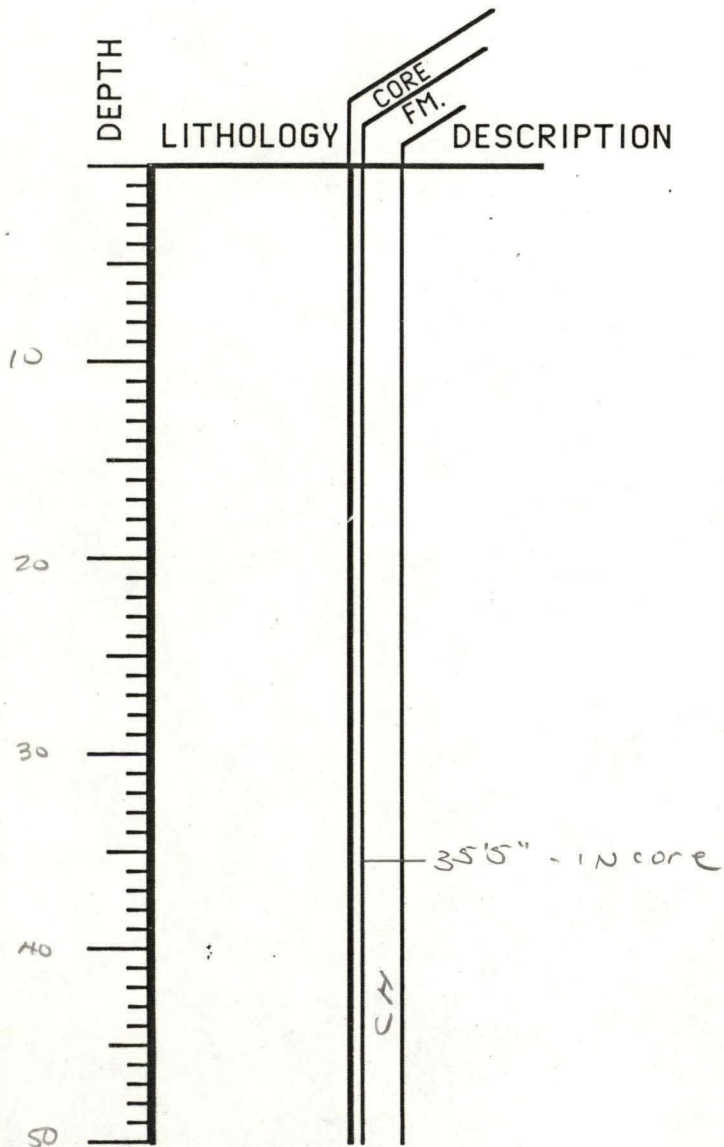


WELL CODE BW-C-2-85

ELEVATION 36'4"

T.D. 74'6"

