

VALUABLE

RETURN TO
PUBLIC WORKS
OFFICE
CAMP LEJEUNE
NORTH CAROLINA

SUBJECT Elev check from
Swamp point to ward & Tidal
Benches @ New River bridge

FIELD PARTY
CROOK IN CHARGE
____ INSTRUMENT
____ NOTES
____ TAPE READ
____ TAPE OR ROD
____ TAPE OR ROD
____ INSTRUMENT NO.
____ TAPE NO.

WEATHER
CLEAR
CLOUDY
WINDY
RAIN
FAIR
SNOW
HOT
MODERATE
COLD
FOG
FIGURED BY _____
NOTES CHECKED BY _____
PLOTTED BY _____

FILE No. _____
FLDR. No. _____
SHEET 1 of
DATE 8-28 1953

Quad. No. _____

STATION	DIST.	ANGLE ° ' "	+	H. I. BEARING	VER: ANG. DIFF.	ELEVATION
BM			2.14	✓	6.56	4.42
TP			3.15	✓	6.37	3.22
TP			3.32	✓	6.00	2.68
TP			3.24	✓	5.76	2.52
TP			3.09	✓	6.20	3.11
TP			3.62	✓	6.57	2.95
TP			3.52	✓	6.74	3.22
TP			2.03	✓	5.83	3.80
TP 2" pipe			3.16	6 ✓	X.60	3.44
TP			3.16	7 ✓	X.12	3 X.76

Army Eng. MARK # B D

VALUABLE

SUBJECT Elev. cont.

RETURN TO
 PUBLIC WORKS
 OFFICE
 CAMP LEJEUNE
 NORTH CAROLINA

FIELD PARTY

Cault
 IN CHARGE

 INSTRUMENT

 NOTES

 TAPE READ

 TAPE OR ROD

 TAPE OR ROD

 INSTRUMENT NO. _____
 TAPE NO. _____

WEATHER

CLEAR
 CLOUDY
 WINDY
 RAIN
 FAIR
 SNOW
 HOT
 MODERATE
 COLD
 FOG

FILE No. _____
 FLDR. No. _____
 SHEET 20f
 DATE _____ 19____

FIGURED BY _____
 NOTES CHECKED BY _____
 PLOTTED BY _____
 Quad. No. _____

STATION	DIST.	ANGLE		+	H. I.	VER: ANG.	ELEVATION
		°	' "		BEARING	DIFF.	

<u>TP</u>					<u>2</u> 12	<u>4.78</u>	<u>2</u> 34
<u>10 T.P.^s</u>					<u>30.43</u>	<u>32.51</u>	

intersection S.W. & int. 4.

TABLE

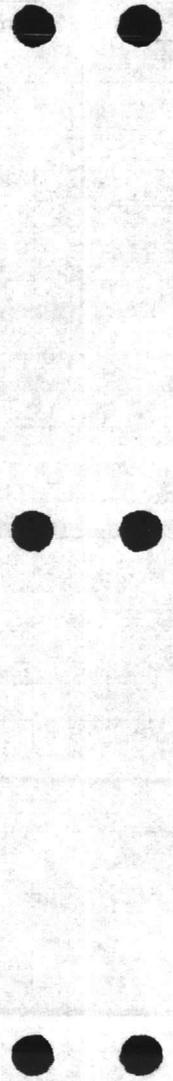
STATION
ELEVATION
DISTANCE
DIRECTION
CAMP IN CHARGE
TO PLACE
FROM WHICH
RETURN TO

HILL
DEPARTING
DIRECTION
NEW AND
ELEVATION

FIELD PARTY
IN CHARGE
IN TRUENT
STATION
TAP READ
TAP OR ROD
TAP OR FOR
INSTRUMENT NO.
TAP NO.

WEATHER
WIND
TEMP
MOISTURE
BAROMETER
TAP
WIND DIRECTION
TAP NO.

THE NO.
FOR NO.



VALUABLERETURN TO
PUBLIC WORKS
OFFICE
CAMP LEJEUNE
NORTH CAROLINASUBJECT E. V. Check on Tidal
Benchmarks to Star Wars @
New River inlet.
Toll. S. C. G. B.M. of Dixon

FIELD PARTY

IN CHARGE _____
INSTRUMENT _____
NOTES _____
TAPE READ _____
TAPE OR ROD _____
TAPE OR ROD _____
INSTRUMENT NO. _____
TAPE No. _____

WEATHER

CLEAR _____
CLOUDY _____
WINDY _____
RAIN _____
FAIR _____
SNOW _____
HOT _____
MODERATE _____
COLD _____
FOG _____FILE No. _____
FLDR. No. _____
SHEET 1 of
DATE 8-31 1953
FIGURED BY _____
NOTES CHECKED BY _____
PLOTTED BY _____

Quad. No. _____

STATION	DIST.	ANGLE		+	H. I. BEARING	VER. ANG. DIFF.	ELEVATION
		°	"				
B.M.#1				4.45			7.34
B.M.#2	1933 Tidal B.M.				11.79	4.76	7.03 (7.03)
B.M.#3						5.35	6.44 (6.44)
B.M.#1					3.36		
					10.70		
TP				1.73		4.51	6.19
					7.92		
TP				4.69		5.09	2.83
					7.52		
TP				2.49		3.06	4.46
					6.95		
TP				9.95		1.04	5.91
					15.86		
"Ward"						2.68	13.18 (13.28)
"Ward"				2.69			13.28
					15.97		
TP				1.18		9.97	6.00
					7.18		
TP				3.06		2.62	4.56
					7.62		

Tidal Benchmarks

VALUABLE

SUBJECT Elev Check Cont.

RETURN TO
PUBLIC WORKS
OFFICE
CAMP LEJEUNE
NORTH CAROLINA

FIELD PARTY

IN CHARGE

INSTRUMENT

NOTES

TAPE READ

TAPE OR ROD

INSTRUMENT NO.

TAPE NO.

WEATHER

CLEAR
CLOUDY
WINDY
RAIN
FAIR

SNOW
HOT
MODERATE
COLD
FOG

FILE No. _____
FLDR. No. _____
FIGURED BY _____
NOTES CHECKED BY _____
PLOTTED BY _____
SHEET 204
DATE 8-31 1952

Quad. No. _____

STATION	DIST.	ANGLE ° ' "	+	H. I. BEARING	VER. ANG. DIFF.	ELEVATION	
				7.62			
TP		6.11		9.04	4.69	2.93	
TP		4.44		10.72	2.76	6.28	
BM #1					3.28	7.44 (7.34)	Tidal Bench
B.M.		-71.30 (19)				7.34	Tidal Bench Mark #1
		3.71		11.05			
T.P.					+74.87 (19)	5.08	
		4.41		10.38		5.97	
T.P.					5.40	4.98	
		3.00		7.98			
T.P.					5.47	7.51	
		5.17		7.68			
					0.46	7.22	
		3.88		11.10			
					8.32	2.78	

VALUABLE

SUBJECT _____

RETURN TO
PUBLIC WORKS
OFFICE
CAMP LEJEUNE
NORTH CAROLINA

FIELD PARTY

 _____ IN CHARGE
 _____ INSTRUMENT
 _____ NOTES
 _____ TAPE READ
 _____ TAPE OR ROD
 _____ TAPE OR ROD
 _____ INSTRUMENT NO.
 _____ TAPE NO.

WEATHER

 CLEAR
 CLOUDY
 WINDY
 RAIN
 FAIR
 SNOW
 HOT
 MODERATE
 COLD
 FOG

FILE No. _____

FLDR. No. _____

FIGURED BY _____

SHEET _____

NOTES CHECKED BY _____

PLOTTED BY _____

DATE _____

19____

Quad. No. _____

STATION	DIST.	ANGLE ° ' "	+	H. I. BEARING	VER. ANG. DIFF.	ELEVATION
						2.78
		6.82		9.60		
				6.44		3.16
		3.58		6.74		
				4.94		1.80
		4.62		6.42		
				3.11		3.31
		3.60		6.91		
TP				5.22		1.69
						(2.34)
						(0.34)
						Stake intersection slug inked
14 T.P. ^s		56.27		67.76		

VALUABLE

RETURN TO
PUBLIC WORKS
OFFICE
CAMP LEJEUNE
NORTH CAROLINA

SUBJECT BENCH MARK CHECK
DIXON TO SNEEDS
FERRY.

FIELD PARTY
DEWINS IN CHARGE
INSTRUMENT _____
NOTES _____
TAPE READ _____
TAPE OR ROD _____
TAPE OR ROD _____
STRUMENT NO. _____
TAPE NO. _____

WEATHER
CLEAR _____
CLOUDY _____
WINDY _____
RAIN _____
FAIR _____
SNOW _____
HOT _____
MODERATE _____
COLD _____
FOG _____

FILE No. _____
FLDR. No. _____
SHEET 10A
DATE 8-27 1953

Quad. No. _____

STATION	DIST.	ANGLE ° ' "	+	H. I. BEARING	VER: ANG. DIFF.	ELEVATION	
M.D.N.				5 350 72.689		67.339	V. S C of G C 148 B.M.
T.P. # 1				2 470 70.404	4.755	67.934	1935 SOUTH OF DIXON N.C.
T.P. # 2				1 760 67.144	5.020	65.384	
T.P. # 3				2.688 64.377	5.455	61.689	
T.P. # 4				3.630 60.747	5.205	65.952	
T.P. # 5				4.430 67.547	2.835	63.117	
T.P. # 6				1 917 66.016	3.448	64.099	
T.P. # 7				2.700 63.656	6.060	60.956 59.956	
T.P. # 8					4.330	59.316 58.326	

STATION
OFFICE
ADDRESS
CITY

RECEIVED
DATE
TIME
BY

WARRANT
NO.
DATE
BY



VALUABLE

SUBJECT _____

RETURN TO
 PUBLIC WORKS
 OFFICE
 CAMP LEJEUNE
 NORTH CAROLINA

FIELD PARTY

 IN CHARGE

 INSTRUMENT

 NOTES

 TAPE READ

 TAPE OR ROD

 TAPE OR ROD

 INSTRUMENT NO. _____
 TAPE NO. _____

WEATHER

CLEAR
 CLOUDY
 WINDY
 RAIN
 FAIR

SNOW
 HOT
 MODERATE
 COLD
 FOG

FILE No. _____
 FLD. No. _____
 SHEET 204
 DATE _____ 19__

FIGURED BY _____
 NOTES CHECKED BY _____
 PLOTTED BY _____
 Quad. No. _____

STATION	DIST.	ANGLE ° ' "	+	H. I. BEARING	VER. ANG. DIFF.	ELEVATION
T.P.# 8				01.001		58.326 59.314
			2 235	62.031		
T.P.# 9				59.036	4.970	56.591 57.581
			2.445	60.026		
T.P.# 10				55.841	4.905	54.131 55.121
			1.710	56.831		
T.P.# 11				51.824	5.810	50.031 51.021
			1.793	52.814		
T.P.# 12				47.524	5.830	45.994 46.984
			1.530	48.514		
T.P.# 13				42.890	6.134	41.390 42.380
			1.500	43.880		
T.P.# 14				35.648	8.175	34.715 35.705
			0.933	36.638		
T.P.# 15				30.438	6.805	28.843 29.833
			1.595	31.428		

VALUABLE

RETURN TO
FIELD OFFICE
SERIAL
LABORATORY
WASHINGTON

STATION TO DIRECTOR

RECEIVED
FEDERAL BUREAU OF INVESTIGATION
U. S. DEPARTMENT OF JUSTICE

DATE
TIME
BY
AGENCY

FIELD PARTY

INCIDENT

INVESTIGATION

PROSECUTION

LABORATORY

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

WEATHER

WIND

TEMPERATURE

MOON

STAR

PLANET

COMET

NEBULA

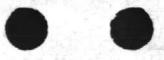
FIELD NO.

DATE

TIME

BY

AGENCY



VALUABLE

SUBJECT _____

RETURN TO
 PUBLIC WORKS
 OFFICE
 CAMP LEJEUNE
 NORTH CAROLINA

FIELD PARTY

 IN CHARGE

 INSTRUMENT

 NOTES

 TAPE READ

 TAPE OR ROD

 TAPE OR ROD

 INSTRUMENT NO. _____
 TAPE NO. _____

WEATHER

CLEAR _____
 CLOUDY _____
 WINDY _____
 RAIN _____
 FAIR _____
 SNOW _____
 HOT _____
 MODERATE _____
 COLD _____
 FOG _____
 FIGURED BY _____
 NOTES CHECKED BY _____
 PLOTTED BY _____

FILE No. _____
 FLDR. No. _____
 SHEET 304
 DATE _____ 19__

Quad. No. _____

STATION	DIST.	ANGLE ° ' "	+	H. I. BEARING	VER: ANG. DIFF.	ELEVATION
T.P.#16				31.128 30.938		24.258
					6180	26.248
				24.278		
		0 020		26.268		
T.P.#17					4490	19.788
				21.943		21.772
		2.155		23.932		
T.P.#18					2995	18.948
				23.928		20.958
		4.980		25.918		
T.P.#19					0745	23.183
				30.168		25.175
		6 985		32.158		
T.P.#20					2645	27.523
				33.513		29.513
		5 990		35.503		
T.P.#21					2390	31.123
				36.743		33.113
		5 620		38.733		
T.P.#22					0845	35.898
				42.183		37.888
		6 285		44.173		
T.P.#23					1285	40.898
						42.888

ON EAST COR. OF BRIDGE BETWEEN
 DIXON N.C. - RIFLE RANGE

FIELD NO.

DATE
TIME
PLACE

STATION

NO. OF
SPECIMENS

FIELD PARTY
IN CHARGE
TREATMENT
DATE
TIME
PLACE
STATION

WEATHER
TEMPERATURE
WIND
MOON
CLOUDS
HUMIDITY
PRECIPITATION
OTHER

FIELD NO.
DATE
TIME
PLACE
STATION

VALUABLE

SUBJECT _____

RETURN TO
 PUBLIC WORKS
 OFFICE
 CAMP LEJEUNE
 NORTH CAROLINA

FIELD PARTY

 IN CHARGE

 INSTRUMENT

 NOTES

 TAPE READ

 TAPE OR ROD

 TAPE OR ROD

 INSTRUMENT NO. _____
 TAPE NO. _____

WEATHER

CLEAR _____
 CLOUDY _____
 WINDY _____
 RAIN _____
 FAIR _____
 SNOW _____
 HOT _____
 MODERATE _____
 COLD _____
 FOG _____

FILE No. _____
 FLDR. No. _____
 SHEET 4 of
 DATE _____ 19__

Quad. No. _____

STATION	DIST.	ANGLE ° ' "	+	H. I. BEARING	VER: ANG. DIFF.	ELEVATION
T.P.#23				47.608		40.898 42.888
			L 710	49.598		
T.P.#24				52.793		46.923
			G 370	54.783	1 185	48.413
T.P.#25				57.923		51.853
			G 070	60.913	0 240	54.843
T.P.#26				63.768		57.698
			L 070	66.758	0 225	40.488
T.P.#27				65.723		62.118
			3 605	68.713	1 650	65.108
T.P.#28				63.318		60.533
			2 785	66.308	5 190	63.523
T.P.#29				62.063		58.518
			3 545	65.053	A 800	61.508
T.P.#30				60.928		57.563
			2 865	63.418	4 500	60.553
T.P.#31						56.178
					4.250	59.168

VALUABLE

SUBJECT

FIELD PARTY
IN CHARGE
ASSIGNMENT
DATE
TAKE UP
TAKE OR TO
ATTENDING

FIELD PARTY

IN CHARGE

ASSIGNMENT

DATE

TAKE UP

TAKE OR TO

ATTENDING

DATE

WEATHER

WIND

TEMP

MOISTURE

WIND

TEMP

MOISTURE

WIND

TEMP

MOISTURE

FIELD NO.

DATE

TIME

PLACE

DATE

STATION

TIME

DATE

PLACE

DATE

TIME

DATE

PLACE

VALUABLE

SUBJECT _____

RETURN TO
 PUBLIC WORKS
 OFFICE
 CAMP LEJEUNE
 NORTH CAROLINA

FIELD PARTY

 IN CHARGE

 INSTRUMENT

 NOTES

 TAPE READ

 TAPE OR ROD

 TAPE OR ROD

 INSTRUMENT NO. _____
 TAPE NO. _____

WEATHER

CLEAR
 CLOUDY
 WINDY
 RAIN
 FAIR

SNOW
 HOT
 MODERATE
 COLD
 FOG

FILE No. _____
 FLD. No. _____
 SHEET 504
 DATE _____ 19__

FIGURED BY _____
 NOTES CHECKED BY _____
 PLOTTED BY _____
 Quad. No. _____

STATION	DIST.	ANGLE ° ' "	+	H. I. BEARING	VER: ANG. DIFF.	ELEVATION
TP.#31			2 503	58.681 61.671		56.178 59.168
TP.#32			3 320	56.881 59.871	5 120	53.561 56.551
TP.#33			3 123	55.319 58.309	4 685	52.196 55.186
TP.#34			3 228	53.437 56.427	5 110	50.209 53.199
TP.#35			2 725	51.367 54.357	4 795	48.642 51.632
TP.#36			2 913	50.000 52.990	4 780	47.087 50.077
TP.#37			6 108	53.243 56.233	2 865	47.135 50.125
TP.#38			5 910	58.716 61.706	0 497	52.746 55.736

VALUABLE

SUBJECT

RETURN TO
PUBLIC WORKS
OFFICE
CAMP LEWIS
SOUTH CAROLINA

STATION DIS

AMBER

BEARING

ELEVATION

FIELD PARTY

IN CHARGE

ASSISTANT

DATE

TABULARY

STATE OR POS

SECTION

TABULARY

CAMP

NO.

DATE

BY

NO.

DATE

BY

NO.

11111

NO.

DATE

BY

NO.



VALUABLE

SUBJECT _____

RETURN TO
 PUBLIC WORKS
 OFFICE
 CAMP LEJEUNE
 NORTH CAROLINA

FIELD PARTY

 IN CHARGE

 INSTRUMENT

 NOTES

 TAPE READ

 TAPE OR ROD

 TAPE OR ROD

 INSTRUMENT NO. _____
 TAPE NO. _____

WEATHER

CLEAR _____
 CLOUDY _____
 WINDY _____
 RAIN _____
 FAIR _____

SNOW _____
 HOT _____
 MODERATE _____
 COLD _____
 FOG _____

FILE No. _____

FLDR. No. _____

FIGURED BY _____ SHEET 624

NOTES CHECKED BY _____

PLOTTED BY _____ DATE _____ 19__

Quad. No. _____

STATION	DIST.	ANGLE ° ' "	+	H. I. BEARING	VER: ANG. DIFF.	ELEVATION
				61.706		
				58.716		57.829
T.P.# 39					0.887	60.819
				62.624		
				4.845	65.664	
						56.474
USMC. MON.# 12 = T.P.# 10					6.200	59.474
						56.36
				7.170	63.644	
T.P.# A1					2.707	60.937
				5.010	65.947	
T.P.# A2					2.625	63.322
				4.625	67.947	
T.P.# A3					2.680	65.267
				4.417	69.684	
T.P.# A4					3.310	66.374
				3.525	69.949	
T.P.# A5					4.607	65.342
				3.600	68.942	
T.P.# A6 T.R.M.					3.320	65.622

VALUABLE

STATION
DIRT
ANGLE
BEARING
DIP
ELEVATION

STATION
DIRT
ANGLE
BEARING
DIP
ELEVATION

FIELD PARTY

IN CHARGE
TREATMENT
DATE OF
TREATMENT

WEATHER

WIND
TEMPERATURE
HUMIDITY
CLOUDS

FILE NO.

DATE

WORK NO.



VALUABLE

SUBJECT _____

RETURN TO
 PUBLIC WORKS
 OFFICE
 CAMP LEJEUNE
 NORTH CAROLINA

FIELD PARTY

 IN CHARGE

 INSTRUMENT

 NOTES

 TAPE READ

 TAPE OR ROD

 TRUMENT NO. _____
 TAPE NO. _____

WEATHER

CLEAR
 CLOUDY
 WINDY
 RAIN
 FAIR

SNOW
 HOT
 MODERATE
 COLD
 FOG

FILE No. _____
 FLDR. No. _____
 SHEET 7A
 DATE 8-28 19__

FIGURED BY _____
 NOTES CHECKED BY _____
 PLOTTED BY _____
 Quad. No. _____

STATION	DIST.	ANGLE ° ' "	+	H. I. BEARING	VER: ANG. DIFF.	ELEVATION	
T.P.# 46	T.B.M.		2 795	68 417		65,622	NAIL IN POWER POLE # K211 43
T.P.# 47					4,000	64,917	
			2 320	66,737			
T.P.# 48					7,005	59,732	
			0 683	60,415			
T.P.# 49					6,570	53,845	
			1 205	55,050			
TP# 50					5 800	49,250	
			2 030	51,280			
T.P.# 51					5 000	46,280	
			2,065	48,345			
T.P.# 52					4 695	43,650	
			3 840	47,490			
T.P.# 53					1 790	45,790	
			5,977	51,767			
T.P.# 54					1 955	49,722	

RETURN TO
FIELD OFFICE
FARMINGTON
NORTH CAROLINA

STATION DIST

H. J. VERRARD
BANKING DIST

FIELD PARTY
IN CHARGE
TREATMENT
TAPES
TAPES ON ROAD
TAPES ON SIDE
TAPES IN

WEATHER
CLEAR
DRIZZLE
WINDY
RAIN
THUNDER
HAIL
FOG
MIST
SMOG
MIST
SMOG
MIST
SMOG

VALUABLE

SUBJECT _____

RETURN TO
 PUBLIC WORKS
 OFFICE
 CAMP LEJEUNE
 NORTH CAROLINA

FIELD PARTY

 IN CHARGE

 INSTRUMENT

 NOTES

 TAPE READ

 TAPE OR ROD

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 INSTRUMENT NO. _____
 TAPE NO. _____

WEATHER

CLEAR _____
 CLOUDY _____
 WINDY _____
 RAIN _____
 FAIR _____
 SNOW _____
 HOT _____
 MODERATE _____
 COLD _____
 FOG _____
 FIGURED BY _____
 NOTES CHECKED BY _____
 PLOTTED BY _____

FILE No. _____
 FLDR. No. _____
 SHEET 8 of
 DATE _____ 19__

Quad. No. _____

STATION	DIST.	ANGLE ° ' "	+	H. I. BEARING	VER: ANG. DIFF.	ELEVATION
T.P.# 51					197	49.812 722
	1.475	54		287		
T.P.# 55					1.247	50.010 49950
	3.893	53		935 843		
T.P.# 56					3.830	50.103 613
	3.797	53		890 800		
T.P.# 57					2.265	51.625 535
	2.885	54		570 420		
T.P.# 58					3.840	50.670 580
	3.927	54		597 507		
T.P.# 59					1.340	50.257 167
	2.685	52		942 832 52,852		
T.P.# 60					5.490	47.452 47.362
	2.345			49.797 49.707		
T.P.# 61					5.310	44.487 44.397
	2.660			47.147 47.057		

NAIL IN TEL. POLE # 159

452
 362

 90

STATION
DIST
ANGLE
BEARING
YTD AND
ELEVATION

STATION
DIST
ANGLE
BEARING
YTD AND
ELEVATION

STATION NO.
ELEVATION

VALUABLE

SUBJECT _____

RETURN TO
 PUBLIC WORKS
 OFFICE
 CAMP LEJEUNE
 NORTH CAROLINA

FIELD PARTY

 IN CHARGE

 INSTRUMENT

 NOTES

 TAPE READ

 TAPE OR ROD

 TAPE OR ROD

 INSTRUMENT NO. _____
 TAPE NO. _____

WEATHER

CLEAR _____
 CLOUDY _____
 WINDY _____
 RAIN _____
 FAIR _____
 SNOW _____
 HOT _____
 MODERATE _____
 COLD _____
 FOG _____
 FIGURED BY _____
 NOTES CHECKED BY _____
 PLOTTED BY _____

FILE No. _____
 FLDR. No. _____
 SHEET 9 of _____
 DATE _____ 19__

Quad. No. _____

STATION	DIST.	ANGLE ° ' "	+	H. I. BEARING	VER: ANG. DIFF.	ELEVATION
T.P. # 62				47.107 47.057	4.585	42.472 42.562
			2963	45.435 45.525		
T.P. # 63					4.588	40.847 40.937
			3260	44.107 44.197		
T.P. # 64					4.455	39.652 39.742
			3370	43.022 43.112		
T.P. # 65					4.400	38.622 38.712
			4065	42.687 42.777		
T.P. # 66					3.585	39.102 39.192
			4005	43.107 43.197		
T.P. # 67					4.360	38.747 38.837
			4195	42.942 43.032		
T.P. # 68					3.250	39.692 39.782
			4270	43.962 44.052		
T.P. # 70					3.815	40.147 40.237

VALUABLE

RETURN TO
PUBLIC WORKS
DEPT.
WASHINGTON
D. C.

DATE OF
DEPT.

TABLE

DEPT.

YEAR AND
LOCATION

FIELD PARTY
IN CHARGE
DEPARTMENT
TABLE NO.
TABLE OR NO.
TABLE OR NO.
TABLE NO.

WEATHER
CLEAR
CLOUDY
WINDY
RAIN
MIST
FOG
HAIL
SNOW
ICE

FIELD NO.
TABLE NO.
TABLE NO.
TABLE NO.



198

VALUABLE

SUBJECT _____

RETURN TO
PUBLIC WORKS
OFFICE
CAMP LEJEUNE
NORTH CAROLINA

FIELD PARTY

IN CHARGE

INSTRUMENT

NOTES

TAPE READ

TAPE OR ROD

TAPE OR ROD

INSTRUMENT NO.

TAPE NO.

WEATHER

CLEAR
CLOUDY
WINDY
RAIN
FAIR
SNOW
HOT
MODERATE
COLD
FOG
FIGURED BY _____
NOTES CHECKED BY _____
PLOTTED BY _____

FILE No. _____
FLDR. No. _____
SHEET 16 of _____
DATE _____ 19__

Quad. No. _____

STATION	DIST.	ANGLE ° ' "	+	H. I. BEARING	VER: ANG. DIFF.	ELEVATION
T.P.#70				44.302		40.147 40.237
			1 155	44.392		
T.P.#71				44.960		40.912 41.002
			1 048	45.040		
T.P.#72				45.645		41.740 41.820 ✓
			3 905	45.725		
T.P.#73				47.055		42.595 42.675
			1 460	47.135		
T.P.#74				46.960		43.475 43.555
			3 485	47.040		
T.P.#75 T.B.m.				44.967		41.640 41.720 ✓
			3.327	45.047		
T.P.#76				43.477		41.792 41.872
			1 685	43.557		
T.P.#77				39.887		36.992 37.072
			2 895	39.967		

HUB ON EAST SIDE OF HIWAY 122 APPROX. 200' SOUTH SNEEDS FERRY RD.

STATION
DATE
TIME
ELEVATION
WIND
TEMPERATURE
PRESSURE
HUMIDITY
CLOUDS
VISIBILITY
WEATHER

STATION
DATE
TIME
ELEVATION
WIND
TEMPERATURE
PRESSURE
HUMIDITY
CLOUDS
VISIBILITY
WEATHER

FIELD PARTY
NAME
NUMBER
SEX
AGE
HEIGHT
WEIGHT
HAIR
EYES
COMPLEXION
BUILD
TENDENCIES
REMARKS

WEATHER
TEMPERATURE
HUMIDITY
CLOUDS
WIND
VISIBILITY
PRESSURE
REMARKS

DATE
TIME
ELEVATION
WIND
TEMPERATURE
PRESSURE
HUMIDITY
CLOUDS
VISIBILITY
WEATHER



VALUABLE

SUBJECT _____

RETURN TO
 PUBLIC WORKS
 OFFICE
 CAMP LEJEUNE
 NORTH CAROLINA

FIELD PARTY

 IN CHARGE

 INSTRUMENT

 NOTES

 TAPE READ

 TAPE OR ROD

 TAPE OR ROD

 INSTRUMENT No. _____
 TAPE No. _____

WEATHER

CLEAR _____
 CLOUDY _____
 WINDY _____
 RAIN _____
 FAIR _____
 SNOW _____
 HOT _____
 MODERATE _____
 COLD _____
 FOG _____

FILE No. _____
 FLDR. No. _____
 SHEET 1114
 DATE _____ 19__

FIGURED BY _____
 NOTES CHECKED BY _____
 PLOTTED BY _____
 Quad. No. _____

STATION	DIST.	ANGLE ° ' "	+	H. I. BEARING	VER: ANG. DIFF.	ELEVATION
T.P. # 78				39.947 38.542	1.520	35.447 35.367
		3 125		38.622 33.937		32.682
T.P. # 79				34.017 33.937	5.860	32.762 32.682
		1 255		34.017 29.922		27.772
T.P. # 80				30.201 29.922	6 165	27.851 27.772
		2 150		30.201 29.732		24.392
T.P. # 81				29.811 29.732	5 530	24.471 24.392
		5 340		29.811 29.092		29.092
T.P. # 82				32.979 32.900	0 640	29.171 29.092
		3 808		32.979 32.900		29.150
T.P. # 83				33.989 33.890	3 750	29.249 ✓ 29.150
		4 740		33.989 33.890		30.415
T.P. # 84				35.349 35.250	3.475	30.514 30.415
		1 835		35.349 35.025		30.805
T.P. # 85				35.124 35.025	4 445	30.704 30.805
		1 220		35.124 35.025		30.805

VALUABLE

RETURN TO
FIELD WORKS
OFFICE
CAMP BUREAU
W. W. W. W.

BYRON DIST

M. J. WELLS AND
SHARING

FIELD PARTY

SIX CHARGE
INSTRUMENT
NOTE
TAPES
TAPES OR
TAPES NO.

WEATHER
WIND
MOON
CLOUDS
RAIN
TEMPERATURE
DIRECTION
DATE

FIELD NO.
DATE



VALUABLE

SUBJECT _____

RETURN TO
PUBLIC WORKS
OFFICE
CAMP LEJEUNE
NORTH CAROLINA

FIELD PARTY

 _____ IN CHARGE
 _____ INSTRUMENT
 _____ NOTES
 _____ TAPE READ
 _____ TAPE OR ROD
 _____ TAPE OR ROD
 _____ INSTRUMENT NO.
 _____ TAPE NO.

WEATHER

 CLEAR _____
 CLOUDY _____
 WINDY _____
 RAIN _____
 FAIR _____
 SNOW _____
 HOT _____
 MODERATE _____
 COLD _____
 FOG _____

FILE No. _____

FLDR. No. _____

SHEET 1218

NOTES CHECKED BY _____

PLOTTED BY _____ DATE _____ 19__

Quad. No. _____

STATION	DIST.	ANGLE ° ' "	+	H. I. BEARING	VER: ANG. DIFF.	ELEVATION
T.P.# 86				35.122 35.125	5.405	29.620 29.719
			3.950	33.570 33.669		
T.P.# 87					2.895	30.675 30.774
			3.380	34.055 34.154		
T.P.# 88					3.035	31.020 31.119
			4.570	35.590 35.689		
T.P.# 89					3.990	31.600 31.699
			3.015	34.615 34.714		
T.P.# 90					3.960	30.655 30.754
			3.840	34.495 34.594		
T.P.# 91					4.230	30.265 30.364
			2.650	32.915 33.014		
T.P.# 92					3.395	29.520 29.719
			4.060	33.580 33.779		
T.P.# 93					5.190	28.390 28.589
			2.880	31.270 31.469		

VALLEY

RETURN TO
SOUTH CAROLINA

SUBJECT

ANGLE

STATION

M. E.

VER. ANG.

ELEVATION

FIELD PARTY

WEATHER

IN CHANGE

LOW

INSTRUMENT

CLOUDY

FACTS

WINDY

TABE READ

RAIN

A. L. VASCOZ 1000

WATER CHANGED BY

TABE OR 100

PLASTER BY

COUNTY NO.

DATE

TA. NO.

CHAS. NO.

FIELD NO.

M. DEWITT

DOGS

TRAINED

WATER CHANGED BY

PLASTER BY

DATE

CHAS. NO.

VALUABLE

SUBJECT _____

RETURN TO
 PUBLIC WORKS
 OFFICE
 CAMP LEJEUNE
 NORTH CAROLINA

FIELD PARTY

 IN CHARGE

 INSTRUMENT

 NOTES

 TAPE READ

 TAPE OR ROD

 TAPE OR ROD

 INSTRUMENT NO. _____
 TAPE NO. _____

WEATHER

CLEAR _____
 CLOUDY _____
 WINDY _____
 RAIN _____
 FAIR _____
 SNOW _____
 HOT _____
 MODERATE _____
 COLD _____
 FOG _____

FILE No. _____
 FLDR. No. _____
 SHEET 130A
 DATE _____ 19__

FIGURED BY _____
 NOTES CHECKED BY _____
 PLOTTED BY _____
 Quad. No. _____

STATION	DIST.	ANGLE ° ' "	+	H. I. BEARING	VER. ANG. DIFF.	ELEVATION	
TP # 9A				31.270 31.469	1 455	26.815 27.014	
				29.920 30.149		3105	
TP # 95				31.103 31.302	3 580	26.340 26.539	
				4763			
TP # 96				30.465 30.664	3 945	27.158 27.357	
				3307			
TP # 97				31.445 31.644	3 375	27.090 27.289	
				4355			
TP # 98 T.B.M.				4060 4410	4 410	27.234	HUB EAST SIDE RD NEAR POWER POLES
				USE FOR CHECK	4 325	27.120 27.319	# 112 REA. M1 NAIL IN E RD. 1/10 MILE NORTH J.R. LUCAS STORE
				31.090 31.289		3.970	
TP # 98.					1 085	30.005 30.204	
				35.412 35.611		5407	
TP # 99					2.490	32.922 33.121	
				36.827 37.026		3905	

9/1/53

ATLANTA

RECEIVED
FEDERAL BUREAU OF INVESTIGATION
COMMUNICATIONS SECTION
WASHINGTON, D.C.

SUBJECT

STATION

DATE

AMOUNT

H. J. VIGORANT
BANKING DEPT.
ELEVATION

FIELD PARTY

IN CHARGE

INSTRUMENT

NOTE

TAPE FOR

TAPE OR LOG

TAPE OR LOG

INSTRUMENT NO.

TAPE NO.

WEATHER

TEMP.

HUMIDITY

WIND

SEA

MOON

PHASE

TIME

DATE

QUALITY

VALUABLE

SUBJECT _____

RETURN TO
 PUBLIC WORKS
 OFFICE
 CAMP LEJEUNE
 NORTH CAROLINA

FIELD PARTY

 IN CHARGE

 INSTRUMENT

 NOTES

 TAPE READ

 TAPE OR ROD

 TAPE OR ROD

 INSTRUMENT NO. _____
 TAPE NO. _____

WEATHER

CLEAR _____
 CLOUDY _____
 WINDY _____
 RAIN _____
 FAIR _____
 SNOW _____
 HOT _____
 MODERATE _____
 COLD _____
 FOG _____
 FIGURED BY _____
 NOTES CHECKED BY _____
 PLOTTED BY _____

FILE No. _____
 FLDR. No. _____
 SHEET 1407
 DATE _____ 19__

Quad. No. _____

STATION	DIST.	ANGLE		+	H. I.	VER. ANG.	ELEVATION
		°	' "		BEARING	DIFF.	
T.P. #100					30.827		32.402
					32.827	9 425	32.621
T.P. #101					32.69.2		23.077
	0 290				32.871	9 615	23.276
T.P. #102					28.917		24.567
	5 810				29.111	4 350	24.766
T.P. #103					28.707		23.837
	4 140				28.906	4 870	24.036
T.P. #104					27.282		21.132
	3 445				27.481	6 150	21.331
T.P. #105					23.405		18.060
	2 273				23.604	5 345	18.259
T.P. #106					24.290		20.725
	6 230				24.489	3 565	20.924
T.P. #107					24.190		17.220
	3 465				24.389	4 970	17.119
					17.220	6 840	17.259

17.220
 .207
 17.013
17.015 M.S.L.
 AT FLI LANIER'S LANDING,
 U.S. ARMY ENGINEER SURVEY EDEN ECC.
 17.355

VALUABLE

SUBJECT _____

 RETURN TO
 PUBLIC WORKS
 OFFICE
 CAMP LEJEUNE
 NORTH CAROLINA

FIELD PARTY

 IN CHARGE

 INSTRUMENT

 NOTES

 TAPE READ

 TAPE OR ROD

 TAPE OR ROD

 INSTRUMENT No.

 TAPE No. _____

WEATHER

CLEAR
 CLOUDY
 WINDY
 RAIN
 FAIR

SNOW
 HOT
 MODERATE
 COLD
 FOG

FILE No. _____
 FLDR. No. _____
 SHEET 152f
 DATE _____ 19__

FIGURED BY _____
 NOTES CHECKED BY _____
 PLOTTED BY _____
 Quad. No. _____

STATION	DIST.	ANGLE ° ' "	+	H. I. BEARING	VER: ANG. DIFF.	ELEVATION
				24.060 21.359		
T.P.# 108				24.165	3 230	20.830 21.029
		3 335		21.364		
T.P.# 109				23.285	6 090	18.075 18.274
		5 210		23.184		
T.P.# 110				27.150	2 185	21.100 21.277
		6 050		27.317		
T.P.# 111				28.480	3 320	23.830 24.229
		4 650		28.679		
T.P.# 112 T.B.M.				25.985	7.950	20.530 20.729
		5 455		26.204		
T.P.# 113				21.625	4.705	21.280 21.499
		0 345		21.844		
T.P.# 11A				20.175	2.060	19.565 19.774
		0 410		20.394		
T.P.# 115					4 730	13.445 13.664

NAIL IN LIVE OAK WEST SIDE DIRT RD
 APPRO. 75' SOUTH INT. FULCHER LANDING
 RD & ELL LAMIER LANDING RD.

ALUMINUM

QUEST

EST. NO.
MATERIALS
GRADE
DATE
SOUTH

STATION

DATE

NO.

+

BEARING

DIST.

ELEVATION

FIELD PARTY

IN CHARGE

INSTRUMENT

OBJECT

DATE

TIME

TYPE OF LOG

INSTRUMENT NO.

TAB. NO.

WEATHER

TEMP.

WIND

MOON

STATE

LOCAL TIME

DATE

TIME

NAME

FILE NO.

DATE

DATE

VALUABLE

SUBJECT _____

RETURN TO
 PUBLIC WORKS
 OFFICE
 CAMP LEJEUNE
 NORTH CAROLINA

FIELD PARTY

 IN CHARGE

 INSTRUMENT

 NOTES

 TAPE READ

 TAPE OR ROD

 TAPE OR ROD

 INSTRUMENT NO. _____
 TAPE NO. _____

WEATHER

CLEAR _____ SNOW _____
 CLOUDY _____ HOT _____
 WINDY _____ MODERATE _____
 RAIN _____ COLD _____
 FAIR _____ FOG _____
 FIGURED BY _____
 NOTES CHECKED BY _____
 PLOTTED BY _____

FILE No. _____
 FLDR. No. _____
 SHEET 161
 DATE _____ 19__

Quad. No. _____

STATION	DIST.	ANGLE ° ' "	+	H. I. BEARING	VER: ANG. DIFF.	ELEVATION
T.P.# 115				15.965		13.445 13.664
	2.020			15.684		
T.P.# 116				19.408	0.387	15.078 15.277
	4.330			19.127		
T.P.# 117				11.643	2.855	11.553 11.772
	0.090			11.862		
T.P.# 118				9.936	3.270	8.373 8.592
	1.563			10.155		
T.P.# 119				10.721	3.460	6.476 6.595
	4.295			10.940		
T.P.# 120 =				4.041	6.680	4.041 4.260
120 T.P. ⁵				432.714	496.012	

U.S. ARMY ENGINEER SURVEY B. D.
 ELEV. 4.420
 AT. MAKK FULCHER'S LANDING.

4.420
 4.041
 1.379

ALPHABET

RETURN TO
FIELD WORK
OFFICE
CAMP 22 TENT
NORTH CAROLINA

STATION DIST.

DATE

CLASSED

N. J. VENTURE
ELEVATION

TAPE NO.

INSTRUMENT NO.

TAKE OR LOD

TAKE OR TROD

TAKE READ

NOTES

INSTRUMENT

IN CHANGE

FIELD PARTY

WEATHER

WIND

TEMPERATURE

RELATIVE HUMIDITY

WIND DIRECTION

WIND VELOCITY

WIND FORCE

WIND STATE

WEATHER

FIELD NO.

DATE

10



DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
WASHINGTON 25

IN REPLY ADDRESS THE DIRECTOR
U. S. COAST AND GEODETIC SURVEY
AND NOT THE SIGNER OF THIS LETTER
AND REFER TO NO. 65 2

30 August 1948

My dear Sir:

The data requested in your recent communication are being sent to you herewith. If this Office can be of further service to you at any time, please do not hesitate to call on us.

Line 89 N. Car.

Leveling---"Hollyridge to New Topsail and New River Inlets, North Carolina." has not been published---photostatic copies sent.

Very truly yours,

L. O. Colburn.
Director.



CC August 1948

Line 88 N. car.

leveling---"Hollyridge
to New Topall and New
River bridge, for
"Carolina" has not been
published---photostatic
copies sent.

SUMMARY SHEET

HOLLYRIDGE TO NEW TOPSAIL AND NEW RIVER INLETS, No. CAROLINA

865
HGE
1947
R

C. R. REED 1947 **SECOND-ORDER** L-12115

SHEET 1 OF 3

B. M.	DISTANCE (KM)	Obs. ELEV. (M)	ORTH. CORR. (M)	HGT. CORR. (M)	ADJUSTED (M)	ELEVATION (FT)	REMARKS
T27	0	21.0446	0.0000	0.0000	21.0446	69.045	IN CORR. JACKSONVILLE TOWNSHIP, INLETS TO SOUTH RIVER, N.C.
K230 (S)	2	20.5340	/	+ 17	20.536	67.375	
U27	3	20.5377	/	+ 25	20.540	67.388	
Z229	5	20.4987	/	+ 25	20.501	67.260	
TBM7	5	22.2009	0.0000	+0.0025	22.203	72.844	NOT DESCRIBED

SPUR TO CAMP DAVIS A.A.F.

TBM7	5	22.2009	0.0000	+0.0025	22.203	72.844	NOT DESCRIBED
L230	5	20.4183	/	+ 25	20.421	66.998	
M230	6	20.1861	/	+ 25	20.189	66.237	
N230	6	19.7285	/	+ 25	19.731	64.734	
TBM1	7	19.9000	0.0000	+0.0025	19.902	65.295	HIGH PT. OF RUNWAY

MAIN LINE CONTINUES

TBM7	5	22.2009	0.0000	+0.0025	22.203	72.844	
J230 (S)	6	17.9856	/	+ 25	17.988	59.016	
V229	7	19.8500	/	+ 25	19.852	65.131	
REST M47 (S)	7	20.2090	/	+ 25	20.212	66.312	
V27	7	20.2090	/	+ 25	20.212	66.312	
N.W. RAIL (S)	7	19.5780	/	+ 25	19.580	64.239	DIR. FROM V27 TOWARD W229
W229	8	18.8910	/	+ 25	18.894	61.988	
X229	10	9.0854	/	+ 25	9.088	29.816	
Y229	12	9.7054	/	+ 25	9.708	31.850	
RD. INT. (S)	12	9.7758	/	+ 25	9.778	32.080	1/2 MI. NORTH OF SEARS LANDING BRIDGE.
B230 (UNKNOWN)	13	9.8465	/	+ 25	9.849	32.313	
J33	14	1.1239	/	+ 25	1.126	3.694	
SEARS RM2	14	1.1911	/	+ 25	1.194	3.917	
SEARS RM1 (S)	14	1.6676	/	+ 25	1.670	5.479	
TBM15	15	2.4241	/	+ 25	2.427	7.963	NOT DESCRIBED S.E. SIDE OF SEARS LANDING BRIDGE.
Jct. (S)	15	2.3588	0.0000	+0.0025	2.361	7.746	

SPUR TO TOWER ONE

TBM15	15	2.4241	0.0000	+0.0025	2.427	7.963	NOT DESCRIBED
C230	16	2.5981	/	+ 25	2.601	8.533	
TOWER FOUR RM1	18	4.2691	/	+ 25	4.272	14.016	
TOWER FOUR (S)	18	13.4148	/	+ 25	13.417	44.019	
D230	19	3.8779	/	+ 25	3.880	12.730	
TOWER THREE RM1	21	6.5884	0.0000	+0.0025	6.591	21.624	
		406.3152	0.0000	+0.0742	406.389	1333.293	
					3894	12945	



SUMMARY SHEET

HOLLYRIDGE TO NEW TOPSAIL

1947
R

AND
NEW RIVER INLETS, No. CAROLINA

C. R. REED
1947

SECOND-ORDER L-12115

SHEET 2 OF 3

B. M.	DISTANCE (KM)	OBS. ELEV. (M)	ORTH. CORR'N (M)	ADJ. CORR'N (M)	ADJUSTED ELEVATION (M)	ELEVATION (FT)	REMARKS
TOWER THREE (S)	21	15.7351	0.0000	+0.0025	15.738	51.634	
R230	22	3.7805		+	25	3.783	12.411
Jct. (S)	23	2.4945		+	25	2.497	8.192
TOWER TWO RM1 (S)	23	2.8802		+	25	2.883	9.459
TOWER TWO 1947 (S)	23	15.0618		+	25	15.064	49.422
CONTROL 1947 (S)	25	1.7321		+	25	1.735	5.692
CAMERA RANGE ONE 1947 (S)	25	1.8669		+	25	1.869	6.132
ZERO LINE MARK ONE (S)	25	2.3492		+	25	2.352	7.717
ZERO LINE MARK TWO (S)	25	4.5203		+	25	4.523	14.839
LINE MARK ONE (S)	25	4.8931		+	25	4.896	16.063
LINE MARK TWO (S)	25	4.9213		+	25	4.924	16.155
PIN TOWER ONE RM1 TOWER ONE	25	5.1188		+	25	5.121	16.801
	26	3.7447		+	25	3.747	12.293
	26	12.8802	0.0000	+0.0025	12.883	42.267	

0.45 MI. FROM R230 TOWARD ZERO 1947.

MAIN LINE CONTINUES

TBM 15 1947 (S)	15	2.4241	0.0000	+0.0025	2.427	7.963	NOT DESCRIBED
CENTRAL TOWER FIVE RM1 (S)	15	2.0708		+	25	2.073	6.801
TOWER FIVE RM1 (S)	16	6.2953		+	25	6.298	20.663
TOWER FIVE HIGH (S)	16	15.4259		+	25	15.428	50.617
HIGH RM (S)	18	5.3273		+	25	5.330	17.487
F230 (S)	18	5.1155		+	25	5.118	16.791
F230 (S)	19	3.9889		+	25	3.991	13.094
BANKS RM (S)	20	11.2194		+	25	11.222	36.818
BANKS TOWER SIX RM1 (S)	20	11.2642		+	25	11.267	36.965
TOWER SIX RM1 (S)	21	4.7511		+	25	4.754	15.597
TOWER SIX (S)	21	13.8864		+	25	13.889	45.567
PED RM1 (S)	22	7.6304		+0.0025	7.633	25.043	
PED 1933 (S)	22	7.7189		+	25	7.721	25.331
F230 TOWER SEVEN RM1 (S)	24	3.4661		+	25	3.469	11.381
TOWER SEVEN RM1 (S)	26	4.0671		+	25	4.070	13.353
TOWER SEVEN RANGE TWO (S)	26	13.2084		+	25	13.211	43.343
TOWER SEVEN RANGE TWO (S)	26	4.5801		+	25	4.583	15.036
Q230 (S)	27	3.5179		+	25	3.520	11.549
CRAB (S)	28	6.8199		+	25	6.822	22.382
MUSH TOWER EIGHT RM1 (S)	29	7.0197		+	25	7.022	23.038
TOWER EIGHT RM1 (S)	30	5.3304		+	25	5.333	17.497
TOWER EIGHT (S)	30	14.4770	0.0000	+0.0025	14.480	47.506	
		241.5835	0.0000	+0.0900	241.676	792.899	
					.6735	.8987	



SEP 1 1948

Officer in Charge Const.
Public Works Department
Camp Lejeune, N. C.

SUMMARY SHEET

HOLLYRIDGE TO NEW TOPSAIL
AND
NEW RIVER INLETS, No. CAROLINA

865
HGZ
1947
R

SHEET 3 OF 3

C. R. REED
1947

SECOND-ORDER-12115

B. M.	DISTANCE (KM)	OBS. ELEV. (M)	ORTHO. CORRN (M)	ADJ. CORRN (M)	ADJUSTED (M)	ELEVATION (FT)	REMARKS
LOG RM2	31	4.5548	0.0000	+0.0025	4.557	14.951	
LOG (S)	31	8.3968	/	+ 25	8.399	27.556	
LOG 2 (S)	31	7.2820		+ 25	7.284	23.898	
LOG 2 RM3 (S)	31	4.0770		+ 25	4.080	13.386	
H230 1932	32	3.1999		+ 25	3.202	10.505	
FISH VIEW RM2	34	5.0098		+ 25	5.012	16.444	
VIEW VIEW RM1	36	2.9032		+ 25	2.906	9.534	
VIEW VIEW RM1	36	5.6830		+ 25	5.686	18.655	
VIEW VIEW RM1	36	2.3048		+ 25	2.307	7.569	
RANGE THREE RM7	37	3.8670		+ 25	3.870	12.697	
TOWER NINE (S) RM1	37	4.0525		+ 25	4.055	13.304	
TOWER NINE (S) 1933	37	4.0551		+ 25	4.058	13.314	
TIDAL 3 1933	38	1.9618		+ 25	1.964	6.444	
TIDAL 2 1933	38	2.1404		+ 25	2.143	7.031	
TIDAL 1	38	2.2344	0.0000	+0.0025	2.237	7.389	
		61.7225	0.0000	+0.0375	61.760	202.627	
					.7600	.6243	



11

New River Inlet Entrance (Sea Island House)

BENCH MARK 1 (1926) is a standard disk set in concrete and projecting a few inches above the ground. It is located 1 foot south of the southwest corner of the long low fisherman's shack that is on the south shore of New River Inlet and just inside the point. It is about 100 yards east of the first slough that makes into the south shore of the inlet and 33 feet from high water line to the north. Elevation; 5.59 feet above mean low water; 4.09 feet above half tide level; 2.59 feet above mean high water.

BENCH MARK 2 (1926) is a standard disk set in concrete and projecting a few inches above the ground. It is located 10 feet from a small hand pump, and about 492 feet south-southwest from Bench Mark 1 and the fisherman's shack, about 98 feet from high water line to the east and 328 feet east from the north end of a slough that makes up from the south, and on sandy ground covered with short grass. Elevation; 6.18 feet above mean low water; 4.68 feet above half tide level; 3.18 feet above mean high water.

BENCH MARK 3 (1926) is a standard disk set in concrete and projecting a few inches above the ground. It is located 1 foot south of the southwest corner of the main building of the fish camp about $\frac{3}{4}$ mile south of New River Inlet. The building is an open shed and in about the center of the camp. The bench mark is about 49 feet from high water line and 164 feet south of triangulation station "HILT." Elevation; 13.14 feet above mean low water; 11.64 feet above half tide level; 10.14 feet above mean high water.

BENCH MARK 1 (1933) is a standard disk set in concrete in the top of a 6-inch terra cotta pipe which extends $2\frac{1}{2}$ feet into the ground. The bench mark is 4 inches above the surface of the ground and is located $36\frac{1}{2}$ feet from high water mark, $93\frac{1}{2}$ feet from face of dock, 90 feet from Bench Mark 2 (1933), 107 feet from Bench Mark 3 (1933), and about 92 feet from the northeast corner of a house that bears the name "SEA ISLAND." The bench mark is located on the west shore of New River Inlet about 164 feet north of the first slough that makes into the west shore of the inlet from the mouth, and $1\frac{1}{2}$ miles (nautical) 138° (true) from Peru, North Carolina. Elevation; 8.65 feet above mean low water; 7.15 feet above half tide level; 5.65 feet above mean high water.

BENCH MARK 2 (1933) is a standard disk set in concrete in the top of a 6-inch terra cotta pipe which extends $2\frac{1}{2}$ feet into the ground. The bench mark is about 4 inches above the surface of the ground and is located about 4 yards east of a hand pump and 4 yards north of the northwesterly corner of the "Sea Island" house. The bench mark is 27 yards from Bench Mark 1 (1933) in a southwesterly direction and is located on the west shore of New River Inlet about 35 yards north of the first slough from the mouth of the inlet. Elevation; 8.34 feet above mean low water; 6.84 feet above half tide level; 5.34 feet above mean high water.

