

Safety Related



ARKANSAS POWER & LIGHT COMPANY
Arkansas Nuclear One

TITLE: RECORD OF CHANGES AND REVISIONS

FORM 1000.006A REV 30

MECHANICAL PERIODIC TEST

SAFETY RELATED YES NO

SPENT FUEL POOL CRACK MAPPING
AND VISUAL INSPECTION
2306.010 REV. 3

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COGNIZANT AUTHORITY APPROVAL:

D.C. Mims for R.A. Fenech

APPROVAL DATE:

5-16-90

REQUIRED EFFECTIVE DATE:

9101230320 910115
PDR ADOCK 05000368
P PDR



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MECHANICAL
PERIODIC TESTS

PROCEDURE WORK PLAN TITLE:
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1.0 PURPOSE

- 1.1 The purpose of this procedure (originally 2304.78) "Spent Fuel Pool Crack Mapping and Visual Inspection" is to provide instruction for a long term survey and extended mapping program to ensure that the structural integrity of the Unit 2 spent fuel pool is intact. This procedure and inspection program were implemented in response to a construction error in which some corner reinforcement bars was misplaced in the spent fuel pool structure.
- 1.2 This procedure requires a periodic inspection of the four grid zones laid out on the pool's concrete surface - two along the concrete slab, Elev. 404', and two on the exterior face of the pool wall along column line 4. All cracks discovered within these grids are to be clearly marked if the width exceeds 0.010 inches and plant engineering is to be promptly notified of these findings. Upon completion of each inspection, plant engineering shall review the inspection team's comments and complete the Engineering Evaluation Report.

2.0 SCOPE

- 2.1 The scope of this procedure is to provide instructions for a mapping program to ensure that the structural integrity of the Unit 2 spent fuel pool is maintained.
- 2.2 This procedure also provides instructions for performing a visual inspection to verify that structural integrity is maintained.
- 2.3 Prior to the initial filling of the spent fuel pool, each square within the mapped areas shall be visually examined.

3.0 DESCRIPTION

Four permanent grids have been laid out on the concrete surfaces at the spent fuel pool. Two are on elevation 404'-0" slab and two are on the exterior face of the column line 4 wall as shown on Attachment A. The grids shall consist of 12 inch squares arranged in the patterns shown on Attachments B through E. The grids are laid out using paint or some other permanent type of marking system. Should the pattern deteriorate during the life of the plant, it shall be re-established. The width of every visible crack shall be measured by optical comparator at what is judged to be the widest point on the portion of the crack line lying within the mapped area. If the measured width equals or exceeds .010 inch the crack shall be mapped according to the following procedure.

4.0 REFERENCES

- 4.1 References used in development of procedure.
 - 4.1.1 Tech. Spec. #4.7.12.2, 3/4.7.12.
 - 4.1.2 Bechtel Spec. 6600-C-2302, Section 14.



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- 4.1.3 Bechtel Correspondence BL-G-464.
- 4.1.4 1025.03 Conduct of Maintenance
- 4.1.5 1025.09 Maintenance Procedure Format and Content
- 4.2 References which are required to perform this procedure.
 - 4.2.1 None
- 4.3 Regulatory Correspondence containing NRC commitments which are implemented in this procedure.
 - 4.3.1 Letter of July 1, 1976, To: Mr. J. F. Stolz, Chief Light Water Reactors Branch #1, U. S. Nuclear Regulatory Commission, From: William Cavanaugh III, Item 6, Last Sentence, (See File #2-0550.1)

5.0 TEST EQUIPMENT

- 5.1 Bausch & Lomb, Inc., Measuring Magnifier, CAT #81-34-35 or equivalent with scale of 0 to .500 in.