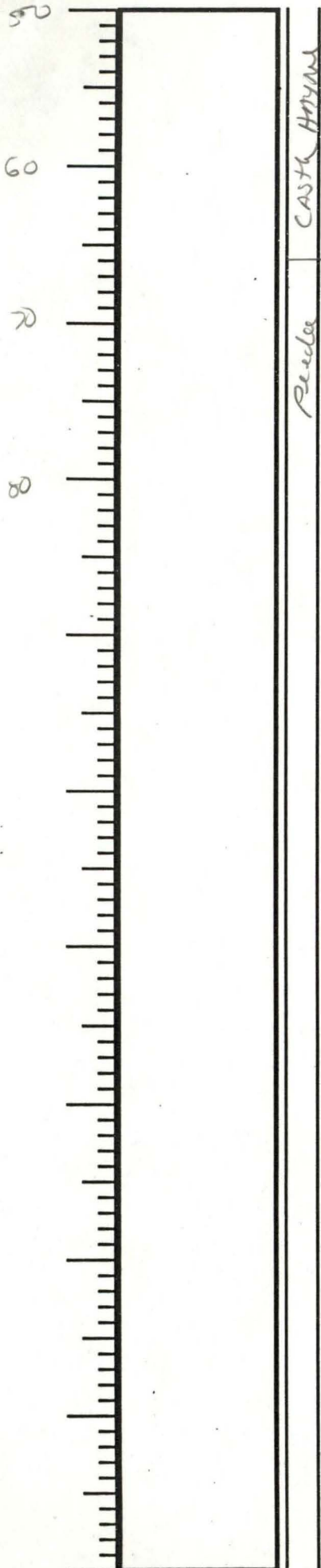
see lith log for core
descriptions



WELL CODE

BW-C-2-85

PAGE # 2



65'11" - note - comfort number on Rocky point member

DRILLING LOG		DIVISION SOUTH ATLANTIC	INSTALLATION WILMINGTON DISTRICT	SHEET 1 OF 3 SHEETS
1. PROJECT MOTSU RR Land Bridge		10. SIZE AND TYPE OF BITS 5 3/8" rock bit & 2 3/4"		
2. LOCATION (Coordinates or Station) 808+20 5' R of E		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MSL X 3 7/8" diamond core barrel		
3. DRILLING AGENCY MOBILE DISTRICT		12. MANUFACTURER'S DESIGNATION OF DRILL Failing 1500		
4. HOLE NO. (As shown on drawing title and file number) LB-83		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED 0	UNDISTURBED 0
5. NAME OF DRILLER C. Moon		14. TOTAL NUMBER CORE BOXES 3		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER 211, 3/29/85		
7. THICKNESS OF OVERBURDEN 35.5'		16. DATE HOLE	STARTED 3-28-85	COMPLETED 3-29-85
8. DEPTH DRILLED INTO ROCK 39.2'		17. ELEVATION TOP OF HOLE 36.4±		
9. TOTAL DEPTH OF HOLE 74.7'		18. TOTAL CORE RECOVERY FOR BORING 84.2 %		
19. SIGNATURE OF INSPECTOR Larry Benjamin, core logged by Tong Haw				

NCGS
C-2-85
BW-C-2-85

ELEVATION a	DEPTH (feet) b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	0'		Overburden, not classified or sampled.			Drilled with rock bit from 0.0' to 35.5' with drill mud; elevation of ground water not observed.
W.L. 21.1'	10'					Set 36.0' of 4" casing. 12 hr. W.L. at 15.3'. Core logged by T. Haw 31Mar85.
12 hrs	20'					Begin with 2 3/4" X 3 7/8" diamond core barrel.
	30'					
	35'		Top of Rock @ 35.5'			
0.9	35.5'	[Brick pattern]	Castle Hayne Limestone: Moderately to well cemented; bluish-gray to dark gray; spar or micrite cement; occasional vug; moderately hard to hard.			Pull #1: From 35.5' to 41.7' Run 6.2' Gain 0.0' Rec 3.7' UL 2.5' Loss 2.5'
35.8'	36'		35.5' to 36.0' discontinuous mechanical, vertical fracture.			37.0' to 37.2' vug across diameter of core