BENCH MARK 3 (1933) is a standard disk set in concrete in the top of a 6-inch terra cotta pipe which extends $2\frac{1}{2}$ feet into the ground. The bench mark is about 4 inches above the surface of the ground and is located about 8 yards from the southeast corner of the "Sea Island" house. The bench mark is about 33 yards from Bench Mark 1 (1933), on the west shore of New River Inlet about 66 feet north of the first slough from the mouth that makes into the west shore of the inlet and runs in a southerly direction. Elevation; 7.77 feet above mean low water; 6.27 feet above half tide level; 4.77 feet above mean high water.

Elevations are based on 113 high waters and 112 low waters, December 9, 1926 -February 28, 1927, reduced to mean values.

8.65
734
1.31

Faint, illegible text at the bottom of the page.

	M.S.L.	L.W.D.
U.S.C+G. B.M - C148 (1935) at Dixon	67.339	
U.S.E. B.M - "Edens" at Lewis Landing	17.015	17.555
U.S.E. B.M - BD at Mark Fulcher's Landing	3.81	4.42
U.S.E. B.M. "Ward" at New River Inlet	13.18 (13.28 Used)	13.78
U.S.C.+G. B.M. Tidal #1 at New River Inlet	7.34	8.65
" " Tidal #2 " " " "	7.03	8.34
" " Tidal #3 " " " "	6.44	7.77

On Run from B.M C-148 to Tidal B.Ms at New River Inlet,
 139 Turns in approx 16 miles, we hit the Tidal B.M 0.27' High.
 Adjustment = .00194' per turn. Allowable error = $.05 \sqrt{16} = 0.20$

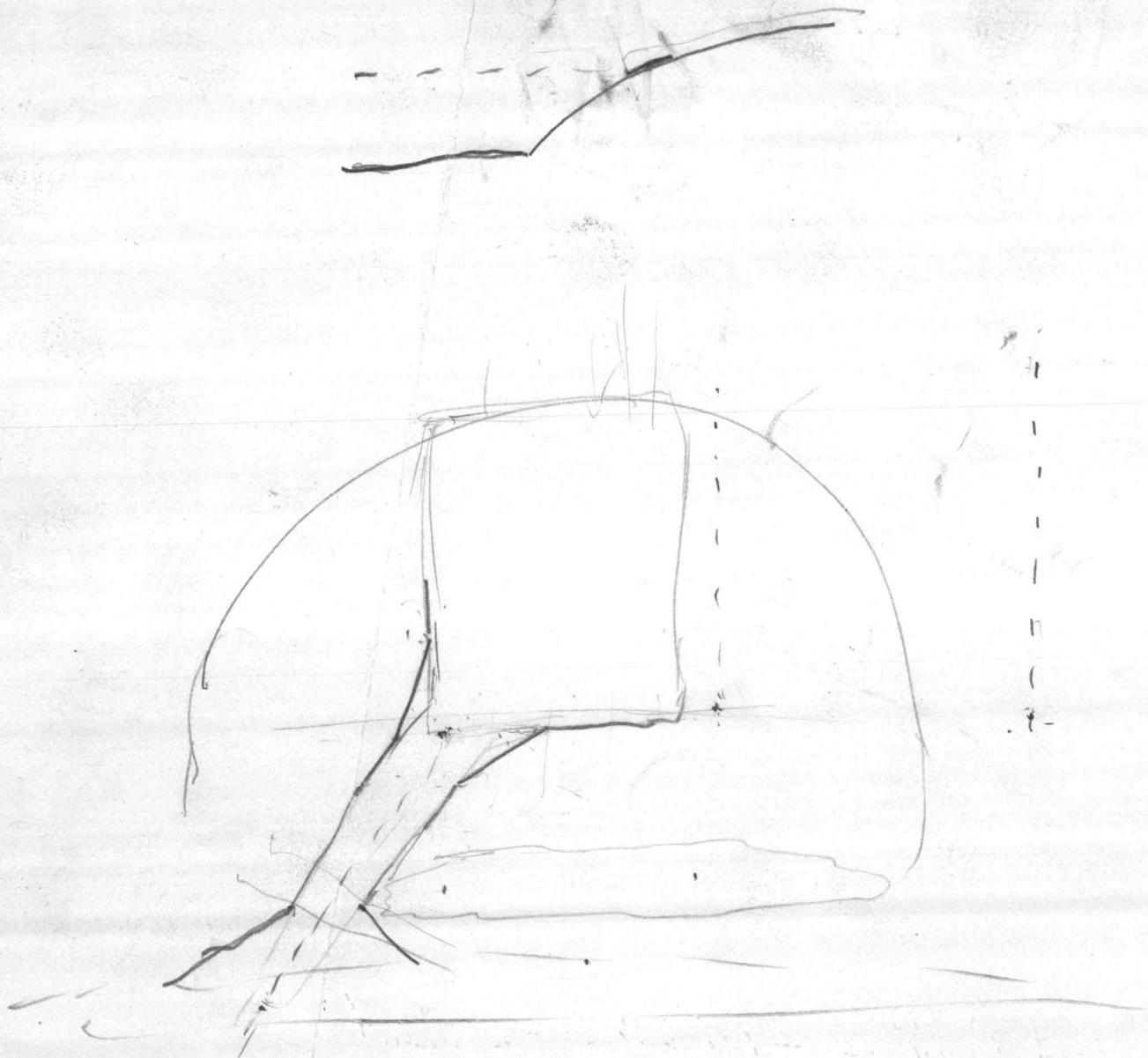
Project Depth of -12' h.W.D - Beaufort

17.01	17.55	17.55
13.28	13.78	14.59
3.73	3.77	2.96

13.78
2.00
11.78
25.78
11.78
-14.00

+ 13.78
- 12.00
25.78
13.28
- 12.50

.05
4
.20



Site plan for Dredging, any job.

~~Came to New River Outlet to check~~

~~Pier condition - Part 3:00~~

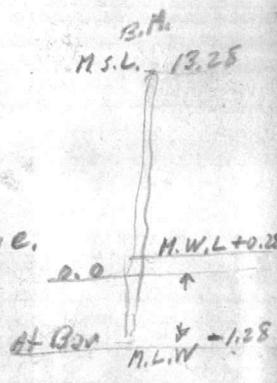
~~Dillon~~

At M.H.W +1.65 1.27
 Gauge M.W.L. +0.28 X
 M.L.W -0.97 1.25

~~1.21~~
~~1.21~~

1.56
 8 | 1.28

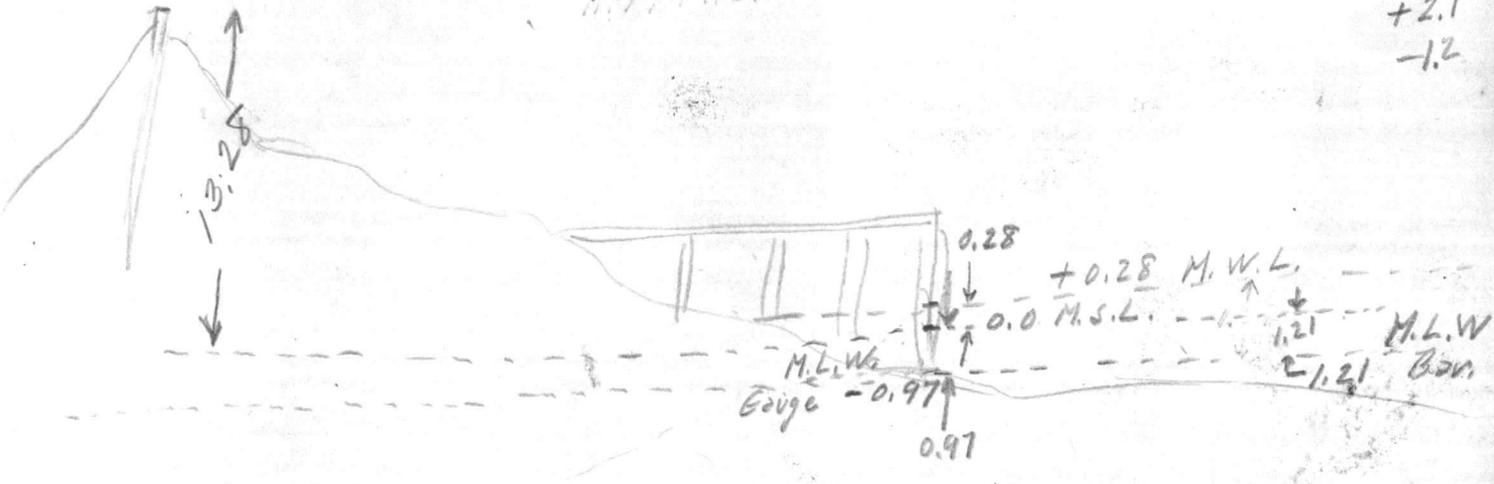
-0.97
 +0.28
 8 = 1.250 Variation between M.W.L + M.L.W. at Gauge.
 -1.56 M.L.W. at Bar below M.W.L. at Gauge.
 +0.28 M.W.L. at Gauge.
 -1.28 Elev. M.L.W. at Bar.



Elev. M.W.L. at Gauge = +0.28
 Elev. M.L.W. at Gauge = -0.97
 Elev. M.L.W. at Bar = -1.28
 Elev. M.L.W. at B.M. = 13.28 + 1.28 = 14.56 Sta. Ward

8 | 1.65
 2.06

Used B.M. Elev. 13.28 M.S.L. = 14.56 M.L.W. Computed ✓
 = 13.78 M.L.W. Corps of Engr. ✓
 0.78 M.S.L.



6 Cards K&E #6490; Plumb Bob Cord, 25 yds. Medium, Linen,
@ \$ 1.00 ----- \$ 6.00

1 Box K&E # 6495-5 Steel Stake Tools, 5 lbs.
@ \$.85 ----- \$ 4.25

~~1 Gross, Sherbondy Faber, Hexagon Lead Crayons, Blue, 50ft,
(on Dixons)~~
~~@ \$ 3.00 ----- \$ 3.00~~

1 Gross, Dixons #3405, Lumber Crayons, Blue ----- \$ 14.50

1 K&E, # 6299, Rod Level, circular ----- \$ 7.50

1 K&E # N6970C, Reading Glass ----- \$ 3.90

6 K&E # N7452D, 50ft. Refill non-metallic woven tapes
@ \$ 7.20 ----- \$ 43.20

15.00
3
\$ 94.35

420
94
420
94
37

ADDRESS REPLY TO
DISTRICT ENGINEER
U. S. ENGINEER OFFICE
WILMINGTON, NORTH CAROLINA

WAR DEPARTMENT
UNITED STATES ENGINEER OFFICE

308 CUSTOMHOUSE
WILMINGTON, NORTH CAROLINA

REFER TO FILE No. SAWGS

11 December 1951

SUBJECT: Hydrographic Survey and Jetties at Entrance Channel of Mile Hammock Bay, Marine Barracks, Camp Lejeune, N. C.

TO: Resident Officer in Charge of Construction
Office of Public Works Officer
Marine Barracks
Camp Lejeune, North Carolina

1. Reference is made to your letter, subject as above, file No. SJR:bb, dated 5 December 1951.

2. The vertical control for the hydrographic survey at the Entrance Channel to Mile Hammock Bay was based on the elevation given for triangulation station "Ward," which is 13.78 feet above Beaufort Datum. This datum is mean low water at Beaufort Inlet, N. C., as established by the Corps of Engineers, and is used as the plane of reference for all soundings taken in the Intracoastal Waterway between Beaufort and the Cape Fear River, N. C. This office has found thru years of use that this datum has been very satisfactory for all hydrographic survey work on the Intracoastal Waterway and adjacent inlets between Beaufort and the Cape Fear River.

3. In 1935, the U. S. Coast and Geodetic Survey determined that Beaufort Datum is 2.01 feet below mean sea level at Beaufort. This gives triangulation station "Ward" a mean sea level elevation of 11.77 feet.

4. In regard to triangulation station "NEW" being destroyed by storm tides, this office has been aware of that, and a new station "NEW No. 2" has been established. It has not been triangulated in yet.

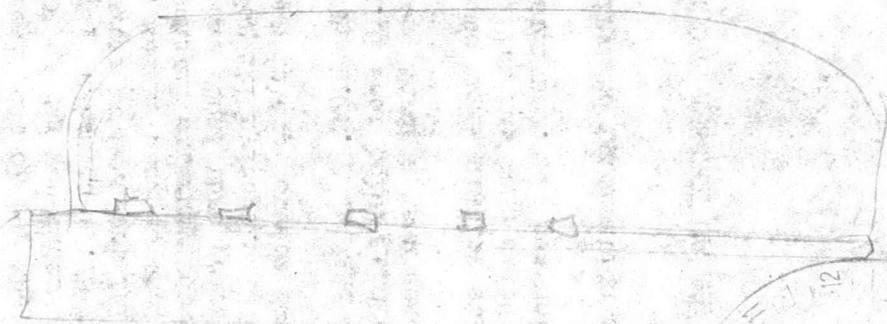
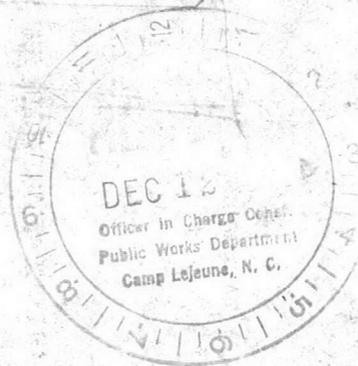
5. Your inquiry and information concerning the above subject is appreciated.

FOR AND IN THE ABSENCE OF THE DISTRICT ENGINEER:

T. J. HEWITT
Executive Officer



*Disregard - by direction of Mr. W. F. Fowler U.S.C.E.
9/3/53 . Difference in field = 0.50'*



REFER TO PLTZ NO.

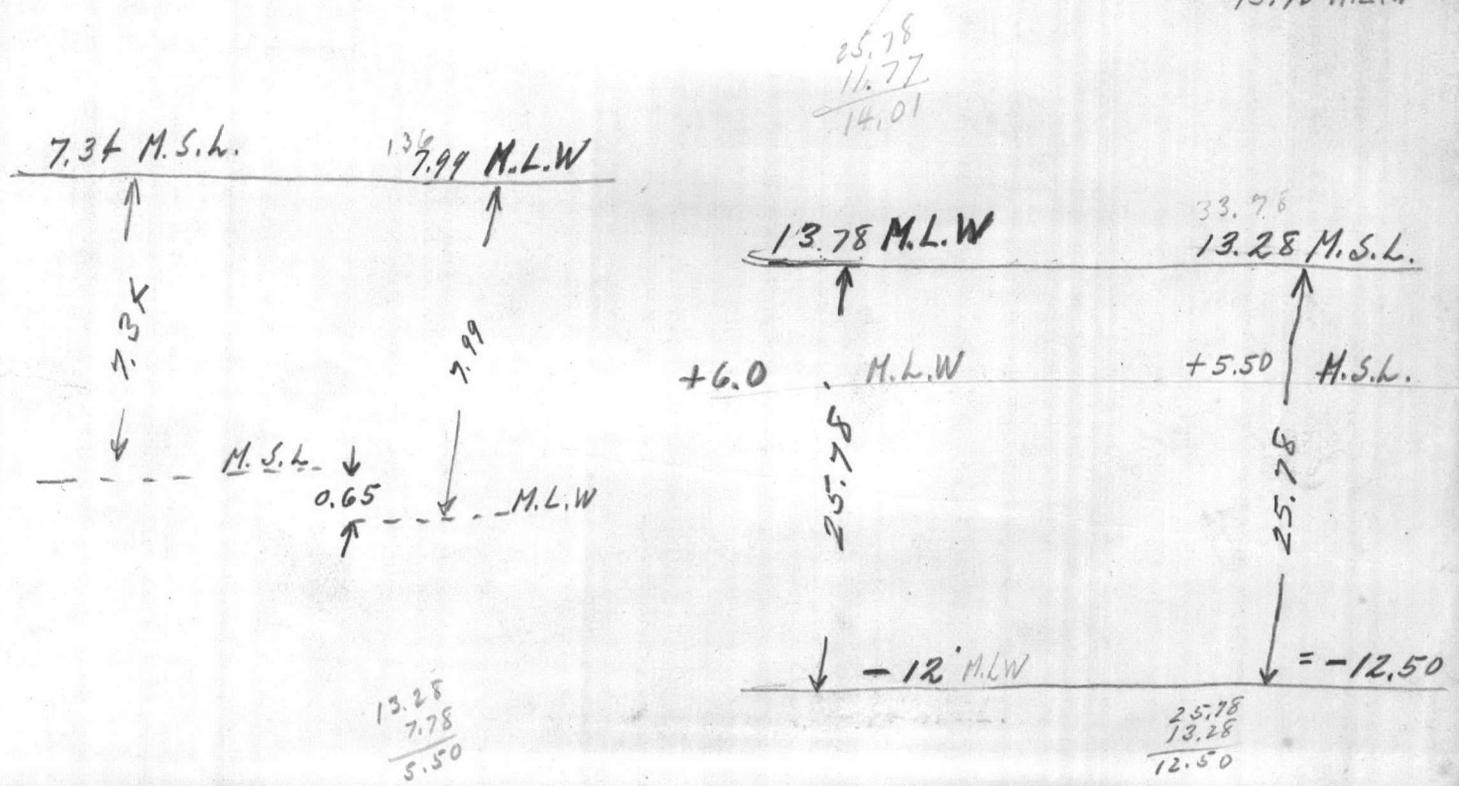
OFFICE OF PUBLIC WORKS
U. S. ENGINEER OFFICE
DISEASE CONTROL
CAMP LEJEUNE, N. C.

WILMINGTON, NORTH CAROLINA
800 CUSTOMHOUSE
UNITED STATES ENGINEER OFFICE
PUBLIC WORKS DEPARTMENT

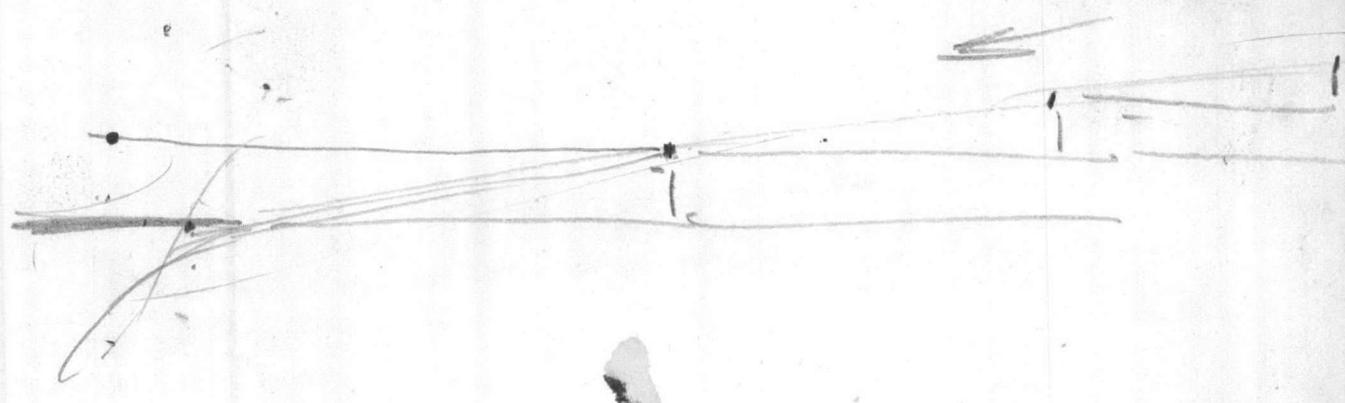
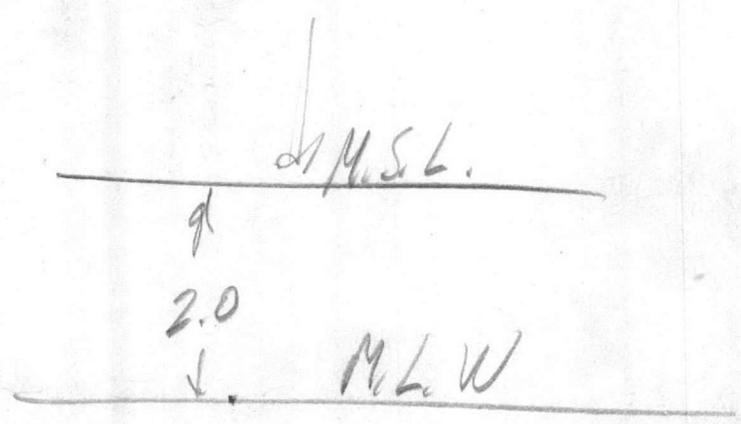
From U.S.E. Mark # 30 at Fulcher's Landing at Swan Point (Elev. 4.42) assumed as Low Water Datum, on run to Sta. "Ward" at New River Inlet, we establish an elevation of 13.83 which compares favorably with the elevation of 13.78 M.L.W as shown on the Hydrographic Map made by the Corps of Engineers and used as their Vertical Control for New River Inlet.

In tying Level Run to Tidal B.M.s (1933) on West Side of New River Inlet, we establish an elevation of 7.99 M.L.W as compared to an elevation of 7.34 Mean Sea Level Datum as established by the U.S. Coast and Geodetic Surveys for Vertical Control at Camp Davis. This difference, = 0.65, does not compare favorably with the difference of 2.01 as stated to be the accepted variation between Mean Sea Level Datum and Mean Low Water Datum as established by the C & G Surveys for this area.

Above
15.78 M.L.W



12.0



L-12114

Hollyridge to New Topical and New River Sights, No. Caroline

70-638
12-685
8a

RECOVERY NOTE, BENCH MARK

Designation U 27 State North Carolina County Onslow
Nearest town Hollyridge
Distance and direction from nearest town 2.1 miles northeast
Character of mark A bench mark disk
Established by U. S. C. & G. Survey Stamping U 27 1932
Present condition Good

Detailed report 2.1 miles northeast along the Atlantic Coast Line Railroad from the station at Hollyridge, 0.4 mile southwest of Milepost CB 276-N 32, approximately 100.0 feet northeast of the beginning of the first curve northeast of Hollyridge and the point where the highway which has paralleled the railroad northeast from Hollyridge begins curve to east away from the railroad, 46.5 feet northwest of the northeast edge of U. S. Highway 17 (3-lane road), 23.8 feet southeast of the southeast rail, 6.0 feet northwest of the line of the telegraph poles, in the east angle of the crossing of the railroad and a dirt woods road, 1.5 foot southwest of a white reference post, set in the top of a concrete post projecting 1.5 foot above the ground.

Note: Mark appears to be leaning to the northwest but close inspection shows that this illusion is caused by the shape of the form in which the concrete was poured.

Chief of Party Clarence R. Reed Date Feb. 1947 /4
Described by C. K. Withrow Checked by

DESCRIPTION OF BENCH MARK

Designation M 230 State North Carolina County Onslow
Nearest town Hollyridge
Distance and direction from nearest town At Hollyridge
Character of mark A bench mark disk
Established by U. S. C. & G. Survey Stamping M 230 1947

Detailed description At Hollyridge, at Camp Davis, 0.9 mile northeast along the Atlantic Coast Line Railroad from the station, thence 0.45 mile northeast along 27th Street, 356.0 feet southeast of the southeast edge of the most southeasterly concrete taxiway at the Camp Davis Army Airfield measured along the centerline of 27th Street, 213.0 feet northwest of the centerline of F Street, 19.0 feet southwest of the southeast face of frame theatre building, set in the top of a 12-inch square concrete post which was formerly the anchor base for guy wire supporting large steel stack for the theatre furnace, 1.3 foot above the ground, 35.0 feet northeast of the centerline of 27th Street.

Chief of party Clarence R. Reed Date Feb. 1947 /9
Described by C. K. Withrow Checked by

DESCRIPTION OF BENCH MARK

Designation V 229 State North Carolina County Onslow
Nearest town Hollyridge
Distance and direction from nearest town At Hollyridge
Character of mark A bench mark disk
Established by U. S. C. & G. Survey Stamping V 229 1937

Detailed description At Hollyridge, at Camp Davis, 97.5 feet north of the corner of the concrete island for the brick guard house at the center of the main entrance to Camp Davis, in the south corner of the large parade grounds in front of the administrative area, 34.0 feet northwest of the centerline of A Street, 07.0 feet northeast of the centerline of 20th Street, set in the top of a concrete post projecting 0.9 foot above the ground and surrounded by shrubbery.

Chief of party Clarence R. Reed Date Feb. 1947 /2
Described by C. K. Withrow Checked by

RECOVERY NOTE, BENCH MARK

Designation T 27 State North Carolina County Onslow
Nearest town Folkstone
Distance and direction from nearest town At Folkstone
Character of mark A bench mark disk
Established by U. S. Coast & Geodetic Survey Stamping T 27 1932
Present condition Good

Detailed report At Folkstone, 40.1 feet north of the northeast corner of the Atlantic Coast Line Railroad station-shed platform, 30.7 feet east of the east rail of the main track, 15.7 feet east of the east rail of siding track, 67.0 feet north of the extension to west across U. S. Highway 17 the centerline of a public dirt road leading west, 54.5 feet west of the west face of the 2-story frame store of Nora Everett, 3 1/2 miles north of the crossing of a private dirt road leading to a white frame dwelling, 1.5 foot east of white reference post, 1.2 foot southwest of a telegraph pole, set in the top of a concrete post projecting 0.3 foot above the ground.

Note: The disk is slightly tilted. The rod was held over the "4" marked in the metal between the letters "H" and "S" of the word "IMPRISONMENT".

Chief of Party Clarence R. Reed Date Feb. 1947 /1
Described by C. K. Withrow Checked by

DESCRIPTION OF BENCH MARK

Designation Z 229 State North Carolina County Onslow
Nearest town Hollyridge
Distance and direction from nearest town 1.2 mile northeast
Character of mark A bench mark disk
Established by U. S. C. & G. Survey Stamping Z 229 1947

Detailed description 1.2 mile northeast along the Atlantic Coast Line Railroad from the station at Hollyridge, 0.3 mile northeast of the 27th Street gate to Camp Davis, 0.35 mile southwest of milepost CB 275 - W 31, 30.1 feet southeast of the southeast rail, 36.5 feet northwest of the northeast edge of U. S. Highway 17 (3-lane road), approximately 40.0 feet southwest of the northeast end of low sand bank along the side of railroad drainage ditch, in line with the telegraph poles, 1.5 feet southwest of a white reference post, set in the top of a concrete post projecting 1.3 feet above the ground.

Chief of party Clarence R. Reed Date Feb. 1947 /5
Described by C. K. Withrow Checked by

DESCRIPTION OF BENCH MARK

Designation N 230 State North Carolina County Onslow
Nearest town Hollyridge
Distance and direction from nearest town At Hollyridge
Character of mark A bench mark disk
Established by U. S. C. & G. Survey Stamping N 230 1947

Detailed description At Hollyridge, at Camp Davis, at the Camp Davis Army Airfield, 0.9 mile northeast along the Atlantic Coast Line Railroad from the station, thence 0.5 mile northwest along 27th Street, 56.0 feet southwest of the centerline of the street, 59.0 feet southeast of the southeast edge of the most southeasterly concrete taxiway, 17.5 feet northwest of the north corner of the hangar on top of which the control tower is located, 7.0 feet northeast of the northwest side of the concrete apron in front of the hangar, 2.0 feet southwest of a white reference post, set in the top of a concrete post projecting 0.8 foot above the ground.

Chief of party Clarence R. Reed Date Feb. 1947 /7
Described by C. K. Withrow Checked by

RECOVERY NOTE, BENCH MARK

Designation V 27 State North Carolina County Onslow
Nearest town Hollyridge
Distance and direction from nearest town At Hollyridge
Character of mark A bench mark disk
Established by U. S. C. & G. Survey Stamping V 27 1932
Present condition Destroyed

Detailed report The concrete post in which the disk was set was knocked over during the construction of Camp Davis. The post was located and reset near the old point. For the description of the reset post see V 27 RESET 1947.

Chief of Party Clarence R. Reed Date Feb. 1947 /3
Described by C. K. Withrow Checked by

RECOVERY NOTE, BENCH MARK

Designation E 148 State North Carolina County Onslow
Nearest town Folkstone
Distance and direction from nearest town 0.6 mile south
Character of mark A bench mark disk
Established by U. S. C. & G. Survey Stamping
Present condition Destroyed

Detailed report U. S. Highway 17 has been rebuilt and the culvert in which the mark was set has been replaced with a concrete pipe culvert without headwalls. The disk was not recovered.

Chief of Party C. R. Reed Date Feb. 1947 /2
Described by C. K. Withrow Checked by

RECOVERY NOTE, BENCH MARK

Designation F 148 State North Carolina County Onslow
Nearest town Hollyridge
Distance and direction from nearest town 1.0 mile northeast
Character of mark A bench mark disk
Established by U. S. C. & G. Survey Stamping F 148 1935
Present condition Destroyed

Detailed report The concrete post in which the disk was set was found broken and portion containing the disk was recovered. The mark is definitely destroyed.

Chief of Party C. R. Reed Date Feb. 1947 /6
Described by C. K. Withrow Checked by

DESCRIPTION OF BENCH MARK

Designation TRH 1 State North Carolina County Onslow
Nearest town Hollyridge
Distance and direction from nearest town At Hollyridge
Character of mark surface of the runway
Established by U. S. C. & G. Survey Stamping None

Detailed description At Hollyridge, at Camp Davis Army Airfield, 0.4 mile southwest of the control tower, at the point where the asphalt runway meets the landing apron for the southwest end of the runway, the highest point of the runway.

Chief of party Clarence R. Reed Date March 1947 /10
Described by C. K. Withrow Checked by

DESCRIPTION OF BENCH MARK

Designation V 27 RESET 1947 State North Carolina County Onslow
Nearest town Hollyridge
Distance and direction from nearest town At Hollyridge
Character of mark A bench mark disk
Established by U. S. C. & G. Survey Stamping V 27 1932
Present condition Destroyed

Detailed description The original post containing the disk was found pulled from ground and reset near the same location. At Hollyridge, 0.1 mile northeast of the Atlantic Coast Line Railroad station, 13 1/2 miles northeast of the center of the crossing of bar road leading to the main gate to Camp Davis, directly across the highway from the junction of a bar road leading east and U. S. Highway 17, 31.5 feet northwest of the northwest rail of the main track, 18.1 feet northwest of the northwest rail of a siding, 11.5 feet southeast of the Camp Davis fence line, 1.5 foot southwest of a white reference post, set in the top of a concrete post projecting 0.2 foot above the ground.

Note: The top of the northeast side of the post has been broken.

Chief of party Clarence R. Reed Date March 1947 /14
Described by C. K. Withrow Checked by

DESCRIPTION OF BENCH MARK

Designation K 230 State North Carolina County Onslow
Nearest town Folkstone
Distance and direction from nearest town 1.35 mile south
Character of mark A bench mark disk
Established by U. S. C. & G. Survey Stamping K 230 1947

Detailed description 1.35 mile south along the Atlantic Coast Line Railroad from the station at Folkstone, 2.75 miles northeast of the station at Hollyridge, 33 1/2 miles northeast of milepost CB 276 - W 32, 27.3 feet southeast of the southeast rail, 15.0 feet northeast of the first telegraph pole southwest of the northeast end of low sand ridge along the southeast side of small railroad cut and side ditch, 2.0 feet northwest of the line of the telegraph poles, 2.0 feet southwest of a white reference post, set in the top of a concrete post projecting 0.7 foot above the ground.

Chief of party Clarence R. Reed Date Feb. 1947 /2
Described by C. K. Withrow Checked by

DESCRIPTION OF BENCH MARK

Designation L 230 State North Carolina County Onslow
Nearest town Hollyridge
Distance and direction from nearest town At Hollyridge
Character of mark A bench mark disk
Established by U. S. C. & G. Survey Stamping L 230 1947

Detailed description At Hollyridge, at Camp Davis, 0.9 mile northeast along the Atlantic Coast Line Railroad from the station, thence 0.15 mile northwest along 27th Street, at the second tall steel water tank southwest of the northeast boundary of Camp Davis, 133.5 feet southeast of the centerline of C Street, 111.0 feet northeast of the centerline of 26th Street, 69.0 feet southwest of the centerline of 27th Street, set in the top of the northeast corner of the concrete foundation supporting the east steel leg of the water tank, 1.0 foot above the ground.

Chief of party Clarence R. Reed Date Feb. 1947 /7
Described by C. K. Withrow Checked by

DESCRIPTION OF BENCH MARK

Designation J 230 State North Carolina County Onslow
Nearest town Hollyridge
Distance and direction from nearest town At Hollyridge
Character of mark A bench mark disk
Established by U. S. Coast & Geodetic Survey Stamping J 230 1947

Detailed description At Hollyridge, 0.45 mile northeast along the Atlantic Coast Line Railroad from the station, 0.1 mile southwest of milepost CB 274 - W 30, 55.5 feet southeast of the southeast rail, 10.5 feet northwest of the northwest edge of U. S. Highway 17 (3-lane road), set in the top of northwest concrete headwall for large concrete box culvert under the highway, 1.0 foot southeast of the northeast end of the headwall, 0.3 foot below the level of the highway.

Chief of party Clarence R. Reed Date Feb. 1947 /11
Described by C. K. Withrow Checked by

RECOVERY NOTE, BENCH MARK

Designation C 148 State North Carolina County Onslow
Nearest town Hollyridge
Distance and direction from nearest town 0.9 mile southwest
Character of mark A bench mark disk
Established by U. S. C. & G. Survey Stamping
Present condition Destroyed

Detailed report U. S. Highway 17 has been rebuilt and the culvert in which the mark was set has been replaced with a concrete pipe culvert without headwalls. The disk was not recovered.

Chief of Party Clarence R. Reed Date /15
Described by C. K. Withrow Checked by

1870

1871

1872

1873

1874

1875

DESCRIPTION OF BENCH MARK

Designation W 229
 Nearest town Hollyridge
 Distance and direction from nearest town 0.95 mile south
 Character of mark A bench mark disk
 Established by U. S. C. & G. Survey
 Detailed description 0.95 mile south along the Sears Landing Road from the railroad station at Hollyridge, 0.2 mile south of the parking area for old CCC Camp, leading west to old CCC Camp garage area and a dirt road leading east through the woods, 46.0 feet east of the east edge of the Sears Landing Road, across the highway fills, near point where highway begins downgrade to south, 5.0 feet north of a 6-inch pine tree, 1.5 feet south of reference post, set in the top of a concrete post projecting 1.0 foot above the ground.

Chief of party Clarence R. Reed
 Described by C. K. Withrow
 Date Feb. 1947 16
 Checked by

RECOVERY NOTE, BENCH MARK

Designation H. J. PENDER
 Nearest town Hollyridge
 Distance and direction from nearest town 2 1/2 miles southwest
 Character of mark
 Established by
 Present condition Destroyed
 Detailed report U. S. Highway 17 has been rebuilt and widened and it is very likely that the mark was destroyed during the construction. Measurements place the location of the mark along the graded shoulder of the road and no trace of the post could be found.

Chief of Party Clarence R. Reed
 Recovered by G. K. Withrow
 Date Feb. 1947 20
 Checked by

DESCRIPTION OF BENCH MARK

Designation Y 229
 Nearest town Hollyridge
 Distance and direction from nearest town 3.3 miles south
 Character of mark A bench mark disk
 Established by U. S. C. & G. Survey
 Detailed description 3.3 miles south along the Sears Landing Road from the railroad station at Hollyridge, 183.5 feet southwest of the centerline of the Sears Landing Road measured from a point at the center of the crossing of a dirt road, 27.0 feet southeast of the centerline of the dirt road, 47.0 feet northeast of the centerline of dirt drive to the home of Tim Atkinson, 116.5 feet northeast of the north corner of the Atkinson home, 5.0 feet west of a 25-inch pine tree, set in the top of a concrete post projecting 1.0 foot above the ground.

Chief of party Clarence R. Reed
 Described by C. K. Withrow
 Date Feb. 1947 24
 Checked by

DESCRIPTION OF BENCH MARK

Designation SEARS BM 3
 Nearest town Hollyridge
 Distance and direction from nearest town 4.75 miles south
 Character of mark A reference mark disk
 Established by U. S. Coast & Geodetic Survey
 Detailed description 4.75 miles south along the Sears Landing Road from the railroad station at Hollyridge, 184.5 feet northwest of the northmost end of the Sears Landing bridge, 28.9 feet southwest of the centerline of the Sears Landing road, 1.5 feet southeast of reference mark No. 2, 2.7 feet north of a telegraph pole, into an 8-inch tile projecting 0.1 foot above the ground.

Chief of party Clarence R. Reed
 Described by C. K. Withrow
 Date Feb. 1947 28
 Checked by

RECOVERY NOTE, BENCH MARK

Designation R. M. J. PENDER
 Nearest town Hollyridge
 Distance and direction from nearest town 1.9 miles southwest
 Character of mark
 Established by
 Present condition Destroyed
 Detailed report U. S. Highway 17 has been rebuilt and the culvert in which the mark was located has been replaced. A new mark was set at the time the old culvert was replaced; however the present line of levels did not follow the railroad to this point so the new azimuth mark has no elevation established for it.

Chief of Party C. R. Reed
 Recovered by G. K. Withrow
 Date Feb. 1947 17
 Checked by

REPORT ON CONDITION OF BENCH MARK

Designation H 148
 Nearest town Edgewood
 Distance and direction from nearest town 0.3 mile northeast
 Character of mark
 Established by
 Present condition Destroyed
 Detailed Report U. S. Highway 17 has been rebuilt and the concrete culvert in which the mark was set has been replaced with a concrete pipe culvert without headwalls. The disk was not recovered.

Chief of Party Clarence R. Reed
 Reported by G. K. Withrow
 Date Feb. 1947 21
 Checked by

DESCRIPTION OF BENCH MARK

Designation B 230
 Nearest town Hollyridge
 Distance and direction from nearest town 3.75 miles south
 Character of mark A bench mark disk
 Established by U. S. C. & G. Survey
 Detailed description 3.75 mile south along the Sears Landing Road from the railroad station at Hollyridge, at the south corner of woods area, near the west corner of area from which dirt was removed to construct highway fill, 46.0 feet northeast of the centerline of the road, 47.5 feet northwest of the centerline of dirt road leading northwest to farm, 6.0 feet northwest of borrow pit bank, 2.0 feet northwest of white reference post, set in the top of a concrete post projecting 1.0 foot above the ground.

Chief of party Clarence R. Reed
 Described by C. K. Withrow
 Date Feb. 1947 25
 Checked by

DESCRIPTION OF BENCH MARK

Designation C 230
 Nearest town Hollyridge
 Distance and direction from nearest town 5.25 miles south, thence 0.75 mile southwest
 Character of mark A bench mark disk
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 0.75 mile southwest along Sand Spit Road, on the Sand Spit between New Topsail Inlet and New River Inlet, 0.3 mile southwest of milepost 6, 0.5 mile northeast of the point where the road crosses under the communication lines, approximately 500.0 feet northwest of the main ridge of dunes, about 200.0 feet southeast of the edge of the marsh, near the first curve in the road southwest of the junction of the Sears Landing Road, on the north slope of a low east-west sand dune ridge, about 30.0 feet north of the top of the dune ridge, 70.5 feet southeast of the centerline of the road, about 5.0 feet above the level of the road, 2.0 feet southwest of a white reference post, set in the top of a concrete post projecting 1.3 feet above the ground.

Chief of party Clarence R. Reed
 Described by C. K. Withrow
 Date Feb. 1947 29
 Checked by

RECOVERY NOTE, BENCH MARK

Designation PENDER RM 2
 Nearest town Hollyridge
 Distance and direction from nearest town 2.0 miles southwest
 Character of mark A reference mark disk
 Established by U. S. C. & G. Survey
 Present condition Good
 Detailed report 2.0 miles southwest along the Atlantic Coast Line Railroad from the station at Hollyridge, 0.4 mile northeast of milepost CB 271 - W 27, 148.7 feet east of the triangulation station, 84.5 feet southeast of the southeast edge of U. S. Highway 17 measured from a point 265.0 feet southwest of the junction of main dirt road leading southeast, 128.0 feet southwest of the south corner of concrete block store building, 12.0 feet south of the centerline of little-used connecting road leading to main dirt road, 1.5 feet east of reference post, set in the top of a concrete post projecting 0.3 foot above the ground.

Chief of Party Clarence R. Reed
 Recovered by C. K. Withrow
 Date Feb. 1947 18
 Checked by

RECOVERY NOTE, BENCH MARK

Designation W 27
 Nearest town Edgewood
 Distance and direction from nearest town 0.2 mile southwest
 Character of mark
 Established by
 Present condition Destroyed
 Detailed report U. S. Highway 17 has been rebuilt and the concrete culvert in which the mark was set has been replaced with a concrete pipe culvert without headwalls. The disk was not recovered.

Chief of Party Clarence R. Reed
 Recovered by C. K. Withrow
 Date Feb. 1947 22
 Checked by

DESCRIPTION OF BENCH MARK

Designation 3.33 (Unknown)
 Nearest town Hollyridge
 Distance and direction from nearest town 4.6 miles south
 Character of mark A railroad spike
 Established by Probably Army or contractor in construction of Camp Davis
 Detailed description 4.6 miles south along the Sears Landing Road from the railroad station at Hollyridge, 0.2 mile northwest of the Sears Landing Bridge, at the southeast edge of the first woods area northwest of the bridge, 108.0 feet northeast of the centerline of the road, driven into the southwest side of a 20-inch live oak tree, 1.0 foot above the ground.

Chief of party Clarence R. Reed
 Described by C. K. Withrow
 Date Feb. 1947 26
 Checked by

DESCRIPTION OF BENCH MARK

Designation TOWER FOUR RM 1
 Nearest town Hollyridge
 Distance and direction from nearest town 5.25 miles south, thence 1.55 miles southwest
 Character of mark A reference mark disk
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 1.55 miles southwest along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.1 mile southwest of milepost 5, just inside the main ridge of sand dunes, at the U. S. Navy Test Range Tower No. 4, 78.5 feet southeast of the centerline of the road, 7.6 feet north of the south corner of the concrete apron around the base of the tower, 1.4 feet north of the south corner of the concrete tower, set in the concrete apron.

Chief of party Clarence R. Reed
 Described by C. K. Withrow
 Date Feb. 1947 20
 Checked by

RECOVERY NOTE, BENCH MARK

Designation PENDER 1932
 Nearest town Hollyridge
 Distance and direction from nearest town 2.0 miles southwest
 Character of mark A triangulation station disk
 Established by U. S. Coast & Geodetic Survey
 Present condition Appears undisturbed but close to the road
 Detailed report The highway has been widened to a three lane road and the mark is now near the foot of the shoulder of the road. The mark appears to be undisturbed.
 New description: 2.0 miles southwest along the Atlantic Coast Line Railroad from the station at Hollyridge, 0.6 mile northeast of milepost CB 271 - W 27 and a curve in the highway and the railroad, 0.3 mile southwest of the Pender-Onslow county line, 9 rails northeast of the center of the crossing of a bar road leading to a Camp Davis camp range, 9 1/2 rails southwest of the extension to northwest of the centerline of a public dirt road leading southeast, in line with the extension across highway of little-used connecting road leading to the main dirt road, 49.5 feet southeast of the southeast rail, 17.0 feet northwest of the northwest edge of U. S. Highway 17, 1.5 feet southwest of a white reference post, set in the top of a concrete post projecting 0.7 foot above the ground.

Notes: Levels were not extended to this mark in 1947.

Chief of Party Clarence R. Reed
 Recovered by C. K. Withrow
 Date Feb. 1947 19
 Checked by

DESCRIPTION OF BENCH MARK

Designation X 229
 Nearest town Hollyridge
 Distance and direction from nearest town 2.35 miles south
 Character of mark A bench mark disk
 Established by U. S. C. & G. Survey
 Detailed description 2.35 miles south along the Sears Landing Road from the railroad station at Hollyridge, 0.1 mile south of the crossing of a dirt road leading west from the west side of the main road and paralleling the main road for short distance on the east side, 24.5 feet east of the centerline of the dirt road which parallels the main road for short distance, 110.0 feet east of the centerline of the main road, 60.0 feet south of the centerline of a dirt road leading east, in a grove of several large pine trees, 2.0 feet south of a white reference post, set in the top of a concrete post projecting 1.0 foot above the ground.

Chief of party Clarence R. Reed
 Described by C. K. Withrow
 Date Feb. 1947 23
 Checked by

DESCRIPTION OF BENCH MARK

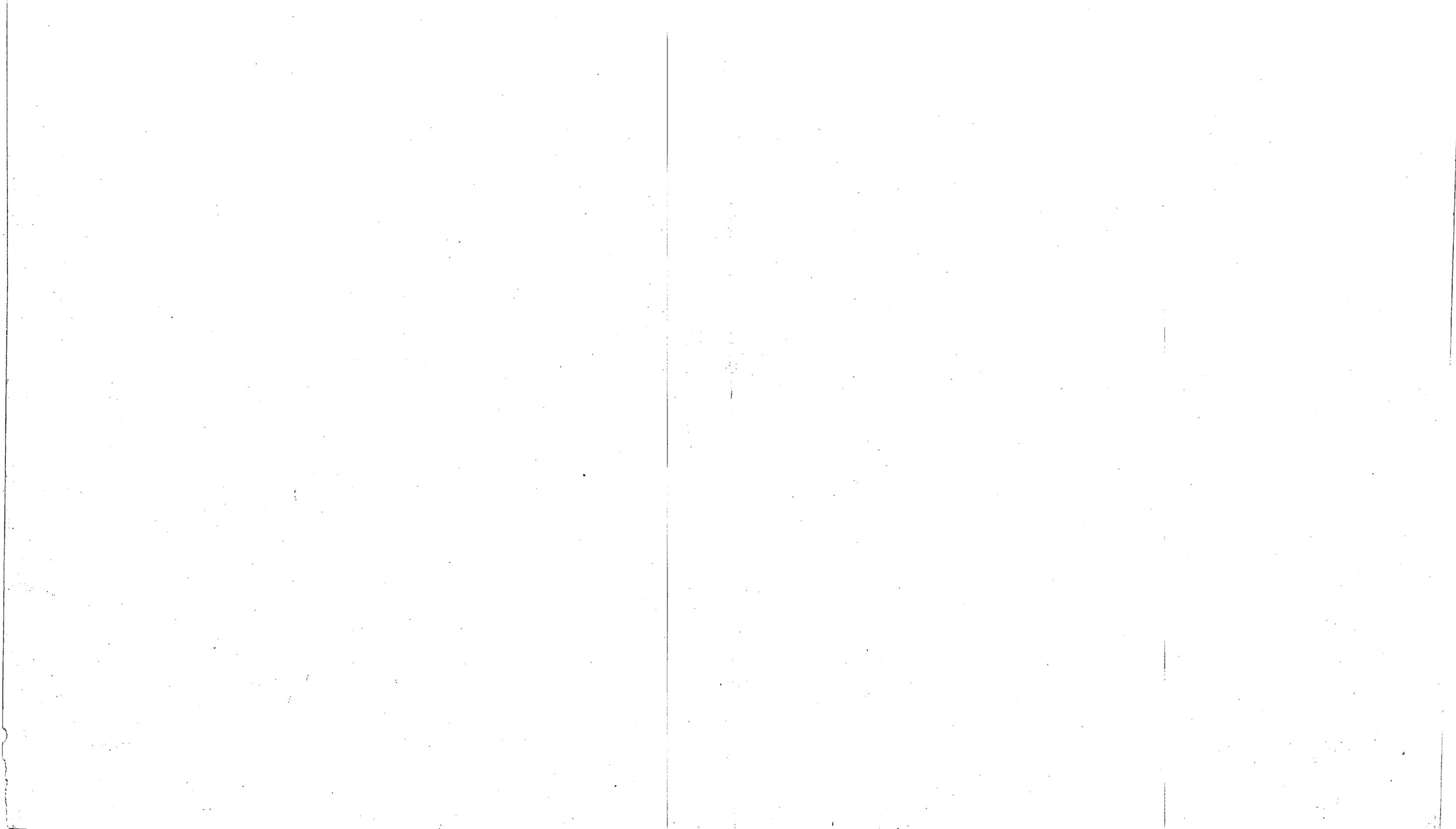
Designation SEARS BM 2
 Nearest town Hollyridge
 Distance and direction from nearest town 4.75 miles south
 Character of mark A reference mark disk
 Established by U. S. C. & G. Survey
 Detailed description 4.75 miles south along the Sears Landing Road from the railroad station at Hollyridge, 223.5 feet northwest of the northmost end of the Sears Landing bridge, 47.0 feet southwest of the centerline of the Sears Landing Road 42.5 feet northwest of reference mark No. 1, 15.0 feet southwest of the line of the telegraph poles, 1.5 feet southeast of a white reference post, set in concrete poured in to an 8-inch tile projecting 0.1 foot above the ground.

Chief of party Clarence R. Reed
 Described by C. K. Withrow
 Date Feb. 1947 27
 Checked by

DESCRIPTION OF BENCH MARK

Designation TOWER FOUR 1947
 Nearest town Hollyridge
 Distance and direction from nearest town 5.25 miles south, thence 1.55 miles southwest
 Character of mark A triangulation station disk
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 1.55 miles southwest along the Sand Spit Road, at the U. S. Navy Test Range Tower No. 4, set in the top of the concrete deck on top of the concrete tower, 3.0 feet southeast of the northeast edge of the deck, 3.0 feet southwest of the northeast edge of the deck.

Chief of party Clarence R. Reed
 Described by C. K. Withrow
 Date Feb. 1947 27
 Checked by



DESCRIPTION OF BENCH MARK

Designation **TOWER 230** State North Carolina County Pender
 Nearest town **Hollyridge** County **Onslow**
 Distance and direction from nearest town **5.25 miles south, thence 2.45 miles southwest**
 Character of mark **A bench mark disk** Stamping **TOWER 230 1947**
 Established by **U. S. C. & G. Survey**
 Detailed description **5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 2.45 miles southwest along the Sand Spit Road, 29.5 feet south of milepost 4, approximately 250.0 feet southwest of high peak in the sand dune ridge and a tall iron flagpole, about midway between the main dune ridge and the road, 43.0 feet southeast of the centerline of the road, 2.5 feet southwest of a white reference post, set in the top of a concrete post projecting 1.2 foot above the ground.**

Chief of party **Clarence R. Reed** Date **Feb. 1947** **32**
 Described by **C. K. Withrow** Checked by

U. S. Coast and Geodetic Survey—Form 638 (Rev. 1946)

DESCRIPTION OF BENCH MARK

Designation **TOWER TWO RM 1** State North Carolina County Pender
 Nearest town **Hollyridge** County **Onslow**
 Distance and direction from nearest town **5.25 miles south, thence 5.0 miles southwest**
 Character of mark **A reference mark disk** Stamping **TOWER TWO RM 1 1947**
 Established by **U. S. C. & G. Survey**
 Detailed description **5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 5.0 miles southwest along the Sand Spit Road, 0.15 mile northwest of the Sand Spit Road, at U. S. Navy Test Range Tower No. 2, in the top of the concrete apron around the concrete tower, 7.7 feet north of the south corner of the apron, 1.1 foot south of the south corner of the concrete tower.**

Chief of party **Clarence R. Reed** Date **Feb. 1947** **36**
 Described by **C. K. Withrow** Checked by

U. S. Coast and Geodetic Survey—Form 638 (Rev. 1946)

DESCRIPTION OF BENCH MARK

Designation **RANGE ONE 1947** State North Carolina County Pender
 Nearest town **Hollyridge** County **Onslow**
 Distance and direction from nearest town **5.25 miles south, thence 6.15 miles southwest**
 Character of mark **A traverse station disk** Stamping **RANGE ONE 1947**
 Established by **U. S. C. & G. Survey**
 Detailed description **5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 6.15 miles southwest along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.1 mile northwest of the Sand Spit Road, in line with the extension to northwest of the centerline of the rail covered road leading to the range tower (frame), 41.0 feet southeast of the southeast bank of the Banks Channel, 10.5 feet south of the east leg of the frame range tower, 9.0 feet east of the south leg of the tower, 1.3 feet northeast of a white reference post, set in the top of a concrete post flush with the ground.**

Chief of party **Clarence R. Reed** Date **Feb. 1947** **40**
 Described by **C. K. Withrow** Checked by

U. S. Coast and Geodetic Survey—Form 638 (Rev. 1946)

DESCRIPTION OF BENCH MARK

Designation **RM** State North Carolina County Pender
 Nearest town **Hollyridge** County **Onslow**
 Distance and direction from nearest town **5.25 miles south, thence 6.3 miles southwest**
 Character of mark **A 3-inch iron pin** Stamping **RM**
 Established by **U. S. C. & G. Survey**
 Detailed description **5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 6.3 miles southwest along the Sand Spit Road, at the U. S. Navy Test Range Launching platform, on the Sand Spit between New Topsail Inlet and New River Inlet, 35.2 feet southeast of the northeast edge of the platform, 24.8 feet southeast of the northeast edge of the platform, set in and projecting 0.65 foot above the concrete platform.**

Note: Rod was held on the center of the top of the pin.