6.0 LIMITS AND PRECAUTIONS

- 6.1 Equipment used in performance of this task is available.
- 6.2 Take precautions to assure nothing is dropped in spent fuel pool.
- 6.3 Maintain required cleanliness level as specified by procedure 1025.019
- 6.4 Observe all Radiological and Safety postings.
- 6.5 The steps in this procedure need not be followed in sequence.
- 6.6 Wipe the surface to be examined to free it of abrasive grit. Similarly, brush off any grit which may have accumulated on the scale. Set the magnifier directly on the surface so that the scale is in contact with the material to be measured. This will ensure that measurements are as accurate as possible.

7.0 PREREQUISITES AND INITIAL CONDITIONS

- 7.1 Obtain clearance from Shift Supervisor prior to starting test. _____ / _____
- 7.2 Verify test equipment Calibration data is current and M&TE Number is assigned. _____ / _____
- 7.3 Review procedure to assure that it is current and complete. _____ / _____

INITIAL/DATE



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8.0 INSTRUCTIONS

8.1 Verify the grids are intact and clearly marked as specified in the description of the procedure.

IF NOT,
THEN re-establish the grids using some type of permanent marker.

8.2 Crack Mapping

8.2.1 Measure the width of an existing crack at the point where the previous measurement was made and as required to define changes in crack characteristics. The crack width and length shall be recorded on the data sheet (attachment B - E).

8.2.2 Record length increases ~~as in described 8.1.2,~~ extending the existing permanent type marking line and noting the new end point by a short cross line. Crack lengthening activity shall be marked using another color and dated.

8.2.3 Measure the width of any new or previously mapped crack at the point judged to be the widest. ~~The new crack shall be marked according to Section 8.1.1 if the measured width is equal to or exceeds .010 inch.~~ All new crack activity shall be marked using a permanent type marking system and dated. The color shall be the same as that used for identifying crack increases.

NOTE

Minor spalling in this area is not an indication of a structural failure.

8.2.4 IF Spalling of concrete occurs on the exterior face of the column at elevation 404'-0" as indicated on Attachment A.
THEN repair the concrete in accordance with Specification 6600-C-2302, Section 14.0, repair of concrete.

IF NOT,
THEN mark this step N/A.

8.2.5 Make a sketch of the crack made on the appropriate data form, Attachments B through E. A decrease in crack width and length shall be indicated on the form.

Repairs needed: Yes _____ NO _____



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8.3 Visual Inspection

NOTE

Due to erroneous installation of reinforcing steel into the wall front face instead of the rear face of the adjoining walls during construction, a visual inspection is required to assure that structural integrity is maintained and that pool remains safe for use.

8.3.1 Perform visual inspection of accessible interior and exterior spent fuel pool surfaces, the struts in the tilt pit, the separation wall surfaces and the structural slabs adjoining the pool walls. _____ /

8.3.2 Visually verify no changes in concrete crack patterns. No abnormal degradation or other signs of structural distress (i.e., cracks bulges, out of plumbness, leakage, discolorations, efflorescence, etc.) _____ /

8.3.3 Record any deficiencies or changes noted on Attachment A through E, as applicable. _____ /

8.3.4 IF any changes or deficiencies are noted, THEN notify the engineering section immediately and get an evaluation.
IF an evaluation is made, THEN attach to the procedure to be returned to records for inclusion in J.O. package.
IF no evaluation is required, THEN complete the procedure and return through normal process. _____ /

9.0 RESTORATION AND CHECKOUT

9.1 Verify that all permanent grids are clearly marked. _____ /

9.2 Notify Shift Supervisor that activity is completed. _____ /

9.3 Verify that all required steps of this procedure have been completed. _____ /

9.4 Verify that all deficiencies found have been recorded on Attachment G and reported to the Plant Engineering Section. _____ /



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9.3 Verify that all cracks exceeding the Screening Criteria of Attachment F have been examined and are within the Acceptance Criteria of Unit 2 Tech. Spec. 4.7.12.2 or the appropriate reporting requirements have been initiated. The appropriate corrective action has been initiated as specified by Engineering and the Job Request/Job Order Number recorded below.

Job Request/Job Order Number _____
(if applicable).

