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 FACIL: 50-400 SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1, CAROLINA
 50-401 SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 2, CAROLINA
 50-402 SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 3, CAROLINA
 AUTH. NAME: MCDUFFIE, M.A. AUTHOR AFFILIATION: CAROLINA POWER & LIGHT CO.
 RECIP. NAME: DENTON, H.R. RECIPIENT AFFILIATION: OFFICE OF NUCLEAR REACTOR REGULATION

DOCKET #
05000400
 05000401
 05000402
 50-403

SUBJECT: RESPONDS TO REGION 2 790504 REQUEST RE CRITERIA FOR PREVIOUSLY PLACED BACKFILL.

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	AD SITE ANALYSIS	1	0	DIRECTOR NRR	1	0
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MAY 30 1979

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1. The first part of the document
 discusses the general principles
 of the project and the
 objectives that have been
 set for the study.

The second part of the document
 describes the methodology used
 in the study and the results
 of the data analysis.



Carolina Power & Light Company

May 18, 1979

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SHEARON HARRIS NUCLEAR POWER PLANT UNIT NOS. 1, 2, 3, AND 4
DOCKET NOS. 50-400, 50-401, 50-402, 50-403
CRITERIA FOR PREVIOUSLY PLACED BACKFILL

Dear Mr. Denton:

On May 4, 1979, NRC Region II informed Carolina Power & Light Company (CP&L) that the Office of Nuclear Reactor Regulation's approval of previously placed fill at the powerhouse block, dams and dikes, and Class 1 piping areas would be required in writing prior to the placement of additional Category 1 fill. In our letter to you on May 4, 1979, we identified changes made to Ebasco Specification CAR-SH-CH-8 "Excavation, Backfill, Filling, & Grading" which you have subsequently approved. The following criteria was imposed by these changes:

- A. Field permeability tests shall be run every 2,000 cubic yards.
- B. Permeability shall not exceed 10 feet per year.
- C. Backfill material shall be placed at a moisture content within \pm 4 percent of the optimum moisture content determined by the Standard Proctor Density method.

The in-place backfill material previously placed against the waste processing building, a Seismic Category I structure, is evaluated below relative to the the current specifications which have been reviewed and approved by your staff.

- A. Field permeability test every 2,000 cubic yards.

The attached figure contains a plan view and developed profile of backfill in place on three sides of the Waste Processing building and identifies locations and elevations of in-place permeability tests conducted between April 18, 1979 and May 8, 1979. The ten test locations are horizontally and vertically spaced to represent a conservative sample for the 15,000 cubic yards which have been placed.

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SE 1/1*

411 Fayetteville Street • P. O. Box 1551 • Raleigh, N. C. 27602

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CHAPTER I

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CHAPTER II

CHAPTER III

CHAPTER IV

CHAPTER V

CHAPTER VI

CHAPTER VII

B. Permeability of ten feet per year or less.

The field permeability tests were conducted in accordance with the Bureau of Reclamation Department of the Interior test procedure E-19. The results of the permeability tests are tabulated below:

Permeability

Test 1	16.40 ft/year
Test 1R	7.28 ft/year
Test 2	11.43 ft/year
Test 2R	7.11 ft/year
Test 3	5.87 ft/year
Test 4	12.37 ft/year
Test 4R	4.34 ft/year
Test 5	6.22 ft/year
Test 6	1.68 ft/year
Test 7	7.97 ft/year
Test 8	2.79 ft/year
Test 9	8.57 ft/year
Test 10	7.70 ft/year

Three tests (1, 2, and 4) which exceeded the 10 ft/year criteria were run without sufficient time for saturation. Retests allowing more time for saturation were run adjacent to these locations. The results of the above tests meet the permeability requirements of the current approved specifications.