Chief of party **Clarence R. Reed** Date **March 1947** **44**
 Described by **C. K. Withrow** Checked by

U. S. Coast and Geodetic Survey—Form 638 (Rev. 1946)

DESCRIPTION OF BENCH MARK

Designation **TOWER THREE RM 1** State North Carolina County Pender
 Nearest town **Hollyridge** County **Onslow**
 Distance and direction from nearest town **5.25 miles south, thence 3.6 miles southwest**
 Character of mark **A reference mark disk** Stamping **TOWER THREE RM 1 1947**
 Established by **U. S. C. & G. Survey**
 Detailed description **5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 3.6 miles southwest along the Sand Spit Road, along the main ridge of dunes, 0.15 mile southwest of milepost 3, at the U. S. Navy Test Range Tower No. 3, 63.0 feet southeast of the centerline of the road, in the top of the concrete apron around the base of the concrete tower, 7.6 feet north of the south corner of the apron, 1.4 feet south of the south corner of the tower.**

Chief of party **Clarence R. Reed** Date **Feb. 1947** **33**
 Described by **C. K. Withrow** Checked by

U. S. Coast and Geodetic Survey—Form 638 (Rev. 1946)

DESCRIPTION OF BENCH MARK

Designation **TOWER TWO 1947** State North Carolina County Pender
 Nearest town **Hollyridge** County **Onslow**
 Distance and direction from nearest town **5.25 miles south, thence 5.0 miles southwest**
 Character of mark **A triangulation station disk** Stamping **TOWER TWO 1947**
 Established by **U. S. C. & G. Survey**
 Detailed description **5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 5.0 miles southwest along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.15 mile northwest of the Sand Spit Road, at U. S. Navy Test Range Tower No. 2, in the top of the concrete deck on the top of the concrete tower, 3.1 feet southwest of the northeast edge of the deck, 3.2 feet southeast of the northwest edge of the deck, 2.6 feet northeast of the northeast edge of the low concrete wall around the head of the stairway.**

Chief of party **Clarence R. Reed** Date **Feb. 1947** **37**
 Described by **C. K. Withrow** Checked by

U. S. Coast and Geodetic Survey—Form 638 (Rev. 1946)

DESCRIPTION OF BENCH MARK

Designation **ZERO 1947** State North Carolina County Pender
 Nearest town **Hollyridge** County **Onslow**
 Distance and direction from nearest town **5.25 miles south, thence 6.3 miles southwest**
 Character of mark **A triangulation station disk** Stamping **ZERO 1947**
 Established by **U. S. C. & G. Survey**
 Detailed description **5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 6.3 miles southwest along the Sand Spit Road, on the Sand Spit between New Topsail Inlet and New River Inlet, approximately 1.0 mile northeast of New Topsail Inlet, at the U. S. Navy Test Range launching platform, 0.05 mile southeast of the Sand Spit Road, 46.6 feet northwest of the south corner of the concrete platform, 61.0 feet southeast of the west corner of the platform, 20.1 feet southwest of the southwest edge of the platform, 2.0 feet northwest of a white painted reference post, set in the top of a concrete post, 0.3 foot underground.**

Chief of party **Clarence R. Reed** Date **Feb. 1947** **41**
 Described by **C. K. Withrow** Checked by

U. S. Coast and Geodetic Survey—Form 638 (Rev. 1946)

DESCRIPTION OF BENCH MARK

Designation **TOWER ONE RM 1** State North Carolina County Pender
 Nearest town **Hollyridge** County **Onslow**
 Distance and direction from nearest town **5.25 miles south, thence 6.6 miles southwest**
 Character of mark **A reference mark disk** Stamping **TOWER ONE RM 1 1947**
 Established by **U. S. C. & G. Survey**
 Detailed description **5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 6.6 miles southwest along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, at the U. S. Navy Test Range Tower No. 1, 0.3 mile southwest of the launching platform, about 100.0 feet southeast of the highwater line of the Banks Channel, in the top of the concrete apron around the tower, 4.6 feet northwest of the southeast edge of the platform, 2.1 feet east of the east corner of the concrete tower.**

Chief of party **Clarence R. Reed** Date **March 1947** **45**
 Described by **C. K. Withrow** Checked by

U. S. Coast and Geodetic Survey—Form 638 (Rev. 1946)

DESCRIPTION OF BENCH MARK

Designation **TOWER THREE 1947** State North Carolina County Pender
 Nearest town **Hollyridge** County **Onslow**
 Distance and direction from nearest town **5.25 miles south, thence 3.6 miles southwest**
 Character of mark **A triangulation station disk** Stamping **TOWER THREE 1947**
 Established by **U. S. C. & G. Survey**
 Detailed description **5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 3.6 miles southwest along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, at the U. S. Navy Test Range Tower No. 3, in the top of the concrete deck on top of the tower, 3.0 feet southeast of the northwest edge of the tower, 3.0 feet southwest of the northeast edge of the tower.**

Chief of party **Clarence R. Reed** Date **Feb. 1947** **34**
 Described by **C. K. Withrow** Checked by

U. S. Coast and Geodetic Survey—Form 638 (Rev. 1946)

DESCRIPTION OF BENCH MARK

Designation **CONTROL 1947** State North Carolina County Pender
 Nearest town **Hollyridge** County **Onslow**
 Distance and direction from nearest town **5.25 miles south, thence 6.3 miles southwest**
 Character of mark **A traverse station disk** Stamping **CONTROL 1947**
 Established by **U. S. C. & G. Survey**
 Detailed description **5.25 miles south along the Sears Landing Road from the railroad station at Holly ridge, thence 6.3 miles southwest along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, approximately 1.0 mile northeast of the New Topsail Inlet, 30.5 feet southwest of the centerline of road leading from the launching platform to warehouse area, 18.0 feet northwest of the centerline of the Sand Spit Road, 9.2 feet east of the south corner of the concrete control tower for the U. S. Navy Test Range, 9.4 feet south of the east corner of the tower, 3.6 feet southeast of the southeast face of the tower, set in the top of a concrete post flush with the ground.**

Chief of party **Clarence R. Reed** Date **Feb. 1947** **38**
 Described by **C. K. Withrow** Checked by

U. S. Coast and Geodetic Survey—Form 638 (Rev. 1946)

DESCRIPTION OF BENCH MARK

Designation **LINE MARK ONE** State North Carolina County Pender
 Nearest town **Hollyridge** County **Onslow**
 Distance and direction from nearest town **5.25 miles south, thence 6.3 miles southwest**
 Character of mark **A reference mark disk** Stamping **ONE**
 Established by **U. S. C. & G. Survey**
 Detailed description **5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 6.3 miles southwest along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, at the U. S. Navy Test Range launching platform, 39.4 feet northwest of the southeast edge of the platform, 7.9 feet southwest of the northeast edge of the platform, set in the top of the concrete platform.**

Chief of party **Clarence R. Reed** Date **March 1947** **42**
 Described by **C. K. Withrow** Checked by

U. S. Coast and Geodetic Survey—Form 638 (Rev. 1946)

DESCRIPTION OF BENCH MARK

Designation **TOWER ONE 1947** State North Carolina County Pender
 Nearest town **Hollyridge** County **Onslow**
 Distance and direction from nearest town **5.25 miles south and 6.6 miles southwest**
 Character of mark **A triangulation station disk** Stamping **TOWER ONE 1947**
 Established by **U. S. C. & G. Survey**
 Detailed description **5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 6.6 miles southwest along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, at the U. S. Navy Test Range Tower No. 1, 0.3 mile southwest of the launching platform, in the top of the concrete deck on top of the concrete tower, 2.9 feet northeast of the southwest edge of the platform, 2.8 feet southeast of the northwest edge of the platform.**

Chief of party **Clarence R. Reed** Date **March 1947** **46**
 Described by **C. K. Withrow** Checked by

U. S. Coast and Geodetic Survey—Form 638 (Rev. 1946)

DESCRIPTION OF BENCH MARK

Designation **A 230** State North Carolina County Pender
 Nearest town **Hollyridge** County **Onslow**
 Distance and direction from nearest town **5.25 miles south, thence 4.5 miles southwest**
 Character of mark **A bench mark disk** Stamping **A 230 1947**
 Established by **U. S. C. & G. Survey**
 Detailed description **5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 4.5 miles southwest along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.45 mile northeast of the junction of road leading to U. S. Navy Test Range Tower No. 2, 0.1 mile southwest of milepost 2, at a point where a view is obtained of the marsh and inland waterway to the northwest through a break in the main ridge of the sand ridges and the live oak trees, about 35.0 feet northwest of the top of the main ridge of sand dunes, about 10.0 feet northwest of the base of the dune ridge, 32.0 feet southeast of the centerline of the road, 7.0 feet northeast of my wire pole for telephone pole, 2.9 feet southwest of a white painted reference post, set in the top of a concrete post projecting 1.3 foot above the ground.**

Chief of party **Clarence R. Reed** Date **Feb. 1947** **35**
 Described by **C. K. Withrow** Checked by

U. S. Coast and Geodetic Survey—Form 638 (Rev. 1946)

DESCRIPTION OF BENCH MARK

Designation **CAMERA 1947** State North Carolina County Pender
 Nearest town **Hollyridge** County **Onslow**
 Distance and direction from nearest town **5.25 miles south, thence 6.15 miles southwest**
 Character of mark **A traverse station disk** Stamping **CAMERA 1947**
 Established by **U. S. Coast & Geodetic Survey**
 Detailed description **5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 6.15 miles southwest along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.15 mile northeast of the concrete U. S. Navy Test Range control tower, 24.0 feet northwest of the centerline of the Sand Spit Road, 49.0 feet northeast of the centerline of a road leading northwest to warehouse and frame range tower, 5.6 feet southwest of power pole, 1.5 foot northeast of a white painted reference post, set in the top of a concrete post projecting 0.1 foot above the ground.**

Chief of party **Clarence R. Reed** Date **Feb. 1947** **39**
 Described by **C. K. Withrow** Checked by

U. S. Coast and Geodetic Survey—Form 638 (Rev. 1946)

DESCRIPTION OF BENCH MARK

Designation **LINE MARK TWO** State North Carolina County Pender
 Nearest town **Hollyridge** County **Onslow**
 Distance and direction from nearest town **5.25 miles south, thence 6.3 miles southwest**
 Character of mark **A reference mark disk** Stamping **TWO**
 Established by **U. S. C. & G. Survey**
 Detailed description **5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 6.3 miles southwest along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 1.0 mile northeast of New Topsail Inlet (estimated), 0.05 mile southeast of the Sand Spit Road, at the U. S. Navy Test Range launching platform, 16.9 feet southeast of the northwest edge of the platform, 8.3 feet southwest of the northeast edge of the platform, set in the top of the concrete platform.**

Chief of party **Clarence R. Reed** Date **Feb. 1947** **43**
 Described by **C. K. Withrow** Checked by

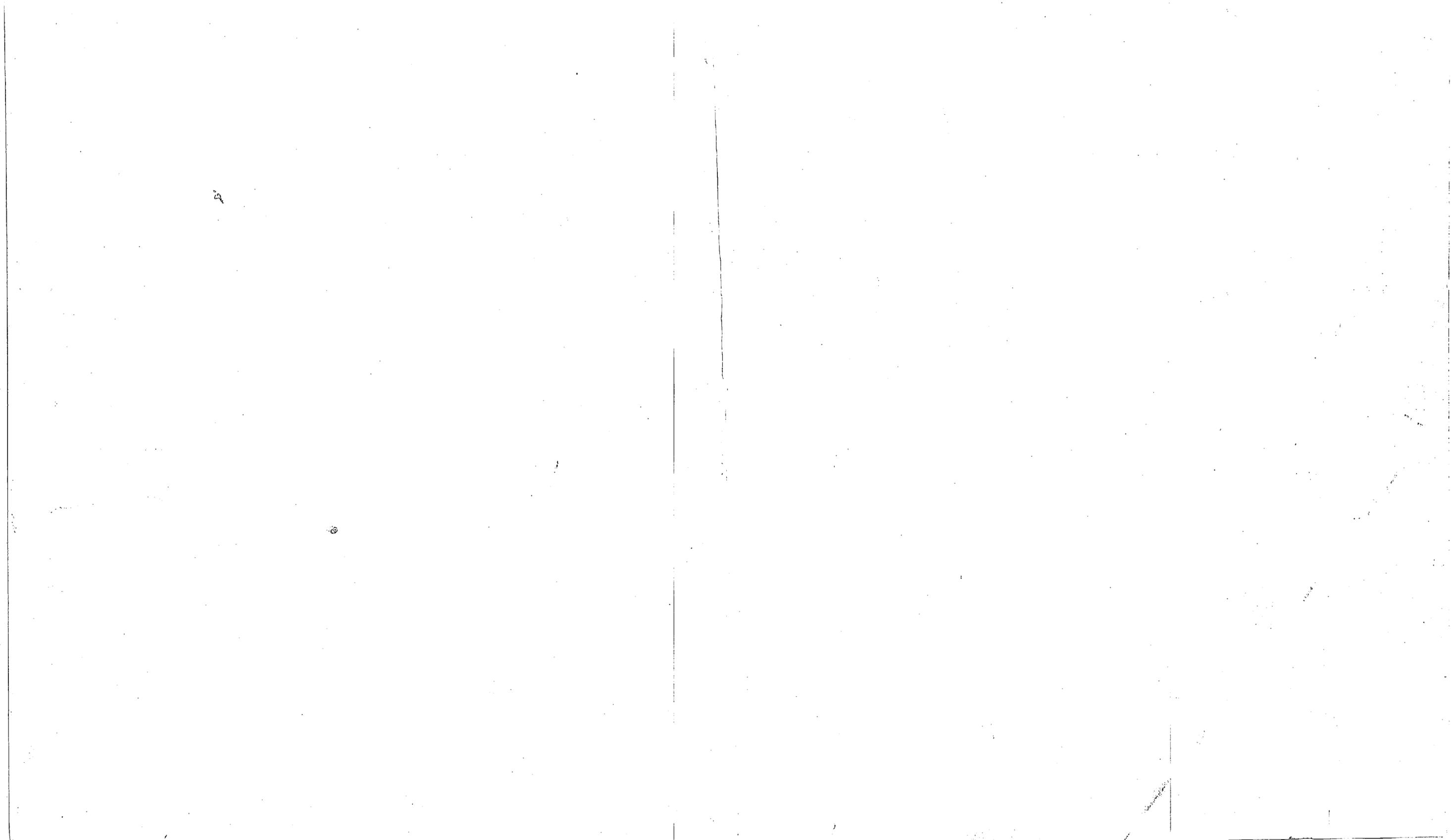
U. S. Coast and Geodetic Survey—Form 638 (Rev. 1946)

DESCRIPTION OF BENCH MARK

Designation **CENTRAL 1947** State North Carolina County Pender
 Nearest town **Hollyridge** County **Onslow**
 Distance and direction from nearest town **5.25 miles south**
 Character of mark **A traverse station disk** Stamping **CENTRAL 1947**
 Established by **U. S. C. & G. Survey**
 Detailed description **5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, on the Sand Spit between New Topsail Inlet and New River Inlet, at the junction of the Sand Spit Road and the Sears Landing Road, 90.5 feet southeast of the center of the road junction, 10.6 feet east of the south leg northeast of the center of the Sand Spit Road measured from a point 38.0 feet northeast of the center of the road junction, 10.6 feet east of the south leg of frame range tower, 10.3 feet south of the east leg of the range tower, 2.0 foot southwest of a white reference post, set in the top of a concrete post projecting 0.1 foot above the ground.**

Chief of party **Clarence R. Reed** Date **Feb. 1947** **47**
 Described by **C. K. Withrow** Checked by

U. S. Coast and Geodetic Survey—Form 638 (Rev. 1946)



DESCRIPTION OF BENCH MARK

Designation **TOWER FIVE RM 1** State North Carolina County Pender
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 0.4 mile northeast
 Character of mark A reference mark disk Stamping **TOWER FIVE RM 1**
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 0.4 mile northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.05 mile southeast of the sand spit road, at U. S. Navy Test Range Tower No. 5, set in the top of the concrete apron around the base of the tower, 1.4 foot south of the south corner of the concrete tower, 7.6 feet north of the south corner of the concrete apron.

Chief of party Clarence R. Reed Date March 1947 48
 Described by C. K. Withrow Checked by

U. S. Coast and Geodetic Survey—Form 628 (Rev. 1942)

DESCRIPTION OF BENCH MARK

Designation **E 230** State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 2.4 miles northeast
 Character of mark A bench mark disk Stamping **E 230 1947**
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 2.4 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.7 mile southeast of 30-foot cut where the road passes through a northwest-southeast dune ridge, 0.55 mile northeast of point where the road makes turn to west away from the main dune ridge, about 125.0 feet west of the top of long tall sand dune peak in the main dune ridge, about 140.0 feet northeast of slight rise in the road, about 70.0 feet northwest of the top of the main dune ridge, 14.5 feet southeast of the centerline of the road measured from a point 347.0 feet southwest of milepost 9, 2.5 feet southwest of white painted reference post, set in the top of a concrete post projecting 1.3 foot above the ground and about 5.0 feet above the level of the road.

Chief of party Clarence R. Reed Date March 1947 52
 Described by C. K. Withrow Checked by

U. S. Coast and Geodetic Survey—Form 628 (Rev. 1942)

DESCRIPTION OF BENCH MARK

Designation **TOWER SIX 1947** State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 3.4 miles northeast
 Character of mark A triangulation station disk Stamping **TOWER SIX 1947**
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 3.4 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.05 mile southwest of milepost 10, at U. S. Navy Test Range Tower No. 6, set in the top of the concrete deck on top of the concrete tower, 2.8 feet southwest of the northeast edge of the concrete deck, 2.9 feet southeast of the northwest edge of the deck.

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 Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK

Designation **TOWER SEVEN RM 1** State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 5.5 miles northeast
 Character of mark A reference mark disk Stamping **TOWER SEVEN RM 1**
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 5.5 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.05 mile northeast of milepost 13, set in the top of the concrete apron which surrounds U. S. Navy Test Range Tower No. 7, 3 foot south of the south corner of the concrete tower, 7.7 feet north of the south corner of the concrete apron.

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 Described by C. K. Withrow Checked by

U. S. Coast and Geodetic Survey—Form 628 (Rev. 1942)

DESCRIPTION OF BENCH MARK

Designation **TOWER FIVE** State North Carolina County Pender
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 0.4 mile northeast
 Character of mark A triangulation station disk Stamping **TOWER FIVE 1947**
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 0.4 mile northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.05 mile southeast of the sand spit road, at U. S. Navy Test Range Tower No. 5, set in the top of the concrete deck on top of the concrete tower, 2.9 feet southeast of the northwest edge of the deck, 2.9 feet southeast of the northeast edge of the deck.

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 Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK

Designation **BANKS RM** State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 3.1 miles northeast
 Character of mark A reference mark disk Stamping **BANKS 1933**
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 3.1 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.3 mile southwest of U. S. Navy Test Range Tower No. 6 and milepost 10, at point where the road cuts through a 30-foot tall northwest-southeast sand dune ridge, on the top of the dune ridge which is the tallest and most prominent dune in the vicinity, 118.0 feet northwest of the centerline of the road and the center of the cut, 34.5 feet northwest of the triangulation station, 1.5 foot northwest of a white painted reference post, in the top of concrete poured into an 8-inch tile which projects 1.0 foot above the ground.

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 Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK

Designation **FED RM 1** State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 4.45 miles northeast
 Character of mark A reference mark disk Stamping **FED NO 1 1933**
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 4.45 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, about 0.1 mile southwest of point where the road makes an 8-foot cut through a northwest-southeast ridge of sand dunes, 179.0 feet southeast of the centerline of the road measured from a point 75.0 feet northeast of milepost 11, along the sharp top of the main ridge of sand dunes, 37.6 feet southwest of the triangulation station, 1.8 foot northeast of a white painted reference post, set in the top of concrete poured into an 8-inch tile which projects 1.4 foot above the ground.

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 Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK

Designation **TOWER SEVEN 1947** State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 6.5 miles northeast
 Character of mark A triangulation station disk Stamping **TOWER SEVEN 1947**
 Established by U. S. Coast & Geodetic Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 6.5 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.05 mile northeast of milepost 13, set in the top of the concrete deck on top of U. S. Navy Test Range Tower No. 7, 2.9 feet southwest of the northeast edge of the concrete deck, 2.9 feet southeast of the northwest edge of the deck.

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 Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK

Designation **HIGH** State North Carolina County Pender
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 1.6 miles northeast
 Character of mark A triangulation station disk Stamping **HIGH 1933 1947**
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 1.6 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.3 mile southwest of point where the marl covered road makes turn to west away from the sand dunes (main ridge), approximately 500.0 feet southeast of a point on the main road which is about 0.1 mile northeast of road milepost No. 8, 164.8 feet southeast of the 10th communication line pole southwest of the point where the line crosses the main road, 96.0 feet southeast of the centerline of sand road paralleling the main ridge of dunes (measured from a point about 285.0 feet southwest of the northeast end of cut where the road passes through the first northwest-southeast dune ridge southwest of curve in the main road), 1.5 foot southwest of a white painted reference post, set in the top of a concrete post projecting 0.4 foot above the ground.

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 Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK

Designation **BANKS** State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 3.1 miles northeast
 Character of mark A triangulation station disk Stamping **BANKS 1933 1947**
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 3.1 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.3 mile southwest of U. S. Navy Test Range Tower No. 6 and milepost no. 10, on the peak of the top of the northwest-southeast ridge of sand dunes (this is the highest and most prominent dune peak in the vicinity), approximately 300.0 feet southeast of point where the north-south dirt road and telephone line leading north across the marsh join the sand area and the northwest end of the northwest-southeast dune ridge, 83.5 feet northwest of the centerline of the marl covered road measured from a point at the center of 30-foot cut through the sand ridge, 1.5 foot southwest of a white painted reference post, in the top of concrete poured into an 8-inch tile which projects 0.6 foot above the ground.

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 Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK

Designation **FED 1933** State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 4.45 miles northeast
 Character of mark A triangulation station disk Stamping **FED 1933**
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 4.45 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 180.0 feet southeast of the centerline of the road measured from a point 133.0 feet northeast of milepost 11, along the sharp top of the main sand dune ridge, 1.5 foot southwest of a white painted reference post, set in concrete poured into an 8-inch tile which projects 1.5 foot above the ground.

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 Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK

Designation **RANGE TWO 1947** State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 6.8 miles northeast
 Character of mark A traverse station disk Stamping **RANGE TWO 1947**
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 6.8 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.35 mile northeast of U. S. Navy Test Range Tower No. 7 and milepost No. 13, about 200.0 feet southeast of the beginning of the first curve in the road northeast of Tower 7, about 200.0 feet northwest of the main ridge of the dunes, 131.0 feet northwest of the centerline of the road measured from a point at the northeast end of road cut through an 8-foot high sand ridge, 75.5 feet west northwest of the first communication line pole northeast of the northeast end of low straight section of communication line poles, 10.0 feet east of the south leg of frame range tower, 10.5 foot south of the east leg of the tower, 2.0 feet southwest of a white painted reference post, set in the top of a concrete post flush with the ground.

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 Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK

Designation **HIGH RM** State North Carolina County Pender
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 1.6 miles northeast
 Character of mark A reference mark disk Stamping **HIGH 1933**
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 1.6 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.3 mile southwest of a point where the marl covered road which has paralleled the main ridge of dunes from the northeast makes a turn to west away from the dune ridge and communication lines, approximately 500.0 feet southeast of a point on the main road which is 0.1 mile northeast of road mile post No. 8, along the top of the main ridge of the dunes, 166.0 feet southeast of the line of the communication line poles, 99.0 feet southeast of the centerline of sand road paralleling the dune ridge (measured from a point about 225.0 feet southwest of the northeast end of cut where the road passes through the first northwest-southeast dune ridge southwest of curve in the main road), 60.0 feet northeast of the triangulation station, 1.3 foot southwest of a white painted reference post, set in the top of a concrete post flush with the ground.

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 Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK

Designation **TOWER SIX RM 1** State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 3.4 miles northeast
 Character of mark A reference mark disk Stamping **TOWER SIX RM 1**
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 3.4 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.05 mile southwest of milepost 10, at U. S. Navy Test Range Tower No. 6, set in the top of the concrete apron which surrounds the concrete tower, 1.3 foot south of the south corner of the concrete tower, 7.7 feet north of the south corner of the concrete apron.

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 Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK

Designation **F 230** State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 5.5 miles northeast
 Character of mark A bench mark disk Stamping **F230 1947**
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 5.5 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 9.0 feet east of milepost 12, at the foot of the main ridge of sand dunes, across the road from and near the southwest end of a 200.0-foot long and 4-foot high fill on the northwest side of the road, 26.0 feet southeast of the centerline of the road, 46.0 feet northeast of the top of the main sand dune ridge, 2.0 feet southwest of a white painted reference post, set in the top of a concrete post projecting 1.2 foot above the ground.

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 Described by C. K. Withrow Checked by

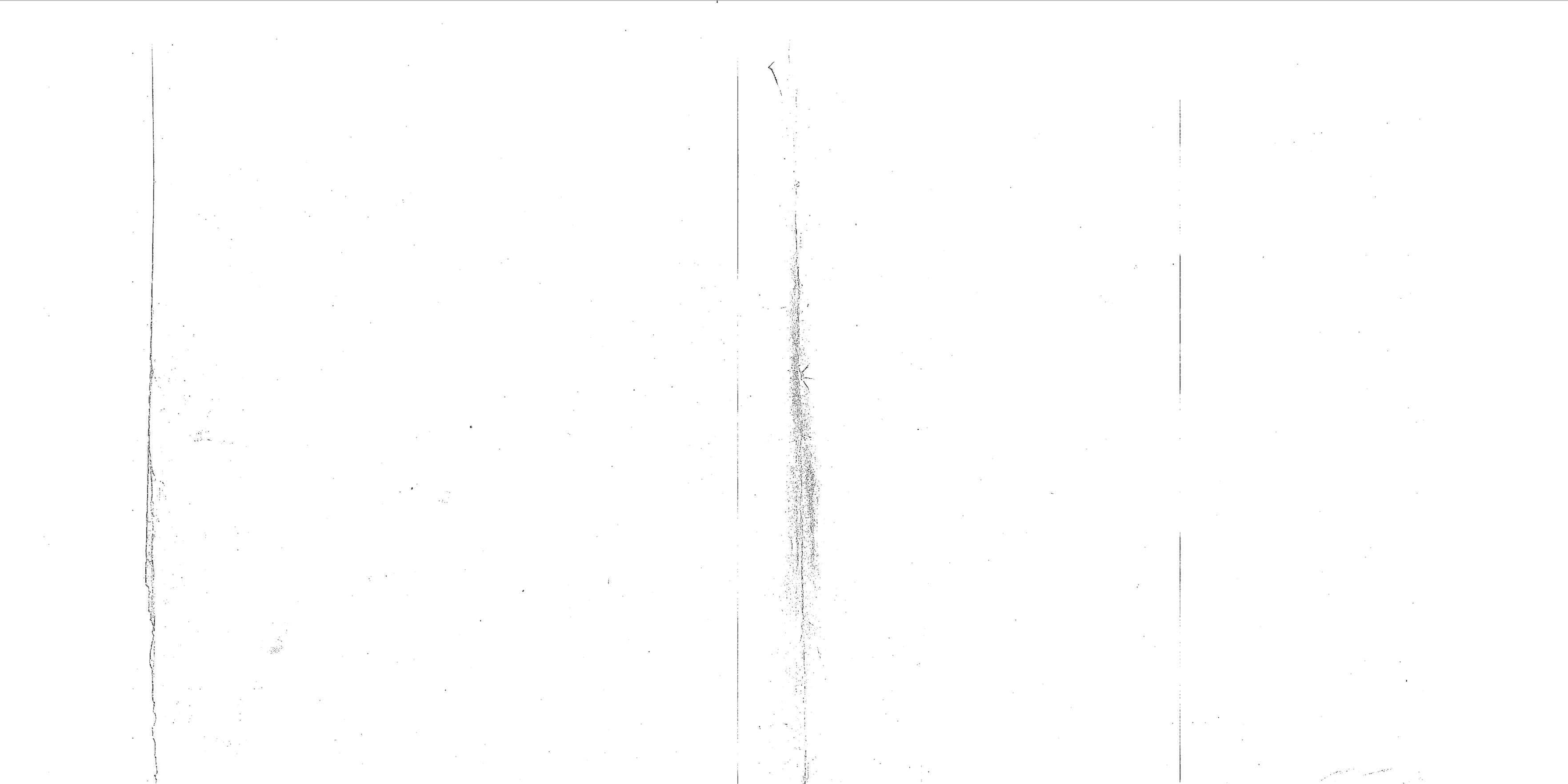
U. S. Coast and Geodetic Survey—Form 628 (Rev. 1942)

DESCRIPTION OF BENCH MARK

Designation **G 230** State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 7.5 miles northeast
 Character of mark A bench mark disk Stamping **G 230 1947**
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 7.5 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 27.7 feet east of milepost 11, 80.5 feet southeast of the line of the communication poles measured from a point 25.0 feet southwest of the 5th pole northeast of the southwest end of low straight section of poles, on the top of low sand ridge which runs from the road to the base of the main sand dune ridge, 38.0 feet southeast of the centerline of the road, 81.0 feet northwest of the top of the main ridge of the dunes, 1.5 foot southwest of a white painted reference post, set in the top of a concrete post projecting 1.2 foot above the ground.

Chief of party Clarence R. Reed Date March 1947
 Described by C. K. Withrow Checked by

U. S. Coast and Geodetic Survey—Form 628 (Rev. 1942)



DESCRIPTION OF BENCH MARK

Designation CRAB State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 7.8 miles northeast
 Character of mark A triangulation station disk
 Established by U. S. C. & G. Survey Stamping CRAB 1914 1947
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 7.8 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.3 mile northeast of milepost 14, along the top of the main ridge of the sand dunes, 124.0 feet southeast of the centerline of the road measured from a point about 150.0 feet southwest of the southwest end of a 10.0-foot cut through a northwest-southeast ridge of dunes, 97.0 feet southeast of the top of the main ridge of the dunes, 2.0 feet northwest of white painted reference post, set in the top of a concrete post projecting 1.0 foot above the ground.

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 Described by C. K. Withrow Date March 1947 64
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DESCRIPTION OF BENCH MARK

Designation LOG RM 2 State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 9.9 miles northeast
 Character of mark A reference mark disk
 Established by U. S. C. & G. Survey Stamping LOG 2
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 9.9 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.5 mile northeast of milepost 16, 166.5 feet west of the centerline of the road measured from a point 60.0 feet southwest of the southwest end of a 20-foot cut through a sand dune, 59.0 feet north of the first pole southwest of the sand ridge, 1.5 foot northeast of white painted reference post, set in the top of concrete poured into a 6-inch tile projecting 0.3 foot above the ground.

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 Described by C. K. Withrow Date March 1947 68
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DESCRIPTION OF BENCH MARK

Designation H 230 State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 10.75 miles northeast
 Character of mark A bench mark disk
 Established by U. S. C. & G. Survey Stamping H 230 1947
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 10.75 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.4 mile northeast of milepost 17, about midway between two 15-foot cuts on the southeast side of the highway and which are about 0.2 mile apart, 39.5 feet southeast of the centerline of the road, 59.0 feet northwest of the top of the main ridge of the dunes, 2.0 feet southeast of white painted reference post, set in the top of a concrete post projecting 1.0 foot above the ground, about 2.0 feet above the level of the road.

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 Described by C. K. Withrow Date March 1947 72
 Checked by

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DESCRIPTION OF BENCH MARK

Designation VES RM 1 State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 13.0 miles northeast
 Character of mark A reference mark disk
 Established by U. S. C. & G. Survey Stamping None
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 13.0 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 1.0 mile southwest of New River Inlet, 0.45 mile southwest of milepost 20, 355.0 feet northwest of the centerline of the road measured from a point 0.15 mile southwest of a group of fish camp shacks and the junction of an east-west sand road, 150.0 feet southeast of the top of which the triangulation station is located, set on the top of low sand ridge running between two sand dune peaks about 200 feet apart, in the northeast-southwest opening between marsh bushes, set in the top of a concrete filled 6-inch tile which projects 0.2 foot above the ground, 2.0 feet northwest of a 3-foot high 6-inch creosote reference post.

Chief of party Clarence R. Reed
 Described by C. K. Withrow Date April 1947 76
 Checked by

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DESCRIPTION OF BENCH MARK

Designation MUSH State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 8.6 miles northeast
 Character of mark A triangulation station disk
 Established by U. S. C. & G. Survey Stamping None
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 8.6 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.15 mile northeast of milepost 15, along the line of the top of the main sand dune ridge, 136.0 feet southeast of the northeast end of long straight section of poles, 59.0 feet southeast of the centerline of the road, 55.0 feet east of the foot of the northeast end of 15-foot cut on the southeast side of the road, 17.0 feet southwest of the top of peak in the dune ridge and about 3.0 feet lower than the peak, 1.3 foot west of white painted reference post, set in the top of concrete poured into a 5-inch tile which projects 1.0 foot above the ground.

Chief of party Clarence R. Reed
 Described by C. K. Withrow Date March 1947 65
 Checked by

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DESCRIPTION OF BENCH MARK

Designation LOG State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 9.9 miles northeast
 Character of mark A triangulation station disk
 Established by U. S. C. & G. Survey Stamping None
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 9.9 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.5 mile northeast of milepost 16, at a 20.0-foot cut through a prominent sand ridge, at the top of the southeast edge of the cut, 43.0 feet southeast of the centerline of the road, 65.0 feet northwest of the top of the main ridge of the sand dunes, 3.0 feet southeast of the sharp edge of the cut, 4.2 feet northwest of a white painted reference post, set in the top of concrete poured into a 5-inch tile projecting 0.5 foot above the ground.

Note: The sand is falling along the top of the cut and the mark will probably be lost in a short time.

Chief of party Clarence R. Reed
 Described by C. K. Withrow Date March 1947 69
 Checked by

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DESCRIPTION OF BENCH MARK

Designation FISH 1932 State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 11.75 miles northeast
 Character of mark A triangulation station disk
 Established by U. S. C. & G. Survey Stamping FISH 1932
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 11.75 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.4 mile northeast of milepost 18, on the top of an 8-foot sand dune ridge on the northwest side of the highway and overlooking the marsh and inland waterway about 0.2 mile to the northwest, 90.0 feet northwest of the centerline of the road, about 200.0 feet northwest of the top of a high peak in the main dune ridge (there is a break in the main dune ridge to the southwest of this peak and the dune ridge drops to the approximate level of the road for a very short distance, 1.5 foot northeast of a white painted reference post, set in the top of concrete poured into an 8-inch tile which projects 0.4 foot above the ground.

Chief of party Clarence R. Reed
 Described by C. K. Withrow Date March 1947 73
 Checked by

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DESCRIPTION OF BENCH MARK

Designation RAINE THREE 1947 State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 13.5 miles northeast
 Character of mark A traverse station disk
 Established by U. S. C. & G. Survey Stamping RAINE THREE 1947
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 13.5 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 34.8 feet west of TOWER NINE 1947, 157.0 feet northwest of the centerline of the road measured from a point 47.0 feet northeast of milepost 20, 11.0 feet east of the south pole leg of frame tower, 10.0 feet south of the east leg of the frame tower, 1.5 foot southwest of a white painted reference post, set in the top of a concrete post projecting 0.1 foot above the ground.

Chief of party Clarence R. Reed
 Described by C. K. Withrow Date April 1947 77
 Checked by

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DESCRIPTION OF BENCH MARK

Designation TOWER EIGHT RM 1 State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 9.5 miles northeast
 Character of mark A reference mark disk
 Established by U. S. C. & G. Survey Stamping TOWER EIGHT RM 1 1947
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 9.5 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.1 mile northeast of milepost 16, set in the top of the concrete apron around U. S. Navy Test Range Tower No. 8, 3.1 foot south of the south corner of the concrete tower, 7.6 feet north of the south corner of the concrete apron.

Chief of party Clarence R. Reed
 Described by C. K. Withrow Date March 1947 66
 Checked by

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DESCRIPTION OF BENCH MARK

Designation LOG 2 1947 State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 9.9 miles northeast
 Character of mark A triangulation station disk
 Established by U. S. C. & G. Survey Stamping LOG 2 1947
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 9.9 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.5 mile northeast of milepost 16, at point where the road cuts through a high and prominent sand dune ridge, 61.5 feet southeast of the centerline of the road and the center of the cut, along the top of the northwest-southeast sand ridge, 52.0 feet northwest of the top LOG and the top of the highest part of the ridge, 2.0 feet northwest of a 3-foot high 8-inch creosote reference post, set in the top of a concrete post projecting 0.7 foot above the ground.

Chief of party Clarence R. Reed
 Described by C. K. Withrow Date April 1947 70
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DESCRIPTION OF BENCH MARK

Designation VIER RM 2 State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 13.0 miles northeast
 Character of mark A reference mark disk
 Established by U. S. C. & G. Survey Stamping None
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 13.0 miles northeast along the Sand Spit Road, on the sand spit between New River Inlet and New Topsail Inlet, 1.0 mile southwest of New River Inlet, 0.45 mile southwest of milepost 20, 280.0 feet northwest of the centerline of the road measured from a point 139.4 feet south southwest of the triangulation station, 187.0 feet southwest of reference mark No. 1, about 20.0 feet south of the base of the large dune on top of which the triangulation station is located, on the top of a low sand dune, set in the top of a concrete filled 6-inch tile which projects 0.4 foot above the ground, 1.5 foot southwest of a white painted reference post.

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 Described by C. K. Withrow Date April 1947 74
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DESCRIPTION OF BENCH MARK

Designation TOWER NINE RM 1 State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 13.5 miles northeast
 Character of mark A reference mark disk
 Established by U. S. C. & G. Survey Stamping NO 1 1947
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 13.5 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.5 mile southwest of New River Inlet, 0.1 mile northeast of milepost 20, set in the top of the concrete apron for U. S. Navy Test Range Tower No. 9 (the concrete tower has not been constructed in March 1947), 15.8 feet southeast of TOWER NINE 1947, 5.2 feet northwest of the southeast edge of the apron, 5.4 feet southwest of the northeast edge of the apron.

Chief of party Clarence R. Reed
 Described by C. K. Withrow Date March 1947 78
 Checked by

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DESCRIPTION OF BENCH MARK

Designation TOWER EIGHT 1947 State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 9.5 miles northeast
 Character of mark A triangulation station disk
 Established by U. S. C. & G. Survey Stamping TOWER EIGHT 1947
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 9.5 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.1 mile northeast of milepost 16, set in the top of the concrete deck on top of U. S. Navy Test Range Tower No. 8, 2.9 feet southeast of the northeast edge of the concrete deck, 3.0 feet southwest of the northeast edge of the deck.

Chief of party Clarence R. Reed
 Described by C. K. Withrow Date March 1947 67
 Checked by

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DESCRIPTION OF BENCH MARK

Designation LOG 2 RM 3 State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 9.9 miles northeast
 Character of mark A reference mark disk
 Established by U. S. C. & G. Survey Stamping LOG 2 RM 3 1947
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 9.9 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.5 mile northeast of milepost 16, at a point where the road cuts through a high and prominent sand dune ridge, on a shelf-like cove between the northwest-southeast ridge of dunes and the main dune ridge, 164.0 feet east southeast of LOG 2 RM 2, 86.0 feet southeast of the centerline of the road measured from a point near the southwest end of the cut, 57.6 feet southwest of LOG 2 1947, 26.0 feet northwest of the top of the main sand dune ridge, 2.0 feet southeast of a 3-foot high 8-inch creosote reference post, set in the top of a concrete post projecting 0.7 foot above the ground.

Chief of party Clarence R. Reed
 Described by C. K. Withrow Date March 1947 71
 Checked by

U. S. Coast and Geodetic Survey—Form 628 (Rev. 1942)

DESCRIPTION OF BENCH MARK

Designation VIER State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.5 miles south, thence 13.0 miles northeast
 Character of mark A triangulation station disk
 Established by U. S. C. & G. Survey Stamping None
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 13.0 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 1.0 mile southwest of New River Inlet, 0.45 mile southwest of milepost 20, 361.0 feet northwest of the centerline of the road measured from a point 0.15 mile southwest of the junction of east-west sand road and a group of fish camp shacks, at the center of a broken-top sand dune peak (base of dune is surrounded by marsh bushes except on the south side), 190.0 feet south of the point where the east-west sand road enters the marsh bushes, 2.0 feet north of a 4-foot high 6-inch creosote reference post, set in the top of concrete poured into an 8-inch tile which projects 0.6 foot above the ground.

Chief of party Clarence R. Reed
 Described by C. K. Withrow Date March 1947 75
 Checked by

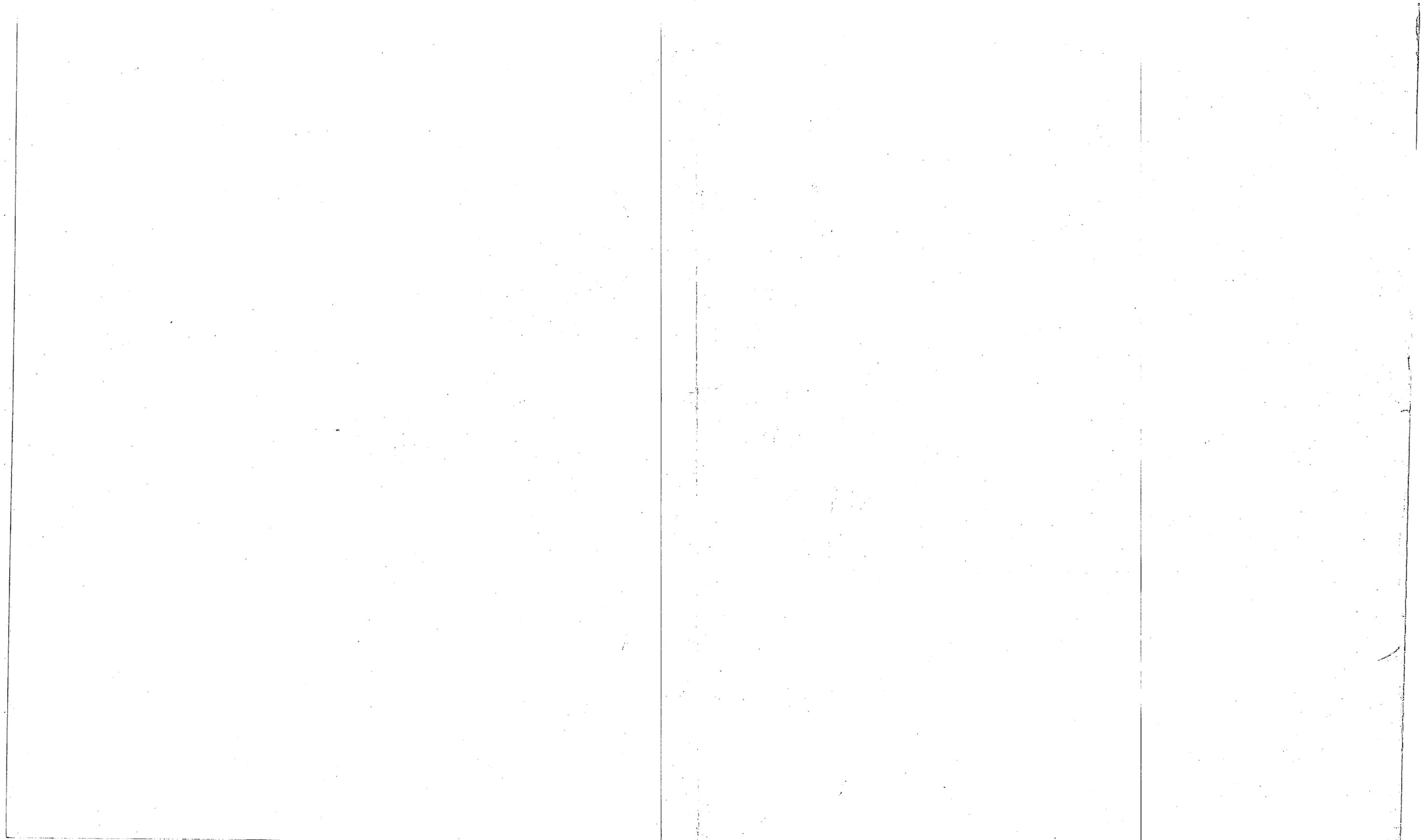
U. S. Coast and Geodetic Survey—Form 628 (Rev. 1942)

DESCRIPTION OF BENCH MARK

Designation TOWER NINE 1947 State North Carolina County Onslow
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 13.5 miles northeast
 Character of mark A triangulation station disk
 Established by U. S. C. & G. Survey Stamping TOWER NINE 1947
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 13.5 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.5 mile southwest of New River Inlet, 0.1 mile northeast of milepost 20, set in the top of the concrete apron for U. S. Navy Test Range Tower No. 9 (the concrete tower has not been constructed in March 1947), 7.5 feet southeast of the northeast edge of the apron, 9.0 feet southeast of the northwest edge of the apron.

Chief of party Clarence R. Reed
 Described by C. K. Withrow Date March 1947 77
 Checked by

U. S. Coast and Geodetic Survey—Form 628 (Rev. 1942)



DESCRIPTION OF BENCH MARK

Designation: TIDAL 1 (1919) State: North Carolina County: Onslow
 Nearest town: Hollyridge County: Onslow
 Distance and direction from nearest town: 5.25 miles south, thence 1.0 mile northeast
 Character of mark: A bench mark disk Stamping: 3
 Established by: U. S. G. & G. Survey

Detailed description: 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 1.0 mile northeast along the Sand Spit Road, thence 0.55 mile north along the sand on the southeast side of slough, about 0.15 mile northwest of the mouth of the New River Inlet, about 500.0 feet southwest across open sand area from the 1947 southwest bank of the Inlet channel (the sand area now covers old channel location and blocks the mouth of old slough), about 400.0 feet north of the north corner of the old blocked slough, near point where low bank along tree and bush covered area (the bank is northwest bank of old slough) begins curve to south and southwest, at the extreme northeast corner of the tree and bush covered area which was probably at one time an island, at former location of house known as Sea Island House (now destroyed) which was located on the north side of the large trees (do not confuse with the small wooded area which is located to the south and southwest and across a 75-foot wide marsh strip from the larger wooded area), about 100.0 feet north of point where the 75-foot wide marsh strip between the wooded areas begins, 12.0 feet southwest of the northeast edge of the wooded area and the low bank, 18.0 feet west southwest of the northernmost one of large live oak trees, 4.0 feet southeast of 3-foot hole, 1.0 foot northeast of reference post, in 6-inch tile 0.1 foot above ground.

Checked by: Clarence M. Reed Date: April 1947
 Described by: G. L. Withrow Date: 1947

DESCRIPTION OF BENCH MARK

Designation: TIDAL 1 (1919) State: North Carolina County: Onslow
 Nearest town: Hollyridge County: Onslow
 Distance and direction from nearest town: 5.25 miles south, thence 1.0 mile northeast
 Character of mark: A bench mark disk Stamping: 2
 Established by: U. S. G. & G. Survey

Detailed description: 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 1.0 mile northeast along the Sand Spit Road, thence 0.55 mile north along the sand on the southeast side of slough, about 0.15 mile northwest of the mouth of the New River Inlet, about 500.0 feet southwest across open sand area from the 1947 southwest bank of the Inlet channel (the sand area now covers old channel location and blocks the mouth of old slough), about 400.0 feet north of the north corner of the old blocked slough, near point where low bank along tree and bush covered area (the bank is northwest bank of old slough) begins curve to south and southwest, at the extreme northeast corner of the tree and bush covered area which was probably at one time an island, at former location of house known as Sea Island House (now destroyed) which was located on the north side of the large trees (do not confuse with the small wooded area which is located to the south and southwest and across a 75-foot wide marsh strip from the larger wooded area), about 100.0 feet north of point where the 75-foot wide marsh strip between the wooded areas begins, 12.0 feet southwest of the northeast edge of the wooded area and the low bank, 18.0 feet west southwest of the northernmost one of large live oak trees, 4.0 feet southeast of 3-foot hole, 1.0 foot northeast of reference post, in 6-inch tile 0.1 foot above ground.

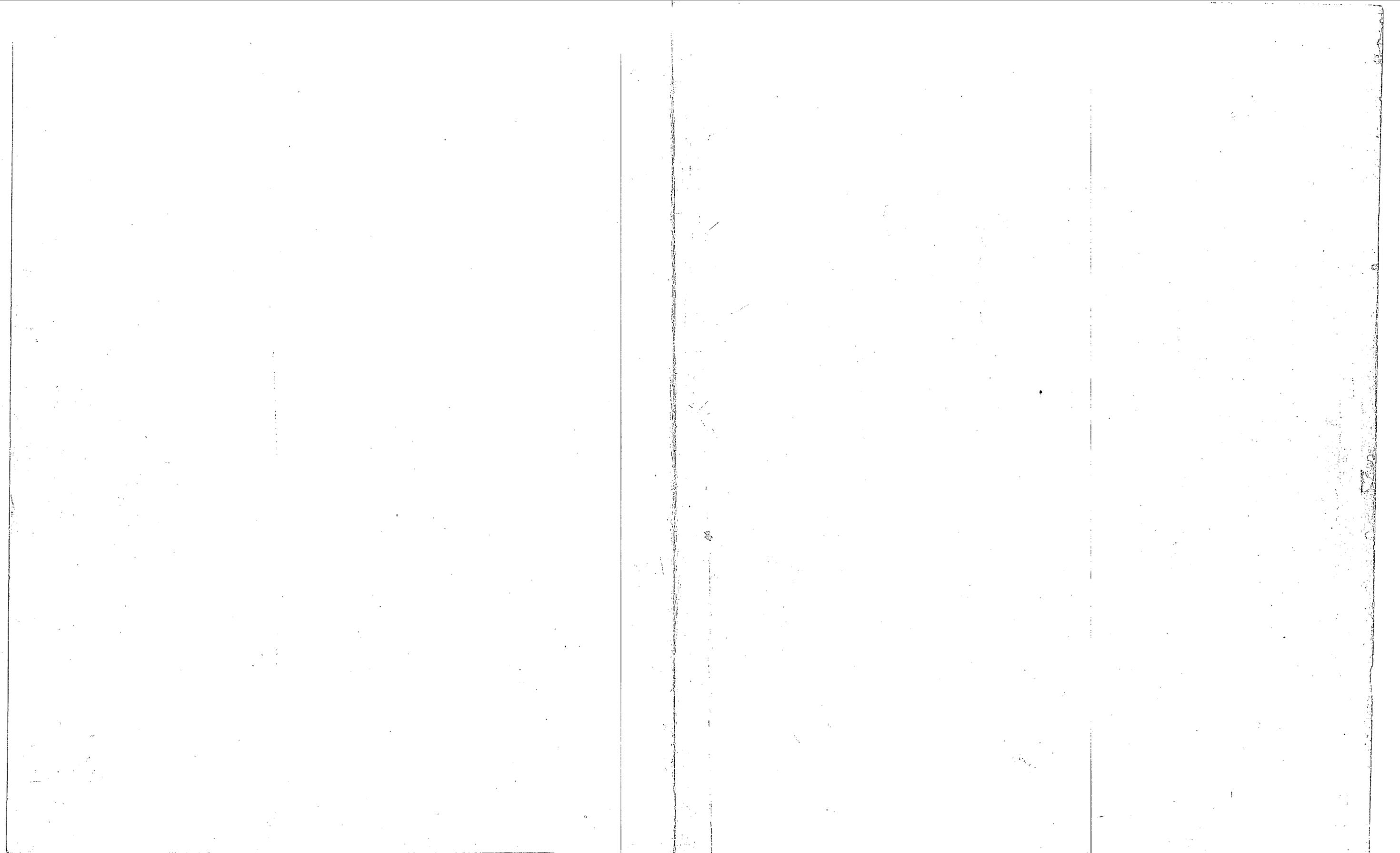
Checked by: Clarence M. Reed Date: April 1947
 Described by: G. L. Withrow Date: 1947

DESCRIPTION OF BENCH MARK

Designation: TIDAL 1 (1919) State: North Carolina County: Onslow
 Nearest town: Hollyridge County: Onslow
 Distance and direction from nearest town: 5.25 miles south, thence 1.0 mile northeast
 Character of mark: A bench mark disk Stamping: 1
 Established by: U. S. G. & G. Survey

Detailed description: 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 1.0 mile northeast along the Sand Spit Road, thence 0.55 mile north along the sand on the southeast side of slough, about 0.15 mile northwest of the mouth of the New River Inlet, about 500.0 feet southwest across open sand area from the 1947 southwest bank of the Inlet channel (the sand area now covers old channel location and blocks the mouth of old slough), about 400.0 feet north of the north corner of the old blocked slough, near point where low bank along tree and bush covered area (the bank is northwest bank of old slough) begins curve to south and southwest, at the extreme northeast corner of the tree and bush covered area which was probably at one time an island, at former location of house known as Sea Island House (now destroyed) which was located on the north side of the large trees (do not confuse with the small wooded area which is located to the south and southwest and across a 75-foot wide marsh strip from the larger wooded area), about 100.0 feet north of point where the 75-foot wide marsh strip between the wooded areas begins, 12.0 feet southwest of the northeast edge of the wooded area and the low bank, 18.0 feet west southwest of the northernmost one of large live oak trees, 4.0 feet southeast of 3-foot hole, 1.0 foot northeast of reference post, in 6-inch tile 0.1 foot above ground.