PERFORMED BY _____ / _____
Signature Date

REVIEWED BY _____ / _____
Civil Engineer Date

10.0 ATTACHMENTS AND FORMS

- 10.1 Attachment A, Plan @ El. 404'-0"
- 10.2 Attachment B, Concrete Crack Pattern Grid Zone I
- 10.3 Attachment C, Concrete Crack Pattern Grid Zone II
- 10.4 Attachment D, Concrete Crack Pattern Grid Zone III
- 10.5 Attachment E, Concrete Crack Pattern Grid Zone IV
- 10.6 Attachment F, Table I Screening Criteria Crack Width and Length
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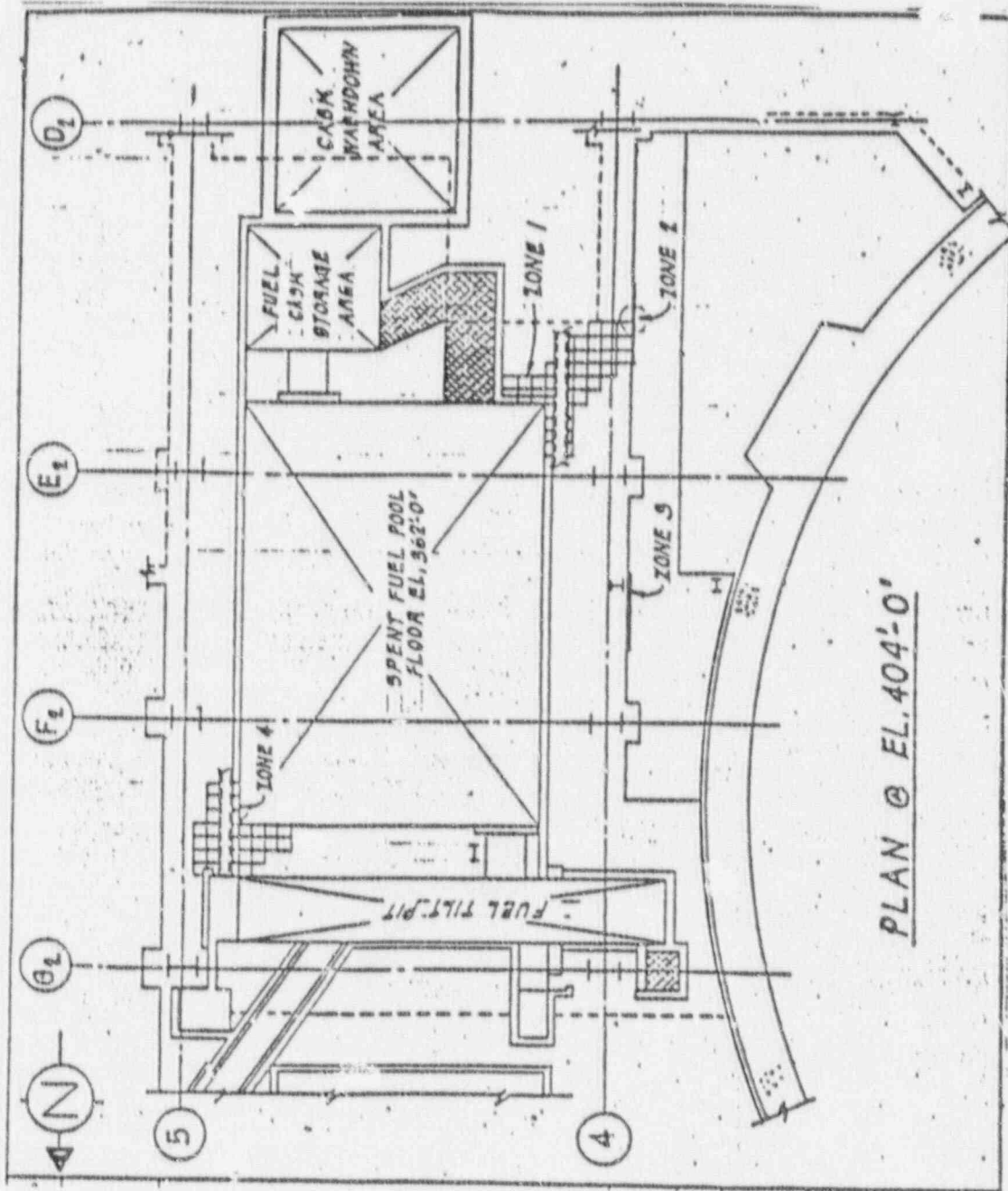
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ATTACHMENT A