C. Moisture content within ± 4 percent of the optimum moisture content determined by Standard Proctor Tests.

The attached permanent waiver (PW-C-666) describes 35 in-place density tests taken during placement of the Category I backfill around the Waste Processing Building. By conservatively adding or subtracting 1.2% to the field moisture percent (the maximum difference between the field stove and the laboratory oven), only five of the thirty-five tests deviated from the ± 4 percent limitation. The maximum probable moisture content differed from the optimum moisture content for the five tests by -4.4%, -4.2%, -4.1%, -4.9%, and 4.2%. Because the results of the tests include the maximum 1.2% deviation, because of the small number of tests falling below -4% of optimum moisture content, and because the actual deviation from specification limits is minor, CP&L has approved a permanent waiver allowing probable maximum moisture content variations of from -0.1 to -0.9 below the lower limit of -4 percent below optimum moisture content.

THE [illegible] OF [illegible]

[illegible text]

[illegible text]

[illegible text]

[illegible text]

May 18, 1979

There are no Seismic Category I pipes or conduits which traverse the previously laid backfill around the Waste Processing Building. Therefore, based on the above information CP&L believes the subject backfill is acceptable against current criteria.

Please formalize your technical concurrence with our evaluation so that Region II Inspection and Enforcement can authorize placing additional backfill around the Waste Processing Building.

Yours very truly,



M. A. McDuffie
Senior Vice President
Engineering & Construction

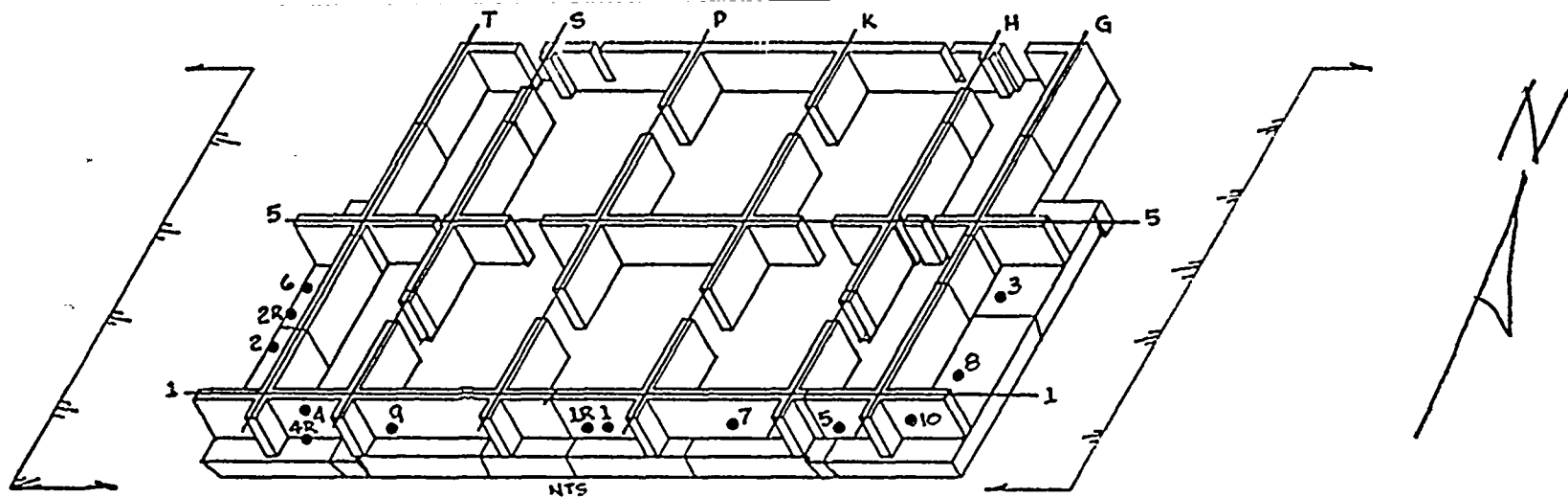
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cc: Mr. J. P. O'Reilly