Checked by: Clarence M. Reed Date: April 1947
 Described by: G. L. Withrow Date: 1947



L-12114
Hollyridge to New Topical and New River Joints, No. Carolina
70-638
12-685
82

RECOVERY NOTE, BENCH MARK R
Designation U 27 State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town 2.1 miles northeast
Character of mark A bench mark disk Stamping U 27 1932
Established by U. S. C. & G. Survey
Present condition Good
Detailed description 2.1 miles northeast along the Atlantic Coast Line Railroad from the station at Hollyridge, 0.4 mile southwest of milepost CB 276-W 32, approximately 100.0 feet northeast of the beginning of the first curve northeast of Hollyridge and the point where the highway which has paralleled the railroad northeast from Hollyridge begins curve to east away from the railroad, 46.5 feet northeast of the northeast edge of U. S. Highway 17 (3-lane road), 23.8 feet southeast of the southeast rail, 6.0 feet northeast of the line of the telegraph poles, in the east angle of the crossing of the railroad and a dirt road, 1.5 feet southwest of a white reference post, set in the top of a concrete post projecting 1.5 feet above the ground.
Notes: Mark appears to be leaning to the northwest but close inspection shows that this illusion is caused by the shape of the form in which the concrete was poured.
Chief of party Clarence R. Reed Date Feb. 1947 4
Described by C. K. Withrow Checked by

DESCRIPTION OF BENCH MARK
Designation M 230 State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town At Hollyridge
Character of mark A bench mark disk Stamping M 230 1947
Established by U. S. C. & G. Survey
Detailed description At Hollyridge, at Camp Davis, 0.9 mile northeast along the Atlantic Coast Line Railroad from the station, thence 0.45 mile northeast along 27th Street, 366.0 feet southeast of the southeast edge of the most southeasterly concrete taxiway at the Camp Davis Army Airfield measured along the centerline of 27th Street, 23.0 feet northwest of the centerline of F Street, 19.0 feet southwest of the southwest face of France theatre building, set in the top of a 12-inch square concrete post which was formerly the anchor base for guy wire supporting large steel stack for the theatre furnace, 1.3 foot above the ground, 35.0 feet northeast of the centerline of 27th Street.
Chief of party Clarence R. Reed Date Feb. 1947 7
Described by C. K. Withrow Checked by

DESCRIPTION OF BENCH MARK
Designation V 229 State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town At Hollyridge
Character of mark A bench mark disk Stamping V 229 1937
Established by U. S. C. & G. Survey
Detailed description At Hollyridge, at Camp Davis, 97.5 feet north of the center of the concrete island for the brick guard house at the center of the main entrance to Camp Davis, in the south corner of the large mowed grounds in front of the administrative area, 34.0 feet northwest of the centerline of A Street, 67.0 feet northeast of the centerline of 20th Street, set in the top of a concrete post projecting 1.9 foot above the ground and surrounded by shrubbery.
Chief of party Clarence R. Reed Date Feb. 1947 12
Described by C. K. Withrow Checked by

RECOVERY NOTE, BENCH MARK R
Designation T 27 State North Carolina County Onslow
Nearest town Folkstone County Onslow
Distance and direction from nearest town At Folkstone Stamping T 27 1932
Character of mark A bench mark disk
Established by U. S. Coast & Geodetic Survey
Present condition Good
Detailed description At Folkstone, 40.1 feet north of the northeast corner of the Atlantic Coast Line Railroad station shed platform, 30.7 feet east of the east rail of the main track, 15.7 feet east of the east rail of siding track, 67.0 feet north of the extension to west across U. S. Highway 17 the centerline of a public dirt road leading east to west across U. S. Highway 17 the centerline of a public dirt road leading east, 31 rails north of the crossing of a private dirt road leading to a white frame dwelling, 1.5 foot east of white reference post, 1.2 foot southeast of a telegraph pole, set in the top of a concrete post projecting 0.3 foot above the ground.
Note: The disk is slightly tilted. The rod was held over the "H" marked in the metal between the letters "I" and "S" of the word "IMPRISONMENT".
Chief of party Clarence R. Reed Date Feb. 1947 1
Described by C. K. Withrow Checked by

DESCRIPTION OF BENCH MARK
Designation Z 229 State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town 1.2 mile northeast
Character of mark A bench mark disk Stamping Z 229 1947
Established by U. S. C. & G. Survey
Detailed description 1.2 mile northeast along the Atlantic Coast Line Railroad from the station at Hollyridge, 0.3 mile northeast of the 27th Street gate to Camp Davis, 0.35 mile southwest of milepost CB 275 - W 31, 30.1 feet southeast of the southeast rail, 36.5 feet northwest of the northeast edge of U. S. Highway 17 (1-lane road), approximately 80.0 feet southwest of the northeast end of low sand bank along the side of railroad drainage ditch, in line with the telegraph poles, 1.5 feet southwest of a white reference post, set in the top of a concrete post projecting 1.3 foot above the ground.
Chief of party Clarence R. Reed Date Feb. 1947 5
Described by C. K. Withrow Checked by

DESCRIPTION OF BENCH MARK
Designation N 230 State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town At Hollyridge
Character of mark A bench mark disk Stamping N 230 1947
Established by U. S. C. & G. Survey
Detailed description At Hollyridge, at Camp Davis, at the Camp Davis Army Airfield, 0.9 mile northeast along the Atlantic Coast Line Railroad from the station, thence 0.5 mile northeast along 27th Street, 56.0 feet southwest of the centerline of the street, 69.0 feet southeast of the southeast edge of the most southeasterly concrete taxiway, 17.5 feet northwest of the north corner of the hangar on top of which the control tower is located, 7.0 feet northeast of the northeast edge of the concrete apron in front of the hangar, 2.0 feet southwest of a white reference post, set in the top of a concrete post projecting 0.8 foot above the ground.
Chief of party Clarence R. Reed Date Feb. 1947 7
Described by C. K. Withrow Checked by

RECOVERY NOTE, BENCH MARK R
Designation V 27 State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town At Hollyridge
Character of mark A bench mark disk Stamping V 27 1932
Established by U. S. C. & G. Survey
Present condition Destroyed
Detailed description The concrete post in which the disk was set was knocked over during the construction of Camp Davis. The post was located and reset near the old post. For the description of the reset post see V 27 RESET 1947.
Chief of party Clarence R. Reed Date Feb. 1947 13
Described by C. K. Withrow Checked by

RECOVERY NOTE, BENCH MARK R
Designation E 148 State North Carolina County Onslow
Nearest town Folkstone County Onslow
Distance and direction from nearest town 0.6 mile south
Character of mark A bench mark disk Stamping
Established by U. S. C. & G. Survey
Present condition Destroyed
Detailed description U. S. Highway 17 has been rebuilt and the culvert in which the mark was set has been replaced with a concrete pipe culvert without headwalls. The disk was not recovered.
Chief of party C. R. Reed Date Feb. 1947 2
Described by C. K. Withrow Checked by

RECOVERY NOTE, BENCH MARK R
Designation F 148 State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town 1.0 mile northeast
Character of mark A bench mark disk Stamping F 148 1935
Established by U. S. C. & G. Survey
Present condition Destroyed
Detailed description The concrete post in which the disk was set was found broken and portion containing the disk was recovered. The mark is definitely destroyed.
Chief of party C. R. Reed Date Feb. 1947 6
Described by C. K. Withrow Checked by

DESCRIPTION OF BENCH MARK
Designation TM 1 State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town At Hollyridge
Character of mark surface of the runway Stamping None
Established by U. S. C. & G. Survey
Detailed description At Hollyridge, at Camp Davis Army Airfield, 0.4 mile southwest of the control tower, at the point where the asphalt runway meets the landing apron for the southwest end of the runway, the highest point of the runway.
Chief of party Clarence R. Reed Date March 1947 10
Described by C. K. Withrow Checked by

DESCRIPTION OF BENCH MARK
Designation V 27 RESET 1947 State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town At Hollyridge
Character of mark A bench mark disk Stamping V 27 1932
Established by U. S. C. & G. Survey
Detailed description The original post containing the disk was found pulled from ground and reset near the same location. At Hollyridge, 0.1 mile northeast of the Atlantic Coast Line Railroad station, 13 1/2 rails northeast of the center of the crossing of tar road leading to the main gate to Camp Davis, directly across the highway from the junction of a tar road leading east and U. S. Highway 17, 31.5 feet northwest of the northwest rail of the main track, 18.1 feet northwest of the northwest rail of a siding, 11.5 feet southeast of the Camp Davis fence line, 1.5 foot southwest of a white reference post, set in the top of a concrete post projecting 0.2 foot above the ground.
Note: The top of the northeast side of the post has been broken.
Chief of party Clarence R. Reed Date March 1947 14
Described by C. K. Withrow Checked by

DESCRIPTION OF BENCH MARK
Designation K 230 State North Carolina County Onslow
Nearest town Folkstone County Onslow
Distance and direction from nearest town 1.35 mile south
Character of mark A bench mark disk Stamping K 230 1947
Established by U. S. C. & G. Survey
Detailed description 1.35 mile south along the Atlantic Coast Line Railroad from the station at Folkstone, 2.75 miles northeast of the station at Hollyridge, 33 1/2 rails northeast of milepost CB 276 - W 32, 27.3 feet southeast of the southeast rail, 15.0 feet northeast of the first telegraph pole southwest of the northeast end of low sand ridge along the southeast side of small railroad cut and side ditch, 2.0 feet northwest of the line of the telegraph poles, 2.0 feet southwest of a white reference post, set in the top of a concrete post projecting 0.7 foot above the ground.
Chief of party Clarence R. Reed Date Feb. 1947 3
Described by C. K. Withrow Checked by

DESCRIPTION OF BENCH MARK
Designation L 230 State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town At Hollyridge
Character of mark A bench mark disk Stamping L 230 1947
Established by U. S. C. & G. Survey
Detailed description At Hollyridge, at Camp Davis, 0.9 mile northeast along the Atlantic Coast Line Railroad from the station, thence 0.15 mile northeast along 27th Street, at the second tall steel water tank southwest of the northeast boundary of Camp Davis, 131.5 feet southeast of the centerline of C Street, 111.0 feet northeast of the centerline of 26th Street, 69.0 feet southwest of the centerline of 27th Street, set in the top of the northeast corner of the concrete foundation supporting the east steel leg of the water tank, 1.0 foot above the ground.
Chief of party Clarence R. Reed Date Feb. 1947 7
Described by C. K. Withrow Checked by

DESCRIPTION OF BENCH MARK
Designation J 230 State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town At Hollyridge
Character of mark A bench mark disk Stamping J 230 1947
Established by U. S. Coast & Geodetic Survey
Detailed description At Hollyridge, 0.45 mile northeast along the Atlantic Coast Line Railroad from the station, 0.1 mile southwest of milepost CB 274 - W 30, 55.5 feet southeast of the southeast rail, 10.5 feet northwest of the northeast edge of U. S. Highway 17 (3-lane road), set in the top of northwest concrete headwall for large concrete box culvert under the highway, 1.0 foot southwest of the northeast end of the headwall, 0.3 foot below the level of the highway.
Chief of party Clarence R. Reed Date Feb. 1947 11
Described by C. K. Withrow Checked by

RECOVERY NOTE, BENCH MARK R
Designation G 143 State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town 0.9 mile southwest
Character of mark A bench mark disk Stamping
Established by U. S. C. & G. Survey
Present condition Destroyed
Detailed description U. S. Highway 17 has been rebuilt and the culvert in which the mark was set has been replaced with a concrete pipe culvert without headwalls. The disk was not recovered.
Chief of party Clarence R. Reed Date Feb. 1947 15
Described by C. K. Withrow Checked by

DESCRIPTION OF BENCH MARK

Designation W 229 State North Carolina County Onslow
 Nearest town Hollyridge
 Distance and direction from nearest town 0.95 mile south
 Character of mark A bench mark disk
 Established by U. S. C. & G. Survey
 Detailed description 0.95 mile south along the Sears Landing Road from the railroad station at Hollyridge, 0.2 mile south of the parking area for old CCC Camp, about 300.0 feet south of the junction with the Sears Landing Road of a tar road leading west to old CCC Camp garage area and a dirt road leading east through the woods, 46.0 feet east of the east edge of the Sears Landing Road, across the highway fills, near point where highway begins downgrade to south, 5.0 feet north of a 6-inch pine tree, 1.5 feet south of reference post, set in the top of a concrete post projecting 1.0 foot above the ground.

Chief of party Clarence R. Reed
 Described by C. K. Withrow Date Feb. 1947 /6
 Checked by

U. S. Coast and Geodetic Survey - Form 624 (Rev. 1946)

RECOVERY NOTE, BENCH MARK

Designation W 229 State North Carolina County Onslow
 Nearest town Hollyridge
 Distance and direction from nearest town 2 1/2 miles southwest
 Character of mark
 Established by U. S. C. & G. Survey
 Present condition Destroyed
 Detailed report U. S. Highway 17 has been rebuilt and widened and it is very likely that the mark was destroyed during the construction. Measurements place the location of the mark along the graded shoulder of the road and no trace of the post could be found.

Chief of Party Clarence R. Reed
 Reported by C. K. Withrow Date Feb. 1947 20
 Checked by

U. S. Coast and Geodetic Survey - Form 624 (Rev. 1946)

DESCRIPTION OF BENCH MARK

Designation Y 229 State North Carolina County Pender
 Nearest town Hollyridge
 Distance and direction from nearest town 3.3 miles south
 Character of mark A bench mark disk
 Established by U. S. C. & G. Survey
 Detailed description 3.3 miles south along the Sears Landing Road from the railroad station at Hollyridge, 183.5 feet southwest of the centerline of the Sears Landing Road measured from a point at the center of the crossing of a dirt road, 27.0 feet southwest of the centerline of the dirt road, 47.0 feet northeast of the centerline of dirt drive to the home of Tin Atkinson, 116.5 feet northwest of the north corner of the Atkinson home, 5.0 feet west of a 25-inch pine tree, set in the top of a concrete post projecting 1.0 foot above the ground.

Chief of party Clarence R. Reed
 Described by C. K. Withrow Date Feb. 1947 24
 Checked by

U. S. Coast and Geodetic Survey - Form 624 (Rev. 1946)

DESCRIPTION OF BENCH MARK

Designation SEARS RM 1 State North Carolina County Pender
 Nearest town Hollyridge
 Distance and direction from nearest town 4.75 miles south
 Character of mark A reference mark disk
 Established by U. S. Coast & Geodetic Survey
 Detailed description 4.75 miles south along the Sears Landing Road from the railroad station at Hollyridge, 184.5 feet northwest of the northwest end of the Sears Landing bridge, 28.9 feet southwest of the centerline of the Sears Landing road, 42.5 feet southeast of reference mark No. 2, 2.7 feet north of a telephone pole, 1.5 foot southeast of a white reference post, set in the top of concrete poured into an 8-inch tile projecting 0.1 foot above the ground.

Chief of party Clarence R. Reed
 Described by C. K. Withrow Date Feb. 1947 28
 Checked by

U. S. Coast and Geodetic Survey - Form 624 (Rev. 1946)

RECOVERY NOTE, BENCH MARK

Designation H. M. 1 FENDER State North Carolina County Onslow
 Nearest town Hollyridge
 Distance and direction from nearest town 1.9 miles southwest
 Character of mark
 Established by U. S. C. & G. Survey
 Present condition Destroyed
 Detailed report U. S. Highway 17 has been rebuilt and the culvert in which the mark was located has been replaced. A new mark was set at the time the old culvert was replaced; however the present line of levels did not follow the railroad to this point so the new azimuth mark has no elevation established for it.

Chief of Party C. R. Reed
 Reported by C. K. Withrow Date Feb. 1947 /7
 Checked by

U. S. Coast and Geodetic Survey - Form 624 (Rev. 1946)

REPORT ON CONDITION OF BENCH MARK

Designation H 148 State North Carolina County Pender
 Nearest town Edgecombe
 Distance and direction from nearest town 0.3 mile northeast
 Character of mark
 Established by U. S. C. & G. Survey
 Present condition Destroyed
 Detailed report U. S. Highway 17 has been rebuilt and the concrete culvert in which the mark was set has been replaced with a concrete pipe culvert without headwalls. The disk was not recovered.

Chief of Party Clarence R. Reed
 Reported by C. K. Withrow Date Feb. 1947 21
 Checked by

U. S. Coast and Geodetic Survey - Form 624 (Rev. 1946)

DESCRIPTION OF BENCH MARK

Designation B 230 State North Carolina County Pender
 Nearest town Hollyridge
 Distance and direction from nearest town 3.75 miles south
 Character of mark A bench mark disk
 Established by U. S. C. & G. Survey
 Detailed description 3.75 mile south along the Sears Landing Road from the railroad station at Hollyridge, at the south corner of woods area, near the west corner of area from which dirt was removed to construct highway fill, 46.0 feet northeast of the centerline of the road, 47.5 feet northwest of the centerline of dirt road leading northeast to farm, 8.0 feet northwest of borrow pit bank, 2.0 feet northwest of white reference post, set in the top of a concrete post projecting 1.0 foot above the ground.

Chief of party Clarence R. Reed
 Described by C. K. Withrow Date Feb. 1947 25
 Checked by

U. S. Coast and Geodetic Survey - Form 624 (Rev. 1946)

DESCRIPTION OF BENCH MARK

Designation C 230 State North Carolina County Pender
 Nearest town Hollyridge
 Distance and direction from nearest town 5.25 miles south, thence 0.75 mile southwest
 Character of mark A bench mark disk
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 0.75 mile southwest along Sand Spit Road, on the Sand Spit between How Tossall Inlet and How River Inlet, 0.3 mile southwest of milepost 6, 0.5 mile northeast of the point where the road crosses under the communication lines, approximately 500.0 feet northwest of the main ridge of dunes, about 200.0 feet southeast of the edge of the marsh, near the first curve in the road southwest of the junction of the Sears Landing Road, on the north slope of a low east-west sand dune ridge, about 30.0 feet north of the top of the dune ridge, 70.5 feet southeast of the centerline of the road, about 5.0 feet above the level of the road, 2.0 feet southeast of a white reference post, set in the top of a concrete post projecting 1.3 foot above the ground.

Chief of party Clarence R. Reed
 Described by C. K. Withrow Date Feb. 1947 29
 Checked by

U. S. Coast and Geodetic Survey - Form 624 (Rev. 1946)

RECOVERY NOTE, BENCH MARK

Designation FENDER RM 2 State North Carolina County Pender
 Nearest town Hollyridge
 Distance and direction from nearest town 2.0 miles southwest
 Character of mark A reference mark disk
 Established by U. S. C. & G. Survey
 Present condition Good
 Detailed report 2.0 miles southwest along the Atlantic Coast Line Railroad from the station at Hollyridge, 0.4 mile northeast of milepost CB 271 - W 27, 148.7 feet east of the triangulation station, 86.5 feet southeast of the southeast edge of U. S. Highway 17 measured from a point 265.0 feet southeast of the junction of dirt road leading southeast, 128.0 feet southwest of the south corner of main block store building, 12.0 feet south of the centerline of little-used connecting road leading to main dirt road, 1.5 feet east of reference post, set in the top of a concrete post projecting 0.3 foot above the ground.

Chief of Party Clarence R. Reed
 Reported by C. K. Withrow Date Feb. 1947 18
 Checked by

U. S. Coast and Geodetic Survey - Form 624 (Rev. 1946)

RECOVERY NOTE, BENCH MARK

Designation H 27 State North Carolina County Pender
 Nearest town Edgecombe
 Distance and direction from nearest town 0.2 mile southwest
 Character of mark
 Established by U. S. C. & G. Survey
 Present condition Destroyed
 Detailed report U. S. Highway 17 has been rebuilt and the concrete culvert in which the mark was set has been replaced with a concrete pipe culvert without headwalls. The disk was not recovered.

Chief of Party Clarence R. Reed
 Reported by C. K. Withrow Date Feb. 1947 22
 Checked by

U. S. Coast and Geodetic Survey - Form 624 (Rev. 1946)

DESCRIPTION OF BENCH MARK

Designation 3.33 (Unknown) State North Carolina County Pender
 Nearest town Hollyridge
 Distance and direction from nearest town 4.6 miles south
 Character of mark A railroad spike
 Established by Probably Army or contractor in construction of Camp Davis
 Detailed description 4.6 miles south along the Sears Landing Road from the railroad station at Hollyridge, 0.2 mile northwest of the Sears Landing bridge, at the southeast edge of the first woods area northwest of the bridge, 108.0 feet southeast of the centerline of the road, driven into the southwest side of a 20-inch live oak tree, 1.0 foot above the ground.

Chief of party Clarence R. Reed
 Described by C. K. Withrow Date Feb. 1947 26
 Checked by

U. S. Coast and Geodetic Survey - Form 624 (Rev. 1946)

DESCRIPTION OF BENCH MARK

Designation TOWER FOUR RM 1 State North Carolina County Pender
 Nearest town Hollyridge
 Distance and direction from nearest town 5.25 miles south, thence 1.55 miles southwest
 Character of mark A reference mark disk
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 1.55 miles southwest along the Sand Spit Road, on the sand spit between How Tossall Inlet and How River Inlet, 0.1 mile southwest of milepost 5, just inside the main ridge of sand dunes, at the U. S. Navy Test Range Tower No. 4, 78.5 feet southeast of the centerline of the road, 7.6 feet north of the south corner of the concrete apron around the base of the tower, 1.4 foot south of the south corner of the concrete tower, set in the concrete apron.

Chief of party Clarence R. Reed
 Described by C. K. Withrow Date Feb. 1947 30
 Checked by

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RECOVERY NOTE, BENCH MARK

Designation FENDER 1932 State North Carolina County Pender
 Nearest town Hollyridge
 Distance and direction from nearest town 2.0 miles southwest
 Character of mark A triangulation station disk
 Established by U. S. Coast & Geodetic Survey
 Present condition Appears undisturbed but close to the road
 Detailed report The highway has been widened to a three lane road and the mark is now near the foot of the shoulder of the road. The mark appears to be undisturbed.
 New description: 2.0 miles southwest along the Atlantic Coast Line Railroad from the station at Hollyridge, 0.4 mile northeast of milepost CB 271 - W 27 and a curve in the highway and the railroad, 0.3 mile southwest of the Pender-Onslow county line, 9 rails northeast of the center of the crossing of a tar road leading to a Camp Davis firing range, 94 rails southwest of the extension to northwest of the centerline of a public dirt road leading southeast, in line with the extension across highway of little-used connecting road leading to the main dirt road, 49.5 feet southeast of the southeast rail, 17.0 feet northwest of the northwest edge of U. S. Highway 17, 1.5 feet southeast of a white reference post, set in the top of a concrete post projecting 0.7 foot above the ground.

Note: Levels were not extended to this mark in 1947.

Chief of Party Clarence R. Reed
 Reported by C. K. Withrow Date Feb. 1947 19
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DESCRIPTION OF BENCH MARK

Designation X 229 State North Carolina County Pender
 Nearest town Hollyridge
 Distance and direction from nearest town 2.35 miles south
 Character of mark A bench mark disk
 Established by U. S. C. & G. Survey
 Detailed description 2.35 miles south along the Sears Landing Road from the railroad station at Hollyridge, 0.1 mile south of the crossing of a dirt road leading west from the east side, 24.5 feet east of the centerline of the main road for short distance on the main road for short distance, 140.0 feet east of the centerline of the main road, 60.0 feet south of the centerline of a dirt road leading east, in a grove of several large pine trees, 2.0 feet south of a white reference post, set in the top of a concrete post projecting 1.0 foot above the ground.

Chief of party Clarence R. Reed
 Described by C. K. Withrow Date Feb. 1947 23
 Checked by

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DESCRIPTION OF BENCH MARK

Designation SEARS RM 2 State North Carolina County Pender
 Nearest town Hollyridge
 Distance and direction from nearest town 4.75 miles south
 Character of mark A reference mark disk
 Established by U. S. C. & G. Survey
 Detailed description 4.75 miles south along the Sears Landing Road from the railroad station at Hollyridge, 223.5 feet northwest of the northwest end of the Sears Landing bridge, 47.0 feet southwest of the centerline of the Sears Landing Road, 47.5 feet northwest of reference mark No. 1, 15.0 feet southwest of the line of the telephone poles, 1.5 foot southeast of a white reference post, set in concrete poured in an 8-inch tile projecting 0.1 foot above the ground.

Chief of party Clarence R. Reed
 Described by C. K. Withrow Date Feb. 1947 27
 Checked by

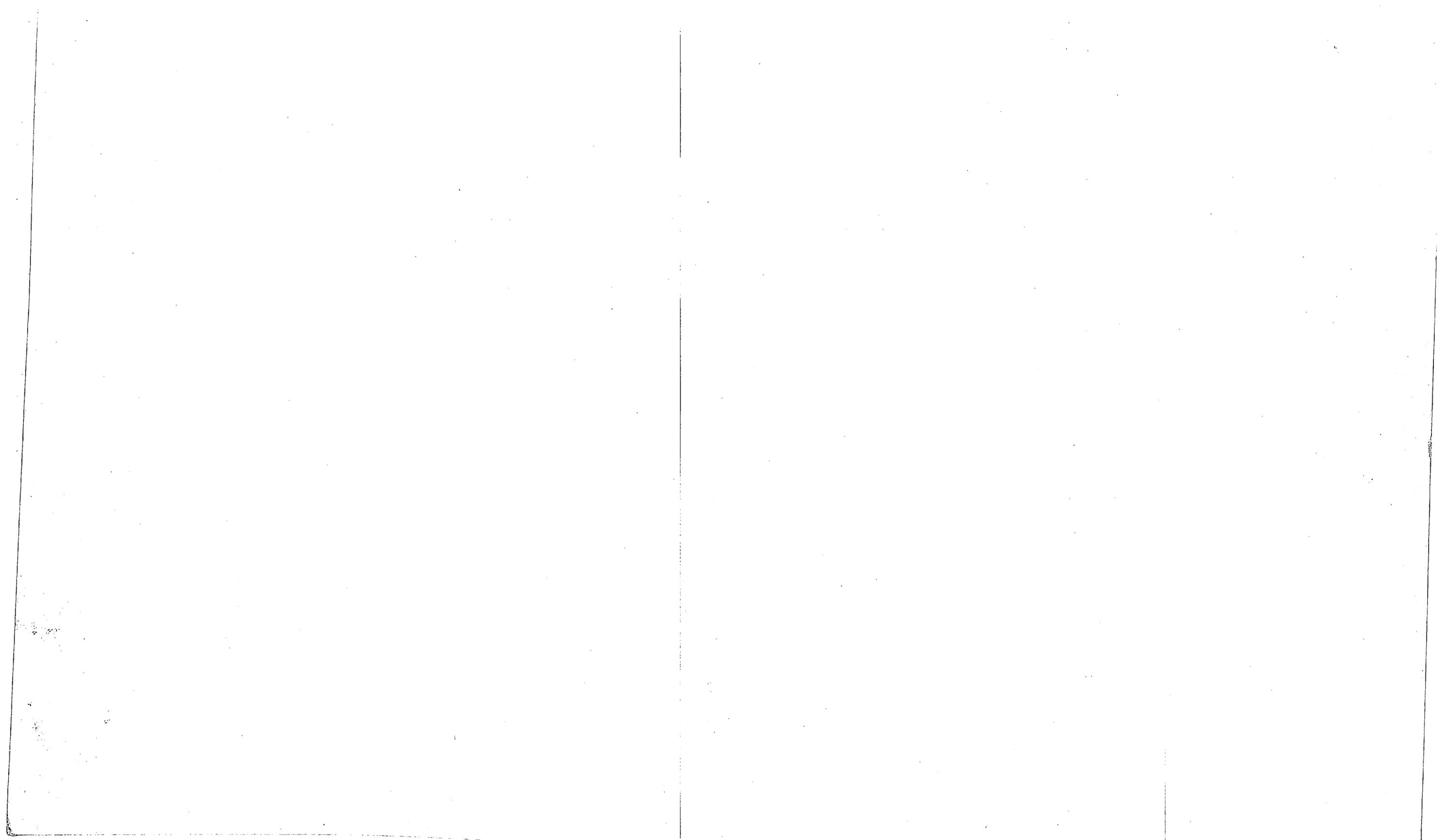
U. S. Coast and Geodetic Survey - Form 624 (Rev. 1946)

DESCRIPTION OF BENCH MARK

Designation TOWER FOUR 1947 State North Carolina County Pender
 Nearest town Hollyridge
 Distance and direction from nearest town 5.25 miles south, thence 1.55 miles southwest
 Character of mark A triangulation station disk
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 1.55 miles southwest along the Sand Spit Road, at the U. S. Navy Test Range Tower No. 4, set in the top of the concrete deck on top of the concrete tower, 3.0 feet southeast of the northwest edge of the deck, 3.0 foot southwest of the northeast edge of the deck.

Chief of party Clarence R. Reed
 Described by C. K. Withrow Date Feb. 1947 31
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DESCRIPTION OF BENCH MARK

Designation **D 230** State North Carolina County Pender
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 2.45 miles southwest
 Character of mark A bench mark disk Stamping D 230 1947
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 2.45 miles southwest along the Sand Spit Road, 29.5 feet south of milepost A, approximately 250.0 feet southwest of high peak in the sand dune ridge and a tall iron flagpole, about midway between the main dune ridge and the road, 43.0 feet southeast of the centerline of the road, 2.5 feet southwest of a white reference post, set in the top of a concrete post projecting 1.2 feet above the ground.

Chief of party Clarence R. Reed Date Feb. 1947 32
 Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK

Designation **TOWER TWO RM 1** State North Carolina County Pender
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 5.0 miles southwest
 Character of mark A reference mark disk Stamping TOWER TWO RM
 Established by U. S. C. & G. Survey NO 1 1947
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 5.0 miles southwest along the Sand Spit Road, 0.15 mile northwest of the Sand Spit Road, at U. S. Navy Test Range Tower No. 2, in the top of the concrete apron around the concrete tower, 7.7 feet north of the south corner of the apron, 1.1 foot south of the south corner of the concrete tower.

Chief of party Clarence R. Reed Date Feb. 1947 30
 Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK

Designation **RANGE ONE 1947** State North Carolina County Pender
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 6.15 miles southwest
 Character of mark A traverse station disk Stamping RANGE ONE 1947
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 6.15 miles southwest along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.1 mile northwest of the Sand Spit Road, in line with the extension to northwest of the centerline of the south bank of the Banks Channel, 10.5 feet south of the east leg of the frame range tower, 9.0 feet east of the south leg of the tower, 1.3 feet northeast of a white reference post, set in the top of a concrete post flush with the ground.

Chief of party Clarence R. Reed Date Feb. 1947 4
 Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK

Designation **MIN** State North Carolina County Pender
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 6.3 miles southwest
 Character of mark A 3-inch iron pin Stamping None
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 6.3 miles southwest along the Sand Spit Road, at the U. S. Navy Test Range launching platform, on the sand spit between New Topsail Inlet and New River Inlet, 35.2 feet southeast of the northeast edge of the platform, 24.8 feet southeast of the northwest edge of the platform, set in and projecting 0.65 foot above the concrete platform.

Note: Rod was held on the center of the top of the pin.

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 Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK

Designation **TOWER THREE RM 1** State North Carolina County Pender
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 3.6 miles southwest
 Character of mark A reference mark disk Stamping TOWER THREE RM
 Established by U. S. C. & G. Survey NO 1 1947
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 3.6 miles southwest along the Sand Spit Road, along the main ridge of dunes, 0.15 mile southwest of milepost 3, at the U. S. Navy Test Range Tower No. 3, 63.0 feet southeast of the centerline of the road, in the top of the concrete apron around the base of the concrete tower, 7.6 feet north of the south corner of the apron, 1.4 foot south of the south corner of the tower.

Chief of party Clarence R. Reed Date Feb. 1947 23
 Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK

Designation **TOWER TWO 1947** State North Carolina County Pender
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 5.0 miles southwest
 Character of mark A triangulation station disk Stamping TOWER TWO 1947
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 5.0 miles southwest along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.15 mile northwest of the Sand Spit Road, at U. S. Navy Test Range Tower No. 2, in the top of the concrete deck on the top of the concrete tower, 1.1 feet southwest of the northeast edge of the deck, 3.2 feet southeast of the northwest edge of the deck, 2.6 feet northeast of the northeast edge of the low concrete wall around the head of the stairway.

Chief of party Clarence R. Reed Date Feb. 1947 27
 Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK

Designation **ZERO 1947** State North Carolina County Pender
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 6.3 miles southwest
 Character of mark A triangulation station disk Stamping ZERO 1947
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 6.3 miles southwest along the Sand Spit Road, on the Sand Spit between New Topsail Inlet and New River Inlet, approximately 1.0 mile northeast of New Topsail Inlet, at the U. S. Navy Test Range launching platform, 0.05 mile southeast of the Sand Spit Road, 46.6 feet northwest of the south corner of the concrete platform, 61.0 feet southeast of the east corner of the platform, 20.1 feet southwest of the southeast edge of the platform, 2.0 feet northwest of a white painted reference post, set in the top of a concrete post, 0.3 foot underground.

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 Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK

Designation **TOWER ONE RM 1** State North Carolina County Pender
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 6.6 miles southwest
 Character of mark A reference mark disk Stamping TOWER ONE RM
 Established by U. S. C. & G. Survey NO 1 1947
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 6.6 miles southwest along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, at the U. S. Navy Test Range Tower No. 1, 0.3 mile southwest of the launching platform, about 100.0 feet southeast of the highwater line of the Banks Channel, in the top of the concrete apron around the tower, 4.6 feet northwest of the southeast edge of the platform, 1.1 feet east of the east corner of the concrete tower.

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DESCRIPTION OF BENCH MARK

Designation **TOWER THREE 1947** State North Carolina County Pender
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 3.6 miles southwest
 Character of mark A triangulation station disk Stamping TOWER THREE 1947
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 3.6 miles southwest along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, at the U. S. Navy Test Range Tower No. 3, in the top of the concrete deck on top of the tower, 3.0 feet southeast of the northwest edge of the tower, 3.0 feet southeast of the northeast edge of the tower.

Chief of party Clarence R. Reed Date Feb. 1947 2
 Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK

Designation **CONTROL 1947** State North Carolina County Pender
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 6.3 miles southwest
 Character of mark A traverse station disk Stamping CONTROL 1947
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 6.3 miles southwest along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, approximately 1.0 mile northeast of the New Topsail Inlet, 30.5 feet southeast of the centerline of road leading from the launching platform to warehouse area, 18.0 feet northwest of the centerline of the Sand Spit Road, 9.2 feet east of the south corner of the concrete control tower for the U. S. Navy Test Range, 9.4 feet south of the east corner of the tower, 3.6 feet southeast of the southeast face of the tower, set in the top of a concrete post flush with the ground.

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 Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK

Designation **LINE MARK ONE** State North Carolina County Pender
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 6.3 miles southwest
 Character of mark A reference mark disk Stamping None
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 6.3 miles southwest along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, at the U. S. Navy Test Range launching platform, 30.4 feet northwest of the southeast edge of the platform, 29.9 feet southeast of the northeast edge of the platform, set in the top of the concrete platform.

Chief of party Clarence R. Reed Date March 1947 32
 Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK

Designation **TOWER ONE 1947** State North Carolina County Pender
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south and 6.6 miles southwest
 Character of mark A triangulation station disk Stamping TOWER ONE 1947
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 6.6 miles southwest along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, at the U. S. Navy Test Range Tower No. 1, 0.3 mile southwest of the launching platform, in the top of the concrete deck on the top of the concrete tower, 2.9 feet northeast of the southeast edge of the platform, 2.8 feet southeast of the northwest edge of the platform.

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 Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK

Designation **A 230** State North Carolina County Pender
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 4.5 miles southwest
 Character of mark A bench mark disk Stamping A 230 1947
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 4.5 miles southwest along the Sand Spit Road, on the junction of road leading to U. S. Navy Test Range Tower No. 2, 0.15 mile south of milepost 2, at a point where a view is obtained of the marsh and inland waterway to the northwest through a break in the sand ridges and the live oak trees, about 35.0 feet northwest of the top of the main ridge of sand dunes, about 10.0 feet northwest of the base of the dune ridge, 32.0 feet southeast of the centerline of the road, 7.0 feet northeast of my wire pole for telephone pole, 2.9 feet southwest of a white painted reference post, set in the top of a concrete post projecting 1.3 feet above the ground.

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 Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK

Designation **GAZEA 1947** State North Carolina County Pender
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 6.15 miles southwest
 Character of mark A traverse station disk Stamping GAZEA 1947
 Established by U. S. Coast & Geodetic Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 6.15 miles southwest along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.15 mile northeast of the Sand Spit Road, 49.0 feet northeast of the centerline of a road leading northwest to warehouse and frame range tower, 5.6 feet southeast of power pole, 1.5 feet northeast of a white painted reference post, set in the top of a concrete post projecting 0.1 foot above the ground.

Chief of party Clarence R. Reed Date Feb. 1947 7
 Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK

Designation **LINE MARK TWO** State North Carolina County Pender
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south, thence 6.3 miles southwest
 Character of mark A reference mark disk Stamping None
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 6.3 miles southwest along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 1.0 mile northeast of the New Topsail Inlet, southeast of the Sand Spit Road, at the U. S. Navy Test Range launching platform, 15.4 feet northwest of the northeast edge of the platform, 4.3 feet southeast of the northeast edge of the platform, set in the top of the concrete platform.

Chief of party Clarence R. Reed Date Feb. 1947 21
 Described by C. K. Withrow Checked by

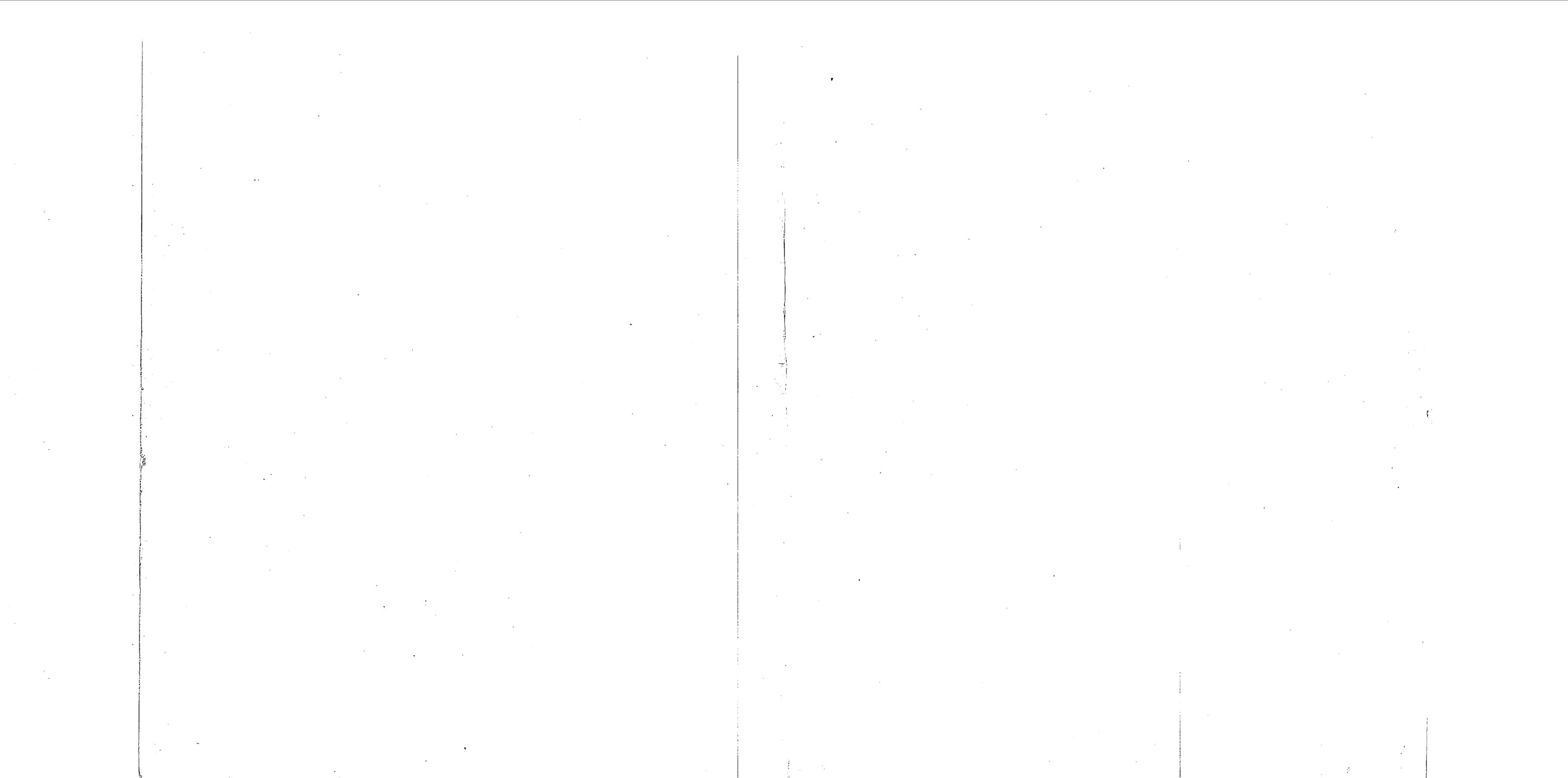
U. S. Coast and Geodetic Survey—Form 628 (Rev. 1946)

DESCRIPTION OF BENCH MARK

Designation **CENTRAL 1947** State North Carolina County Pender
 Nearest town Hollyridge County Onslow
 Distance and direction from nearest town 5.25 miles south
 Character of mark A traverse station disk Stamping CENTRAL 1947
 Established by U. S. C. & G. Survey
 Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, on the Sand Spit between New Topsail Inlet and New River Inlet, at the junction of the Sand Spit Road and the Sears Landing Road, 90.5 feet southeast of the centerline of the Sand Spit Road measured from a point 38.0 feet northeast of the center of the road junction, 10.6 feet east of the south leg of frame range tower, 10.3 feet south of the east leg of the range tower, 2.0 feet southwest of a white reference post, set in the top of a concrete post projecting 0.1 foot above the ground.

Chief of party Clarence R. Reed Date Feb. 1947 7
 Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK
Designation **TOWER FIVE RM 1** State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town 5.25 miles south, thence 0.4 mile northeast
Character of mark A reference mark disk
Established by U. S. C. & G. Survey Stamping **TOWER FIVE RM 1**
Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 0.4 mile northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.05 mile southeast of the sand spit, at U. S. Navy Test Range Tower No. 5, set in the top of the concrete deck on the base of the tower, 1.4 feet south of the south corner of the concrete tower, 7.6 feet north of the south corner of the concrete apron.

Chief of party Clarence R. Reed Date March 1947 48
Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK
Designation **TOWER FIVE** State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town 5.25 miles south, thence 3.1 miles northeast
Character of mark A triangulation station disk
Established by U. S. C. & G. Survey Stamping **TOWER FIVE 1947**
Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 0.4 mile northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.3 mile southeast of the sand spit, at U. S. Navy Test Range Tower No. 5, set in the top of the concrete deck on the top of the concrete tower, 2.9 feet southeast of the northeast edge of the deck, 2.9 feet southeast of the northeast edge of the deck.

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Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK
Designation **HIGH** State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town 5.25 miles south, thence 1.6 miles northeast
Character of mark A triangulation station disk
Established by U. S. C. & G. Survey Stamping **HIGH 1933 1947**
Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 1.6 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.3 mile southeast of the sand spit, at U. S. Navy Test Range Tower No. 6, set in the top of the concrete tower, 1.5 feet southeast of the northeast end of cut where the road passes through the first northwest-southeast dune ridge southwest of curve in the main road, 1.5 feet southeast of a white painted reference post, set in the top of a concrete post projecting 0.4 feet above the ground.

Chief of party Clarence R. Reed Date March 1947 50
Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK
Designation **HIGH RM** State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town 5.25 miles south, thence 1.6 miles northeast
Character of mark A reference mark disk
Established by U. S. C. & G. Survey Stamping **HIGH RM 1933**
Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 1.6 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.3 mile southeast of the sand spit, at U. S. Navy Test Range Tower No. 6, set in the top of the concrete tower, 1.5 feet southeast of the northeast end of cut where the road passes through the first northwest-southeast dune ridge southwest of curve in the main road, 60.0 feet northeast of the triangulation station, 1.3 feet southeast of a white painted reference post, set in the top of a concrete post flush with the ground.

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Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK
Designation **E 230** State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town 5.25 miles south, thence 2.4 miles northeast
Character of mark A bench mark disk
Established by U. S. C. & G. Survey Stamping **E 230 1947**
Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 2.4 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.7 mile southeast of the northeast of point where the road makes a turn to west away from the main dune ridge, about 125.0 feet west of the top of lone tall sand dune peak in the main dune ridge, the top of the main dune ridge, 44.5 feet southeast of the centerline of the road measured from a point 147.0 feet southeast of milepost 9, 2.5 feet southeast of white painted reference post, set in the top of a concrete post projecting 1.3 feet above the ground and about 5.0 feet above the level of the road.

Chief of party Clarence R. Reed Date March 1947 52
Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK
Designation **BAIRS RM** State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town 5.25 miles south, thence 3.1 miles northeast
Character of mark A reference mark disk
Established by U. S. C. & G. Survey Stamping **BAIRS 1933**
Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 3.1 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.3 mile southeast of U. S. Navy Test Range Tower No. 6 and milepost 10, at point where the road cuts through a 30-foot tall northwest-southeast sand dune ridge, on the top of the dune ridge which is the tallest and most prominent dune in the vicinity, 118.0 feet northwest of the centerline of the road and the center of the cut, 31.5 feet northwest of the triangulation station, 1.5 feet northwest of a white painted reference post, in the top of concrete poured into an 8-inch tile which projects 1.0 foot above the ground.

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Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK
Designation **BAINS** State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town 5.25 miles south, thence 3.1 miles northeast
Character of mark A triangulation station disk
Established by U. S. C. & G. Survey Stamping **BAINS 1933 1947**
Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 3.1 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.3 mile southeast of U. S. Navy Test Range Tower No. 6 and milepost 10, on the peak of the top of the dune peak in the vicinity, approximately 100.0 feet southeast of a point where the road-south dirt road and telephone line leading north across the marsh join the dirt road and the northwest end of the northwest-southeast dune ridge, 81.5 feet northwest of the centerline of the road measured from a point 147.0 feet southeast of milepost 9, 1.5 feet northwest of a white painted reference post, in the top of concrete poured into an 8-inch tile which projects 0.6 feet above the ground.

Chief of party Clarence R. Reed Date March 1947 54
Described by C. K. Withrow Checked by

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DESCRIPTION OF BENCH MARK
Designation **TOWER SIX RM 1** State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town 5.25 miles south, thence 3.4 miles northeast
Character of mark A reference mark disk
Established by U. S. C. & G. Survey Stamping **TOWER SIX RM 1**
Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 3.4 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.9 mile southeast of milepost 10, at U. S. Navy Test Range Tower No. 6, set in the top of the concrete tower, 1.3 feet south of the south corner of the concrete tower, 7.7 feet north of the south corner of the concrete apron.

Chief of party Clarence R. Reed Date March 1947 55
Described by C. K. Withrow Checked by

U. S. Coast and Geodetic Survey - Form 628 (Rev. 1945)

DESCRIPTION OF BENCH MARK
Designation **TOWER SIX 1947** State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town 5.25 miles south, thence 3.4 miles northeast
Character of mark A triangulation station disk
Established by U. S. C. & G. Survey Stamping **TOWER SIX 1947**
Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 3.4 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.9 mile southeast of milepost 10, at U. S. Navy Test Range Tower No. 6, set in the top of the concrete deck on the concrete tower, 7.8 feet southeast of the northeast edge of the concrete deck, 2.9 feet southeast of the northwest edge of the deck.

Chief of party Clarence R. Reed Date March 1947 56
Described by C. K. Withrow Checked by

U. S. Coast and Geodetic Survey - Form 628 (Rev. 1945)

DESCRIPTION OF BENCH MARK
Designation **FED RM 1** State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town 5.25 miles south, thence 4.45 miles northeast
Character of mark A reference mark disk
Established by U. S. C. & G. Survey Stamping **FED RM 1 1933**
Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 4.45 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, about 0.1 mile southeast of a 30-foot tall northwest-southeast sand dune ridge, on the top of the dune ridge which is the tallest and most prominent dune in the vicinity, 118.0 feet northwest of the centerline of the road and the center of the cut, 31.5 feet northwest of the triangulation station, 1.5 feet northwest of a white painted reference post, set in the top of concrete poured into an 8-inch tile which projects 1.0 foot above the ground.

Chief of party Clarence R. Reed Date March 1947 57
Described by C. K. Withrow Checked by

U. S. Coast and Geodetic Survey - Form 628 (Rev. 1945)

DESCRIPTION OF BENCH MARK
Designation **FED 1933** State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town 5.25 miles south, thence 4.45 miles northeast
Character of mark A triangulation station disk
Established by U. S. C. & G. Survey Stamping **FED 1933**
Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 4.45 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 160.0 feet southeast of the centerline of the road measured from a point 113.0 feet northwest of milepost 11, along the sharp top of the main sand dune ridge, 1.5 feet southeast of a white painted reference post, set in concrete poured into an 8-inch tile which projects 1.0 foot above the ground.

Chief of party Clarence R. Reed Date March 1947 58
Described by C. K. Withrow Checked by

U. S. Coast and Geodetic Survey - Form 628 (Rev. 1945)

DESCRIPTION OF BENCH MARK
Designation **F 230** State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town 5.25 miles south, thence 5.5 miles northeast
Character of mark A bench mark disk
Established by U. S. C. & G. Survey Stamping **F 230 1947**
Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 5.5 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 9.0 feet east of milepost 12, at the foot of the main ridge of the communication ridge measured from a point 25.0 feet southeast of the 5th pole northeast of the southeast end of lone straight section of pole, on the top of lone straight section of pole, 46.0 feet northwest of the top of the main ridge of the dune, 2.0 feet southeast of a white painted reference post, set in the top of a concrete post projecting 1.2 feet above the ground.

Chief of party Clarence R. Reed Date March 1947 59
Described by C. K. Withrow Checked by

U. S. Coast and Geodetic Survey - Form 628 (Rev. 1945)

DESCRIPTION OF BENCH MARK
Designation **TOWER SEVEN RM 1** State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town 5.25 miles south, thence 6.5 miles northeast
Character of mark A reference mark disk
Established by U. S. C. & G. Survey Stamping **TOWER SEVEN RM 1**
Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 6.5 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.95 mile northeast of milepost 13, set in the top of the concrete apron which surrounds U. S. Navy Test Range Tower No. 7, 1.3 feet south of the south corner of the concrete tower, 7.7 feet north of the south corner of the concrete apron.

