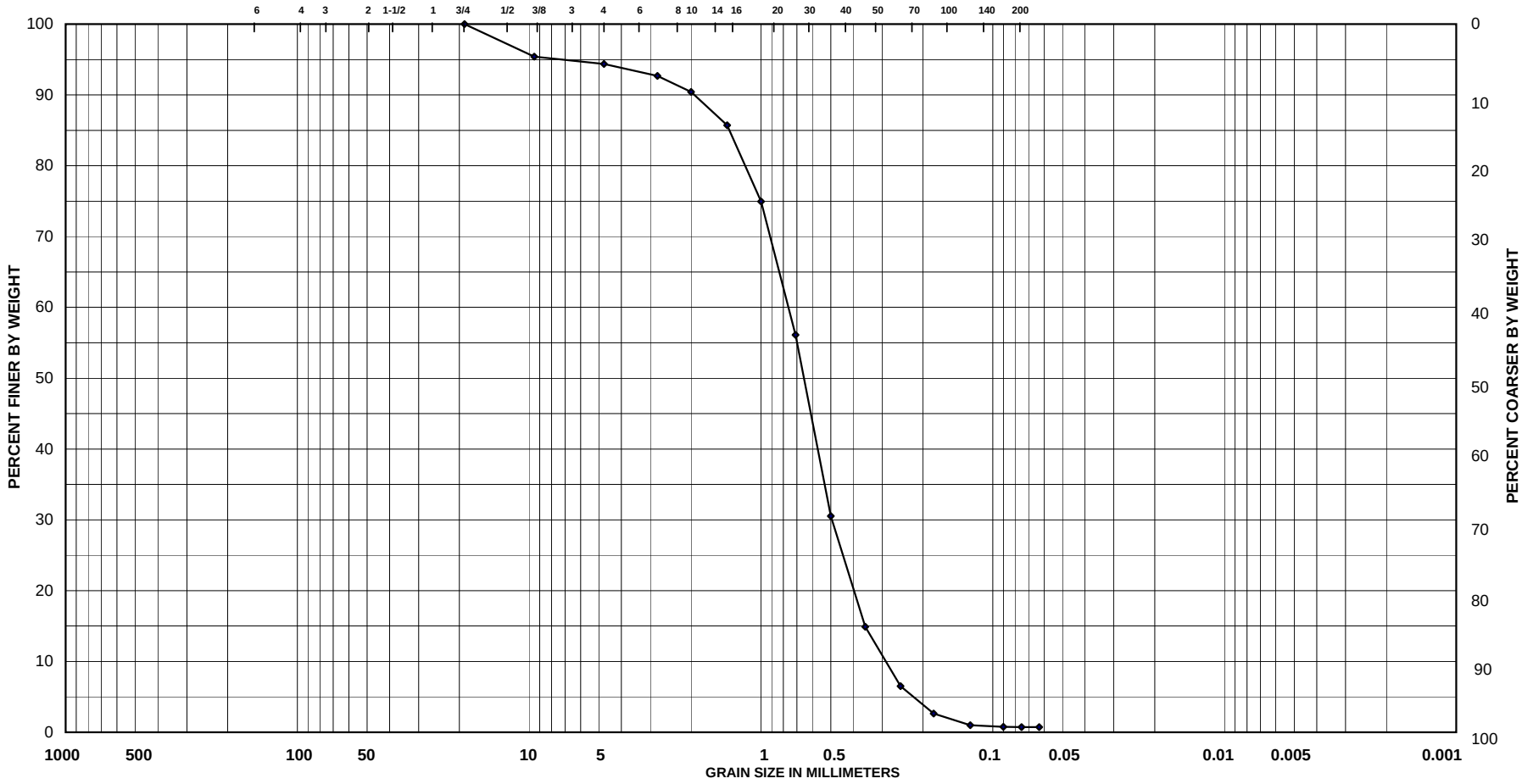
VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	**Wilmington Inner Ocean Bar**	**Depth:**	**41.9'-42.4'**
Project No.:	**WPC6308.00105**	**Date:**	**11/5/2008**
Boring No.:	**OBAR-08-V-2**		
Sample No.:	**1**		
Description:	**SAND, poorly-graded, mostly medium to fine-grained quartz, little fine-gravel to medium sand-size shell fragments, grayish brown 2.5Y 5/2**		

Tare Weight, (g):	50.45	
Dry Wt. Before Washing (g):	210.67	(with tare)
Dry Weight After Washing (g):	209.5	(with tare)

Sieve Size (Name)	Sieve Size (mm)		% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	7.37	95.40	100	7.37
#4	4.750	1.64	94.38	100	1.64
#7	2.800	2.74	92.67	90	2.47
#10	2.000	3.57	90.44	70	2.50
#14	1.400	7.58	85.71	50	3.79
#18	1.000	17.22	74.96	30	5.17
#25	0.710	30.21	56.10	20	6.04
#35	0.500	40.99	30.52	10	4.10
#45	0.355	25.03	14.90	5	1.25
#60	0.250	13.45	6.50	0	0.00
#80	0.180	6.21	2.63	0	0.00
#120	0.125	2.62	0.99	0	0.00
#170	0.090	0.34	0.78	0	0.00
#200	0.075	0.06	0.74	0	0.00
#230	0.063	0.02	0.73	0	0.00
Total Shell Content:		**21**		**%**	



Sample No.	Elev. Or Depth	Classification	%VS	G_s	Nat w%	LL	PL	PI
◆ 1	41.9'-42.4'	SAND, poorly-graded, mostly medium to fine-grained quartz, little fine-gravel to medium sand-size shell fragments, grayish brown 2.5Y 5/2 (SP)	21					

Project Wilmington Inner Ocean Bar

Area

Boring No. OBAR-08-V-2

Date 11/5/2008

GRADATION CURVES

** The USC classification is based on laboratory grain size distribution and visual classification*

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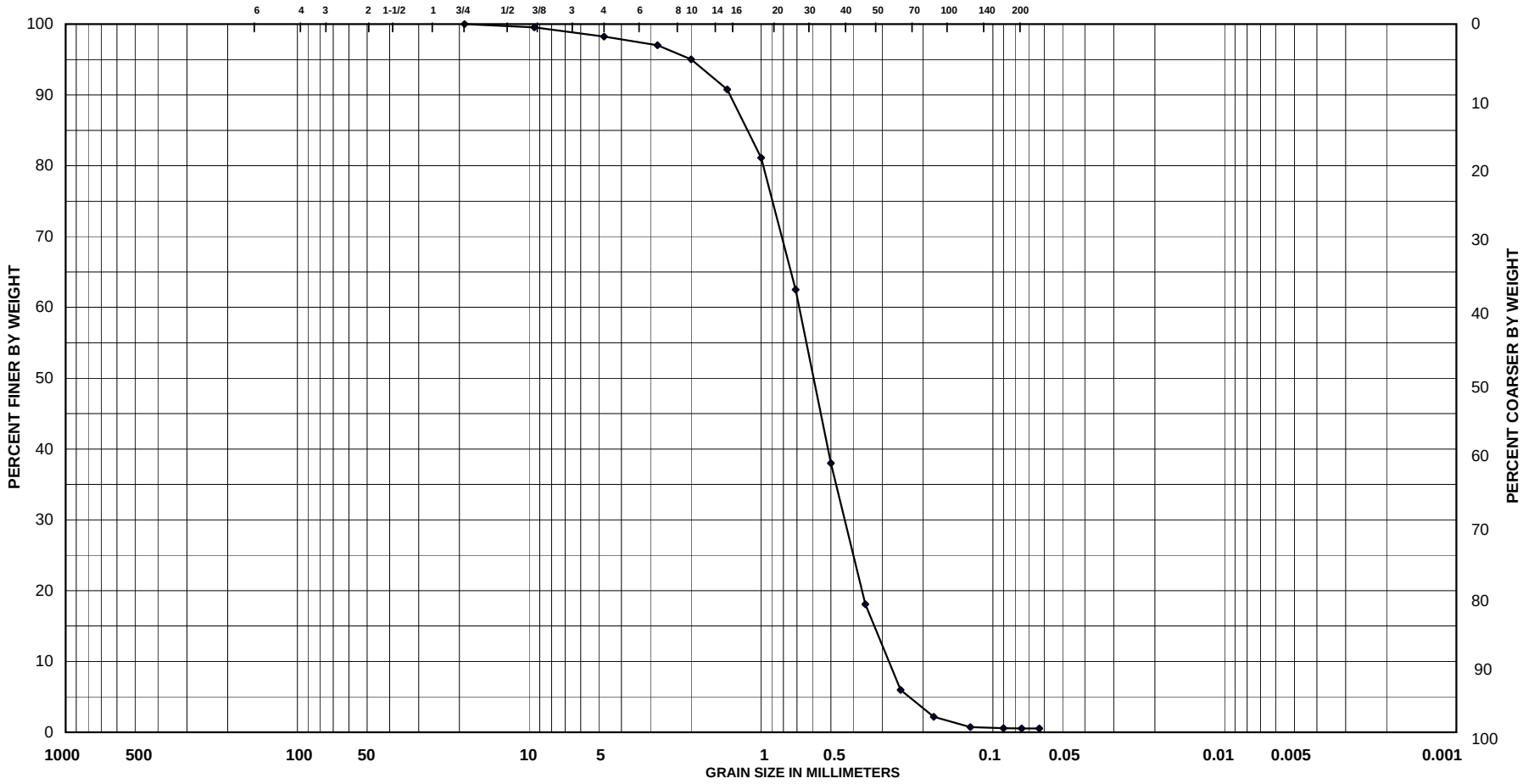
VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	**Wilmington Inner Ocean Bar**	**Depth:**	**44.0'-44.5'**
Project No.:	**WPC6308.00105**	**Date:**	**11/5/2008**
Boring No.:	**OBAR-08-V-2**		
Sample No.:	**2**		
Description:	**SAND, poorly-graded, mostly medium to fine-grained quartz, little fine-gravel to medium sand-size shell fragments, grayish brown 2.5Y 5/2**		

Tare Weight, (g):	49.84	
Dry Wt. Before Washing (g):	194.78	(with tare)
Dry Weight After Washing (g):	193.74	(with tare)

Sieve Size (Name)	Sieve Size (mm)		% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.64	99.56	0.64	0.00
#4	4.750	1.90	98.25	1.9	0.04
#7	2.800	1.81	97.00	1.81	0.03
#10	2.000	2.88	95.01	2.88	0.08
#14	1.400	6.16	90.76	6.16	0.38
#18	1.000	14.00	81.10	14	1.96
#25	0.710	26.94	62.52	26.94	7.26
#35	0.500	35.53	38.00	35.53	12.62
#45	0.355	28.87	18.08	28.87	8.33
#60	0.250	17.53	5.99	17.53	3.07
#80	0.180	5.52	2.18	5.52	0.30
#120	0.125	2.09	0.74	2.09	0.04
#170	0.090	0.25	0.57	0.25	0.02
#200	0.075	0.05	0.53	0.05	0.00
#230	0.063	0.02	0.52	0.02	0.00
Total Shell Content:		**24**		**%**	



Sample No.	Elev. Or Depth	Classification	%VS	G_s	Nat w%	LL	PL	PI
◆ 2	44.0'-44.5'	SAND, poorly-graded, mostly medium to fine-grained quartz, little fine-gravel to medium sand-size shell fragments, grayish brown 2.5Y 5/2 (SP)	24					

Project Wilmington Inner Ocean Bar

Area

Boring No. OBAR-08-V-2

Date 11/5/2008

GRADATION CURVES

** The USC classification is based on laboratory grain size distribution and visual classification*

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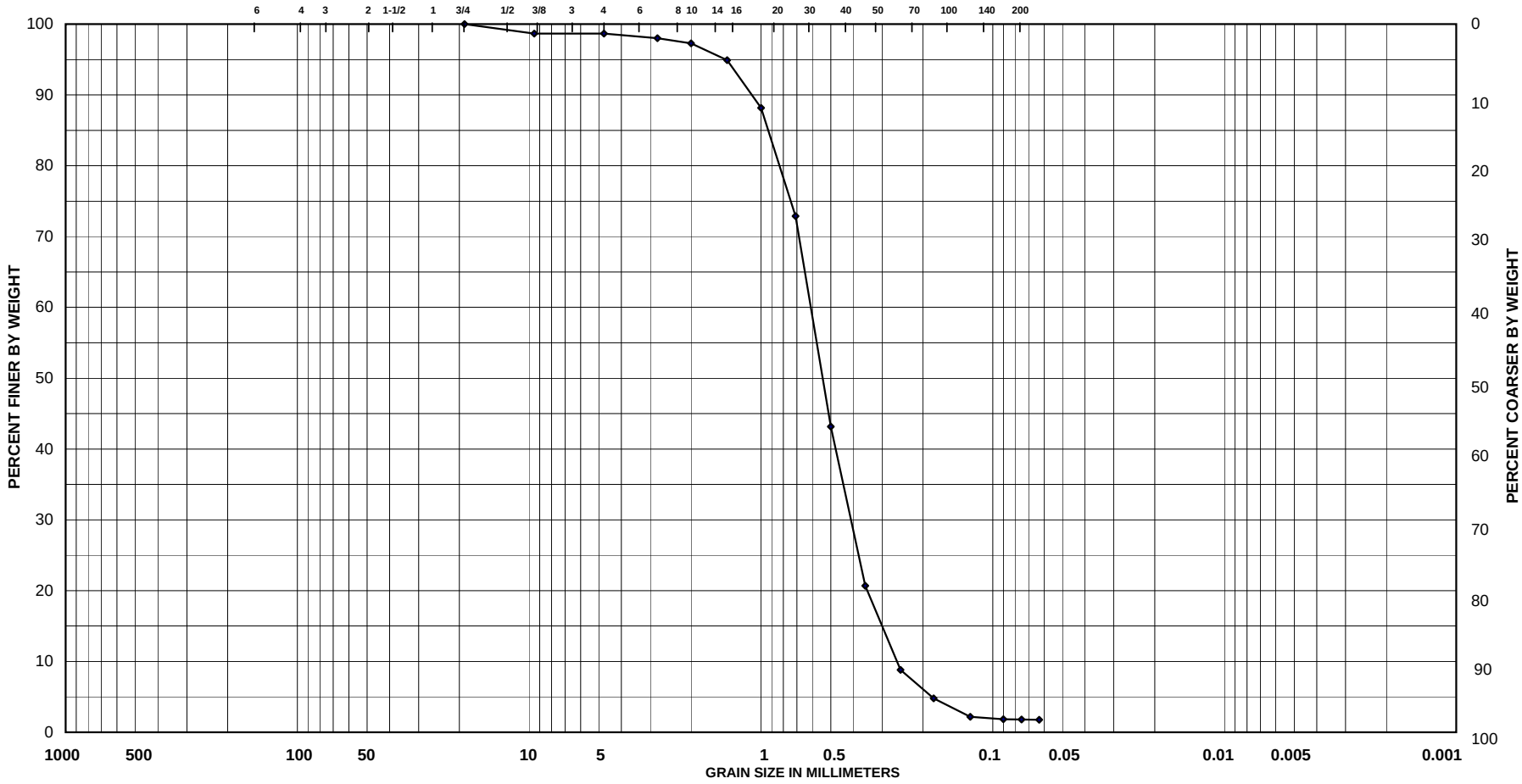
VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	**Wilmington Inner Ocean Bar**	**Depth:**	**46.0' - 46.5'**
Project No.:	**WPC6308.00105**	**Date:**	**11/5/2008**
Boring No.:	**OBAR-08-V-2**		
Sample No.:	**3**		
Description:	**SAND, poorly-graded, mostly medium to fine-grained quartz, little fine-gravel to medium sand-size shell fragments, grayish brown 2.5Y 5/2**		

Tare Weight, (g):	50.05	
Dry Wt. Before Washing (g):	206.97	(with tare)
Dry Weight After Washing (g):	205.71	(with tare)

Sieve Size (Name)	Sieve Size (mm)		% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	2.13	98.64	100	2.13
#4	4.750	0.00	98.64	0	0.00
#7	2.800	1.00	98.01	95	0.95
#10	2.000	1.15	97.27	90	1.04
#14	1.400	3.71	94.91	80	2.97
#18	1.000	10.58	88.17	60	6.35
#25	0.710	23.98	72.88	30	7.19
#35	0.500	46.63	43.17	20	9.33
#45	0.355	35.30	20.67	10	3.53
#60	0.250	18.62	8.81	0	0.00
#80	0.180	6.32	4.78	0	0.00
#120	0.125	4.08	2.18	0	0.00
#170	0.090	0.55	1.83	0	0.00
#200	0.075	0.06	1.79	0	0.00
#230	0.063	0.02	1.78	0	0.00
Total Shell Content:		**21**		**%**	



Sample No.	Elev. Or Depth	Classification	%VS	G_s	Nat w%	LL	PL	PI
◆ 3	46.0' - 46.5'	SAND, poorly-graded, mostly medium to fine-grained quartz, little fine-gravel to medium sand-size shell fragments, grayish brown 2.5Y 5/2 (SP)	21					

Project Wilmington Inner Ocean Bar

Area

Boring No. OBAR-08-V-2

Date 11/5/2008

GRADATION CURVES

** The USC classification is based on laboratory grain size distribution and visual classification*

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Hole No. OBAR-08-V-9

DRILLING LOG	DIVISION: SOUTH ATLANTIC	INSTALLATION: WILMINGTON DISTRICT	SHEET 1 OF 2 SHEETS

1. PROJECT: WILMINGTON HARBOR OCEAN BAR
2. LOCATION (Coordinates or Station): NC COORD N44771 E2299962 NAD83
3. DRILLING AGENCY: WILMINGTON DISTRICT
4. HOLE NO. (As shown on drawing title and file number): OBAR-08-V-9
5. NAME OF DRILLER: LESTER GAUGHF CRANE OPERATOR
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: N/A (36.5' of Water)
8. DEPTH DRILLED INTO ROCK: 0.0'
9. TOTAL DEPTH OF HOLE: 56.5'
10. SIZE AND TYPE OF BIT: 4" Dia. Vibracore
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MLLW
12. MANUFACTURER'S DESIGNATION OF DRILL: VIBRACORE SNELL
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 7 UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: N/A
15. ELEVATION GROUND WATER: N/A
16. DATE HOLE: STARTED 8/04/08 COMPLETED 8/04/08
17. ELEVATION TOP OF HOLE: 0.0' MLLW
18. TOTAL CORE RECOVERY FOR BORING: N/A %
19. SIGNATURE OF INSPECTOR: ROBERT MCGHEE

ELEVATION MLLW	DEPTH feet	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0.0	0		0.0' TO 36.5' WATER			Time begin vibracoring: 1139 hrs. Soils described by Larry Benjamin, Civil Engr. Tech.
	36.0		RIVER BOTTOM @ 36.5'		36.5'	
-36.5	36.5		SP-Tan, coarse, poorly graded sand with shell fragments		1	NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the actual tide such that top of Hole is 0.0 EL MLLW.
					37.0'	
	38.0				38.5'	VIBRACORE BORING From 0.0' to 20.0' Ran 20.0' Rec: 16.0'
					2	
					39.0'	
	40.0				40.5'	Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
					3	
					41.0'	
	42.0				42.5'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
					4	
					43.0'	
	44.0				44.5'	LAB CLASSIFICATION
					5	Jar Number / Classification: 1 SP; 2 SP; 3 SP; 4 SP; **5 SP**
					45.0'	
-46.0	46.0		CONTINUED ON SHEET 2			
			SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: HOLE TERMINATED AT PREDETERMINED DEPTH AT 20.0'.

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE | Hole No. OBAR-08-V-9

PROJECT WILMINGTON HARBOR OCEAN BAR | INSTALLATION WILMINGTON DISTRICT | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH 46.0	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			SP-Tan, coarse, poorly graded sand trace shell fragments		46.5'	
					6	
					47.0'	
			48.0'		48.0'	
	48.0		CH Dark gray, fat clay with wood and roots		7	
					48.5'	
	50.0					
	52.0		52.5'			
			ASSUMED NOT RECOVERED			
	54.0					
	56.0					
-56.5	56.5		BOTTOM OF HOLE AT 56.5'			
			SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			

WOLF TECHNOLOGIES, INC.

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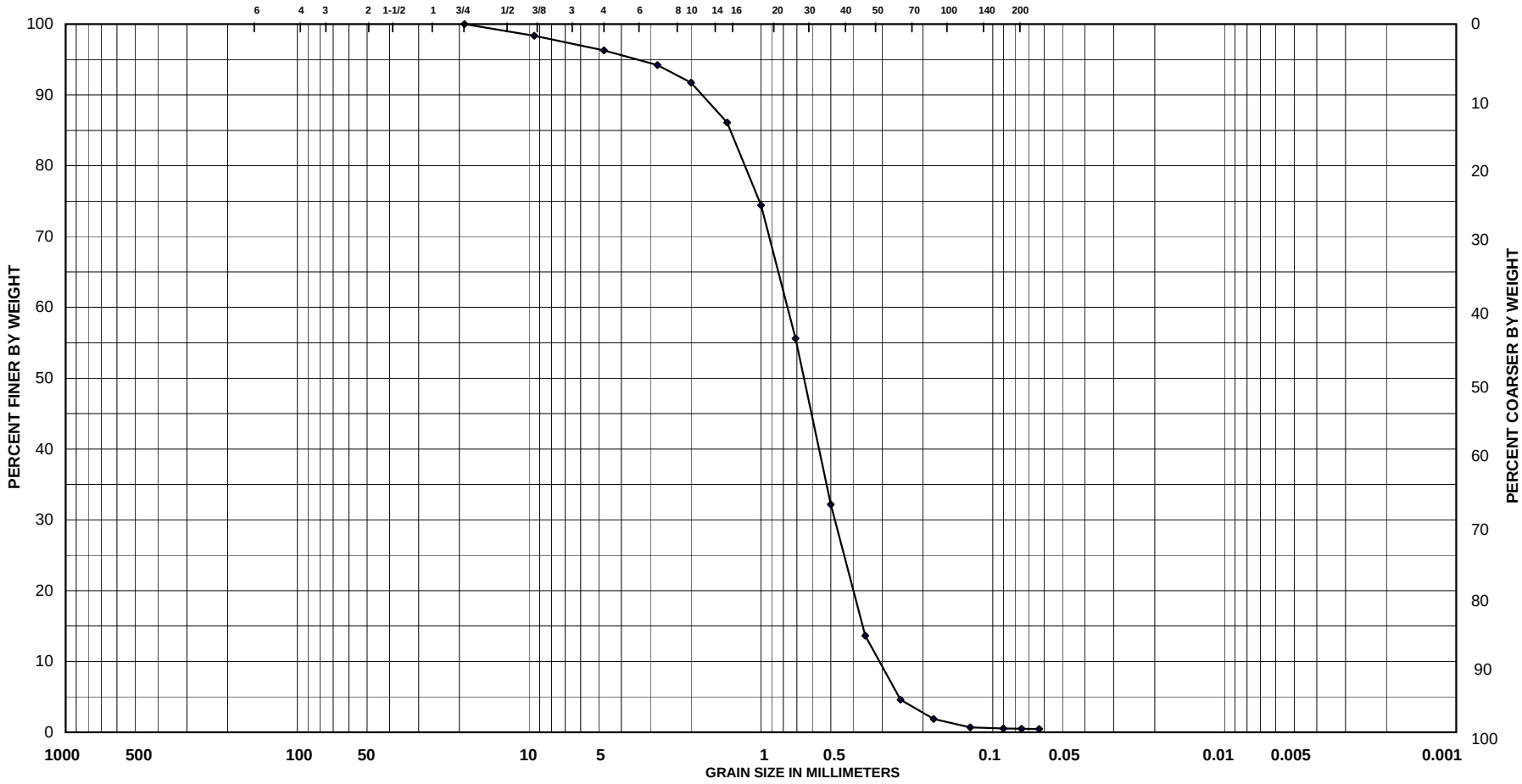
VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	**Wilmington Inner Ocean Bar**	**Depth:**	**36.5' - 37.0'**
Project No.:	**WPC6308.00105**	**Date:**	**11/5/2008**
Boring No.:	**OBAR-08-V-9**		
Sample No.:	**1**		
Description:	**SAND, poorly-graded, mostly medium to fine-grained quartz, little fine-gravel to medium sand-size shell fragments, light olive brown 2.5Y 5/3**		

Tare Weight, (g):	50.13	
Dry Wt. Before Washing (g):	197.94	(with tare)
Dry Weight After Washing (g):	197.38	(with tare)

Sieve Size (Name)	Sieve Size (mm)		% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	2.43	98.36	100	2.43
#4	4.750	3.05	96.29	100	3.05
#7	2.800	3.07	94.22	95	2.92
#10	2.000	3.65	91.75	90	3.29
#14	1.400	8.33	86.11	80	6.66
#18	1.000	17.28	74.42	40	6.91
#25	0.710	27.80	55.61	30	8.34
#35	0.500	34.64	32.18	20	6.93
#45	0.355	27.41	13.63	10	2.74
#60	0.250	13.33	4.61	0	0.00
#80	0.180	4.05	1.87	0	0.00
#120	0.125	1.77	0.68	0	0.00
#170	0.090	0.18	0.55	0	0.00
#200	0.075	0.09	0.49	0	0.00
#230	0.063	0.06	0.45	0	0.00
Total Shell Content:		**29**		**%**	



Sample No.	Elev. Or Depth	Classification	%VS	G_s	Nat w%	LL	PL	PI
◆ 1	36.5' - 37.0'	SAND, poorly-graded, mostly medium to fine-grained quartz, little fine-gravel to medium sand-size shell fragments, light olive brown 2.5Y 5/3 (SP)	29					

Project Wilmington Inner Ocean Bar

Area

Boring No. OBAR-08-V-9

Date 11/5/2008

GRADATION CURVES

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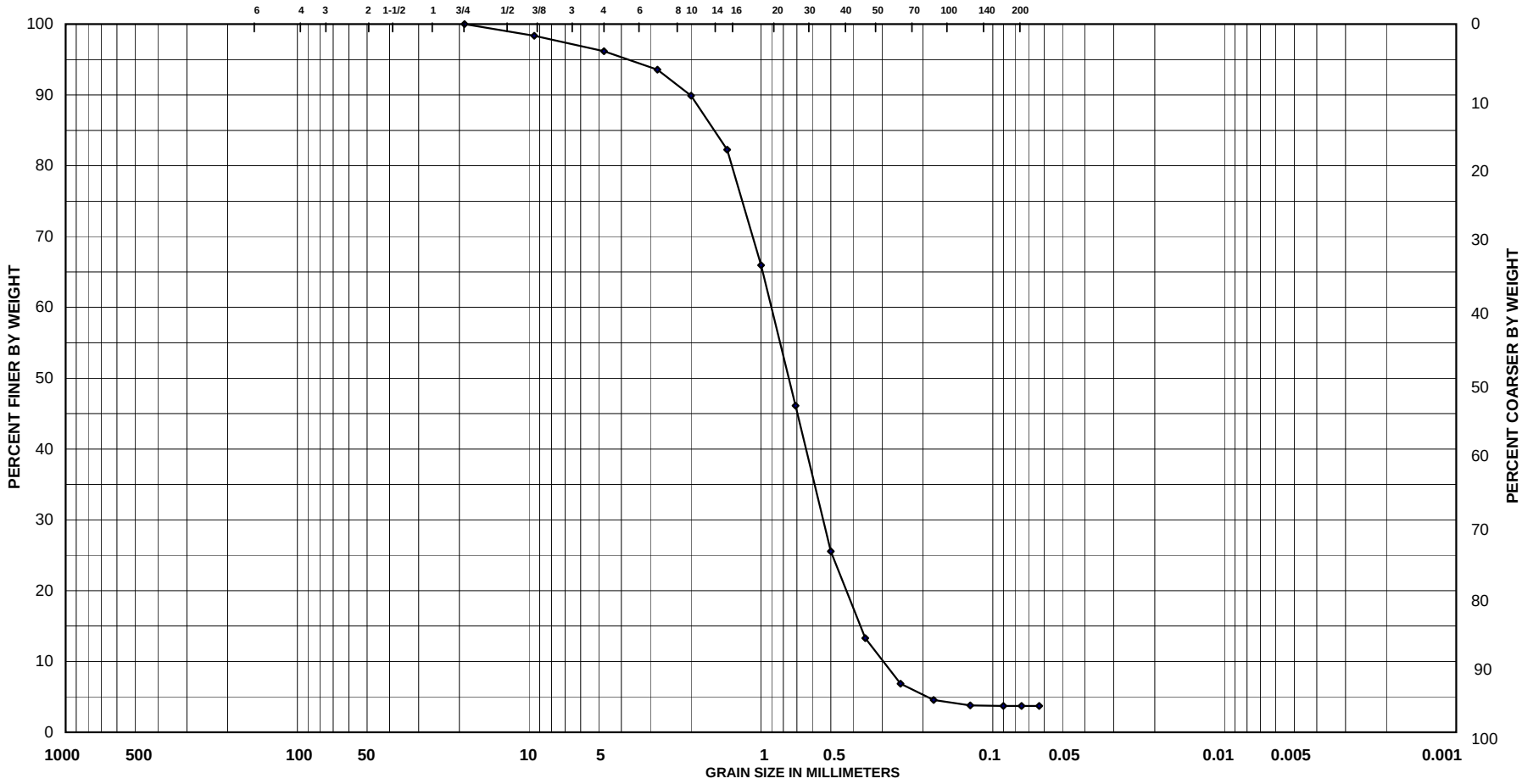
VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	**Wilmington Inner Ocean Bar**	**Depth:**	**38.5' - 39.0'**
Project No.:	**WPC6308.00105**	**Date:**	**11/5/2008**
Boring No.:	**OBAR-08-V-9**		
Sample No.:	**2**		
Description:	**SAND, poorly-graded, mostly medium to fine-grained quartz, some fine-gravel to medium sand-size shell fragments, light olive brown 2.5Y 5/3**		

Tare Weight, (g):	50.19	
Dry Wt. Before Washing (g):	197.65	(with tare)
Dry Weight After Washing (g):	197.14	(with tare)

Sieve Size (Name)	Sieve Size (mm)		% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	2.43	98.35	100	2.43
#4	4.750	3.20	96.18	100	3.20
#7	2.800	3.83	93.58	95	3.64
#10	2.000	5.45	89.89	90	4.91
#14	1.400	11.25	82.26	80	9.00
#18	1.000	24.05	65.95	40	9.62
#25	0.710	29.27	46.10	30	8.78
#35	0.500	30.30	25.55	20	6.06
#45	0.355	18.07	13.30	10	1.81
#60	0.250	9.52	6.84	0	0.00
#80	0.180	3.36	4.56	0	0.00
#120	0.125	1.15	3.78	0	0.00
#170	0.090	0.10	3.72	0	0.00
#200	0.075	0.02	3.70	0	0.00
#230	0.063	0.00	3.70	0	0.00
Total Shell Content:		**34**		**%**	



Sample No.	Elev. Or Depth	Classification	%VS	G_s	Nat w%	LL	PL	PI
◆ 2	38.5' - 39.0'	SAND, poorly-graded, mostly medium to fine-grained quartz, some fine-gravel to medium sand-size shell fragments, light olive brown 2.5Y 5/3 (SP)	34					

Project Wilmington Inner Ocean Bar

Area

Boring No. OBAR-08-V-9

Date 11/5/2008

GRADATION CURVES

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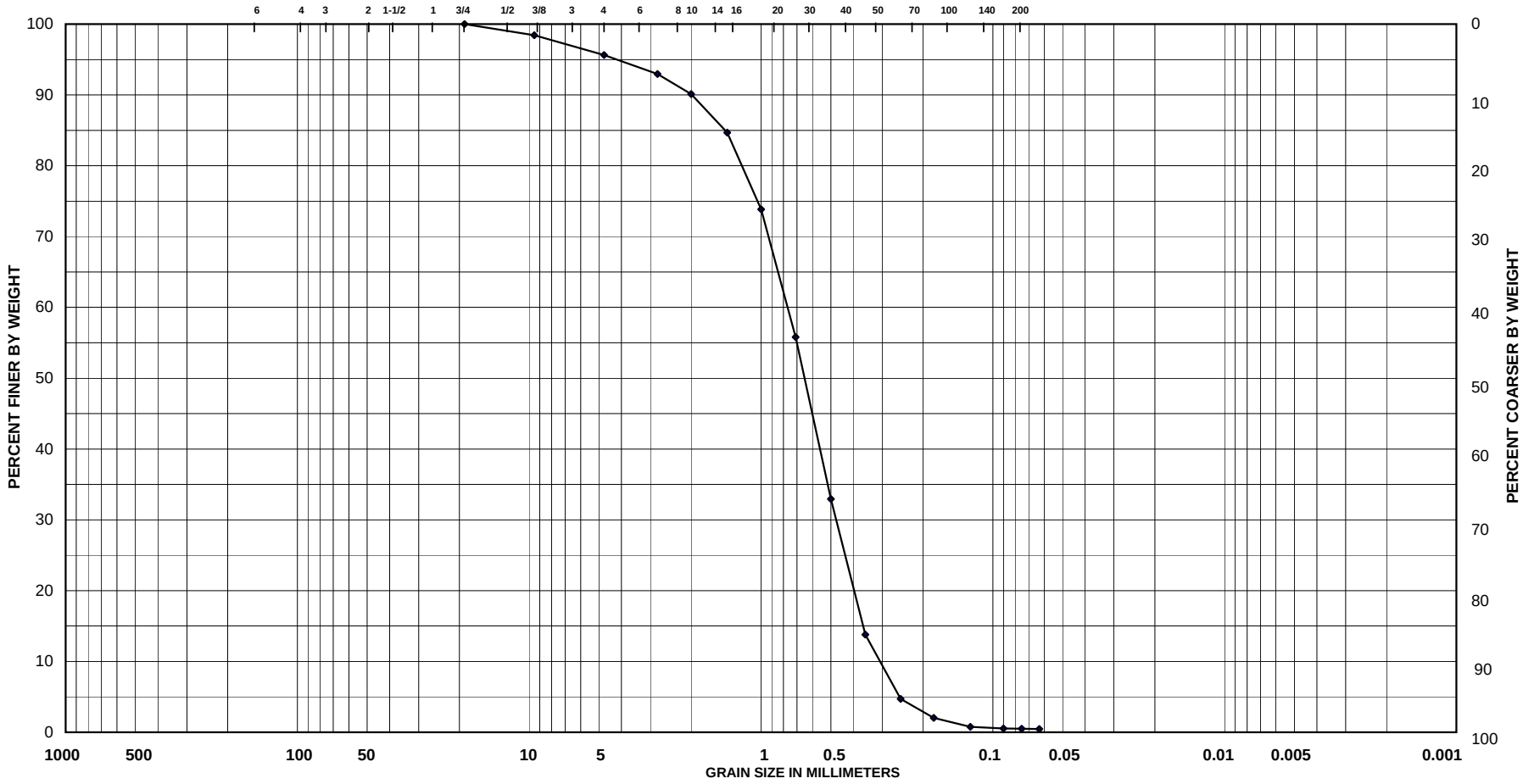
VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	**Wilmington Inner Ocean Bar**	**Depth:**	**40.5' - 41.0'**
Project No.:	**WPC6308.00105**	**Date:**	**11/5/2008**
Boring No.:	**OBAR-08-V-9**		
Sample No.:	**3**		
Description:	**SAND, poorly-graded, mostly medium to fine-grained quartz, little fine-gravel to medium sand-size shell fragments, grayish brown 2.5Y 5/2**		

Tare Weight, (g):	50.75	
Dry Wt. Before Washing (g):	185.96	(with tare)
Dry Weight After Washing (g):	185.14	(with tare)

Sieve Size (Name)	Sieve Size (mm)		% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	2.12	98.43	100	2.12
#4	4.750	3.77	95.64	100	3.77
#7	2.800	3.62	92.97	95	3.44
#10	2.000	3.86	90.11	90	3.47
#14	1.400	7.35	84.68	80	5.88
#18	1.000	14.64	73.85	40	5.86
#25	0.710	24.42	55.79	20	4.88
#35	0.500	30.90	32.93	10	3.09
#45	0.355	25.88	13.79	0	0.00
#60	0.250	12.26	4.73	0	0.00
#80	0.180	3.63	2.04	0	0.00
#120	0.125	1.75	0.75	0	0.00
#170	0.090	0.30	0.53	0	0.00
#200	0.075	0.06	0.48	0	0.00
#230	0.063	0.01	0.47	0	0.00
Total Shell Content:		**24**		**%**	



Sample No.	Elev. Or Depth	Classification	%VS	G_s	Nat w%	LL	PL	PI
◆ 3	40.5' - 41.0'	SAND, poorly-graded, mostly medium to fine-grained quartz, little fine-gravel to medium sand-size shell fragments, grayish brown 2.5Y 5/2 (SP)	24					