	37'		Castle Hayne Limestone: Moderately cemented; gray; occasional vug; some internal fossil molds; slightly to moderately argillaceous, mod. hard.	60	Box 1 of 3	38.8' to 39.2', very fragmented core; length of core estimated.
	38'					
	39'					
-2.8	40'	Core Loss				39.2' to 47.7', 2.5' accumulative unaccountable core loss through Pull #1.
			Continued on Sheet 2			

A-231

DRILLING LOG (Cont Sheet)		ELEVATION TOP OF HOLE 36.4		Hole No. LB-83		
PROJECT MOTSU RR Land Bridge			INSTALLATION WILMINGTON DISTRICT			
			SHEET 2 OF 3 SHEETS			
ELEVATION a	DEPTH (feet) b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVER- ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	40'	Core Loss			Cont.	Pull#1: continued from above. Note: Scale changed at 40.0'. C.D 41.7'
40.8 - 41.2	42'		Limestone, continued from above. 41.7' to 46.7', about 12 mechanical breaks. 45.4' to 46.7' mostly fragmented core; broken by drill action.	59	Box 1 of 3	Pull#2: From 41.7' to 50.2' Run 8.5' Gain 0.0' Rec 5.0' UL 3.5' Loss 3.5' 46.7' to 50.2', unaccountable core loss; probably ground up by drilling action and washed away.
43.0 - 43.1	44'					
-9.4'	46'		Castle Hayne Limestone: Poorly to moderately cemented fine to medium grained, mod. soft, fossil fragments; lt. gray; argillaceous (bryozoan shell facies).			
	48'	Core Loss				
50.2 - 50.4	50'					C.D. 50.2'
	52'		50.4' to 51.4' very fragmented core, probably broken by drilling action; length of core estimated. Moderately hard to moderately soft.			Pull#3: From 50.2' to 57.0' Run 6.8' Gain 0.0' Rec 6.6' UL 0.2' Loss 0.2'
	54'			97	Box 2 of 3	52.5' 52.5' to 55.6', 17 horizontal mechanical breaks 55.6' to 56.2', very fragmented core, broken by drilling action; length of core estimated
54.0 - 54.2	56'		57.0' to 63.6', 13 irregular horizontal mechanical breaks.			C.D. 57.0'
	58'		Castle Hayne Limestone, continued, as above.	100		Pull#4: continued
			Continued on Sheet 3			