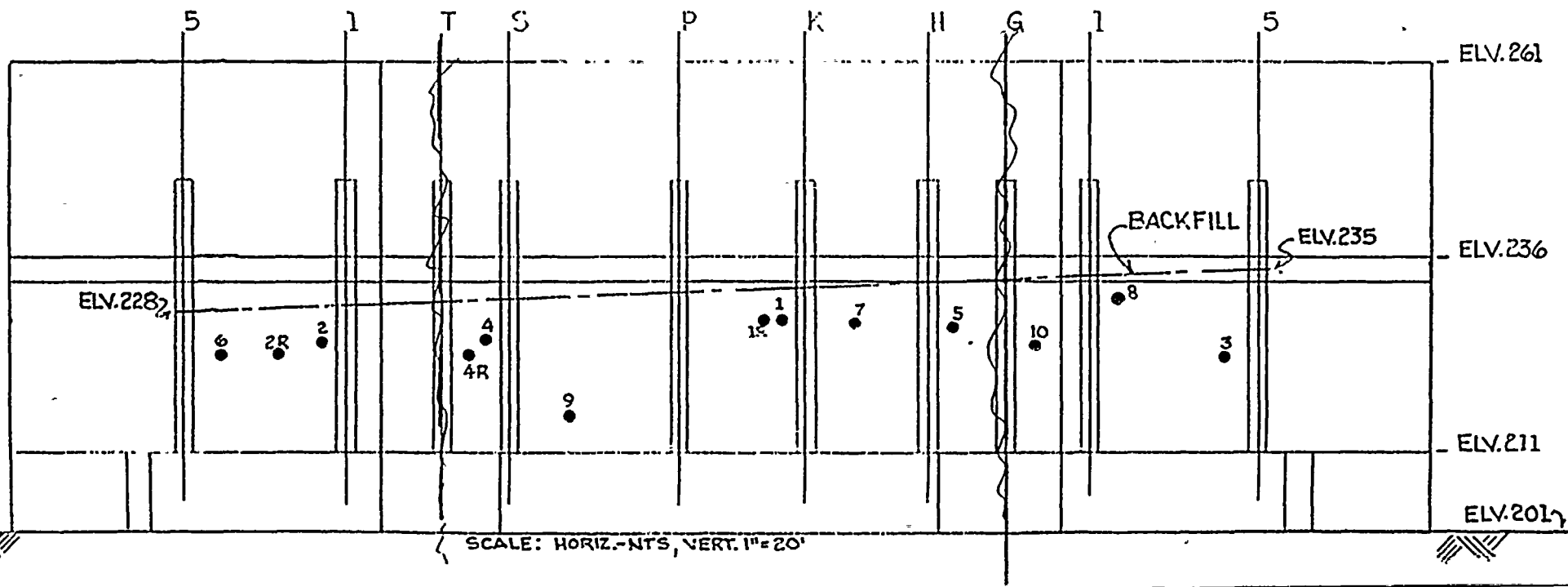
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 FBI on the above named individual:

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 FBI on the above named individual:

The following information was obtained from the files of the
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TEST #	ELEV.	STATION	TEST #	ELEV.	STATION
1	228'	1+4'S K+4'W	7	228'	H+22'W 1+10'S
2	225'	1+10'N T+3'W	8	231'	1+30'N G+10'E
3	223'	G+20'E 5+10'S	1R	228'	1+4'S K+4'W
4	225'	1+5'S S+5'W	2R	224'	T+12'W 1+18'N
5	227'	H+9'E 1+3'S	4R	224'	S+18'W 1+8'S
6	224'	T+10'W 5+15'S	9	216'	1+8'S S+29'E
			10	225'	1+10'S G+11'E



CAROLINA POWER & LIGHT COMPANY
SHEARON HARRIS NUCLEAR POWER PLANT
FIELD CHANGE REQUEST/PERMANENT WAIVER

~~FCR~~ PW C-666

Type of Request: Permanent Waiver to "use-as-is" Reviewed for Safety Significance
 Field Change See Recommended Action
J. F. Smith
Signature & Date

Identification of Area and Item: Q ASME Section III
Waste Processing Building Backfill Moisture Control Non-Q Non-ASME Section III

Conflict/Condition

Reference Documents or Attachment Ebasco Specification CAR-SH-CH-8 Revision 8

SEE CONTINUATION SHEET

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FOR INFORMATION ONLY

Recommended Action: Please Investigate and Resolve
 Please Resolve as Follows

Allow the select backfill to remain in place.