SPENT FUEL POOL CRACK MAPPING AND VISUAL INSPECTION





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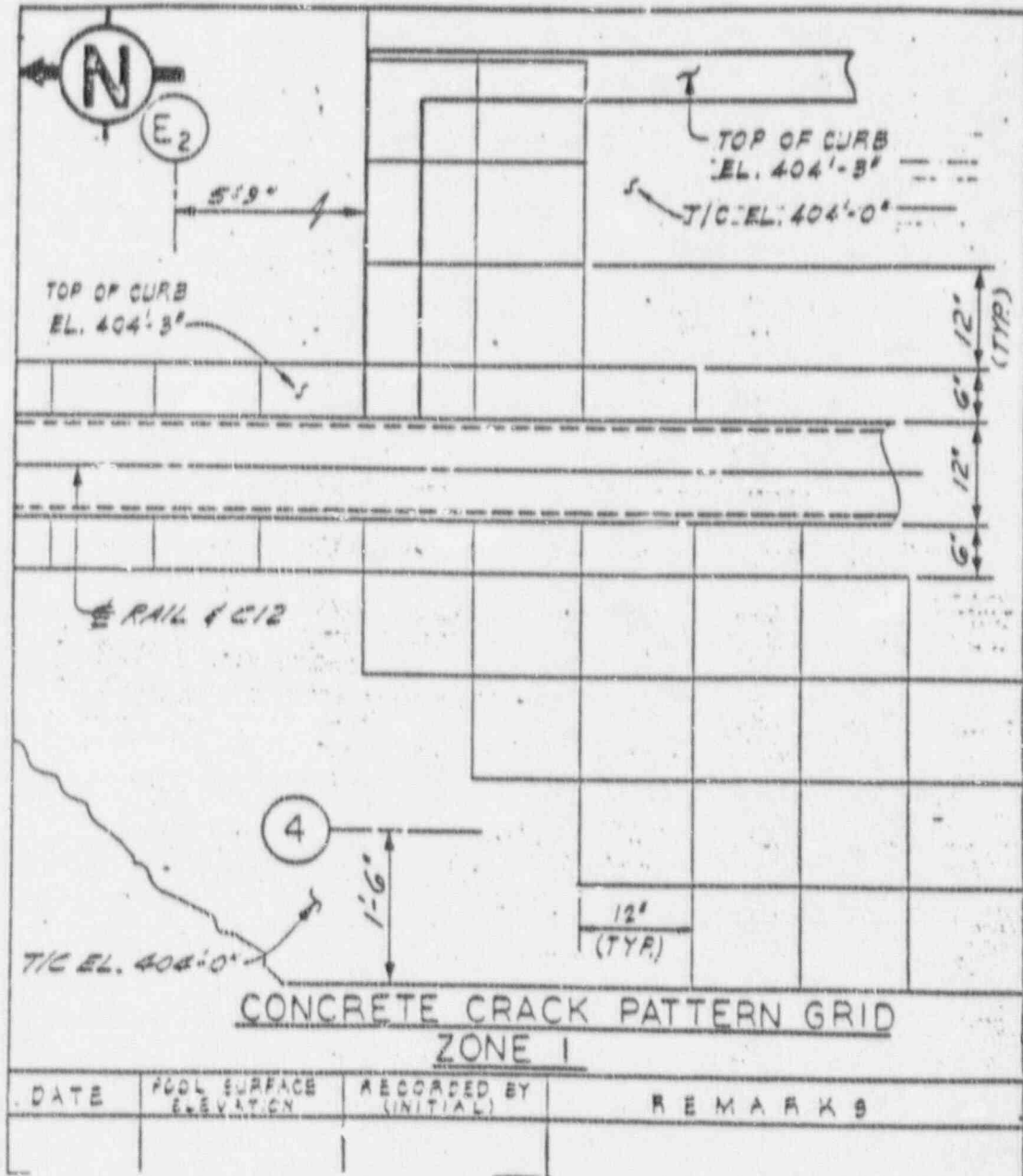
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ATTACHMENT B