A-232

DRILLING LOG (Cont Sheet)

ELEVATION TOP OF HOLE

36.4

Hole No. LB-83

PROJECT

MOTSU RR Land Bridge

INSTALLATION

WILMINGTON DISTRICT

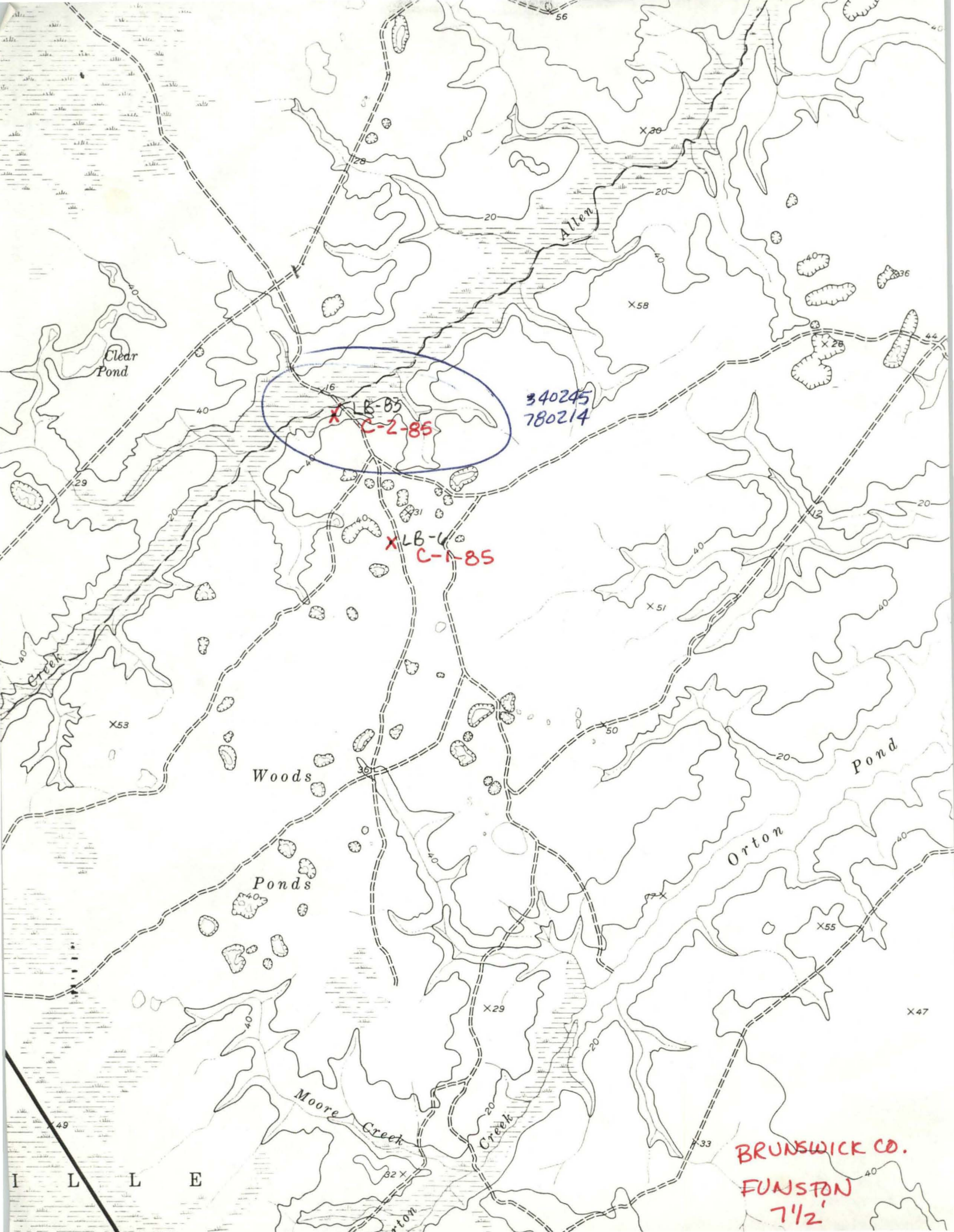
SHEET

3

OF 3 SHEETS

ELEVATION a	DEPTH (feet) b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV- ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	58'	[Symbol]	Limestone from above: Moderately to poorly cemented; fine to medium grained fossil fragments; tan, buff to light gray; argillaceous, moderately soft to moderately hard.		Box 2	Pull#4: From 57.0' to 67.0' Run 10.0' Gain 0.0' UL 0.0' Loss 0.0'
	60'	[Symbol]		100		
	62'	[Symbol]				
63.4		[Symbol]				
63.6		[Symbol]				
	64'	[Symbol]			Box 3 of 3	
	66'	[Symbol]	Bottom of Castle Hayne @ 65.9'. Limestone (Pee Dee Fm) - Moderately to well cemented, dark gray; occasional vug; slightly arenaceous, hard.			C.D. 67.0'
-29.5		[Symbol]				
65.8		[Symbol]				
66.3		[Symbol]				