Project Wilmington Inner Ocean Bar

Area

Boring No. OBAR-08-V-9

Date 11/5/2008

GRADATION CURVES

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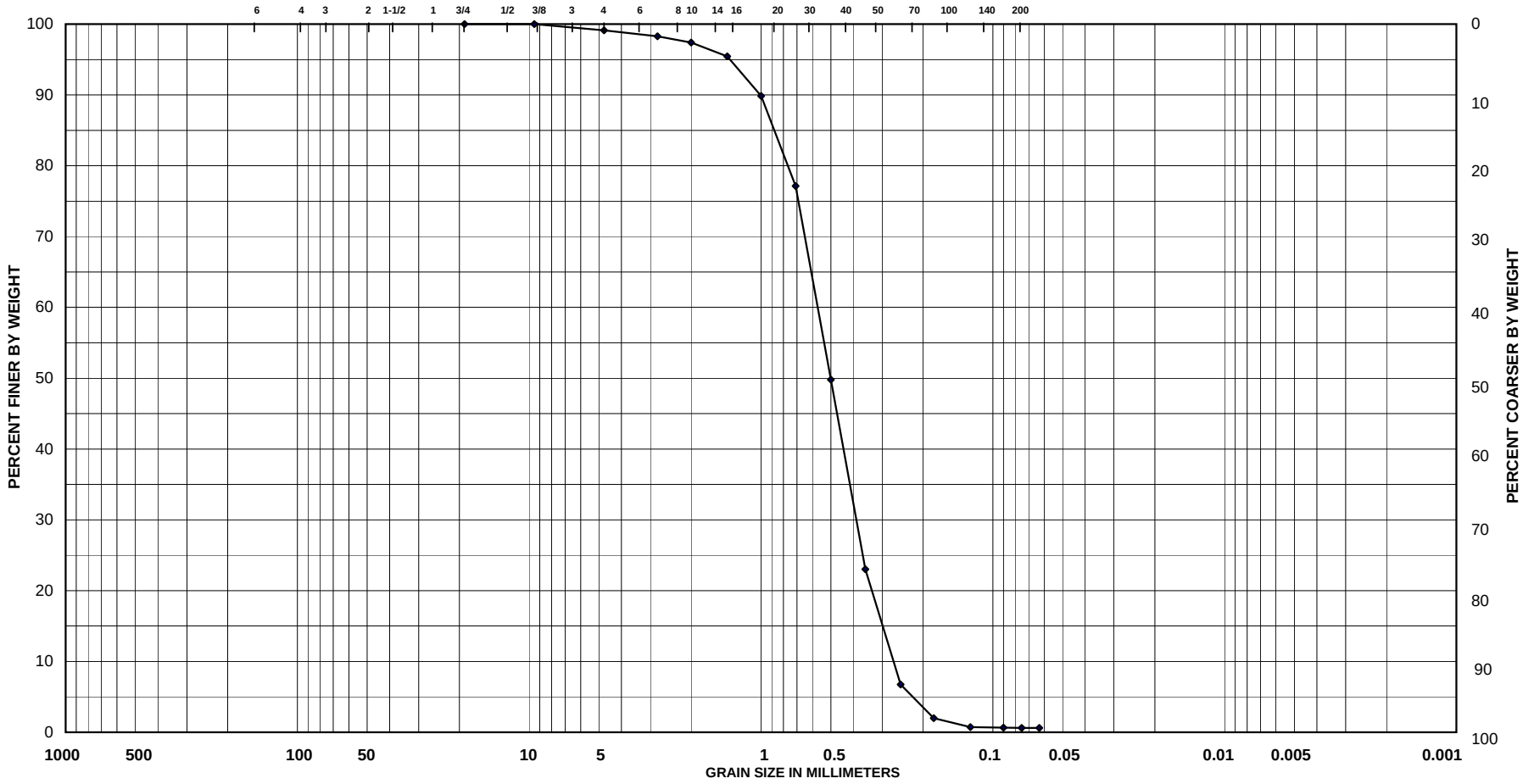
VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	**Wilmington Inner Ocean Bar**	**Depth:**	**42.5' - 43.0'**
Project No.:	**WPC6308.00105**	**Date:**	**11/5/2008**
Boring No.:	**OBAR-08-V-9**		
Sample No.:	**4**		
Description:	**SAND, poorly-graded, mostly medium to fine-grained quartz, little fine-gravel to medium sand-size shell fragments, grayish brown 2.5Y 5/2**		

Tare Weight, (g):	50.25	
Dry Wt. Before Washing (g):	185.59	(with tare)
Dry Weight After Washing (g):	184.58	(with tare)

Sieve Size (Name)	Sieve Size (mm)		% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.00	100.00	0	0.00
#4	4.750	1.20	99.11	100	1.20
#7	2.800	1.14	98.27	100	1.14
#10	2.000	1.17	97.41	95	1.11
#14	1.400	2.66	95.44	90	2.39
#18	1.000	7.56	89.86	60	4.54
#25	0.710	17.24	77.12	30	5.17
#35	0.500	37.00	49.78	20	7.40
#45	0.355	36.23	23.01	10	3.62
#60	0.250	22.04	6.72	0	0.00
#80	0.180	6.43	1.97	0	0.00
#120	0.125	1.68	0.73	0	0.00
#170	0.090	0.11	0.65	0	0.00
#200	0.075	0.03	0.63	0	0.00
#230	0.063	0.02	0.61	0	0.00
Total Shell Content:		**20**		**%**	



Sample No.	Elev. Or Depth	Classification	%VS	G_s	Nat w%	LL	PL	PI
◆ 4	42.5' - 43.0'	SAND, poorly-graded, mostly medium to fine-grained quartz, little fine-gravel to medium sand-size shell fragments, grayish brown 2.5Y 5/2 (SP)	20					

Project Wilmington Inner Ocean Bar

Area

Boring No. OBAR-08-V-9

Date 11/5/2008

GRADATION CURVES

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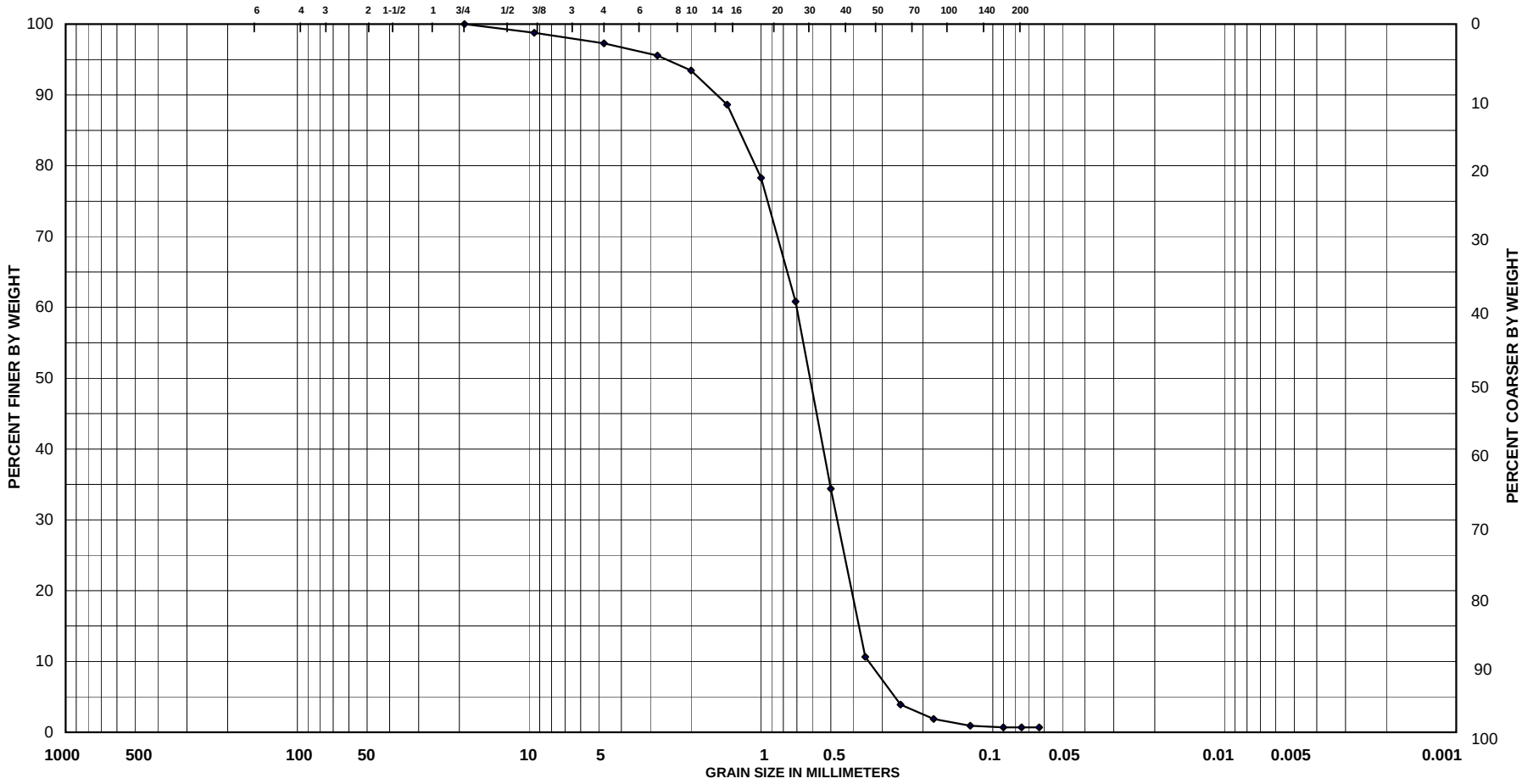
VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	**Wilmington Inner Ocean Bar**	**Depth:**	**44.5' - 45.0**
Project No.:	**WPC6308.00105**	**Date:**	**11/5/2008**
Boring No.:	**OBAR-08-V-9**		
Sample No.:	**5**		
Description:	**SAND, poorly-graded, mostly medium to fine-grained quartz, little fine-gravel to medium sand-size shell fragments, grayish brown 2.5Y 5/2**		

Tare Weight, (g):	48.36	
Dry Wt. Before Washing (g):	191.51	(with tare)
Dry Weight After Washing (g):	190.48	(with tare)

Sieve Size (Name)	Sieve Size (mm)		% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	1.75	98.78	100	1.75
#4	4.750	2.14	97.28	100	2.14
#7	2.800	2.45	95.57	90	2.21
#10	2.000	3.01	93.47	80	2.41
#14	1.400	6.95	88.61	70	4.87
#18	1.000	14.80	78.27	40	5.92
#25	0.710	24.98	60.82	30	7.49
#35	0.500	37.82	34.40	20	7.56
#45	0.355	34.03	10.63	10	3.40
#60	0.250	9.61	3.92	0	0.00
#80	0.180	2.93	1.87	0	0.00
#120	0.125	1.37	0.92	0	0.00
#170	0.090	0.30	0.71	0	0.00
#200	0.075	0.03	0.68	0	0.00
#230	0.063	0.00	0.68	0	0.00
Total Shell Content:		**26**		**%**	



Sample No.	Elev. Or Depth	Classification	%VS	G_s	Nat w%	LL	PL	PI
◆ 5	44.5' - 45.0	SAND, poorly-graded, mostly medium to fine-grained quartz, little fine-gravel to medium sand-size shell fragments, grayish brown 2.5Y 5/2 (SP)	26					

Project Wilmington Inner Ocean Bar

Area

Boring No. OBAR-08-V-9

Date 11/5/2008

GRADATION CURVES

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Hole No. OBAR-08-V-11

DRILLING LOG	DIVISION SOUTH ATLANTIC	INSTALLATION WILMINGTON DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT WILMINGTON HARBOR OCEAN BAR	10. SIZE AND TYPE OF BIT 4" Dia. Vibracore
2. LOCATION (Coordinates or Station) NC COORD N43941 E2299344 NAD83	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLLW
3. DRILLING AGENCY WILMINGTON DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL VIBRACORE SNELL
4. HOLE NO. (As shown on drawing title and file number) OBAR-08-V-11	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4 / UNDISTURBED 0
5. NAME OF DRILLER LESTER GAUGHF CRANE OPERATOR	14. TOTAL NUMBER CORE BOXES N/A
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER N/A
7. THICKNESS OF OVERBURDEN N/A (22.6' of Water)	16. DATE HOLE STARTED 8/04/08 COMPLETED 8/04/08
8. DEPTH DRILLED INTO ROCK 0.0'	17. ELEVATION TOP OF HOLE 0.0' MLLW
9. TOTAL DEPTH OF HOLE 32.6'	18. TOTAL CORE RECOVERY FOR BORING N/A %
	19. SIGNATURE OF INSPECTOR ROBERT MCGHEE

ELEVATION MLLW (a)	DEPTH feet (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
0.0	0		0.0' TO 22.6' WATER			Time begin vibracoring: 1204 hrs. Soils described by Larry Benjamin, Civil Engr. Tech.
	22.0					
-22.6	22.6		RIVER BOTTOM @ 22.6'		22.6'	NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the actual tide such that top of Hole is 0.0 EL MLLW.
			SP-Tan, coarse, poorly graded sand trace shell fragments		1 / 23.1'	
	24.0				24.5' / 2 / 25.0'	VIBRACORE BORING From 0.0' to 10.0' Ran 10.0' Rec: 7.7' Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
	26.0				26.5' / 3 / 27.0'	
	28.0				28.5' / 4 / 29.0'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
	30.0		30.3'			LAB CLASSIFICATION: Jar Number 1 SP; 2 SP; 3 SP; 4 SP
			ASSUMED NOT RECOVERED			
	32.0					
-32.6	32.6		BOTTOM OF HOLE AT 32.6' SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: HOLE TERMINATED AT PREDETERMINED DEPTH AT 10.0'.

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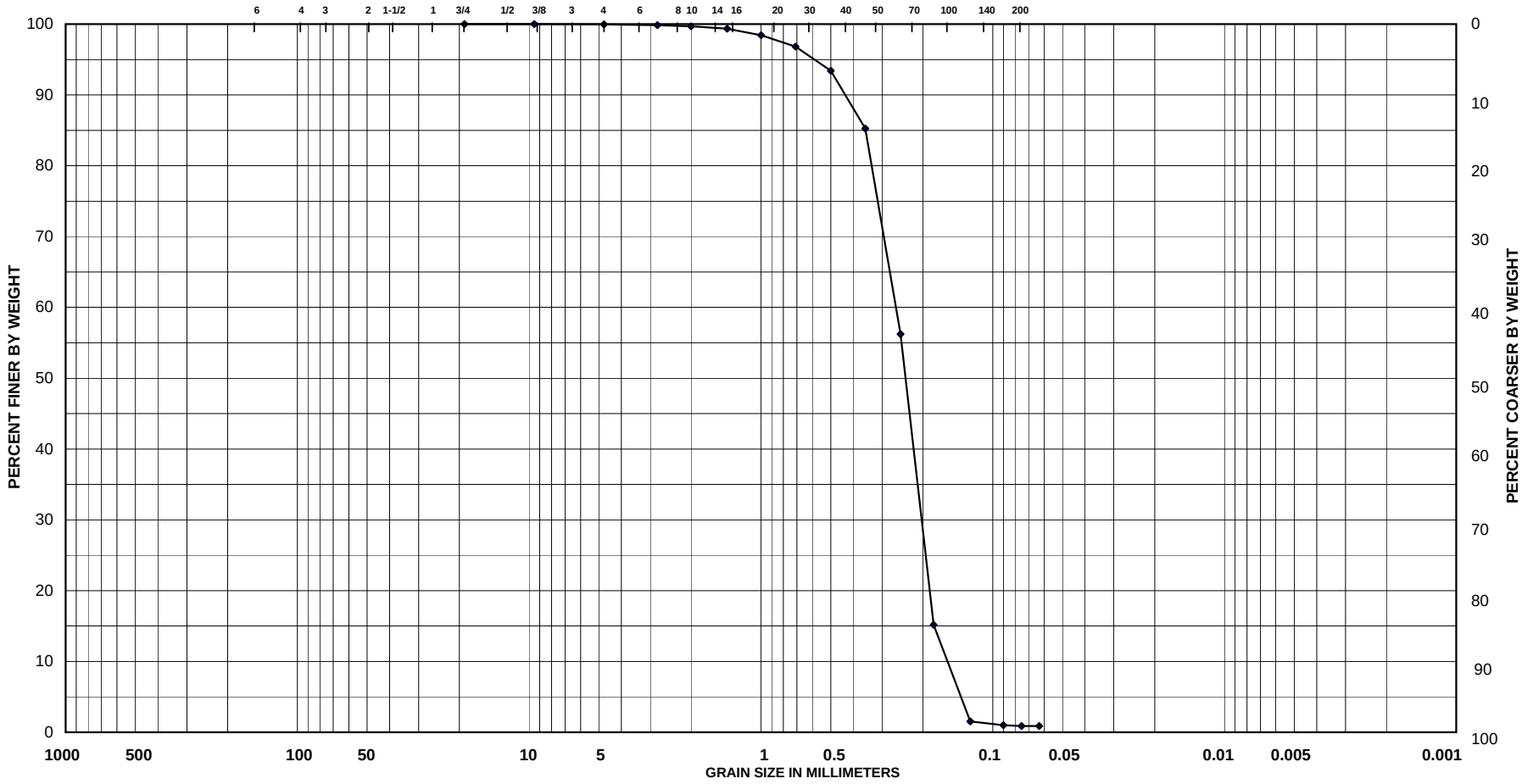
VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	**Wilmington Inner Ocean Bar**	**Depth:**	**22.6' - 23.1'**
Project No.:	**WPC6308.00105**	**Date:**	**11/5/2008**
Boring No.:	**OBAR-08-V-11**		
Sample No.:	**1**		
Description:	**SAND, poorly-graded, mostly medium to fine-grained quartz, trace fine-gravel to medium sand-size shell fragments, olive gray 5Y 5/2 (SP)**		

Tare Weight, (g):	50.01	
Dry Wt. Before Washing (g):	188.05	(with tare)
Dry Weight After Washing (g):	186.78	(with tare)

Sieve Size (Name)	Sieve Size (mm)		% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.00	100.00	0	0.00
#4	4.750	0.06	99.96	100	0.06
#7	2.800	0.15	99.85	100	0.15
#10	2.000	0.21	99.70	95	0.20
#14	1.400	0.50	99.33	90	0.45
#18	1.000	1.27	98.41	70	0.89
#25	0.710	2.21	96.81	40	0.88
#35	0.500	4.70	93.41	20	0.94
#45	0.355	11.26	85.25	10	1.13
#60	0.250	40.09	56.21	0	0.00
#80	0.180	56.63	15.18	0	0.00
#120	0.125	18.84	1.54	0	0.00
#170	0.090	0.72	1.01	0	0.00
#200	0.075	0.17	0.89	0	0.00
#230	0.063	0.03	0.87	0	0.00
Total Shell Content:		**3**		**%**	



Sample No.	Elev. Or Depth	Classification	%VS	G_s	Nat w%	LL	PL	PI
◆ 1	22.6' - 23.1'	SAND, poorly-graded, mostly medium to fine-grained quartz, trace fine-gravel to medium sand-size shell fragments, olive gray 5Y 5/2 (SP)	3					

Project Wilmington Inner Ocean Bar

Area

Boring No. OBAR-08-V-11

Date 11/5/2008

GRADATION CURVES

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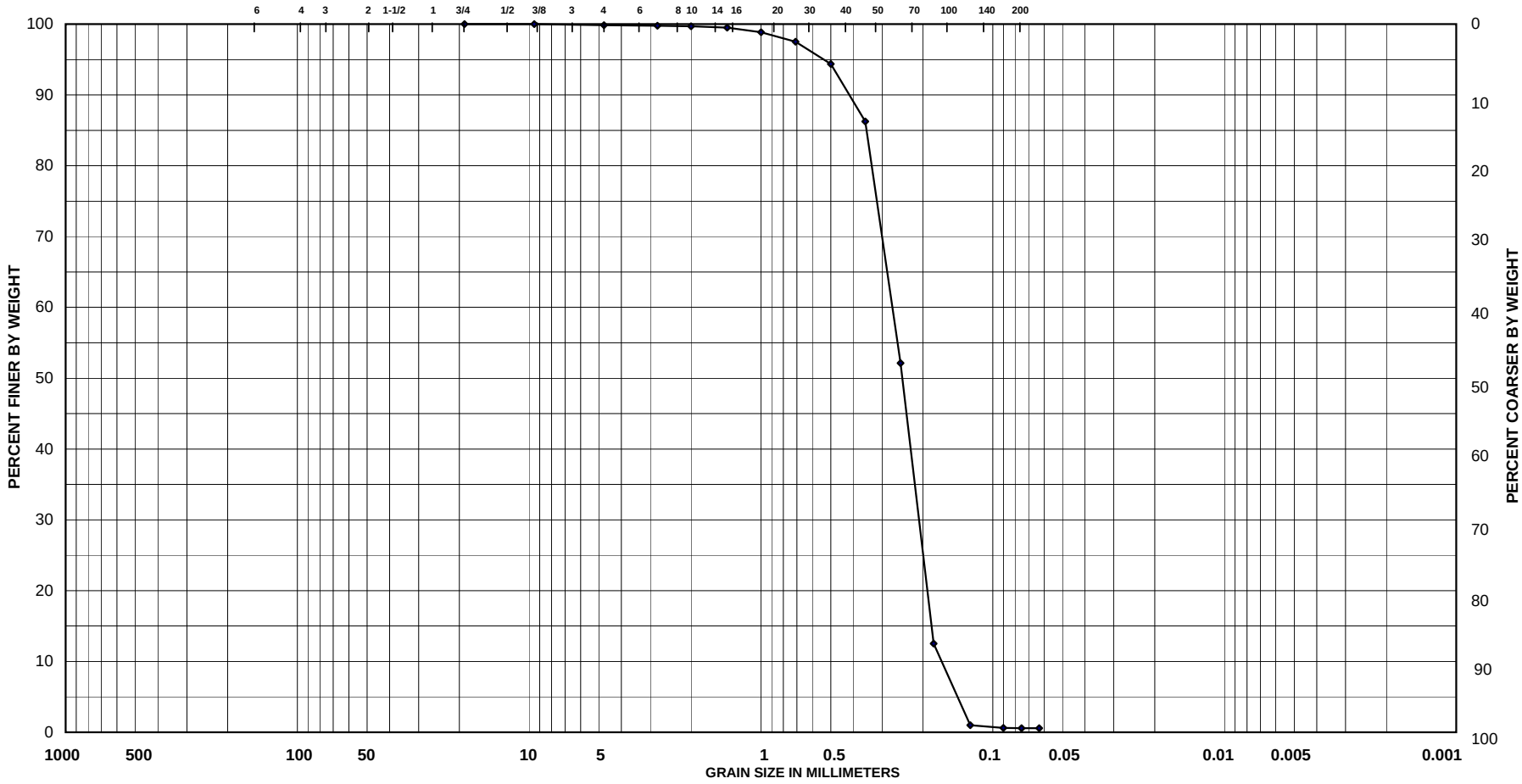
VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	**Wilmington Inner Ocean Bar**	**Depth:**	**24.5' - 25.0'**
Project No.:	**WPC6308.00105**	**Date:**	**11/5/2008**
Boring No.:	**OBAR-08-V-11**		
Sample No.:	**2**		
Description:	**SAND, poorly-graded, mostly fine-grained quartz, trace fine-gravel to medium sand-size shell fragments, olive gray 5Y 5/2 (SP)**		

Tare Weight, (g):	50.40	
Dry Wt. Before Washing (g):	191.84	(with tare)
Dry Weight After Washing (g):	190.74	(with tare)

Sieve Size (Name)	Sieve Size (mm)		% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.00	100.00	0	0.00
#4	4.750	0.19	99.87	100	0.19
#7	2.800	0.15	99.76	100	0.15
#10	2.000	0.08	99.70	95	0.08
#14	1.400	0.29	99.50	90	0.26
#18	1.000	0.92	98.85	60	0.55
#25	0.710	1.91	97.50	30	0.57
#35	0.500	4.40	94.39	20	0.88
#45	0.355	11.51	86.25	10	1.15
#60	0.250	48.24	52.14	1	0.48
#80	0.180	56.04	12.52	0	0.00
#120	0.125	16.29	1.00	0	0.00
#170	0.090	0.54	0.62	0	0.00
#200	0.075	0.08	0.57	0	0.00
#230	0.063	0.00	0.57	0	0.00
Total Shell Content:		**3**		**%**	



Sample No.	Elev. Or Depth	Classification	%VS	G_s	Nat w%	LL	PL	PI
◆ 2	24.5' - 25.0'	SAND, poorly-graded, mostly fine-grained quartz, trace fine-gravel to medium sand-size shell fragments, olive gray 5Y 5/2 (SP)	3					

Project Wilmington Inner Ocean Bar

Area

Boring No. OBAR-08-V-11

Date 11/5/2008

GRADATION CURVES

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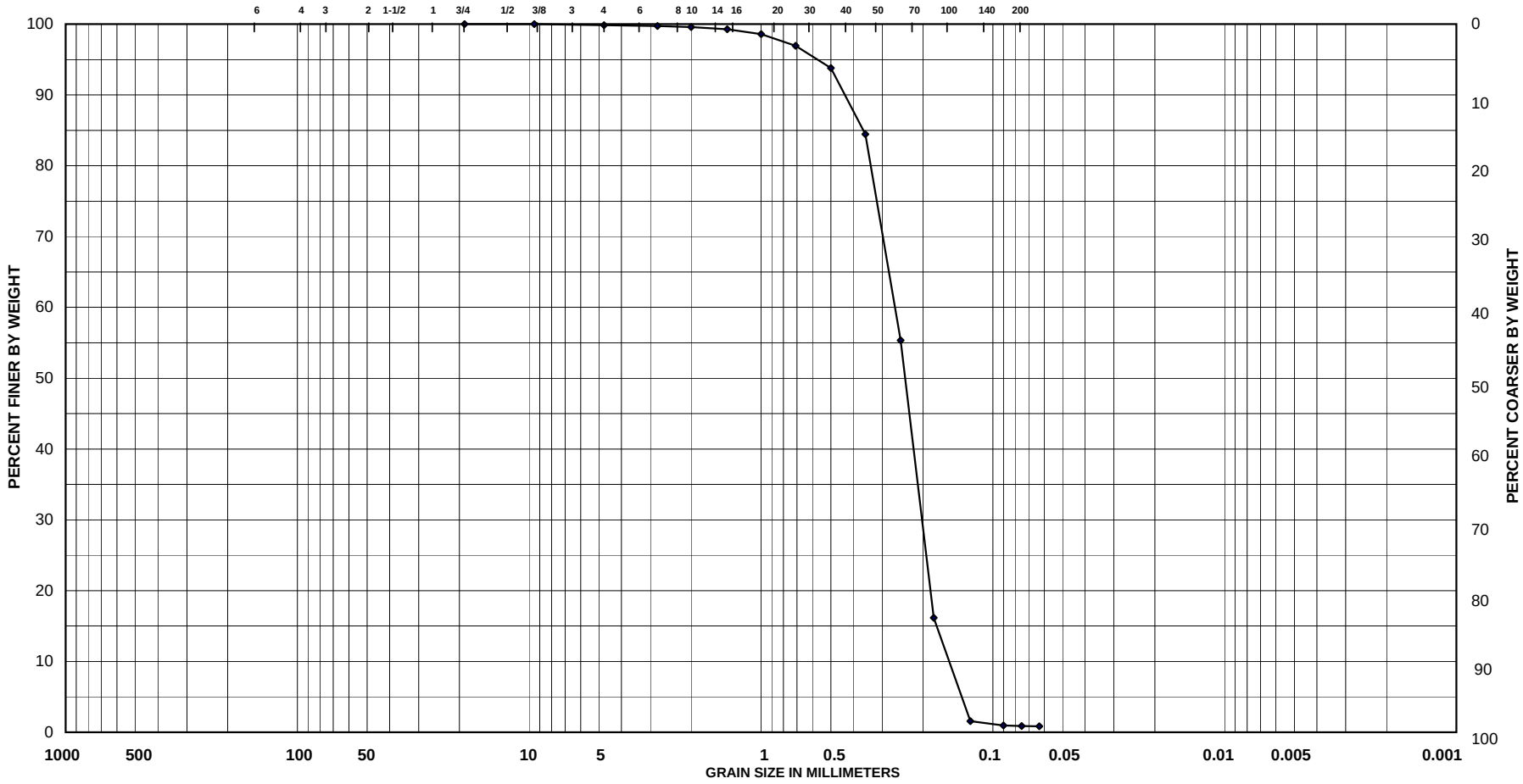
VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	**Wilmington Inner Ocean Bar**	**Depth:**	**26.5' - 27.0'**
Project No.:	**WPC6308.00105**	**Date:**	**11/5/2008**
Boring No.:	**OBAR-08-V-11**		
Sample No.:	**3**		
Description:	**SAND, poorly-graded, mostly fine-grained quartz, few fine-gravel to medium sand-size shell fragments, olive gray 5Y 5/2 (SP)**		

Tare Weight, (g):	50.40	
Dry Wt. Before Washing (g):	197.45	(with tare)
Dry Weight After Washing (g):	195.92	(with tare)

Sieve Size (Name)	Sieve Size (mm)		% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.00	100.00	0	0.00
#4	4.750	0.24	99.84	100	0.24
#7	2.800	0.15	99.73	100	0.15
#10	2.000	0.21	99.59	95	0.20
#14	1.400	0.46	99.28	90	0.41
#18	1.000	1.01	98.59	80	0.81
#25	0.710	2.43	96.94	40	0.97
#35	0.500	4.61	93.80	30	1.38
#45	0.355	13.73	84.47	20	2.75
#60	0.250	42.82	55.35	10	4.28
#80	0.180	57.60	16.18	0	0.00
#120	0.125	21.46	1.58	0	0.00
#170	0.090	0.94	0.95	0	0.00
#200	0.075	0.07	0.90	0	0.00
#230	0.063	0.08	0.84	0	0.00
Total Shell Content:		**8**		**%**	



Sample No.	Elev. Or Depth	Classification	%VS	G_s	Nat w%	LL	PL	PI
◆ 3	26.5' - 27.0'	SAND, poorly-graded, mostly fine-grained quartz, few fine-gravel to medium sand-size shell fragments, olive gray 5Y 5/2 (SP)	8					

Project Wilmington Inner Ocean Bar

Area

Boring No. OBAR-08-V-11

Date 11/5/2008

GRADATION CURVES

** The USC classification is based on laboratory grain size distribution and visual classification*

ENG FORM 2087
MAY 63

WOLF TECHNOLOGIES, INC.

3047-4 St. Johns Bluff Road S.
Jacksonville, Florida 32246
(904) 997-1400 (Tel) · (904) 997-9150 (Fax)

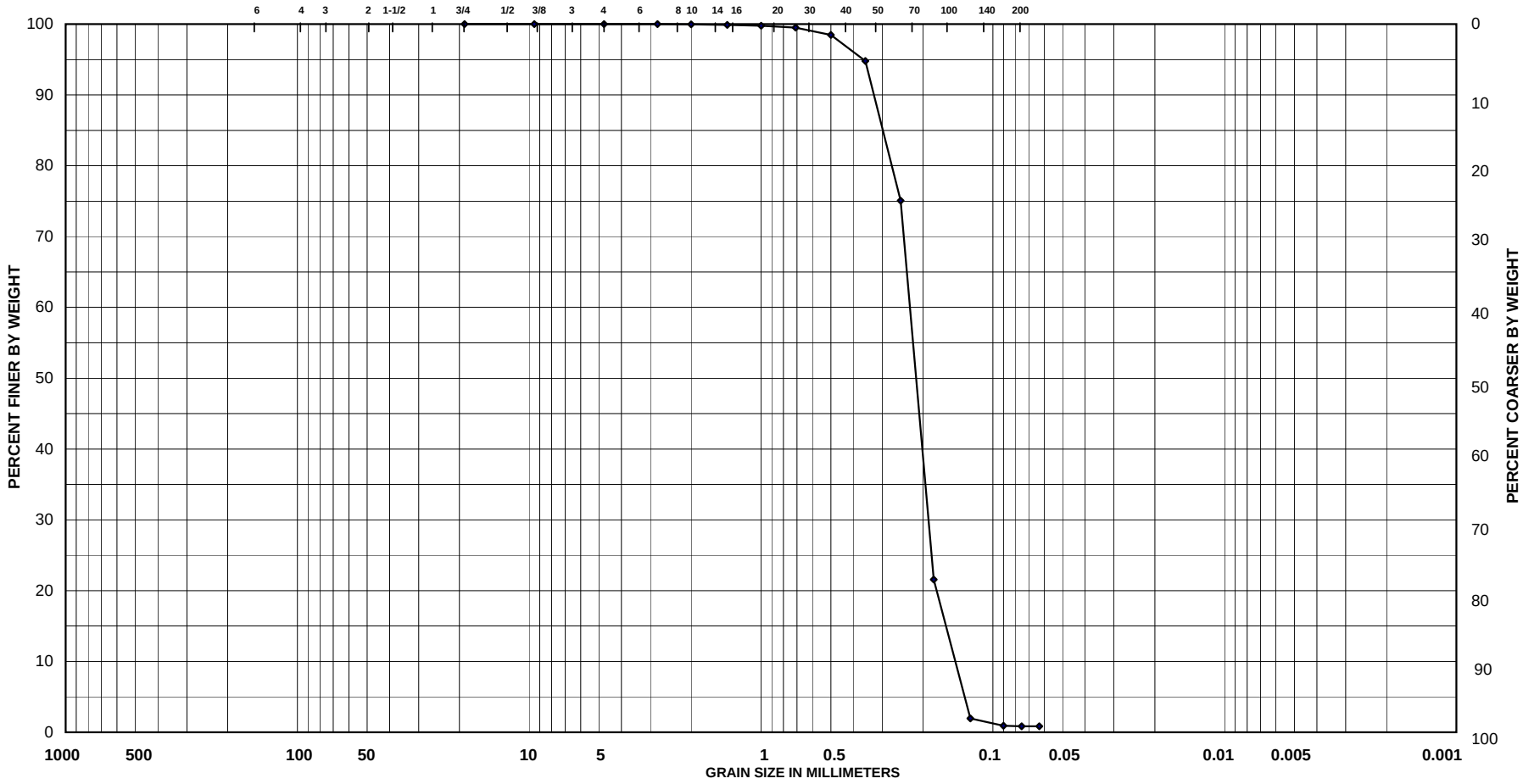
VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	**Wilmington Inner Ocean Bar**	**Depth:**	**28.5' - 29.0'**
Project No.:	**WPC6308.00105**	**Date:**	**11/5/2008**
Boring No.:	**OBAR-08-V-11**		
Sample No.:	**4**		
Description:	**SAND, poorly-graded, mostly medium to fine-grained quartz, little fine-gravel to medium sand-size shell fragments, trace silt, olive gray 5Y 5/2**		

Tare Weight, (g):	50.04	
Dry Wt. Before Washing (g):	181.04	(with tare)
Dry Weight After Washing (g):	179.75	(with tare)

Sieve Size (Name)	Sieve Size (mm)		% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.00	100.00	0	0.00
#4	4.750	0.00	100.00	0	0.00
#7	2.800	0.02	99.98	100	0.02
#10	2.000	0.03	99.96	100	0.03
#14	1.400	0.08	99.90	95	0.08
#18	1.000	0.18	99.76	95	0.17
#25	0.710	0.36	99.49	90	0.32
#35	0.500	1.35	98.46	80	1.08
#45	0.355	4.78	94.81	40	1.91
#60	0.250	25.85	75.08	20	5.17
#80	0.180	70.12	21.55	10	7.01
#120	0.125	25.68	1.95	0	0.00
#170	0.090	1.36	0.91	0	0.00
#200	0.075	0.09	0.84	0	0.00
#230	0.063	0.00	0.84	0	0.00
Total Shell Content:		**12**		**%**	



Sample No.	Elev. Or Depth	Classification	%VS	G_s	Nat w%	LL	PL	PI
◆ 4	28.5' - 29.0'	SAND, poorly-graded, mostly medium to fine-grained quartz, little fine-gravel to medium sand-size shell fragments, trace silt, olive gray 5Y 5/2 (SP)	12					

Project Wilmington Inner Ocean Bar

Area

Boring No. OBAR-08-V-11

Date 11/5/2008

GRADATION CURVES

** The USC classification is based on laboratory grain size distribution and visual classification*

ENG FORM 2087
MAY 63

Boring Designation 2023-WH-01

DRILLING LOG

DIVISION	Moffatt & Nichol
INSTALLATION	Offshore Oak Island, North Carolina
SHEET	1 OF 1 SHEETS

1. PROJECT: Stage 2 Oak Island Beach Management Plan - Town of Oak Island
2. BORING DESIGNATION: 2023-WH-01
3. DRILLING AGENCY: Amdrill, Inc
4. NAME OF DRILLER: Brian Simmons
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED
6. THICKNESS OF OVERBURDEN: 0.0 Ft.
7. DEPTH DRILLED INTO ROCK: 0.0 Ft.
8. TOTAL DEPTH OF BORING: 10.0 Ft.

LOCATION COORDINATES	X = 2301361.65 Y = 50974.265
PROJECT NO.	10128/02
DEG. FROM VERTICAL	
BEARING	

9. SIZE AND TYPE OF BIT: 4.0 In.
10. COORDINATE SYSTEM/DATUM: State Plane North Carolina FIPS 3200 Feet; HORIZONTAL: NAD 1983; VERTICAL: NAVD 88
11. MANUFACTURER'S DESIGNATION OF DRILL: Amdrill 80 Pneumatic Sampler ☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES: DISTURBED 3; UNDISTURBED (UD)
13. TOTAL NUMBER CORE BOXES: 2
14. ELEVATION GROUND WATER
15. DATE BORING: STARTED 06-09-23 08:11; COMPLETED 06-09-23 08:11
16. ELEVATION TOP OF BORING: -48.1 Ft.
17. TOTAL RECOVERY FOR BORING: 9.5 Ft.
18. SIGNATURE AND TITLE OF INSPECTOR: Finn Whiting, P.G.

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	SIEVE SAMPLE	REMARKS
-48.1	0.0				
			Poorly graded sand (m), trace silt, light brownish gray (10YR-6/2), (SP).	S1	Sample #S1, Depth = 0.0' - 3.3' Mean (mm): 0.26, Phi Sorting: 0.77 Shell: 0%, Fines (200): 1.44%; (230): 1.41% (SP)
-51.4	3.3				
				S2	Sample #S2, Depth = 3.3' - 6.3' Mean (mm): 0.39, Phi Sorting: 0.96 Shell: 0%, Fines (200): 0.91%; (230): 0.89% (SW)
			Well graded sand (m-c), trace shell fragments (up to 0.04' in size) with large shell (0.12' in size) from 8.8' - 8.9', light brownish gray (10YR-6/2), (SW).	S3	Sample #S3, Depth = 6.3' - 9.2' Mean (mm): 0.57, Phi Sorting: 1.12 Shell: 4%, Fines (200): 0.73%; (230): 0.72% (SW)
-57.3	9.2				
-57.6	9.5		Silty sand (f-m), few shell fragments (up to 0.08' in size), very dark gray (10YR-3/1), (SM).		
-58.1	10.0		No recovery.		
			End of Boring		

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FLORIDA DEP ROSS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

SAJ FORM 1836 JUN 02 **MODIFIED FOR THE FLORIDA DEP** JUN 04

Boring Designation 2023-WH-02B

DRILLING LOG

DIVISION	Moffatt & Nichol
INSTALLATION	Offshore Oak Island, North Carolina
SHEET	1 OF 1 SHEETS
1. PROJECT	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
9. SIZE AND TYPE OF BIT	4.0 In.
10. COORDINATE SYSTEM/DATUM	State Plane North Carolina FIPS 3200 Feet
HORIZONTAL	NAD 1983
VERTICAL	NAVD 88
2. BORING DESIGNATION	2023-WH-02B
LOCATION COORDINATES	X = 2301038.604 Y = 49004.422
11. MANUFACTURER'S DESIGNATION OF DRILL	Amdrill 80 Pneumatic Sampler
☐ **AUTO HAMMER** ☐ **MANUAL HAMMER**	
3. DRILLING AGENCY	Amdrill, Inc
PROJECT NO.	10128/02
12. TOTAL SAMPLES	**DISTURBED** 4 / **UNDISTURBED (UD)**
4. NAME OF DRILLER	Brian Simmons
13. TOTAL NUMBER CORE BOXES	2
5. DIRECTION OF BORING ☒ **VERTICAL** ☐ **INCLINED**	**DEG. FROM VERTICAL** / **BEARING**
14. ELEVATION GROUND WATER	
15. DATE BORING	**STARTED** 06-09-23 08:55 / **COMPLETED** 06-09-23 08:55
6. THICKNESS OF OVERBURDEN	0.0 Ft.
16. ELEVATION TOP OF BORING	-39.6 Ft.
7. DEPTH DRILLED INTO ROCK	0.0 Ft.
17. TOTAL RECOVERY FOR BORING	6.5 Ft.
8. TOTAL DEPTH OF BORING	11.0 Ft.
18. SIGNATURE AND TITLE OF INSPECTOR	Finn Whiting, P.G.