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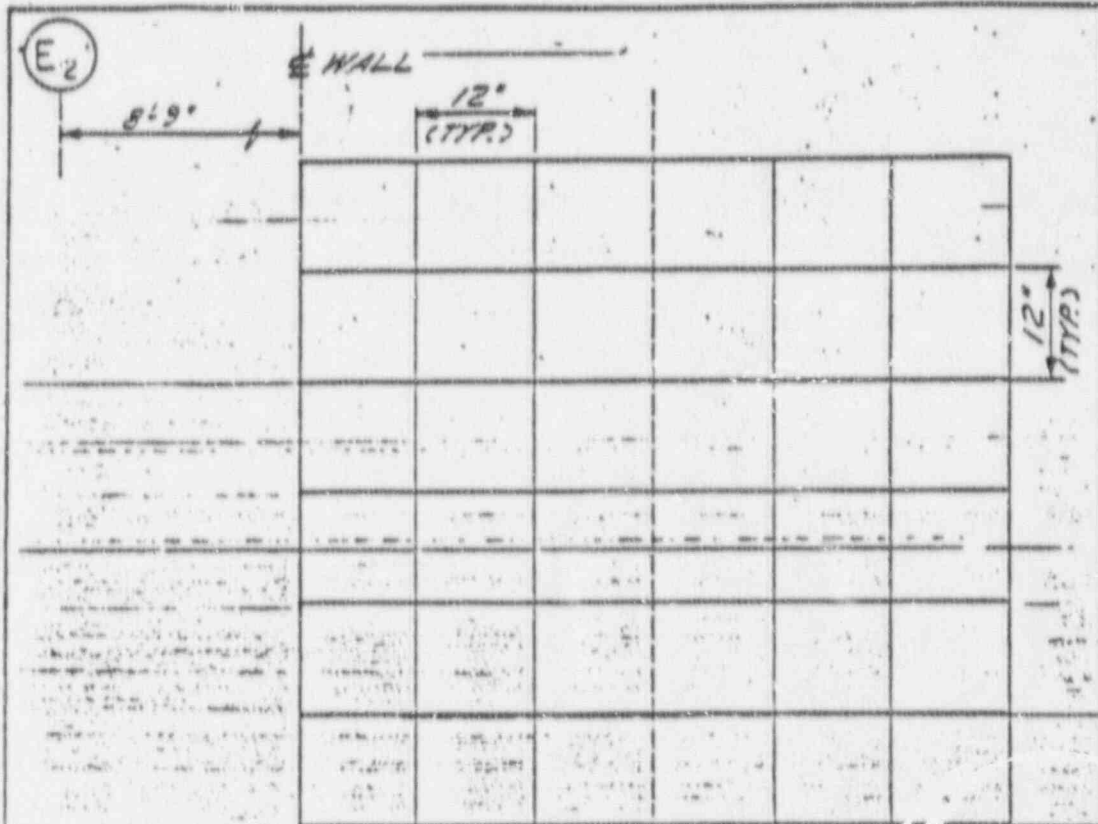
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ATTACHMENT C