	68'	[Symbol]	Pee Dee FM: Limestone - Moderately well cemented; gray; abundant internal fossil molds; probably highly permeable; arenaceous; hard.			Pull#5: From 67.0' to 74.7' Run 7.7' Gain 0.0' Rec 7.7' UL 0.0' Loss 0.0' Note: Scale changed at 70.0'.
	70'	[Symbol]		100		
	74'	[Symbol]				
70.95		[Symbol]				
71.3		[Symbol]				
73.8		[Symbol]				
73.9		[Symbol]				
-38.3	74.7'	[Symbol]	Bottom of Hole @ 74.7'			Note: Hole grouted with 4 bags of cement, 3/30/85.
74.6		[Symbol]				
74.7		[Symbol]				

A-233



Clear Pond

Allen

Woods

Ponds

Moore Creek

Creek

Orton

Pond

XLB-85
C-2-85

340245
780214

XLB-U
C-1-85

BRUNSWICK CO.
FUNSTON
7 1/2'

I L L E

STATE		COMPANY BW-C-2-85	
COUNTY		FARM	WELL NO.
BLOCK		SURVEY	
SEC.			
T.	R.	TOTAL DEPTH	
		Note: See COE Lith log	
		COMMENCED in files for	
		COMPLETED description of	
		REMARKS complete core	
ALTITUDE			
PRODUCTION			

CASING RECORD

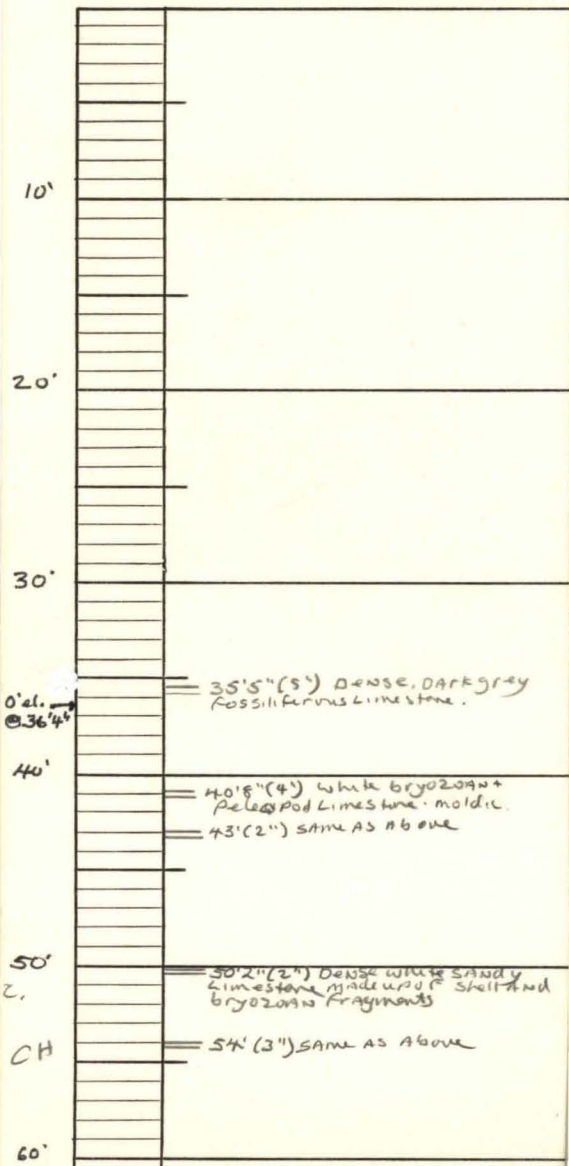
= - core sample
XX'XX" (X") - thickness of core sample.
<u>top of core sample</u>