Justification: By Ebasco

Requested by: *J. F. Smith*
Discipline Engineer Date 5-11-79

Site Approval: *J. F. Smith* Ex AML
Resident Engineer - Project Date 5-11-79

First Distribution: (Copy) _____
(Original) Ebasco (Copy) _____
(Copy) (Copy) _____



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Design Engineering Approval (AE) ~~(N335)~~

Telephone Resolution

Yes No

Approved as Recommended Rejected Conditional Approval

This change requires the following Document(s) (Specification, Drawing, SAR, etc.)
to be changed NONE

Comments: EBASCO APPROVAL RECEIVED PER TELECONFERENCE BETWEEN M. PAVONE, M. WEBER
AND J. NEVILL ON 5-11-79. IN PLACE MATERIAL MEETS DESIGN CRITERIA,
J. Nevill 5-11-79

Signature Title Date Signature Title Date

CP&L Engineering Pool Approval Required

Yes
 No

Telephone Resolution

Yes No

Approved as Recommended Rejected Conditional Approval

CP&L ENGR POOL APPROVAL RECEIVED PER TELECONFERENCE BETWEEN J. CARTER,
J. DUGGAR AND J. NEVILL ON 5-11-79. J. Nevill 5-11-79

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FOR INFORMATION ONLY

Discipline Engineer Date NEP or PPF Date

Site Concurrence: Recommend Implementation AM Linn 5-11-79
 Alternate Resolution Resident Eng.-Project Date

Second Distribution:

(Original) James Nevill (Copy) _____
(Cognizant Discipline Engineer) (Copy) _____
(Copy) Principal Q.A. Specialist (Copy) _____

Implementation Completed as Approved? Yes

No

Comments:

Discipline Engineer

Final Distribution:

(Original) File in Doc. Control (Copy) Principal Q.A. Specialist
(Copy) Ebasco (Copy) _____
(Copy) PPED (Copy) _____

CONFLICT/CONDITION

Starting on 9/13/78, approximately 15,000 cubic yards of select backfill has been placed along the south wall of the waste process building from Elevation 200 to 231 (including the area at the future annex). The material as required by CAR-SH-CH-8 Revision 8 was compacted to at least 95% standard proctor maximum density. DCN-550-259 dated 4/27/79 imposed an additional requirement of moisture content control within ± 4 percent of the optimum. At the time of placement, no control of moisture was required.

Out of a total 35 in-place density tests taken and which represent the 15,000 cubic yards, 5 resulted in material out of the ± 4 percent limitation. The five tests are out only if the probable deviation for the method used for determination is included. See data below for moisture content, density, elevation and location.

<u>TEST</u>	<u>LOCATION</u>	<u>ELEV.</u>	<u>DENSITY</u>	<u>PROBABLE MOISTURE CONTENT FROM OPTIMUM</u>
WPB-10	3' off south wall and 80' west of K	209	110.0 lb/ft ³	-4.4%
WPB-16	30' west of H in area of future annex	211	119.9 lb/ft ³	-4.2%
WPB-19R	70' east of G and 10' north of I	218	109.8 lb/ft ³	-4.1%
WPB-20	3' south of 5 and 20' east of G	225	108.6 lb/ft ³	-4.9%
WPB-27	10' west of P	213	108.3 lb/ft ³	-4.2%

NOTES

1. The probable deviation was used to determine the worst possible case although the deviation could be plus or minus.
2. For determination of moisture content for density computation, a field stove was used which resulted in a probable deviation of $\pm 1.2\%$.
3. The maximum probable moisture content for the density tests above optimum moisture was +3.9%.

11-11-52



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