Chief of party Clarence R. Reed Date March 1947 60
Described by C. K. Withrow Checked by

U. S. Coast and Geodetic Survey - Form 628 (Rev. 1945)

DESCRIPTION OF BENCH MARK
Designation **TOWER SEVEN 1947** State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town 5.25 miles south, thence 6.5 miles northeast
Character of mark A triangulation station disk
Established by U. S. C. & G. Survey Stamping **TOWER SEVEN 1947**
Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 6.5 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.95 mile northeast of milepost 13, set in the top of the concrete deck on the top of U. S. Navy Test Range Tower No. 7, 2.9 feet southeast of the northeast edge of the concrete deck, 2.9 feet southeast of the northeast edge of the deck.

Chief of party Clarence R. Reed Date March 1947 61
Described by C. K. Withrow Checked by

U. S. Coast and Geodetic Survey - Form 628 (Rev. 1945)

DESCRIPTION OF BENCH MARK
Designation **TWO 1947** State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town 5.25 miles south, thence 6.8 miles northeast
Character of mark A traverse station disk
Established by U. S. C. & G. Survey Stamping **TWO 1947**
Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 6.8 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 0.35 mile northeast of U. S. Navy Test Range Tower No. 7 and milepost 10, 13, about 200.0 feet southeast of the beginning of the first curve in the road northeast of tower 7, about 200.0 feet northwest of the main ridge of the dune, 131.0 feet northwest of the centerline of the road measured from a point at the northeast end of road cut through an 8-foot high sand ridge, 75.5 feet west northwest of the first communication line pole northwest of the northeast end of lone straight section of communication line pole, 10.0 feet east of the south leg of fence range tower, 10.5 feet south of the east leg of the tower, 2.0 feet southeast of a white painted reference post, set in the top of a concrete post flush with the ground.

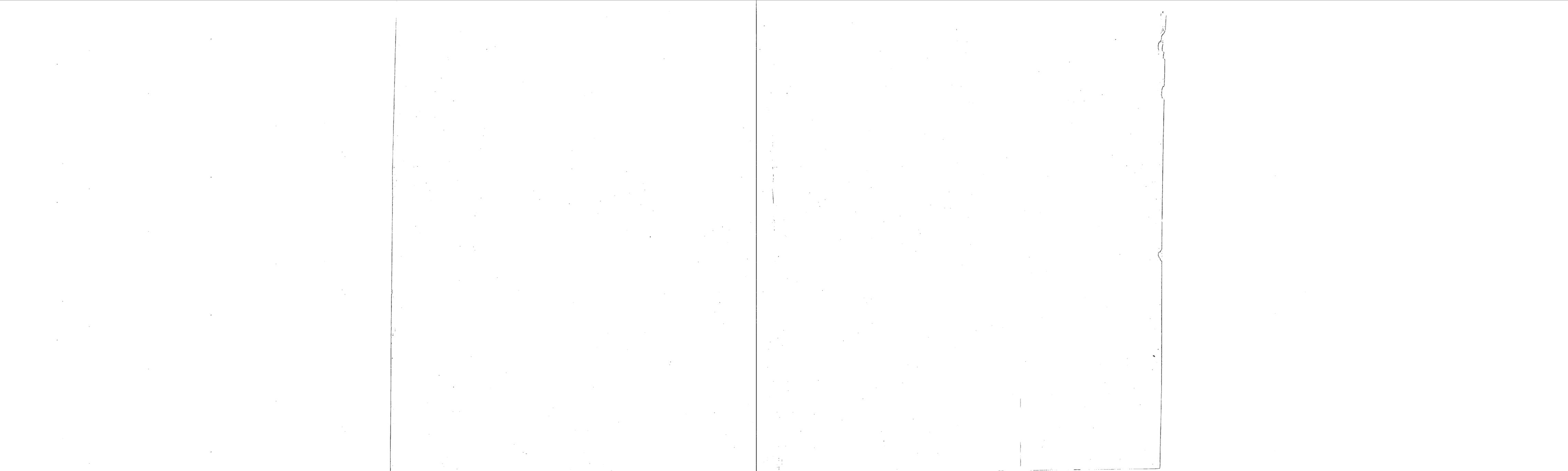
Chief of party Clarence R. Reed Date March 1947 62
Described by C. K. Withrow Checked by

U. S. Coast and Geodetic Survey - Form 628 (Rev. 1945)

DESCRIPTION OF BENCH MARK
Designation **G 230** State North Carolina County Onslow
Nearest town Hollyridge County Onslow
Distance and direction from nearest town 5.25 miles south, thence 7.5 miles northeast
Character of mark A bench mark disk
Established by U. S. C. & G. Survey Stamping **G 230 1947**
Detailed description 5.25 miles south along the Sears Landing Road from the railroad station at Hollyridge, thence 7.5 miles northeast along the Sand Spit Road, on the sand spit between New Topsail Inlet and New River Inlet, 27.7 feet east of milepost 14, 81.5 feet northwest of the top of the main ridge of the dune measured from a point 25.0 feet southeast of the 5th pole northeast of the southeast end of lone straight section of pole, on the top of lone straight section of pole, 46.0 feet northwest of the top of the main ridge of the dune, 2.0 feet southeast of a white painted reference post, set in the top of a concrete post projecting 1.2 feet above the ground.

Chief of party Clarence R. Reed Date March 1947 63
Described by C. K. Withrow Checked by

U. S. Coast and Geodetic Survey - Form 628 (Rev. 1945)



DESCRIPTION OF BENCH MARK

Benjamin M. D. (1899) State North Carolina County Onslow
 Located town Hollyridge
 Character of mark A bench mark disk Stamp 3

Directions and distance from nearest town 5.25 miles south, thence 11.0 miles northeast

Established by U. S. C. & G. Survey

Detailed description 5.25 miles south along the Sears Lumber Road from the railroad station at Hollyridge, thence 11.0 miles northeast along the Sand Spit Road, thence 0.55 mile north along the road on the southeast side of slough, about 0.15 mile northwest of the mouth of the New River Inlet, about 500.0 feet southwest across open sand area from location and blocks the mouth of old slough (the sand area now covers old channel corner of the old blocked slough, near point where low bank along tree and bush covered area (the bank is northeast bank of old slough), about 100.0 feet north of the north southwest, at the extreme northeast corner of old slough begins curve to south and probably at one time an island, at former location of house known as Sea Island House (now destroyed) which was located on the northeast side of the large trees (do not confuse with the small wooded area which is located to the south and southwest, and across a 75-foot wide marsh strip from the larger wooded area), about 100.0 feet north of point where the 75-foot marsh strip between the wooded area begins, N. 80° W. 120.0 feet southwest of the northeast edge of the wooded area, and the low bank, 12.0 feet west of the northeast edge of large live oak trees, 100.0 feet southeast of the point where the 75-foot marsh strip between the wooded area begins, 100.0 feet southwest of reference mark, 100.0 feet southwest of reference mark.

DESCRIPTION OF BENCH MARK

Benjamin M. D. (1899) State North Carolina County Onslow
 Located town Hollyridge
 Character of mark A bench mark disk Stamp 3

Directions and distance from nearest town 5.25 miles south, thence 11.0 miles northeast

Established by U. S. C. & G. Survey

Detailed description 5.25 miles south along the Sears Lumber Road from the railroad station at Hollyridge, thence 11.0 miles northeast along the Sand Spit Road, thence 0.55 mile north along the road on the southeast side of slough, about 0.15 mile northwest of the mouth of the New River Inlet, about 500.0 feet southwest across open sand area from location and blocks the mouth of old slough (the sand area now covers old channel corner of the old blocked slough, near point where low bank along tree and bush covered area (the bank is northeast bank of old slough), about 100.0 feet north of the north southwest, at the extreme northeast corner of old slough begins curve to south and probably at one time an island, at former location of house known as Sea Island House (now destroyed) which was located on the northeast side of the large trees (do not confuse with the small wooded area which is located to the south and southwest, and across a 75-foot wide marsh strip from the larger wooded area), about 100.0 feet north of point where the 75-foot marsh strip between the wooded area begins, N. 80° W. 120.0 feet southwest of the northeast edge of the wooded area, and the low bank, 12.0 feet west of the northeast edge of large live oak trees, 100.0 feet southeast of the point where the 75-foot marsh strip between the wooded area begins, 100.0 feet southwest of reference mark, 100.0 feet southwest of reference mark.

DESCRIPTION OF BENCH MARK

Benjamin M. D. (1899) State North Carolina County Onslow
 Located town Hollyridge
 Character of mark A bench mark disk Stamp 3

Directions and distance from nearest town 5.25 miles south, thence 11.0 miles northeast

Established by U. S. C. & G. Survey

Detailed description 5.25 miles south along the Sears Lumber Road from the railroad station at Hollyridge, thence 11.0 miles northeast along the Sand Spit Road, thence 0.55 mile north along the road on the southeast side of slough, about 0.15 mile northwest of the mouth of the New River Inlet, about 500.0 feet southwest across open sand area from location and blocks the mouth of old slough (the sand area now covers old channel corner of the old blocked slough, near point where low bank along tree and bush covered area (the bank is northeast bank of old slough), about 100.0 feet north of the north southwest, at the extreme northeast corner of old slough begins curve to south and probably at one time an island, at former location of house known as Sea Island House (now destroyed) which was located on the northeast side of the large trees (do not confuse with the small wooded area which is located to the south and southwest, and across a 75-foot wide marsh strip from the larger wooded area), about 100.0 feet north of point where the 75-foot marsh strip between the wooded area begins, N. 80° W. 120.0 feet southwest of the northeast edge of the wooded area, and the low bank, 12.0 feet west of the northeast edge of large live oak trees, 100.0 feet southeast of the point where the 75-foot marsh strip between the wooded area begins, 100.0 feet southwest of reference mark, 100.0 feet southwest of reference mark.

SEP 1941

TOWER FOUR North Carolina Pender
C.R. Reed 1947 Holly Ridge

Line Mark to Tower Three is 13.15 feet from the station in the direction of Tower Three. The disk is a standard Reference Mark disk stamped THREE.
Line Mark to Tower Five is 13.30 feet from the station in the opposite direction from Tower Five. The disk is a standard Reference Mark disk stamped FIVE.
An elevation has been determined.
A traverse connection was made to triangulation station TOWER FIVE and the distance was found to be 3070.9335 meters.

NAME OF STATION: PENDER STATE: North Carolina COUNTY: Pender
ESTABLISHED BY: R.P.S. YEAR: 1914 LOCALITY: Holly Ridge
RECOVERED BY: C.R. Reed YEAR: 1947

Detailed statement as to the fitness of the original description: See p. 13
The station was recovered as described and all marks were found in good condition with the exception of R.M. No. 1 which could not be found and R.M. No. 3 which had been run over by a tractor and moved slightly. A complete new description follows:
The station is located about 25 miles northeast of Wilmington and 8 miles south of Holly Ridge on the west edge of The Inland Waterway about 10 feet west of high water. The mark projects about 10 inches and the disk is stamped ATKINSON 1914 1932, note 1a 7a.
Reference Mark No. 2 is 88.19 feet southwest of the station and about 40 feet west of high water. The mark projects about 10 inches and the disk is stamped ATKINSON NO 2 1932.
Reference Mark No. 3 was used as an Azimuth Mark. It is approximately 0.2 mile west of the station and 15 feet south of a track road. The mark projects about 8 inches and the disk is stamped ATKINSON NO 3 1932, note 1a.
Reference Mark No. 4 is 97.67 feet northwest of the station and 10 feet south of the track road leading to the station. The mark projects about 8 inches and the disk is stamped ATKINSON NO 4 1932, note 1a.
To reach the station from the Post Office in Holly Ridge, go southwest on U.S. Highway 17 for 0.64 miles, turn left on a main travelled dirt road for 0.185 miles, take right fork for 0.2 miles, turn right on track road for 0.7 miles and turn left along edge of field just before coming to white house on the right. Go along edge of field for 0.45 mile to the Azimuth Mark (R.M. No. 3) on the right as described. (continued on card 2 of 2)
continued from card 1 of 2) Continue straight ahead to edge of woods, bearing left, then right thru woods to the beach and the station as described.
Objects V.G.

Object	old distance	new distance	Direction
HAMPSTEAD 2	feet	feet	0 00 00
Reference Mark No. 2	88.15	88.19	19 11 51
Reference Mark No. 3	Approximately 0.2 mile		65 39 45.5
Reference Mark No. 4	98.57	97.67	29.770
TOWER THREE			218° 07' 17.6
TOWER TWO			282 22 57.4
TOWER ONE			312 25 43.4

PENDER (Pender County, N.C., G.D.M., 1932)--About 30 miles by road northeast of Wilmington, on north side of highway right-of-way, and is reached by following route 17 direct to station site. Station is 15 meters (49 feet) south of south rail of Atlantic Coast Line Railroad, 10 meters (33 feet) north of center line of route 17, and 13 meters (43 feet) west of intersection of sand road with highway. Surface and underground marks are standard disk station marks in concrete, notes 1a and 7a. Reference mark No. 1 is standard reference disk, on south end of cement bridge on highway, and approximately one-fourth mile from station in azimuth 220°39'45". Reference marks Nos. 2 and 3 are standard reference disks in concrete, note 1a. No. 2 is 4 meters (13 feet) west of the center line of sand road leading south, and 45.29 meters (148.6 feet) from station in azimuth 284°09'. No. 3 is 10 meters (33 feet) north of center line of route 17, approximately 15 meters (49 feet) south of south rail of railroad, and 48.67 meters (159.7 feet) from station in azimuth 39°23'.

DEPARTMENT OF COMMERCE U. S. COAST AND GEODETIC SURVEY FORM 536
RECOVERY NOTE, TRIANGULATION STATION 1680 R

NAME OF STATION: PENDER STATE: North Carolina COUNTY: Pender County
ESTABLISHED BY: C. D. Meaney YEAR: 1932 LOCALITY:
RECOVERED BY: R. A. Pollock YEAR: 1940 Original description is published in State Highway & Public Works Commission Special Publication No. 192.
Detailed statement as to the fitness of the original description:
On August 8, 1940, Mr. R. A. Pollock, Resident Engineer, State Highway and Public Works Comm., Jacksonville, N. C., was sent a new reference mark disk stamped "PENDER NO. 1 RESET 1940". A letter dated Nov. 2, 1940, from Mr. Pollock contains the following statement:
"THE location of the new reference mark PENDER NO. 1 was not changed; so all previous data will remain the same."

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DEPARTMENT OF COMMERCE U. S. COAST AND GEODETIC SURVEY FORM 536
RECOVERY NOTE, TRIANGULATION STATION 2198 R

NAME OF STATION: BUMBLE STATE: North Carolina COUNTY: Pender
ESTABLISHED BY: R.P.S. YEAR: 1914 LOCALITY: Holly Ridge
RECOVERED BY: C.R. Reed YEAR: 1947

Detailed statement as to the fitness of the original description: See p. 12
The station was recovered as described and the station mark was found to be in good condition. The reference mark was searched for but not recovered. It has probably been destroyed due to the erosion of the beach. A complete new description follows:
The station is on the inland side of the banks, opposite Virginia Creek, on the marsh at the curve of the channel from loop point to the banks. The station is on the beach and is under water at extreme high tide. The mark is a standard unstamped bronze disk in the end of a 4" tile which projects about 12" above the surface of the ground.
To reach the station from the bridge at Sears Landing, go across bridge towards the beach for 0.5 mile, turn right and go 0.32 miles to E.T.T. (end of truck travel). Go north-west through the scrub trees and brush for about 1/2 mile to the beach and the station as described.
Objects V.G.

Object	Direction
ATKINSON 1914 1932	0 00 00
TOWER THREE	303 12 45.0
TOWER TWO	321 09 19.8

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DEPARTMENT OF COMMERCE U. S. COAST AND GEODETIC SURVEY FORM 536
RECOVERY NOTE, TRIANGULATION STATION 1917 R

NAME OF STATION: PENDER STATE: North Carolina COUNTY: Pender
ESTABLISHED BY: C.D.M. YEAR: 1932 LOCALITY: Camp Davis
RECOVERED BY: H.C.A. YEAR: 1943

Detailed statement as to the fitness of the original description: The original description is inadequate because of much recent construction which has caused the locality to become known as Camp Davis, instead of Holly Ridge which is the name of the railroad station and the old post office.
The station is 2.1 miles southwest of the Holly Ridge (or Camp Davis) railroad station, about 1/4 mile southwest of the Pender-Onslow County Line, 49 feet southeast of the southeast rail of the Atlantic Coast Line Railroad, and 33 feet northwest of the centerline of U. S. Route 17. The surface and underground marks are described by notes 1a and 7a. The surface mark projects about 8 inches and is stamped PENDER 1932.
Reference mark No. 1 was set in 1940 near but definitely not in the same location as original No. 1 or azimuth mark. The present mark is in the floor of a concrete culvert on Pender-Onslow County Line, about 6 feet southeast of the southeast edge of the road asphalt surface, and near the centerline of the culvert. It is a Coast Survey reference-mark disk stamped PENDER NO 1 RESET 1940. A U. S. Engineers azimuth mark disk in a concrete post projecting about 3 feet and set alongside the railroad about 0.2 mile northeast of the county line should not be confused with the centerline of a sand road leading southeast. Reference mark No. 2 is 13 feet southwest of the centerline of the sand road leading southeast. It is 45.29 meters or 148.6 feet about east of the station and is stamped PENDER NO 2 1932.
Reference mark No. 3 was destroyed by highway construction.

card 1 of 2
DEPARTMENT OF COMMERCE U. S. COAST AND GEODETIC SURVEY FORM 536
DESCRIPTION OF TRIANGULATION STATION 2223

NAME OF STATION: TOWER THREE STATE: North Carolina COUNTY: Pender
CHIEF OF PARTY: C.R. Reed YEAR: 1947 LOCALITY: Holly Ridge

OBJECT	DISTANCE	DIRECTION	AZIMUTH
ZERO		0 00 00	" "
TOWER TWO		07 51 58.0	" "
TOWER FOUR		182 56 12.1	" "
Reference Mark No. 1	7.334	317 03 27.1	" "
BUMBLE 1914		162 14 40.3	" "

Detailed description: The station is located about 4 miles northeast of the southwest end of Topsail Island, 29 miles northeast of Wilmington and 7 miles south of Holly Ridge. The disk is in a drill hole in the roof of a white concrete observing tower which is about 40 feet tall. It is 4.0 feet south of the north corner, 2.8 feet southeast of the north-west side and 2.9 feet southwest of the northeast side of the tower. The disk is stamped TOWER THREE 1947.
Reference Mark No. 1 is 21.52 feet south of the station and 1 foot south of the south corner of the tower in a drill hole in the concrete around around the foot of the tower. The disk is stamped TOWER THREE RM NO 1 1947.
To reach the station from the Holly Ridge Post Office, go 0.1 mile southwest on U.S. Highway 17 to a sideroad left. Go left for 4.85 miles to Sears Landing. Continue straight ahead across bridge for 0.5 mile to a T-road. Turn right and go 3.65 mile to a white concrete tower and the station as described on the left.

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DEPARTMENT OF COMMERCE U. S. COAST AND GEODETIC SURVEY FORM 536
RECOVERY NOTE, TRIANGULATION STATION 2208 R

NAME OF STATION: PENDER STATE: North Carolina COUNTY: Pender
ESTABLISHED BY: C.D.M. YEAR: 1932 LOCALITY: Holly Ridge
RECOVERED BY: C.R. Reed YEAR: 1947

Detailed statement as to the fitness of the original description:
The station was recovered as described and all marks were found in good condition that were recovered by H.C.A. in 1943. A complete new description follows:
The station is located about 28 miles northeast of Wilmington and 0.22 miles southwest of the Holly Ridge Post Office along the northwest side of U.S. Highway 17. It is 34 feet northwest of the centerline of the highway and 49 feet southeast of the southeast rail of the Atlantic Coast Line Railroad. The mark projects about 8 inches and the disk is PENDER 1932.
Reference mark No. 1 (reset 1940) is used as an Azimuth Mark. It is 0.3 mile north-east of the station on the southeast side of U.S. Highway 17 at the Onslow-Pender County Line. The disk is in a drill hole in the flat top of a concrete culvert 20 feet south-east of the centerline of the Highway at the approximate centerline of the culvert. The disk is stamped PENDER NO 1 RESET 1940.
Reference mark No. 2 is 148.66 feet southeast of the station, 104 feet southeast of the centerline of U.S. Highway 17 and 15 feet south of the approximate centerline of a dirt side road. The mark projects about 8 inches and the disk is stamped PENDER NO 2 1932.
Objects V.G.

Object	New Distance	Old Distance	Direction
BETHSA 1932	meters	meters	0 00 00.0
Reference Mark No. 2	45.312	45.29	16 11 46
Reference Mark No. 1 reset 1940	0.3 mile		312 51 01.0

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DEPARTMENT OF COMMERCE U. S. COAST AND GEODETIC SURVEY FORM 536
RECOVERY NOTE, TRIANGULATION STATION 2197 R

NAME OF STATION: BLAKE STATE: North Carolina COUNTY: Pender
ESTABLISHED BY: R.P.S. YEAR: 1914 LOCALITY: Holly Ridge
RECOVERED BY: C.R. Reed YEAR: 1947

Detailed statement as to the fitness of the original description: See p. 13
The station was recovered as described. The mark was found in bad condition and will not last much longer due to erosion of the beach. A complete new description follows:
The station is located on the inshore side of Topsail Island about 2 1/2 miles northeast of Topsail Inlet. It is about 1 foot from the bank at high tide and projects about 18 inches. The disk is in the end of a 4" tile and is unstamped. A traverse connection was made to TOWER TWO R.M. No. 1 and the distance was found to be 92.323 meters.
To reach from Holly Ridge, go southwest on U.S. Highway 17 for 0.1 mile, turn left and go 4.85 miles to Sears Landing. Continue straight ahead across bridge for 0.5 mile to T-road, turn right and go 5.0 miles to side road, turn right and go 0.1 mile to a white concrete observing tower about 40 feet tall. The station is about 100 yards west of this tower at the water's edge.
Objects V.G:

Object	Distance	Direction
ATKINSON 1914-1932	meters	0 00 00.0
TOWER TWO	90.326	111 48 45.2
TOWER TWO, R.M. No. 1	92.123	115 43 15.8

Traverse connection made to TOWER TWO, a distance found to be 90.326 meters.

STATE: North Carolina COUNTY: Onslow
LOCALITY: Holly Ridge

Detailed statement as to the fitness of the original description: See p. 11
The station was recovered as described and all marks were found to be in good condition.

The station is located 2 3/4 miles east of Holly Ridge on land owned by R.H. Bethea. It is about 200 feet southwest of the farmhouse, 30 feet west of a 36" Live Oak tree and 25 feet north of a track road leading to the farm.

(continued from card 1 of 2) on the right as described. Go left diagonally for 0.2 mile and the station on the left just before coming to the farm buildings.

Table with 4 columns: Object, Distance, Direction, Azimuth. Includes entries for TOWER SIX, Reference Mark No. 2, Reference Mark No. 3, and Reference Mark No. 1.

RECOVERY NOTE, TRIANGULATION STATION 2207 R

STATE: North Carolina COUNTY: Pender
LOCALITY: Holly Ridge

Detailed statement as to the fitness of the original description: See p. 11
The station was recovered as described and all marks were found to be in good condition except Reference Mark No. 2 which is believed to have been destroyed.

The station is located near the middle of Topsail Island along the seaward side on the high ridge of dunes. It is about 35 yards from the road and 35 yards from the ocean. The mark is an 8" tile projecting about 8" and the disk is stamped PED 1933.

DESCRIPTION OF TRIANGULATION STATION 2209

STATE: North Carolina COUNTY: Onslow
LOCALITY: Holly Ridge

Detailed description: The station is located at the approximate midpoint of Topsail Island. The disk is in the roof of a concrete observation tower, 4.1 feet south of the north corner, 2.8 feet southwest of the northeast side and 2.9 feet southeast of the northwest side of the tower.

An elevation has been determined.

RECOVERY NOTE, TRIANGULATION STATION 2194 R

STATE: North Carolina COUNTY: Pender
LOCALITY: Holly Ridge

Detailed statement as to the fitness of the original description: The station was recovered as described and all marks were found to be in good condition.

The station is located about 10 miles south of New River Inlet and 3 miles northeast of Sears Landing on Topsail Island. It is on a very high sand dune just at the curve of the main road which runs the length of the Island.

Table with 4 columns: Object, Distance, Direction, Azimuth. Includes entries for TOWER SIX and Reference Mark No. 1.

An elevation has been determined. A traverse connection made to TOWER SIX, distance found to be 471.242 meters.

RECOVERY NOTE, TRIANGULATION STATION 2204 R

STATE: North Carolina COUNTY: Pender
LOCALITY: Holly Ridge

Detailed statement as to the fitness of the original description: The station was recovered as described and the Reference Mark was found to be in good condition.

The station is located along the ridge of dunes on the seaward side of Topsail Island about 2 miles east of Sears Landing. It is 100 feet north of high tide and 100 feet south of a telephone and power line.

Table with 4 columns: Object, Distance, Direction, Azimuth. Includes entries for TOWER FIVE and Reference Mark.

A traverse connection was made to TOWER FIVE, the distance found to be 1908.119 meters. An elevation has been determined.

DESCRIPTION OF TRIANGULATION STATION card 1 of 2

STATE: North Carolina COUNTY: Pender
LOCALITY: Holly Ridge

Table with 4 columns: Object, Distance, Direction, Azimuth. Includes entries for ZERO, TOWER FOUR, TOWER SIX, and Reference Mark No. 1.

Detailed description: The station is located about 30 miles northeast of Wilmington and 5 miles south of Holly Ridge near the middle of Topsail Island.

Reference Mark No. 1 is 21.42 feet south of the station and 1 foot south of the south corner of the tower. The disk is in a drill hole in the concrete apron around the foot of the tower.

To reach the station from the Post Office at Holly Ridge, go southwest on U.S. Highway 17 for 0.1 mile, turn left and go 0.85 miles to Sears Landing.

Line mark six is 13.17 feet from the station in the opposite direction from TOWER SIX. The disk is a standard reference mark disk stamped SIX.

A traverse connection was made to Triangulation station HIGH 1914 1947 and the distance was found to be 1908.119 meters.

A traverse connection was made to CENTRAL, the distance found to be 599.770 meters. An elevation has been determined.

A traverse connection was made to triangulation station TOWER FOUR and the distance was found to be 3070.9335 meters.

DESCRIPTION OF TRIANGULATION STATION 2211

STATE: North Carolina COUNTY: Pender
LOCALITY: Holly Ridge

This is a traverse station

Detailed description: The station is located near the middle of Topsail Island on the seaward side of a wooden range tower. It is 95 feet east of a T-road intersection, 12 feet east of the south leg of the range tower and 12 feet south of the east leg of the range tower.

A traverse connection was made to Triangulation station TOWER FIVE and the distance was found to be 599.770 meters.

To reach the station from Sears Landing, go 0.5 mile southeast toward the ocean to a T-road intersection and the wooden range tower just across the road and the station as described.

DESCRIPTION OF TRIANGULATION STATION card 1 of 2

STATE: North Carolina COUNTY: Pender
LOCALITY: Holly Ridge

Table with 4 columns: Object, Distance, Direction, Azimuth. Includes entries for ZERO, TOWER THREE, TOWER FIVE, and Reference Mark No. 1.

Detailed description: The station is located about 5 1/2 miles northeast of the southwest end of Topsail Island, about 30 miles northeast of Wilmington and 5 1/2 miles south of Holly Ridge.

Reference Mark No. 1 is 21.43 feet south of the station and 1 foot south of the south corner of the tower in a drill hole in the concrete apron around the foot of the tower.

To reach the station from the Holly Ridge Post Office, go southwest on U.S. Highway 17 for 0.1 mile, turn left between two brick pillars for 4.85 miles to Sears Landing.

(Tower Four continued on page 22)

VALUABLE

SUBJECT

Traverse to Mouth
of new River from
Waterway at Mills
Hammock Bay.

Return To
Public Works
Office
Camp Lejeune
North Carolina

FIELD PARTY

Turlington In Charge
Cooper Instrument
Notes
Ketchum Tape Read
Padgett Tape or Rod
Rover Tape or Rod
Instrument No.
Tape No.

WEATHER

Clear Snow
Cloudy Hot
Windy Moderate
Rain Cold
Fair Fog

FILE No. 24060

Fldr. No. _____

Sheet 1-6

Date 7-8-1948

Figured By _____

Notes Checked By _____

Plotted By _____

Quad. No. _____

Station	Dist.	Angle "	+	H. I. Bearing	Ver: Ang. Diff.	Elevation
---------	-------	---------	---	---------------	-----------------	-----------

A

	53 32 30		①			
	160 37 45		③			
	53 32 35		M			

B

	81 20 45		①			
	244 02 15		③			
	81 20 45		M			

C

	45 07 15					
	135 21 30					
	45 07 10		M			

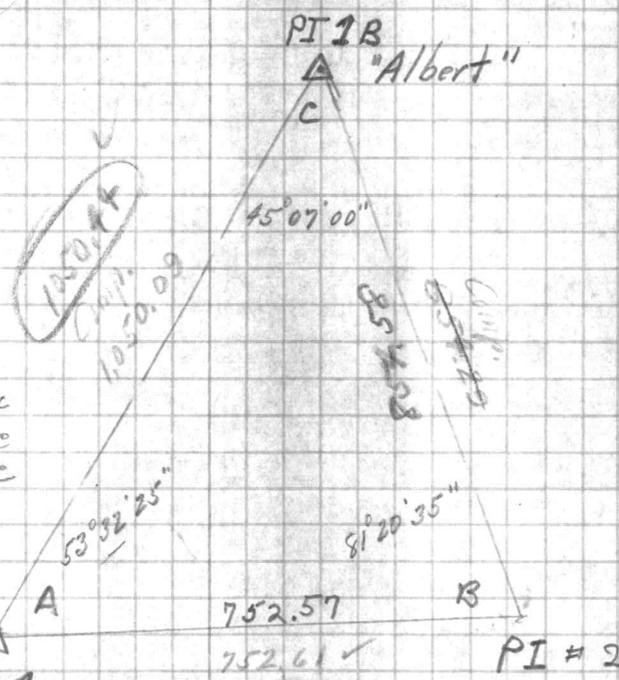
Albert
Axel
Alton
Adonis
Andrew
Arthur
Asa
Attila
August ✓
Avery ✓
Aaron ✓

April ✓

Adams ✓ 1c
Ainsworth ✓ 2c
Allen ✓ 3c
Austin ✓
Angus ✓
Archie ✓
Albie ✓
Ambrose ✓
Anthony ✓
Alexis ✓
Alonso ✓
Ashley ✓

Aubrey ✓

Abel
Adolph
Adrian



VALUABLE

SUBJECT _____

Return To
Public Works
Office
Camp Lejeune
North Carolina

FIELD PARTY

_____ In Charge
_____ Instrument
_____ Notes
_____ Tape Read
_____ Tape or Rod
_____ Instrument No.
_____ Tape No.

WEATHER

Clear _____
Cloudy _____
Windy _____
Rain _____
Fair _____
Snow _____
Hot _____
Moderate _____
Cold _____
Fog _____

FILE No. _____

Fldr. No. _____

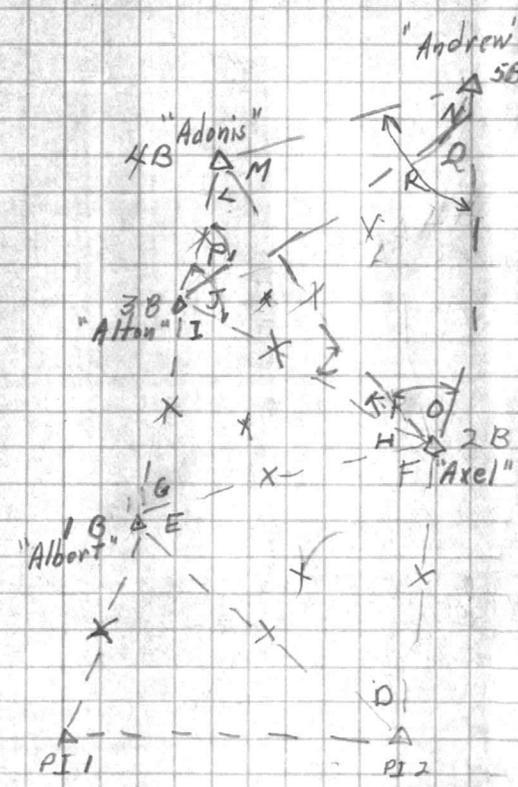
Sheet 2-2

Date _____ 19__

Figured By _____
Notes Checked By _____
Plotted By _____

Quad. No. _____

Station	Dist.	Angle "	+	H. I. Bearing	Ver: Ang. Diff.	Elevation
D	π on 2	\angle 18 to 28				
		51 12				51-12
		153 36				98 51-20
		51 12 M				29 57 05
						180-00 20
E	π 18	\angle 2 to 28				
		98 51 15				
		296 34				
		98 51 20 M				
F	π on 28	\angle 2 to 18				
		29 57				
		89 51 15				41-05-20
		29 57 05 M				37-26-20
						101 28 40
						180-00 20
G	π on 18	\angle 38 to 28				
		41 05 15				
		123 16				
		41 05 20 M				
H	π on 28	\angle 18 to 38				
		37 26 15				
		112 19		37		
		37 26 20				
I	π 38	\angle 18 to 28				
		101 28 45				
		304 26 00				
		101 28 40 M				



YALUARD

SUBJECT

Return To
Post Office
Camp Laramie
North Carolina

Station

Dist

Ang

Boarding

Dist

Mail No

Type No

Time of Day

Time of Day

Time of Day

Time of Day

Card No

Notes Checked BY

Placed BY

Placed BY

Placed BY

WEATHER

Clear
Snow
Ice
Cloudy
Windy
Mist
Rain
Cold
Fog

FIELD PARTY

In Charge
Instrument
Notes

FILE NO

FILE NO

FILE NO

FILE NO

RECORDED
INDEXED

YANUARY
Return To
Public Works
Office
Cante Lajune
North Carolina

SUBJECT

FIELD PARTY
In Charge _____
Instrument _____
Notes _____
Time Read _____
Type of Rod _____
Type of Rod _____
Name of Station _____
Date _____

WEATHER
Clear _____
Snow _____
Hot _____
Cloudy _____
Windy _____
Mist _____
Rain _____
Cold _____
Fog _____
Thunder _____
Lightning _____
Checked By _____
Recorded By _____
Date _____

WILL NO. _____
Book No. _____
Sheet _____
Date _____

Station _____
Dist. _____
Angle _____
Bearing _____
Mgt. _____
Elevation _____

VALUABLE

SUBJECT _____

 Return To
 Public Works
 Office
 Camp Lejeune
 North Carolina

FIELD PARTY

_____ In Charge
 _____ Instrument
 _____ Notes
 _____ Tape Read
 _____ Tape or Rod
 _____ Tape or Rod
 _____ Instrument No.
 _____ Tape No.

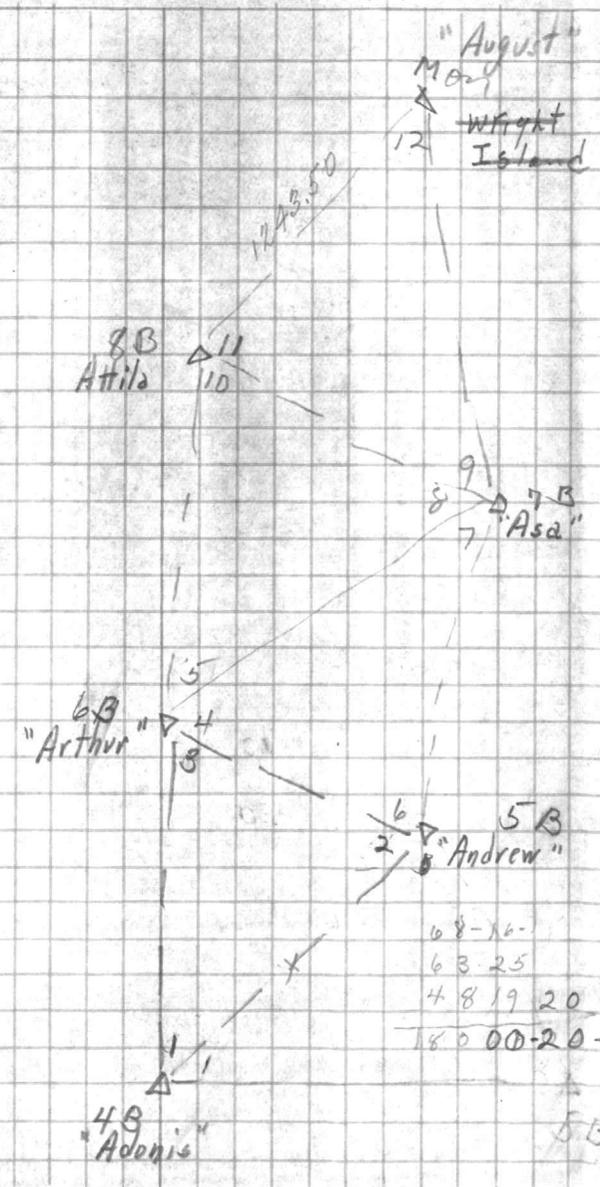
WEATHER

Clear _____
 Cloudy _____
 Windy _____
 Rain _____
 Fair _____
 Snow _____
 Hot _____
 Moderate _____
 Cold _____
 Fog _____

FILE No. _____
 Fldr. No. _____
 Sheet 4
 Date _____ 19__

Quad. No. _____

Station	Dist.	Angle "	+	H. I. Bearing	Ver: Ang. Diff.	Elevation
				Top 4B < 5B to 6B		
①	68 16	204 48		68 16	M	
				T 5B < 4B to 6B		
②	63 25	190 15		63 25	M	
				T 5B < 6B to 7B		
⑥	49 23	148 08 45		49 22 55	M	
				T 6B < 4B to 5B		
③	48 19 15	144 59		48 19		
				T 6B < 5B to 7B		
④	110 07 45	330 23 30		110 07 30	M	



AVAILABLE

Station
Camp Lejeune
Office
Public Works
Harris To
North Carolina

SUBJECT

Station _____
Dist _____
Radio _____
M _____
Station _____
Dist _____
Radio _____
M _____

FIELD PARTY

In Charge _____
Instruments _____
Notes _____
Tape Roll _____
Type of Roll _____
Type of Roll _____
Type of Roll _____
Amount No _____
Tape No _____

WEATHER

Clear _____
Cloudy _____
Hot _____
Windy _____
Rain _____
Fog _____
Foggy _____
Foggy _____
Foggy _____
Foggy _____

FIELD No

FIELD No

VALUABLE

SUBJECT _____

Return To
Public Works
Office
Camp Lejeune
North Carolina

FIELD PARTY

____ In Charge
____ Instrument
____ Notes
____ Tape Read
____ Tape or Rod
____ Tape or Rod
____ Instrument No.
____ Tape No.

WEATHER

Clear
Cloudy
Windy
Rain
Fair
Snow
Hot
Moderate
Cold
Fog

FILE No. _____

Fldr. No. _____

Figured By _____ Sheet 5

Notes Checked By _____

Plotted By _____ Date _____ 19__

Quad. No. _____

Station	Dist.	Angle "	+	H. I. Bearing	Ver: Ang. Diff.	Elevation
⑤	6 B	< 7 B to 8 B				
		30 00 30				30 00 30
		90 01 30				53 26 50
		30 00 30				96 38 52
						180 00 40
⑩	8 B	< 6 B to 7 B				
		53 27				
		160 20 30				
		53 26 30 M				
⑪	8 B	< 7 B to Mon				
		100 55 30				
		302 46		107 53		
		100 55 20				
⑧	7 B	< 6 B to 8 B				
		96 33 00				49-22-55
		289 38 30				110-07-50
		96 32 50				20 29 05
						179-59-50
⑦	7 B	< 5 B - 6 B				
		20 29				
		61 27 15				
		20 29 05				
⑨	7 B	< 8 B to Mon				
		45 07 30				
		135 22 30				
		45 07 30		S 32-30 W		

VALUABLE

SUBJECT

Return To
Public Works
Office
Camp Lejeune
North Carolina

FIELD PARTY
In Charge
Instrument
Notes
Time Read
Type of Rod
Type of Soil
Elevation No.
Time No.

WEATHER
Clear
Snow
Ice
Cloudy
Windy
Moderate
Rain
Cold
Fog
Fogged By
Notes Checked By
Project By
Date

FILE NO.
Field No.
Sheet

Station
Dist.
Angle
M.L. Vert. Angle
Sighting
Elevation

10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
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39
40
41
42
43
44
45
46
47
48
49
50

VALUABLE

SUBJECT _____

Return To
Public Works
Office
Camp Lejeune
North Carolina

FIELD PARTY

____ In Charge
____ Instrument
____ Notes
____ Tape Read
____ Tape or Rod
____ Tape or Rod
____ Instrument No.
____ Tape No.

WEATHER

Clear
Cloudy
Windy
Rain
Fair

Snow
Hot
Moderate
Cold
Fog

FILE No. _____

Fldr. No. _____

Sheet 6-6

Date _____ 19__

Figured By _____

Notes Checked By _____

Plotted By _____

Quad. No. _____

Station	Dist.	Angle " +	H. I. Bearing	Ver: Ang. Diff.	Elevation
---------	-------	--------------	------------------	--------------------	-----------

π Mon \angle 78 to 8B

(12)

33 57 30

101 52 15

33 57 25

33 - 57 - 25

100 52 20

45 07 32

180 00 15

π Mon \angle 7B to tower
snead ferry

2830615

12919

2830620 M

RECEIVED
OFFICE
CHIEF CLERK
JAMES C. [unclear]

SUBJECT

Station
Date
Time
By

FIELD PARTY

in Charge
Treatment
Notes

Time Recd
Time of Day
Time of Recd

WEATHER

Clear
Snow
Hot
Windy
Rain
Fog

Checked BY
Checked BY
Checked BY

FILE NO

Page No

Sheet

Date

Field No

1918

1918

VALUABLE

Return To
Public Works
Office
Camp Lejeune
North Carolina

SUBJECT Traverse From
"Amos" to Mon at
New River Inlet (wright
Island)

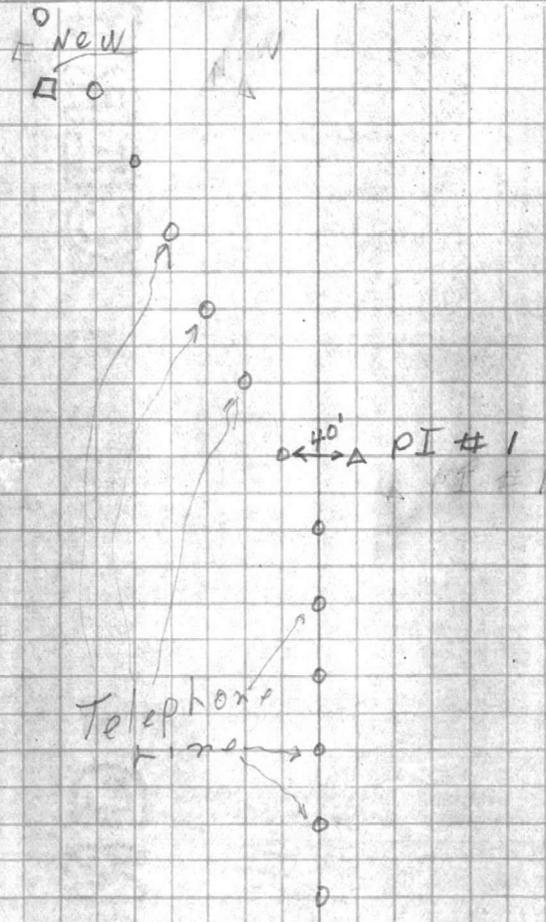
FIELD PARTY
Turlington In Charge
Instrument _____
Notes _____
Tape Read _____
Tape or Rod _____
Tape or Rod _____
Instrument No. _____
Tape No. _____

WEATHER
Clear _____
Cloudy _____
Windy _____
Rain _____
Fair _____
Snow _____
Hot _____
Moderate _____
Cold _____
Fog _____
Figured By _____
Notes Checked By _____
Plotted By _____

FILE No. 240 Gen.
Fldr. No. _____
Sheet 1 2
Date _____ 19__

Quad. No. _____

Station	Dist.	Angle "	+	H. I. Bearing	Ver. Ang. Diff.	Elevation
PI # 3 = "August" Wright Island	1282.37	268 00 30				
		60 01 45				
		268 00 35 M		N 31 W		
PI # II = "New" USED	1151.4	186 25 30				
		199 16 15				
		186 25 25 M				
PI # I	1126.02	184 52				
		194 35 45				
		184 51 55 M				
Tom AMOS						
B S Passett						



AMOS

VALUABLE

SUBJECT _____

Return To
Public Works
Office
Camp Lejeune
North Carolina

FIELD PARTY

 _____ In Charge
 _____ Instrument
 _____ Notes
 _____ Tape Read
 _____ Tape or Rod
 _____ Tape or Rod
 _____ Instrument No.
 _____ Tape No.

WEATHER

 Clear _____
 Cloudy _____
 Windy _____
 Rain _____
 Fair _____
 Snow _____
 Hot _____
 Moderate _____
 Cold _____
 Fog _____

F.I.E. No. _____

Fldr. No. _____

Sheet _____

Date _____ 19__

Quad. No. _____

Station	Dist.	Angle	"	+	H. I. Bearing	Ver: Ang. Diff.	Elevation
---------	-------	-------	---	---	------------------	--------------------	-----------

August
 T on W. I. B S NEW F.S. water
 Tank Beach

268 23
 85 08 45
 268 22 55 M

PI 8 B

276 54 16
 110 42 30
 276 54 10 M

VALUABLE

Return To
Public Works
Office
Camp Lejeune
North Carolina

SUBJECT BENCH LEVELS
AT NEW RIVER INLET.

FIELD PARTY
KELLY In Charge
Instrument _____
Notes _____
Tape Read _____
Tape or Rod _____
Tape or Rod _____
Instrument No. _____
Tape No. _____

WEATHER
Clear _____
Cloudy _____
Windy _____
Rain _____
Fair _____
Snow _____
Hot _____
Moderate _____
Cold _____
Fog _____
Figured By _____
Notes Checked By _____
Plotted By _____

FILE No. _____
Fldr. No. _____
Sheet 1-05-3
Date 7-20-1948

Quad. No. _____

Station	Dist.	Angle "	+	H. I. Bearing	Ver. Ang. Diff.	Elevation
B.M.						13.11
				4.62 27.73		
T.P.					11.87	15.86
				2.33 18.19		
T.P.					11.48	6.71
				6.82 13.03		
T.P.					7.80	5.23
				6.94 12.17		
T.P.					5.88	6.29
				8.20 14.49		
T.P.					9.72	4.77
				5.54 10.31		
B.M.					1.55	8.76

ON 1" IRON PIPE SETTLED IN SAND ABOUT 1' ABOVE GROUND 100' ± FROM NEAREST SHORELINE AND 100' ± SOUTH OF BEACH ROAD LEADING TO INLET COVE AND 200' ± FROM END OF ROAD. SNEADS FERRY FIRE TOWER AND CONTRADY TOWER ON TOPSAIL BEACH ARE PLAINLY VISIBLE FROM B.M.

VALUABLE

SUBJECT BENCH LEVELS NEW
RIVER INLET

Return To
Public Works
Office
Camp Lejeune
North Carolina

FIELD PARTY

In Charge _____
Instrument _____
Notes _____
Tape Read _____
Tape or Rod _____
Tape or Rod _____
Instrument No. _____
Tape No. _____

WEATHER

Clear _____
Cloudy _____
Windy _____
Rain _____
Fair _____
Snow _____
Hot _____
Moderate _____
Cold _____
Fog _____

FILE No. _____

Fldr. No. _____

Sheet 2-01-3

Date 7-20-19 28

Figured By _____

Notes Checked By _____

Plotted By _____

Quad. No. _____

Station	Dist.	Angle	"	+	H. I. Bearing	Ver: And. Diff.	Elevation	
B.M.							8.76	ON 1" IRON PIPE
	7.75	16.51						14.16 Beaufort Datum
B.M.						2.72	12.79	ON CORPS OF ENGINEERS A "NEW"
	1.69	15.48				+ 1.64		- Used by Co. E Surveys for Channel Topog
T.P.						7.24	8.24	
	2.08	10.32						
T.P.						5.33	4.99	
	10.26	15.25						
T.P.						4.25	11.00	
	5.21	16.21						
T.P.						1.30	14.91	
	10.01	24.22						
T.P.						6.80	18.12	
	9.62	27.74						
B.M.						4.64	23.10	U.S.C. + G. A "BMDS"
							23.11	

14.16
13.79
- .37
M.S.L. of 6. Datum

10.2
14.5
2.0

AVAILABLE
Section 70
Public Works
Office
Car. Station
North Carolina

SUBJECT

Station East Angle Bearing Vert. Ang. Elevation

FIELD PARTY

In Charge _____
Instrument _____
Notes _____
Tape Read _____
Tape or Rod _____
Tape No. _____

WEATHER

Clear _____
Snow _____
Hot _____
Clouds _____
Windy _____
Moderate _____
Rain _____
Cold _____
Fog _____
Fair _____
Foggy _____
Clear _____
Hot _____
Clouds _____
Windy _____
Moderate _____
Rain _____
Cold _____
Fog _____
Fair _____

FIELD NO.

VALUABLE

Return To
Public Works
Office
Camp Lejeune
North Carolina

SUBJECT BENCH LEVELS
AT NEW RIVER INLET.

FIELD PARTY
KELLM In Charge
Instrument _____
Notes _____
Tape Read _____
Tape or Rod _____
Tape or Rod _____
Instrument No. _____
Tape No. _____

WEATHER
Clear _____
Cloudy _____
Windy _____
Rain _____
Fair _____
Snow _____
Hot _____
Moderate _____
Cold _____
Fog _____
Figured By _____
Notes Checked By _____
Plotted By _____

FILE No. _____
Fldr. No. _____
Sheet 3-04-3
Date 7-20-1948

Quad. No. _____

*Cap E. Elev. 0.50 ± 0.31
Higher than U.S. Co. E. Datum*

Station	Dist.	Angle	"	+	H. I. Bearing	Ver: Ang. Diff.	Elevation
B. M.							8.76
	7.97	16.73					
B. M. (C. P.)					3.45	13.48	11.77
	3.40	16.68				+1.51	
B. M.					7.91	8.77	8.76
B. M.						13.78	
	0.68	13.96					
T. B. M. (T. P.)					9.81	4.15	
	3.00	7.15					
T. P.					3.46	3.69	
	10.18	13.87					
B. M.					0.57	13.30	13.28

ON 1" IRON PIPE
13.78 Benchmark Datum
3.28
10.50 U.S. Co. E. Datum
CORPS OF ENGINEERS
Used by Coy E. Surveys for Channel Topog.

"(Ward)" ✓
"August"

ON 1" IRON PIPE

A "WRIGHTS ISLAND" "August" "Ward" ✓

ON PIER

A "WRIGHTS ISLAND" "August"

AVAILABLE

STATION - DIST
DATE
TIME

STATION - DIST
DATE
TIME

WEATHER
WIND
TEMP
PRESS
HUMIDITY
SEA
STATE
TYPE OF FOG
TYPE OF SNOW
TYPE OF ICE
TYPE OF SAND
TYPE OF GRAVEL
TYPE OF ROCK
TYPE OF DEBRIS
TYPE OF OTHER

NO. 11



VALUABLE

SUBJECT _____

RETURN TO
PUBLIC WORKS
OFFICE
CAMP LEJEUNE
NORTH CAROLINA

FIELD PARTY

 _____ IN CHARGE
 _____ INSTRUMENT
 _____ NOTES
 _____ TAPE READ
 _____ TAPE OR ROD
 _____ TAPE OR ROD
 _____ INSTRUMENT NO.
 _____ TAPE NO.

WEATHER

 CLEAR _____ SNOW _____
 CLOUDY _____ HOT _____
 WINDY _____ MODERATE _____
 RAIN _____ COLD _____
 FAIR _____ FOG _____

FILE No. _____

FLDR. No. _____

FIGURED BY _____

SHEET # 2 of

NOTES CHECKED BY _____

PLOTTED BY _____

DATE _____

19 _____

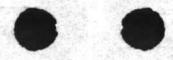
Quad. No. _____

STATION	DIST.	ANGLE ° ' "	+	H. I. BEARING	VER: ANG. DIFF.	ELEVATION
					Match	↓ Line
				New River	C. Bay	
1345				+0.40	+0.35	+0.24
1400				+0.55	+0.36	+0.23
1415				+0.75	+0.37	+0.22
1430				+0.90	+0.42	+0.21
1445				+1.05	+0.49	+0.21
1500				+1.10	+0.52	+0.25
1515				+1.25	+0.59	+0.31
1530				+1.40	+0.62	+0.34
1545				+1.45	+0.65	
1600				+1.60		
1615				+1.70		
1630				+1.85		
1645				+1.95		
1700		H.		+2.00		
1715				+1.95		
1730				+1.80		
1745				+1.70		
1800				+1.60		
1815						
1830						
1845						
1900						
1915						
1930						
1945						
2000						
2015						
2030						
					Match	↑ Line

WELD PARTY
NAME
ADDRESS
CITY
STATE
ZIP
DATE
TIME
WEATHER
EVEN NO.