SHOT	QUARTS	BETWEEN
------	--------	---------

Kraftbilt 186-B

TULSA 74101

PRINTED IN U.S.A.



60'

63'4" (3") SAME AS ABOVE - more sandy

PD

65'8" (8") upper 3" SAME AS ABOVE - CONTACT - lower 5" medium gray moldic limestone, upper 1" with abundant phosphite grains

70'

70'9" (5") medium gray Plecty pod mold limestone.

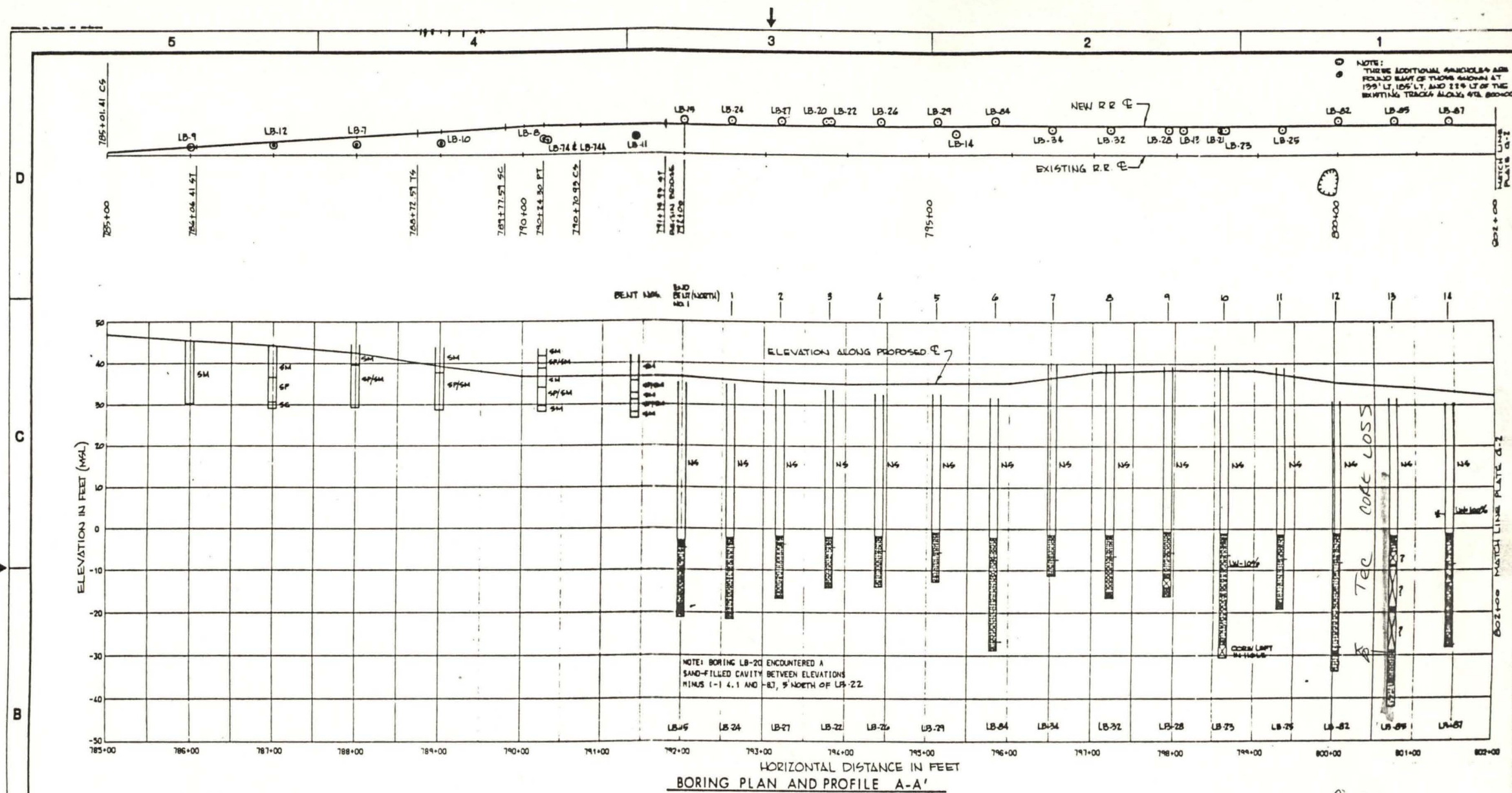
73'8" (2") SAME AS ABOVE

74'6" (2") SAME AS ABOVE, but cream colored.

80'

BRUNSWICK CO.
C-2-85

58-2-2-85
BM-C-2-2-85



LEGEND

- OR ⊙ COREBORING - LB-32 OR LB-76/LB-96A
- ⊙ SPLITSPOON BORING-LB-1
- ⊙ SPLITSPOON & CORE BORING, LB-70
- UNDISTURBED SOIL BORING, LB-70A
- LW=100% LOSS OF DRILLING FLUID, PERCENT INDICATED
- * SOIL/OVERBURDEN CAVITY
- ⊙ SINKHOLES, ACTIVE AND INACTIVE
- CAVITY, OPEN OR SAND FILLED
- CORE LOSS DURING DRILLING, ≥ 1/2 FOOT
- ? CORE LOSS, POSSIBLE SAND FILLED CAVITY
- ▨ LIMESTONE, SHELLY, SOLUTION PRONED
- ▨ LIMESTONE, ARGILLACEOUS (CLAYEY)
- ▨ LIMESTONE, SANDY
- ▨ SANDSTONE, CALCAREOUS (LIMEY)
- SANDSTONE, BEDDED, FINE GRAIN
- NR NO RECOVERY
- NS NOT SAMPLED
- SP SANDY, POORLY GRADED
- SM SAND, SILTY
- SC SAND, CLAYEY
- CL CLAY, LEAN TO SANDY