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	SIEVE SAMPLE	REMARKS
-39.6	0.0				
			Well graded sand (m), trace shell fragments (up to 0.03' in size), trace silt with siltier pockets from 0.2' - 0.5' & 1.0' - 1.5', light brownish gray (10YR-6/2), (SW).	S1	Sample #S1, Depth = 0.0' - 1.5' Mean (mm): 0.30, Phi Sorting: 1.13 Shell: 1%, Fines (200): 1.63%; (230): 1.59% (SW)
				S2	Sample #S2, Depth = 1.5' - 4.5' Mean (mm): 0.37, Phi Sorting: 0.98 Shell: 0%, Fines (200): 1.08%; (230): 1.03% (SW)
				S3	Sample #S3, Depth = 4.5' - 6.5' Mean (mm): 0.44, Phi Sorting: 1.09 Shell: 1%, Fines (200): 0.74%; (230): 0.71% (SW)
-46.1	6.5				
			No recovery.		
-50.6	11.0				
			End of Boring		

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FLORIDA DEP ROSS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

SAJ FORM 1836 JUN 02 **MODIFIED FOR THE FLORIDA DEP** JUN 04

Boring Designation 2023-WH-03

DRILLING LOG

DIVISION	Moffatt & Nichol
INSTALLATION	Offshore Oak Island, North Carolina
SHEET	1 OF 1 SHEETS
1. PROJECT	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
9. SIZE AND TYPE OF BIT	4.0 In.
10. COORDINATE SYSTEM/DATUM	State Plane North Carolina FIPS 3200 Feet
HORIZONTAL	NAD 1983
VERTICAL	NAVD 88
2. BORING DESIGNATION	2023-WH-03
LOCATION COORDINATES	X = 2296910.61 Y = 40112.41
11. MANUFACTURER'S DESIGNATION OF DRILL	Amdrill 80 Pneumatic Sampler
☐ AUTO HAMMER ☐ MANUAL HAMMER	
3. DRILLING AGENCY	Amdrill, Inc
PROJECT NO.	10128/02
12. TOTAL SAMPLES	DISTURBED 5 / UNDISTURBED (UD)
4. NAME OF DRILLER	Brian Simmons
13. TOTAL NUMBER CORE BOXES	2
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
14. ELEVATION GROUND WATER	
15. DATE BORING	STARTED 06-09-23 09:58 / COMPLETED 06-09-23 09:58
6. THICKNESS OF OVERBURDEN	0.0 Ft.
16. ELEVATION TOP OF BORING	-47.4 Ft.
7. DEPTH DRILLED INTO ROCK	0.0 Ft.
17. TOTAL RECOVERY FOR BORING	8.6 Ft.
8. TOTAL DEPTH OF BORING	10.5 Ft.
18. SIGNATURE AND TITLE OF INSPECTOR	Finn Whiting, P.G.

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	SIEVE SAMPLE	REMARKS
-47.4	0.0				
			Poorly graded sand (f), trace silt, pocket of coarser sand from 3.6' - 4.1', light gray (10YR-7/2), (SP).	S1	Sample #S1, Depth = 0.0' - 3.6' Mean (mm): 0.24, Phi Sorting: 0.74 Shell: 0%, Fines (200): 1.36%; (230): 1.32% (SP)
-51.0	3.6				
			Well graded sand (m), trace shell fragments (up to 0.03' in size), light brownish gray (10YR-6/2), (SW).	S2	Sample #S2, Depth = 3.6' - 4.8' Mean (mm): 0.38, Phi Sorting: 1.11 Shell: 1%, Fines (200): 1.62%; (230): 1.54% (SW)
-52.2	4.8				
			Poorly graded silty sand (m), lense of very dark gray (10YR-3/1) silt (ML) from 4.8' - 5.0', gray (10YR-6/1), (SP-SM).	S3	Sample #S3, Depth = 4.8' - 5.8' Mean (mm): 0.29, Phi Sorting: 0.68 Shell: 0%, Fines (200): 10.26%; (230): 10.06% (SP-SM)
-53.2	5.8				
			Silt, organic inclusions (up to 0.20' in size) throughout, very dark gray (10YR-3/1) grading into, dark gray (10YR-4/1), (ML).	S4	Sample #S4, Depth = 5.8' - 8.6' Mean (mm): 0.35, Phi Sorting: 1.44 Shell: 0%, Fines (200): 54.37%; (230): 54.15% (ML)
-56.0	8.6				
			No recovery.		
-57.9	10.5				
			End of Boring		

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FLORIDA DEP ROSS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

SAJ FORM 1836 JUN 02 **MODIFIED FOR THE FLORIDA DEP** JUN 04

Boring Designation 2023-WH-04

DRILLING LOG

DIVISION	Moffatt & Nichol
INSTALLATION	Offshore Oak Island, North Carolina
SHEET	1 OF 1 SHEETS
1. PROJECT	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
9. SIZE AND TYPE OF BIT	4.0 In.
10. COORDINATE SYSTEM/DATUM	State Plane North Carolina FIPS 3200 Feet
HORIZONTAL	NAD 1983
VERTICAL	NAVD 88
2. BORING DESIGNATION	2023-WH-04
LOCATION COORDINATES	X = 2297840.622 Y = 41878.552
11. MANUFACTURER'S DESIGNATION OF DRILL	Amdrill 80 Pneumatic Sampler
☐ **AUTO HAMMER** ☐ **MANUAL HAMMER**	
3. DRILLING AGENCY	Amdrill, Inc
PROJECT NO.	10128/02
12. TOTAL SAMPLES	
DISTURBED	4
UNDISTURBED (UD)	
4. NAME OF DRILLER	Brian Simmons
13. TOTAL NUMBER CORE BOXES	2
14. ELEVATION GROUND WATER	
5. DIRECTION OF BORING ☒ **VERTICAL** ☐ **INCLINED**	
DEG. FROM VERTICAL	
BEARING	
15. DATE BORING	
STARTED	06-09-23 09:44
COMPLETED	06-09-23 09:44
6. THICKNESS OF OVERBURDEN	0.0 Ft.
16. ELEVATION TOP OF BORING	-48.2 Ft.
7. DEPTH DRILLED INTO ROCK	0.0 Ft.
17. TOTAL RECOVERY FOR BORING	8.2 Ft.
8. TOTAL DEPTH OF BORING	10.0 Ft.
18. SIGNATURE AND TITLE OF INSPECTOR	Finn Whiting, P.G.

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	SIEVE SAMPLE	REMARKS
-48.2	0.0				
			Poorly graded sand (f), trace silt, black (10YR-2/1) staining from 0.4' - 0.9', light brownish gray (10YR-6/2), (SP).	S1	Sample #S1, Depth = 0.0' - 3.1' Mean (mm): 0.22, Phi Sorting: 0.45 Shell: 0%, Fines (200): 1.90%; (230): 1.84% (SP)
				S2	Sample #S2, Depth = 3.1' - 5.9' Mean (mm): 0.23, Phi Sorting: 0.46 Shell: 0%, Fines (200): 1.26%; (230): 1.24% (SP)
-54.1	5.9				
			Poorly graded sand (m), trace silt, brown (10YR-5/3), (SP).	S3	Sample #S3, Depth = 5.9' - 8.2' Mean (mm): 0.34, Phi Sorting: 0.85 Shell: 0%, Fines (200): 1.92%; (230): 1.80% (SP)
-56.4	8.2				
			No recovery.		
-58.2	10.0				
			End of Boring		

0 5 10 15

FLORIDA DEP ROSS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

SAJ FORM 1836 JUN 02 **MODIFIED FOR THE FLORIDA DEP** JUN 04

Boring Designation 2023-WH-08A

DRILLING LOG

DIVISION	Moffatt & Nichol
INSTALLATION	Offshore Oak Island, North Carolina
SHEET	1 OF 1 SHEETS
1. PROJECT	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
2. BORING DESIGNATION	2023-WH-08A
LOCATION COORDINATES	X = 2296321.292 Y = 38494.509
3. DRILLING AGENCY	Amdrill, Inc
PROJECT NO.	10128/02
4. NAME OF DRILLER	Brian Simmons
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	0.0 Ft.
7. DEPTH DRILLED INTO ROCK	0.0 Ft.
8. TOTAL DEPTH OF BORING	11.0 Ft.
9. SIZE AND TYPE OF BIT	4.0 In.
10. COORDINATE SYSTEM/DATUM	State Plane North Carolina FIPS 3200 Feet
HORIZONTAL	NAD 1983
VERTICAL	NAVD 88
11. MANUFACTURER'S DESIGNATION OF DRILL	Amdrill 80 Pneumatic Sampler
☐ AUTO HAMMER ☐ MANUAL HAMMER	
12. TOTAL SAMPLES	
DISTURBED	4
UNDISTURBED (UD)	
13. TOTAL NUMBER CORE BOXES	3
14. ELEVATION GROUND WATER	
15. DATE BORING	
STARTED	06-09-23 10:33
COMPLETED	06-09-23 10:33
16. ELEVATION TOP OF BORING	-37.0 Ft.
17. TOTAL RECOVERY FOR BORING	11 Ft.
18. SIGNATURE AND TITLE OF INSPECTOR	Finn Whiting, P.G.

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	SIEVE SAMPLE	REMARKS
-37.0	0.0				
-37.7	0.7		Well graded sand (m), trace shell fragments (up to 0.04' in size) decreasing with depth, trace silt, light gray (10YR-7/1), (SW).	S1	Sample #S1, Depth = 0.0' - 0.7' Mean (mm): 0.26, Phi Sorting: 1.00 Shell: 1%, Fines (200): 1.63%; (230): 1.56% (SW)
-38.5	1.5		Poorly graded silty sand (f), dark gray (10YR-4/1), (SP-SM).	S2	Sample #S2, Depth = 0.7' - 1.5' Mean (mm): 0.22, Phi Sorting: 0.85 Shell: 0%, Fines (200): 6.20%; (230): 5.89% (SP-SM)
				S3	Sample #S3, Depth = 1.5' - 6.5' Mean (mm): 0.28, Phi Sorting: 1.31 Shell: 0%, Fines (200): 38.65%; (230): 37.96% (SM)
			Silty sand (m), pocket of sand from 9.0' -9.2', very dark gray (10YR-3/1), (SM).		
-48.0	11.0				
			End of Boring		

0 5 10 15

FLORIDA DEP ROSS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

SAJ FORM 1836 JUN 02 **MODIFIED FOR THE FLORIDA DEP** JUN 04

Boring Designation 2023-WH-09

DRILLING LOG

DIVISION	Moffatt & Nichol
INSTALLATION	Offshore Oak Island, North Carolina
SHEET	1 OF 1 SHEETS
1. PROJECT	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
2. BORING DESIGNATION	2023-WH-09
LOCATION COORDINATES	X = 2298845.708 Y = 43350.273
3. DRILLING AGENCY	Amdrill, Inc
PROJECT NO.	10128/02
4. NAME OF DRILLER	Brian Simmons
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	0.0 Ft.
7. DEPTH DRILLED INTO ROCK	0.0 Ft.
8. TOTAL DEPTH OF BORING	10.0 Ft.
9. SIZE AND TYPE OF BIT	4.0 In.
10. COORDINATE SYSTEM/DATUM	State Plane North Carolina FIPS 3200 Feet
HORIZONTAL	NAD 1983
VERTICAL	NAVD 88
11. MANUFACTURER'S DESIGNATION OF DRILL	Amdrill 80 Pneumatic Sampler
☐ AUTO HAMMER ☐ MANUAL HAMMER	
12. TOTAL SAMPLES	
DISTURBED	5
UNDISTURBED (UD)	
13. TOTAL NUMBER CORE BOXES	2
14. ELEVATION GROUND WATER	
15. DATE BORING	
STARTED	06-09-23 09:23
COMPLETED	06-09-23 09:25
16. ELEVATION TOP OF BORING	-19.5 Ft.
17. TOTAL RECOVERY FOR BORING	9 Ft.
18. SIGNATURE AND TITLE OF INSPECTOR	Finn Whiting, P.G.

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	SIEVE SAMPLE	REMARKS
-19.5	0.0				
-20.2	0.7		Well graded sand (m), light brownish gray (10YR-6/2), (SW).	S1	Sample #S1, Depth = 0.0' - 0.7' Mean (mm): 0.47, Phi Sorting: 0.87 Shell: 0%, Fines (200): 0.83%; (230): 0.82% (SW)
				S2	Sample #S2, Depth = 0.7' - 5.0' Mean (mm): 0.27, Phi Sorting: 0.43 Shell: 0%, Fines (200): 0.57%; (230): 0.55% (SP)
			Poorly graded sand (m), gray (10YR-6/1), (SP).		
				S3	Sample #S3, Depth = 5.0' - 9.0' Mean (mm): 0.25, Phi Sorting: 0.38 Shell: 0%, Fines (200): 0.87%; (230): 0.87% (SP)
-28.5	9.0				
-29.5	10.0		No recovery.		
			End of Boring		

0 5 10 15

FLORIDA DEP ROSS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

SAJ FORM 1836 JUN 02 **MODIFIED FOR THE FLORIDA DEP** JUN 04

Boring Designation 2023-WH-10

DRILLING LOG

DIVISION	Moffatt & Nichol
INSTALLATION	Offshore Oak Island, North Carolina
SHEET	1 OF 1 SHEETS

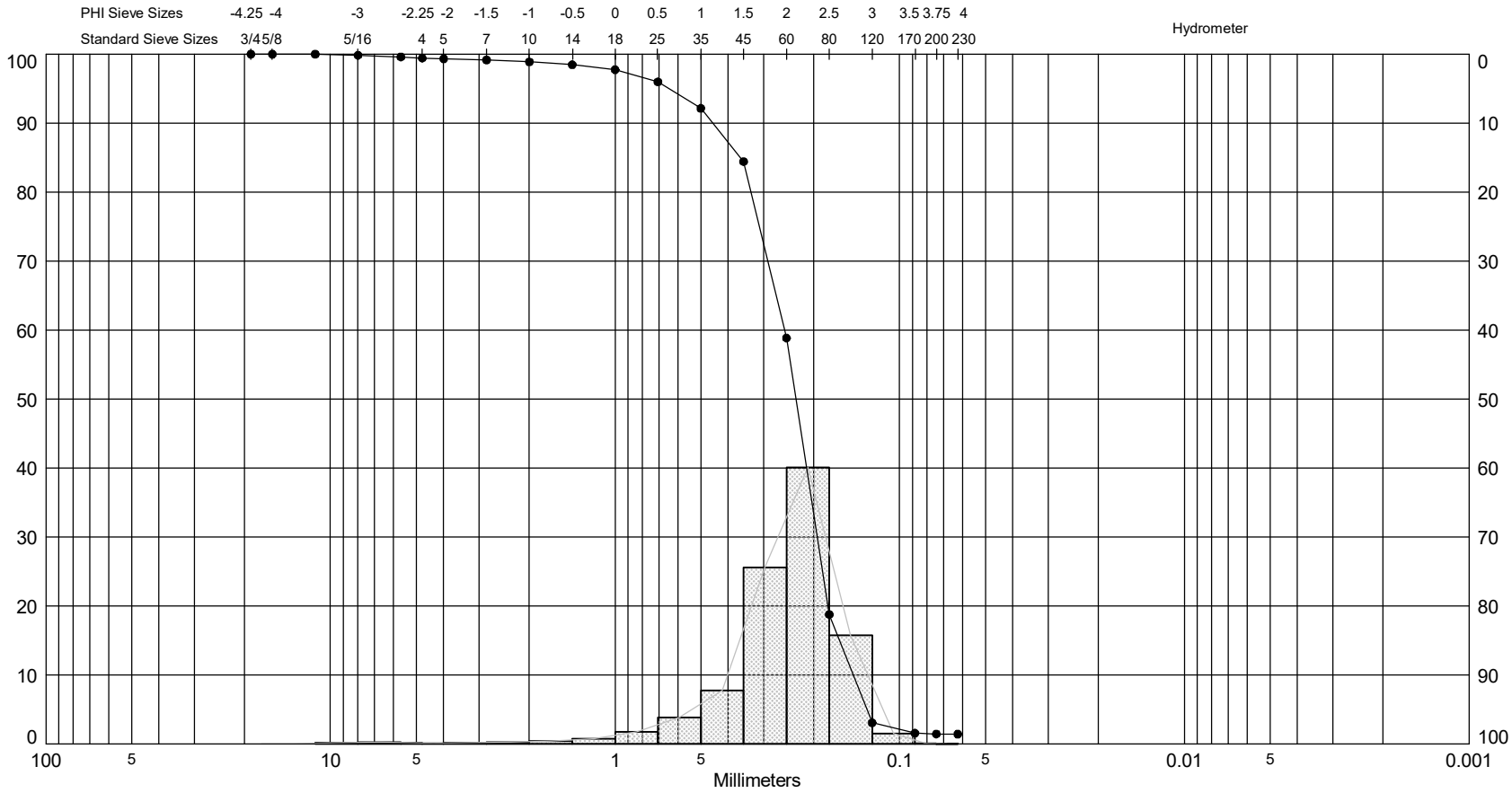
1. PROJECT: Stage 2 Oak Island Beach Management Plan - Town of Oak Island
2. BORING DESIGNATION: 2023-WH-10
3. DRILLING AGENCY: Amdrill, Inc
4. NAME OF DRILLER: Brian Simmons
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED
6. THICKNESS OF OVERBURDEN: 0.0 Ft.
7. DEPTH DRILLED INTO ROCK: 0.0 Ft.
8. TOTAL DEPTH OF BORING: 10.0 Ft.
9. SIZE AND TYPE OF BIT: 4.0 In.
10. COORDINATE SYSTEM/DATUM: State Plane North Carolina FIPS 3200 Feet; HORIZONTAL: NAD 1983; VERTICAL: NAVD 88
11. MANUFACTURER'S DESIGNATION OF DRILL: Amdrill 80 Pneumatic Sampler; ☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES: DISTURBED 6; UNDISTURBED (UD)
13. TOTAL NUMBER CORE BOXES: 2
14. ELEVATION GROUND WATER
15. DATE BORING: STARTED 06-09-23 09:07; COMPLETED 06-09-23 09:08
16. ELEVATION TOP OF BORING: -50.7 Ft.
17. TOTAL RECOVERY FOR BORING: 9.1 Ft.
18. SIGNATURE AND TITLE OF INSPECTOR: Finn Whiting, P.G.

ELEV. (ft)	DEPTH (ft)	LEGEND	CLASSIFICATION OF MATERIALS Depths and elevations based on measured values	SIEVE SAMPLE	REMARKS
-50.7	0.0				
			Well graded sand (c), trace shell fragments (up to 0.04' in size), light brownish gray (10YR-6/2), (SW).	S1	Sample #S1, Depth = 0.0' - 2.7' Mean (mm): 0.71, Phi Sorting: 0.89 Shell: 2%, Fines (200): 1.00%; (230): 0.99% (SW)
-53.4	2.7				
-53.8	3.1		Silty sand (m), with organic inclusions throughout, pocket of sand from 2.8' - 2.9', very dark gray (10YR-3/1), (SM).	S2	Sample #S2, Depth = 2.7' - 3.1' Mean (mm): 0.32, Phi Sorting: 1.01 Shell: 0%, Fines (200): 31.42%; (230): 30.95% (SM)
			Silt, with organic inclusions throughout (up to 0.40' in size) dark gray (10YR-4/1) to, very dark gray (10YR-3/1), (ML).		
-59.8	9.1				
-60.7	10.0		No recovery.		
			End of Boring		

0 5 10 15

FLORIDA DEP ROSS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

SAJ FORM 1836 JUN 02 MODIFIED FOR THE FLORIDA DEP JUN 04



Sample	Symbol	Elev. (ft)	USCS	% Fines		% Carbonates	Median	Mean	Skew	Kurt	Sort
2023-WH-01 #S1	—●—	-48.1	SP	#200 - 1.44	#230 - 1.41	10.09	2.11	1.96	-2.42	13.43	0.77

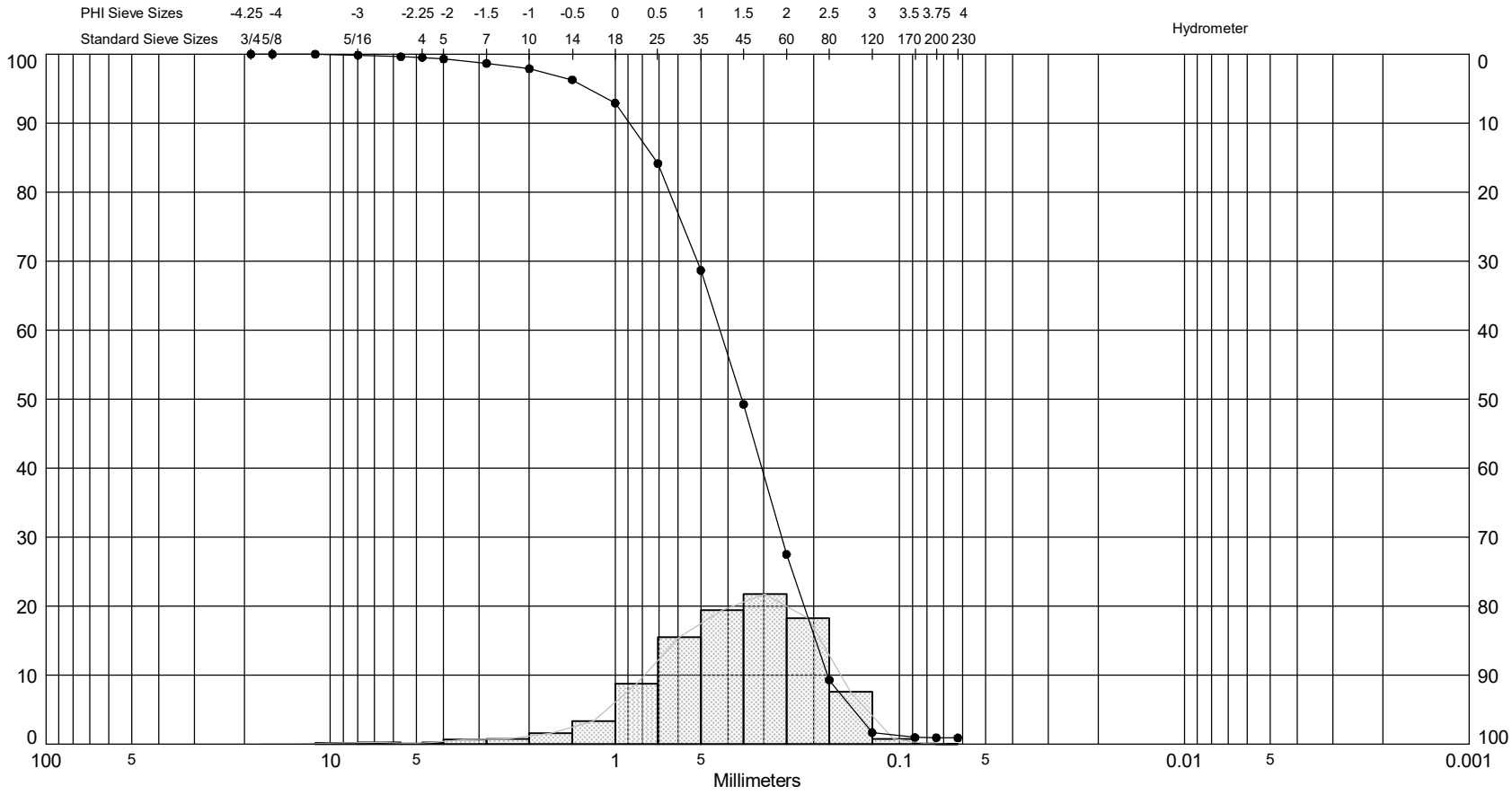
Comments: Poorly graded sand (m), trace silt

Depths and elevations based on measured values

Sample Information	
Project Name:	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
Analysis Date:	11-02-23
Easting (X, ft):	2301361.65
Northing (Y, ft):	50974.265
Horizontal System:	NAD 1983
Vertical System:	NAVD 88

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SIEVE ANALYSIS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23



Sample	Symbol	Elev. (ft)	USCS	% Fines		% Carbonates	Median	Mean	Skew	Kurt	Sort
2023-WH-01 #S2	—●—	-51.4	SW	#200 - 0.91	#230 - 0.89	11.08	1.48	1.36	-0.94	4.82	0.96

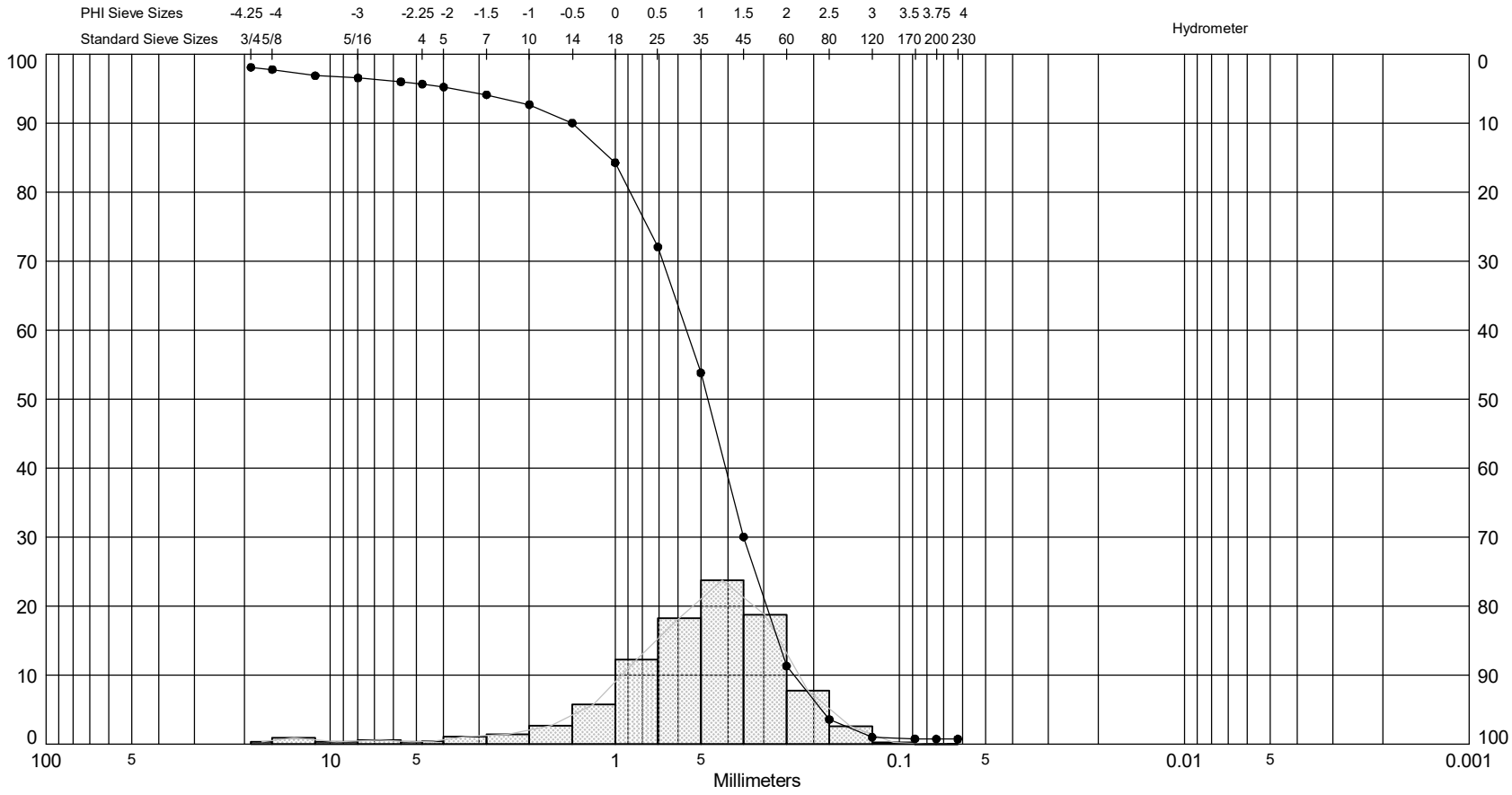
Comments: Well graded sand (m)

Depths and elevations based on measured values

Sample Information	
Project Name:	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
Analysis Date:	11-02-23
Easting (X, ft):	2301361.65
Northing (Y, ft):	50974.265
Horizontal System:	NAD 1983
Vertical System:	NAVD 88

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SIEVE ANALYSIS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23



Sample	Symbol	Elev. (ft)	USCS	% Fines		% Carbonates	Median	Mean	Skew	Kurt	Sort
2023-WH-01 #S3	—●—	-54.4	SW	#200 - 0.73	#230 - 0.72	14.85	1.08	0.81	-1.27	6.46	1.12

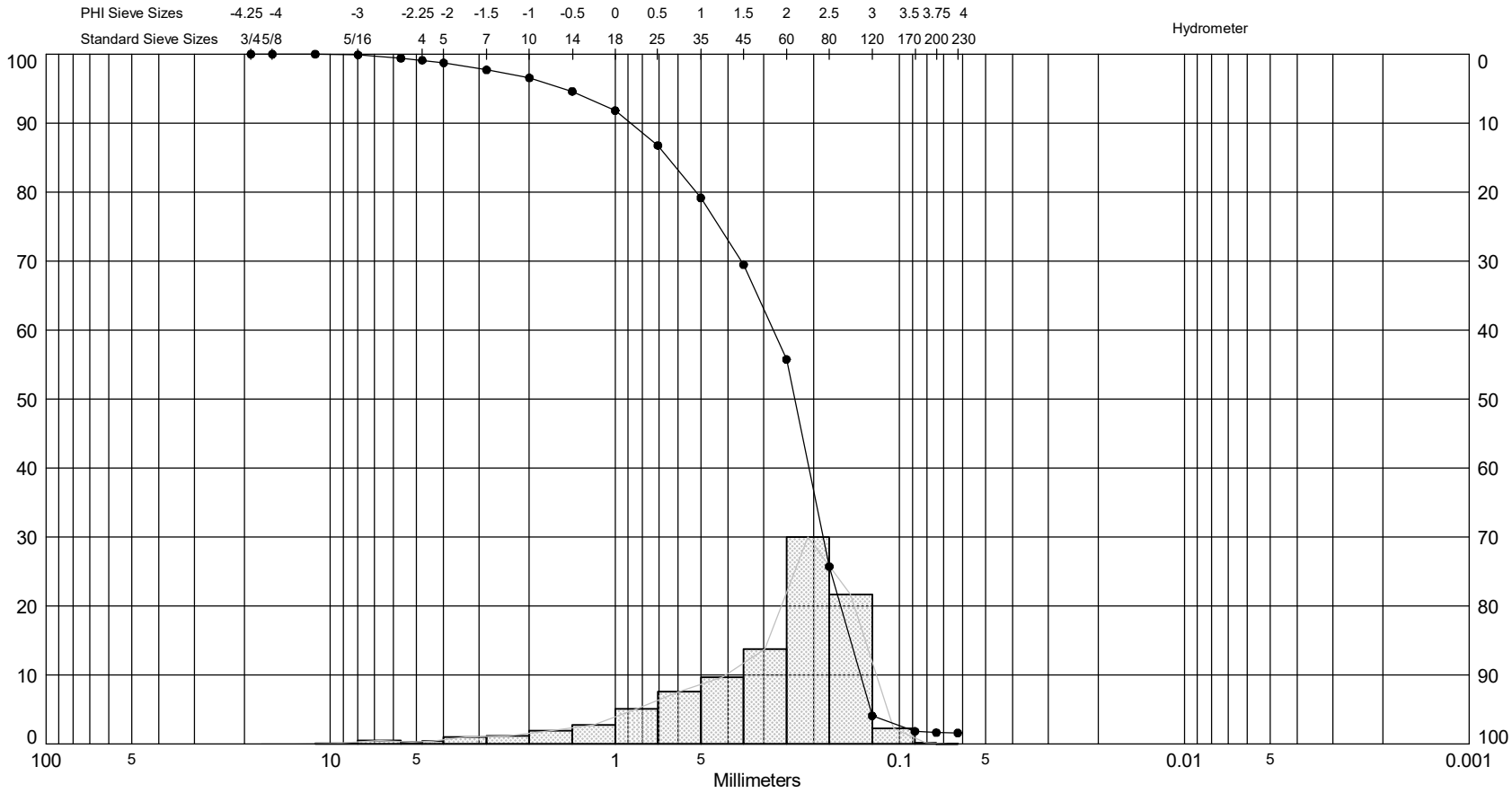
Comments: Well graded sand (c), trace shell fragments

Depths and elevations based on measured values

Sample Information	
Project Name:	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
Analysis Date:	11-02-23
Easting (X, ft):	2301361.65
Northing (Y, ft):	50974.265
Horizontal System:	NAD 1983
Vertical System:	NAVD 88

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SIEVE ANALYSIS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23



Sample	Symbol	Elev. (ft)	USCS	% Fines		% Carbonates	Median	Mean	Skew	Kurt	Sort
2023-WH-02B #S1	—●—	-39.6	SW	#200 - 1.63	#230 - 1.59	15.11	2.1	1.73	-1.47	5.3	1.13

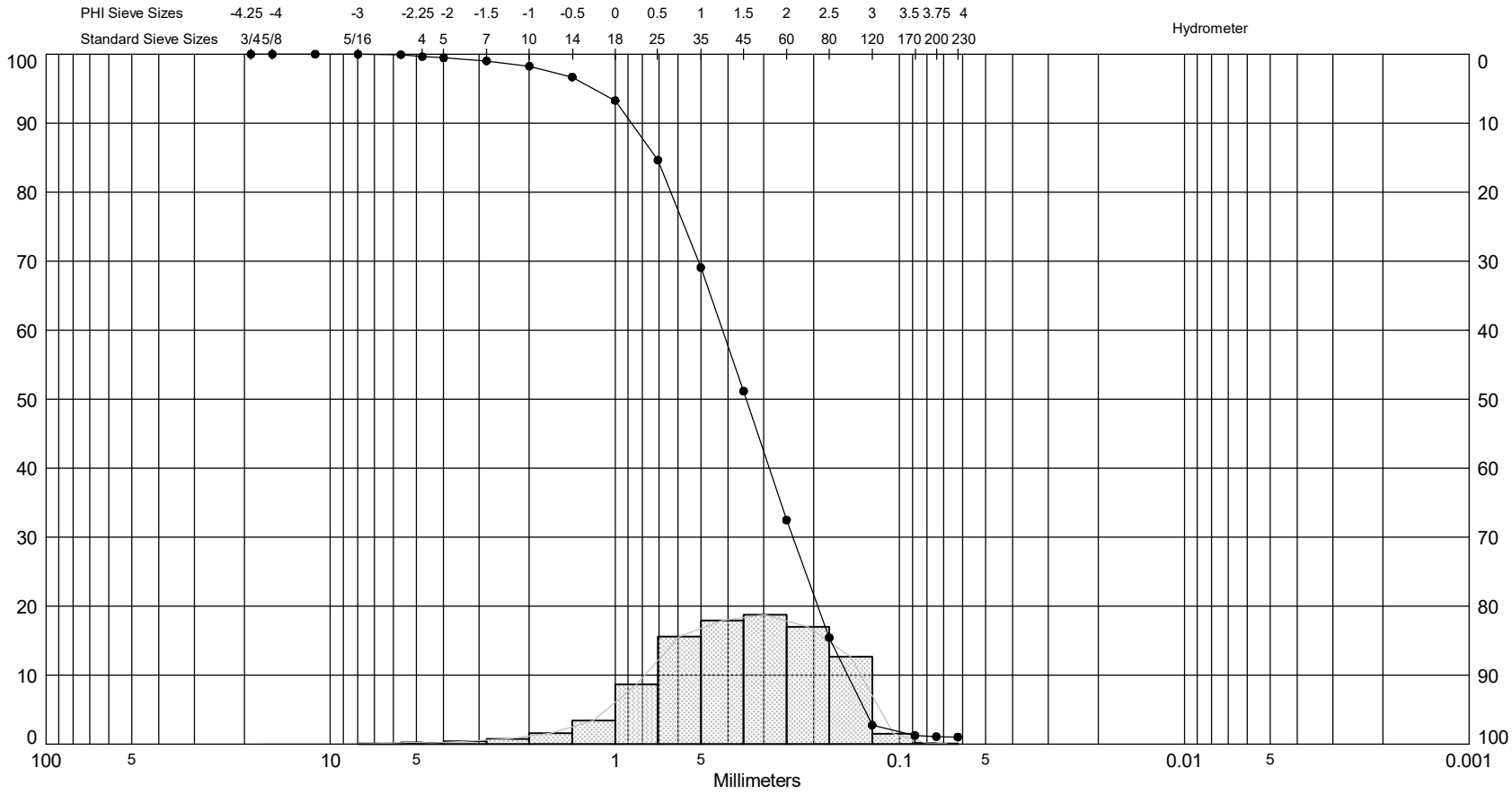
Comments: Well graded sand (m), trace shell fragments, trace silt