WILLIAM E. DUFF
RETURN TO
PUBLIC WORKS
SERVICE
CAMP B. BUNG
NEW BRUNSWICK

STATION
DIR
ADDER
M
SERIAL
D.C.
NEWARK
ELEVATION



VALUABLE

SUBJECT Tide check @ sneeds
Ferry Bridge

RETURN TO
PUBLIC WORKS
OFFICE
CAMP LEJEUNE
NORTH CAROLINA

FIELD PARTY

Chalk
IN CHARGE
INSTRUMENT
NOTES
TAPE READ
TAPE OR ROD
INSTRUMENT NO.
TAPE NO.

WEATHER

CLEAR
CLOUDY ✓
WINDY ✓
RAIN ✓
FAIR
SNOW
HOT
MODERATE
COLD
FOG

FILE No. _____
FLDR. No. _____
SHEET 107
DATE 3-31 1950

FIGURED BY _____
NOTES CHECKED BY _____
PLOTTED BY _____
Quad. No. _____

STATION	DIST.	ANGLE ° ' "	+	H. I. BEARING	VER. ANG. DIFF.	ELEVATION
B.M.			0.81			9.06
9:15				9.87	9.50	0.37
9:30					9.43	0.41
9:45					9.47	0.40
10:00					9.40	0.47
10:15					9.52	0.35
10:30					9.52	0.35
10:45					9.54	0.33
11:00					9.54	0.33
11:15					9.55	0.32
11:30					9.55	0.32
11:45					9.55	0.32
12:00					9.56	0.31
12:15					9.56	0.31
12:30					9.56	0.31
B.M.			0.81			9.06

Wind Northwest

Wind Northeast

Wind from South.

TABLE
STATION
DATE
TIME
COURSE

STATION DIR. BEARING DIST. VERG. ELEVATION

MEMO PARTY
IN CHARGE
INSTRUMENT
NOTE
TAPES USED
TIME ON JOB
DATE OF JOB
LOCAL TIME

WEATHER
WIND
MOON
TEMP.
HUMIDITY
PRESSURE
WIND DIR.
WIND VELOCITY

FIELD NO.
DATE
TIME



VALUABLE

SUBJECT

Tide check cont.RETURN TO
PUBLIC WORKS
OFFICE
CAMP LEJEUNE
NORTH CAROLINA

FIELD PARTY

 _____ IN CHARGE
 _____ INSTRUMENT
 _____ NOTES
 _____ TAPE READ
 _____ TAPE OR ROD
 _____ TAPE OR ROD
 _____ INSTRUMENT No.
 _____ TAPE No.

WEATHER

 CLEAR
 CLOUDY
 WINDY
 RAIN
 FAIR

 SNOW
 HOT
 MODERATE
 COLD
 FOG

FILE No. _____

FLDR. No. _____

FIGURED BY _____

SHEET

2 of

NOTES CHECKED BY _____

PLOTTED BY _____

DATE

3-31-1954

Quad. No. _____

STATION	DIST.	ANGLE			H. I. BEARING	VER. ANG. DIFF.	ELEVATION
		°	'	"			
BM				0 85		9.06	
					9.91		
12:45					9.61	0.30	
13:00					9.61	0.30	
13:15					9.63	0.28	
13:30					9.65	0.26	
13:45					9.67	0.24	
14:00					9.68	0.23	
14:15					9.69	0.22	
14:30					9.70	0.21	
14:45					9.70	0.21	
15:00					9.66	0.25	
15:15					9.60	0.31	
15:30					9.57	0.34	
BM				0.85		9.06	

UNCLASSIFIED

RETURN TO:
FIELD WORKS
DIVISION
MAIL ROOM
1000 CAROLINA

STATION DATE

MAIL

SEARCHED

INDEXED

TASK NO.

INSTR. NO.

TASK NO.

TASK OR NO.

TASK NO.

INSTR. NO.

IN CHARGE

FIELD PARTY

DATE

TIME

BY

NO.

WIND

TEMP.

DATE

TIME

BY

NO.

WIND

TEMP.

WIND

TEMP.

NO.

WIND

TEMP.

WIND

TEMP.

VALUABLE

SUBJECT Tide Elevs. at Mon, U.S.M.C.
#1 Court House Bay 522

RETURN TO
 PUBLIC WORKS
 OFFICE
 CAMP LEJEUNE
 NORTH CAROLINA

FIELD PARTY

Morton IN CHARGE
 _____ INSTRUMENT
 _____ NOTES
 _____ TAPE READ
 _____ TAPE OR ROD
 _____ TAPE OR ROD
 _____ INSTRUMENT NO.
 _____ TAPE NO.

WEATHER

CLEAR SNOW
 CLOUDY HOT
 WINDY MODERATE
 RAIN COLD
 FAIR FOG

FIGURED BY _____
 NOTES CHECKED BY _____
 PLOTTED BY _____

FILE No. _____
 FLDR. No. _____
 SHEET 1 of 1
 DATE 3/31 1954

Quad. No. _____

STATION	DIST.	ANGLE		H. I. BEARING	VER. ANG. DIFF.	ELEVATION	TIME		REMARKS
		°	' "						
B.M.						3.77			Mon U.S.M.C. #1
			1.84	5.61		5.09	0.52	08:45	0'clock
						5.10	0.51	09:00	"
						5.11	0.50	:15	"
						5.17	0.44	:30	"
						5.19	0.42	:45	"
						5.21	0.40	10:00	"
						5.22	0.39	:15	"
						5.24	0.37	:30	"
						5.24	0.37	:45	"
						5.24	0.37	11:00	"
						5.23	0.38	:15	"
						5.23	0.38	:30	"
						5.23	0.38	:45	"
						5.23	0.38	12:00	"
						5.23	0.38	:15	"
						5.24	0.37	:30	"
						5.24	0.37	:45	"
						5.24	0.37	13:00	"
						5.28	0.33	:15	"
						5.24	0.37	:30	"
						5.26	0.35	:45	"
						5.25	0.36	14:00	"
						5.24	0.37	:15	"
						5.19	0.42	:30	"
						5.12	0.49	:45	"
						5.09	0.52	15:00	"
						5.02	0.59	:15	"
						4.99	0.62	:30	"
						4.96	0.65	:45	"
B.M.						1.84	3.77		

VALUABLE

RETURN TO
POSTAL BOARD
OFFICE
WASHINGTON
D.C. 20540

DATE: _____

FIELD PARTY

IN CHARGE: _____

TREATMENT: _____

DATE: _____

CLASS OF SPECIES: _____

TYPE OF SPECIES: _____

NUMBER OF SPECIES: _____

LOCALITY: _____

WEATHER

Clear & low

Cloudy

Windy

Moist

Hot

Other

Notes

FIELD NO. _____

DATE: _____

TIME: _____

PLACE: _____

COLLECTOR: _____



VALUABLE

SUBJECT

12 Mile
Horn Marsh Bay AreaReturn To
Public Works
Office
Camp Lejeune
North Carolina

FIELD PARTY

Turlong
Cooper In Charge

Instrument

Notes

Tape Read

Tape or Rod

Tape or Rod

Instrument No.

Tape No.

WEATHER

Clear
Cloudy
Windy
Rain
FairSnow
Hot
Moderate
Cold
Fog

Figured By Est

Notes Checked By

Plotted By

Quad. No.

FILE No. 240 Gm

Fldr. No.

Sheet 1-6

Date 19

Station	Dist.	Angle "	+	H. I. Bearing	Ver: Ang. Diff.	Elevation
---------	-------	---------	---	------------------	--------------------	-----------

 π on 18 \angle Avery to PI #2

60 07

180 21 00

60 07 00 M

 π on PI #2 \angle Albert to Avery

76 27 30

229 22 45

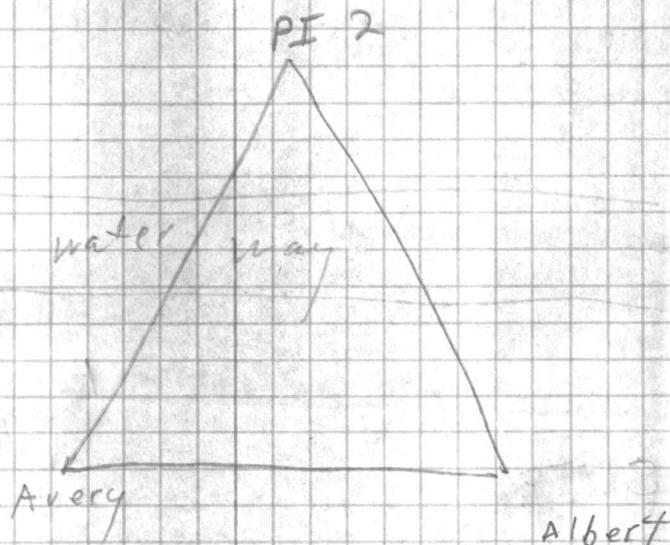
76 27 35 M

 π on Avery \angle PI 2 to Albert

43 25 30

130 16 15

43 25 25



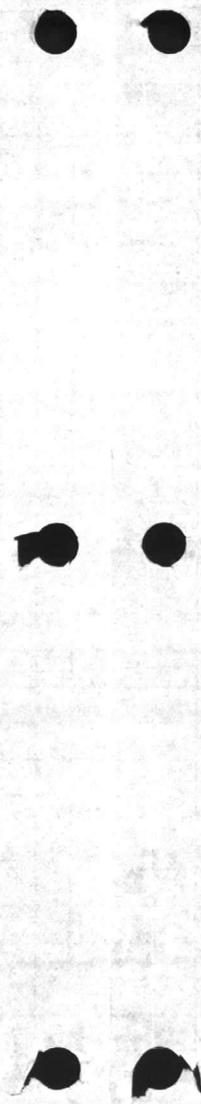
60	-	06	-	53
76	-	27	-	30
43		25		25
179		58		115

NEW YORK
Date
Place
Name
Address
City
State
Zip
Country

POST OFFICE
Box
No.
City
State
Zip
Country

Station
Dist.
And
Post Office
City
State
Zip
Country

Post Office
City
State
Zip
Country



VALUABLE

SUBJECT _____

 Return To
 Public Works
 Office
 Camp Lejeune
 North Carolina

FIELD PARTY

_____ In Charge
 _____ Instrument
 _____ Notes
 _____ Tape Read
 _____ Tape or Rod
 _____ Tape or Rod
 _____ Instrument No.
 _____ Tape No.

WEATHER

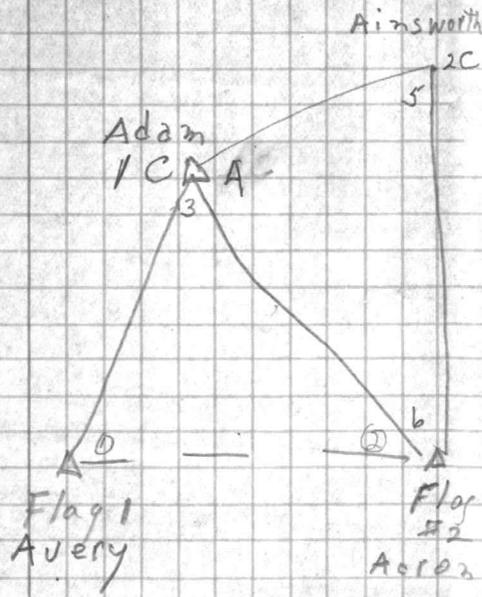
Clear
 Cloudy
 Windy
 Rain
 Fair

Snow
 Hot
 Moderate
 Cold
 Fog

FILE No. _____
 Fldr. No. _____
 Sheet 2
 Date _____ 19____
 Quad. No. _____

Station	Dist.	Angle " +	H. I. Bearing	Ver: Ang. Diff.	Elevation
T on Flag #1 \angle IC to Flag 2					
①		46 38 30			
		139 53 30			
		46 38 30			
T on Flag 2 \angle Flag 1 to IC					
②		64 06 30			
		192 19 15			
		64 06 25 M			
T on IC \angle Flag 1 to Flag 2					
③		69 15 00			
		207 45 00			
		69 15 00 M			
T on IC \angle 2C to Flag 2					
④		101 31 30			
		301 34 15			
		101 31 25 M			
T on 2C \angle Flag 2 to IC					
⑤		43 00 45			
		129 02			
		43 00 40 M			

64 06 25
 69 15
 46 38 30
 179 59 55



VALUABLE

Return to
Post Office
Office
Camp Lejeune
North Carolina

PLAID

Station

Date

April

General

D/C

Post Office

RIGHT PARTY
Name
Address
City
State
Zip

WEATHER
Clear
Cloudy
Windy
Rain
Snow
Fog
Thunder
Hail

Time
Date
Day
Month
Year



VALUABLE

SUBJECT _____

Return To
Public Works
Office
Camp Lejeune
North Carolina

FIELD PARTY

_____ In Charge
_____ Instrument
_____ Notes
_____ Tape Read
_____ Tape or Rod
_____ Tape or Rod
_____ Instrument No.
_____ Tape No.

WEATHER

Clear
Cloudy
Windy
Rain
Fair
Snow
Hot
Moderate
Cold
Fog

FILE No. _____

Fldr. No. _____

Figured By _____ Sheet 3

Notes Checked By _____

Plotted By _____ Date _____ 19__

Quad. No. _____

Station	Dist.	Angle	"	+	H. I. Bearing	Ver: Ang. Diff.	Elevation
---------	-------	-------	---	---	------------------	--------------------	-----------

T	on	Flag 2		L	IC 40 20		
		35 27 45					
(D)		106 23 30					
		35 27 50		M			

43-00-40
101-31-25
35 27 50
<u>179-58-115</u>

AVAILABLE

SUBJECT

Report to
Weather Service
Camp Location
North Carolina

Station

Dist.

Range

Bearing

Mag. Cor.

Elevation

Station No.
This Year

Station or Rod

Station Rod

Station

Notes

Instrument

Observer

Weather

Clear

Fair

Cloudy

Misty

Light

Drizzle

Light

Clouds

Heavy

Thunder

Storm

Other

Remarks

Time

Date

Observer

Checked by

Station

Number

Year

Checked by

Date

VALUABLE

SUBJECT _____

Return To
Public Works
Office
Camp Lejeune
North Carolina

FIELD PARTY

____ In Charge
____ Instrument
____ Notes
____ Tape Read
____ Tape or Rod
____ Tape or Rod
____ Instrument No.
____ Tape No.

WEATHER

Clear _____
Cloudy _____
Windy _____
Rain _____
Fair _____
Snow _____
Hot _____
Moderate _____
Cold _____
Fog _____
Figured By _____
Notes Checked By _____
Plotted By _____

FILE No. _____

Fldr. No. _____

Sheet 4

Date _____ 19__

Quad. No. _____

Station	Dist.	Angle " "	+	H. I. Bearing	Ver: Ang. Diff.	Elevation
π on Aaron		<		2C to 3C		
①		34 03				
		102 09				
		34 03	m			
π ON 2C		<		3C TO AARON		
②		112 46 45				
		338 20				
		112 46 40				
π ON 2C		<		4C TO 3C		
⑤		49° 07' 15"				
		147 22 00				
		49° 07' 20"				
π ON 3C		<		AARON TO 2C		
③		33 10 30				
		99 31 30				
		33 10 30				

Armsworth

PI # 2C

②

PI # 3C

④

3 Allen

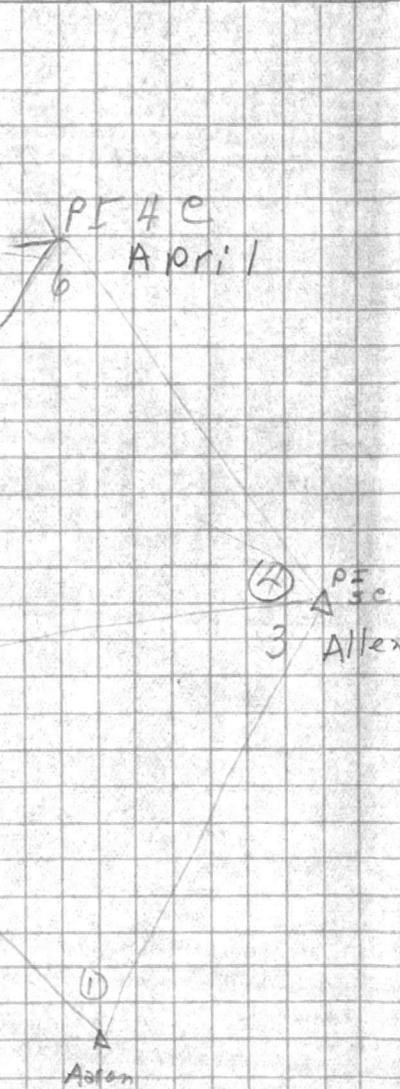
①
Aaron

33 10 30

112 46 40

34 03

180-00-10



VACUUM

SUBJECT

Return To
Public Works
Office
Camp Lejeune
North Carolina

Station

Dist

Angle

+

Reserve

Dir

Vall. Ang.

Station

FIELD PARTY

In Charge

Instrument

Notes

Time Read

Time of Day

Type of Day

Number

Time

WEATHER

Clear

Cloudy

Windy

Rain

Fog

Light

Storm

Other

FIELD No.

Field No.

Sheet

Date

Time

VALUABLE

SUBJECT _____

Return To
Public Works
Office
Camp Lejeune
North Carolina

FIELD PARTY

 _____ In Charge
 _____ Instrument
 _____ Notes
 _____ Tape Read
 _____ Tape or Rod
 _____ Instrument No.
 _____ Tape No.

WEATHER

 Clear _____
 Cloudy _____
 Windy _____
 Rain _____
 Fair _____
 Snow _____
 Hot _____
 Moderate _____
 Cold _____
 Fog _____

FILE No. _____

Fldr. No. _____

Sheet 5

Figured By _____

Notes Checked By _____

Plotted By _____

Date _____ 19__

Quad. No. _____

Station	Dist.	Angle	"	+	H. I. Bearing	Ver: Ang. Diff.	Elevation
---------	-------	-------	---	---	------------------	--------------------	-----------

π on 3C (4)		L	25		T	4C	
--------------------	--	---	----	--	---	----	--

108 00
324 00
108 00

108	00
49	07 20
22	52 30

π on 4C	L	30	40	2C
-------------	---	----	----	----

22 52 30
68 37 30
22 52 80

M

VALUABLE

Return To
Public Works
Office
Camp Lejeune
North Carolina

SUBJECT

Station - Dist.

Angle

Bearing

Dist. Elevation
M. and
D. ft.

FIELD PARTY

In Charge

Instrument

Notes

Time Read

Type of Rod

Number of

Top No.

WEATHER

Clear

Wind

Temp

Figure

Notes

Checked by

Station No.

FILE No.

File No.

Sheet

Date

Quarry No.

100
100
100
100

VALUABLE

SUBJECT _____

Return To
 Public Works
 Office
 Camp Lejeune
 North Carolina

FIELD PARTY

_____ In Charge
 _____ Instrument
 _____ Notes
 _____ Tape Read
 _____ Tape or Rod
 _____ Instrument No.
 _____ Tape No.

WEATHER

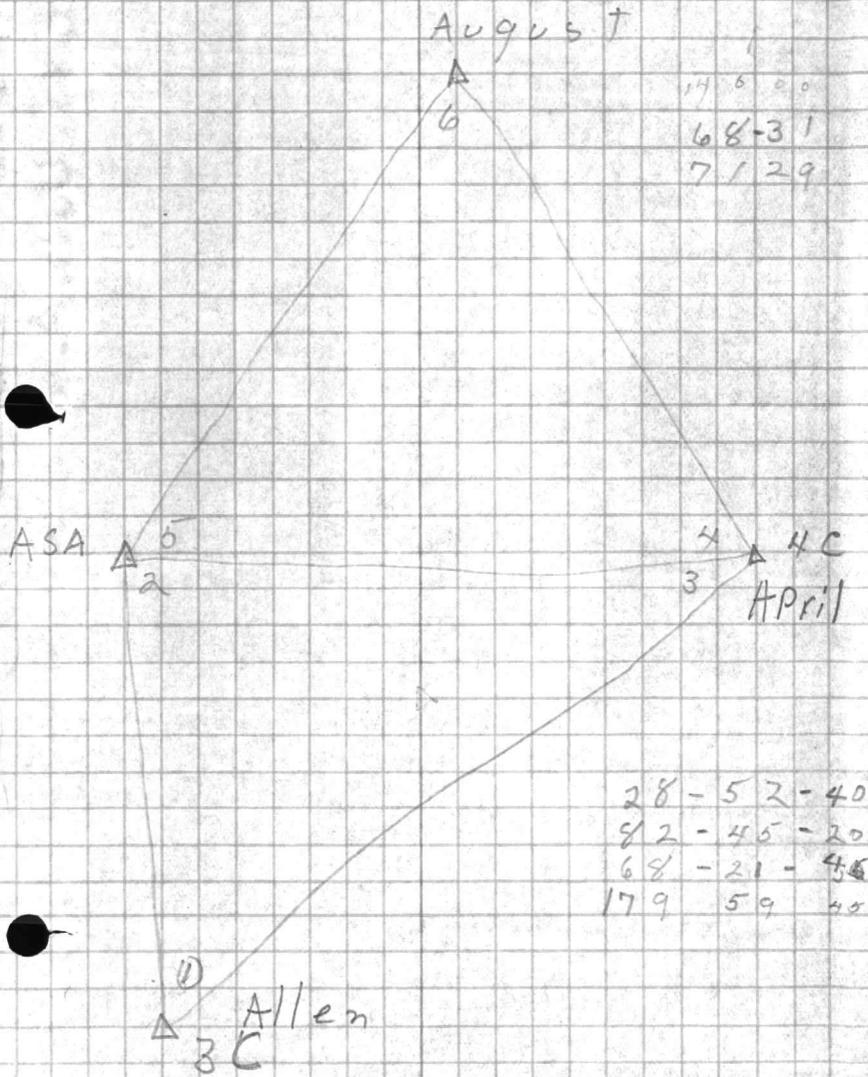
Clear
 Cloudy
 Windy
 Rain
 Fair

Snow
 Hot
 Moderate
 Cold
 Fog

FILE No. _____
 Fldr. No. _____
 Sheet 6
 Date _____ 19__

Quad. No. _____

Station	Dist.	Angle " "	+	H. I. Bearing	Ver: Ang. Diff.	Elevation
①	28	52 45		ASA to 4C		
	86	38				
	28	52 40				
②	68	21 45		4C to 3C		
	205	05 15				
	68	21 45				
③	82	45 15		3C to ASA		
	248	16				
	82	45 20 M				
④	68	31		4C to August		
	225	33				
	68	31				
⑥	40	00		August to 4C		
	119	59 45				
	39	59 55				
⑤	71	29		ASA to August		
	214	29 15				
	71	29 05				



179 60
 68 31
 71 29

AVAILABLE

Result To
Public Works
Other
Dams, Levees
North Carolina

SUBJECT

Station Dist

Angle

Bearing

Vert. Ang. Elevation
Dir.

FIELD PARTY

to Charge _____
Instrument _____
Notes _____
Tape Head _____
Tape or Rod _____
Mounting to _____
Tape No. _____

WEATHER

Snow _____
Cloudy _____
Hazy _____
Windy _____
Rain _____
Fog _____
Figured By _____
Notes Checked By _____
Plotted By _____

FIELD No.

Field No.

Sheet

Date

Quad No.

37
1114

2-2-42

20

PUBLIC WORKS DEPARTMENT
Camp Lejeune, North Carolina
Survey Department

File _____
Quadrangle _____
Date _____
Sheet _____ of _____

Traverse Computation
Description

Station	Distance	Bearing	Cosine	Sine	Latitude	Departure	Y Coordinate North	X Coordinate East
Avery to Aaron		N 75-43-30 W					294,246.53	2,503,911.62
Adam	^{991.69} 991.69	S 57-37-59 W	555.33959	844.63692	^{530.89} 531.10	837.95	297,715.64	2,503,074.00
Ainsworth	^{681.72} 681.72	S 66-51-31 W	39300147	91953784	^{267.91} 268.02	627.17	293,447.73	2,502,447.13
Allen	^{1177.54} 1177.54	N 88-55-44 W	01867394	99982563	22.00	1177.49	293,469.73	2,501,269.79
April	^{2290.37} 2290.43	S 19-04-16 W	94511378	32674141	⁴⁶⁶ 2165.54	748.66	291,305.07	2,500,521.41
August "Ward"	^{1755.53} 1756.92	S 9-39-20 E	98583387	16772472	^{0.68} 1731.38	294.57	289,574.40	2,500,816.09
to A SA		N 30-20-36 E					289,574.40	2,500,816.09
		30-21-34						

VALUABLE

SUBJECT

Stadia Topog

RETURN TO
PUBLIC WORKS
OFFICE
CAMP LEJEUNE
NORTH CAROLINA

East Side of New River Inlet

FIELD PARTY

Dillon IN CHARGE
Dennis INSTRUMENT
NOTES
Psdrick TAPE READ
TAPE OR ROD
INSTRUMENT NO.
TAPE NO.

WEATHER

CLEAR
CLOUDY
WINDY
RAIN
FAIR
SNOW
HOT
MODERATE
COLD
FOG

FILE No. *240-601*

FLDR. No. _____

FIGURED BY _____

SHEET *#1 of*

NOTES CHECKED BY _____

PLOTTED BY _____

DATE *5/20* 19 *55*

Quad. No. _____

STATION	DIST.	ANGLE ° ' "	+	H. I. BEARING	VER. ANG. DIFF.	ELEVATION
---------	-------	----------------	---	------------------	--------------------	-----------

*T at Triangulation Sta. for soundings on East Side of New River Inlet.
Sight on Water Tank at Courthouse Bay.*

*1st. 107° 17' 45" Clockwise
Doble 214° 35'*

*to
T. B. M.*

T at T. B. M.

*Sight on Tri. Sta. 4.31 Top of Hub.
5.24 9.55*

Clockwise Angles.

<i>183'</i>	<i>89° 26'</i>			<i>6.4</i>	<i>3.1</i>	
<i>380'</i>	<i>"</i>			<i>5.0</i>	<i>4.5</i>	
<i>412'</i>	<i>"</i>			<i>2.8</i>	<i>6.7</i>	
<i>515'</i>	<i>117° 25'</i>			<i>1.2</i>	<i>8.3</i>	
<i>465'</i>	<i>"</i>			<i>4.6</i>	<i>4.9</i>	
<i>410'</i>	<i>"</i>			<i>3.0</i>	<i>6.5</i>	
<i>385'</i>	<i>"</i>			<i>4.4</i>	<i>5.1</i>	
<i>345'</i>	<i>"</i>			<i>2.1</i>	<i>7.4</i>	
<i>305'</i>	<i>"</i>			<i>3.8</i>	<i>5.7</i>	
<i>280'</i>	<i>"</i>			<i>5.3</i>	<i>4.2</i>	
<i>170'</i>	<i>"</i>			<i>6.1</i>	<i>3.4</i>	
<i>200'</i>	<i>139° 45'</i>			<i>6.0</i>	<i>3.5</i>	
<i>270'</i>	<i>"</i>			<i>5.0</i>	<i>4.5</i>	
<i>320'</i>	<i>"</i>			<i>3.6</i>	<i>5.9</i>	
<i>370'</i>	<i>"</i>			<i>2.9</i>	<i>6.6</i>	
<i>385'</i>	<i>"</i>			<i>3.9</i>	<i>5.6</i>	
<i>415'</i>	<i>"</i>			<i>2.8</i>	<i>6.7</i>	
<i>465'</i>	<i>"</i>			<i>1.3</i>	<i>8 2</i>	

270° - 100' 0.0 Elev.

Bottom of 8 ft. Dune "A" 50' Dia.

VALUABLE

SUBJECT _____

RETURN TO
PUBLIC WORKS
OFFICE
CAMP LEJEUNE
NORTH CAROLINA

FIELD PARTY

IN CHARGE

INSTRUMENT

NOTES

TAPE READ

TAPE OR ROD

TAPE OR ROD

INSTRUMENT NO.

TAPE NO.

WEATHER

CLEAR
CLOUDY
WINDY
RAIN
FAIR

SNOW
HOT
MODERATE
COLD
FOG

FILE No. _____

F.L.R. No. _____

FIGURED BY _____ SHEET #2

NOTES CHECKED BY _____

PLOTTED BY _____ DATE _____ 19__

Quad. No. _____

STATION	DIST.	ANGLE ° ' "	+	H. I. BEARING	VER. ANG. DIFF.	ELEVATION
				9.55		
	550'	153° 21'			0.8	8.7
	470'	"			2.5	7.0
	450'	"			4.1	5.4
	390'	"			2.5	7.0
	320'	"			4.2	5.3
	300'	"			5.2	4.3
to P.I. #1	675'	166° 54'			4.3	5.2
at P.I. #1				Backsight on T.B.M. 5.8 10.0		
	60'	270°			6.0	4.0
	150'	"			10.0	0.0
	75'	61° 29'			2.7	7.3
	125'	"			3.7	6.3
	160'	"			1.0	9.0
	205'	"			4.8	5.2
	240'	"			2.7	7.3
	290'	"			2.6	7.4
	295'	95° 40'			2.3	7.7
	260'	"			3.0	7.0
	220'	"			3.7	6.3
	170'	"			1.3	8.7

Edge between Dunes "A" & "B"
Bottom of 12 ft. Dune "B" 40' Dist.

4.3 5.2
5.8 9.5
10.1 10.0

Edge of 6 ft. Dune 100 ft. Dist. "C"

WATER
PLANT TO
FEDERAL WORKS
AGENCY
NORTH CAROLINA

DATE
TIME

VERIFIED BY
SIGNATURE

FIELD PARTY
SUPERVISOR
DATE
TIME

WEATHER
WIND
TEMP
HUMIDITY
CLOUDS
MOON
STAR

PROJECT NO.
SHEET NO.
DATE
TIME



VALUABLE

SUBJECT _____

RETURN TO
PUBLIC WORKS
OFFICE
CAMP LEJEUNE
NORTH CAROLINA

FIELD PARTY

IN CHARGE

INSTRUMENT

NOTES

TAPE READ

TAPE OR ROD

TAPE OR ROD

INSTRUMENT NO.

TAPE NO.

WEATHER

CLEAR

CLOUDY

WINDY

RAIN

FAIR

SNOW

HOT

MODERATE

COLD

FOG

FIGURED BY

NOTES CHECKED BY

PLOTTED BY

DATE

FILE No. _____

FLDR. No. _____

SHEET # 3

DATE _____ 19__

Quad. No. _____

STATION	DIST.	ANGLE ° ' "	+	H. I. BEARING	VER. ANG. DIFF.	ELEVATION
				10.0		
# at P.M. 41	90'	95° 40'			2.7	7.3
	120'	135° 29'			2.9	7.1
	180'	"			1.9	8.1
	225'	"			4.3	5.7
	275'	"			2.3	7.7
	325'	"			3.8	6.2
	485'	157° 51'			3.0	7.0
	380'	"			3.0	7.0
	250'	"			3.5	6.5
	170'	175° 34'			4.4	5.6
	315'	"			4.9	5.1
	440'	"			4.9	5.1

Edge of 6 ft. Dune same Dune "C"

Dunes washed away
for 1200' East.

RECEIVED
FEDERAL BUREAU OF INVESTIGATION
U. S. DEPARTMENT OF JUSTICE
WASHINGTON, D. C.

STATION DATE
LATITUDE
LONGITUDE
ELEVATION
MAGNETIC VARIATION
MAGNETIC DIRECTION

FIELD PARTY
IN CHARGE
THEIR NAME
NOTES
TAPES READ
TAPES ON HAND
TAPES ON FOOT
STATION NO.
TAPES NO.

WEATHER
CLEAR
CLOUDY
WINDY
RAIN
FOG
THUNDER
LIGHTNING
HAIL
SNEEZE
OTHER

FIELD NO.
DATE
TIME
MAGNETIC VARIATION
MAGNETIC DIRECTION

STATION
DATE
TIME
WIND
TEMP
PRES

STATION DATE TIME WIND TEMP PRES

WIND DIRECTION
WIND FORCE
WIND VELOCITY
WIND STATE
WIND GUSTS
WIND SQUALLS
WIND BURSTS
WIND LULLS
WIND CALMS
WIND OTHER

WIND DIRECTION
WIND FORCE
WIND VELOCITY
WIND STATE
WIND GUSTS
WIND SQUALLS
WIND BURSTS
WIND LULLS
WIND CALMS
WIND OTHER



NORTH CAROLINA SHORE LINE, BEACH EROSION STUDY

LETTER

FROM

THE SECRETARY OF THE ARMY

TRANSMITTING

A LETTER FROM THE CHIEF OF ENGINEERS, UNITED STATES ARMY, DATED DECEMBER 5, 1947, SUBMITTING A REPORT, TOGETHER WITH ACCOMPANYING PAPERS AND ILLUSTRATIONS ON A COOPERATIVE BEACH EROSION STUDY OF CERTAIN PORTIONS OF THE SHORE LINE OF NORTH CAROLINA, MADE UNDER THE PROVISIONS OF SECTION 2 OF THE RIVER AND HARBOR ACT APPROVED JULY 3, 1930, AS AMENDED AND SUPPLEMENTED

(Pursuant to Public Law 296, 80th Cong.)

DECEMBER 22, 1948.—Referred to the Committee on Public Works and ordered to be printed, with 13 illustrations

DEPARTMENT OF THE ARMY,
Washington, D. C., December 9, 1948.

THE SPEAKER OF THE HOUSE OF REPRESENTATIVES.

DEAR MR. SPEAKER: I am transmitting herewith a report dated December 5, 1947, from the Chief of Engineers, United States Army, together with accompanying papers and illustrations, on a cooperative beach-erosion study of certain portions of the shore line of North Carolina, made under the provisions of section 2 of the River and Harbor Act approved on July 3, 1930, as amended and supplemented.

The Bureau of the Budget advises that there is no objection to the submission of the report to Congress.

Sincerely yours,

KENNETH C. ROYALL,
Secretary of the Army.

DEPARTMENT OF THE ARMY,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, D. C., December 5, 1947.

Subject: Beach-erosion study, shore line of North Carolina.
To: The Secretary of the Army.

1. I submit for transmission to Congress my report with accompanying illustrations, on a beach-erosion study of certain portions of the shore line of North Carolina, made by the Beach Erosion Board in cooperation with the State of North Carolina, under the provisions of section 2 of the River and Harbor Act approved July 3, 1930, as amended and supplemented.

2. The investigation covered the shore line of the State with particular reference to four detached portions as follows:

(a) From Paul Gamiels Hill Coast Guard Station, about 4 miles northerly of Kitty Hawk Beach downcoast to New Inlet, about 34 miles;

(b) Atlantic Beach for about 4 miles west from Fort Macon Point at the west side of Beaufort Inlet;

(c) Wrightsville Beach, including Moore and Masonboro Inlets, about 3 miles; and

(d) Carolina Beach and the beach in front of Fort Fisher, about 7 miles.

Except for the shore from Carolina Beach to Fort Fisher, which lies on the mainland peninsula separating Cape Fear River from Atlantic Ocean, all the areas studied lie on relatively narrow barrier beaches. These barriers are separated from the mainland by tidal sounds interconnected by a navigation channel maintained as an integral part of the federally improved Intracoastal Waterway.

3. The purpose of the Board's study was to obtain data which would contribute to the advancement of the technical knowledge of the processes of North Carolina beach and inlet changes, be useful in planning for the proper development of the beaches as recreational areas and serve as a guide for further cooperative studies. The Board has reviewed the geological history of the area and has studied the tides, currents, winds and wave action, changes in hydrographic detail, movement of beach material and effect of storms on the shore. These technical data are summarized in its report.

4. The Board concludes that (a) the data obtained, although inadequate for the formulation of definite conclusions concerning the technical phases of shore processes, will be of value in connection with laboratory and field studies now being undertaken by the Board for the further development of the science of shore protection; (b) the ocean shore line of North Carolina is, in general, retreating slowly and will continue to retreat; (c) protection of the entire length of the study area is unwarranted at this time; (d) existing dunes afford valuable protection and should be preserved; (e) threatened structures or low portions of the barrier can be protected by dunes constructed artificially or formed by sand fences or planting; (f) histories of accretion and erosion of the shore line should be considered in planning future development; (g) stabilization of inlets is generally impracticable, but partial control of inlet changes may be effected by dune building to prevent breaching or by excavation to facilitate breaching by natural forces where desired.

5. The Board further concludes that the justification of protective measures for Fort Macon Point may be the subject of further study if desired by the State, that at Wrightsville Beach existing protective measures should be maintained, that the north shore of Masonboro

Inlet should be stabilized by revetment, and that closure of Moore Inlet would be beneficial to Wrightsville Beach. Copy of the Board's report has been furnished the cooperating agency.

6. The Board also states that, as the application by the State of North Carolina for this study was made prior to enactment of legislation requiring a statement of the Board's opinion as to the public interest involved in any improvement, no item was included for study of estimated costs and benefits on which to base an evaluation of such interest. The State, informed of the additional work necessary to evaluate the public interest, indicated it desired no additional work under the study for this purpose and agreed to the scope of the report herewith. The Board therefore is unable at this time to state its opinion as to the extent of public interest, the advisability of adopting a Federal project for participation in the first cost of protective works, or what share, if any, of the expense of such works should be borne by the United States. It is the opinion of the Board that under existing law no Federal interest is involved in any of the improvements considered. If additional cooperative studies of localities on the North Carolina coast are arranged, they will include when requested by the cooperating agency the determination of possible Federal aid under the provisions of Public Law 727, Seventy-ninth Congress, approved August 13, 1946.

7. Public Law 727, Seventy-ninth Congress, declared it to be the policy of the Federal Government to assist in the construction, but not the maintenance, of works for the improvement and protection against erosion by waves and currents of the shores of the United States that are owned by States, municipalities, or other political subdivisions. The Federal contribution toward the construction of protective works for such publicly owned shores is limited by that law to not more than one-third of the first cost. Federal participation in the construction of works for protecting privately owned shores is not authorized by the afore-mentioned act.

8. After due consideration of the report, I concur in the views and conclusions of the Board. Because of the general value of this report, I recommend that it be published with illustrations.

R. A. WHEELER,
Lieutenant General,
Chief of Engineers.

REPORT OF THE BEACH EROSION BOARD

SYLLABUS

This report covers study of the coast of North Carolina with particular reference to four detached areas. The objectives of the investigation were (a) to obtain data which would contribute to the advancement of the technical knowledge of the processes of beach changes, and (b) to obtain data useful in planning for the proper development of the beaches as recreational areas.

The Board concludes that (a) the data obtained, although inadequate for the formulation of definite conclusions concerning the technical phases of shore processes, will be of value in connection with laboratory and field studies now being undertaken by the Board for the further development of the science of shore protection; (b) the ocean shore line of North Carolina is, in general, retreating slowly and will continue to retreat; (c) protection of the entire length of the study area is unwarranted at this time; (d) existing dunes afford valuable protection and should be preserved; (e) threatened structures or low portions of the barrier can be

protected by dunes constructed artificially or formed by sand fences or planting; (f) histories of accretion and erosion of the shore line should be considered in planning future development; (g) stabilization of inlets is generally impracticable, but partial control of inlet changes may be effected by dune building to prevent breaching or by excavation to facilitate breaching by natural forces where desired.

The Board further concludes that the justification of protective measures for Fort Macon Point may be the subject of further study if desired by the State, and that at Wrightsville Beach existing protective measures should be maintained and the north shore of Masonboro Inlet should be stabilized by revetment. Closure of Moore Inlet would be beneficial to Wrightsville Beach.

As this study did not include an item for evaluation of the public interest involved in improvement of these shores, the Board is unable to state its opinion as to the extent of that interest, the advisability of adopting a Federal project for participation in the first cost of protective works, or what share, if any, of the expense of such works should be borne by the United States.

WAR DEPARTMENT,
BEACH EROSION BOARD,
Washington, D. C., May 22, 1947.

Subject: Beach erosion report on cooperative study of the shore line of the State of North Carolina.

To: The Chief of Engineers, United States Army.

I. GENERAL

1. *Authority.*—This cooperative study of the North Carolina shore has been made by the United States (acting through the Chief of Engineers, the Beach Erosion Board, the division engineer, South Atlantic Division, and the district engineers at Norfolk, Va., and Wilmington, N. C.), and the State of North Carolina (acting through its Department of Conservation and Development) under authority of section 2 of the River and Harbor Act approved July 3, 1930 (Public No. 520, 71st Cong.), as amended and supplemented. Formal application for the investigation was made by the North Carolina Department of Conservation and Development to the district engineers at Norfolk, Va., and Wilmington, N. C., on January 13, 1936. The Norfolk and Wilmington districts' portions of the study were approved by the Chief of Engineers on February 6 and 17, 1936. Modification of the scope of the work and of the cooperative agreement, requested by the State on May 5, 1937, was approved by the Chief of Engineers on June 4, 1937.

2. *Purpose.*—As stated in the letters of application and subsequent correspondence, the study was intended to cover investigations as to the cause and extent of beach erosion and inlet changes along the coast of North Carolina with particular reference to the following four detached areas:

- (a) From Paul Gamiels Hill Coast Guard Station to and including New Inlet, about 34 miles;
- (b) Atlantic Beach from Fort Macon Point to and including the beach in front of the Atlantic Beach Hotel, about 4 miles;
- (c) Wrightsville Beach including both inlets, about 3 miles; and
- (d) Carolina Beach and the beach in front of Fort Fisher, about 7 miles.

The distances along shore between the foregoing detached study areas are approximately as follows: (a) to (b), 120 miles; (b) to (c), 70 miles; and (c) to (d), 9 miles. The application contemplated that this study would constitute a continuation of the studies previously reported on, as described in the following paragraph. It was felt that such continued studies would provide a marked contribution to beach-erosion

technology, as well as to specific purposes. Subsequent correspondence between the State and the Board indicated a desire that the data secured would be useful in State planning to assure an orderly and properly controlled development of the beaches as recreational areas, and to prevent mistakes which usually result from unplanned development. To secure these results, the study covers the general character of past shore changes, the causes of such changes, the probable future trends, and the need for protective works. The original application proposed a continuing study to be terminated at the pleasure of either cooperating agency. As application for this study was made prior to enactment of Public Law 727, Seventy-ninth Congress on August 13, 1946, the outline of work did not include an item for evaluation of the public interest in improvement of these shores, upon which a recommendation for Federal participation in the cost of construction could be based. At a meeting held on October 10, 1946, it was agreed between representatives of the State and of the Beach Erosion Board that a complete report on work covered to date would be prepared as a guide to future studies, without data on which to base a determination of public interest. The State indicated its inability at that time to request additional work under the study, and confirmed the acceptability of a report of the scope proposed by letter of January 9, 1947 thereby waiving any rights to Federal participation under the present study.

3. *Prior reports.*—There have been prior Beach Erosion Board reports on three localities in North Carolina as follows:

(a) *Fort Fisher, 1931.*—A report published in House Document No. 204, Seventy-second Congress, first session, recommended protection of Fort Fisher by a bulkhead and four groins of steel sheet-pile construction.

(b) *Wrightsville Beach, 1934.*—A report published in House Document No. 218, Seventy-third Congress, second session, recommended protection of Wrightsville Beach by artificial fill, a bulkhead, and 16 groins of steel sheet-pile construction.

(c) *Kitty Hawk, Nags Head, and Oregon Inlet, 1935.*—A report published in House Document No. 155, Seventy-fourth Congress, first session, discussed means of increasing the salinity of Albemarle and Pamlico Sounds waters. The Board considered it advisable for the State to keep well informed as to the condition of New Inlet by periodic surveys, and to have funds available for maintenance dredging in case it showed signs of closing.

4. In addition to the foregoing reports on beach erosion, War Department reports have been prepared on proposed navigation improvements at localities within the area of this study. The findings and recommendations of pertinent reports have been reviewed insofar as they bear upon problems here involved and are summarized as follows:

(a) *Beaufort Inlet, 1881.*—A report published on pages 1013 to 1017 of the Annual Report of the Chief of Engineers for 1881 stated that five short stone jetties previously built at Fort Macon Point had served their purpose of preserving the site. It recommended installation of three similar stone jetties each 200 feet long on Shackelford Point.

(b) *Beaufort Inlet, 1934.*—An unpublished report by the Shore Protection Board (Beach Erosion Board) included data indicating a predominant eastward littoral drift averaging 29,500 cubic yards per year at Fort Macon Point, Beaufort Inlet. It was the opinion of the Board that a safe and reliable channel 25 feet deep could be maintained across the ocean bar at this inlet by dredging alone, but that a deeper channel would require the construction of two jetties.

5. The inlets of the North Carolina coast have also been the subject of a report to the North Carolina Fisheries Commission Board. This report, published in 1923 by that board and entitled "Additional

Inlets on the North Carolina Coast," includes a report by B. S. Drane on the proposal to open additional inlets. Of the proposed locations north of Cape Lookout, the report found that New Inlet could be opened at the lowest cost, but that conditions were not favorable for long life of an inlet at that location.

6. *Description.*—The ocean shore line of North Carolina is shown on United States Coast and Geodetic Survey Charts Nos. 1227, 1229, 1232, 1233, 1234, 1235, and 1236, and on plate I of this report. It has a total length of approximately 330 miles, almost all of which consists of barrier beach separated from the mainland by lagoons or sounds. The barrier beach is not continuous, but is broken by many tidal inlets which connect the inner waters with the ocean. These inlets have a long history of migration, closure, and reopening. Figure 1 is an aerial view of Oregon, New, and Beaufort Inlets. Severe storms frequently cause new openings through the beach, which varies in width from a few hundred feet to several miles and is composed principally of sand. Sand dunes averaging from 10 to 20 feet high exist along most of the beach. A few large dunes rise to 75 feet or more.

7. From the Virginia line to Beaufort Inlet, the water areas behind the barrier consist of large shallow sounds, connecting waterways, and estuaries. In order from the north, they are Back Bay, which lies principally in Virginia, at the north end of which the barrier separates from the mainland; Currituck Sound, about 30 miles long from north to south, and averaging 4 miles wide; Albemarle Sound with a maximum width of about 13 miles and extending westward inland about 55 miles; Croatan and Roanoke Sounds, relatively narrow bodies of water lying respectively west and east of Roanoke Island; Pamlico Sound, the largest of all, and finally Core and Back Sounds. Albemarle and Pamlico Sounds extend deeply into the State and receive the drainage of large rivers. Croatan and Roanoke Sounds are in effect two straits connecting Albemarle and Pamlico Sounds. Currituck Sound and Back Bay form a narrow arm of Albemarle Sound, extending northward behind the barrier beach. Core and Back Sounds average about 3 miles in width and have a combined length of about 36 miles from Pamlico Sound to Beaufort Inlet. The maximum depth of these sounds is about 20 feet, the average probably about 10 feet.

8. The land areas of eastern North Carolina are generally low, sometimes marshy, and frequently wooded. The population is rather sparse, especially in areas on and near the barrier, although farther to the west, on the mainland shores of Albemarle and Pamlico Sounds, there is considerable farming and some lumbering. Several small prosperous communities are located there. The fish of these waters and the game birds that visit them on their annual migration are important elements in the economic life of the territory, both as a food supply and as an attraction to sportsmen.

9. Within the eastern coastal portion of the State, there are two points of considerable historical interest. South of Kitty Hawk are located the high sand dunes known as Kill Devil Hills, from which the Wright brothers took off on their first airplane flights. A monument to the Wright brothers has been erected on one of the dunes. About 10 miles south of Kill Devil Hills, and at the north end of Pamlico Sound, lies Roanoke Island, reported to have been the location of the first English-speaking settlement in America. At Fort

Raleigh, a State reservation at the north end of this island, there is a stone monument commemorating the birth in 1587 of Virginia Dare, the first white child of English colonists born in America. These two historic points are reached by the Wright Memorial Bridge across Currituck Sound and by a hard-surfaced highway, known as Virginia Dare Trail, along the barrier beach.

10. Atlantic Beach, a small recreational beach resort on the barrier beach known as Bogue Banks, extends about 4 miles west of Beaufort Inlet. This inlet and Atlantic Beach are shown on figure 1.¹ The barrier is separated from the mainland by Bogue Sound, which averages about 1 mile in width. A highway bridge connects Atlantic Beach with the mainland highway system at Morehead City on the north side of Bogue Sound. Morehead City and Beaufort, located respectively on the west and east sides of the estuary known as Newport River, had a combined population of about 7,000 in 1940.

11. Wrightsville Beach is an incorporated town having a summer population of about 4,000. It occupies the entire island of the same name, which is about 3 miles long and has a width varying from about 250 to 1,500 feet. The island is a typical part of the barrier beach, separated from other portions of the beach by Moore Inlet at its north end, by Masonboro Inlet to the south, and from the mainland by a sound about 1¼ miles in width, which consists of open channels, salt marsh, and small islands. Wrightsville Beach and the inlets are shown on figure 2.¹

12. Wrightsville is the largest and most important beach resort in North Carolina. The Atlantic Coast Line and Seaboard Air Line railways have terminals at Wilmington, about 8 miles to the west from which the beach is accessible by paved highways. The resort draws visitors from all parts of the State and from other States. Adequate hotel and other accommodations are available. The beach is open to the public without restriction.

13. Carolina Beach is on the ocean front of the mainland peninsula which separates Cape Fear River from the ocean. It is about 15 miles south of Wilmington. The peninsula is about 1.5 miles wide at Carolina Beach. The town is a small resort area. Figures 3¹ and 4¹ are aerial views of the coastal area from Carolina Beach to Fort Fisher.

14. Fort Fisher is also located on the ocean front of the peninsula separating Cape Fear River from the ocean. It is located at Federal Point, about 5 miles south of Carolina Beach and 9 miles north of Cape Fear. The fort, constructed by the Confederate Army during the Civil War, has been destroyed by erosion of the ocean shore line.

15. *Geology.*—The area under study is part of the coastal plain, which is the name applied to the low and partially submerged area of width varying up to 125 miles confined between the Piedmont Plateau on the west and the Continental Shelf on the east. The area of the plain exceeds 20,000 square miles in the State, or about 40 percent of the State's total area. A series of marine deposits attesting to several cycles of uplift and submergence were deposited upon the ancient rocks of the area. The source of these materials was probably adjacent portions of the Piedmont Plateau. The fluctuations in sea level appear to be correlated with the Pleistocene glacial and interglacial

¹ Not printed.

stages during which great quantities of water were alternately withdrawn and returned to the sea by the freezing and melting of the continental ice sheets.

16. The coastal plain area of North Carolina was submerged in early Pleistocene time. With each emergence and subsequent submergence increasingly larger areas were left above the sea. Several well-defined terraces have been recognized in North Carolina. The seaward part of the coastal plain was covered by a thin mantle of the lowest of these terraces—the Pamlico. This covering, composed almost entirely of sand, was deposited by waves and currents during the flooding attending the last interglacial stage. When, finally, the sea withdrew during the last glacial stage (the Wisconsin), it never rose again to a level higher than its present one.

17. Along the emergent coast of North Carolina with its gently sloping shore covered by the sandy Pleistocene formations, barrier beaches have formed under wave and current action in geologically recent times. They are composed of recent marine deposits consisting of sand and shell in varying mixtures. Available evidence is not conclusive as to the source of the sand. At the present time, material moves southward from the beaches as far north as Cape Henry at the south side of the Chesapeake Bay entrance. Some authorities doubt that the extensive barrier beaches could have been formed in this manner. They believe that the barriers are composed of material reworked from other deposits in the vicinity, the bar being thrown up to restore a stable gradient where the slope of the emerging offshore bottom was too flat.

18. Along the north shore of Roanoke Island, there are some large sand dunes, now largely covered with foliage, which are indicative of the seacoast line. They could not have formed on the shore of the sound under existing conditions. Albemarle Sound is the sunken valley of the Roanoke River, which evidently once flowed to the sea past the present location of Nags Head. Roanoke Island was then simply a part of the south shore of the estuary. Croatan Sound was evidently only a low place in the divide between the Albemarle and Pamlico estuaries. Roanoke Sound and the barrier beach at Nags Head did not then exist. During this period the dunes on Roanoke Island were formed. The formation of the barrier beach reclaimed Currituck and Roanoke Sounds from the ocean and closed the entrance to Albemarle Sound, thus shutting Roanoke Island off from the sea.

19. *Composition of beaches.*—The composition of the beaches was determined by test of samples taken generally at mid-tide level. In the area from Paul Gamiels Hill Coast Guard Station to New Inlet the sand was generally a medium size with median diameters between 0.5 and 0.4 millimeter. The shell content was generally less than 3 percent. At Atlantic, Wrightsville, and Carolina Beaches and at Fort Fisher, the sand was also generally of medium size with median diameters of 0.2 to 0.3 millimeter, except that a few samples with shell contents of 22 to 35 percent had median diameters between 0.4 and 0.7 millimeter. There is a ledge of coquina rock exposed on the beach to the north of Fort Fisher. A tabulation giving the location and analysis data for samples is included as Appendix A.¹

¹ Not printed.

II. FACTORS AFFECTING SHORE PROCESSES

20. *Winds and storms.*—Records of the United States Weather Bureau stations at Hatteras and Wilmington, N. C., were used in compiling the wind data for this study. In addition, offshore wind charts of the United States Hydrographic Office were included in the study. Hurricane paths and frequency were also examined. (See pl. II.)

21. Wind data for Hatteras have been considered applicable to the shore north of Cape Lookout, those for Wilmington applicable to the shore south of Cape Lookout. The portion of the coast north of Cape Hatteras is exposed to waves induced by winds from the north through east to south. South of Cape Hatteras, the coast generally is exposed to waves induced by winds from the northeast through east and south to southwest. The exposure to waves created by winds from the northeast, east, and southeast is over the practically unlimited fetch across the Atlantic Ocean. Fetches to the south and southwest are less, but still are extensive.

22. Of the waves that affect the shore north of Cape Hatteras those formed by winds from the north and northeast are more frequent and stronger than those from the east, southeast and south, as shown by the wind diagram for Hatteras and by the offshore wind chart. Of the winds that produce waves which affect the shore south and west of Cape Lookout, the lighter winds tending to produce northward drift and those tending to produce southward drift are about equal, but of the stronger winds, those tending to produce northward and eastward drift are more frequent, as shown by the wind diagram for Wilmington.

23. Records of the United States Weather Bureau station at Hatteras show that between 1911 and 1935 there were 52 storms with wind velocities of over 45 miles per hour. The following table shows the occurrence of these storm winds by months with the average velocity of the winds for each month. Although there were more storms in March than in any other month, those in August and September had higher wind velocities.

Month	Number of winds over 45 miles per hour	Average wind velocity	Month	Number of winds over 45 miles per hour	Average wind velocity
January.....	5	49	August.....	7	53
February.....	4	49	September.....	6	61
March.....	13	49	October.....	1	45
April.....	3	48	November.....	6	49
May.....	0	-----	December.....	4	49
June.....	2	49	Total.....	52	-----
July.....	1	45			

The directions of these storm winds were as follows:

Direction.....	N	NE	E	SE	S	SW	W	NW
Number of storms.....	11	4	1	4	1	3	9	19

24. Of the storms in the North Carolina coastal area from 1879 to 1943, 16 were tropical storms of hurricane intensity. The variation in frequency of these storms from 1879 to 1941 by months was as follows:

July.....	1	September.....	8
August.....	5	October.....	1

The paths of the major tropical storms affecting the coastal region of North Carolina during the past 70 years are shown on Plate II.

25. *Effects of storms.*—The major changes in the barrier beach, such as opening and closing of inlets, occur during storms. The most notable storms in this respect during this century occurred in January 1922 when New Inlet closed, in March 1932 when New Inlet reopened, and in September 1933 when Drum Inlet was cut through the beach. In each of these cases of breaching of the barrier, the breach was caused by washing from the sound to the ocean and not by high water in the ocean. A change in direction of the storm wind, which had driven the sound water away from the barrier, swept the water back rapidly, overtopping the beach from the sound side. Appendix B¹ contains available date on storms and their effects on the beaches for the past 70 years. Figures 5 and 6 illustrate the erosive effects of storm waves on the beach and bluff in the vicinity of Kure Beach and at Fort Fisher during the fall of 1946.

26. *Swells.*—The swell diagrams shown on Plate II were compiled from records of the United States Hydrographic Office. The data from which the swell diagrams were derived were obtained by ships operating offshore within the entire area between latitudes 30° and 39° N. and from the shore eastward for an average distance of about 5°. The data thus secured include swells moving from the direction of the land, which do not exist along the shore, and which obviously would have no effect on the shore in the study area.

27. For the portion of the study area north of Cape Hatteras the swell diagram indicates for swell movements toward shore a preponderance of light swells that would tend to produce northward littoral drift, but a far greater predominance of medium and heavy swells from directions that would tend to cause southward drift. For the Atlantic Beach area the swell diagram indicates that the effective swells of all magnitudes are from the east and southeast. For the remainder of the study area, comprising Wrightsville and Carolina Beaches, swells of all magnitudes are more frequent from directions that would tend to produce southward littoral drift.

28. *Tides.*—The tides along the outer coast of North Carolina and in the inlets, as given in the United States Coast and Geodetic Survey Tide Tables, are as follows:

Location	Tidal ranges in feet	
	Mean	Spring
Currituck Beach Light.....	3.6	4.3
Oregon Inlet.....	1.8	2.2
Cape Hatteras.....	3.6	4.3
Cape Lookout.....	3.7	4.4
Beaufort.....	2.5	3.0
Bogue Inlet.....	2.2	2.6
Moore Inlet.....	3.8	4.5
Carolina Beach.....	4.2	4.8
Cape Fear.....	4.5	5.1

¹ Not printed.

It will be noted that the mean tidal range in the ocean gradually increases from about 3½ feet near the Virginia State line to about 4½ feet near the South Carolina line. The ranges in the inlets close to the ocean are generally considerably smaller than those in the ocean outside, depending on the size of the inlet and of the sound connected thereto, and the proximity of the point of observations to the ocean. In the larger sounds regular tides are observed only at locations close to the inlets. Elsewhere in those sounds the major fluctuations in surface elevations are caused by variations in winds and barometric pressures.

29. Higher tides in the ocean and sounds occur occasionally as a result of storms. The following tabulation contains reported extreme tidal heights for several coastal localities:

Location	Date	Tidal height in feet above mean low water
Pamlico Sound at New Inlet.....	Mar. 6, 1932.....	12
Ocean at Hatteras.....	Sept. 14, 1944.....	7
Core Sound at Atlantic.....	Sept. 16, 1933.....	8
Core Sound near Drum Inlet.....	do.....	15
Cape Lookout Bight.....	Aug. 18, 1879.....	10.7
Wrightsville Beach.....	Occasional.....	8
Zeke Island, Cape Fear River.....	Oct. 13, 1893.....	7.8

It will be noted that the two highest tides reported are those in the sounds just inside the barrier beach, and that these two caused the opening of New and Drum Inlets.

30. *Offshore currents.*—An extensive study of ocean currents at lightships off the North Carolina coast has been made by the United States Coast and Geodetic Survey. Observations were made for 175 months from 1909 to 1928 at Diamond Shoal Lightship about 13 miles southeast of Cape Hatteras, for 13 months in 1918 and 1919 at Cape Lookout Shoals Lightship about 19 miles south of Cape Lookout, and for 37 months from 1912 to 1921 at Frying Pan Shoals Lightship about 18 miles south of Cape Fear. Analysis of the currents revealed that the tidal components are of the rotary type and are weak. The velocities were from 0.03 to 0.04 knot at Diamond Shoal, from 0.07 to 0.18 knot at Cape Lookout Shoals, and from 0.19 to 0.32 knot at Frying Pan Shoals. Somewhat higher velocities were observed for the latter two stations during an earlier short period of observations. Analysis of the nontidal currents by months revealed seasonal differences in direction, as shown by current diagrams on plate II. The velocities of nontidal currents varied from 0.13 knot in September to 0.83 knot in July at Diamond Shoal, from 0.15 knot in November to 0.51 knot in July at Cape Lookout Shoals, and from 0.03 knot in September to 0.45 knot in July at Frying Pan Shoals. The effect of the Gulf Stream is evident at Diamond Shoal, as the currents flow approximately northeastward during all months of the year. A study of the relation between winds and currents was also made. It indicated that current velocities in knots averaged from 1.7 to 2.6 percent of the wind velocities in statute miles per hour, and that on the average the currents set from 18° to 20° to the right of the wind direction.

31. *Littoral currents.*—Observations of currents were made at Nags Head, at Atlantic, Wrightsville and Carolina Beaches, and at Fort Fisher. Subsurface floats were used offshore and colored water was used inside the breakers. The floats moved generally parallel to the shore except at slack water, when their movements were erratic. The tabulation on the following page summarizes general information regarding these observations. More detailed data are included as appendix C.¹ The data secured are too incomplete to form the basis of definite conclusions as to directions and strengths of currents. At Nags Head the currents flowed northward on the rising tide. On the ebb the floats moved southward, but the colored water moved northward. At Atlantic Beach currents were eastward on the flood, as might be expected just to the west of Beaufort Inlet. On the ebb the floats moved westward, but the colored water moved eastward with light northwest winds and failed to move with light southeast winds. At Wrightsville Beach the tidal currents are apparently weak, as the floats moved southwest on both flood and ebb tides, light north to east winds during the ebbs probably controlling their direction. Colored water moved northeast on both flood and ebb tides. At Carolina Beach all currents observed moved northward, probably as a result of light to moderate southerly winds. At Fort Fisher the floats moved generally southward during both flood and ebb tides, while the colored water moved northward during the same period. Probably the direction of wave approach, no data on which were obtained, was the controlling influence on direction of currents observed by means of colored water inside the breakers.

NAGS HEAD

Tide	Method	Current direction	Maximum velocities (feet per minute)	Wind
Flood	Floats	North	70 to 89	Light southeast to southwest.
	Colored water	do.	56 to 69	Do.
Ebb	Floats	South	45 to 79	Do.
	Colored water	North	32 to 98	Do.

ATLANTIC BEACH

Tide	Method	Current direction	Maximum velocities (feet per minute)	Wind
Flood	Floats	East	52 to 94	Light variable.
	Colored water	do.	0 to 248	Do.
Ebb	Floats	West	30 to 37	Do.
	Colored water	East	0 to 133	Do.

WRIGHTSVILLE BEACH

Tide	Method	Current direction	Maximum velocities (feet per minute)	Wind
Flood	Floats	Southwest	26 to 55	Light east and southeast.
	Colored water	Northeast	35 to 168	Light to moderate southeast and light east.
Ebb	Floats	Southwest	18 to 120	Light northeast and north to east.
	Colored water	Northeast	92 to 185	Light north to east and calm.

CAROLINA BEACH

Tide	Method	Current direction	Maximum velocities (feet per minute)	Wind
Flood	Floats	North	66	Light southwest to south.
	Colored water	do.	62	Do.
Ebb	Floats	do.	52	Moderate south.
	Colored water	do.	91	Do.

¹ Not printed.

FORT FISHER

Tide	Method	Current direction	Maximum velocities (feet per minute)	Wind
Flood	Floats	South	34	Light east to south.
	Colored water	North	124	Do.
Ebb	Floats	South	47	Light northwest to northeast.
	Colored water	North	100	Do.

32. *Inlet investigations.*—Two sets of current measurements were made at each of the following inlets: Oregon, New, Moore, and Masonboro. Approximate tidal inflows and outflows were computed from these surveys, although in no case did observations cover a complete tidal cycle. The results of these observations are tabulated below. The results of previous observations at Oregon Inlet reported in House Document No. 155, Seventy-fourth, Congress, are also given for comparison.

OREGON INLET

Date	Cross section (square feet) ¹	Predicted tidal ranges (feet)		Maximum velocities (feet per second)		Maximum rates of flow (cubic feet per second)		Total flows (acres-feet)	
		Flood	Ebb	Flood	Ebb	Inflow	Outflow	Inflow	Outflow
Sept. 9, 1931	39,400	2.0	1.5	2.5	2.3	134,050	89,150	47,769	37,399
Aug. 31, 1932	-----	2.2	1.8	2.4	2.6	129,100	102,700	42,726	40,054
Oct. 11, 1932	-----	1.7	1.8	2.4	3.2	126,500	127,300	34,873	57,208
Aug. 24, 1937	44,400	2.2	2.1	3.7	3.3	180,000	142,000	63,500	55,900
Aug. 14, 1939	56,000	2.5	2.2	2.8	3.8	152,000	141,000	37,800	71,500

NEW INLET

Aug. 26, 1937	4,250	2.3	2.0	2.9	2.8	15,000	10,000	4,800	4,000
Aug. 11, 1939	4,500	2.0	1.5	3.4	2.5	11,100	4,800	4,500	1,200

MOORE INLET

June 30, 1937	2,830	3.5	3.1	3.2	4.3	26,900	21,000	9,000	6,600
June 15, 1938	2,240	2.9	2.9	2.3	3.1	14,300	15,600	4,500	4,800

MASONBORO INLET

June 25, 1937	10,000	2.9	3.0	2.6	4.1	37,000	50,500	12,900	18,900
June 17, 1938	4,450	2.9	2.7	2.0	3.6	17,400	21,500	4,700	8,200

¹ Below datum plane used in the surveys.

33. It will be noted that the tidal flows for any inlet vary considerably. These variations are due to differences in the tidal range, differences in water levels in the sounds, especially for Oregon and New Inlets, and differences in the conditions of the inlet, as evidenced by the differences in cross-sectional area.

III. EFFECTS OF SHORE PROCESSES

34. *Shore-line changes—General.*—The changes in the ocean shore line of the entire State have been studied by comparing surveys of record made by the United States Coast and Geodetic Survey between

1848 and 1934. The changes have been separated into three categories: (a) For unbroken stretches of shore beyond the influence of the inlets and capes; (b) for the capes; and (c) for the vicinities of existing inlets.

35. The net erosion and accretion along the unbroken reaches of beach beyond the immediate influence of inlets or capes are shown on plate IV and in table 1 of appendix D. From the Virginia line to Cape Hatteras, a distance of about 100 miles, there was an average annual accretion of 0.8 foot over the 56 miles of shore considered. Plate IV shows that the area of erosion generally was located near where the coast changes direction between miles 50 and 80 from the Virginia line. From Cape Hatteras to Cape Lookout the coast forms a concave arc, the center portion of which shows accretion while the ends show erosion. The average change over the 60 miles considered in this 80-mile stretch of coast was erosion of 2.2 feet per year. The coast from Cape Lookout to Cape Fear also forms a concave arc. The most stable portion of this shore is a 13-mile stretch east from Bogue Inlet, where accretion averaged 2.66 feet per year. Of the 110 miles of coast in this area, the entire 83 miles considered showed an average change amounting to about 0.5 foot of erosion per year. Between Cape Fear and the South Carolina line, the net erosion averaged 2.7 feet per year. Considering the entire 330 miles of coast line of the State, except the areas near inlets, capes, and where no surveys are available, there has been an average erosion of 0.9 foot per year over 224 miles of beach. The average period between surveys compared was 66 years.

36. At Cape Hatteras over the 65-year period there has been progressive erosion of the eastern face averaging 21 feet per year for a distance of $4\frac{1}{2}$ miles. The southwestern face of the cape has shown accretion averaging 24.2 feet per year for $2\frac{1}{2}$ miles. The net change in the shore lines over the 7 miles indicates a loss of 127 acres during the period of record. Since the survey of 1853 Cape Lookout has shown a much different pattern of change from Cape Hatteras. The tip of the cape has moved progressively eastward with accretion along the eastern face and erosion on the west. The net change over 60 years has been an increase in area amounting to 321 acres. At Cape Fear the changes have been of the same nature as at Cape Hatteras. The east face has eroded and the southwest face accreted. The erosion along the east face of the cape has averaged nearly 20 feet per year during the past 75 years for a distance of $9\frac{1}{2}$ miles. This represents a total loss of 1,684 acres. The accretion on the southwest face between the tip of the cape and the Cape Fear River, a distance of $3\frac{1}{2}$ miles, has averaged nearly 8 feet per year for the past 80 years. This total gain in area amounted to 259 acres, but for the cape as a whole the resulting net loss was 1,425 acres. The shore-line changes at the capes are shown on plates V, VI, and VII.

37. *Inlet changes.*—The existence and histories of inlets along the North Carolina coast so far as can be determined from maps, charts, and reports are shown in table 2 of appendix D. The surveys shown are so widely spaced in point of time that they do not show all the changes which have taken place. The table does show the permanence of most of the inlets. Of those shown in Harriot's chart of 1585, only three from Cape Henry to Cape Lookout—Oregon, Hatteras, and Ocracoke—have remained open at all times. Numer-

ous other inlets along the North Carolina shore have closed, or opened and closed during this time. None of these inlets has been stabilized by jetties. New Inlet was opened artificially in 1924, but remained open only a few months. The Beaufort Inlet and Cape Fear River entrance channels have been improved by dredging.

38. The prevalence of inlets increases to the southward along the coast. The latest information indicates that there is only 1 inlet open along the 100 miles of coast from the Virginia line to Cape Hatteras, 6 in the second hundred miles, 12 in the third hundred miles and 6 between the Cape Fear River and the South Carolina line, a distance of 32 miles.

39. Plates VIII through XI and table 3 of appendix D show the changes at the inlets which were open during the first and latest surveys by the United States Coast and Geodetic Survey. In all cases except that of Rich Inlet the migration has been down coast (southward or westward), with a resultant movement of the inlet gorge inward from the coast. Data for Rich Inlet are insufficient to provide a basis for conclusions as to its movement. For the shore line affected by the inlets the areas of erosion and accretion are summarized in table 2. The net result in the 39 miles of shore line considered is a loss of over 960 acres, or an average shore line recession of 3 feet per year.

40. A comparison of the low-water shore lines at Oregon Inlet from 1931 to 1939 is shown on plate III. At the base line, the width of the inlet in 1931 was 2,770 feet. By 1935 it had widened to 4,300 feet. It varied from 4,000 feet in 1936 to nearly 4,300 feet again in 1937, and in 1939 was about 4,350 feet in width. During the entire period the increase in width was nearly equal on the two sides of the inlet, so that no marked tendency toward migration was evidenced, although previously this inlet had migrated southward about 1.5 miles in 65 years.

41. New Inlet was reopened during the storm of March 6, 1932. It originally consisted of several small openings in addition to the main opening about 800 feet wide at mean low water. By 1935 all had closed except the main opening which had shifted southward nearly 1,200 feet and had narrowed to a least width of about 400 feet. Surveys in 1936, 1937, and 1939 showed successive southward shifts, making a total migration from 1932 to 1939 of about one-half mile. The low water width had increased by 1939 to about 600 feet. These changes in the inlet are shown on plate III.¹ This inlet is now closed.

42. Although the survey of 1857 did not show Moore Inlet, it showed an inlet about 3,500 feet north of the present position of Moore Inlet, which was named Barren Inlet. This inlet is not shown on any later surveys, but the 1887 survey shows Moore Inlet about 3,200 feet south of its present position. It seems probable that Barren Inlet was a forerunner of Moore Inlet, migrating southward about 6,700 feet between 1857 and 1887. By 1910 it was located northward about 700 feet, thence about 2,400 feet farther northward by 1930. Surveys of Moore Inlet from 1927 to 1940 are shown on plates XV¹ and XVIII.¹ They indicate relative stability of the north low-water shore line of this inlet over the period, but the south shore and intervening shoals varied widely. By 1940 the secondary channels had closed, leaving only the main opening about 250 feet wide at low water. Comparison of the high-water shore lines shows that these lines on both sides of

¹ Not printed.

the inlet occupied positions separated by more than 1,000 feet between 1927 and 1939, but no marked tendency to migrate was apparent.

43. *Masonboro Inlet* has had a history somewhat similar to Moore Inlet. Between 1857 and 1887 it migrated southward about 3,800 feet, returning to within 700 feet of its 1857 position by 1932. Greater stability of the north shore of Masonboro Inlet compared to the south shore is indicated by comparison of surveys from 1927 to 1940. As at Moore Inlet, the south shore alternately elongates northward and is cut through leaving middle-ground shoals in the inlet. The low-water width thus varied from about 1,700 feet in 1935 to about 900 feet in 1940. These changes are shown on plates XVII¹ and XX.¹

44. *Shore-line changes—Paul Gamiels Hill Coast Guard Station to New Inlet (now closed)*.—This section of the North Carolina coast is 34 miles in length, its north end being 32 miles from the Virginia line. As indicated in table 1 of appendix D, surveys from 1848-52 to 1915-17 showed erosion along sections of the shore aggregating about one-half of this length and accretion along the other half. A study of profiles (pl. XII)¹ taken between 1928 and 1939 revealed a mixed pattern of erosion and accretion over that period as given in table 4¹ of appendix D. Erosion occurred at most stations prior to 1935. From 1935 to 1937 accretion prevailed. Likewise, from 1937 to 1939 accretion occurred at more stations than erosion. However, the net result for all stations except for those close to inlets was erosion of from 5 to 95 feet, or at a maximum rate of nearly 12 feet per year. From 1931 to 1939 there was recession of 1,020 feet at the station near the north side of Oregon Inlet, but accretion of 165 feet at the station near its south side. The station north of New Inlet had accretion of 35 feet during the same period.

45. *Shore-line changes—Atlantic Beach*.—This beach lies immediately west of Beaufort Inlet. As indicated in table 1 of appendix D, surveys from 1854 to 1933 showed slight erosion for the first mile west of Beaufort Inlet, thence accretion averaging 0.9 foot per year for the next 2 miles, and erosion averaging 1.1 feet per year for the remaining mile. Comparative profiles of this beach, taken from 1927 to 1940, are shown on plate XIII.¹ These profiles show, at station 20, near the end of the point, accretion of 100 feet from 1927 to 1930. This occurred when the area between the point and the small offshore island filled in between 1928 and 1929, as shown on plate XIV.¹ Since 1930, erosion at station 20 has been continuous, amounting to 675 feet. Available profiles for stations farther west show less erosion. Those at stations 190 and 219 show some accretion, but for these stations no profiles are available after 1935. The period 1935-40 may have shown erosion at these stations as well as at stations farther east. As shown on plate XIV,¹ the 1947 low-water shore line indicates that erosion of the point has continued. Table 5¹ of appendix D contains tabulated data on shore-line changes at Atlantic Beach.

46. *Shore-line changes—Wrightsville Beach*.—The previous study of this beach, published in House Document No. 218, Seventy-third Congress, disclosed average annual erosion of about 12 feet per year over the period from 1927 to 1932. Beach profiles (pl. XIII)¹ taken near each end and near the midpoint of the island from 1931 to 1938

¹ Not printed.

revealed an average annual recession of the mean-high-water shore line of about 29 feet near the south end of the island, about 3.6 feet near the midpoint, and about 15 feet near the north end. Except at the south end these losses were somewhat more than replaced by artificial fill in 1939. From January 1941 to July 1946, five examinations were made of profiles generally 100 feet north and 100 feet south of alternate groins in order to determine the effectiveness of the groin system installed in 1939. During the first period of 7 months, accretion occurred on both sides of nearly all groins. Subsequently, there was a mixed pattern of accretion and erosion, but the net result of the 5-year period of observations indicated a condition of approximate stability. Although there was erosion on both sides of the most southerly groin, there was accretion on both sides of the next groin and also on both sides of the most northerly groin. At all other groins, erosion on the north side was approximately balanced by accretion on the south side. The tabulated results of this investigation are given in table 6¹ of appendix D. High- and low-water shore-line changes for Wrightsville Beach are shown on plates XV¹ through XX.¹

47. *Shore-line changes—Carolina Beach to Fort Fisher*.—This portion of the coast, about 7 miles in length lies between 9 and 16 miles south of Masonboro Inlet. The mean high-water lines from surveys of 1852 to 1942 are shown on plate XXI.¹ As indicated in table 1 of appendix D, comparative surveys from 1857 to 1934 showed an average recession of the mean high-water line amounting to about 2.3 feet. Comparative profiles of the beaches in this area taken between 1927 and 1940 are shown on plate XXII.¹ A tabulation of changes in the mean high-water shore line as shown by these profiles is included as table 7,¹ of appendix D. These data show that the shore line moved both landward and seaward during the interval between 1927 and 1940, but that the resultant movement over the whole period was landward. The landward movement amounted to from 0 to 4 feet per year, except at Fort Fisher, where the most southerly two profiles showed erosion averaging over 16 feet per year from 1931 to 1940. (See fig. 5.)

48. *Offshore depth changes—General*.—The hydrographic surveys of the offshore area are generally so incomplete as to prevent a comparison of conditions at different dates. On Diamond Shoal off Cape Hatteras the only complete survey by the United States Coast and Geodetic Survey was made in 1872. Prior and subsequent surveys have not covered the entire shoal in any one year and cannot be used for comparison. The same condition exists in the surveys of the shoals off Cape Lookout. The only complete survey in this area was made in 1865-66. At Cape Fear a comparison for Frying Pan Shoals is afforded by a complete survey in 1851 and another in 1923. Elsewhere alongshore the scattered surveys are insufficient for comparison. Plate XXIV¹ shows the underwater conditions on Diamond Shoal and the outer shoal off Cape Hatteras from a survey by the United States Coast and Geodetic Survey in 1872. From the tip of the cape the shoals extend 8.5 miles in a direction 33° east of south. The area enclosed by the 18-foot depth curve was 2,843 acres, by the

¹ Not printed.

12-foot depth curve 795 acres, and by the 6-foot depth curve, 23 acres. Plate XXV¹ shows the underwater conditions on the Cape Lookout Shoals from the survey of 1865-66 by the United States Coast and Geodetic Survey. The shoal extends 9.3 miles from the tip of the cape in a direction 22° east of south. The area enclosed by the 18-foot depth curve was 6,532 acres; by the 12-foot depth curve, 2,419 acres; and by the 6-foot depth curve, 750 acres. There have been two surveys by the United States Coast and Geodetic Survey which covered the entire area of Frying Pan Shoals off Cape Fear. The first survey was made in 1851 and the last in 1923. Plates XXVI¹ through XXVIII¹ show the comparison between the 6-, 12-, and 18-foot-depth curves for the two surveys. The axis of the shoal has not changed. It extends 16.3 miles from the tip of the cape in a direction 20° east of south. The areas enclosed by the depth curves of the 1851 survey were 18-foot, 11,109 acres; 12-foot, 3,077 acres; 6-foot, none. In the 1923 survey the areas were 18-foot, 10,647 acres; 12-foot, 5,072 acres; 6-foot, 1,016 acres. Assuming a uniform slope between the depth curves, these changes in area would represent an accretion on the shoal of 4,842,000 cubic yards in 72 years, or an average of 67,250 cubic yards per year.

49. *Offshore depth changes—Paul Gamie's Hill Coast Guard Station to New Inlet (now closed).*—Comparison has been made of profiles surveyed in 1931, 1935, 1937, and 1939. The changes in the 6-, 12-, 18-, and 24-foot-depth curves from available data are shown on plate XII¹ and given in tables 8¹ and 9¹ of appendix D. From table 8¹ it will be noted that the 6-foot contour generally moved shoreward from 1931 to 1937 and seaward from 1937 to 1939, but that the net effect over the whole period was generally recession of the 6-foot contour. The amount of recession varied up to 85 feet, except for one profile at Oregon Inlet which showed much greater recession. In table 9¹ the tabulated values show general accretion of the 12-, 18-, and 24-foot contours. These changes are associated with the formation, enlargement, and shifting of an offshore bar.

50. *Offshore depth changes—Atlantic Beach.*—Profiles of this beach taken from 1928 to 1940 are shown on plate XIII¹. Tabulated data on changes in the 6- and 12-foot-depth contours are given in table 10¹ of appendix D. The generally unstable condition of the bottom is quite evident, varying from erosion of over 200 feet in a year for the 12-foot contour at one station to accretion of 300 feet in the same year at another station. The net result for both the 6- and 12-foot contours, was recession of from 100 to 300 feet in 4 years. Comparative profiles 7 miles in length from surveys made by the United States Coast and Geodetic Survey in 1857 and 1927 are shown on plate XXVIII¹. The depth increases from shore nearly to 50 feet in 2 miles, thence only about 5 feet more in the next 5 miles. The first 2 miles show general shoaling of from 0 to 5 feet. The remaining distance shows generally smaller and inconclusive changes.

51. *Offshore depth changes—Wrightsville Beach.* The changes in the offshore depth contours as revealed by comparison of the 1937, 1938, and 1940 profiles of this beach are given in table 2 of appendix D. Typical profiles are shown on plate XIII¹. The tabulated changes

¹ Not printed.

indicate a mixed pattern of accretion and erosion, with accretion predominating from 1937 to 1938. In spite of artificial fill placed on this beach in 1939, erosion predominated for the period from 1938 to 1940, to such an extent that it generally offset earlier accretion and was predominant over the entire period from 1937 to 1940. The 6-foot contour receded at four of the six profiles studied, the 12-foot receded at three and advanced at the other three profiles, but the 18-foot contour receded on all profiles. Changes on a profile 7 miles long from surveys of 1879 and 1927 are shown on plate XXVIII¹. Increases in depths varying from 0 to 5 feet are indicated along the inner 2,000 feet of this profile, out to a depth of about 22 feet. The remainder of the profile generally shows shoaling with a maximum of about 5 feet. From a point about 1 mile offshore the slope of the bottom is quite uniform, amounting to about 20 feet in the remaining 6 miles. A depth of 50 feet is reached about 4 miles offshore.

52. *Offshore depth changes—Carolina Beach to Fort Fisher.*—The changes in the 6-, 12-, 18-, and 24-foot offshore depth contours as indicated by a comparison of the 1938 and 1940 profiles of the beaches along this stretch of coast are shown on plate XXII¹ and tabulated in table 12¹ of appendix D. The tabulation indicates considerable erosion of the offshore bottom at all except the most southerly profile at Fort Fisher. The 6-foot contour generally receded from 65 to 180 feet, the 12-foot contour from 50 to 240 feet, the 18-foot contour from 40 to 640 feet, and the 24-foot contour from 65 to about 600 feet. At the most southerly profile at Fort Fisher, advances of the 6-, 12-, and 18-foot contours were respectively 150, 240, and 320 feet. Profiles at Carolina Beach 7 miles long from surveys of 1879 and 1927 are shown on plate XXVIII¹. The inshore portion of this profile is relatively steep, a depth of 20 feet being reached in about 600 feet. This section shows erosion to a depth of 7 feet below mean low water, thence accretion. The next 2 miles have a fairly uniform slope to a depth of about 43 feet. They show both erosion and shoaling. The remaining 5 miles of bottom are irregular, depths of 54 and 58 feet being reached 7 miles offshore. Shoaling predominates over this area, the maximum being about 5 feet.

53. *Littoral drift—north of Cape Hatteras.*—Of the winds and swells to which this portion of the study area is exposed, those from directions that would tend to produce southward littoral drift are of greater magnitude than those that would cause northward drift, and all except the light swells are more frequent from the former than from the latter directions. Consequently a marked predominance of southward drift as a result of wave action would be expected. Other available data such as southward migration of inlets and southward trailing of underwater spits at Cape Hatteras confirm the existence of a predominant southward drift. The volume of drift must be large, as indicated by early closure of most of the breaches through the barrier beach.

54. *Littoral drift—Atlantic Beach.*—This portion of the North Carolina coast receives some protection from the east by Cape Lookout, but is exposed to winds and waves from southeast, south, and southwest. Of the winds and swells to which this area is exposed, those from the southeast would tend to produce westward drift and those

¹ Not printed.

from the southwest would tend to produce eastward drift, while those from the south probably would not produce much littoral movement. As winds of all magnitudes are more frequent from the southwest than from the southeast, a predominant eastward drift would be expected. However, as the most effective swells are from the east and southeast, they would tend to produce westward drift. A reversing drift would therefore be expected, with little predominance in either direction. The Shore Protection Board study referred to in paragraph 4 (b) indicated a predominant eastward drift, the volume of which was determined by computation of the volume of accretion in the offshore area from 1850 to 1908 to average 29,500 cubic yards per year. The formation of the small island off Fort Macon Point and the later filling of the intervening area appear to have been the result of eastward drift. (See pl. XIV.)¹ A short groin at the point has accumulated sand on its south side. In the absence of other sources of supply, the material must be provided by erosion of the beaches to the westward.

55. *Littoral drift—Wrightsville Beach.*—This portion of the coast is exposed to winds and waves from the northeast through east to south. As indicated by the diagram on plate II, swells of all magnitudes from the northeast and east, which would cause southward littoral drift are more frequent than those that would cause northward drift. The wind diagram for Wilmington indicates that the stronger winds tending to produce northward drift are more frequent than those tending to produce southward drift. Under these conditions a reversing drift would be expected, with no great predominance in either direction. The probable southward migration of Moore Inlet prior to 1887 and the shift northward thereafter until 1930 present no conclusive evidence of a predominant direction of drift. The similar history of Masonboro Inlet is also inconclusive. The general accretion south of and erosion north of the Wrightsville Beach groins, as indicated by the study of shore line changes in paragraph 46, indicates a predominant northward drift, but a recent inspection showed no marked differences in beach elevations between the north and south sides of these structures. The northward elongation of the south shores of Moore and Masonboro Inlets as noted in paragraphs 42 and 43, also evidences northward drift. The fact that these inlets remain open indicates that the volume of material moving at Wrightsville Beach is not great. The groins constructed in 1939 also reduce the amount of littoral drift. It appears that little new material reaches Wrightsville Beach by natural processes, as the transfer of sand across Moore and Masonboro Inlets is uncertain.

56. *Littoral drift—Carolina Beach to Fort Fisher.*—This stretch of shore has a direction slightly closer to north-south than Wrightsville Beach. With this similarity of exposure, a reversing drift like that at Wrightsville would be expected. However, the greater length of unbroken beach north of Carolina Beach (as far as Masonboro Inlet) than north of Wrightsville provides a larger source of supply for the area from Carolina Beach to Fort Fisher. The slightly higher beach north of the intake structure at Kure Beach, the good beach north of the coquina outcrop at Fort Fisher and erosion south thereof, the southward extension of the spit just south of Fort Fisher, as reported in House Document No. 204, Seventy-second Congress, and shown

¹ Not printed.

on plate XXI,¹ and the extensive shoals off Cape Fear all indicate some predominance toward the south.

IV. PRIOR CORRECTIVE ACTION AND EXISTING STRUCTURES

57. *Kitty Hawk to Oregon Inlet.*—In this area sand fences were built prior to 1940 for the purpose of building up a continuous dune line. They were placed parallel to the shore line and about 200 feet shoreward of the mean low water line. Inspections in 1940 and 1947 indicate that they were quite effective, having been almost covered with sand, as shown by the upper photograph on figure 7¹ taken at Kitty Hawk. However, similar fences in the immediate vicinity of Oregon Inlet were completely ineffective, as shown on the lower photograph on the same figure.

58. *New Inlet.*—Closure of New Inlet in 1922 caused the State to study means of reopening this inlet or forming an additional inlet at some other locality in order to provide salinity of sound waters necessary for the propagation of fish and shellfish. As a result of this study an opening was dredged in 1924, through the barrier beach in the vicinity of the former location of New Inlet. Three short pile-and-timber groins, connected to a light wooden bulkhead, were built along the beach on the north side of the dredged cut. These structures did not afford much protection to the inlet, which completely filled and closed during the following winter. As stated in paragraph 41, natural forces reopened the inlet in 1932 and have since closed in again.

59. *Fort Macon Point.*—There are five short stone groins around the end of Fort Macon Point, which are probably the remains of those built prior to 1881 (par. 4a). Only one of these was reported as being seen on inspection in 1940. Now all are visible, apparently having been uncovered by erosion since 1940. Some of these structures are now being flanked and the dunes behind them are being eroded. Some accretion to the south of these groins indicates that they are of some value, but they are so short that their influence extends only a short distance. Considerable planting of grass and shrubs around the point was done about 1938. This work was entirely ineffective. Inspection in 1940 disclosed that most of the plants had died.

60. *Wrightsville Beach.*—In 1939 the town of Wrightsville Beach completed construction of a beach-improvement project with the aid of PWA funds. The completed work consisted of 16 creosoted pile-and-timber groins each 325 feet long with an average spacing of about 800 feet, and artificial fill in amount of approximately 700,000 cubic yards. Two of these groins are shown on figure 8. The completed project differed somewhat from that recommended by the Beach Erosion Board in 1934 (H. Doc. No. 218, 73d Cong., 2d sess.). The principal differences were the elimination of the recommended bulkhead and the substitution of timber for steel sheet piling. The groins are generally about 1 foot higher than those recommended. The profile of the groin slopes from an elevation of +10 feet at the shore end to +8.5 feet in a distance of 90 feet, thence to +3 feet in the next 140 feet, the seaward 95 feet having a uniform elevation of 3 feet above mean low water. Between 1939 and 1942, the most southerly

¹ Not printed.

groin was extended 160 feet landward in an attempt to prevent flanking. The two southerly groins have since been flanked. Repairs and extension of the southerly groin were being made in April 1947. Recent inspection disclosed serious erosion of the south end of the island. The seaward ends of all the groins have deteriorated and are in need of repairs. The investigation of shore-line changes outlined in paragraph 46 indicates that this groin system has been effective in stabilizing all except the extreme southern end of this beach.

61. *Kure Beach*.—At this beach a water intake about 100 feet long has been built out into the ocean. It consists of solid steel sheet piling, except for an opening about 30 feet from the shore line, which permits sand to pass the structure. A recent inspection disclosed a slightly higher beach on the north side than on the south side of the structure, but the opening permits the passage of sand so that the north side does not fill to the top of the structure. The sand on the north side of the intake pipe inside the structure was level with the top of the pipe, as shown on figure 9.¹

V. DISCUSSION

62. *General*.—The objectives of this study, as stated in paragraph 2, were:

- (a) To obtain data which would contribute to the advancement of the technical knowledge of the processes of beach changes;
- (b) To obtain data useful in planning for the proper development of the beaches as recreational areas.

The cooperating agency has requested that this report include consideration of the desirability of further studies.

63. With reference to item (a) of paragraph 62, the original program provided for annual surveys of beach profiles, inlet cross sections and topography, offshore currents and inlet tidal prisms each for one complete tidal cycle. When it became evident that this schedule could not be adhered to because of financial and personnel limitations, it was modified to include the same items biennially instead of annually. The study included only a general study of wind and weather conditions from existing records. The outline of work did not contemplate an attempt to correlate wind, wave, and current data during the study period with changes in beaches disclosed by periodic surveys. Obviously such an attempt would require more intensive observations of all known variables during the entire period between surveys. To secure these data over the widespread areas included in the present study would necessitate a far greater expenditure than the funds available for this investigation. A more productive plan for such a general investigation of shore processes would be continuous or daily observation of winds, waves, currents, and any other factors involved, with frequent surveys of beach profiles for a short stretch of beach. In this manner it may be possible to determine how natural forces operate to cause beach changes. For these reasons the data obtained are not adequate for the formulation of definite conclusions concerning shore processes. They will, however, be available for further studies

¹ Not printed.

in connection with other data to be obtained in the laboratory and in the field under the Board's program of general investigations authorized by Public Law 166, Seventy-ninth Congress. Further studies of a general nature to advance the technical knowledge of shore processes are desirable, but they should only be attempted by intensive investigation over small areas.

64. With reference to item (b) of paragraph 62, data obtained from the study which are considered useful in planning future beach and inlet development are discussed in the following paragraphs.

65. The coastal region of North Carolina is characterized by narrow barrier beaches separating protected sounds from the Atlantic Ocean. The barriers are composed generally of medium sand which is easily moved by winds, waves, and littoral currents. These natural forces erode the beaches and transport the material in both directions along these shores. There are no headlands of importance forming natural sources of additional beach material. Therefore, unless material is moved to the beaches from the offshore bottom, the effect of natural forces must be a redistribution of material now composing the beaches. The variations in rate of supply and loss at any point cause alternate advances and recessions of the shore line at that point, as indicated by studies of comparative profiles. Over the entire area studied during the period covered by historical surveys recession has generally prevailed. At some localities sand is washed or blown across the barrier beaches, causing a gradual retreat of the barrier as a whole. The net general effect of recession is probably due to this movement across the barrier and to losses of material from the ends of the several areas to form the extensive shoals off Capes Hatteras, Lookout, and Fear. Although continuation of such recession can be expected, costly protective measures for the entire length of the study areas are obviously unwarranted at this time.

66. Existing dunes constitute valuable protection to buildings and highways and a reservoir of beach material. They should be preserved. The cutting of paths through or the erection of buildings on the dunes should be prevented. In some localities existing dunes are too low to afford desirable protection to present structures. A recent case of the wash-out of a street end could have been prevented if the dune had not been cut down across the street end. Where necessary, dunes could be constructed artificially. Dune building could also be encouraged by sand fences and planting. The importance of the dunes in protecting property behind them cannot be overemphasized.

67. The rate of recession of the shore line and the extent of development to date have not been sufficient, except at Wrightsville Beach, to cause the construction of structures extending into the ocean for the protection of beaches. This is a fortunate condition, since once such structures are erected, the stoppage of littoral drift for the benefit of one beach area frequently results in starvation of adjacent areas. The knowledge that continued slow recession of the shore line is, in general, to be expected, should be of value in planning future development of shore areas. Construction of costly permanent buildings close to the ocean should not be permitted, unless the interests in-

volved are prepared to meet the costs of beach stabilization. There are, however, portions of the shore of the west side of Cape Hatteras and on the east side of Cape Lookout that have benefited by continuous and extensive accretion during the period of record. Such areas should receive first consideration in the planning of recreational development. Other areas indicated in table 1 of appendix D, such as the 9-mile section between Kitty Hawk and Nags Head, the 12-mile section north of Cape Hatteras and the 13-mile section east of Bogue Inlet have advanced over the period of record. Such areas have a favorable outlook for continued accretion and should receive more favorable consideration in planning future development than areas such as Fort Fisher which have had a history of erosion.

68. *Inlets to Pamlico Sound.*—Oregon Inlet is the only inlet now open from the Virginia State line to Cape Hatteras, and only two of importance, Hatteras and Ocracoke, connect Pamlico Sound with the ocean west of Cape Hatteras, in spite of the extensive drainage area tributary to this sound. The changes in New Inlet have been noted in paragraphs 41 and 58. It closed in 1922 and was opened artificially in 1924, but closed during the following winter. Natural forces reopened it in 1932 and have since closed it again during the period of this study. The littoral drift and the inlet currents are two opposing forces, the former tending to close inlets and the latter tending to prevent sand from depositing in the inlets and closing them. The closure of all but three of the inlets that have connected Albemarle and Pamlico Sounds with the ocean at one time or another attests to the large volume of sand moving along these shores. The construction of jetties or other works to prevent closure of any of these inlets would be very costly.

69. Reports of the opening of inlets through the barrier beach indicate that the usual combination of events causing such breaches of the barrier in this area begins with a sudden shifting of the waters from the landward to the seaward side of the sounds, caused by changes in wind direction during infrequent cyclonic storms of great intensity. The resulting high sound waters overtop low places in the barrier and sometimes flow toward the ocean for many hours, cutting a deep gorge through the beach. These openings persist until overcome by the sand drifting alongshore and entering the cuts.

70. The past history of inlets indicates that the waters of Albemarle and Pamlico Sounds will again overtop the barrier beach during future storms to form additional inlets. The importance of these inlets in increasing the salinity of sound waters and in permitting the entrance of fish makes the opening of additional inlets desirable. The dredging of a cut through the beach is an expensive operation, and unless attended by unusual tidal flows to scour a deep gorge, is unlikely to be more successful than the attempt in 1924 to reopen New Inlet. However, reopening of New Inlet could be encouraged by keeping the elevation of the barrier down as close to mean high water as possible by land equipment and thus assuring overtopping during future storms. The highest part of the barrier is a relatively narrow ridge, which could be cut through at little cost.

71. *Shore north of Cape Hatteras.*—Profiles surveyed prior to and during this study indicate a general recession of the shore line of the study area north of Cape Hatteras. There was also general recession of the 6-foot-depth contour, but general advance of the 12-, 18-, and 24-foot contours, associated with the formation, enlargement, and shifting of an offshore bar in this area. These data on past shore changes indicate that recession of the shore line north of Cape Hatteras will continue at a slow rate. However, as a result of transportation of material across low, narrow portions of the barrier by winds and waves the whole barrier will also move landward. The continued existence of the barrier beach will thus be assured for many years. This retreat of the barrier may be retarded by dune formation, which may be promoted by sand fences, and dune fixation by planting. However, the extent of present development of this area does not warrant the expenditure of funds in such amount as would be necessary for complete stabilization of these shores. Such work would be warranted at low sections of the barrier where undesirable breaching by storm action is likely. Planning for future development should take cognizance of the probable future changes as outlined herein.

72. *Atlantic Beach.*—Study of profiles at this beach indicated general recession of the mean high-water shore line and of the 6- and 12-foot-depth contours. Unless protection is provided, continuation of this erosion is to be expected, although some littoral drift may reach the area from beaches to the west. Although the quantity of sand reaching the area does not appear to be large, the accumulation south of the existing groins indicates that groins or a jetty would be effective in improving the beach. Present development of the threatened portion of this beach does not appear to warrant extensive works for protection of the beach itself. No surveys of this beach have been made since 1940. The eastern portion of this beach is part of Fort Macon State Park. If the State considers stabilization of its beach essential, the study of this area should be brought up to date with new surveys, at which time a definite plan of improvement could be devised.

73. *Wrightsville Beach.*—The improvement of this beach by a groin system and artificial fill has stabilized its shore line, except at its southern end. Recession of the offshore contours was general in spite of the placement of artificial fill. However, no surveys of the offshore area have been made since 1940. In connection with repairing the groin system, a determination of the present condition of the offshore area would be desirable. If that area has shown further deepening, the rebuilding of the outer ends of the groins will require greater penetration of piling. Additional fill or riprap to protect the ends of the groins may be desirable. The shore ends of the two most southerly groins need shoreward extensions as they have been flanked. Unless the groin system and fill are maintained in good condition, increasing erosion of the beach may be anticipated. Replacement of lost fill must be regarded as an essential feature of any adequate program for the continued existence of a satisfactory beach at Wrightsville.

74. The previous report on Wrightsville Beach (H. Doc. No. 218, 73d Cong., pars. 23 and 24) pointed out that bulkheads and groins could be built in such a manner as to conserve the existing supply of beach material, but that the structures would not prevent some loss of material. It stated that artificial replacement of lost sand would be necessary. Replenishment could be effected periodically by hydraulic dredge, in the same way the artificial fill was provided in 1939. Ample material is available in the sound west of the island. Whenever suitable material is dredged in the vicinity for any other purpose, it should be placed on the beach. In some localities the dredging of pleasure-craft basins or channels and replenishment of beaches have been combined to form a beneficial project at a much lower cost than if the two operations had been accomplished separately. The dependability of the supply of material from beaches to the north of Moore Inlet by natural forces could be improved by closure of Moore Inlet. Although the volume of material that would reach Wrightsville Beach following such closure might not be sufficient to eliminate the necessity of periodic nourishment by other means, it would at least reduce the frequency and volume of such nourishment. It would also provide additional land for expansion of recreational facilities. In such event, erection of permanent buildings close to the shore should be prevented, as erosion of the beach would create a demand for costly northward extension of the groin system. Such northward extension and stabilization of that beach would, by depriving Wrightsville Beach of an improved supply of material, defeat the major purpose for which closure of Moore Inlet has been considered.

75. As noted in a previous paragraph, the two most southerly groins at Wrightsville Beach have been flanked and the south end of the island is being seriously eroded. Prior to construction of the groin system in 1939, the southward littoral drift along Wrightsville Beach and the northward drift south of Masonboro Inlet apparently caused the alternate southward and northward migration of the inlet previously noted. During periods of northward drift the south shore of the inlet moves northward forcing the channel against the south end of the island, thereby eroding the end of the island. The southward drift along the island, which replaced the losses at the end of the island and occasionally caused southward migration of the inlet, has been retarded by the groin system. Therefore, continued erosion of the south end of the island may be expected unless protective measures are provided. The south end of the island could be effectively stabilized by revetment.

76. *Carolina Beach to Fort Fisher.*—Profiles taken from 1927 to 1940 indicate a continuation of the slow recession of the high-water shore line shown by earlier surveys for all of this area except Fort Fisher. The same portion of the coast lost a large quantity of material from the offshore bottom with resultant steepening of bottom profiles. Continued recession of the shore line may be anticipated. Prevention of this recession could be accomplished by supplying artificially a greater quantity of material to these beaches than is now reaching them naturally. The installation of groins would reduce the amount of artificial nourishment that would be required. However, the present development of this area does not appear to warrant expensive remedial measures. In view of the slow recession

of the shore line, a less costly plan would be the shifting of threatened buildings to safer positions.

77. At Fort Fisher the recession of the shore line from 1926 to 1931, indicated in the previous report (H. Doc. No. 204, 72d Cong.) to have averaged 56 feet per year, has continued, although at a considerably slower rate. The average rate at two profiles from 1931 to 1940 has exceeded 16 feet per year. The changes of the offshore bottom varied from heavy erosion at the north end to not quite so extensive accretion at the south end. Continued recession of this shore line may be expected unless protective measures are taken. However, the sand mounds which constituted the principal historic features of Fort Fisher have disappeared as a result of erosion since the Board recommended a bulkhead and groin system to preserve them in 1931. The groin system was designed to retard recession of the beach and the bulkhead to preserve the historic mounds. No protective structures have been built to date. Since the mounds have already been lost, a groin system alone could be constructed now to retard erosion of the shore providing it were extended sufficiently shoreward to prevent outflanking. However, the value of the land now being lost is too small to warrant construction of protective works at this time.

VI. CONCLUSIONS

78. The Board concludes that with respect to the shores of the State in general:

(a) The data obtained in this study, while not adequate for the formulation of definite conclusions concerning the general technical phases of shore processes, will be of value in connection with laboratory and field studies now being undertaken by the Board for the further development of the science of shore protection. Further field studies of this nature should be based on more intensive coverage of smaller areas;

(b) The ocean shore line of North Carolina is, in general, slowly retreating under the attack of winds, waves, and currents. It will continue to retreat in the future;

(c) Protection of the entire length of the study areas against further erosion is obviously unwarranted at this time;

(d) Existing dunes afford valuable protection and should be preserved;

(e) Threatened structures can be protected by dunes, either constructed artificially or formed as a result of sand fences and planting. Low portions of the barrier beach can be similarly protected except where the opening of new inlets is desired;

(f) The anticipated general slow recession of the shore line should be considered in planning future development of shore areas. If permanent buildings are erected too close to the ocean, expensive protective measures will be required sooner or later. Areas indicated in this report as having a history of accretion should receive more favorable consideration in planning future development than those having a history of erosion.

79. Consideration of the history of inlets through the barrier beach leads to the conclusions that:

(a) Existing inlets will be unstable in the future as they have been in the past;

(b) Stabilization of these inlets cannot be effected at reasonable cost;

(c) New inlets will open, migrate and eventually close. The only measures considered by the Board to be practicable in effecting partial control of inlet changes comprise the construction of dunes to prevent breaching at low sections where new inlets are not desired, and dry excavation at low sections to facilitate breaching during storms where inlets are desired.

80. The areas for which protective measures may be justified at this time are Fort Macon Point at the east end of Atlantic Beach, and

Wrightsville Beach. The Board concludes that the following actions should be taken with respect to these localities:

(a) *Atlantic Beach*.—If the State considers stabilization of the Fort Macon State Park Beach essential, it should initiate a new cooperative study with a view to securing a definite plan of improvement with economic analysis based on new survey data;

(b) *Wrightsville Beach*.—It is essential that existing groins be maintained and the artificial fill be replenished periodically. Repairs of the groins should be initiated promptly. Replenishment of artificial fill can be effected by placement of fill by hydraulic dredge. Closure of Moore Inlet would be beneficial to the beach in lessening the frequency and volume of artificial nourishment. A determination of the condition of the offshore bottom should be made to ascertain the necessity of additional fill around the ends of the groins. The north shore of Masonboro Inlet should be stabilized by revetment.

81. The application for this cooperative study did not call for estimates of costs and benefits. It has not been deemed proper to increase the expense to the applicant for the purpose of obtaining economic data not desired by it. In the absence of such data no statement can be made as to what public interest, other than Federal, is involved in the proposed improvements. It is the opinion of the Board that under existing law no Federal interest is involved in the proposed improvements. In accordance with the desires of the cooperating agency stated in paragraph 2, the scope of the study was not increased to provide for determination of possible Federal aid in accordance with the provisions of Public Law 727, Seventy-ninth Congress, which was approved after the study was initiated. Accordingly, the Board is unable to state its opinion as to the advisability of adopting a Federal project for participation in the first cost of protective works, or what share, if any, of the expense of such works should be borne by the United States. If additional cooperative studies of localities on the North Carolina coast are arranged, they will include the determination of possible Federal aid under Public Law 727, Seventy-ninth Congress.

For the Board:

C. L. HALL,
Colonel, Corps of Engineers,
Senior Member.

At the time of adoption of this report the members of the Board were: Col. C. L. Hall, Corps of Engineers, senior member; Col. L. H. Hewitt, Corps of Engineers; Col. H. D. Vogel, Corps of Engineers; Lt. Col. W. B. Stelzenmuller, Corps of Engineers, assistant resident member; Richard K. Hale, Commonwealth of Massachusetts; Morrough P. O'Brien, State of California; Thorndike Saville, State of New York.

APPENDIXES

(Only tables 1-3 of appendix D printed)

- A. Analysis of sand samples.
- B. Major storms and their effects.
- C. Littoral currents.
- D. Shore line, inlet, and offshore depth changes:
 - Table 1. Shore-line changes along unbroken reaches of the coast.
 - Table 2. Comparative conditions of inlets on North Carolina coast.
 - Table 3. Inlet changes.
 - Table 4. Shore-line changes—Paul Gamiels Hill Coast Guard Station to New Inlet.
 - Table 5. Shore-line changes—Atlantic Beach.
 - Table 6. Shore-line changes—Wrightsville Beach.
 - Table 7. Shore-line changes—Carolina Beach to Fort Fisher.
 - Table 8. Changes in 6-foot contours—Paul Gamiels Hill Coast Guard Station to New Inlet.
 - Table 9. Changes in offshore contours—Paul Gamiels Hill Coast Guard Station to New Inlet.
 - Table 10. Changes in offshore contours—Atlantic Beach.
 - Table 11. Changes in offshore contours Wrightsville Beach.
 - Table 12. Changes in offshore contours—Carolina Beach to Fort Fisher.

PLATES

(Only pls. I, II, IV, and V to XI printed)

- I. Locality map.
- II. Hurricanes, swells, and wind diagrams, and nontidal currents.
- III. Changes in low-water shore line—New Inlet and Oregon Inlet.
- IV. Areas of erosion and accretion.
- V. Cape Hatteras, N. C.—shore-line changes.
- VI. Cape Lookout, N. C.—shore-line changes.
- VII. Cape Fear, N. C.—shore-line changes.
- VIII. Movement of inlets on North Carolina coast.
- IX. Movement of inlets on North Carolina coast.
- X. Movement of inlets on North Carolina coast.
- XI. Movement of inlets on North Carolina coast.
- XII. Comparative profiles—Paul Gamiels Hill Coast Guard station to New Inlet.
- XIII. Comparative profiles—Atlantic Beach and Wrightsville Beach.
- XIV. Shore-line changes—Fort Macon Point.
- XV. High-water-shore-line changes—Wrightsville Beach and Moore Inlet.
- XVI. High-water-shore-line changes—Wrightsville Beach.
- XVII. High-water-shore-line changes—Wrightsville Beach and Masonboro Inlet.
- XVIII. Low-water-shore-line changes—Wrightsville Beach and Moore Inlet.
- XIX. Low-water-shore-line changes—Wrightsville Beach.
- XX. Low-water-shore-line changes—Wrightsville Beach and Masonboro Inlet.
- XXI. High-water-shore-line changes—Fort Fisher and Carolina Beach.
- XXII. Comparative profiles—Carolina Beach—Fort Fisher.
- XXIII. Shoals offshore at Cape Hatteras.
- XXIV. Shoals offshore at Cape Lookout.
- XXV. Comparison of shore-line and offshore conditions (6-foot curve) at Cape Fear, N. C.
- XXVI. Comparison of shore-line and offshore conditions (12-foot curve) at Cape Fear, N. C.
- XXVII. Comparison of shore-line and offshore conditions (18-foot curve) at Cape Fear, N. C.
- XXVIII. Comparative profiles—offshore.

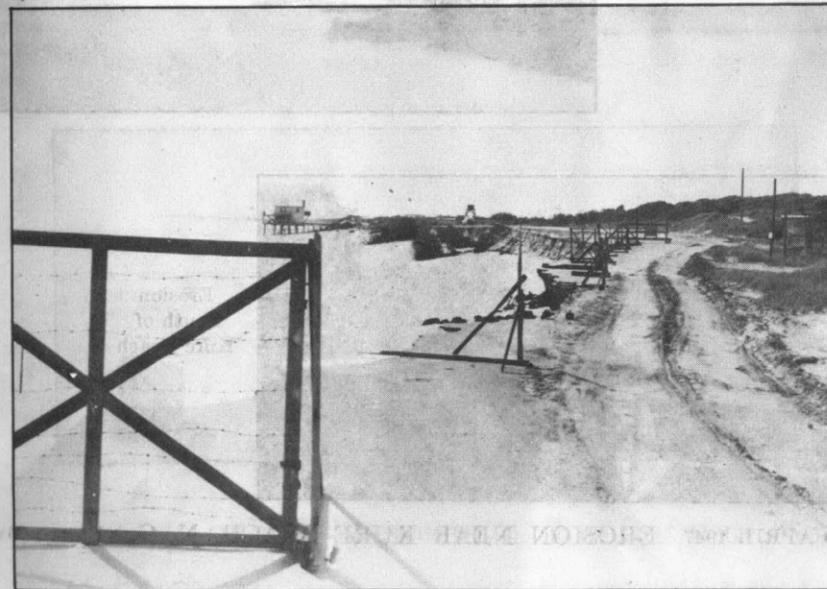
FIGURES

(Only figs. 5, 6, and 8 printed)

- 1. Oregon, New, and Beaufort Inlets, N. C.
- 2. Wrightsville Beach, N. C.
- 3. Carolina Beach, N. C.
- 4. Fort Fisher, N. C.
- 5. Erosion at Fort Fisher, N. C.
- 6. Erosion near Kure Beach, N. C.
- 7. Effects of sand fences.
- 8. Groins—Wrightsville Beach, N. C.
- 9. Intake structure, Kure Beach, N. C.



19 AUGUST 1946



6 DECEMBER 1946 EROSION AT FORT FISHER, N. C. FIGURE 5



Washout of
Street End
North of
Kure Beach

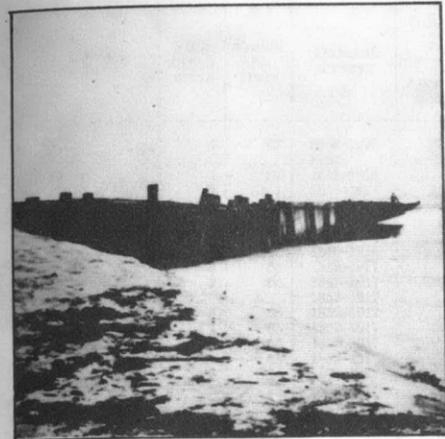


Erosion
North of
Kure Beach

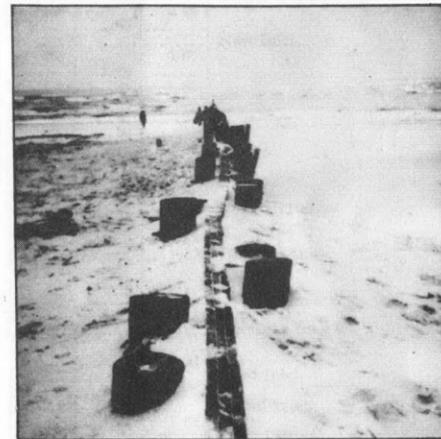


Erosion
South of
Kure Beach

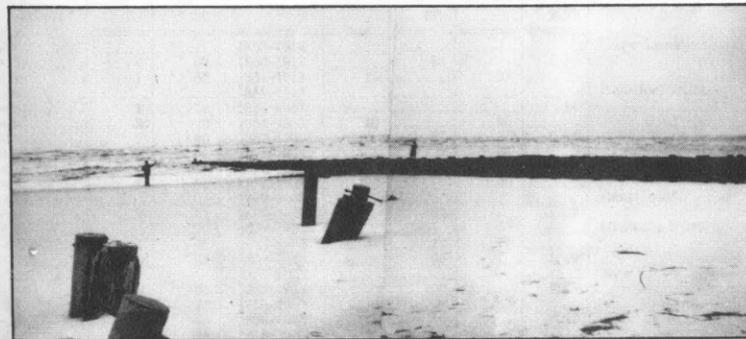
10 APRIL 1947 EROSION NEAR KURE BEACH, N. C. FIGURE 6



Groin at South End of Beach
Showing South Side Exposed



Sand Accumulation on
North Side of Groin



Groin at North End of Beach

9 OCTOBER 1946 GROINS—WRIGHTSVILLE BEACH, N. C. FIGURE 8

APPENDIX D

TABLE 1.—Shore-line changes along unbroken reaches of the coast

Location mile No. ¹	Number of miles	Period in years	Dates of surveys	Net change in feet		Average annual change in feet		Remarks
				Accretion	Erosion	Accretion	Erosion	
0-4	4	67	1858-1925	239		3.56		
4-32			1857					Only 1 survey.
32-34	2	67	1848-1915		63		0.94	
34-43	9	65.7	1849-1915	312		4.78		
43-45	2	64	1851-1915		131		2.05	
45-46	1	64	1851-1915	10		.15		
46-55	9	66	1849-1915		249		3.77	Oregon Inlet.
55-59			1849-1915					
59-62	3	65	1852-1917		148		2.24	
62-64	2	65	1852-1917	105		1.60		New Inlet.
64-69			1852-1917					
69-74	5	65	1852-1917		395		6.07	
74-75	1	65	1852-1917	119		1.84		
75-77	2	65	1852-1917		118		1.81	
77-89	12	65	1852-1917	379		5.83		
89-90	1	65	1852-1917		15		.23	
90-91	1	65	1852-1917	63		.96		
91-93	2	65	1852-1917		160		2.46	
0-93	56	65.6		55		.84		
93-100			1852-1917					Cape Hatteras.
100-102	2	57	1860-1917	348		6.10		
102-110	8	57	1860-1917		588		10.32	Hatteras Inlet.
110-112			1860-1917					
112-119	7	56	1860-1916		563		10.05	
119-124	5	50	1866-1916	171		3.42		
124-125	1	64	1852-1916		87		1.36	
125-127	2	64	1852-1916	353		5.51		Ocracoke Inlet.
127-130			1852-1916					
130-139	9	50	1866-1916	182		3.64		
139-142	3	50	1866-1916		91		1.82	Sand Inlet.
142-144			1866-1916					
144-148	4	70	1866-1936	302		4.31		Drum Inlet.
148-149			1866-1936					
149-157	8	70	1866-1936				1.88	Only 1 survey.
157-158			1866-1936					
158-159	1	70	1866-1936		241		3.44	Only 1 survey.
159-161			1866-1936					
161-163	2	70	1866-1936		101		1.44	
163-164	1	70	1866-1936	38		.54		
164-171	7	60	1853-1913		354		6.26	
93-171	60	59			131		2.22	
171-179			1853-1913					Cape Lookout.
179-185	6	60	1853-1913		93		1.55	
185-186	1	62	1851-1913	15		.24		Beaufort Inlet.
186-190			1851-1913					
190-191	1	79	1854-1933				.14	
191-193	2	79	1854-1933	70		.90		
193-200	7	66	1867-1933		77		1.14	
200-213	13	62	1871-1933	165		2.66		Bogue Inlet.
213-216			1871-1933					
216-217	1	61	1872-1933	125		2.06		Bear Inlet.
217-219			1872-1933					
219-221	2	61	1872-1933		62		1.02	Brown's Inlet.
221-222			1872-1933					
222-223	1	61	1872-1933	47		.78		
223-228	5	61	1872-1933		67		1.10	
228-230			1856-1933					New River Inlet.
230-242	12	77	1856-1933		100		1.31	
242-244	2	75	1858-1933	125		1.66		
244-246	2	75	1858-1933		36		.48	
246-247	1	75	1858-1933	40		.53		
247-248	1	75	1858-1933		25		.33	
248-249	1	75	1858-1933	31		.41		
249-251			1858-1933					New Topsail Inlet.
251-252	1	75	1858-1933		669		8.92	Old Topsail Inlet.
252-253			1858-1933					
253-254	1	75	1858-1933		110		1.47	
254-256	2	76	1857-1933	148		1.95		Rich Inlet.
256-257			1857-1933					
257-260	3	76	1857-1933		409		5.38	Mason Inlet.
260-261			1857-1933					
261-262	1	76	1857-1933		630		8.30	

¹ Measured from Virginia State line.

TABLE 1.—Shore-line changes along unbroken reaches of the coast—Continued

Location mile No. ¹	Number of miles	Period in years	Dates of surveys	Net change in feet		Average annual change in feet		Remarks
				Accretion	Erosion	Accretion	Erosion	
262-264	1	77	1857-1933		44		.57	Barren and Moore Inlets.
264-265			1857-1934					Masonboro Inlet.
265-266	2	77	1857-1934	149		1.94		
266-268			1857-1934		107		1.39	
268-272	4	77	1857-1934		82		1.06	
272-275	3	77	1857-1934		179		2.32	
275-282	7	77	1857-1934					
171-282	83	70.4			43		.52	
282-298			1852-1934					Cape Fear.
298-309	11	82	1852-1934		189		2.31	
309-311			1856-1933					Lockwoods Folly.
311-316	5	76	1857-1933				3.58	
316-318	2	74	1859-1933		61		.82	Shalotte Inlet.
318-319			1859-1933					
319-320	1	74	1859-1933	201		2.72		Tubbs Inlet.
320-323	3	74	1859-1933		355		4.79	
323-324	1	10	1924-34	45		4.50		Mad Inlet.
324-325			1924-34					
325-326	1	10	1924-34		32		3.20	
326-327	1		1872-1934					
327-328	1	62	1872-1934		500		16.25	
282-328	25	72.3			196		2.71	
0-328	224	66.2			59		0.9	

¹ Measured from Virginia State line.

TABLE 2.—Comparative conditions of inlets on North Carolina coast

O indicates open; C, closed; —, not given

[Table originally given in Annual Report of Chief of Engineers for 1876]

Name	Condition as shown by map of—								Remarks
	Harlot, 1885	Lawson, 1708	Wimble, 1738	Mouzin, 1775	Atlantic Neptune, 1780	Lewis, 1795	U. S. Coast Survey, 1875	1896	
Currituck	O	O	O	C	C	C	C	C	Closed in 1828.
New Currituck	O	O	O	O	O	O	O	O	
Caffeys	O	O	O	O	O	O	O	O	
Roanoke	O	O	O	O	O	O	O	O	
Oregon	O	O	O	O	O	O	O	O	
New (Dare County)	C	—	C	C	C	C	O	O	Known as New 1838; as Hatorask in 1590; as Gunt in 1775 and as Gant in 1795. Closed in January 1922. Artificially reopened in 1924 but closed immediately. Reopened by storm in March 1932. Now closed (1947).
Loggerhead	C	—	C	C	C	C	O	C	Known as Chickinockcomi-ock in 1775.
Chickinoke	C	—	C	C	C	C	O	C	
Hatteras	O	O	O	O	O	O	O	O	Known as Wokoken in 1590; as Okeracock in 1738 and as Occacock in 1775.
Ocracoke	O	O	O	O	O	O	O	O	
Whalebone	—	—	—	—	—	—	O	C	Reopened by storm in September 1933.
New	O	—	O	C	—	—	O	O	
Normans (Sand)	O	—	O	C	—	—	O	O	
Drum	O	—	O	—	—	—	O	O	
Cedar	—	—	C	C	—	—	C	C	Known as Core Sound in 1708, and 1738, 1775.
The Drain (Lookout Bight)	—	—	C	C	—	—	C	C	
Beaufort	—	O	O	O	O	O	O	O	

TABLE 2.—Comparative conditions of inlets on North Carolina coast—Continued

Name	Condition as shown by map of—								Remarks
	Harlot, 1885	Lawson, 1708	Wimble, 1738	Mouzin, 1775	Atlantic Neptune, 1780	Lewis, 1795	U. S. Coast Survey, 1875	1896	
Bogue	—	—	O	O	—	O	O	O	Known as Boug in 1738.
Bear	—	—	O	O	—	O	O	O	
Browns	—	—	O	O	—	O	O	O	
Little	—	—	O	O	—	O	O	O	
New River	—	—	O	O	—	O	O	O	
Stump	—	—	O	O	—	O	O	O	
New Topsail	—	—	O	O	—	O	O	O	
Old Topsail	—	—	O	O	—	O	O	O	
Rich	—	—	O	O	—	O	O	O	
Queen (Mason)	—	—	O	O	—	O	O	O	
Barren (Moore)	—	—	O	O	—	O	O	O	
Sandy	—	—	O	O	—	O	O	O	
Bread	—	—	O	O	—	O	O	O	
Shoal	—	—	O	O	—	O	O	O	
Masonboro	—	—	O	O	—	O	O	O	
New (Cape Fear)	—	—	C	C	—	C	O	C	Known as Cabbage in 1738 and 1775. Open in 1774 according to map of John Collet and in 1806 according to map of Cole & Price. Closed in 1876 by Col. Craighill, C. E.
Corncake	—	—	—	—	—	—	—	O	Open in 1871.
Cape Fear River	—	—	—	—	—	—	—	O	
Lockwoods Folly	—	—	—	—	—	—	—	O	
Mary	—	—	—	—	—	—	—	O	
Bacon	—	—	—	—	—	—	—	O	
Shalotte	—	—	—	—	—	—	—	O	
Tubs	—	—	—	—	—	—	—	O	
Mad	—	—	—	—	—	—	—	O	
Little River	—	—	—	—	—	—	—	O	

TABLE 3.—Inlet changes

Inlet	Years	Dis- tance (miles)	Area change (acres) ¹	Average change (feet per year)	Direction of coast	Migration		Gorge width in feet	
						Distance	Direction	First	Last
Oregon	66	4	-589.0	-18.40	S-27° E	7,000	S-8° E	1,400	2,200
New ²	65	5	-132.0	-3.35					
Hatteras	57	2	-43.5	-3.14	S-68° W	3,800	S-73° W	4,150	5,150
Ocracoke	64	3	+206.0	+8.88	S-57° W	1,500	S-32° W	10,400	10,100
Drum ³	70	1	-52.4	-6.17					
Beaufort	62	4	-200.0	-6.68	N-72° W	1,600	N-74° W	5,400	8,000
Bogue	62	3	-1.9	-0.09	S-72° W	3,000	S-80° W	3,700	2,600
Bear	61	2	+26.0	+1.75	S-61° W	1,100	S-71° W	1,200	2,200
Browns	61	1	-1.9	-0.25	S-56° W	200	S-56° W	1,000	1,200
New River	77	2	-27.5	-1.47	S-58° W	3,100	S-58° W	1,900	1,900
New Topsail ⁴	75	2	+43.5	+2.40					
Old Topsail ⁵	75	1	-129.0	-14.20					
Rich	76	1	+48.3	+5.24	S-41° W	400	N-18° E	6,800	1,800
Mason ⁶	76	1	-40.4	-4.38					
Moore ⁶	76	2	-47.5	-2.58					
Masonboro	77	1	-28.3	-3.03	S-41° W	1,000	S-44° W	1,900	2,100
Lockwoods Folly	77	1	+6.4	+0.69	W	2,200	N-82° W	1,600	1,200
Bacon ⁷	74	1	+6.7	+0.74					
Shalotte	74	1	+52.6	+5.87	S-77° W	800	N-78° W	2,600	1,500
Mad ⁸	61	1	-60.6	-8.20					
Average	67.5	39	-964.7	-3.02					

¹ Area of accretion or erosion along section of shore considered to be affected by inlet.

² Open and closed several times.

³ Closed in survey of 1866.

⁴ Barrier between Old and New Topsail.

⁵ Inlet has broken leaving two high water islands.

⁶ Barren Inlet closed and Mason and Moore opened between surveys.

⁷ Closed in latest survey.

⁸ Closed in earliest survey.

Over Size Form

Too Large

Bound Book

Fragile

Other _____

Sheet Number: _____

Drawing/NAVFAC Number: _____

Title

State of North Carolina

Locality map

Over Size Form

Too Large

Bound Book

Fragile

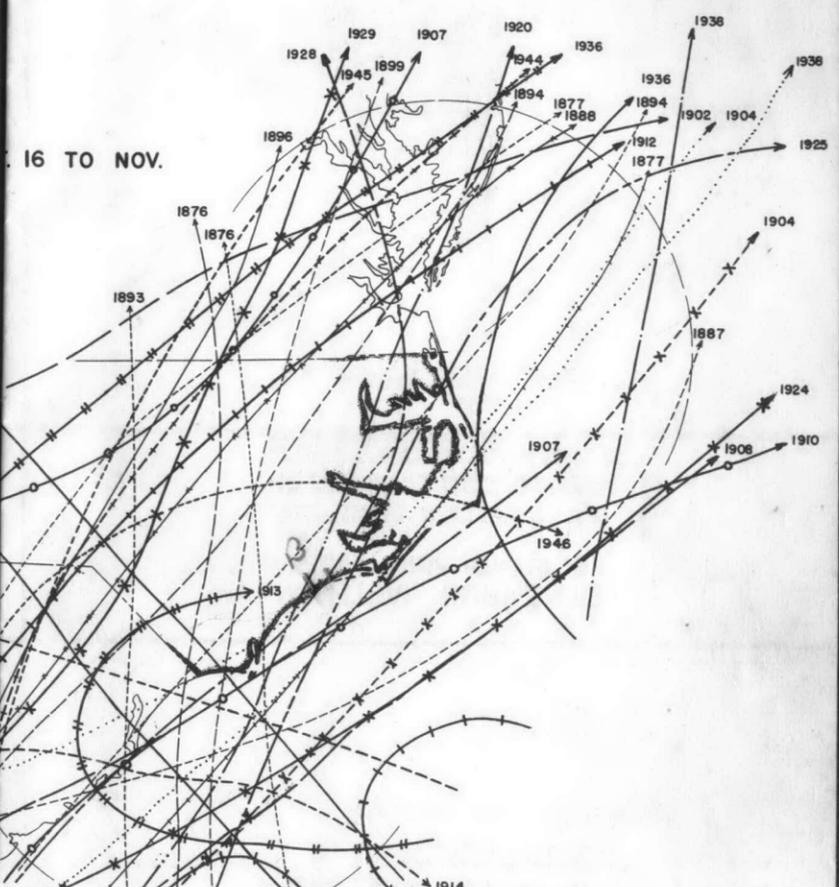
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Sheet Number: _____

Drawing/NAVFAC Number: _____

Title

State of North Carolina
Hurricanes, Swell & Wind Diagrams,
and Nontidal Currents



16 TO NOV.

**SWELL & WIND DIAGRAMS,
AND NONTIDAL CURRENTS**

BEACH EROSION BOARD, WASHINGTON, D.C. MAY 29, 1947

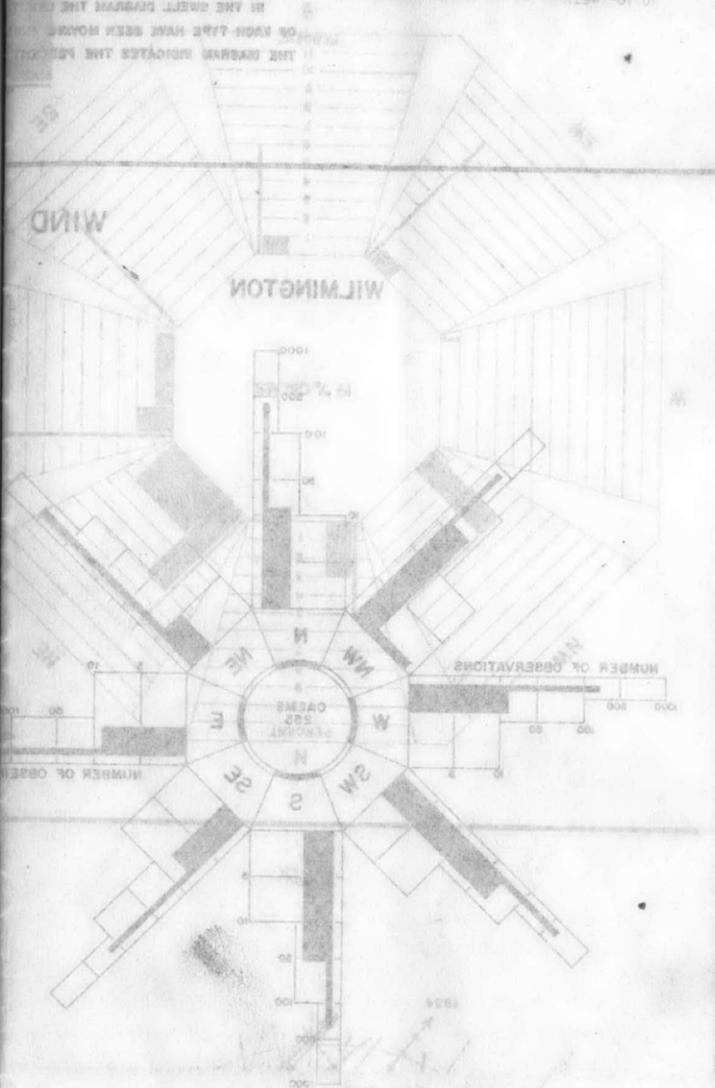
SUBMITTED FOR APPROVAL:
Ronald F. Horton
ENGINEER

APPROVED:
C. Hall
COL., CORPS OF ENGINEERS, U.S. ARMY
SENIOR MEMBER

COMPILED BY: *W.R.*
CHECKED BY: *H.W.*

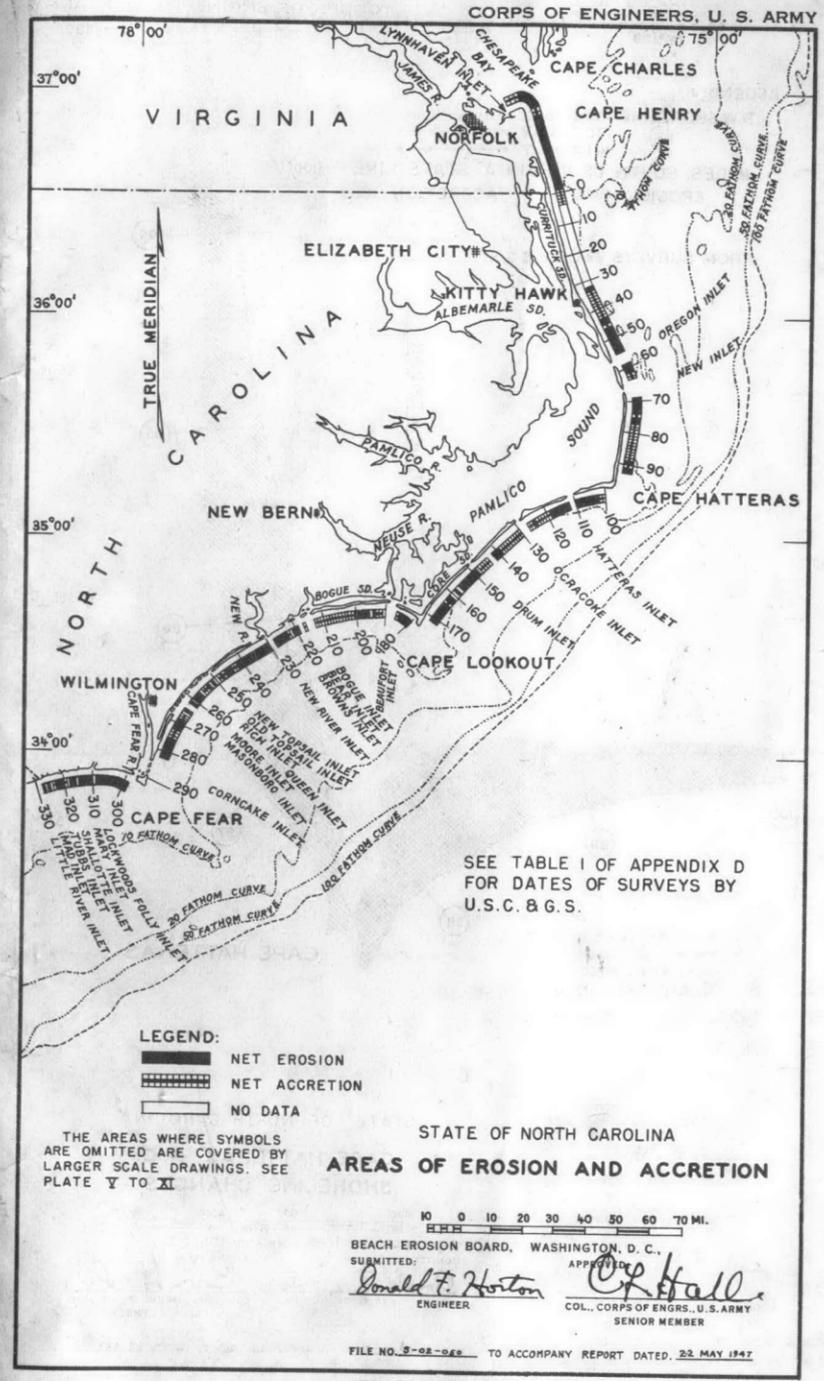
TO ACCOMPANY REPORT
DATED: 22 MAY 1947

FILE NO: B-30-008



SCALE OF VELOCITIES
 0 5 10 15 20 MPH
 THE LENGTH OF THE BASES OF THE LINES FROM THE CENTER OF THE ROSE INDICATES THE FREQUENCY OF WIND BLOWING FROM EACH DIRECTION. THE VELOCITY RANGE FOR EACH MONTH PERIOD IS INDICATED BY THE SHADING OF THE LINES. THE VELOCITIES WERE DETERMINED BY THE U.S. WEATHER BUREAU, WASHINGTON, D.C. FOR THE PERIOD FROM JANUARY 1933 TO DECEMBER 1933.

E. J. HALL (AS IS DRAWN) BY G. J. RICE



SEE TABLE I OF APPENDIX D FOR DATES OF SURVEYS BY U.S.C. & G.S.

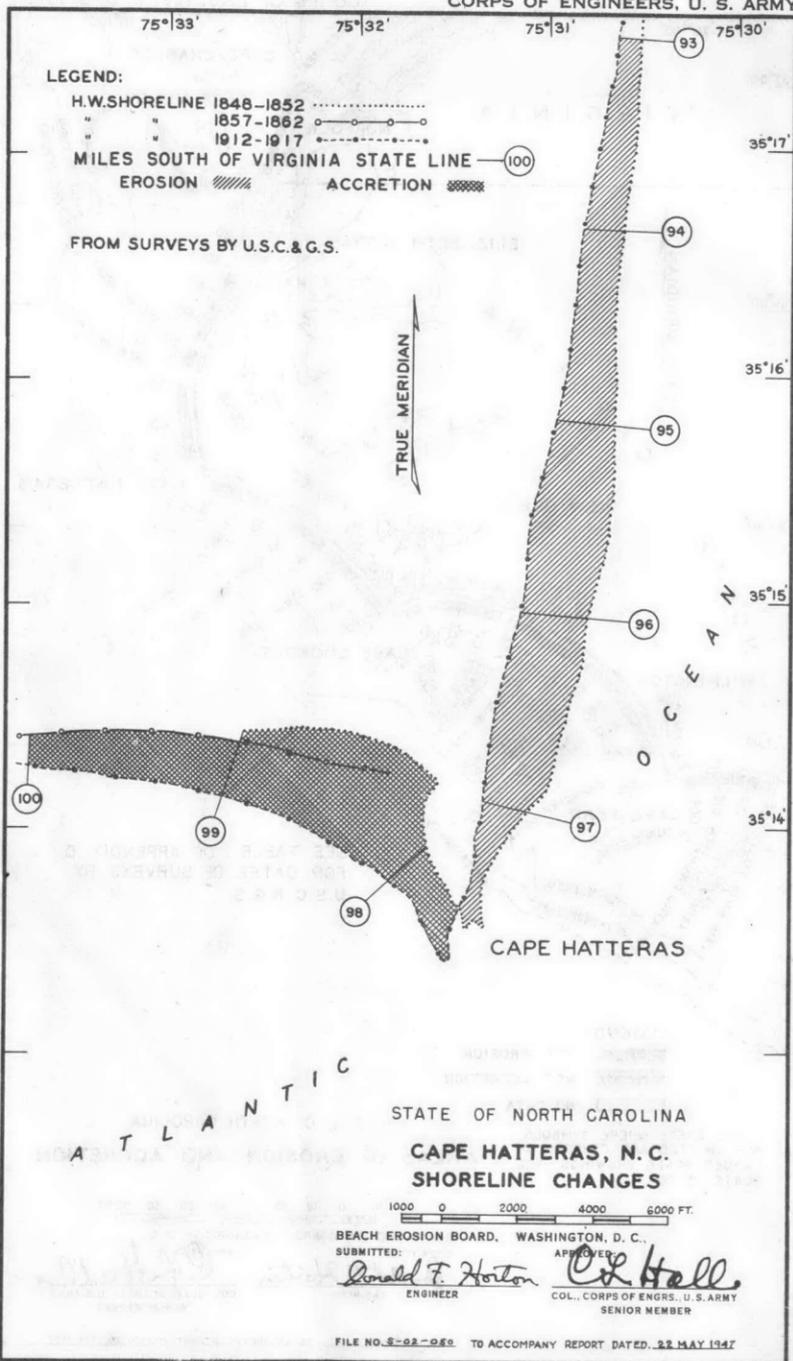


PLATE V

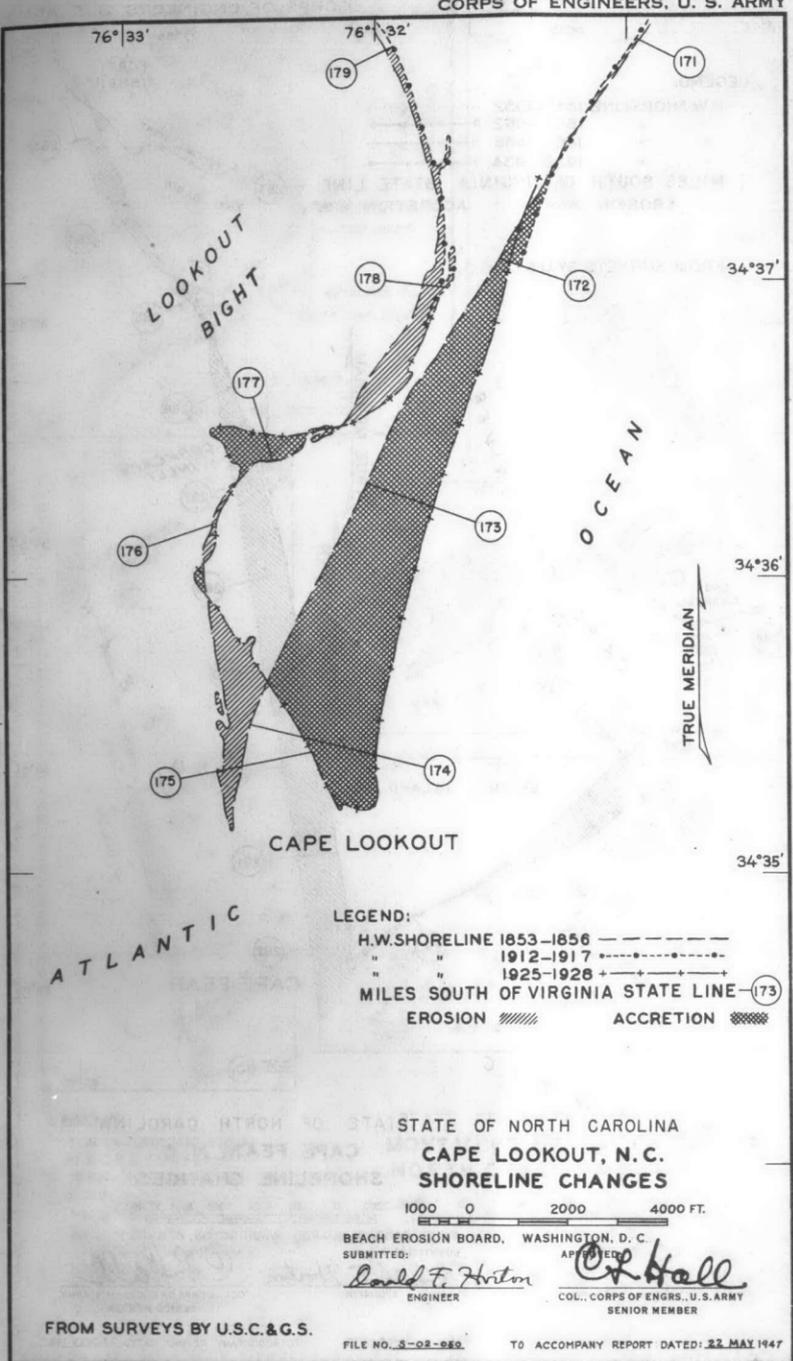


PLATE VI

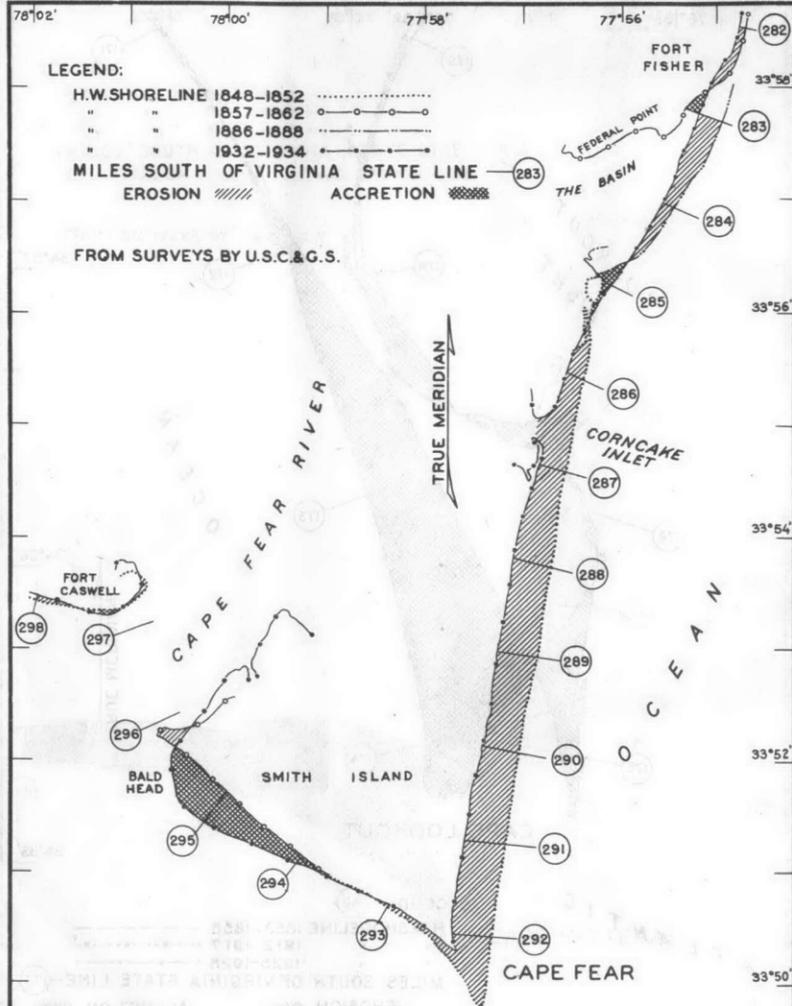


PLATE VII

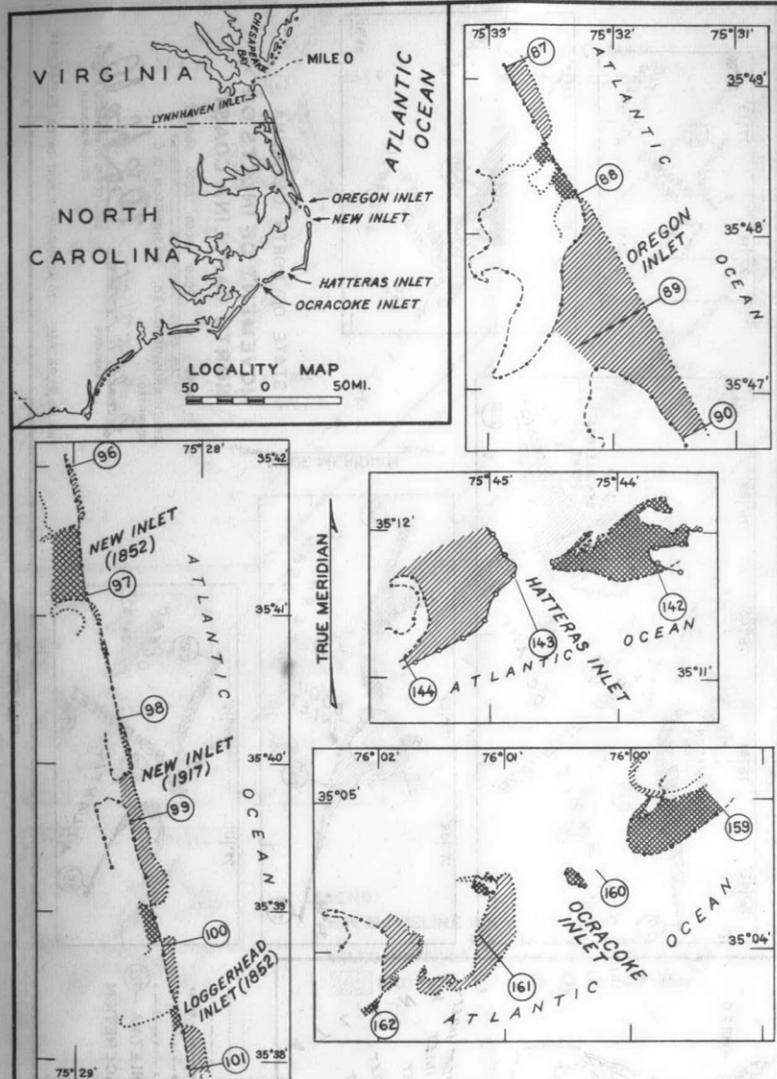


PLATE VIII

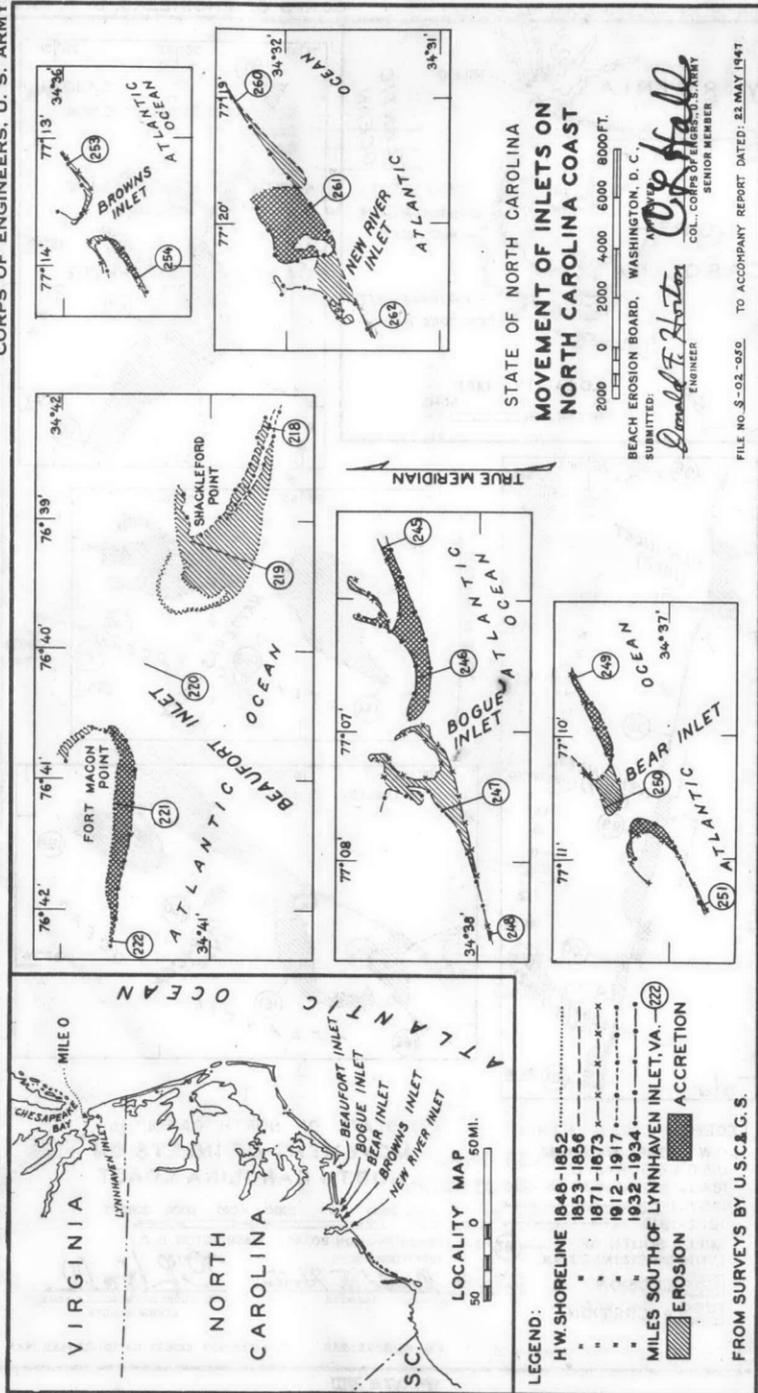


PLATE IX

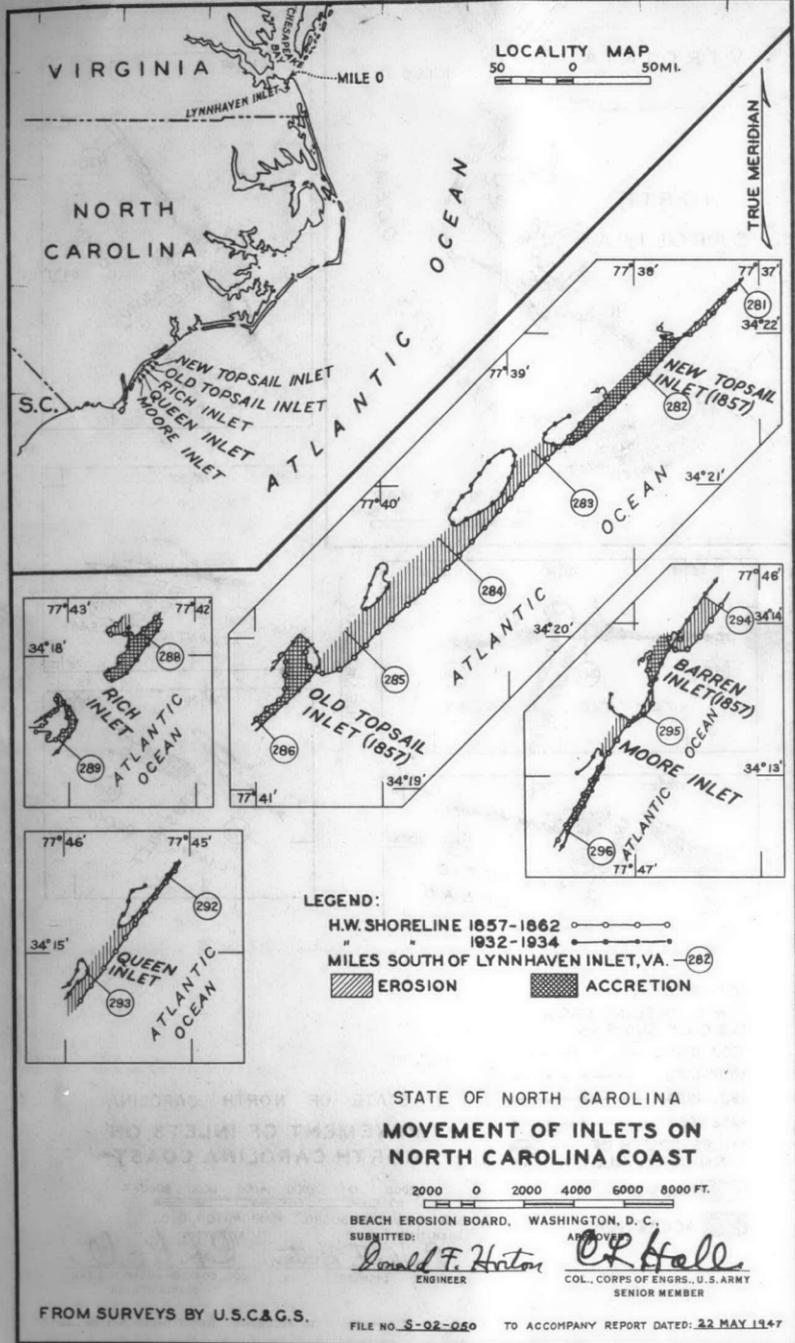
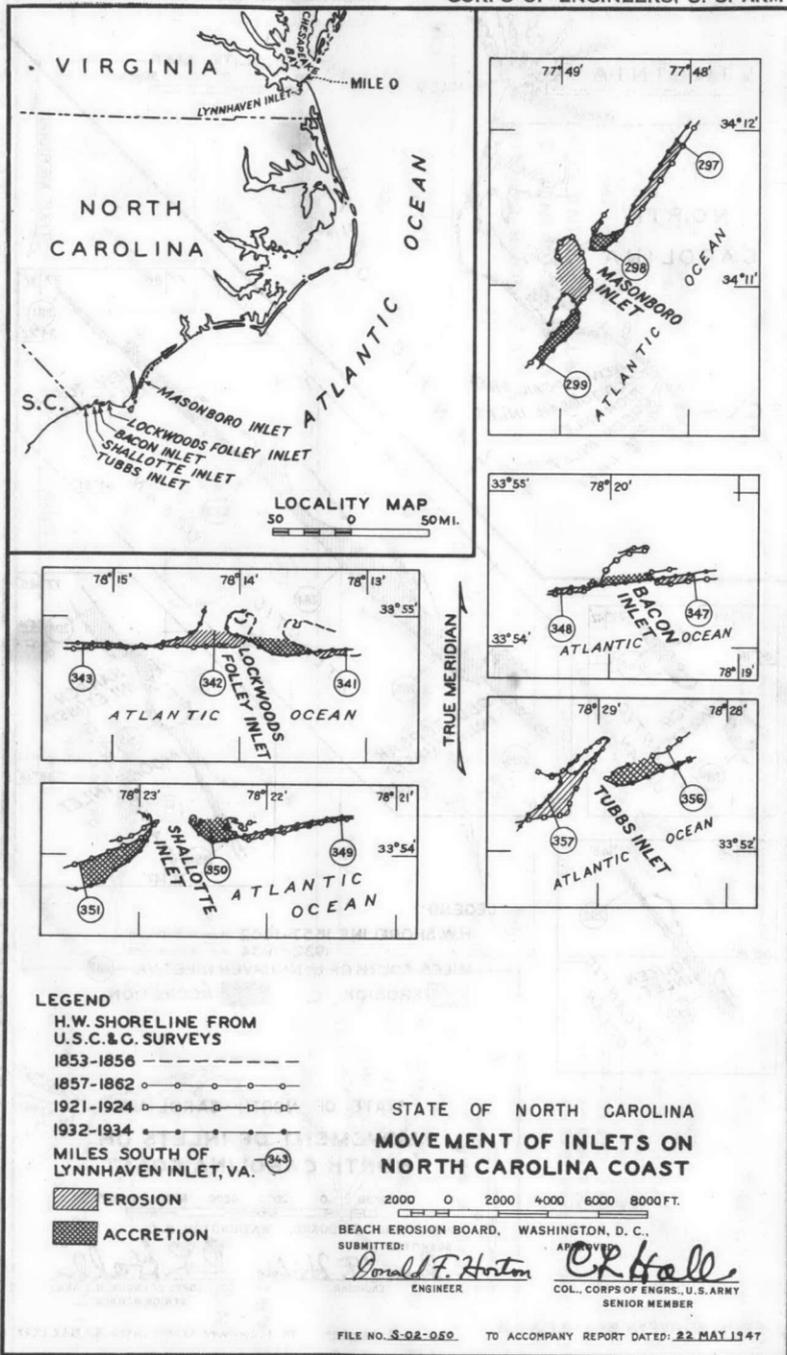


PLATE X



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