G-1

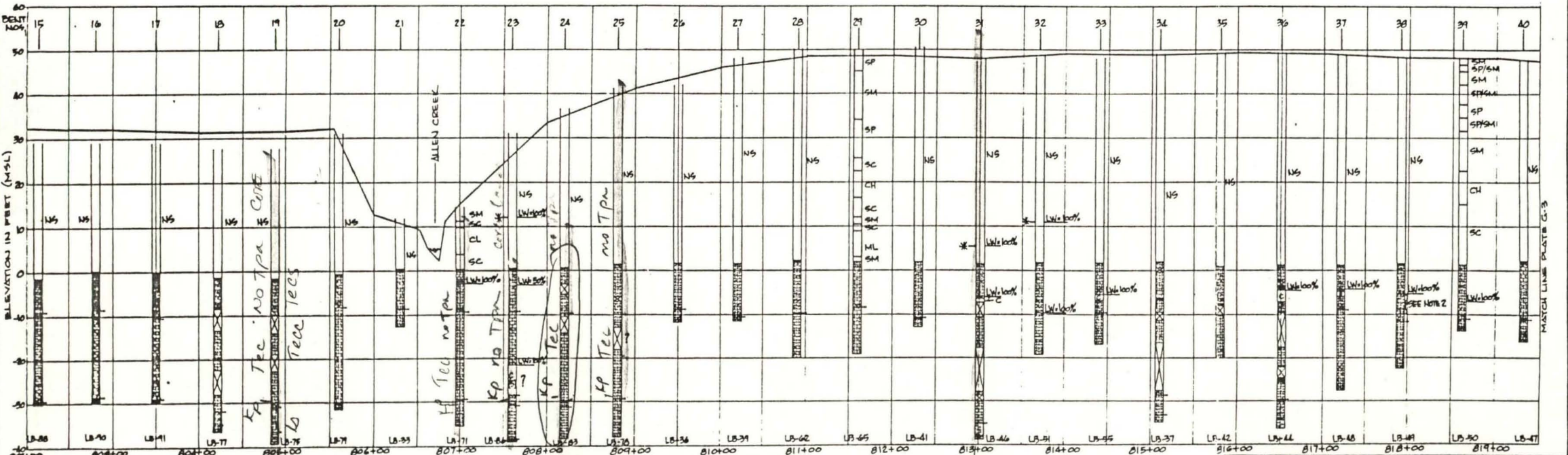
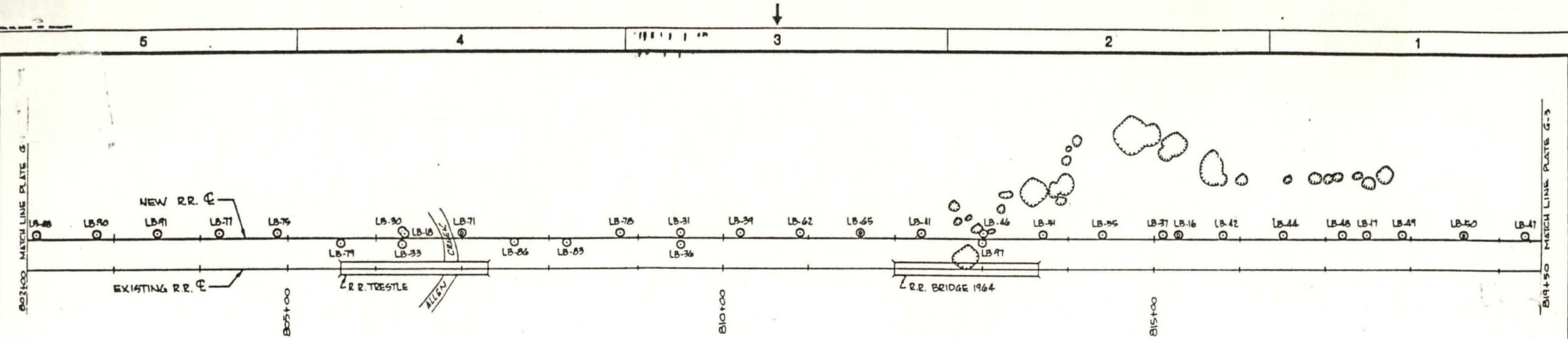
Symbol	Description	Date	Approved