Depths and elevations based on measured values

Sample Information	
Project Name:	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
Analysis Date:	11-01-23
Easting (X, ft):	2301038.604
Northing (Y, ft):	49004.422
Horizontal System:	NAD 1983
Vertical System:	NAVD 88

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SIEVE ANALYSIS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23



Sample	Symbol	Elev. (ft)	USCS	% Fines		% Carbonates	Median	Mean	Skew	Kurt	Sort
2023-WH-02B #S2	—●—	-41.1	SW	#200 - 1.08	#230 - 1.03	12.80	1.53	1.44	-0.66	3.74	0.98

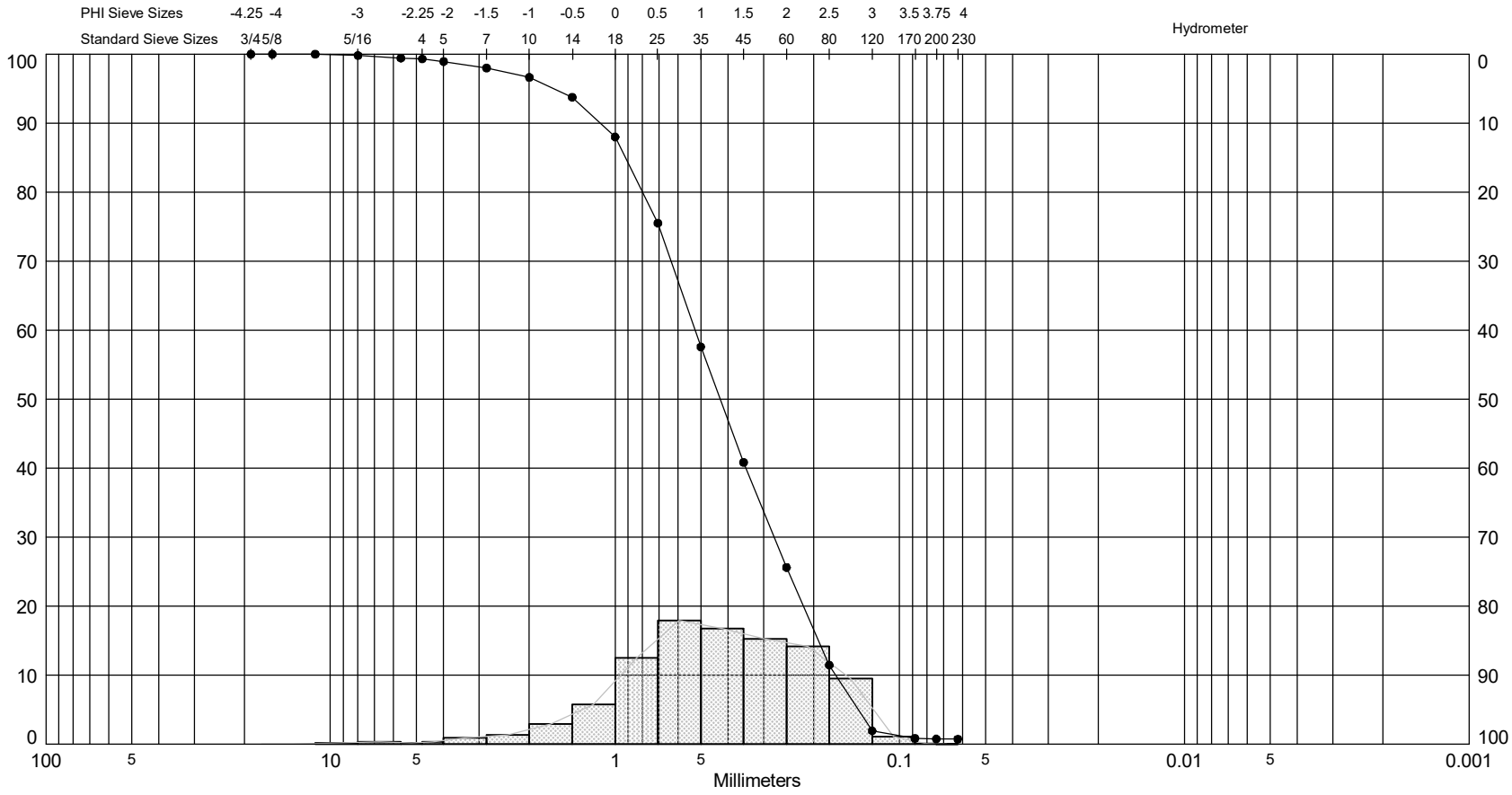
Comments: Well graded sand (m), trace silt

Depths and elevations based on measured values

Sample Information	
Project Name:	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
Analysis Date:	11-02-23
Easting (X, ft):	2301038.604
Northing (Y, ft):	49004.422
Horizontal System:	NAD 1983
Vertical System:	NAVD 88

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SIEVE ANALYSIS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23



Sample	Symbol	Elev. (ft)	USCS	% Fines		% Carbonates	Median	Mean	Skew	Kurt	Sort
2023-WH-02B #S3	—●—	-44.1	SW	#200 - 0.74	#230 - 0.71	14.09	1.23	1.17	-0.62	3.69	1.09

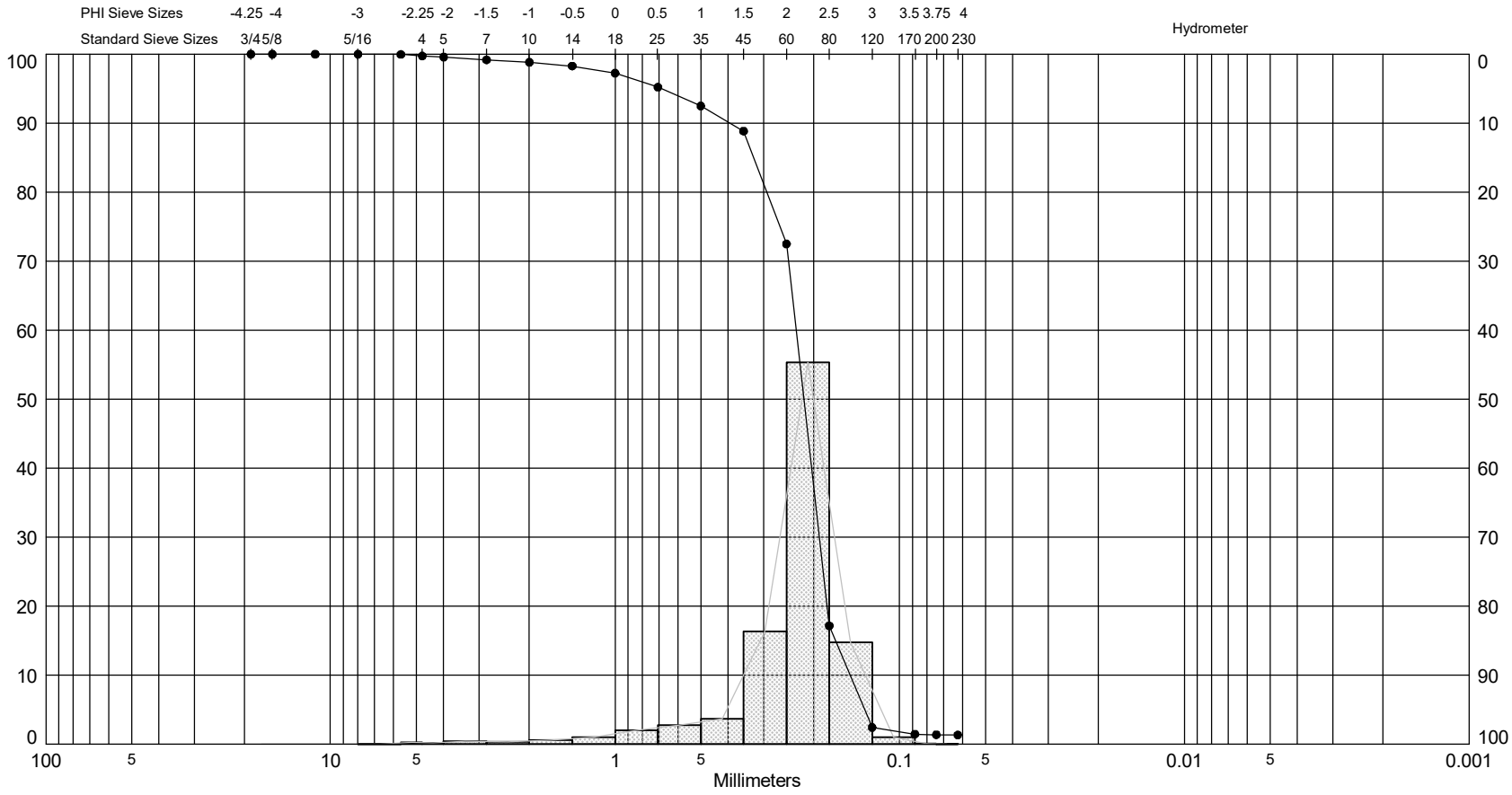
Comments: Well graded sand (m), trace shell fragments, trace silt

Depths and elevations based on measured values

Sample Information	
Project Name:	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
Analysis Date:	11-01-23
Easting (X, ft):	2301038.604
Northing (Y, ft):	49004.422
Horizontal System:	NAD 1983
Vertical System:	NAVD 88

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SIEVE ANALYSIS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23



Sample	Symbol	Elev. (ft)	USCS	% Fines		% Carbonates	Median	Mean	Skew	Kurt	Sort
2023-WH-03 #S1	—●—	-47.4	SP	#200 - 1.36	#230 - 1.32	10.69	2.2	2.04	-2.67	12.93	0.74

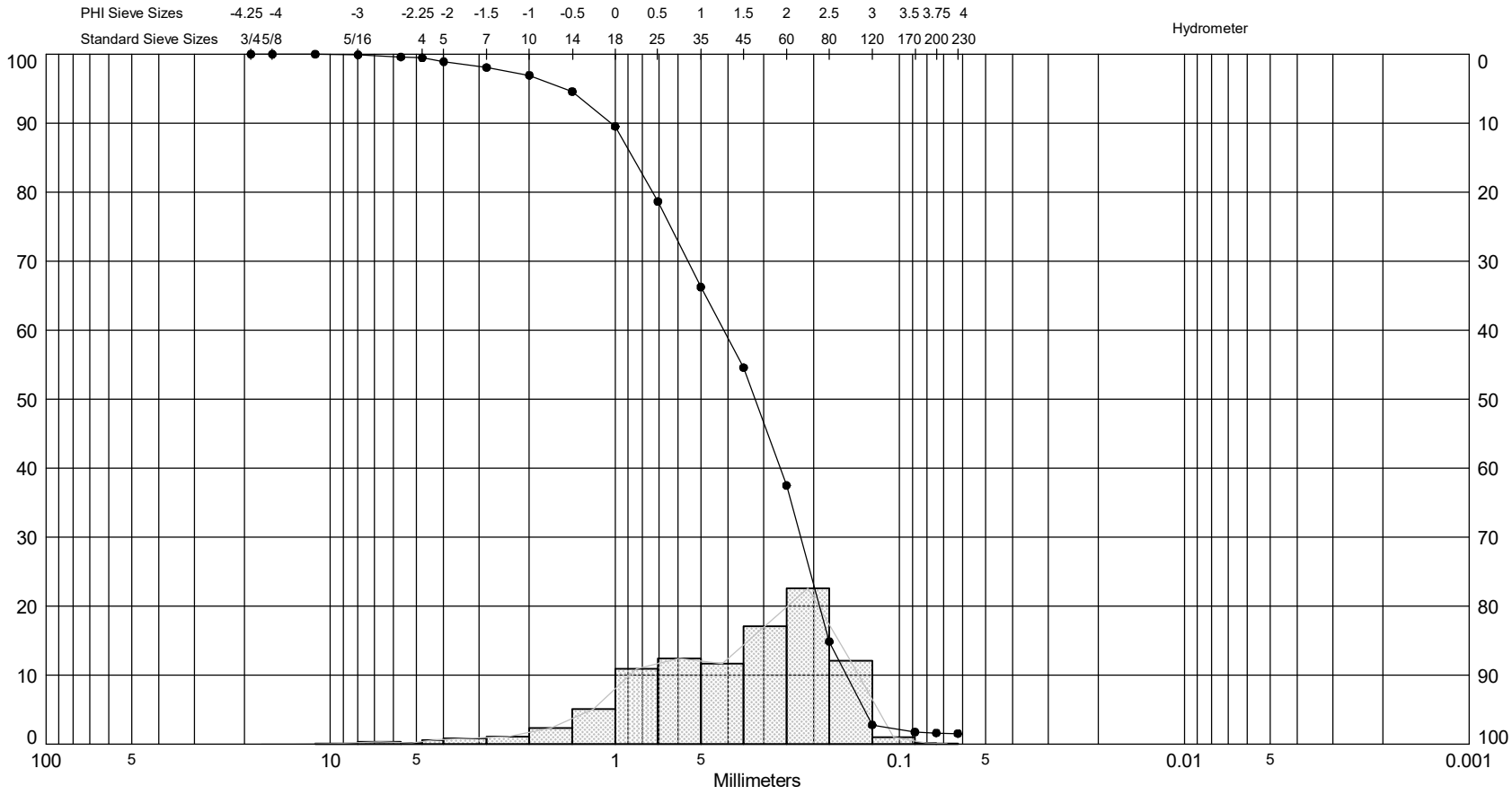
Comments: Poorly graded sand (f), trace silt

Depths and elevations based on measured values

Sample Information	
Project Name:	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
Analysis Date:	11-02-23
Easting (X, ft):	2296910.61
Northing (Y, ft):	40112.41
Horizontal System:	NAD 1983
Vertical System:	NAVD 88

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SIEVE ANALYSIS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23



Sample	Symbol	Elev. (ft)	USCS	% Fines		% Carbonates	Median	Mean	Skew	Kurt	Sort
2023-WH-03 #S2	—●—	-51.0	SW	#200 - 1.62	#230 - 1.54	12.56	1.63	1.38	-0.86	3.68	1.11

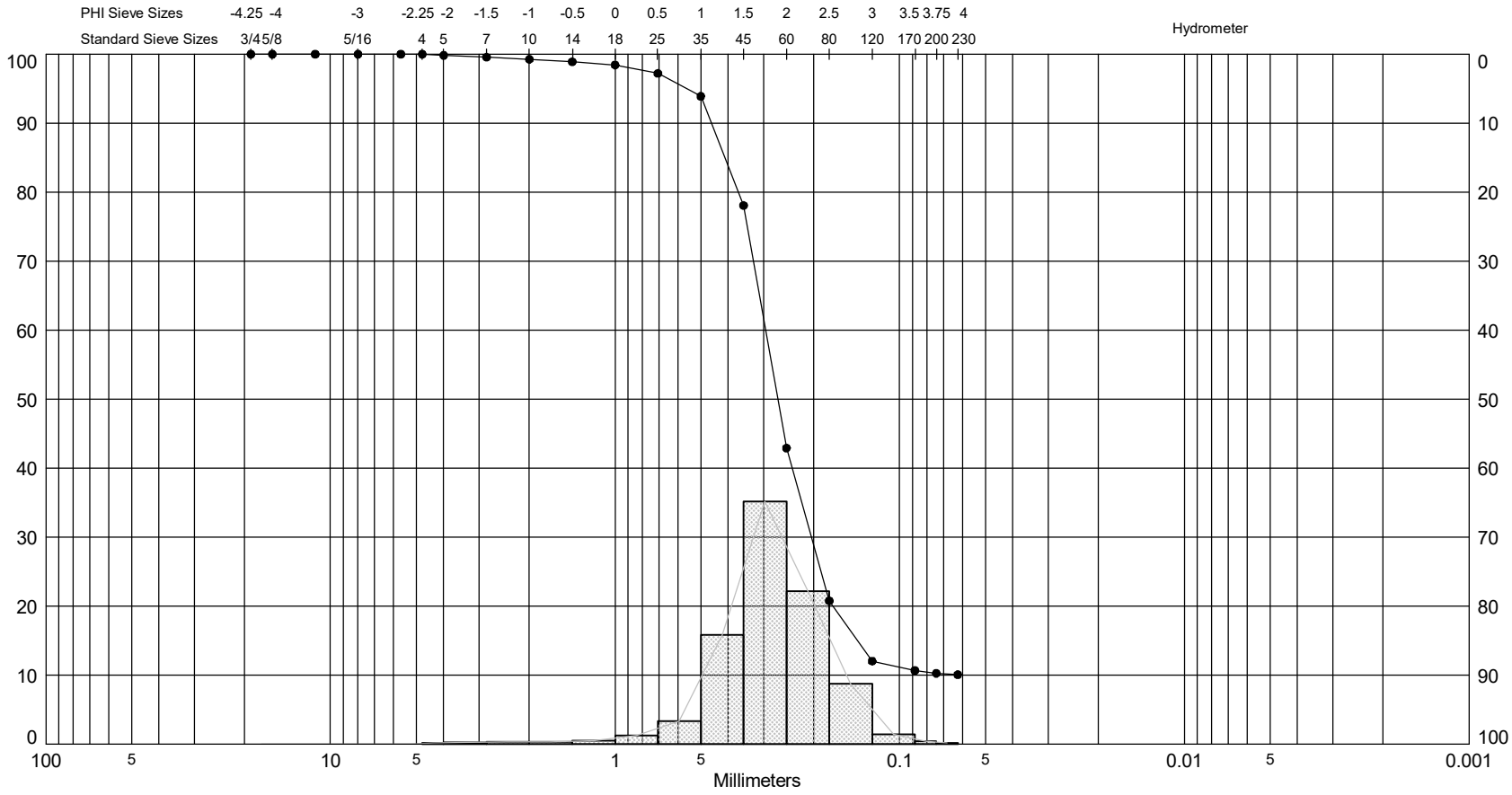
Comments: Well graded sand (m), trace shell fragments

Depths and elevations based on measured values

Sample Information	
Project Name:	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
Analysis Date:	11-02-23
Easting (X, ft):	2296910.61
Northing (Y, ft):	40112.41
Horizontal System:	NAD 1983
Vertical System:	NAVD 88

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SIEVE ANALYSIS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23



Sample	Symbol	Elev. (ft)	USCS	% Fines		% Carbonates	Median	Mean	Skew	Kurt	Sort
2023-WH-03 #S3	—●—	-52.2	SP-SM	#200 - 10.26	#230 - 10.06	2.50	1.9	1.81	-1.23	8.57	0.68

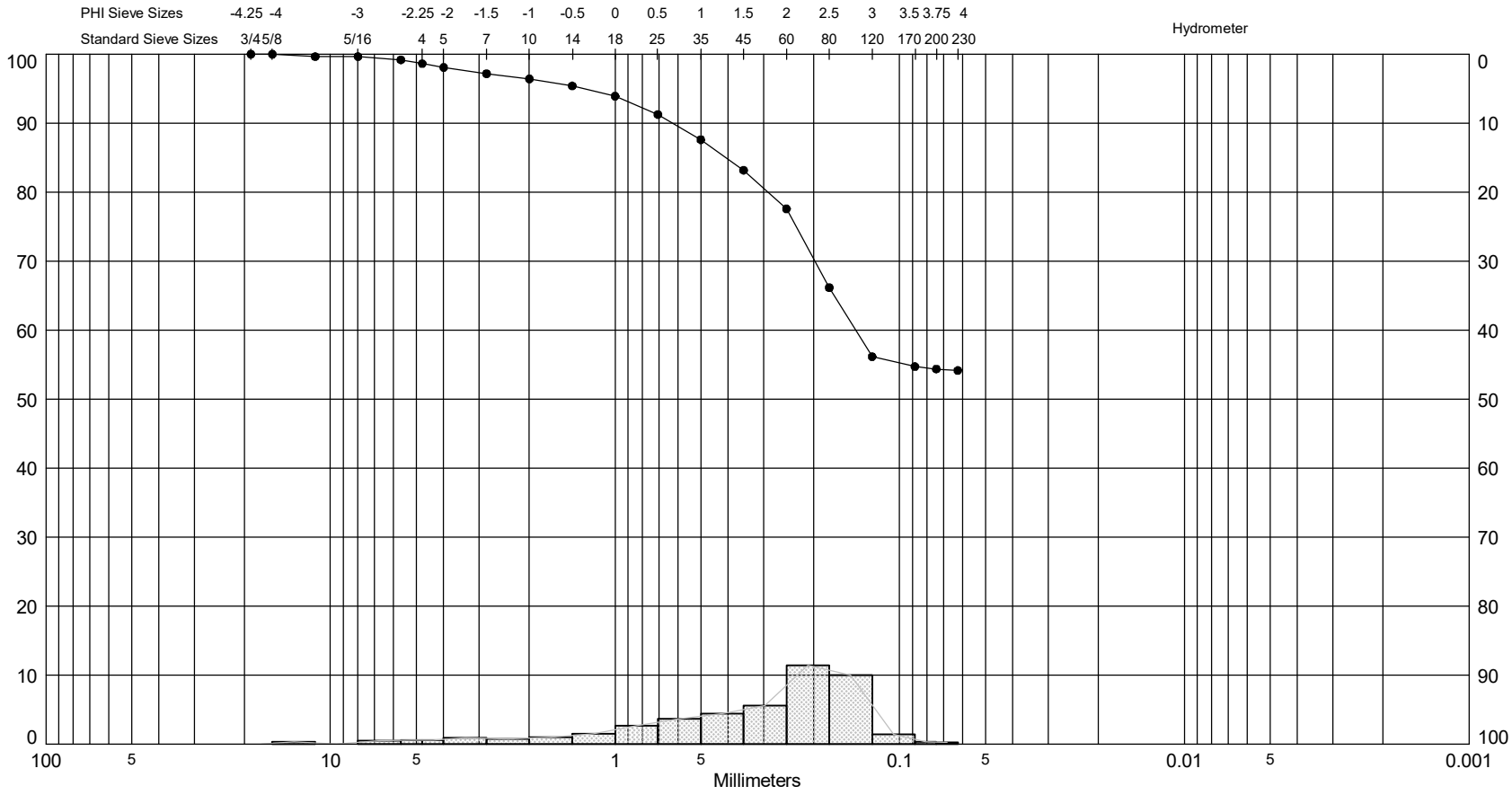
Comments: Poorly graded silty sand (m), with lenses of silt

Depths and elevations based on measured values

Sample Information	
Project Name:	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
Analysis Date:	11-02-23
Easting (X, ft):	2296910.61
Northing (Y, ft):	40112.41
Horizontal System:	NAD 1983
Vertical System:	NAVD 88

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SIEVE ANALYSIS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23



Sample	Symbol	Elev. (ft)	USCS	% Fines		% Carbonates	Median	Mean	Skew	Kurt	Sort
2023-WH-03 #S4	—●—	-53.2	ML	#200 - 54.37	#230 - 54.15	9.15		1.53	-1.38	4.63	1.44

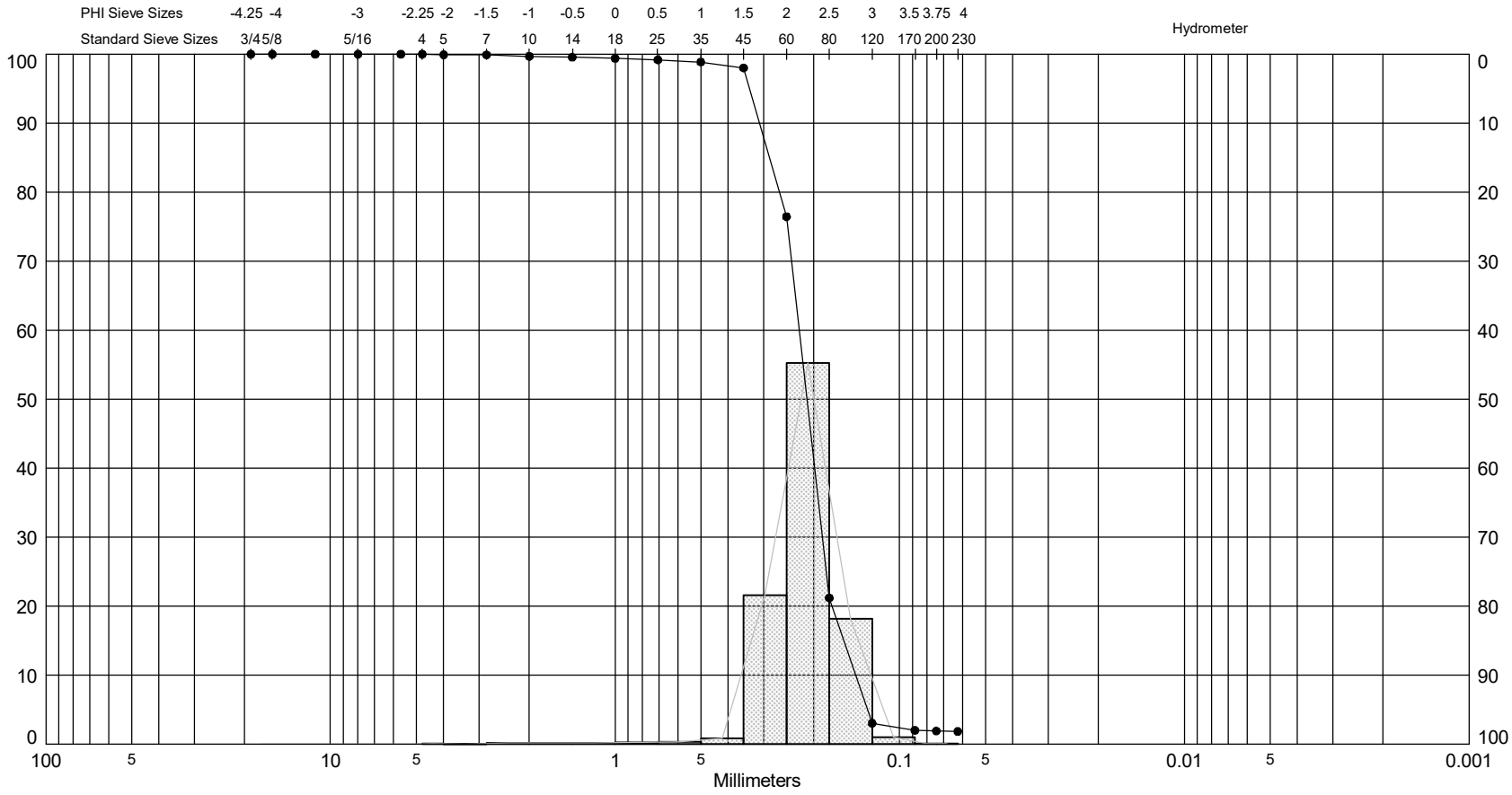
Comments: Silt, with organic inclusions

Depths and elevations based on measured values

Sample Information	
Project Name:	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
Analysis Date:	11-02-23
Easting (X, ft):	2296910.61
Northing (Y, ft):	40112.41
Horizontal System:	NAD 1983
Vertical System:	NAVD 88

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SIEVE ANALYSIS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23



Sample	Symbol	Elev. (ft)	USCS	% Fines		% Carbonates	Median	Mean	Skew	Kurt	Sort
2023-WH-04 #S1	—●—	-48.2	SP	#200 - 1.90	#230 - 1.84	6.30	2.24	2.21	-2.52	21.44	0.45

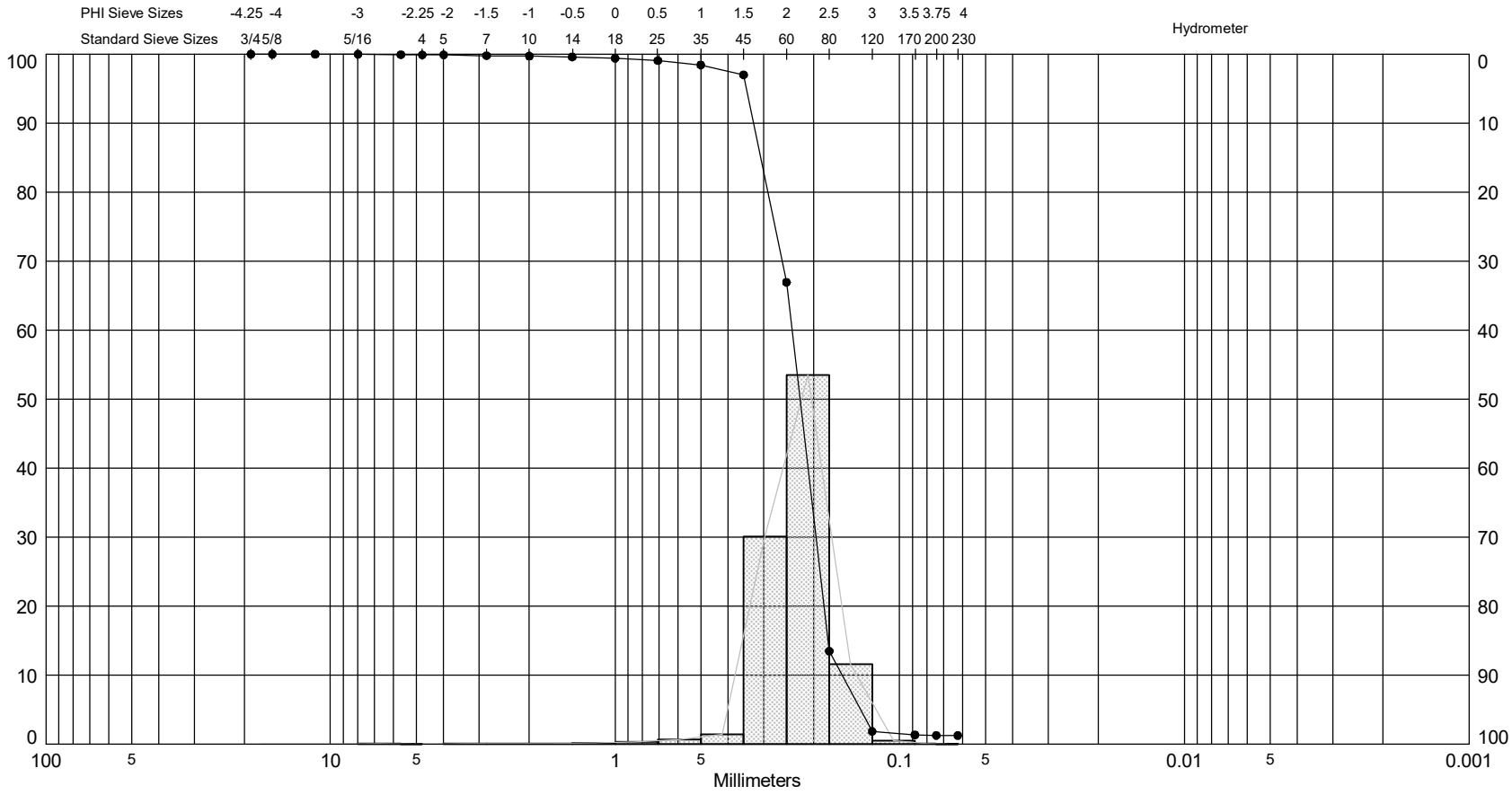
Comments: Poorly graded sand (f), trace silt

Depths and elevations based on measured values

Sample Information	
Project Name:	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
Analysis Date:	11-01-23
Easting (X, ft):	2297840.622
Northing (Y, ft):	41878.552
Horizontal System:	NAD 1983
Vertical System:	NAVD 88

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SIEVE ANALYSIS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23



Sample	Symbol	Elev. (ft)	USCS	% Fines		% Carbonates	Median	Mean	Skew	Kurt	Sort
2023-WH-04 #S2	—●—	-51.3	SP	#200 - 1.26	#230 - 1.24	4.81	2.16	2.11	-2.82	25.19	0.46

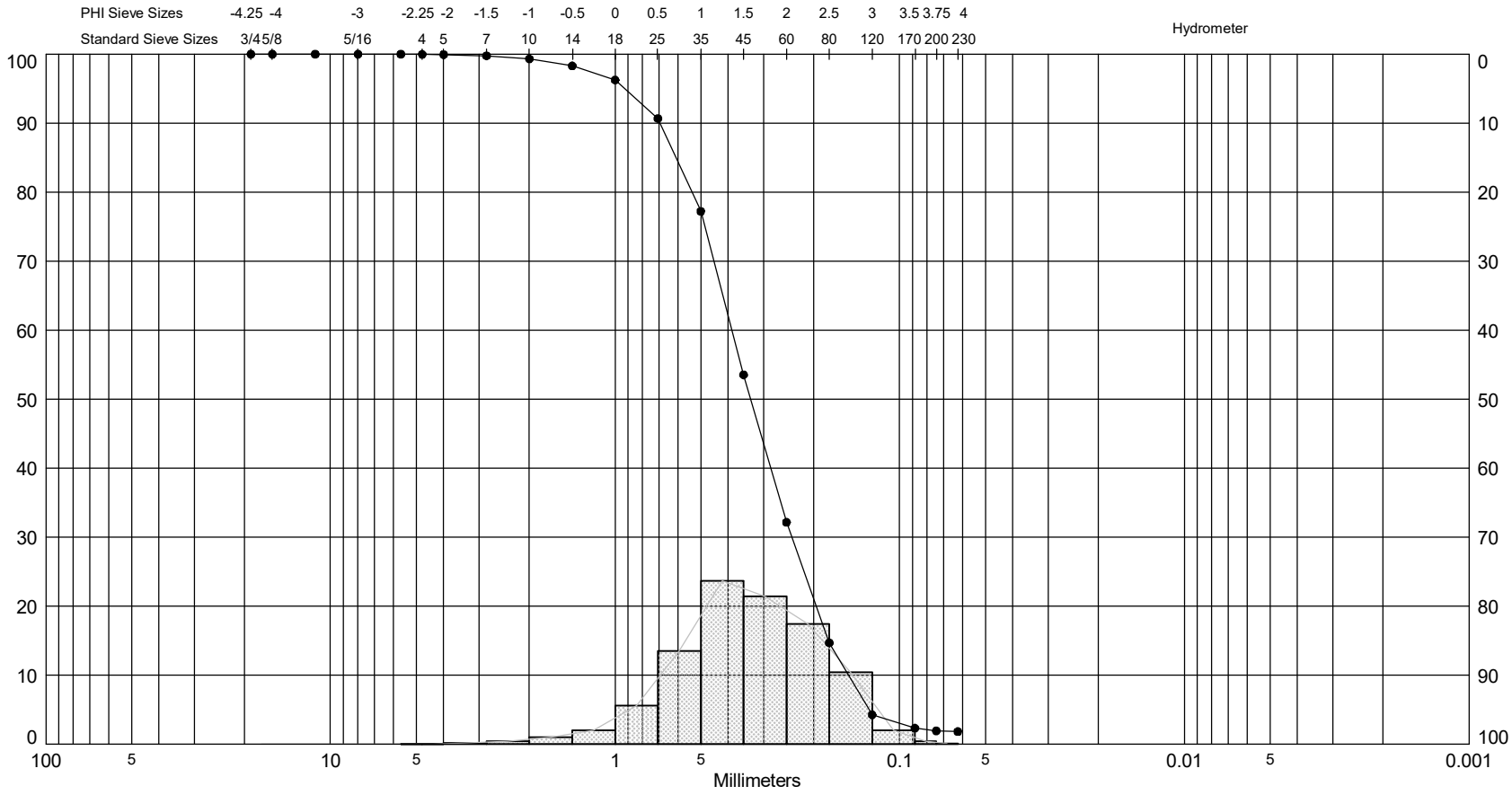
Comments: Poorly graded sand (f), trace silt

Depths and elevations based on measured values

Sample Information	
Project Name:	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
Analysis Date:	11-01-23
Easting (X, ft):	2297840.622
Northing (Y, ft):	41878.552
Horizontal System:	NAD 1983
Vertical System:	NAVD 88

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SIEVE ANALYSIS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23



Sample	Symbol	Elev. (ft)	USCS	% Fines		% Carbonates	Median	Mean	Skew	Kurt	Sort
2023-WH-04 #S3	—●—	-54.1	SP	#200 - 1.92	#230 - 1.80	0.78	1.58	1.55	-0.42	3.62	0.85

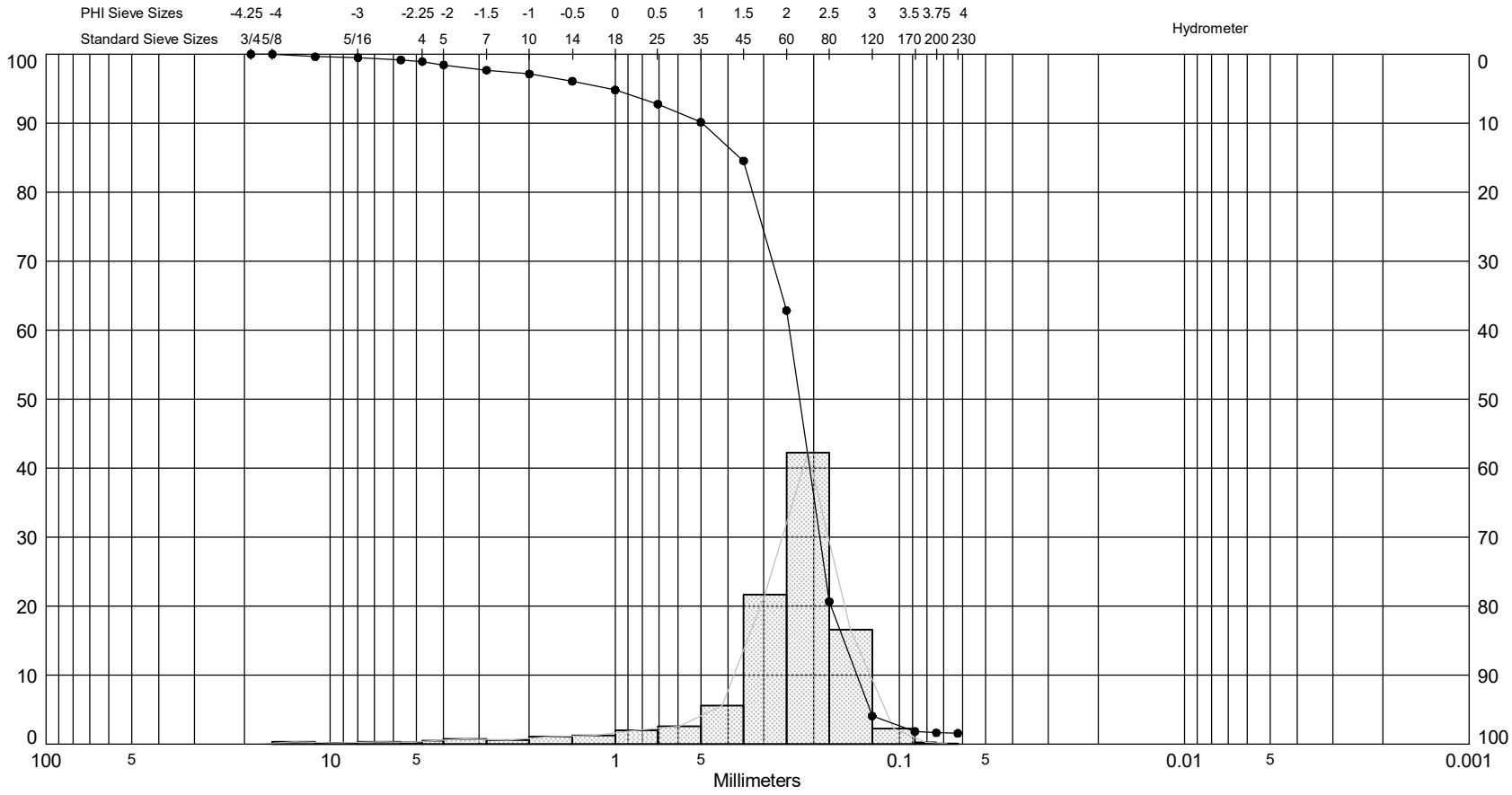
Comments: Poorly graded sand (m), trace silt

Depths and elevations based on measured values

Sample Information	
Project Name:	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
Analysis Date:	11-01-23
Easting (X, ft):	2297840.622
Northing (Y, ft):	41878.552
Horizontal System:	NAD 1983
Vertical System:	NAVD 88

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SIEVE ANALYSIS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23



Sample	Symbol	Elev. (ft)	USCS	% Fines		% Carbonates	Median	Mean	Skew	Kurt	Sort
2023-WH-08A #S1	—●—	-37.0	SW	#200 - 1.63	#230 - 1.56	6.68	2.15	1.92	-2.63	11.99	1

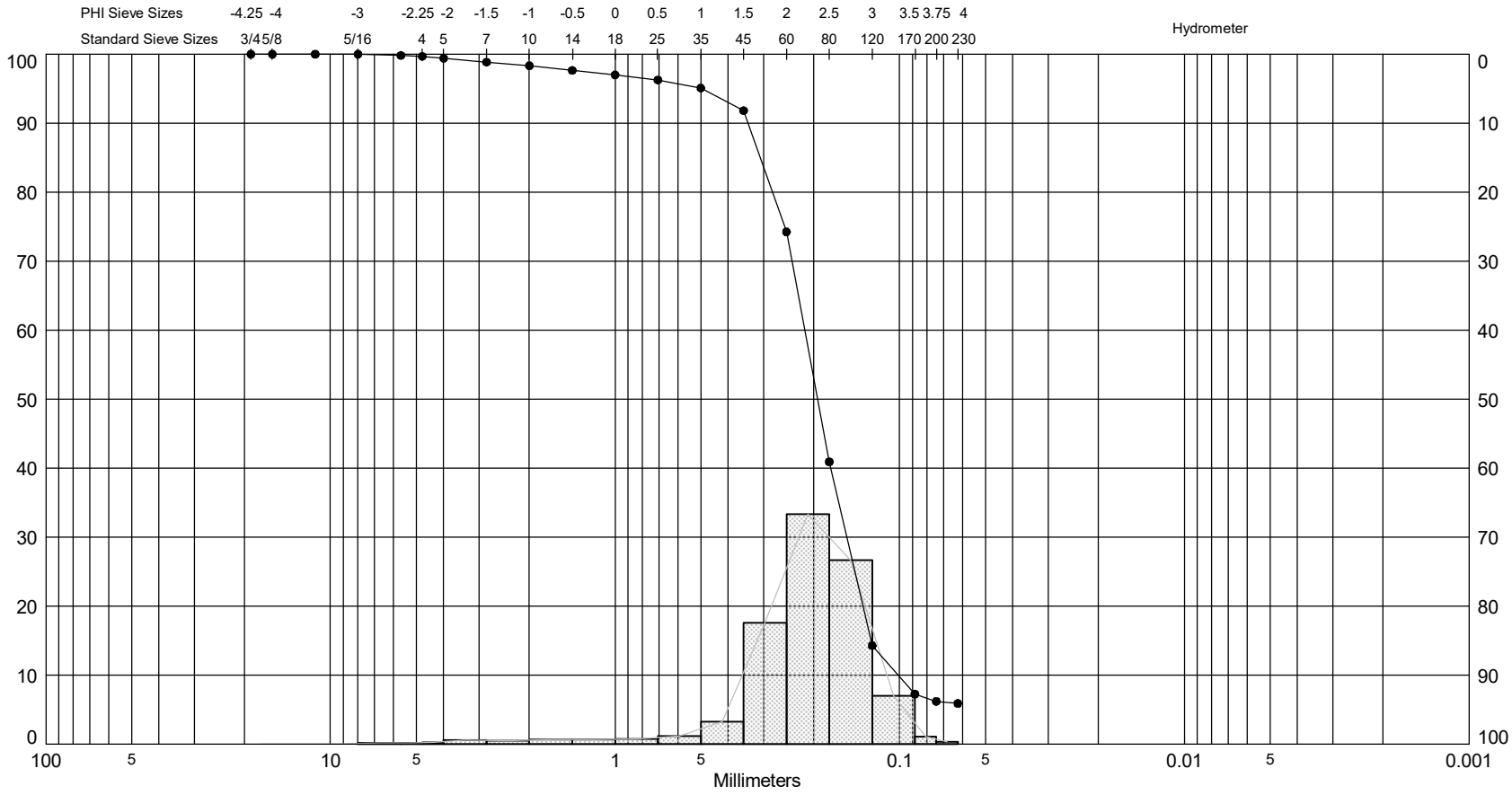
Comments: Well graded sand (m), trace shell fragments, trace silt

Depths and elevations based on measured values

Sample Information	
Project Name:	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
Analysis Date:	11-01-23
Easting (X, ft):	2296321.292
Northing (Y, ft):	38494.509
Horizontal System:	NAD 1983
Vertical System:	NAVD 88

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SIEVE ANALYSIS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23



Sample	Symbol	Elev. (ft)	USCS	% Fines		% Carbonates	Median	Mean	Skew	Kurt	Sort
2023-WH-08A #S2	—●—	-37.7	SP-SM	#200 - 6.20	#230 - 5.89	8.42	2.36	2.21	-2.42	12.15	0.85

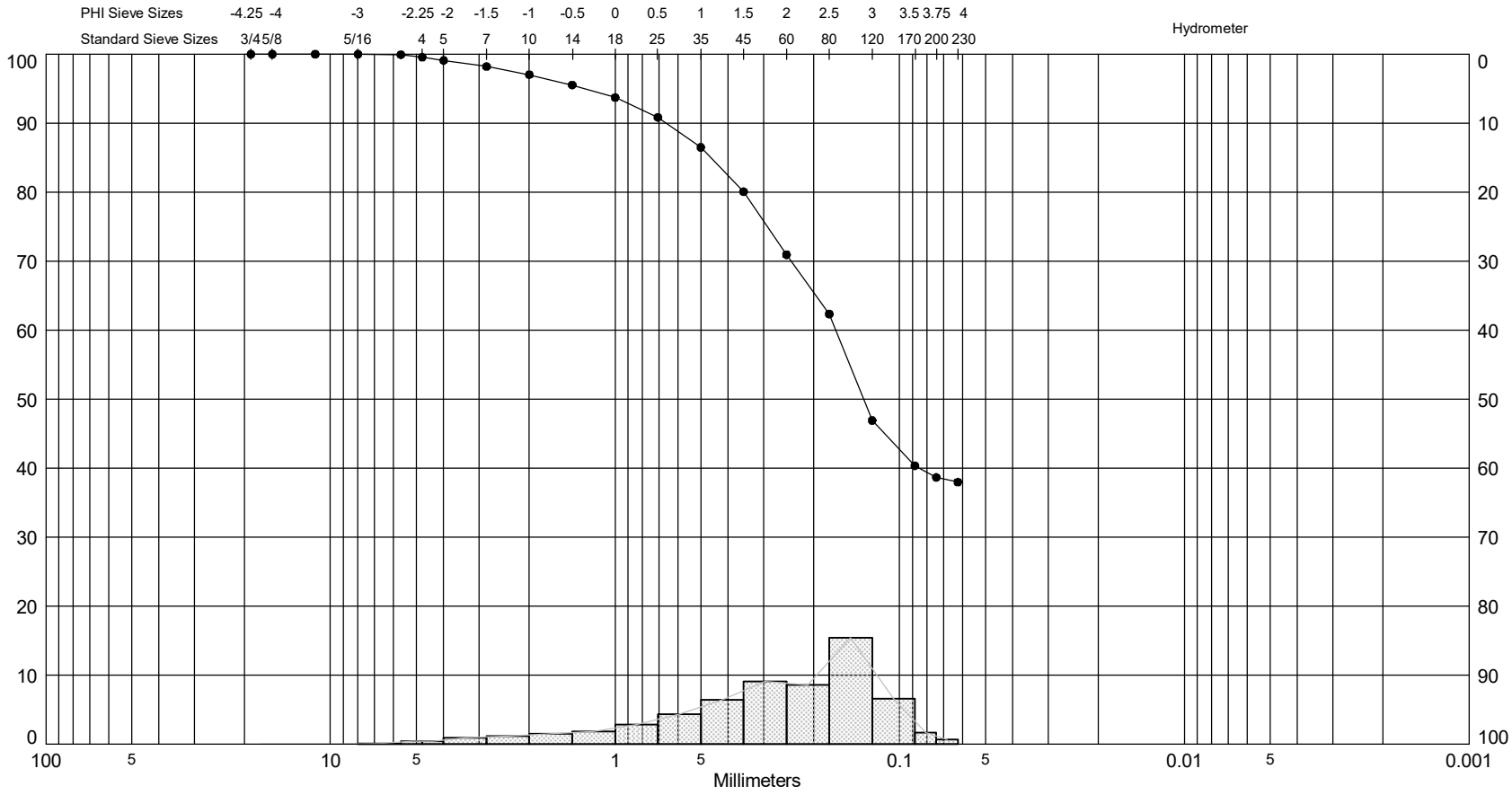
Comments: Poorly graded silty sand (f)

Depths and elevations based on measured values

Sample Information	
Project Name:	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
Analysis Date:	11-01-23
Easting (X, ft):	2296321.292
Northing (Y, ft):	38494.509
Horizontal System:	NAD 1983
Vertical System:	NAVD 88

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SIEVE ANALYSIS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23



Sample	Symbol	Elev. (ft)	USCS	% Fines		% Carbonates	Median	Mean	Skew	Kurt	Sort
2023-WH-08A #S3	—●—	-38.5	SM	#200 - 38.65	#230 - 37.96	8.29	2.9	1.83	-1.07	3.85	1.31

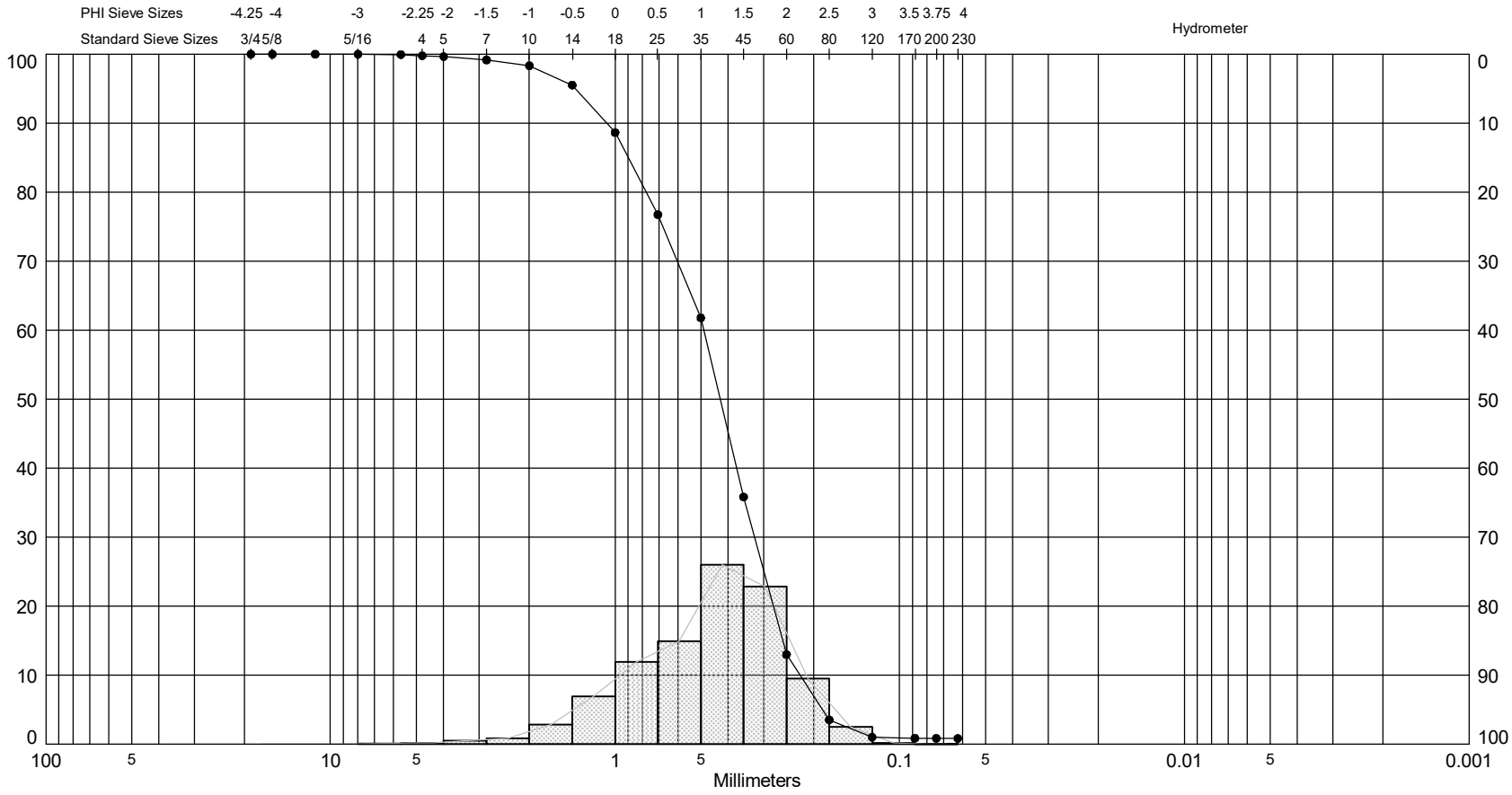
Comments: Silty sand (m)

Depths and elevations based on measured values

Sample Information	
Project Name:	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
Analysis Date:	11-01-23
Easting (X, ft):	2296321.292
Northing (Y, ft):	38494.509
Horizontal System:	NAD 1983
Vertical System:	NAVD 88

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SIEVE ANALYSIS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23



Sample	Symbol	Elev. (ft)	USCS	% Fines		% Carbonates	Median	Mean	Skew	Kurt	Sort
2023-WH-09 #S1	—●—	-19.5	SW	#200 - 0.83	#230 - 0.82	11.19	1.23	1.1	-0.67	3.68	0.87

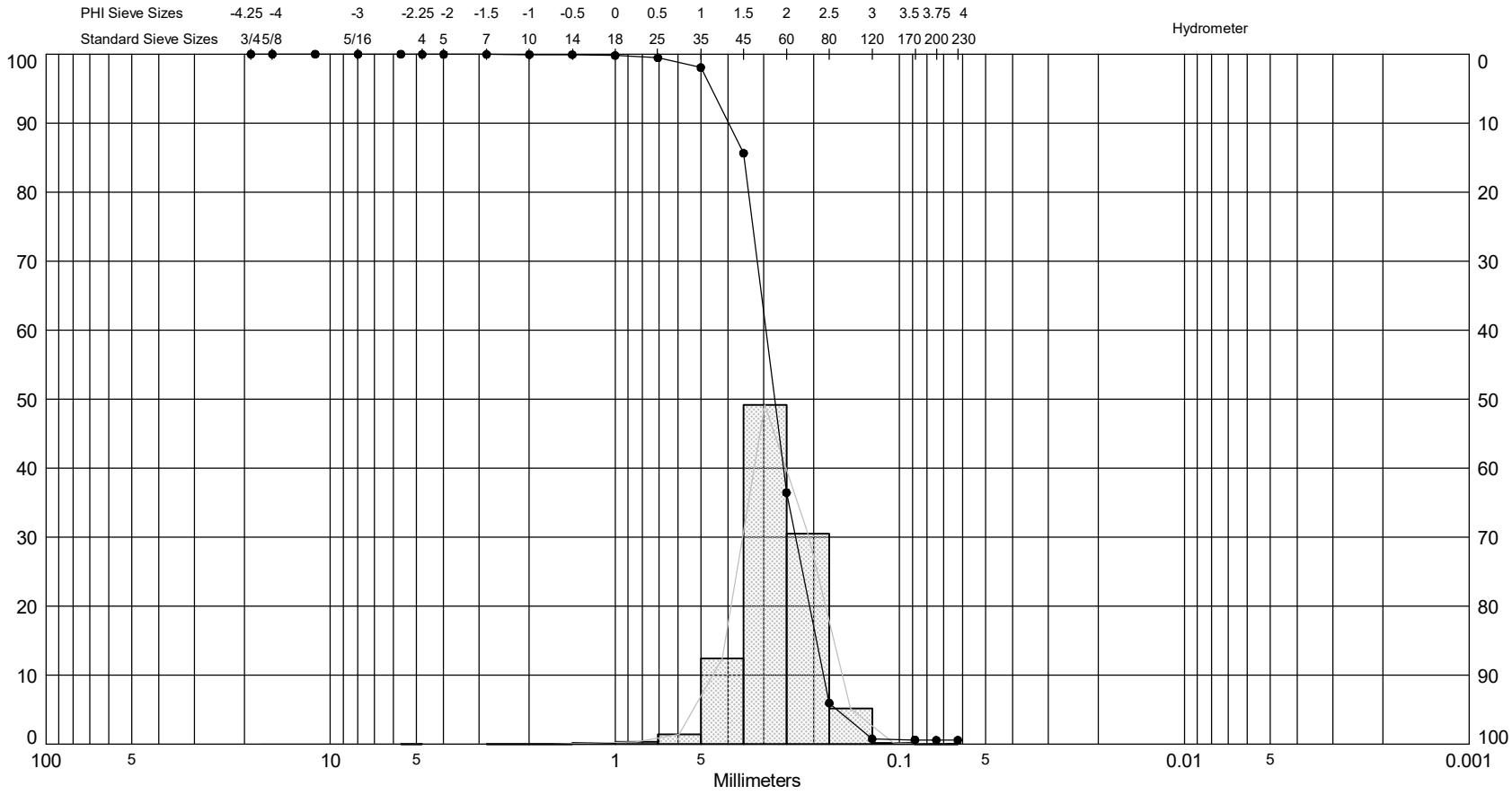
Comments: Well graded sand (m)

Depths and elevations based on measured values

Sample Information	
Project Name:	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
Analysis Date:	11-01-23
Easting (X, ft):	2298845.708
Northing (Y, ft):	43350.273
Horizontal System:	NAD 1983
Vertical System:	NAVD 88

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SIEVE ANALYSIS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23



Sample	Symbol	Elev. (ft)	USCS	% Fines		% Carbonates	Median	Mean	Skew	Kurt	Sort
2023-WH-09 #S2	—●—	-20.2	SP	#200 - 0.57	#230 - 0.55	6.72	1.86	1.87	-0.59	7.37	0.43

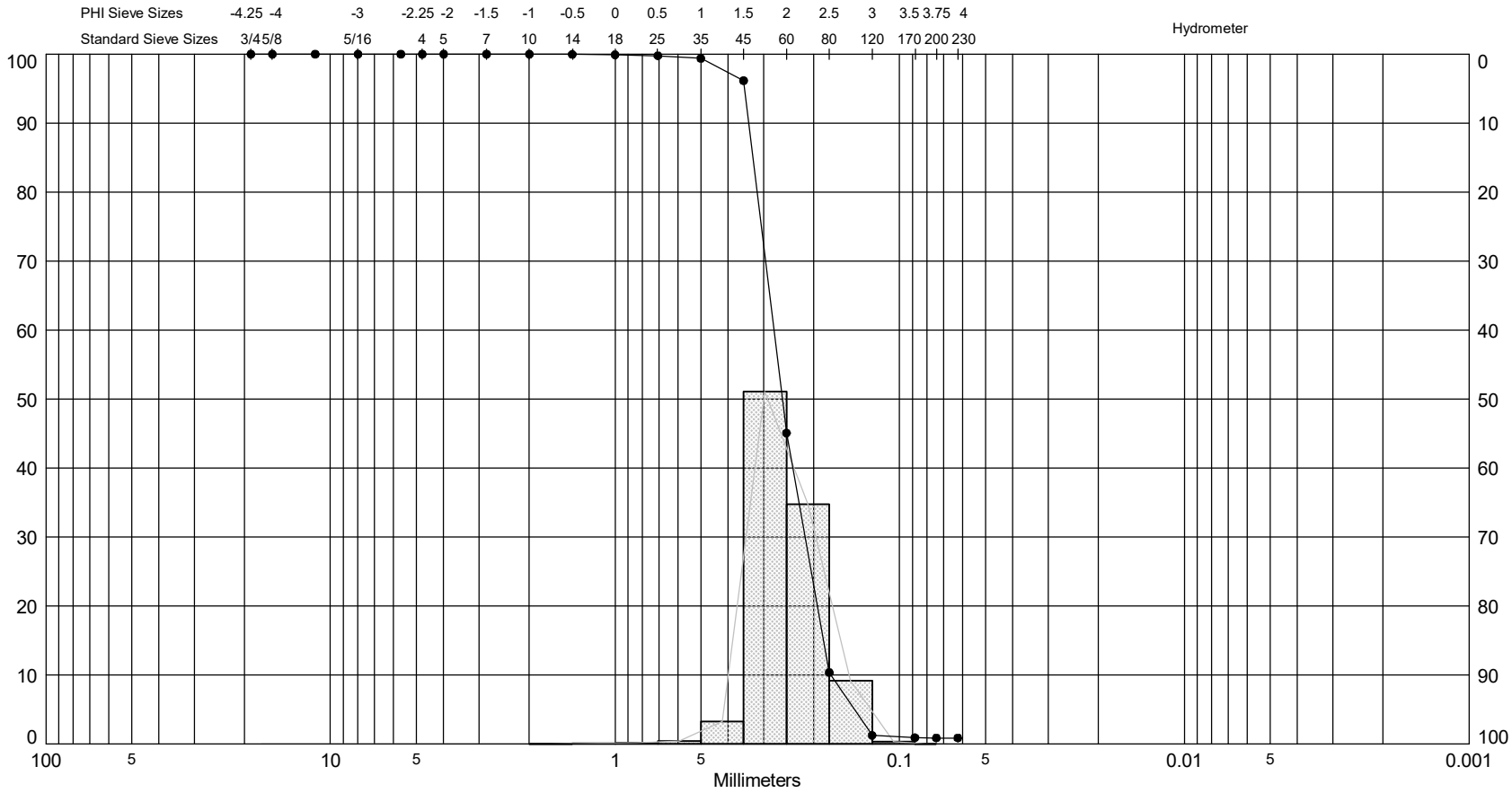
Comments: Poorly graded sand (m)

Depths and elevations based on measured values

Sample Information	
Project Name:	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
Analysis Date:	11-02-23
Easting (X, ft):	2298845.708
Northing (Y, ft):	43350.273
Horizontal System:	NAD 1983
Vertical System:	NAVD 88

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SIEVE ANALYSIS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23



Sample	Symbol	Elev. (ft)	USCS	% Fines		% Carbonates	Median	Mean	Skew	Kurt	Sort
2023-WH-09 #S3	—●—	-24.5	SP	#200 - 0.87	#230 - 0.87	6.22	1.95	2	0.08	4.96	0.38

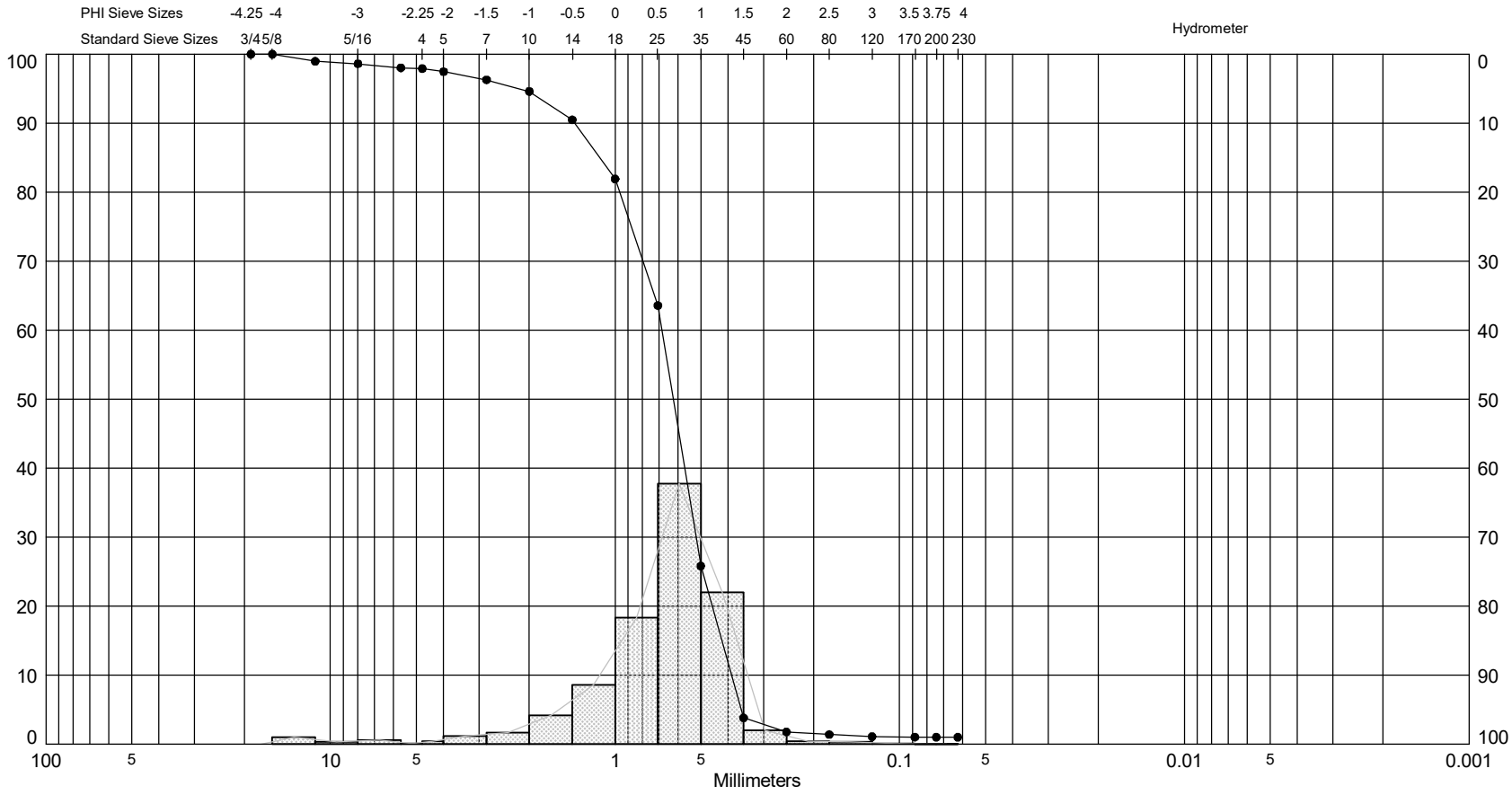
Comments: Poorly graded sand (m)

Depths and elevations based on measured values

Sample Information	
Project Name:	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
Analysis Date:	11-03-23
Easting (X, ft):	2298845.708
Northing (Y, ft):	43350.273
Horizontal System:	NAD 1983
Vertical System:	NAVD 88

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SIEVE ANALYSIS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23



Sample	Symbol	Elev. (ft)	USCS	% Fines		% Carbonates	Median	Mean	Skew	Kurt	Sort
2023-WH-10 #S1	—●—	-50.7	SW	#200 - 1.00	#230 - 0.99	16.32	0.68	0.49	-1.99	9.35	0.89

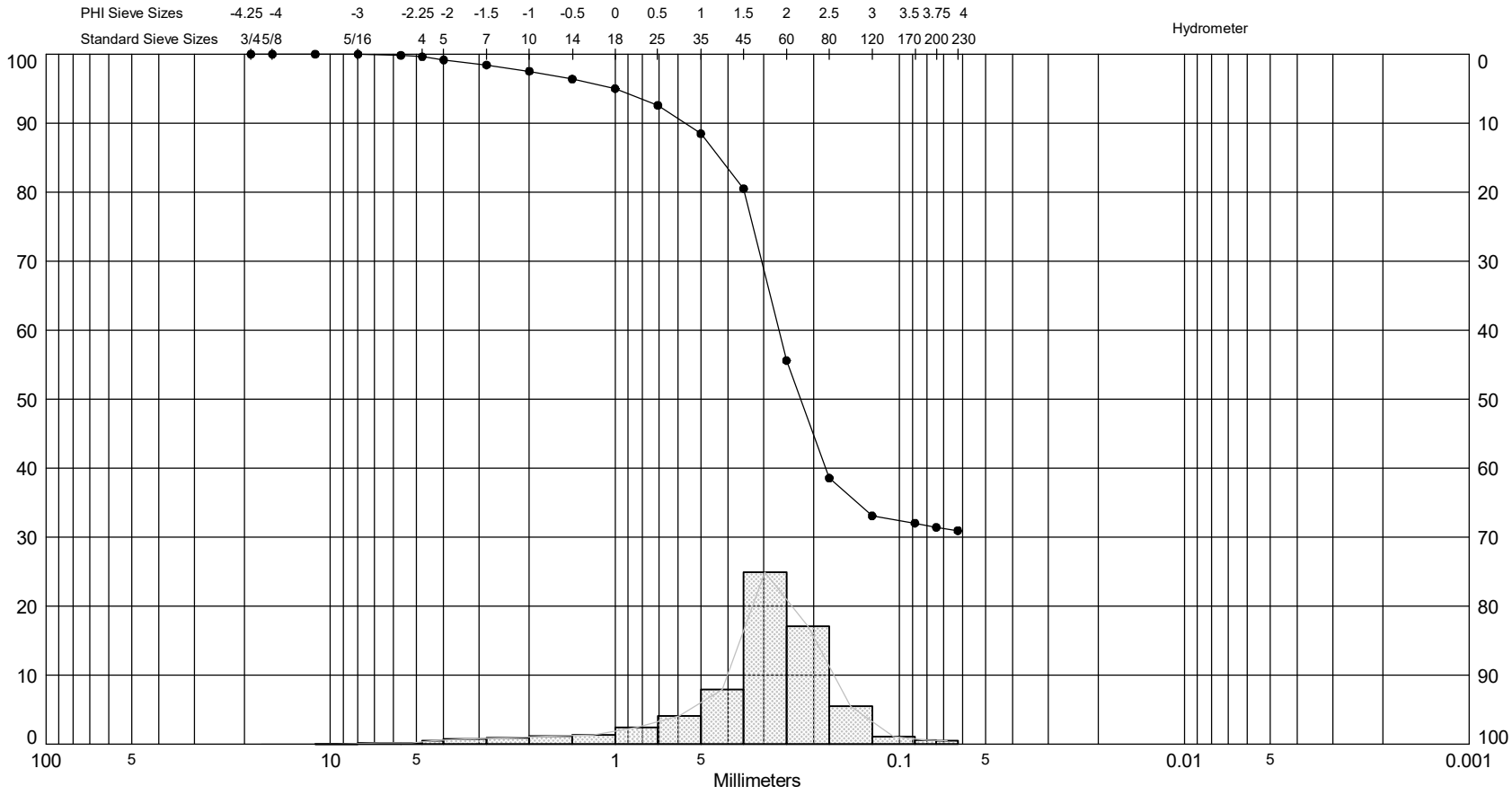
Comments: Well graded sand (c), trace shell fragments

Depths and elevations based on measured values

Sample Information	
Project Name:	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
Analysis Date:	11-03-23
Easting (X, ft):	2300255.702
Northing (Y, ft):	46013.746
Horizontal System:	NAD 1983
Vertical System:	NAVD 88

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

SIEVE ANALYSIS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23



Sample	Symbol	Elev. (ft)	USCS	% Fines		% Carbonates	Median	Mean	Skew	Kurt	Sort
2023-WH-10 #S2	—●—	-53.4	SM	#200 - 31.42	#230 - 30.95	4.06	2.16	1.63	-1.54	6.55	1.01

Comments: Silty sand (m), with organic inclusions throughout

Depths and elevations based on measured values

Sample Information	
Project Name:	Stage 2 Oak Island Beach Management Plan - Town of Oak Island
Analysis Date:	11-03-23
Easting (X, ft):	2300255.702
Northing (Y, ft):	46013.746
Horizontal System:	NAD 1983
Vertical System:	NAVD 88

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

SIEVE ANALYSIS OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-WH-01 #S1

Analysis Date: 11-02-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2301361.65	50974.265	State Plane North Carolina FIPS 3200 Feet	-48.1 NAVD 88

USCS:	Munsell:	Comments:
SP	Wet - 10YR-6/2 Dry - 10YR-8/1	Poorly graded sand (m), trace silt

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
273.96	270.52	0.14	0.10	#200 - 1.44	#230 - 1.41	10.09	0.48

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.42	0.15	0.42	0.15
3.5	-2.50	5.66	0.66	0.24	1.08	0.39
4	-2.25	4.76	0.46	0.17	1.54	0.56
5	-2.00	4.00	0.26	0.09	1.80	0.66
7	-1.50	2.83	0.48	0.18	2.28	0.83
10	-1.00	2.00	0.78	0.28	3.06	1.12
14	-0.50	1.41	1.13	0.41	4.19	1.53
18	0.00	1.00	1.96	0.72	6.15	2.24
25	0.50	0.71	4.87	1.78	11.02	4.02
35	1.00	0.50	10.50	3.83	21.52	7.86
45	1.50	0.35	21.13	7.71	42.65	15.57
60	2.00	0.25	70.09	25.58	112.74	41.15
80	2.50	0.18	109.80	40.08	222.54	81.23
120	3.00	0.13	43.05	15.71	265.59	96.94
170	3.50	0.09	4.11	1.50	269.70	98.45
200	3.75	0.07	0.32	0.12	270.02	98.56
230	4.00	0.06	0.09	0.03	270.11	98.59

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.94	2.59	2.42	2.11	1.68	1.51	0.63

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.96	0.257	0.77	-2.42	13.43

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-WH-01 #S2

Analysis Date: 11-02-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2301361.65	50974.265	State Plane North Carolina FIPS 3200 Feet	-51.4 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-6/2 Dry - 10YR-8/1	Well graded sand (m)

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
				#200 - 0.91	#230 - 0.89		
263.39	261.60	0.07	0.18			11.08	0.47

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.36	0.14	0.36	0.14
3.5	-2.50	5.66	0.61	0.23	0.97	0.37
4	-2.25	4.76	0.27	0.10	1.24	0.47
5	-2.00	4.00	0.61	0.23	1.85	0.70
7	-1.50	2.83	1.66	0.63	3.51	1.33
10	-1.00	2.00	2.06	0.78	5.57	2.11
14	-0.50	1.41	4.21	1.60	9.78	3.71
18	0.00	1.00	8.88	3.37	18.66	7.08
25	0.50	0.71	23.12	8.78	41.78	15.86
35	1.00	0.50	40.75	15.47	82.53	31.33
45	1.50	0.35	51.15	19.42	133.68	50.75
60	2.00	0.25	57.29	21.75	190.97	72.50
80	2.50	0.18	47.96	18.21	238.93	90.71
120	3.00	0.13	20.07	7.62	259.00	98.33
170	3.50	0.09	1.86	0.71	260.86	99.04
200	3.75	0.07	0.13	0.05	260.99	99.09
230	4.00	0.06	0.06	0.02	261.05	99.11

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.78	2.32	2.07	1.48	0.80	0.50	-0.31

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.36	0.390	0.96	-0.94	4.82

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-WH-01 #S3

Analysis Date: 11-02-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2301361.65	50974.265	State Plane North Carolina FIPS 3200 Feet	-54.4 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-6/2 Dry - 10YR-7/2	Well graded sand (c), trace shell fragments

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
				#200 - 0.73	#230 - 0.72		
355.85	353.95	0.02	0.18			14.85	4.34

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	6.77	1.90	6.77	1.90
5/8"	-4.00	16.00	1.10	0.31	7.87	2.21
7/16"	-3.50	11.31	3.24	0.91	11.11	3.12
5/16"	-3.00	8.00	1.16	0.33	12.27	3.45
3.5	-2.50	5.66	1.95	0.55	14.22	4.00
4	-2.25	4.76	1.22	0.34	15.44	4.34
5	-2.00	4.00	1.55	0.44	16.99	4.77
7	-1.50	2.83	3.95	1.11	20.94	5.88
10	-1.00	2.00	5.06	1.42	26.00	7.31
14	-0.50	1.41	9.48	2.66	35.48	9.97
18	0.00	1.00	20.47	5.75	55.95	15.72
25	0.50	0.71	43.51	12.23	99.46	27.95
35	1.00	0.50	64.90	18.24	164.36	46.19
45	1.50	0.35	84.63	23.78	248.99	69.97
60	2.00	0.25	66.60	18.72	315.59	88.69
80	2.50	0.18	27.56	7.74	343.15	96.43
120	3.00	0.13	9.14	2.57	352.29	99.00
170	3.50	0.09	0.85	0.24	353.14	99.24
200	3.75	0.07	0.10	0.03	353.24	99.27
230	4.00	0.06	0.04	0.01	353.28	99.28

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.41	1.87	1.63	1.08	0.38	0.01	-1.90

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	0.81	0.570	1.12	-1.27	6.46

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-WH-02B #S1

Analysis Date: 11-01-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2301038.604	49004.422	State Plane North Carolina FIPS 3200 Feet	-39.6 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-6/2 Dry - 10YR-7/2	Well graded sand (m), trace shell fragments, trace silt

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
207.11	204.22	0.13	0.14	#200 - 1.63	#230 - 1.59	15.11	0.88

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.20	0.10	0.20	0.10
3.5	-2.50	5.66	1.03	0.50	1.23	0.59
4	-2.25	4.76	0.59	0.28	1.82	0.88
5	-2.00	4.00	0.82	0.40	2.64	1.27
7	-1.50	2.83	2.09	1.01	4.73	2.28
10	-1.00	2.00	2.39	1.15	7.12	3.44
14	-0.50	1.41	4.05	1.96	11.17	5.39
18	0.00	1.00	5.77	2.79	16.94	8.18
25	0.50	0.71	10.46	5.05	27.40	13.23
35	1.00	0.50	15.74	7.60	43.14	20.83
45	1.50	0.35	20.09	9.70	63.23	30.53
60	2.00	0.25	28.45	13.74	91.68	44.27
80	2.50	0.18	62.18	30.02	153.86	74.29
120	3.00	0.13	44.83	21.65	198.69	95.93
170	3.50	0.09	4.65	2.25	203.34	98.18
200	3.75	0.07	0.39	0.19	203.73	98.37
230	4.00	0.06	0.08	0.04	203.81	98.41

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.98	2.72	2.52	2.10	1.21	0.68	-0.60

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.73	0.301	1.13	-1.47	5.3

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-WH-02B #S2

Analysis Date: 11-02-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2301038.604	49004.422	State Plane North Carolina FIPS 3200 Feet	-41.1 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-6/2 Dry - 10YR-7/2	Well graded sand (m), trace silt

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
				#200 - 1.08	#230 - 1.03		
223.18	221.28	0.09	0.14			12.80	0.35

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.14	0.06	0.14	0.06
4	-2.25	4.76	0.65	0.29	0.79	0.35
5	-2.00	4.00	0.40	0.18	1.19	0.53
7	-1.50	2.83	0.98	0.44	2.17	0.97
10	-1.00	2.00	1.69	0.76	3.86	1.73
14	-0.50	1.41	3.50	1.57	7.36	3.30
18	0.00	1.00	7.61	3.41	14.97	6.71
25	0.50	0.71	19.32	8.66	34.29	15.36
35	1.00	0.50	34.70	15.55	68.99	30.91
45	1.50	0.35	39.98	17.91	108.97	48.83
60	2.00	0.25	41.76	18.71	150.73	67.54
80	2.50	0.18	37.99	17.02	188.72	84.56
120	3.00	0.13	28.34	12.70	217.06	97.26
170	3.50	0.09	3.33	1.49	220.39	98.75
200	3.75	0.07	0.37	0.17	220.76	98.92
230	4.00	0.06	0.12	0.05	220.88	98.97

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.91	2.48	2.22	1.53	0.81	0.52	-0.25

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.44	0.369	0.98	-0.66	3.74

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-WH-02B #S3

Analysis Date: 11-01-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2301038.604	49004.422	State Plane North Carolina FIPS 3200 Feet	-44.1 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-6/2 Dry - 10YR-7/2	Well graded sand (m), trace shell fragments, trace silt

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
				#200 - 0.74	#230 - 0.71		
268.20	266.66	0.05	0.12			14.09	0.69

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.50	0.19	0.50	0.19
3.5	-2.50	5.66	0.99	0.37	1.49	0.56
4	-2.25	4.76	0.37	0.14	1.86	0.69
5	-2.00	4.00	0.98	0.37	2.84	1.06
7	-1.50	2.83	2.53	0.94	5.37	2.00
10	-1.00	2.00	3.65	1.36	9.02	3.36
14	-0.50	1.41	7.71	2.87	16.73	6.24
18	0.00	1.00	15.42	5.75	32.15	11.99
25	0.50	0.71	33.53	12.50	65.68	24.49
35	1.00	0.50	48.11	17.94	113.79	42.43
45	1.50	0.35	44.89	16.74	158.68	59.16
60	2.00	0.25	40.84	15.23	199.52	74.39
80	2.50	0.18	37.97	14.16	237.49	88.55
120	3.00	0.13	25.54	9.52	263.03	98.07
170	3.50	0.09	2.92	1.09	265.95	99.16
200	3.75	0.07	0.27	0.10	266.22	99.26
230	4.00	0.06	0.07	0.03	266.29	99.29

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.84	2.34	2.02	1.23	0.51	0.16	-0.72

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.17	0.444	1.09	-0.62	3.69

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-WH-03 #S1

Analysis Date: 11-02-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2296910.61	40112.41	State Plane North Carolina FIPS 3200 Feet	-47.4 NAVD 88

USCS:	Munsell:	Comments:
SP	Wet - 10YR-7/2 Dry - 10YR-8/1	Poorly graded sand (f), trace silt

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
277.78	274.32	0.12	0.03	#200 - 1.36	#230 - 1.32	10.69	0.26

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.10	0.04	0.10	0.04
4	-2.25	4.76	0.62	0.22	0.72	0.26
5	-2.00	4.00	0.46	0.17	1.18	0.42
7	-1.50	2.83	1.06	0.38	2.24	0.81
10	-1.00	2.00	0.99	0.36	3.23	1.16
14	-0.50	1.41	1.52	0.55	4.75	1.71
18	0.00	1.00	2.88	1.04	7.63	2.75
25	0.50	0.71	5.64	2.03	13.27	4.78
35	1.00	0.50	7.60	2.74	20.87	7.51
45	1.50	0.35	10.07	3.63	30.94	11.14
60	2.00	0.25	45.49	16.38	76.43	27.51
80	2.50	0.18	153.74	55.35	230.17	82.86
120	3.00	0.13	40.88	14.72	271.05	97.58
170	3.50	0.09	2.69	0.97	273.74	98.55
200	3.75	0.07	0.26	0.09	274.00	98.64
230	4.00	0.06	0.12	0.04	274.12	98.68

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.91	2.54	2.43	2.20	1.92	1.65	0.54

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	2.04	0.243	0.74	-2.67	12.93

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-WH-03 #S2

Analysis Date: 11-02-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2296910.61	40112.41	State Plane North Carolina FIPS 3200 Feet	-51.0 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-6/2 Dry - 10YR-7/2	Well graded sand (m), trace shell fragments

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
233.05	230.08	0.18	0.18	#200 - 1.62	#230 - 1.54	12.56	0.53

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.19	0.08	0.19	0.08
3.5	-2.50	5.66	0.75	0.32	0.94	0.40
4	-2.25	4.76	0.30	0.13	1.24	0.53
5	-2.00	4.00	1.29	0.55	2.53	1.09
7	-1.50	2.83	1.99	0.85	4.52	1.94
10	-1.00	2.00	2.59	1.11	7.11	3.05
14	-0.50	1.41	5.49	2.36	12.60	5.41
18	0.00	1.00	11.78	5.05	24.38	10.46
25	0.50	0.71	25.41	10.90	49.79	21.36
35	1.00	0.50	28.86	12.38	78.65	33.75
45	1.50	0.35	27.22	11.68	105.87	45.43
60	2.00	0.25	39.84	17.10	145.71	62.52
80	2.50	0.18	52.69	22.61	198.40	85.13
120	3.00	0.13	28.14	12.07	226.54	97.21
170	3.50	0.09	2.42	1.04	228.96	98.25
200	3.75	0.07	0.32	0.14	229.28	98.38
230	4.00	0.06	0.19	0.08	229.47	98.46

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.91	2.48	2.28	1.63	0.65	0.25	-0.59

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.38	0.384	1.11	-0.86	3.68

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-WH-03 #S3

Analysis Date: 11-02-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2296910.61	40112.41	State Plane North Carolina FIPS 3200 Feet	-52.2 NAVD 88

USCS:	Munsell:	Comments:
SP-SM	Wet - 10YR-5/2 Dry - 10YR-6/2	Poorly graded silty sand (m), with lenses of silt

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
266.67	240.79	0.26	0.26	#200 - 10.26	#230 - 10.06	2.50	0.00

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.43	0.16	0.43	0.16
7	-1.50	2.83	0.72	0.27	1.15	0.43
10	-1.00	2.00	0.81	0.30	1.96	0.73
14	-0.50	1.41	0.97	0.36	2.93	1.10
18	0.00	1.00	1.22	0.46	4.15	1.56
25	0.50	0.71	3.29	1.23	7.44	2.79
35	1.00	0.50	8.85	3.32	16.29	6.11
45	1.50	0.35	42.23	15.84	58.52	21.94
60	2.00	0.25	93.76	35.16	152.28	57.10
80	2.50	0.18	58.99	22.12	211.27	79.23
120	3.00	0.13	23.29	8.73	234.56	87.96
170	3.50	0.09	3.69	1.38	238.25	89.34
200	3.75	0.07	1.07	0.40	239.32	89.74
230	4.00	0.06	0.51	0.19	239.83	89.94

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	2.77	2.40	1.90	1.54	1.31	0.83

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.81	0.285	0.68	-1.23	8.57

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-WH-03 #S4

Analysis Date: 11-02-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2296910.61	40112.41	State Plane North Carolina FIPS 3200 Feet	-53.2 NAVD 88

USCS:	Munsell:	Comments:
ML	Wet - 10YR-3/2 Dry - 10YR-5/1	Silt, with organic inclusions

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
293.28	134.87	0.38	0.01	#200 - 54.37	#230 - 54.15	9.15	0.39

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	1.02	0.35	1.02	0.35
5/16"	-3.00	8.00	0.00	0.00	1.02	0.35
3.5	-2.50	5.66	1.38	0.47	2.40	0.82
4	-2.25	4.76	1.62	0.55	4.02	1.37
5	-2.00	4.00	1.61	0.55	5.63	1.92
7	-1.50	2.83	2.69	0.92	8.32	2.84
10	-1.00	2.00	2.17	0.74	10.49	3.58
14	-0.50	1.41	2.99	1.02	13.48	4.60
18	0.00	1.00	4.34	1.48	17.82	6.08
25	0.50	0.71	7.80	2.66	25.62	8.74
35	1.00	0.50	10.72	3.66	36.34	12.39
45	1.50	0.35	12.95	4.42	49.29	16.81
60	2.00	0.25	16.47	5.62	65.76	22.42
80	2.50	0.18	33.48	11.42	99.24	33.84
120	3.00	0.13	29.35	10.01	128.59	43.85
170	3.50	0.09	4.21	1.44	132.80	45.28
200	3.75	0.07	1.02	0.35	133.82	45.63
230	4.00	0.06	0.64	0.22	134.46	45.85

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
				2.11	1.41	-0.36

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.53	0.346	1.44	-1.38	4.63

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-WH-04 #S1

Analysis Date: 11-01-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2297840.622	41878.552	State Plane North Carolina FIPS 3200 Feet	-48.2 NAVD 88

USCS:	Munsell:	Comments:
SP	Wet - 10YR-6/2 Dry - 10YR-7/2	Poorly graded sand (f), trace silt

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
206.94	203.29	0.08	0.04	#200 - 1.90	#230 - 1.84	6.30	0.00

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.16	0.08	0.16	0.08
7	-1.50	2.83	0.05	0.02	0.21	0.10
10	-1.00	2.00	0.41	0.20	0.62	0.30
14	-0.50	1.41	0.32	0.15	0.94	0.45
18	0.00	1.00	0.33	0.16	1.27	0.61
25	0.50	0.71	0.42	0.20	1.69	0.82
35	1.00	0.50	0.65	0.31	2.34	1.13
45	1.50	0.35	1.76	0.85	4.10	1.98
60	2.00	0.25	44.64	21.57	48.74	23.55
80	2.50	0.18	114.38	55.27	163.12	78.82
120	3.00	0.13	37.55	18.15	200.67	96.97
170	3.50	0.09	2.16	1.04	202.83	98.01
200	3.75	0.07	0.18	0.09	203.01	98.10
230	4.00	0.06	0.12	0.06	203.13	98.16

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.95	2.64	2.47	2.24	2.01	1.82	1.57

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	2.21	0.216	0.45	-2.52	21.44

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-WH-04 #S2

Analysis Date: 11-01-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2297840.622	41878.552	State Plane North Carolina FIPS 3200 Feet	-51.3 NAVD 88

USCS:	Munsell:	Comments:
SP	Wet - 10YR-6/2 Dry - 10YR-8/1	Poorly graded sand (f), trace silt

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
277.65	274.29	0.04	0.01	#200 - 1.26	#230 - 1.24	4.81	0.10

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.19	0.07	0.19	0.07
4	-2.25	4.76	0.10	0.04	0.29	0.10
5	-2.00	4.00	0.00	0.00	0.29	0.10
7	-1.50	2.83	0.28	0.10	0.57	0.21
10	-1.00	2.00	0.20	0.07	0.77	0.28
14	-0.50	1.41	0.30	0.11	1.07	0.39
18	0.00	1.00	0.54	0.19	1.61	0.58
25	0.50	0.71	0.96	0.35	2.57	0.93
35	1.00	0.50	1.75	0.63	4.32	1.56
45	1.50	0.35	3.98	1.43	8.30	2.99
60	2.00	0.25	83.49	30.07	91.79	33.06
80	2.50	0.18	148.45	53.47	240.24	86.53
120	3.00	0.13	32.27	11.62	272.51	98.15
170	3.50	0.09	1.45	0.52	273.96	98.67
200	3.75	0.07	0.18	0.06	274.14	98.74
230	4.00	0.06	0.07	0.03	274.21	98.76

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.86	2.48	2.39	2.16	1.87	1.72	1.53

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	2.11	0.232	0.46	-2.82	25.19

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-WH-04 #S3

Analysis Date: 11-01-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2297840.622	41878.552	State Plane North Carolina FIPS 3200 Feet	-54.1 NAVD 88

USCS:	Munsell:	Comments:
SP	Wet - 10YR-5/3 Dry - 10YR-6/3	Poorly graded sand (m), trace silt

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
275.97	272.02	0.20	0.29	#200 - 1.92	#230 - 1.80	0.78	0.00

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.08	0.03	0.08	0.03
5	-2.00	4.00	0.06	0.02	0.14	0.05
7	-1.50	2.83	0.50	0.18	0.64	0.23
10	-1.00	2.00	1.24	0.45	1.88	0.68
14	-0.50	1.41	2.81	1.02	4.69	1.70
18	0.00	1.00	5.60	2.03	10.29	3.73
25	0.50	0.71	15.40	5.58	25.69	9.31
35	1.00	0.50	37.20	13.48	62.89	22.79
45	1.50	0.35	65.36	23.68	128.25	46.47
60	2.00	0.25	59.03	21.39	187.28	67.86
80	2.50	0.18	48.14	17.44	235.42	85.31
120	3.00	0.13	28.80	10.44	264.22	95.74
170	3.50	0.09	5.41	1.96	269.63	97.70
200	3.75	0.07	1.03	0.37	270.66	98.08
230	4.00	0.06	0.35	0.13	271.01	98.20

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.96	2.46	2.20	1.58	1.05	0.75	0.11

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.55	0.342	0.85	-0.42	3.62

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-WH-08A #S1

Analysis Date: 11-01-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2296321.292	38494.509	State Plane North Carolina FIPS 3200 Feet	-37.0 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-7/1 Dry - 10YR-8/1	Well graded sand (m), trace shell fragments, trace silt

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
				#200 - 1.63	#230 - 1.56		
249.25	245.62	0.13	0.05			6.68	0.95

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.92	0.37	0.92	0.37
5/16"	-3.00	8.00	0.35	0.14	1.27	0.51
3.5	-2.50	5.66	0.82	0.33	2.09	0.84
4	-2.25	4.76	0.56	0.22	2.65	1.06
5	-2.00	4.00	1.24	0.50	3.89	1.56
7	-1.50	2.83	1.86	0.75	5.75	2.31
10	-1.00	2.00	1.41	0.57	7.16	2.87
14	-0.50	1.41	2.62	1.05	9.78	3.92
18	0.00	1.00	3.19	1.28	12.97	5.20
25	0.50	0.71	5.07	2.03	18.04	7.24
35	1.00	0.50	6.54	2.62	24.58	9.86
45	1.50	0.35	13.96	5.60	38.54	15.46
60	2.00	0.25	54.05	21.69	92.59	37.15
80	2.50	0.18	105.21	42.21	197.80	79.36
120	3.00	0.13	41.31	16.57	239.11	95.93
170	3.50	0.09	5.55	2.23	244.66	98.16
200	3.75	0.07	0.52	0.21	245.18	98.37
230	4.00	0.06	0.18	0.07	245.36	98.44

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.97	2.64	2.45	2.15	1.72	1.51	-0.08

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.92	0.264	1	-2.63	11.99

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-WH-08A #S2

Analysis Date: 11-01-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2296321.292	38494.509	State Plane North Carolina FIPS 3200 Feet	-37.7 NAVD 88

USCS:	Munsell:	Comments:
SP-SM	Wet - 10YR-4/1 Dry - 10YR-5/1	Poorly graded silty sand (f)

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
				#200 - 6.20	#230 - 5.89		
215.30	203.25	0.46	0.08			8.42	0.32

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.38	0.18	0.38	0.18
4	-2.25	4.76	0.30	0.14	0.68	0.32
5	-2.00	4.00	0.61	0.28	1.29	0.60
7	-1.50	2.83	1.19	0.55	2.48	1.15
10	-1.00	2.00	1.12	0.52	3.60	1.67
14	-0.50	1.41	1.46	0.68	5.06	2.35
18	0.00	1.00	1.41	0.65	6.47	3.01
25	0.50	0.71	1.56	0.72	8.03	3.73
35	1.00	0.50	2.53	1.18	10.56	4.90
45	1.50	0.35	7.05	3.27	17.61	8.18
60	2.00	0.25	37.83	17.57	55.44	25.75
80	2.50	0.18	71.76	33.33	127.20	59.08
120	3.00	0.13	57.34	26.63	184.54	85.71
170	3.50	0.09	15.16	7.04	199.70	92.75
200	3.75	0.07	2.25	1.05	201.95	93.80
230	4.00	0.06	0.66	0.31	202.61	94.11

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	2.97	2.80	2.36	1.98	1.72	1.02

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	2.21	0.216	0.85	-2.42	12.15

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-WH-08A #S3

Analysis Date: 11-01-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2296321.292	38494.509	State Plane North Carolina FIPS 3200 Feet	-38.5 NAVD 88

USCS:	Munsell:	Comments:
SM	Wet - 10YR-3/1 Dry - 10YR-4/1	Silty sand (m)

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
244.13	151.99	0.50	0.01	#200 - 38.65	#230 - 37.96	8.29	0.45

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.14	0.06	0.14	0.06
4	-2.25	4.76	0.95	0.39	1.09	0.45
5	-2.00	4.00	1.10	0.45	2.19	0.90
7	-1.50	2.83	2.17	0.89	4.36	1.79
10	-1.00	2.00	2.86	1.17	7.22	2.96
14	-0.50	1.41	3.67	1.50	10.89	4.46
18	0.00	1.00	4.46	1.83	15.35	6.29
25	0.50	0.71	6.99	2.86	22.34	9.15
35	1.00	0.50	10.63	4.35	32.97	13.51
45	1.50	0.35	15.69	6.43	48.66	19.93
60	2.00	0.25	22.25	9.11	70.91	29.05
80	2.50	0.18	21.06	8.63	91.97	37.67
120	3.00	0.13	37.63	15.41	129.60	53.09
170	3.50	0.09	16.02	6.56	145.62	59.65
200	3.75	0.07	4.16	1.70	149.78	61.35
230	4.00	0.06	1.69	0.69	151.47	62.04

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
			2.90	1.78	1.19	-0.35

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.83	0.281	1.31	-1.07	3.85

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-WH-09 #S1

Analysis Date: 11-01-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2298845.708	43350.273	State Plane North Carolina FIPS 3200 Feet	-19.5 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-6/2 Dry - 10YR-8/2	Well graded sand (m)

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
				#200 - 0.83	#230 - 0.82		
291.87	290.24	0.04	0.25			11.19	0.22

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.15	0.05	0.15	0.05
4	-2.25	4.76	0.50	0.17	0.65	0.22
5	-2.00	4.00	0.37	0.13	1.02	0.35
7	-1.50	2.83	1.41	0.48	2.43	0.83
10	-1.00	2.00	2.43	0.83	4.86	1.67
14	-0.50	1.41	8.18	2.80	13.04	4.47
18	0.00	1.00	20.15	6.90	33.19	11.37
25	0.50	0.71	34.69	11.89	67.88	23.26
35	1.00	0.50	43.64	14.95	111.52	38.21
45	1.50	0.35	75.81	25.97	187.33	64.18
60	2.00	0.25	66.68	22.85	254.01	87.03
80	2.50	0.18	27.61	9.46	281.62	96.49
120	3.00	0.13	7.37	2.53	288.99	99.01
170	3.50	0.09	0.36	0.12	289.35	99.14
200	3.75	0.07	0.11	0.04	289.46	99.17
230	4.00	0.06	0.02	0.01	289.48	99.18

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.42	1.93	1.74	1.23	0.56	0.19	-0.46

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.1	0.467	0.87	-0.67	3.68

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-WH-09 #S2

Analysis Date: 11-02-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2298845.708	43350.273	State Plane North Carolina FIPS 3200 Feet	-20.2 NAVD 88

USCS:	Munsell:	Comments:
SP	Wet - 10YR-6/1 Dry - 10YR-8/1	Poorly graded sand (m)

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
239.09	237.77	0.01	0.00	#200 - 0.57	#230 - 0.55	6.72	0.03

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.06	0.03	0.06	0.03
5	-2.00	4.00	0.00	0.00	0.06	0.03
7	-1.50	2.83	0.00	0.00	0.06	0.03
10	-1.00	2.00	0.06	0.03	0.12	0.05
14	-0.50	1.41	0.03	0.01	0.15	0.06
18	0.00	1.00	0.30	0.13	0.45	0.19
25	0.50	0.71	0.81	0.34	1.26	0.53
35	1.00	0.50	3.38	1.41	4.64	1.94
45	1.50	0.35	29.69	12.42	34.33	14.36
60	2.00	0.25	117.60	49.19	151.93	63.55
80	2.50	0.18	72.93	30.50	224.86	94.05
120	3.00	0.13	12.39	5.18	237.25	99.23
170	3.50	0.09	0.37	0.15	237.62	99.39
200	3.75	0.07	0.10	0.04	237.72	99.43
230	4.00	0.06	0.05	0.02	237.77	99.45

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.59	2.34	2.19	1.86	1.61	1.52	1.12

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.87	0.274	0.43	-0.59	7.37

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-WH-09 #S3

Analysis Date: 11-03-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2298845.708	43350.273	State Plane North Carolina FIPS 3200 Feet	-24.5 NAVD 88

USCS:	Munsell:	Comments:
SP	Wet - 10YR-6/1 Dry - 10YR-8/1	Poorly graded sand (m)

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
269.23	266.93	0.03	0.00	#200 - 0.87	#230 - 0.87	6.22	0.00

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.00	0.00	0.00	0.00
7	-1.50	2.83	0.00	0.00	0.00	0.00
10	-1.00	2.00	0.00	0.00	0.00	0.00
14	-0.50	1.41	0.07	0.03	0.07	0.03
18	0.00	1.00	0.14	0.05	0.21	0.08
25	0.50	0.71	0.38	0.14	0.59	0.22
35	1.00	0.50	1.08	0.40	1.67	0.62
45	1.50	0.35	8.68	3.22	10.35	3.84
60	2.00	0.25	137.55	51.09	147.90	54.93
80	2.50	0.18	93.45	34.71	241.35	89.64
120	3.00	0.13	24.56	9.12	265.91	98.77
170	3.50	0.09	0.91	0.34	266.82	99.10
200	3.75	0.07	0.06	0.02	266.88	99.13
230	4.00	0.06	0.02	0.01	266.90	99.13

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.79	2.42	2.29	1.95	1.71	1.62	1.51

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	2	0.250	0.38	0.08	4.96

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-WH-10 #S1

Analysis Date: 11-03-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2300255.702	46013.746	State Plane North Carolina FIPS 3200 Feet	-50.7 NAVD 88

USCS:	Munsell:	Comments:
SW	Wet - 10YR-6/2 Dry - 10YR-8/2	Well graded sand (c), trace shell fragments

Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
				#200 - 1.00	#230 - 0.99		
278.18	276.07	0.03	0.22			16.32	2.09

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	2.86	1.03	2.86	1.03
5/16"	-3.00	8.00	0.99	0.36	3.85	1.38
3.5	-2.50	5.66	1.62	0.58	5.47	1.97
4	-2.25	4.76	0.34	0.12	5.81	2.09
5	-2.00	4.00	1.25	0.45	7.06	2.54
7	-1.50	2.83	3.26	1.17	10.32	3.71
10	-1.00	2.00	4.68	1.68	15.00	5.39
14	-0.50	1.41	11.47	4.12	26.47	9.52
18	0.00	1.00	23.84	8.57	50.31	18.09
25	0.50	0.71	51.02	18.34	101.33	36.43
35	1.00	0.50	105.05	37.76	206.38	74.19
45	1.50	0.35	61.23	22.01	267.61	96.20
60	2.00	0.25	5.66	2.03	273.27	98.23
80	2.50	0.18	1.07	0.38	274.34	98.62
120	3.00	0.13	0.83	0.30	275.17	98.92
170	3.50	0.09	0.17	0.06	275.34	98.98
200	3.75	0.07	0.07	0.03	275.41	99.00
230	4.00	0.06	0.01	0.00	275.42	99.01

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
1.47	1.22	1.02	0.68	0.19	-0.12	-1.12

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	0.49	0.712	0.89	-1.99	9.35

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

Granularmetric Report

Depths and elevations based on measured values

Project Name: Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Sample Name: 2023-WH-10 #S2

Analysis Date: 11-03-23

Analyzed By: FW

Amdrill, Inc.
19498 Fort Dade Ave
Brooksville, Fl 34601

Easting (ft):	Northing (ft):	Coordinate System:	Elevation (ft):
2300255.702	46013.746	State Plane North Carolina FIPS 3200 Feet	-53.4 NAVD 88

USCS:	Munsell:	Comments:
SM	Wet - 10YR-3/1 Dry - 10YR-5/1	Silty sand (m), with organic inclusions throughout

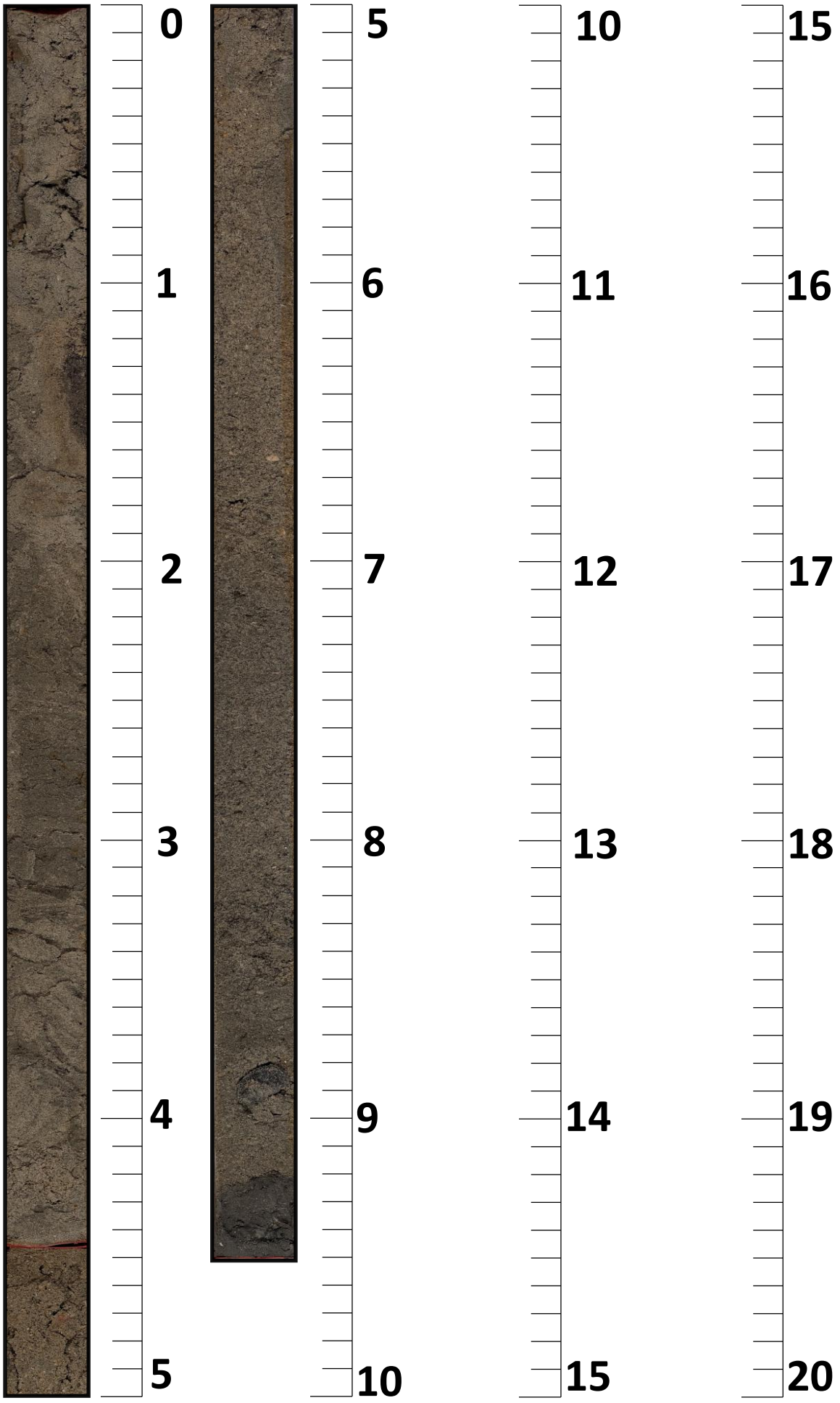
Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%):		Carbonates (%):	Shells (%):
208.17	144.30	0.29	0.13	#200 - 31.42	#230 - 30.95	4.06	0.00

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.03	0.01	0.03	0.01
3.5	-2.50	5.66	0.33	0.16	0.36	0.17
4	-2.25	4.76	0.41	0.20	0.77	0.37
5	-2.00	4.00	0.96	0.46	1.73	0.83
7	-1.50	2.83	1.51	0.73	3.24	1.56
10	-1.00	2.00	1.89	0.91	5.13	2.46
14	-0.50	1.41	2.39	1.15	7.52	3.61
18	0.00	1.00	2.84	1.36	10.36	4.98
25	0.50	0.71	5.08	2.44	15.44	7.42
35	1.00	0.50	8.57	4.12	24.01	11.53
45	1.50	0.35	16.55	7.95	40.56	19.48
60	2.00	0.25	51.86	24.91	92.42	44.40
80	2.50	0.18	35.50	17.05	127.92	61.45
120	3.00	0.13	11.39	5.47	139.31	66.92
170	3.50	0.09	2.18	1.05	141.49	67.97
200	3.75	0.07	1.28	0.61	142.77	68.58
230	4.00	0.06	0.97	0.47	143.74	69.05

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
			2.16	1.61	1.28	0.00

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.63	0.323	1.01	-1.54	6.55

GRANULARMETRIC REPORT OAK ISLAND 2023.GPJ FL DEP ROSS.GDT 12/1/23

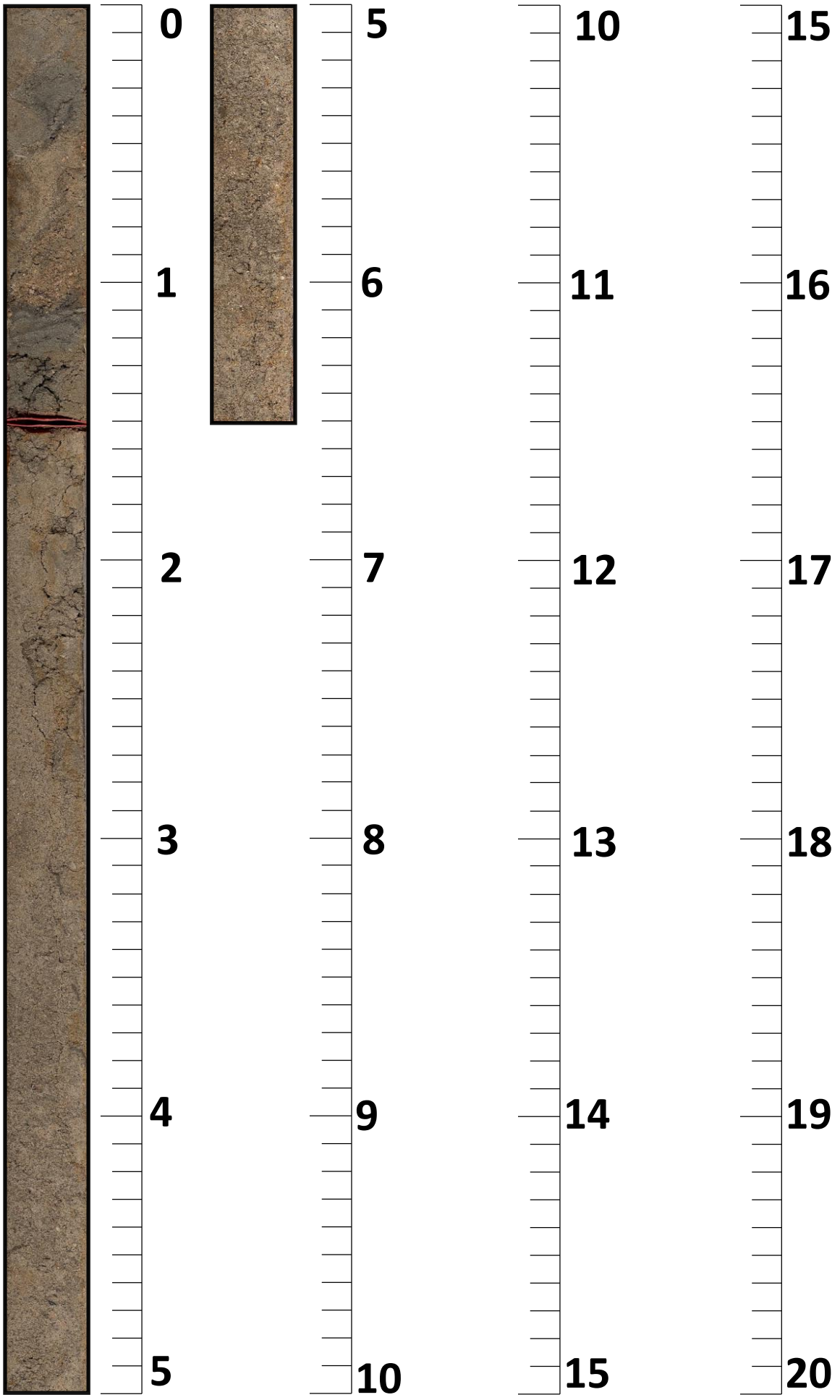


Stage 2
Oak Island Beach Management Plan
–
Town of Oak Island

2023-WH-01
0.0’ – 9.5’

Scale in Feet

-48.09 NAVD 88
Top of Core Elevation



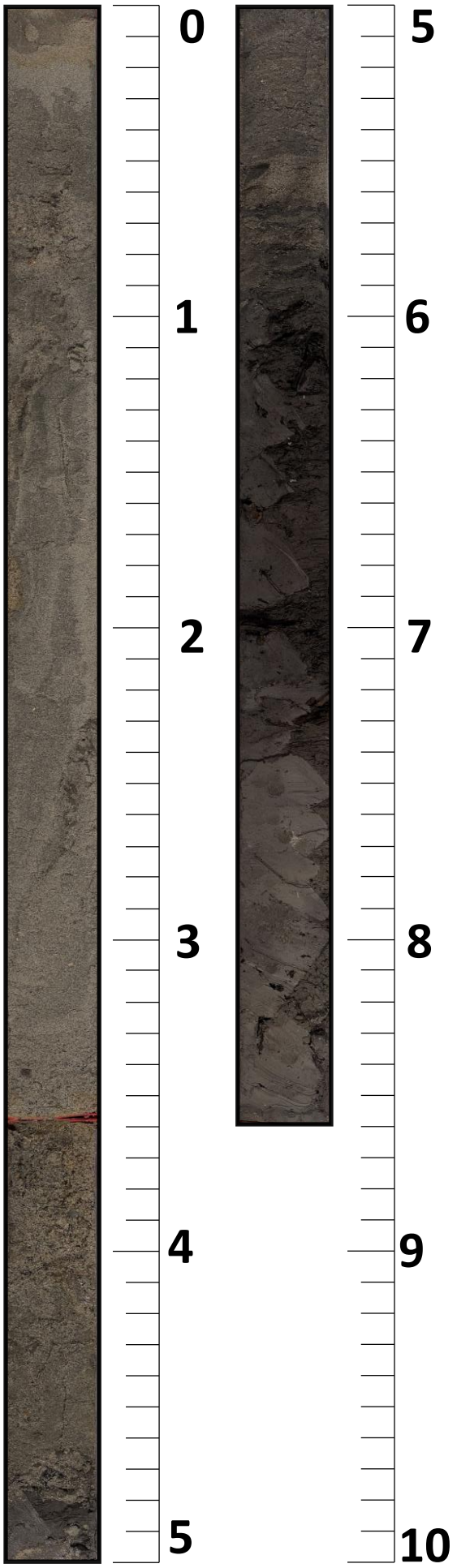
AMDRILL inc.

Stage 2
Oak Island Beach Management Plan
–
Town of Oak Island

2023-WH-02B
0.0’ – 6.5’

Scale in Feet

-39.55 NAVD 88
Top of Core Elevation



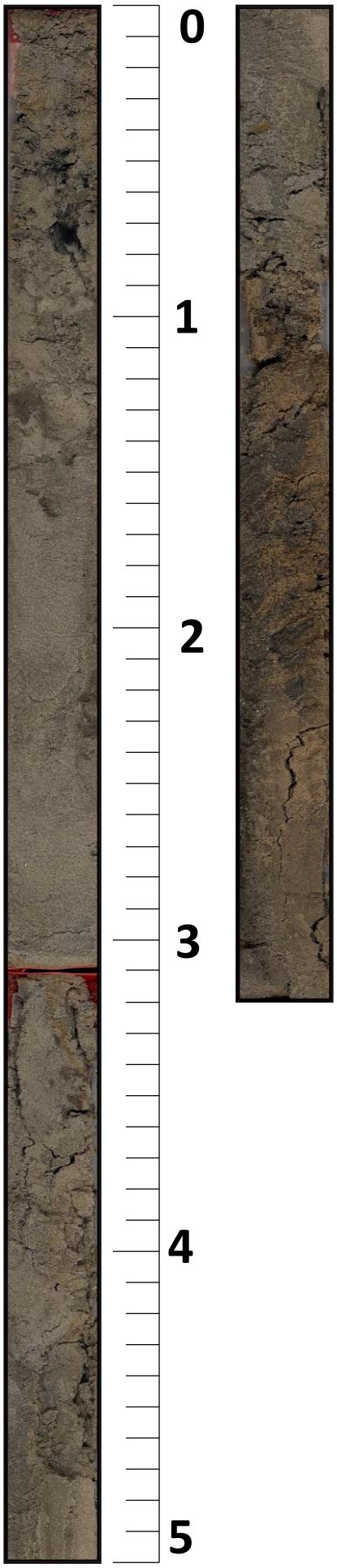
AMDRILL inc.

Stage 2
Oak Island Beach Management Plan
–
Town of Oak Island

2023-WH-03
0.0’ – 8.6’

Scale in Feet

-47.37 NAVD 88
Top of Core Elevation



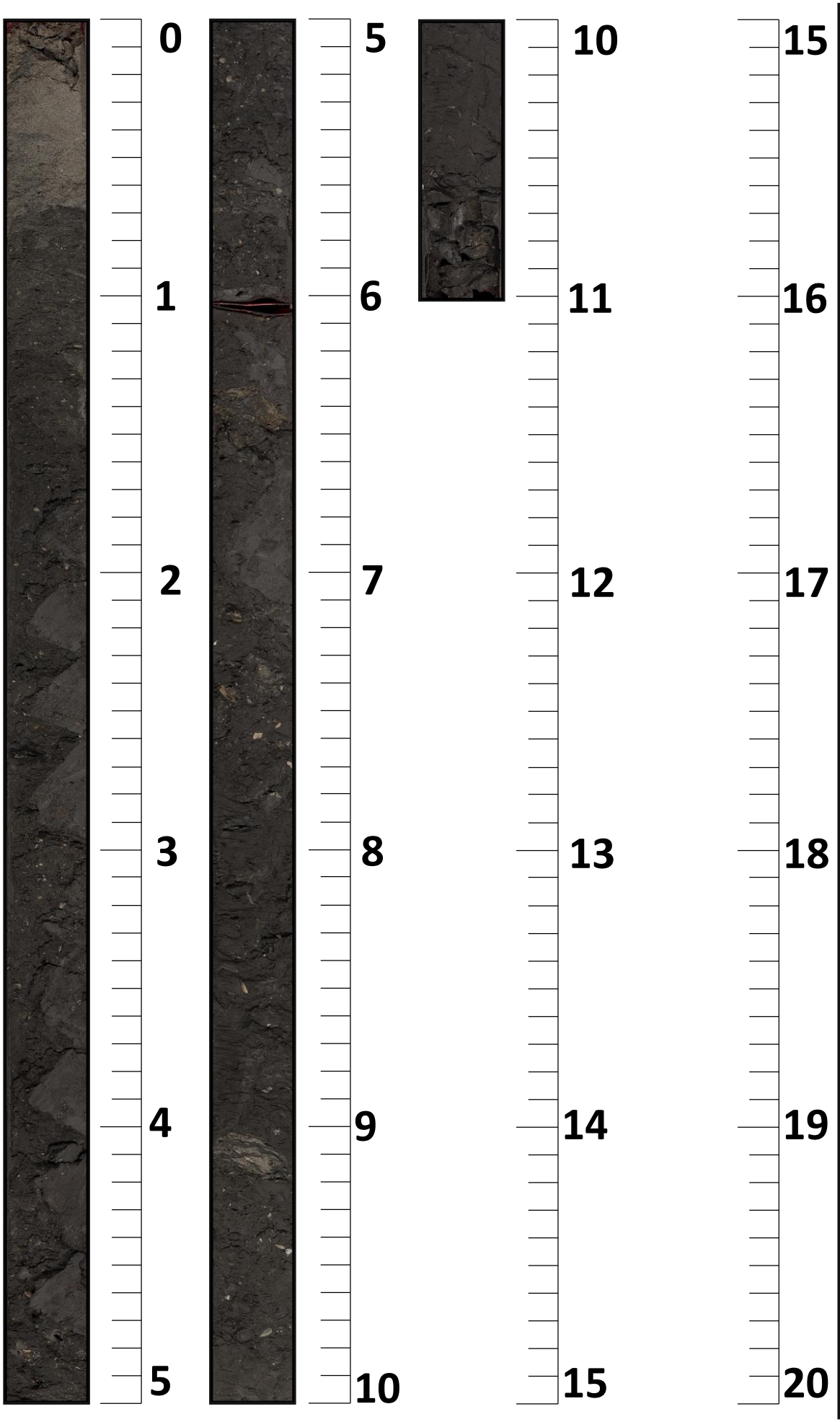
AMDRILL inc.

Stage 2
Oak Island Beach Management Plan
–
Town of Oak Island

2023-WH-04
0.0’ – 8.2’

Scale in Feet

-48.15 NAVD 88
Top of Core Elevation



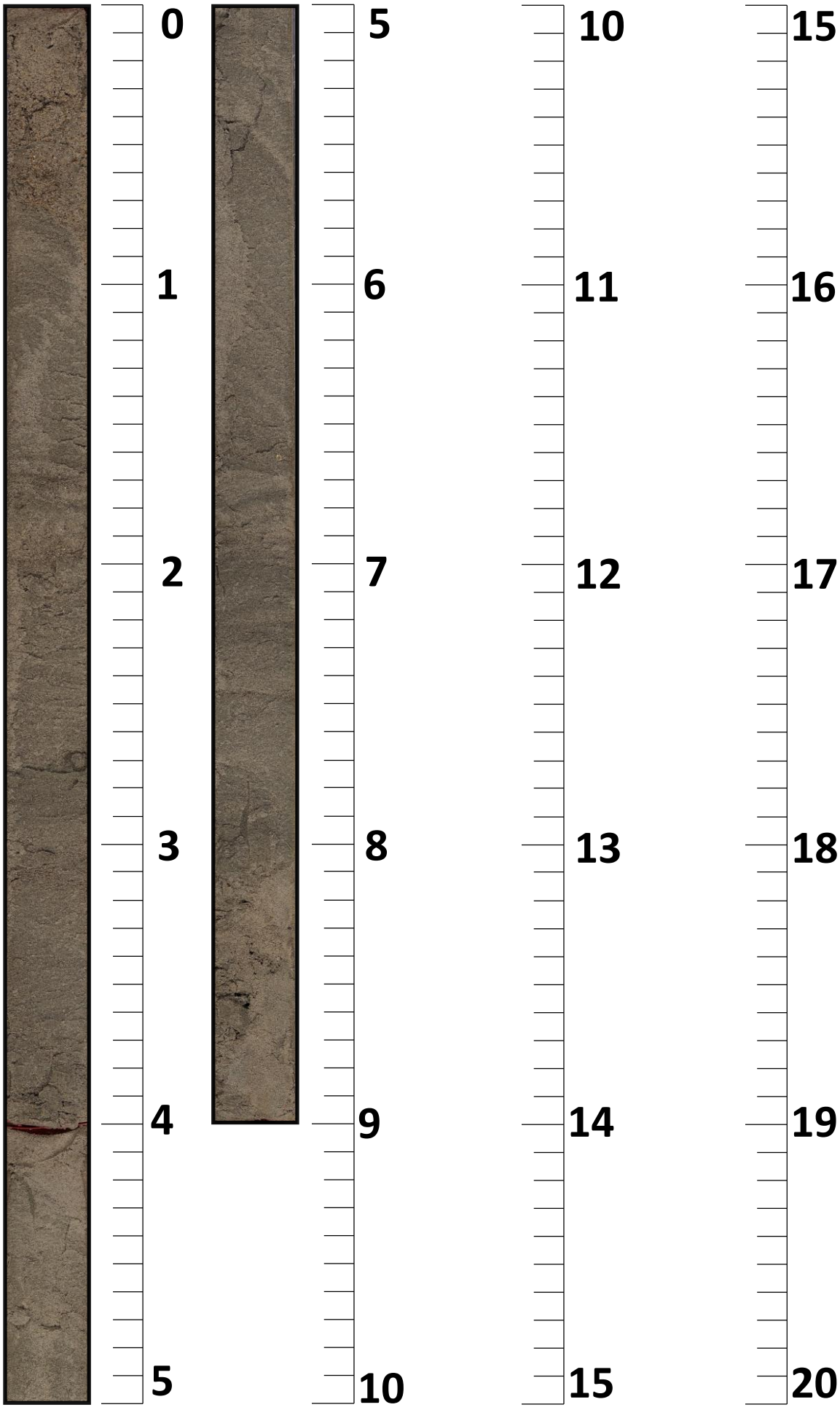
AM DRILL inc.

Stage 2
Oak Island Beach Management Plan
–
Town of Oak Island

2023-WH-08A
0.0’ – 11.0’

Scale in Feet

-37.02 NAVD 88
Top of Core Elevation



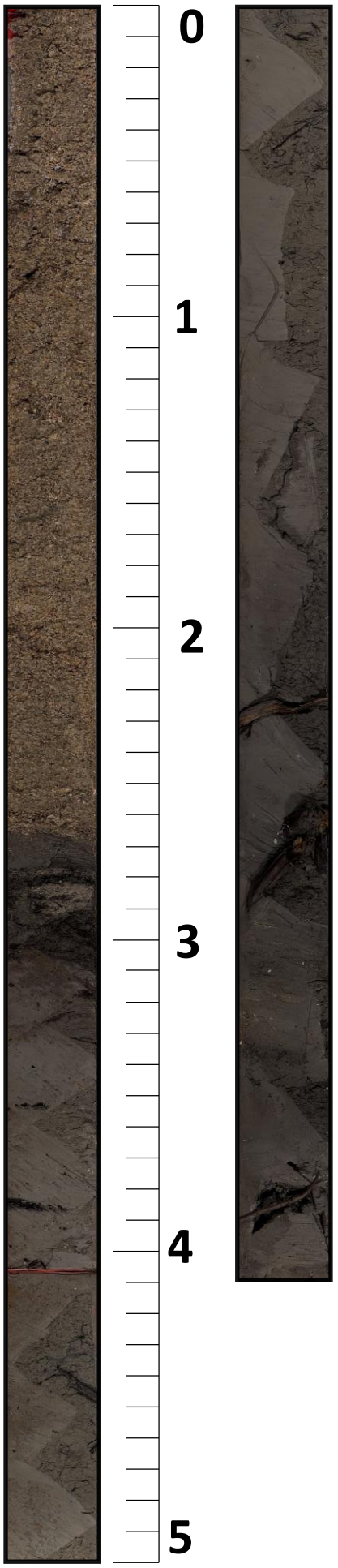
AMDRILL inc.

Stage 2
Oak Island Beach Management Plan
–
Town of Oak Island

2023-WH-09
0.0’ – 9.0’

Scale in Feet

-19.53 NAVD 88
Top of Core Elevation



AMDRILL inc.

Stage 2
Oak Island Beach Management Plan
–
Town of Oak Island

2023-WH-10
0.0’ – 9.1’

Scale in Feet

-50.65 NAVD 88
Top of Core Elevation

Project Stage 2 Oak Island Beach Management Plan - Town of Oak Island

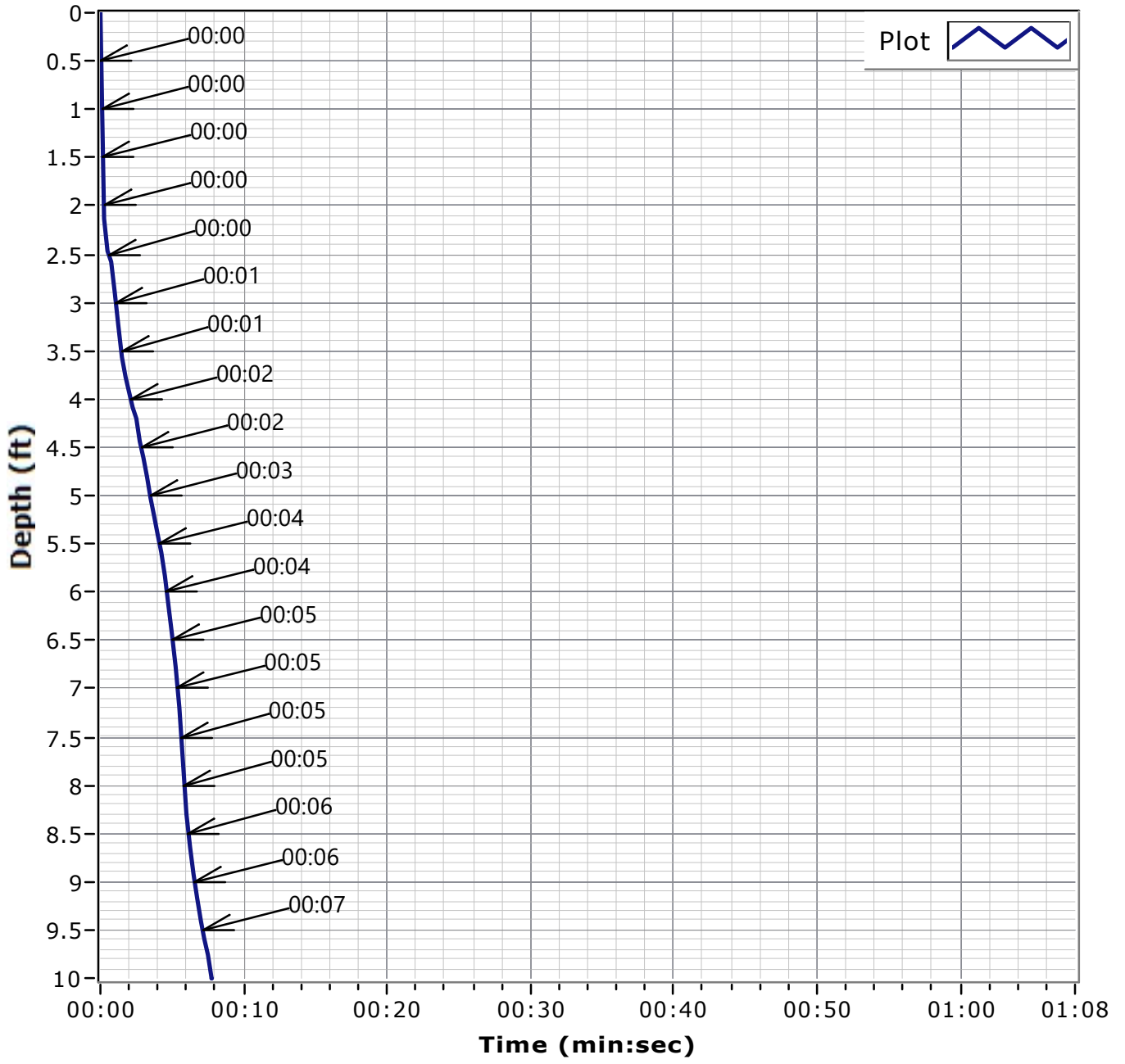
Amdrill
VIBRACORE
S E R V I C E S

Core Identifier 2023-WH-01
Coordinate System
State Plane Coordinates (SPC)
Zone 3200
X 2301361.65
Y 50974.265

Date 06/09/2023
Start Time 08:11:10
End Time 08:11:17
Total Time 00:00:07
Time to Penetrate Last Foot 00:00:01

Top of Hole Elevation -48.09'
Penetration 10.0'
Recovery 9.5'
Recovery % 95.0%

Comments



Project Stage 2 Oak Island Beach Management Plan - Town of Oak Island

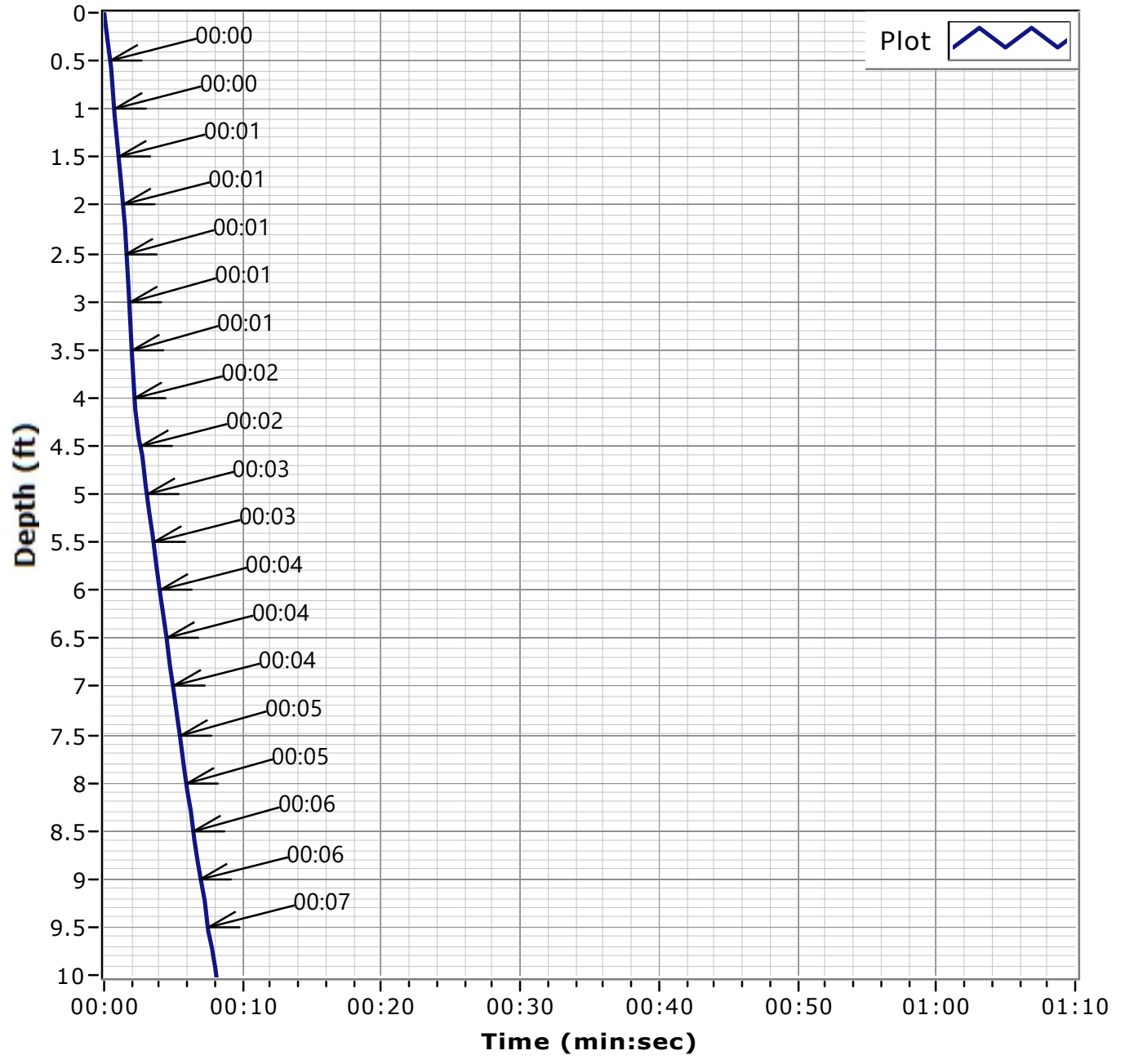
Amdrill
VIBRACORE
S E R V I C E S

Core Identifier 2023-WH-02B
Coordinate System
State Plane Coordinates (SPC)
Zone 3200
X 2301038.604
Y 49004.422

Date 06/09/2023
Start Time 08:55:12
End Time 08:55:21
Total Time 00:00:09
Time to Penetrate Last Foot 00:00:01

Top of Hole Elevation -39.55'
Penetration 11.0'
Recovery 6.5'
Recovery % 59.1%

Comments



Project Stage 2 Oak Island Beach Management Plan - Town of Oak Island

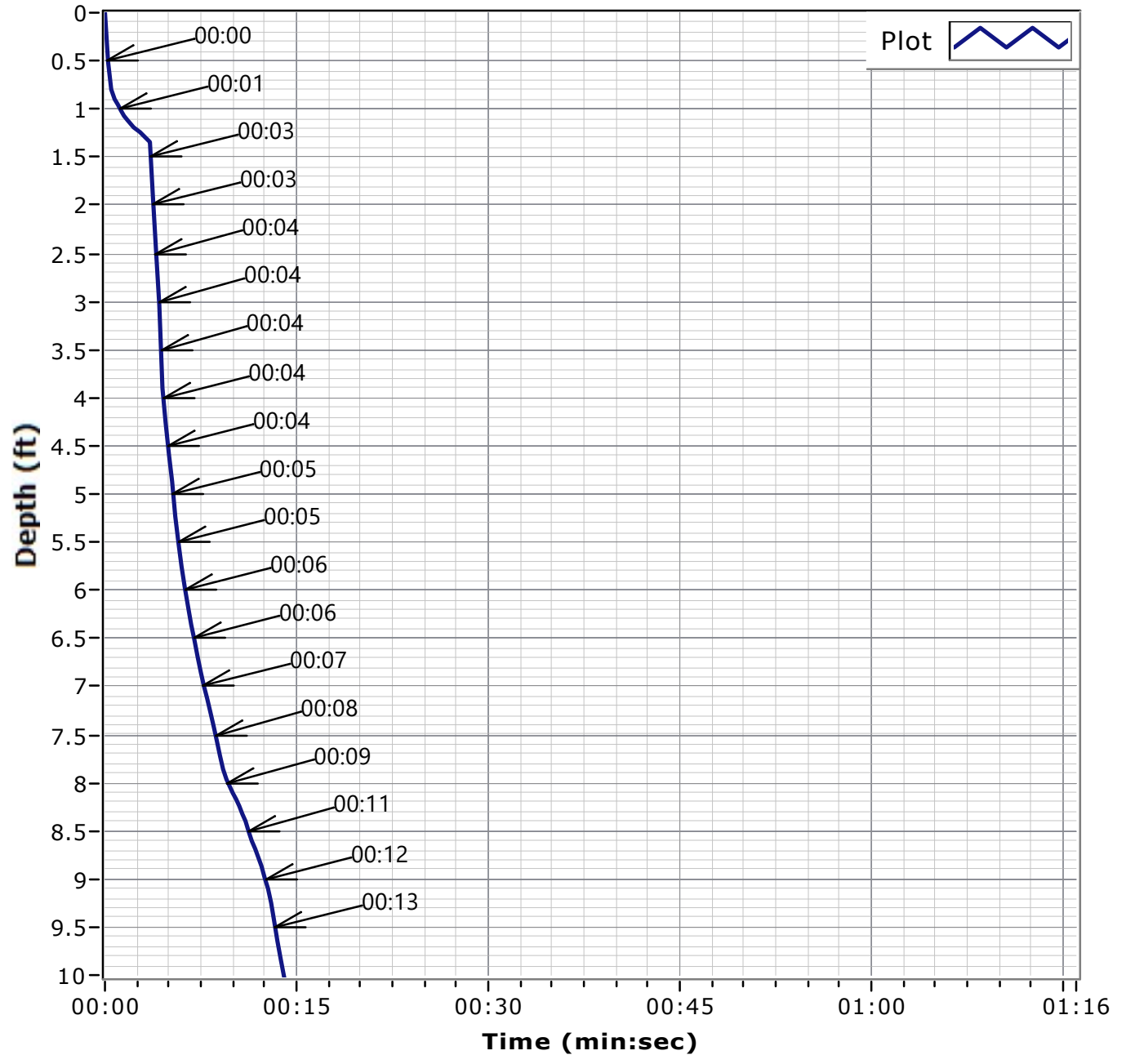
Amdrill
VIBRACORE
S E R V I C E S

Core Identifier 2023-WH-03
Coordinate System
State Plane Coordinates (SPC)
Zone 3200
X 2296910.61
Y 40112.41

Date 06/09/2023
Start Time 09:58:01
End Time 09:58:16
Total Time 00:00:14
Time to Penetrate Last Foot 00:00:01

Top of Hole Elevation -47.37'
Penetration 10.5'
Recovery 8.6'
Recovery % 81.9%

Comments



Project Stage 2 Oak Island Beach Management Plan - Town of Oak Island

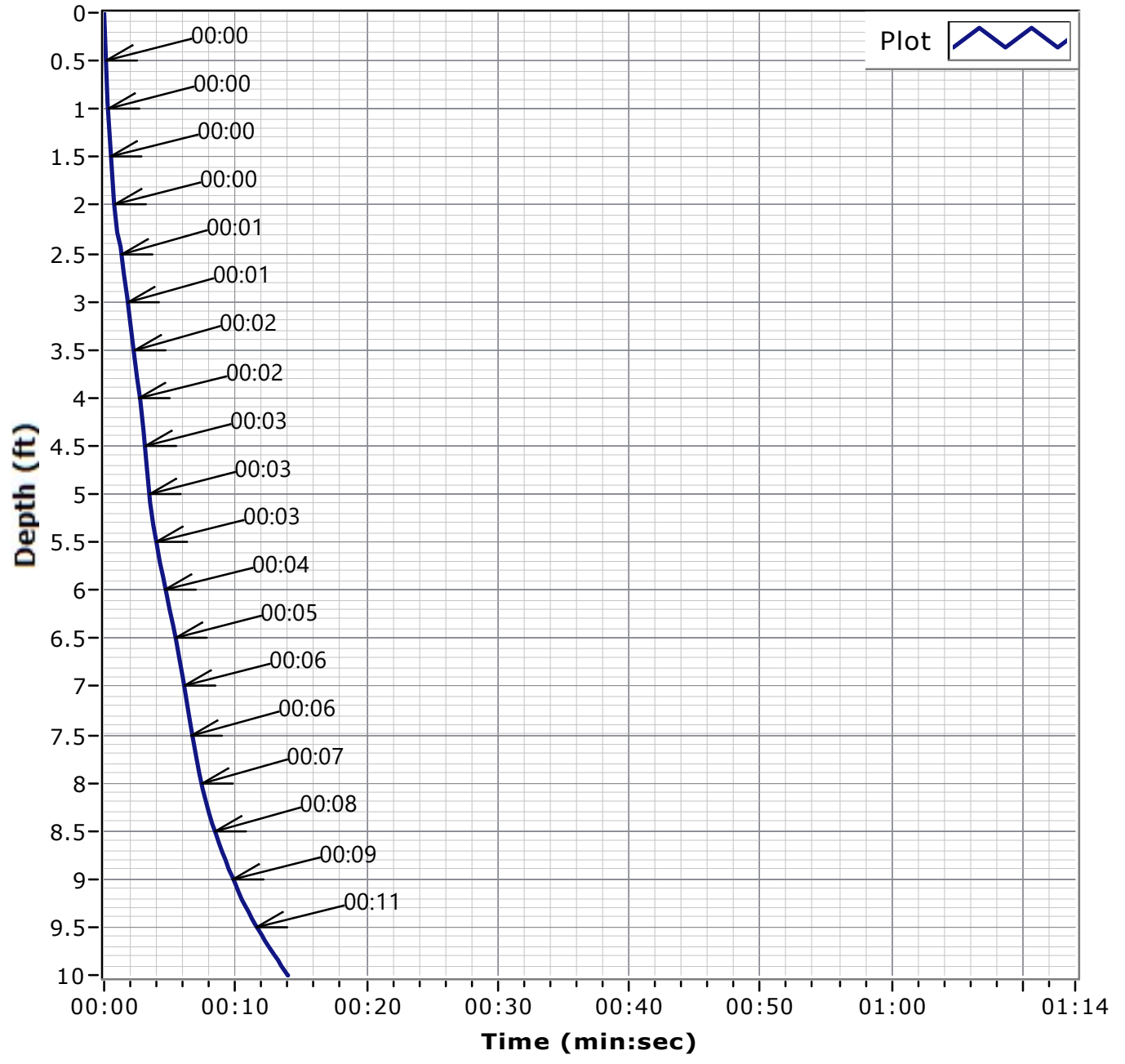
Amdrill
VIBRACORE
S E R V I C E S

Core Identifier 2023-WH-04
Coordinate System
State Plane Coordinates (SPC)
Zone 3200
X 2297840.622
Y 41878.552

Date 06/09/2023
Start Time 09:44:39
End Time 09:44:53
Total Time 00:00:14
Time to Penetrate Last Foot 00:00:04

Top of Hole Elevation -48.15'
Penetration 10.0'
Recovery 8.2'
Recovery % 82.0%

Comments



Project Stage 2 Oak Island Beach Management Plan - Town of Oak Island

Amdrill
VIBRACORE
S E R V I C E S

Core Identifier 2023-WH-08A

Coordinate System
State Plane Coordinates (SPC)

Zone 3200

X 2296321.292

Y 38494.509

Date 06/09/2023

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End Time 10:34:01

Total Time 00:00:31

Time to Penetrate Last Foot 00:00:03

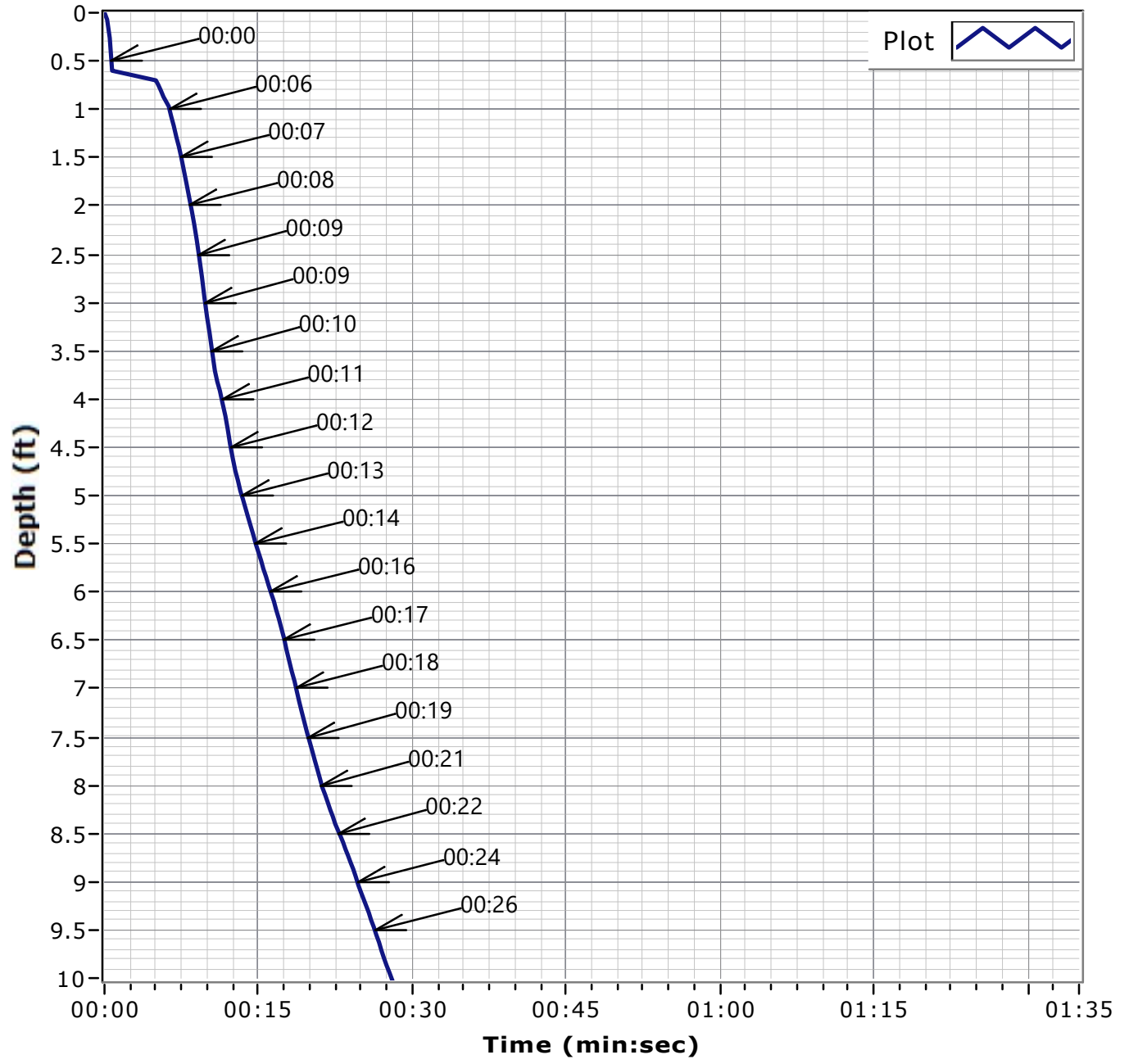
Water Depth -37.02'

Penetration 11.0'

Recovery 11.0'

Recovery % 100.0%

Comments



Project Stage 2 Oak Island Beach Management Plan - Town of Oak Island

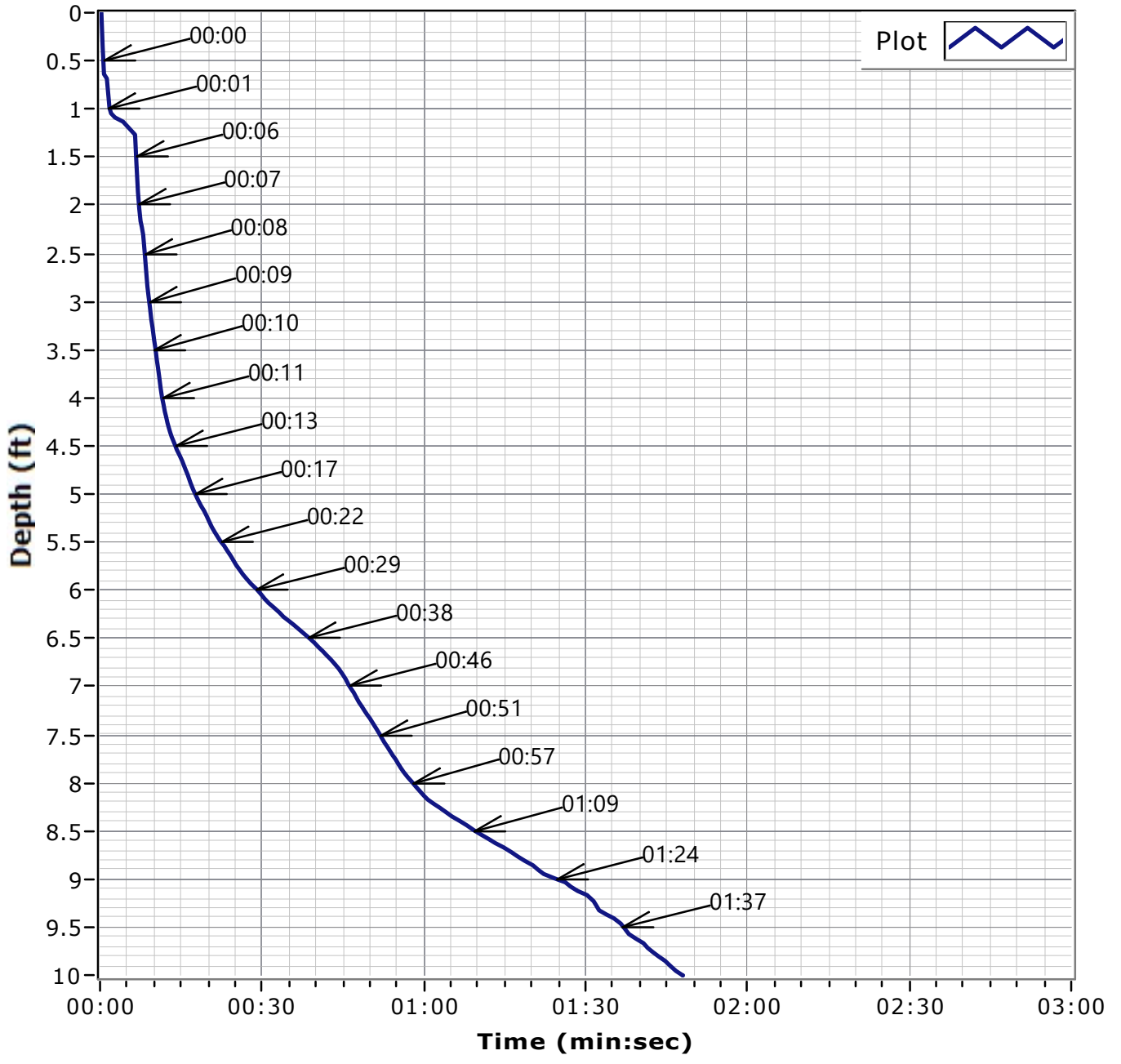
Amdrill
VIBRACORE
S E R V I C E S

Core Identifier 2023-WH-09
Coordinate System
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Y 43350.273

Date 06/09/2023
Start Time 09:23:51
End Time 09:25:39
Total Time 00:01:48
Time to Penetrate Last Foot 00:00:23

Top of Hole Elevation -19.53'
Penetration 10.0'
Recovery 9.0'
Recovery % 90.0%

Comments



Project Stage 2 Oak Island Beach Management Plan - Town of Oak Island

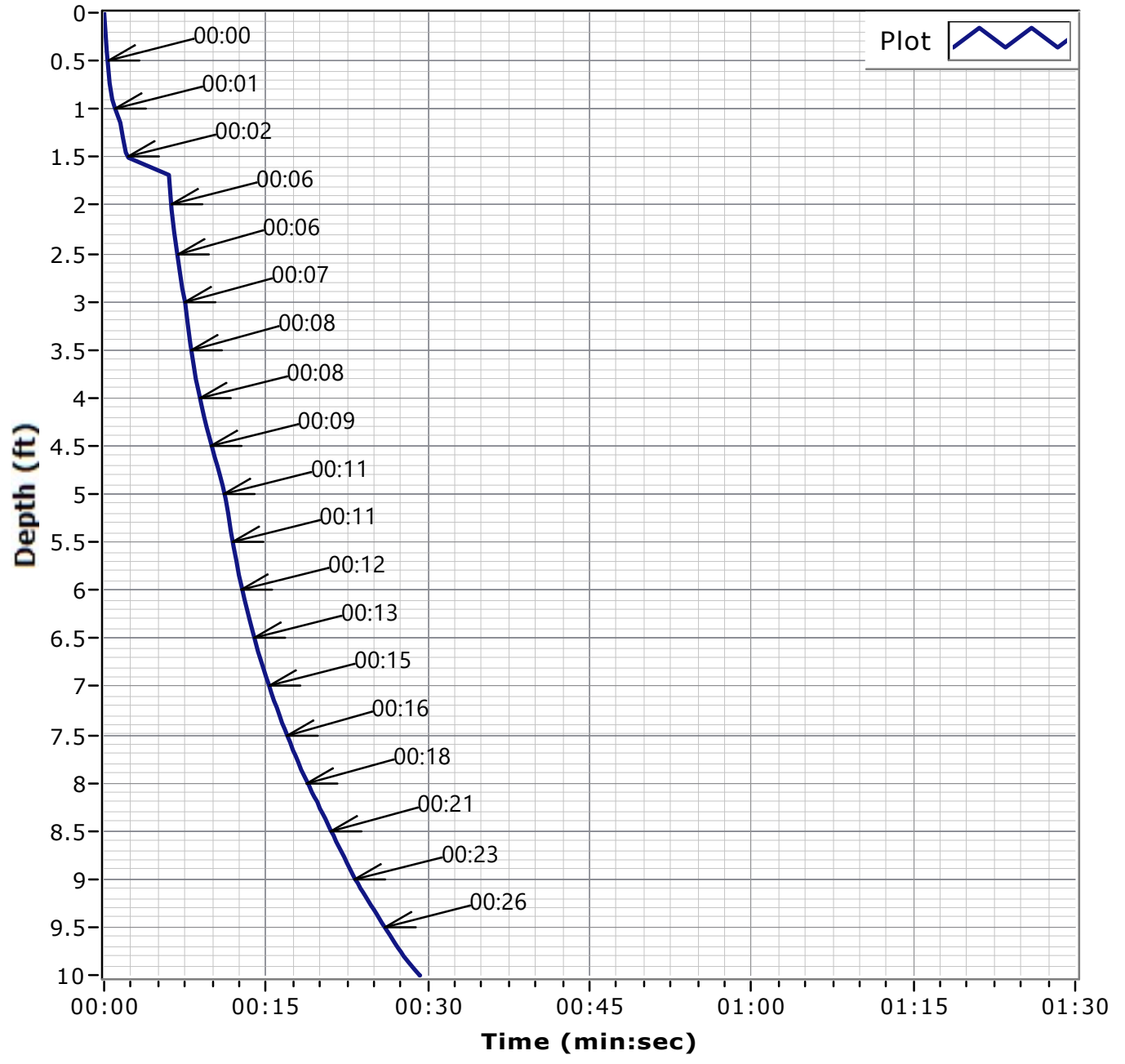
Amdrill
VIBRACORE
S E R V I C E S

Core Identifier 2023-WH-10
Coordinate System
State Plane Coordinates (SPC)
Zone 3200
X 2300255.702
Y 46013.746

Date 06/09/2023
Start Time 09:07:31
End Time 09:08:00
Total Time 00:00:29
Time to Penetrate Last Foot 00:00:05

Top of Hole Elevation -50.65'
Penetration 10.0'
Recovery 9.1'
Recovery % 91.0%

Comments



2024/2025 Town of Oak Island Renourishment Project Oak Island, Brunswick County, North Carolina

U.S. Army Corps of Engineers ENG4345 Application Narrative

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1.0 INTRODUCTION

1.1 Background

The Town of Oak Island (Town) is situated on a 13-mile-long barrier island along the Atlantic Ocean, between the Cape Fear River Inlet to the east and Lockwoods Folly Inlet to the west in Brunswick County, North Carolina. Oak Island is a south facing beach and is separated from mainland Brunswick County to the north by tidal marshes and the Atlantic Intracoastal Waterway. The Town can be accessed by driving south from Wilmington on U.S. Highway 17 past the towns of Belville and Bolivia, then following SR 1500 south across the Atlantic Intracoastal Waterway (AIWW) to the Island (Figure 1-1).

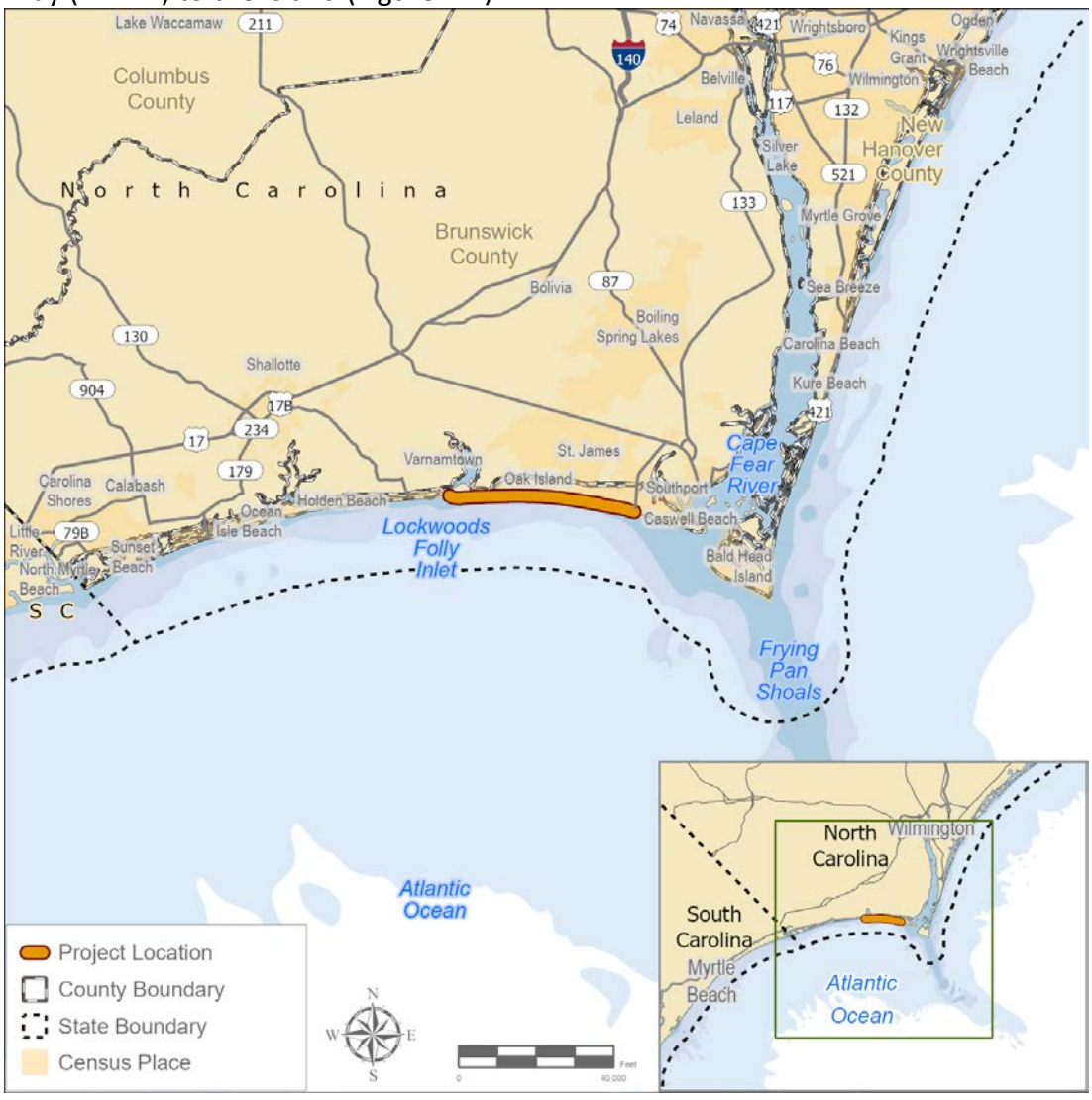


Figure 1-1. Project Location and Vicinity Map

The history of renourishment projects on Oak Island dates to 2001 with the introduction of the Wilmington Harbor deepening project administered by the United States Army Corps of Engineers (USACE) and the periodic maintenance of the harbor entrance regulated by the Wilmington Harbor Sand Management Plan (WHSMP). The initial project by the USACE deepened the Wilmington Harbor entrance channel in 2001 and placed material along the eastern and western portions of the Oak Island shoreline. Following the initial project, Oak Island has received beneficial reuse material from the maintenance dredging events in 2009 and 2018. In 2001 the USACE also conducted a restoration project across the central portion of the island. The material for this restoration project came from Yellow Banks, an upland borrow area, which unintentionally placed rocks on the beach still present today despite removal efforts by the Town. In 2009, the USACE dredged the Lockwoods Folly River Crossing and placed material on the western end of Oak Island's shoreline. In 2015 the Town sponsored the Lockwoods Folly Habitat Restoration Project, which consisted of dredging Eastern Channel with beneficial placement of compatible material on the western end of Oak Island's shoreline. After Hurricane Matthew (October 2016), the Town initiated a dune restoration project to place material along 4.4 miles of shoreline.

Before this project could be completed, Hurricane Florence (September 2018) impacted the Oak Island shoreline, further damaging the dunes. As a result of this further damage, the Town began efforts to restore additional dunes along the Town's shoreline. While this effort was underway, in 2019, material from the AIWW at Lockwoods Folly Inlet was beneficially placed on the western end of Oak Island's shoreline by the USACE. The dune restoration took place in two phases, with the eastern portion of the Town restored in 2021 (728,063 cy) and the western portion in 2022 (768,063 cy). The eastern and western ends of Oak Island's shoreline experience periodic renourishment as sand is readily available from the inlets on either end of the island with established programs by the USACE to dredge them and place beach-compatible material for beneficial use. The central portion of the island has not experienced a significant beach berm renourishment event since 2001. All past USACE and Town renourishment project placement volumes and extents discussed above are shown in Figure 1-2.

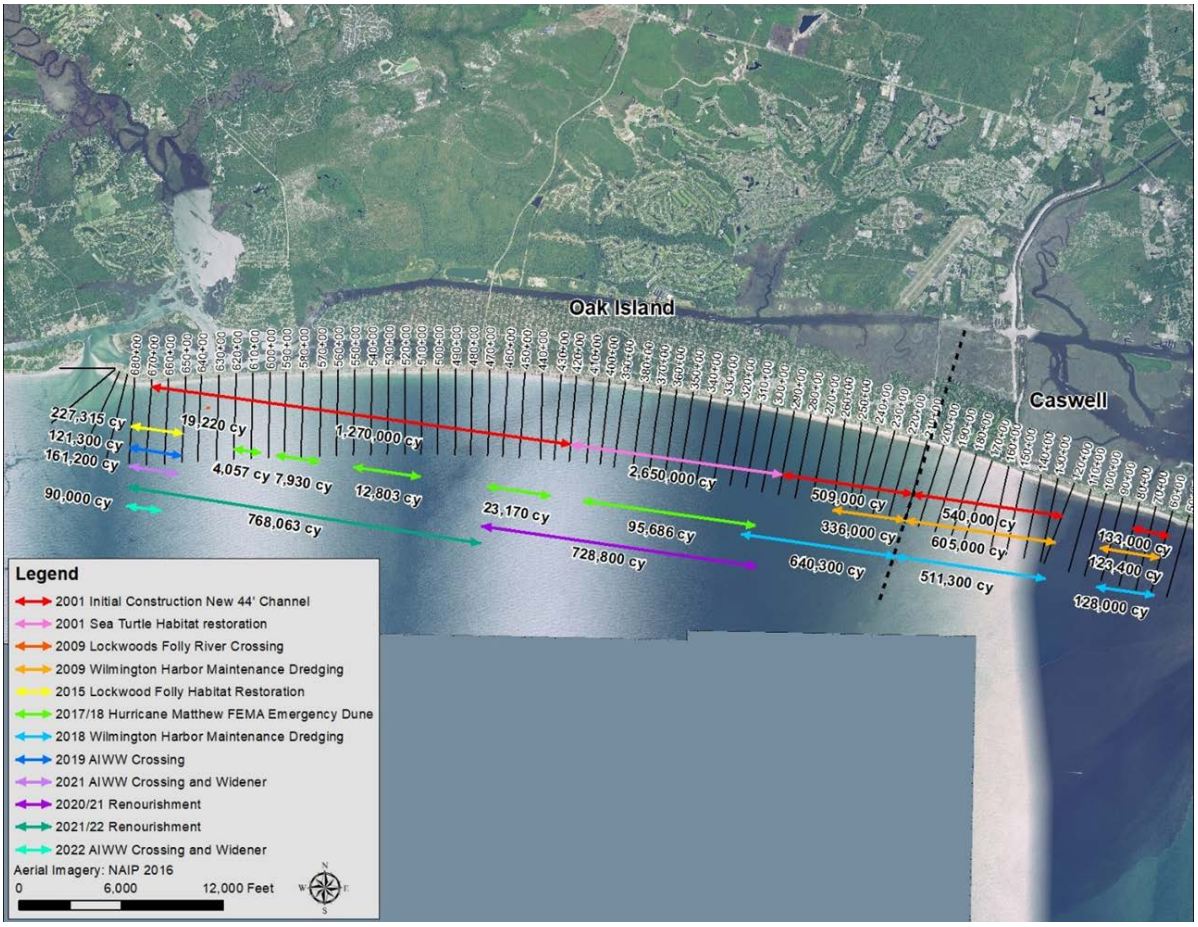


Figure 1-2. Summary of Oak Island Renourishment History

1.2 Purpose

The Town is taking proactive measures to restore the oceanfront shoreline and dune to provide necessary protection. Recent beach renourishment projects conducted in 2021 and 2022 have increased the level of protection of the primary dune system, but to maintain this protection, ongoing beach management is necessary. Storm impacts and background erosion continue to impact the Oak Island oceanfront which increases the risk of damage of upland infrastructure within the Town. The existing dune and berm system shows signs of degradation from recent storm events. The purpose of the proposed project is to:

- Repair the primary dune system to the authorized design level of protection to protect upland infrastructure along the Town's Oceanfront.
- Construct a berm to serve as advanced fill to maintain the design level of protection for a 6-year renourishment interval,
- Enhance sandy beach habitat for nesting sea turtles and wildlife.
- Provide a recreational beach for public access.

2.0 ALTERNATIVES ANALYSIS

2.1 Offshore Field Investigations

The Town has evaluated potential sediment sources available for the next 30 years through both geophysical (multibeam survey, side scan and magnetometer survey, and sub-bottom survey) and geological data (vibracore sampling and sediment gradation analysis) collection. Offshore sources, as depicted in Figure 2-1, consist of Frying Pan Shoals, the Old and New Outer Dredged Material Disposal Site (ODMDS), Lockwoods Folly Inlet Complex, Jay Bird Shoals, Yellow Banks, Offshore Oak Island (OSOKI), and Wilmington Harbor Inner Ocean Bar. These sources were evaluated in terms of quantity and quality of sediment and their suitability for the proposed 2024/2025 Renourishment Project (Table 2-1).

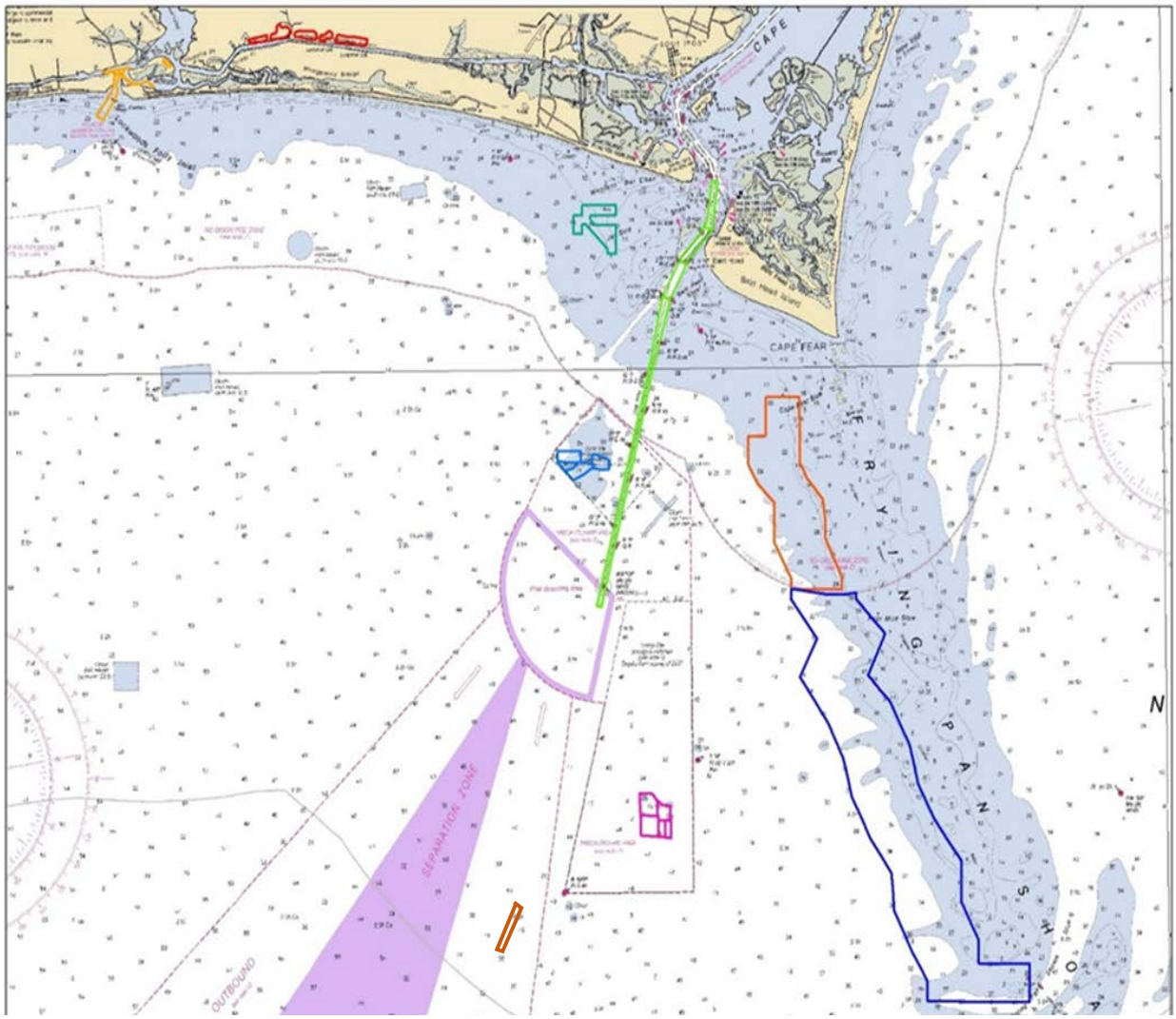


Figure 2-1. Identified Potential Sediment Sources

Table 2-1: Potential Borrow Source Evaluation

Area	Total Preliminary Volume (cy)	Borrow Source Evaluation
Old ODMDS	1,000,000	Not Sufficient Volume, Further Evaluation Required
New ODMDS	700,000	Not Sufficient Volume, Further Evaluation Required
Lockwoods Folly Inlet Complex LFI Bend Widener, Eastern Channel, Sheep Island	4,052,000	Methodological and Volume Constraints
Yellow Banks	4,200,000	Additional Evaluation Required
Frying Pan Shoals - Federal	58,000,000	Additional Environmental evaluation
Frying Pan Shoals - State	29,000,000	Additional Environmental Evaluation
Jay Bird Shoals	N/A (short term)	Additional Monitoring Required before future use
Offshore Oak Island (OSOKI)	**5,000,000**	**Primary Source for 24/25 Renourishment Project,**
Wilmington Harbor Inner Ocean Bar (IOB)	**1,600,000**	**Secondary Source for 24/25 Renourishment Project**

2.2 No Action Alternative

The No Action Alternative is defined as a continuation of the various actions the Town has historically taken to protect their oceanfront shoreline and infrastructure from storm events and chronic erosion. These measures include town sponsored programs to install native dune vegetation along vulnerable sections of its dune to stabilize the dunes and actions by individual property owners to rebuild storm damaged dunes by beach scraping (bulldozing). In addition, a limited number of individual property owners have installed temporary sandbag revetments to protect imminently threatened structures on the west end of Town. This alternative includes maintenance of the 2021 and 2022 nourishment projects, which utilized material from Jay Bird Shoals to rebuild dunes along the oceanfront shoreline. Lastly, the USACE would continue to beneficially place material from the Lockwood Folly Inlet Crossing on the west end as well as place material from the Inner Ocean Bar maintenance cycle as excess material becomes available.

With the No Action Alternative, BOEM would not issue a lease to access an OCS borrow area. Similarly, USACE would not issue a federal permit for any beach nourishment activities.

2.3 Preferred Alternative

2.3.1 Project Description

The 2024-2025 beach renourishment project consists of beach placement of up to 3 million cubic yards along the oceanfront of the Town of Oak Island from Station 210+00 to Station 680+00 approximately 47,100 ft.

As noted in Table 2-1, the proposed borrow areas for this project include the OSOKI borrow area as the primary source and the Wilmington Harbor Inner Ocean Bar (IOB) as a secondary source. The Wilmington Harbor IOB borrow area will only be used if the U.S. Army Corps of Engineers (USACE) does not perform the anticipated maintenance dredging project in 2024-2025 with accompanying placement on Caswell Beach and the east end of Oak Island. The IOB borrow area comprises Smith Island Reach, Baldhead Shoal Channel Reach 1, and Baldhead Shoal Channel Reach 2 to the currently authorized template dredged by the USACE on a 2-to-3-year interval.

At this time, the Town is coordinating with the USACE to develop a Memorandum of Understanding (MOU) to allow the placement of material from IOB on the east end of Oak Island and extend west, as completed in 2009 and 2018. Currently, it is unknown as to the volume and placement extent of material by the USACE. This will be determined by pre-construction surveys conducted by the USACE and/or selected Contractor as well as available budgets

The proposed OSOKI borrow area is a 10,888 ft by 1,000 ft rectangle with an area of approximately 250 acres. The borrow area is subdivided into areas that vary in elevation based on the depth of compatible sediment at each vibracore location (see Section 2.2.2). A summary of the requested permitted elevations within OSOKI is shown in Table 2-2. The center of the borrow area is approximately 16.4 nautical miles south-southwest of the Oak Island Light. This proposed borrow area is within BOEM Outer Continental Shelf (OCS) lease blocks 6336, 6337, and 6386. For a detailed plan view and sections of the proposed borrow areas, see sheet C-120 – C-121 and C-302 – C-303 of the permit drawings respectively as provided in Appendix A.

Table 2-2: OSOKI Permitted Dredge Elevation

Vibracore	Permitted Dredge Elevation (ft, NAVD88)
2023-OSOKI-17A	-70.3
2023-OSOKI-18	-71.6
2023-OSOKI-19	-71.3
2023-OSOKI-05	-72.5

Vibracore	Permitted Dredge Elevation (ft, NAVD88)
2023-OSOKI-20	-72.7
2023-OSOKI-21	-69.1
2023-OSOKI-22	-74.3
2023-OSOKI-06	-70.0
2023-OSOKI-23	-76.7
2023-OSOKI-24	-76.6
BOEMVC-2022-NC-29	-72.7

2.3.2 Construction Template

The proposed project is primarily a berm designed to provide advanced fill for a 6-year renourishment interval. The berm is proposed to be constructed at elevation 7.0 ft NAVD88, with the berm width varying from approximately 40 ft to 200 ft depending upon the historical volumetric erosion rates in that reach. Where escarpment and significant erosion of the built dunes constructed in the 2021 and 2022 renourishment projects is observed, the dunes will be repaired to the same template as authorized.

The dune template previously constructed consisted of a dune designed to withstand a 25-year return period storm. The dune elevation ranged from 13.0 to 15.5 ft NAVD88 with a crest width of 10 ft. The front slope of the dune was 4 Horizontal:1 Vertical (H:V) and the back slope of the dune was 5H:1V. Dune planting will be performed to restore native vegetation in the dune system post-beach nourishment. Dune planting will occur along the landward slope, dune crest, and 1/3 the distance down the seaward slope where necessary. No existing stable dune vegetation shall be disturbed during construction. For a detailed plan and profile view of dune and berm design, see sheets C-110 – C118 and C-300 – C-301 of the permit drawings in Appendix A.

2.3.3 Sediment Compatibility

Regional sediment composition, sediment size and sediment shape are among the many variables affecting a coastline's morphology. Taking material from offshore and placing it onto the beach has the potential to alter the physical characteristics of the native beach. To minimize the risk of such alterations, projects are designed to use similar sediment with regards to sorting, mean grain size, median grain size, and sediment composition. Furthermore, the North Carolina State Sediment Criteria Rule (15A NCAC 07H .0312), sets state standards for nourishment projects to prevent the disposal of incompatible material on the native beach. The rule sets forth the following requirements to ensure the sediment characteristics of material placed on the recipient beach are compatible with the native sediment:

- The average percentage by weight of fine-grained sediment (less than 0.0625 mm) in each borrow site shall not exceed the average percentage by weight of fine-grained sediment of the recipient beach characterization plus five (5) percent.
- The percentage by weight of granular (coarse-grained) sediment (greater than or equal to 2 mm and less than 4.76 mm) in each borrow site shall not exceed the average percentage by weight of granular sediment of the recipient beach characterization plus five (5) percent.
- The percentage by weight of gravel (greater than or equal to 4.76 mm) in a borrow site shall not exceed the average percentage by weight of gravel-sized sediment for the recipient beach characterization plus five (5) percent.
- The average percentage by weight of calcium carbonate in a borrow site shall not exceed the average percentage by weight of calcium carbonate of the recipient beach characterization plus 15 percent.

2.3.4 Native Beach Sediment

Sediments on the native beach were sampled by Athena in 2019. This established a native grain size distribution for purposes of compatibility analyses with borrow areas. The native sediment distribution for Oak Island was defined based on the percent gravel, granular, sand, fine-grained, and calcium carbonate present in samples taken from 13 locations along a defined transect as specified in NC Administrative Code 15A NCAC 07H.0312(1). These 13 samples were then averaged to obtain a composite average for the transect. Eleven transects were sampled along the shoreline of Oak Island (Figure 2-2).

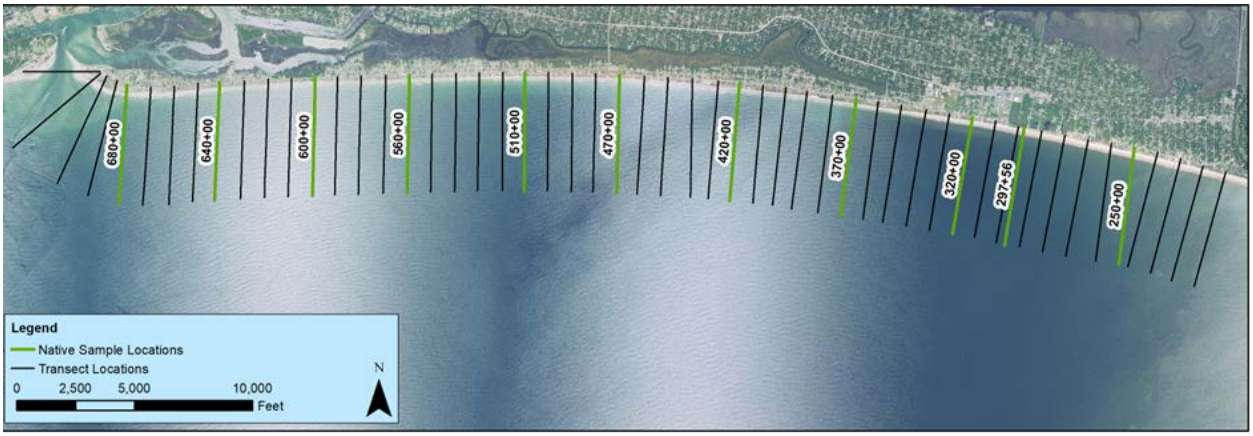


Figure 2-2. Native Sediment Sample Transects

The composite average for each of the 11 transects were then averaged to obtain a global mean for the native beach. The composite average from all 11 transects will be used to classify native material as opposed to only using the composite average for the transects that fall within the project area. A summary of the characteristics for the native beach is provided in Table 2-3. The

table also demonstrates the acceptable grain size criteria for beach placement in accordance with 15A NCAC 07H.0312 (3), this establishes consistent standards for native grain size for all future projects. The native material is characterized as fine-grained sand under the American Society for Testing and Materials (ASTM) Unified Soil Classification System with a mean grain size of 0.26 millimeter (mm). The native beach is coarse skewed and moderately sorted, as indicated by the native beach sediment statistics presented in Table 2-4.

Table 2-3: Native Beach Characteristics and NCAC Rule Parameters

Characteristic	2019 Native Global Mean	NCAC Requirements	NCAC Maximum
Gravel (>#4)	Reported: 0.45%	native + 5%	≤ 6%
Granular (>#10 & <#4)	Reported: 0.71%	native + 10%	≤ 11%
Sand (>#230 & <#10)	Reported: 96.96%	-	-
Fines (<#230)	Reported: 1.88%	native +5%	≤ 7%
Calcium Carbonate	Reported: 9.72%	native + 15%	≤ 25%

Table 2-4: Native Beach Sediment Statistics

Sediment Compatibility	2019 Native Global Mean
Median (mm)	0.26
Median (ϕ)	1.97
Mean (mm)	0.27
Mean (ϕ)	1.9
Standard Deviation (σϕ)	0.81

2.3.5 Proposed Borrow Area Sediment

Vibracores in the OSOKI borrow area were obtained by Amdrill in 2023 and BOEM in 2022. Eleven vibracores were identified to have beach compatible sediment with respect to the NC Technical Standards for sediment parameters.

The OSOKI borrow area has been identified to contain approximately 5.0 million cubic yards (Mcy) of beach-compatible material available for the 2024/2025 renourishment project. A 2-ft overdredge buffer has been included in the excavation volume to allow for dredging equipment inaccuracies and to leave a layer of similar material to in-situ conditions after completion of the project. The objective of the overdredge buffer is to not provide additional volume. Removing the volume associated with the 2 ft buffer leaves approximately 4.2 Mcy available to meet the project volume need. Detailed sediment characteristics for the OSOKI borrow area are presented

in Appendix B, while sediment characteristics for the Inner Ocean Bar borrow area are provided in Appendix C**.**

The sediment characteristics of each vibracore within the OSOKI borrow area were composited down to the permitted elevation and meet all the grain size criteria for beach placement as established in 15A NCAC 07H.0312 (Table 2-5). The typical sediment type in OSOKI is sand (mean size = 0.36 mm). This comparison shows the proposed borrow area sediments to be similar to the native material. Placed material will be visually monitored for sediment quality daily (via visual inspection) and weekly (via sediment analysis).

Table 2-5: Composite sediment characteristics of proposed beach fill compared to native sediment.

Sediment Compatibility	2019 Native Global	OSOKI Composite	NCAC Maximum
Gravel	0.45%	0.67%	6%
Granular	0.71%	1.37%	11%
Sand	96.96%	93.99%	-
Fines	1.88%	3.97%	7%
Carbonate	9.72%	5.97%	25%
Mean (mm)	0.27	0.36	-

2.4 Survey Data Collection

2.4.1 Hard Bottom Survey

Nearshore

TI Coastal conducted sidescan surveys between 2nd Place West and 69th Place West on June 29, 2021, aiming to identify potential hard-bottom areas. The investigation revealed no physical evidence of hard bottom. To verify these findings, UNCW conducted a diver-based seabed field investigation on December 16, 2021. The diver-based observations employed research diving techniques, side-scan sonar surveys, and echo-sounding readings. The analysis of samples retrieved during the survey indicated the presence of silty and/or sandy material. No areas of hard bottom were discovered during this investigation as noted by TI Coastal and UNCW.

Offshore

Geologic and geophysical data, collected by Aptim and under contract by BOEM, was reviewed and analyzed by a certified marine underwater archaeologist through Tidewater Atlantic Research (TAR) for hardbottom and cultural resources within the OSOKI borrow area. Magnetic

data were acquired using a cesium vapor magnetometer and sonar image data was obtained through a high-frequency dual-channel sidescan sonar. Based on the analysis of the APTIM survey data, a determination was made that there were no submerged cultural resources or hard bottoms within the vibracore sites.

Geodynamics/NV5 has completed the geophysical field investigation to identify, assess, and document submerged cultural resources and hardbottom within the OSOKI borrow area, including a 500 m buffer. The data collection involved a multibeam Echosounder, sidescan sonar, sub-bottom profiler, and gradiometer to detect any hardbottom or cultural resources within the proposed borrow area. Surveys beyond the primary borrow area, up to a 500m buffer for cultural and hardbottom clearance, utilize multibeam echosounder and sidescan sonar exclusively. Results of this field investigation are forthcoming and will be provided by the end of February 2024. Preliminary results indicate that the OSOKI borrow area is clear of any hardbottom or cultural resources.

2.5 Construction Methodology

The proposed project entails the use of a medium to large hopper dredge to extract sand from the OSOKI borrow area and Inner Ocean Bar borrow areas. Given the distance offshore of the OSOKI borrow area, as well as the water depths excavation will occur, a medium to large hopper dredge is expected. A hopper dredge will be used to load material into the vessel's hull and pump it ashore through pre-positioned submerged pipelines. A hopper dredge will be used for the Inner Ocean Bar borrow area as well.

Work will progress in sections within the borrow area(s) and along the beach. Fill placement along the beach will typically progress at a rate of 400-700 linear feet per day. Construction activities will involve the movement of heavy equipment and pipe along approximately 1 mile reaches over 1-2 weeks. Once a section is complete, pipes and heavy equipment will be shifted to a new section, and the process repeated. All dredging and beach fill construction activities are anticipated to take place within the 16 November through 30 April environmental moratoria window.

3.0 Effects Determination

An overview of the potential impacts associated with the proposed action concerning species listed under the Endangered Species Act (ESA) and identified within the Action Area are provided in the table below. The determinations of effects on endangered and threatened listed species, including those species with identified critical habitat, are outlined in Table 3-1.

Table 3-1: Summary of Effect Determinations

Common Name	Scientific Name	Agency	Status	Critical Habitat	Effect Determination	Critical Habitat Determination
Fish						
Atlantic sturgeon	*Acipenser oxyrinchus oxyrinchus*	NMFS	Endangered	Occurs in area	NLAA	NLAA
Shortnose sturgeon	*Acipenser brevirostrum*	NMFS	Endangered	None designated	NLAA	--
Sea turtles						
Leatherback sea turtle	*Dermochelys coriacea*	NMFS, USFWS	Endangered	Not present	NLAA	No Effect
Loggerhead sea turtle	*Caretta caretta*	NMFS, USFWS	Threatened	Occurs in area	NLAA	NLAA
Green sea turtle	*Chelonia mydas*	NMFS, USFWS	Threatened	Not present	NLAA	No Effect
Hawksbill sea turtle	*Eretmochelys imbricata*	NMFS, USFWS	Endangered	Not present	NLAA	No Effect
Kemp's ridley sea turtle	*Lepidochelys kempii*	NMFS, USFWS	Endangered	Not present	NLAA	No Effect
Marine Mammals						
North Atlantic right whale	*Eubalaena glacialis*	NMFS	Endangered	Occurs in Area	NLAA	NLAA
Fin Whale	*Balaenoptera physalus*	NMFS	Endangered	None designated	NLAA	--
Sei Whale	*Balaenoptera borealis*	NMFS	Endangered	None designated	NLAA	--
Blue Whale	*Balaenoptera musculus*	NMFS	Endangered	None designated	NLAA	--
Sperm Whale	*Physeter macrocephalus*	NMFS	Endangered	None designated	NLAA	--
West Indian manatee	*Trichechus manatus*	USFWS	Endangered	Not present	NLAA	No Effect
Elasmobranchs						
Smalltooth sawfish	*Pristis pectinata*	NMFS	Endangered	Not present	NLAA	No Effect
Giant Manta Ray	*Manta birostris*	NMFS	Threatened	None designated	NLAA	--
Birds						

Common Name	Scientific Name	Agency	Status	Critical Habitat	Effect Determination	Critical Habitat Determination
Piping plover	*Charadrius melodus*	USFWS	Threatened	Occurs in area	NLAA	NLAA
Red knot	*Calidris canutus rufa*	USFWS	Threatened	Occurs in area	NLAA	NLAA
Wood stork	*Mycteria americana*	USFWS	Threatened	None designated	NLAA	--
Roseate Tern	*Sterna dougallii dougallii*	USFWS	Endangered	None designated	NLAA	NLAA
Plants						
Seabeach amaranth	*Amaranthus pumilus*	USFWS	Threatened	None designated	NLAA	No Effect

-- Critical habitat has not been designated for the species; therefore, effect determinations are not applicable.

4.0 Avoidance and Minimization

The Town is committed to Reasonable Measures and Terms and Conditions listed under sand placement from beach nourishment activities in the USFWS Statewide Programmatic Biological Opinion for Sand Placement Projects and the South Atlantic Regional Biological Opinion.

5.0 Agency Coordination and Consultation

An interagency scoping meeting was held on November 11, 2023 (see Appendix D for the meeting summary and presentation).

Because the project involves use of OCS borrow areas, which fall under the Bureau of Ocean Energy Management (BOEM) jurisdiction, and placement of material on the beach, which falls under the USACE's jurisdiction, it was determined that BOEM and the USACE would act as joint-lead agencies for NEPA purposes and would prepare joint NEPA documents. In a letter dated December 15, 2023, BOEM and the USACE agreed to participate in the required ESA Section 7 consultations; the Magnuson-Stevens Fishery and Conservation Management Act Essential Fish Habitat (EFH) consultation (Section 305); the National Historic Preservation Act Section (NHPA) Section 106 process; and the Coastal Zone Management Act (CZMA) Section 307 consistency process.

NCDWR Pre-Filing Notification

A scoping meeting was held at which the NC Division of Water Resources was present. The date of the scoping meeting was November 11, 2023, and this project was discussed. This meeting met the requirement for requesting a prefiling meeting under 40 CFR Part 121 for 401 Certifications in accordance with the federal Clean Water Act.