CONCRETE CRACK PATTERN GRID
ZONE 2

DATE	POOL SURFACE ELEVATION	RECORDED BY (INITIAL)	REMARKS



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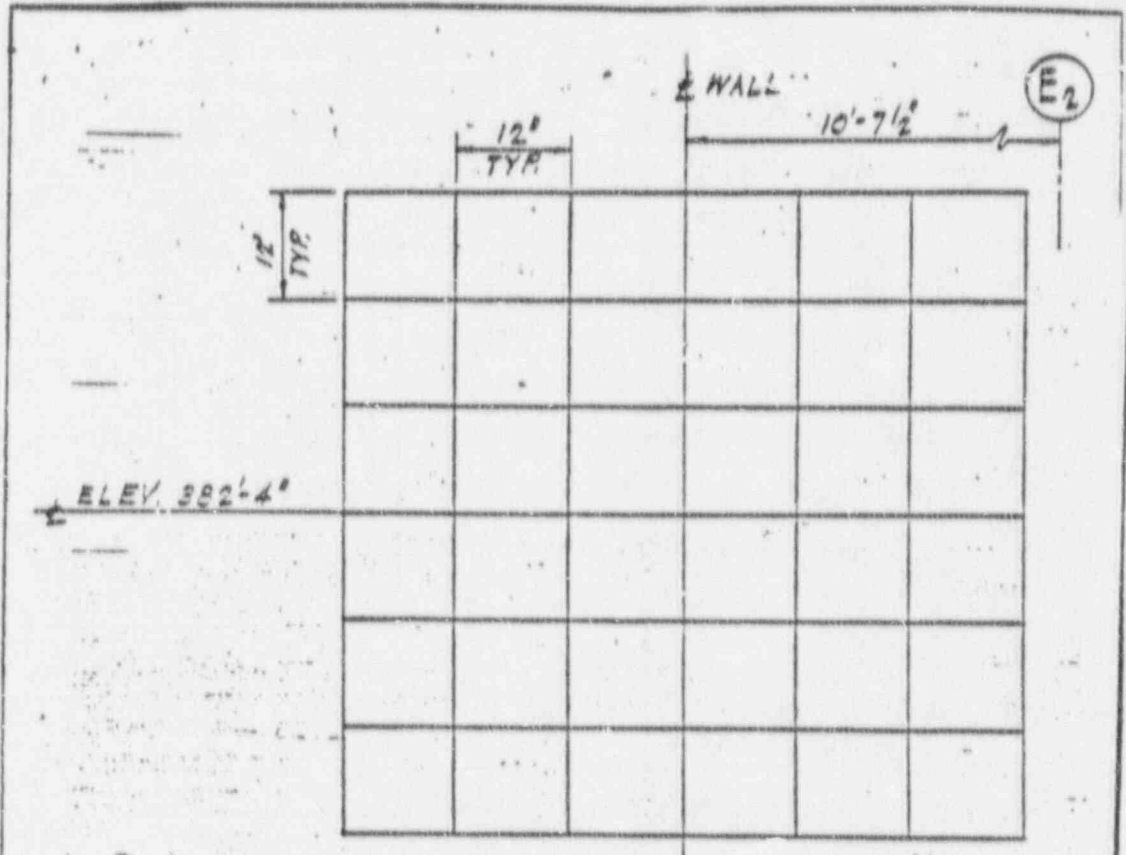
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ATTACHMENT D