Designed by: WPM
Drawn by: WHW

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
WILMINGTON, NORTH CAROLINA

MILITARY OCEAN TERMINAL
SOUTHPOST, NORTH

RAILROAD

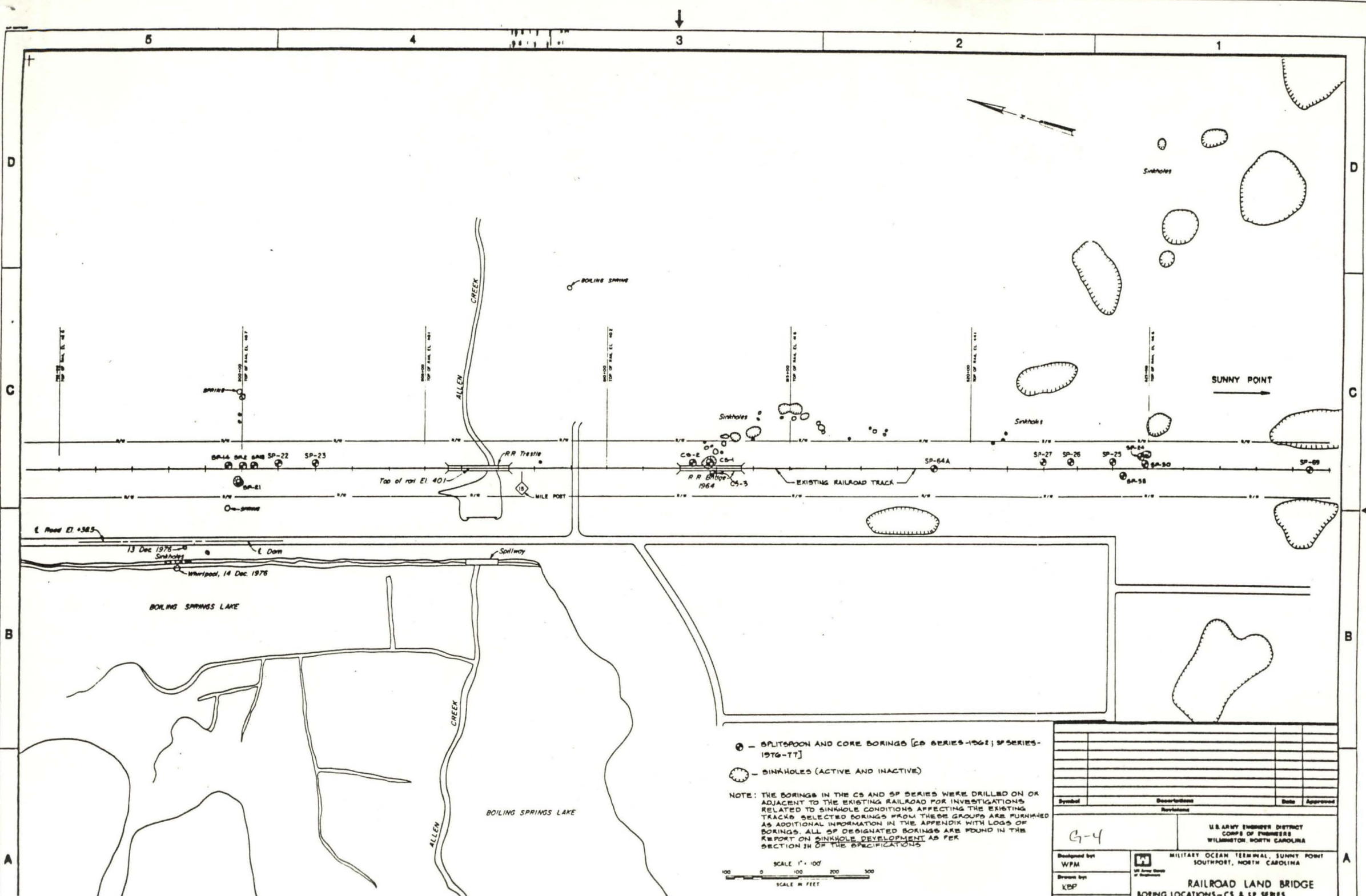


BORING PLAN AND PROFILE A-A' (CONTINUED)

- NOTES:
- SEE PLATE G-1 FOR LEGEND
 - LB-49, 0.2' CAVITY AT 53.7', 1.0' CORE LOSS BETWEEN 53.9' AND 58.1' DUE TO SMALL CAVITIES ON SAND LENSES.

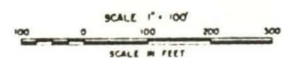
NOTE:
LB-97 IS SIMILAR TO LB-46

Symbol	Descriptions	Date	Approved
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS WILMINGTON, NORTH CAROLINA			
Designed by WPM		MILITARY OCEAN TERMINAL SUPPLY POINT SOUTHPOST, NORTH CAROLINA	
Drawn by WWV		RAILROAD LAND BRIDGE SUBSURFACE BORING PLAN AND PROFILE A-A'	
Checked by HAF			



- ⊙ - SPLITSPOON AND CORE BORINGS (CS SERIES-1962; SP SERIES-1976-77)
- ⊖ - SINKHOLES (ACTIVE AND INACTIVE)

NOTE: THE BORINGS IN THE CS AND SP SERIES WERE DRILLED ON OR ADJACENT TO THE EXISTING RAILROAD FOR INVESTIGATIONS RELATED TO SINKHOLE CONDITIONS AFFECTING THE EXISTING TRACKS. SELECTED BORINGS FROM THESE GROUPS ARE FURNISHED AS ADDITIONAL INFORMATION IN THE APPENDIX WITH LOGS OF BORINGS. ALL SP DESIGNATED BORINGS ARE FOUND IN THE REPORT ON SINKHOLE DEVELOPMENT AS PER SECTION 34 OF THE SPECIFICATIONS.



Symbol	Description	Date	Approved

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
WILMINGTON, NORTH CAROLINA

MILITARY OCEAN TERMINAL, SUNNY POINT
SOUTHPORT, NORTH CAROLINA

RAILROAD LAND BRIDGE
BORING LOCATIONS - CS & SP SERIES

Designed by
WPM

Drawn by
KBP



G-4