CONCRETE CRACK PATTERN GRID
ZONE 3

DATE	POOL SURFACE ELEVATION	RECORDED BY (INITIAL)	REMARKS



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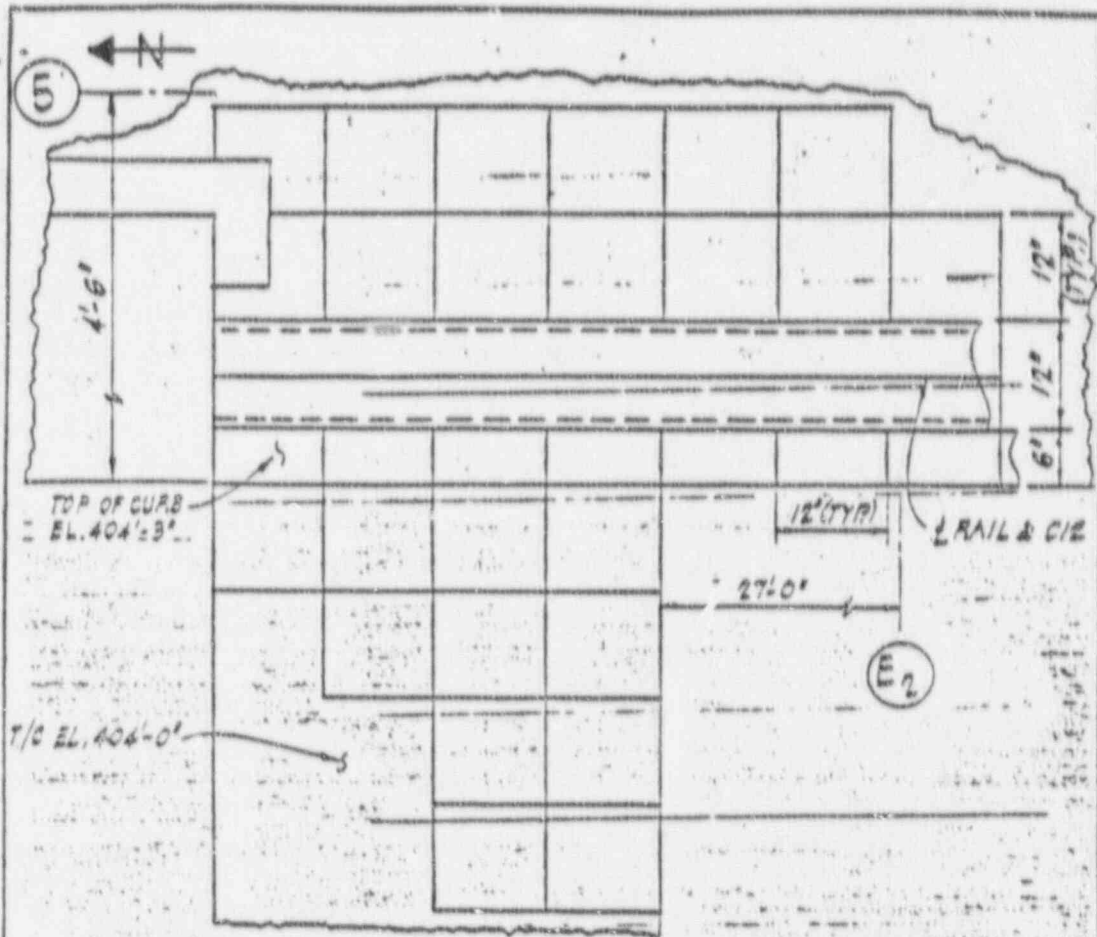
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ATTACHMENT E



CONCRETE CRACK PATTERN GRID
ZONE 4

DATE	POOL SURFACE ELEVATION	RECORDED BY (INITIAL)	REMARKS



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ATTACHMENT F

SCREENING CRITERIA

CRACK WIDTH AND LENGTH

ZONE 1 @ EL. 404'-0"				ZONE 2 E. WALL @ EL. 404'-0"		ZONE 2 (3)	
DIAGONAL		LONGITUDINAL		LONGITUDINAL		VERTICAL	
W'(IN.)	L'(IN.)	W'(IN.)	L'(IN.)	W'(IN.)	L'(IN.)	W'(IN.)	L'(IN.)
0.1	70.0	0.05	30.0	0.05	30.0	0.015	60



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ATTACHMENT G

EVALUATION REPORT

Findings: An inspection of the spent fuel pool grid zones was made on _____ .
 The following information was noted by the inspection team. Date

Plant Engineering is requested to evaluate the following specific cracks or unusual conditions.

Conclusions: Information from the above referenced inspection has been reviewed and the following conclusions were made:

Recommendations: The following recommendations and/or corrective action should be implemented: