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Report to
CONSUMERS POWER COMPANY
Jackson, Michigan

SITE VISIT TO EVALUATE CRACK
REPORTED FEBRUARY 18, 1983
IN ROOF OF FEEDWATER ISOLATION VALVE
PIT UNIT 1, MIDLAND NUCLEAR
POWER PLANT

by

W. G. Corley

Submitted by

CONSTRUCTION TECHNOLOGY LABORATORIES
A Division of the Portland Cement Association
5420 Old Orchard Road
Skokie, Illinois 60077

February 1983

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SITE VISIT TO EVALUATE CRACK REPORTED FEBRUARY 18, 1983
IN ROOF OF FEEDWATER ISOLATION VALVE PIT UNIT 1,
MIDLAND NUCLEAR POWER PLANT

by W. G. Corley*

INTRODUCTION

On February 14, 1983 at approximately 3:30 p.m. central standard time, Dr. W. G. Corley received a call from Bechtel Resident Engineer John Darby indicating a crack had reached the "Alert Level" in the Feedwater Isolation Valve Pit Unit 1. Mr. Darby noted that a new crack had been measured to have a width of 0.10 in.

As required by Section 5.2 of Bechtel Technical Specification 7220-C-200 (Q), a representative of Construction Technology Laboratories made arrangements to visit the site to evaluate the situation. At about 2:00 p.m. eastern standard time on February 15, 1983, Dr. W. G. Corley arrived at the site to gather information for the evaluation.

SITE INSPECTION OBSERVATIONS

Upon arrival at the Midland Nuclear Power Plant, Bechtel Engineer Mr. Mark Bryce accompanied Dr. Corley to the site where cracks were observed. Inspection disclosed that new cracks radiated to the corners of an embedded steel plate located near the hatchway in the roof of Feedwater Isolation

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Valve Pit Unit 1. The embedded steel plate was found to be supporting what appeared to be a spring-loaded pipe hanger. Further inspection disclosed that the pipe hanger supported the top of an expansion loop in an approximately 18-in. diameter pipe running through the Feedwater Isolation Valve Pit from the turbine building to the containment structure.

Approximately seven new cracks were observed around the embedded plate. Measurements by Dr. W. G. Corley using a 30-power magnifying microscope disclosed that one crack exceeded the alert level of 0.010 in. This crack extended from the northeast corner toward the hatchway. It was identified as Crack 23N. Measurements indicated all other cracks were narrower than the alert level.

In addition to the new cracks, freshly chipped concrete was found at about mid-length of the plate along the east edge and west edge. The loose concrete chips were approximately 1-in. long by 3/8-in. wide by 1/8-in. deep.

Observed cracking and chipping of the concrete suggested the possibility of downward movement of the center of the plate in relation to the roof of the valve pit.

Inspection of other portions of the roof disclosed one other new hairline crack that had developed in the roof. Measurements using the 30 power microscope indicated that new cracks other than the one designated 23N were less than 0.005 in. It was noted that the pipe hanger had what appeared to be a gage mounted on it. The gage showed a setting at approximately mid-length of its scale.

ANALYSIS OF OBSERVATIONS

Bechtel Resident Engineer John Darby reported to Dr. Corley that cracks were observed soon after an adjustment had been made in reactions of the system supporting the Feedwater Isolation Valve Pit. Dr. Corley was given documentation showing cracks before the load adjustment was made, and relative deflections before, during, and after the adjustments.

Review of available data disclosed that displacements of Feedwater Isolation Valve Pit Unit 1 relative to surrounding structures did not change by more than about 0.002 in.

It should be noted that these measurements were obtained at locations near the surrounding structures. No measurements were taken of movement of the slab in the vicinity of the new cracks.

Visual inspection of the concrete in the vicinity of the pipe hanger plate embedment disclosed that the plate seemed to have moved downward in relation to the surrounding concrete. This movement could have resulted from an increase in hanger force caused by relative upward movement of the slab in relation to the heavy pipe. Since the hanger contained a load adjustment spring, no large change in hanger force would have been anticipated. However, the crack pattern and chipping suggest that the spring may have been locked thereby permitting a large increase in hanger force.

Even though one measured crack exceeded the alert level of 0.010 in., all cracks were significantly smaller than a valve that would suggest structural distress. Consequently, it was

concluded that work on the underpinning should proceed without interruption. This information was conveyed to the Bechtel Resident Structural Engineer within less than one-half hour after arrival at the site of the cracks. The information was given to Consumers Power representatives within two hours at arrival.

Although no structural damage was observed, it is recommended that an evaluation be made to determine why the pipe hanger seemed to have picked up a large load when hanger forces were adjusted. In addition, it was recommended to the Resident Structural Engineer that procedures for jacking Feedwater Isolation Valve Pit Unit 2 be modified to prevent a recurrence of the problem.

FINDINGS AND CONCLUSIONS

Inspection of new cracks in Feedwater Isolation Valve Pit Unit 1 at the Midland Nuclear Power Plant was completed by Dr. W. G. Corley on February 15, 1983. The following are findings and conclusions:

1. Crack widths, locations, and lengths, indicate that no structural damage occurred to the roof slab of Feedwater Isolation Valve Pit Unit 1.
2. Within less than one-half hour of arrival at the site, Dr. W. G. Corley recommended to the Bechtel Resident Structural Engineer that construction on underpinning of both Feedwater Isolation Valve Pits should continue. The recommendation to continue the underpinning was given to representatives of Consumers Power within two hours of arrival.

3. It was recommended that jacking procedures for Feedwater Isolation Valve Pit Unit 2 be changed to avoid a recurrence of cracks of the type observed in Unit 1.
4. It was recommended than an evaluation be made to determine why the spring-loaded pipe support in Feedwater Isolation Valve Pit Unit 1 created enough change in load to cause movement of the embedded plate and subsequent cracking of the concrete.

EVALUATION OF ALERT LEVEL FOR CRACKS IN FIVP WEST

A.) Impact on future underpinning work:

Construction Technology Laboratories (CTL) evaluation documented in their report dated 24 February 1983, indicates no structural damage has occurred to the FIVP structure and further underpinning work can continue.

B.) The possible causes of the cracking in FIVP West are as follows:

- 1.) Resistance provided by the pipe since the spring hanger was locked, resulting in an increase in load on the hanger.
- 2.) Due to the locked in shrinkage stresses in this area as the area is highly restrained due to an opening which is stiffened by a concrete beam all around. The changes due to the jacking process just opened the shrinkage cracks.

C.) CTL report also recommended a change in the jacking procedure in FIVP East to avoid a recurrence of cracks similar to west side. As a result, the spring loaded hanger was released for Unit #2. There was one new crack 7.5 mils on the ceiling but it is attributed to item B.2 described above.

D.) The spring hanger for FIVP West is also being released to prevent further resistance from the pipe during the undermining of the FIVP West.



**Consumers
Power
Company**

Donald B Miller, Jr
Site Manager
Midland Project

Midland Project: PO Box 1963, Midland, MI 48640 • (517) 631-8650

September 21, 1982

Mr. W. D. Schafer, Chief
Midland Project Section
US Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

PRINCIPAL STAFF

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MIDLAND PROJECT GWO 7020
PROOF LOAD JACKING OF FIVP
File: 0485.16 UFI: 42*05*22*04 Serial: CSC-6332

REFERENCE: Letter dated June 18, 1982, Serial No. 17889

As discussed in the exit interview at the plant site on September 17, 1982, we wish to modify our commitment on proof load jacking of the FIVP, as made in the referenced letter. The following is our justification for not doing the four point proof load jacking of the FIVP temporary support system.

The original temporary steel support system for the FIVP was installed in October 1979. The design of this existing support system was reviewed by the SEB of the NRC during their audit of January 18, 1982 and they concurred with the adequacy of the design.

As part of the original design for the temporary support system, the drawing called for the steel frame to be jacked to 2400 Kips. This was accomplished by individual jacking loads being introduced at the 4 support locations. This original "four point" jacking was accomplished in the spring of 1981.

Subsequently, the underpinning contractor required a proof load test of the FIVP before excavation would be performed under the FIVP. As a result a drawing was prepared to accomplish this proof load testing by jacking the FIVP from four support points of the steel beams.

It was later decided to reinforce the temporary support system to provide additional factor of safety. The details of this reinforcing were submitted to the NRC by reference 1, and were also discussed at a meeting with NRC at Bethesda on June 25, 1982. The reinforcement consisted of additional rock bolts and replacement of certain existing rods. The NRC staff concurred with these modifications.

Subsequently, the details were finalized and the design drawings were completed and called for proof load testing by performing lift off of each rock anchor and rod after their installation. The installation is currently being performed.

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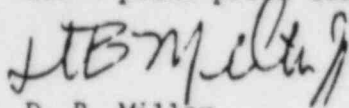
PROOF LOAD JACKING OF FIVP

September 21, 1982

Page 2

Since the proof load jacking is done by the individual lift off of rock bolts and rods, there is no necessity of performing a four point jacking of the temporary support system of FIVP. Furthermore, performing a four point jacking will change the tensions in the rock anchors and rods required by design.

In conclusion, based on the justification provided, we request the requirement for 4 point proof load jacking of the FIVP be deleted.



D. B. Miller
Site Manager

DBM/RMV/dmw

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JUN 23 1982



Site No.
Midland Project

James W Cook
Vice President - Projects, Engineering
and Construction

General Offices: 1945 West Parnell Road, Jackson, MI 49201 • (517) 788-0453

June 18, 1982

Harold R Denton, Director
Office of Nuclear Reactor Regulation
Division of Licensing
US Nuclear Regulatory Commission
Washington, DC 20555

MIDLAND PROJECT
MIDLAND DOCKET NO 50-329, 50-330
FEEDWATER ISOLATION VALVE PIT (FIVP)
LOAD VERIFICATION
FILE: 0485.16. /SERIAL: 17889

- REFERENCES:
- (1) AUDIT OF JANUARY 18 AND 19, 1982
NRC MEETINGS MINUTES DATED MARCH 10, 1982
 - (2) AUDIT OF FEBRUARY 2-5, 1982 NRC MEETING
MINUTES DATED MAY 19, 1982
 - (3) CONFERENCE CALL OF MAY 7, 1982 SUMMARY
DATED MAY 19, 1982
 - (4) NRC LETTER DATED MAY 25, 1982 "COMPLETION
OF SOILS REMEDIAL ACTIVITIES REVIEW"

ENCLOSURE: SUPPLEMENTAL INFORMATION ON THE FEEDWATER ISOLATION
VALVE PITS

During the January and February audits (References 1 and 2 above) the design of the FIVP load transfer structure was reviewed and approved (subject to certain open items) by the NRC Staff. References 3 and 4 above provide additional discussion of the FIVP in an attempt to resolve the remaining items. The enclosed submittal further clarifies these items relative to the FIVP.

The design of the load transfer mechanism remains as discussed during the audits, except that the temporary code allowance, which was reviewed and approved in January, is no longer being used; thus, resulting in even higher margins of safety. This is achieved by the use of additional bolts in the design, as shown in the enclosure.

Many of our recent documents have referred to a "Proof Load Test." This change in nomenclature from the previously discussed "load transfer" may have inadvertently resulted in some confusion. No new activity is planned; however, the complete load transfer to the support structure will still be verified prior to excavation under the FIVP.

Feedwater

DBM
GBS
JMB
VMB
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<i>I GBS</i>

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The load transfer steel was originally installed as a non-Q item. We are presently working with Region III on reviewing the as-built condition of the structure and will make any adjustments necessary to ensure its consistency with the design. The activities associated with this load verification will be completed as a Q-activity under our quality procedure MPQP-1 and will proceed when Region III concurrence is obtained.

James W. Cook

JWC/JRS/mkh

CC Atomic Safety and Licensing Appeal Board, w/o
CBechoefer, ASLB, w/o
MMCherry, Esq, w/o
FPCowan, ASLB, w/o
RJCook, Midland Resident Inspector, w/o
RSDecker, ASLB, w/o
SGadler, w/o
JHarbour, ASLB, w/o
GHarstead, Harstead Engineering, w/a
DSHood, NRC, w/a (2)
DFJudd, B&W, w/o
JDKane, NRC, w/a
FJKelley, Esq, w/o
RBLandsman, NRC Region III, w/a
WHMarshall, w/o
JPMatra, Naval Surface Weapons Center, w/a
WOtto, Army Corps of Engineers, w/o
WDPaton, Esq, w/o
SJPoulos, Geotechnical Engineers, w/a
FRinaldi, NRC, w/a
HSingh, Army Corps of Engineers, w/a
BSTamiris, w/o

BCC RCBauman, P-14-312B, w/o
AJBoos, Bechtel, w/a
JEBrunner, M-1079, w/a
WJCloutier, P-24-611, w/a
BDhar, Bechtel, w/a
PJGriffin, P-24-513, w/o
EMHughes, Bechtel, w/a
RWHuston, Washington, w/a
JKMeisenheimer, P-14-100, w/a
JAMooney, P-14-115A, w/a
DBMiller, Midland, w/a
MIMiller, IL&B, w/a
NRRamanujam, P-14-100, w/a
KBRazdan, P-14-419, w/a
JARutgers, Bechtel, w/a
JRSchaub, P-14-305, w/a
PPStephoe, IL&B, w/a
TJSullivan/DMBudzik, P-24-624A, w/o
RLTeuteberg, P-24-505, w/a
TRThiruvengadam, P-14-400, w/a
DJVandeWalle, P-24-414, w/a
FVillalta, P-14-419, w/a
FCWilliams, IL&B, w/a
NRC Correspondence File

SUPPLEMENTAL INFORMATION ON FEEDWATER ISOLATION VALVE PITS

To provide access to electrical penetration areas and control tower underpinning, the feedwater isolation valve pits (FIVP) have been supported temporarily from a steel structure resting on buttress access shaft and turbine building (see Bechtel Drawing C-2020, Rev 3, attached). As the support structure is to be used during construction condition only, the allowable stresses for the supporting structure were increased by one-third in the present design. This design concept, methodology, details of support structure, and applicable calculations were made available to the NRC staff at the audit conducted during the week of January 18, 1982.

To ensure additional safety during construction on a conservative basis, the following modifications to existing structural support systems are being undertaken:

- (a) Install additional rock anchors in the walls and floor of the FIVP and connect them to existing support structure. Rock anchors are the only structural element where the one-third increase in allowable stresses was utilized. With the addition of these rock anchors, the calculated stresses will be within the allowable stress limits, thereby increasing the conservatism in design.

(b) Provide new brackets on the FIVP walls at selected rod hanger locations and transmit the FIVP wall loads directly to the structural support system. This modification will not stress the roof slab for these hanger loads. The shear capacity at the interface of roof slab and the FIVP walls was computed based on the strength of concrete and the vertical wall rebar with available embedment at that section. This method of the shear capacity computation was also presented to the NRC staff at the audit conducted during the week of January 18, 1982. This modification will only utilize the shear capacity of concrete without any contribution from wall rebar and will increase conservatism in design.

The conceptual details of these modifications are presented in the Bechtel Sketch SK-C-790, Rev. A, attached.

To ensure predicted behavior of the FIVP support structure, it is necessary to ensure that dead load of FIVP has been properly transferred to support structure. For this purpose, all supporting hanger rods and rock anchors will be tensioned and locked off to ensure the desired predetermined tension load exists in these bolts during this modification.

Prior to excavating beneath the FIVP, verification of the adequacy of the temporary support is required by the subcontractor. Support adequacy will be established by proof load jacking of the FIVP temporary support structure at the four support points. The total jacking load

will be at least equal to the calculated weight of the FIVP or a lower load at which the FIVP reaches an upward movement of 1/4". After the proof load has been maintained for at least 6 hours, the support structure system will be locked off at the calculated weight of FIVP or at the load where the structure has moved upwards. This proof load jacking will be performed after the modifications described earlier are completed.

BCC RCBauman, P-14-312B, w/o
AJBoos, Bechtel, w/a
JEBrunner, M-1079, w/a
WJCloutier, P-24-611, w/a
BDhar, Bechtel, w/a
PJGriffin, P-24-513, w/o
EMHughes, Bechtel, w/a
RWHuston, Washington, w/a
JKMeisenheimer, P-14-100, w/a
JAMooney, P-14-115A, w/a
DBMiller, Midland, w/a
MIMiller, IL&B, w/a
NRRamanujam, P-14-100, w/a
KBRazdan, P-14-419, w/a
JARutgers, Bechtel, w/a
JRSchaub, P-14-305, w/a
PPSteptoe, IL&B, w/a
TJSullivan/DMBudzik, P-24-624A, w/o
RLTeuteberg, P-24-505, w/a
TRThiruvengadam, P-14-400, w/a
DJVandeWalle, P-24-414, w/a
FVillalta, P-14-419, w/a
FCWilliams, IL&B, w/a
NRC Correspondence File



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

April 27, 1984

E. W. Harrison

HARRISON

ATS NO: MRR-84-R-3201

Docket Nos: 50-329 OM, CL
and 50-330 OM, OL

MEMORANDUM FOR: Chairman Palladino
Commissioner Gilinsky
Commissioner Roberts
Commissioner Asselstine
Commissioner Bernthal

FROM: Darrell G. Eisenhut, Director
Division of Licensing, NRR

SUBJECT: BOARD NOTIFICATION ON ALLEGATION REGARDING
MISREPRESENTATION OF SOILS DATA
(BN 84-091)

In accordance with the NRC procedures for Board Notifications, the following information is being provided directly to the Commission as new information potentially material and relevant to the Midland OM-OL hearing. This information is applicable only to the Midland Plant, Units 1 and 2. The appropriate Boards and parties are being informed by copy of this memorandum.

An allegation regarding misrepresentation of soils data provided to the NRC has recently been received and is being reviewed by the NRC. This matter could be material and relevant to (1) quality assurance/quality control issues before the Board and (2) to intervenor's Motion to Litigate Issues Raised by Dow Suit and to Open Discovery on the Dow Issues, currently before the Board.

This matter is being referred to the Office of Investigations for evaluation. We will further advise the Commission and appropriate parties regarding this matter as soon as our review permits.

Darrell G. Eisenhut
Darrell G. Eisenhut, Director
Division of Licensing
Office of Nuclear Reactor Regulation

cc: OPE
OGC
EDP
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F. P. Cowan, ASLB
J. Harbour, ASLB
C. Kohl, ASLAB
J. Buck, ASLAR
T. Moore, ASLAB
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Docket Nos. 50-329/330

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py

JAN 18 1984

Docket No. 50-329
Docket No. 50-330

Consumers Power Company
ATTN: Mr. James W. Cook
Vice President
Midland Project
1945 West Parnall Road
Jackson, MI 49201

Gentlemen:

This refers to the audit conducted by Messrs. R. Landsman of Region III, D. Hood, J. Kane and F. Rinaldi of NRR, and S. Poulous and G. Harstead, NRC Consultants, onsite on January 4-6, 1984. The enclosed copy of our report identifies topics discussed during the audit. As indicated in the enclosed report, this audit was held to evaluate what upward building movements the NRC staff should allow during underpinning of the Auxiliary Building.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosure(s) will be placed in the NRC Public Document Room unless you notify this office, by telephone, within ten days of the date of this letter and submit written application to withhold information contained therein within thirty days of the date of this letter. Such application must be consistent with the requirements of 2.790(b)(1). If we do not hear from you in this regard within the specified periods noted above, a copy of this letter and the enclosed inspection report will be placed in the Public Document Room.

Sincerely,

"Original signed by R. F. Warnick"

R. F. Warnick, Director
Office of Special Cases

Enclosure: Inspection Report
No. 50-329/84-01(OSC);
No. 50-330/84-01(OSC)

cc w/encl:
See Distribution Next Page

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JAN 18 1984

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Accountability Project
Stone and Webster Michigan, Inc.

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-329/84-01(OSC); 50-330/84-01(OSC)

Docket No. 50-329; 50-330

License No. CPPR-81; CPPR-82

Licensee: Consumers Power Company
1945 West Parnall Road
Jackson, MI 49201

Facility Name: Midland Plant, Units 1 and 2

Audit At: Plant Site

Audit Conducted: January 4-6, 1984

Report Prepared By: R. E. Landsman

R. E. Landsman

1/17/84
Date

J. J. Harrison

Approved By: J. J. Harrison, Chief
Section 2, Midland

1/17/84
Date

Audit Summary

Audit held on January 4-6, 1984 (Report No. 50-329/84-01(OSC);
50-330/84-01(OSC))

Subject: Perform an audit of the Auxiliary Building to decide what upward building movements the NRC staff should allow during underpinning.

Results: During the audit, Bechtel presented a brief summary of settlements and crack monitoring data along with the upward building movement analytical analysis. Questions were presented by the NRC audit team during and following the Bechtel presentation. The audit team concluded that the upward limits proposed by the licensee were unacceptable.

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54pp.

DETAILS

1. Persons in Attendance

CPCo

T. R. Thorovengadam, Civil Engineer
N. Ramanujam, Soils Engineer
J. A. Mooney, Executive Manager, Soils
K. Razdan, Structural Engineer
J. Schaub, Project Engineer
R. Wieland, Soils Engineer
R. Wheeler, Head Remedial Soils
B. Kern, Licensing

Bechtel

N. Swanberg, Project Manager
E. Dhar, Structural Engineer
M. Sozen, Consultant
M. DasGupta, Structural Engineer
J. Darby, Resident Structural Engineer
E. Cvikl, Soils Engineer
C. Gould, Consultant
D. Lavelle, Head Remedial Soils

Stone & Webster

P. Majeski, Soils Engineer
S. Lucks, Project Manager

U. S. Nuclear Regulatory Commission

R. Samuels, NRC Consultant
F. Rinaldi, Structural Engineer
J. Kane, Soils Engineer
S. Poulous, NRC Consultant
G. Harstead, NRC Consultant
R. Landsman, RIII Inspector
D. Hood, Project Manager Licensing

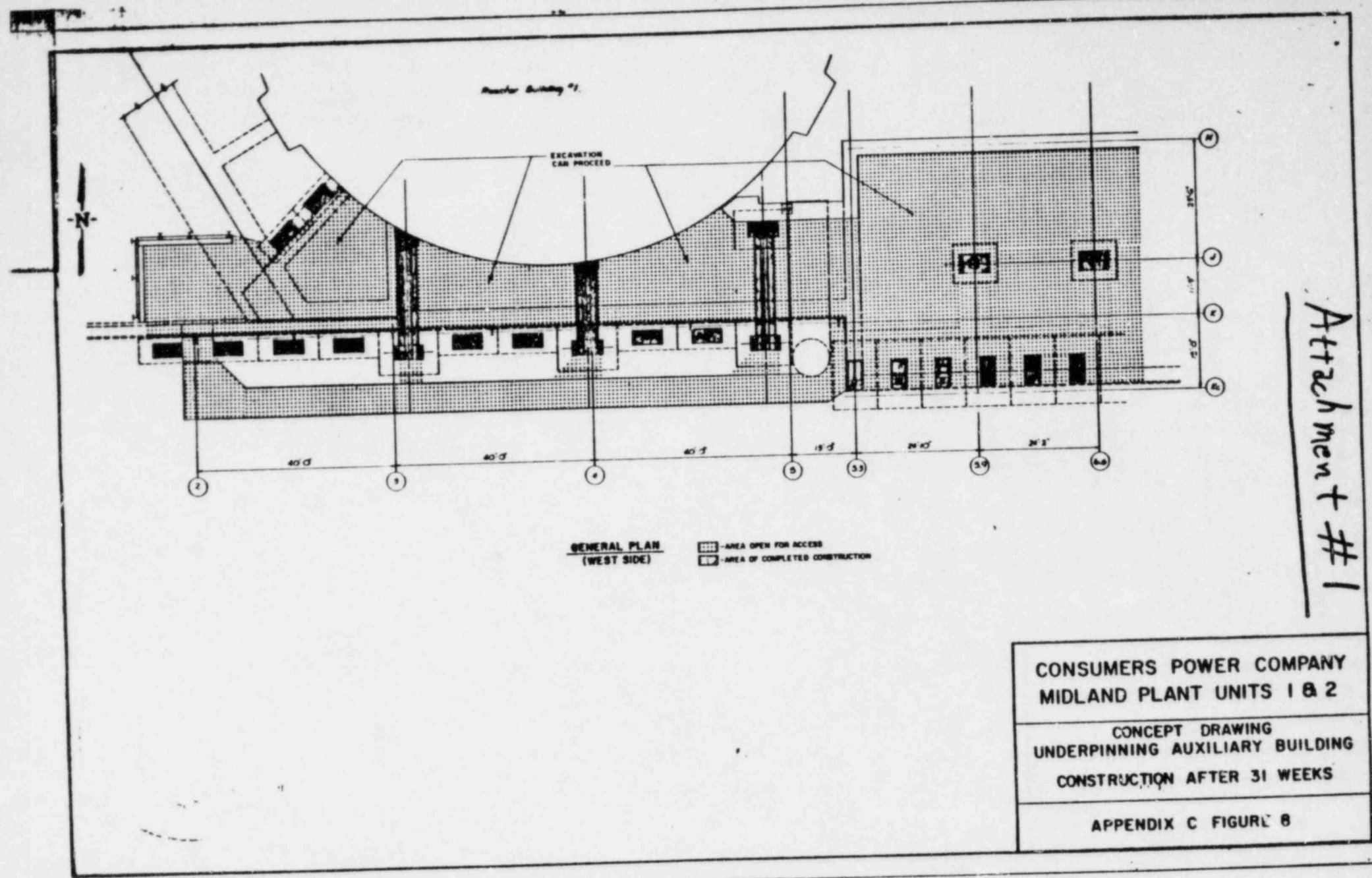
2. Audit

Bechtel presented a summary of settlements and crack monitoring data along with the upward building movement analytical analysis, see Attachments 1 through 4.

During and following the presentations, the staff questioned CPCo and Bechtel in regards to specific aspects of the analysis. Selected responses provided by the licensee during the audit are attached, see Attachments 5 through 11.

Based on the licensee's responses and the engineering judgement of the NRC staff and its consultants, the audit team concluded that the upward limits proposed by the licensee were unacceptable. However, based on the licensee's responses and the engineering judgement of the NRC staff and its consultants, the audit team relaxed their recommendations made in the December 21, 1983, letter to allow a 100 mil upward to zero mil downward deflection value on $\Delta 2$. All other recommendations remain unchanged. Based on the licensee's response to NRC questions, certain issues relating to the Auxiliary Building were raised by the audit team that could not be adequately addressed during the audit, see Attachment 12. The licensee was requested to document their responses to these questions and submit them to the NRC for further review.

Attachments: As stated.

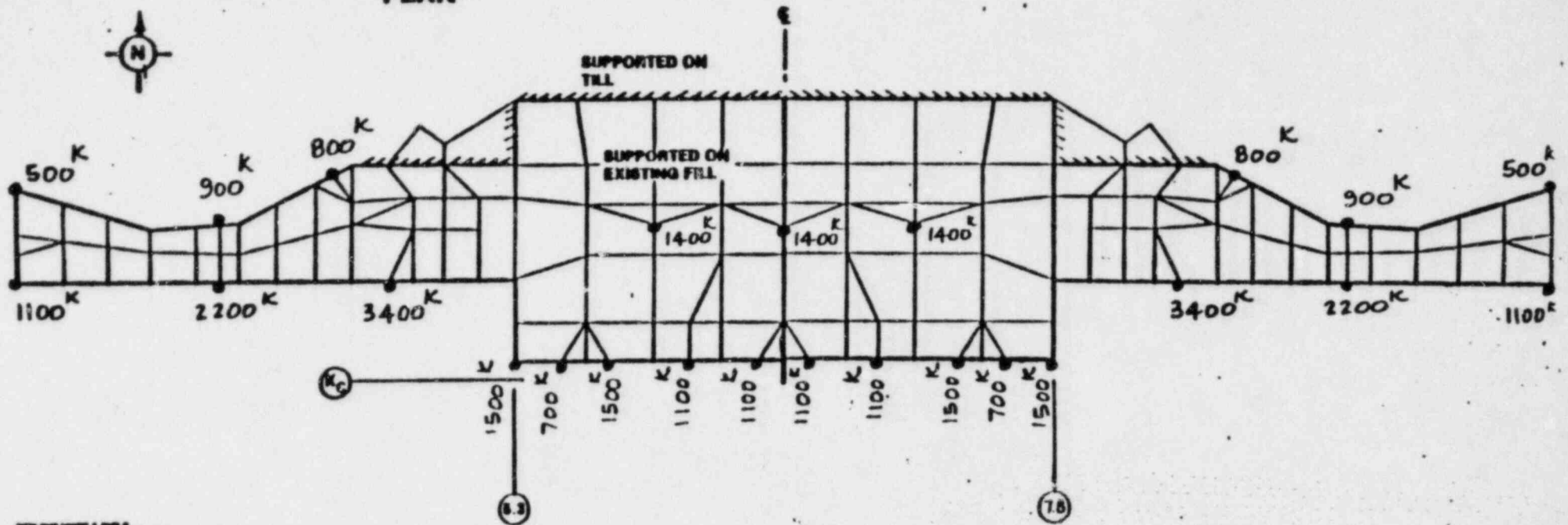


Attachment #1

CONSUMERS POWER COMPANY
 MIDLAND PLANT UNITS 1 & 2
 CONCEPT DRAWING
 UNDERPINNING AUXILIARY BUILDING
 CONSTRUCTION AFTER 31 WEEKS
 APPENDIX C FIGURE 8

(3)

**AUXILIARY BUILDING UNDERPINNING
CONSTRUCTION AREA
PLAN**



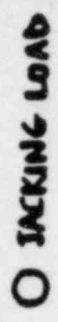
TEMPORARY JACKING LOADS (JL)
(TOTAL JACKING = 33,800^K)

FIGURE 3

LEGEND

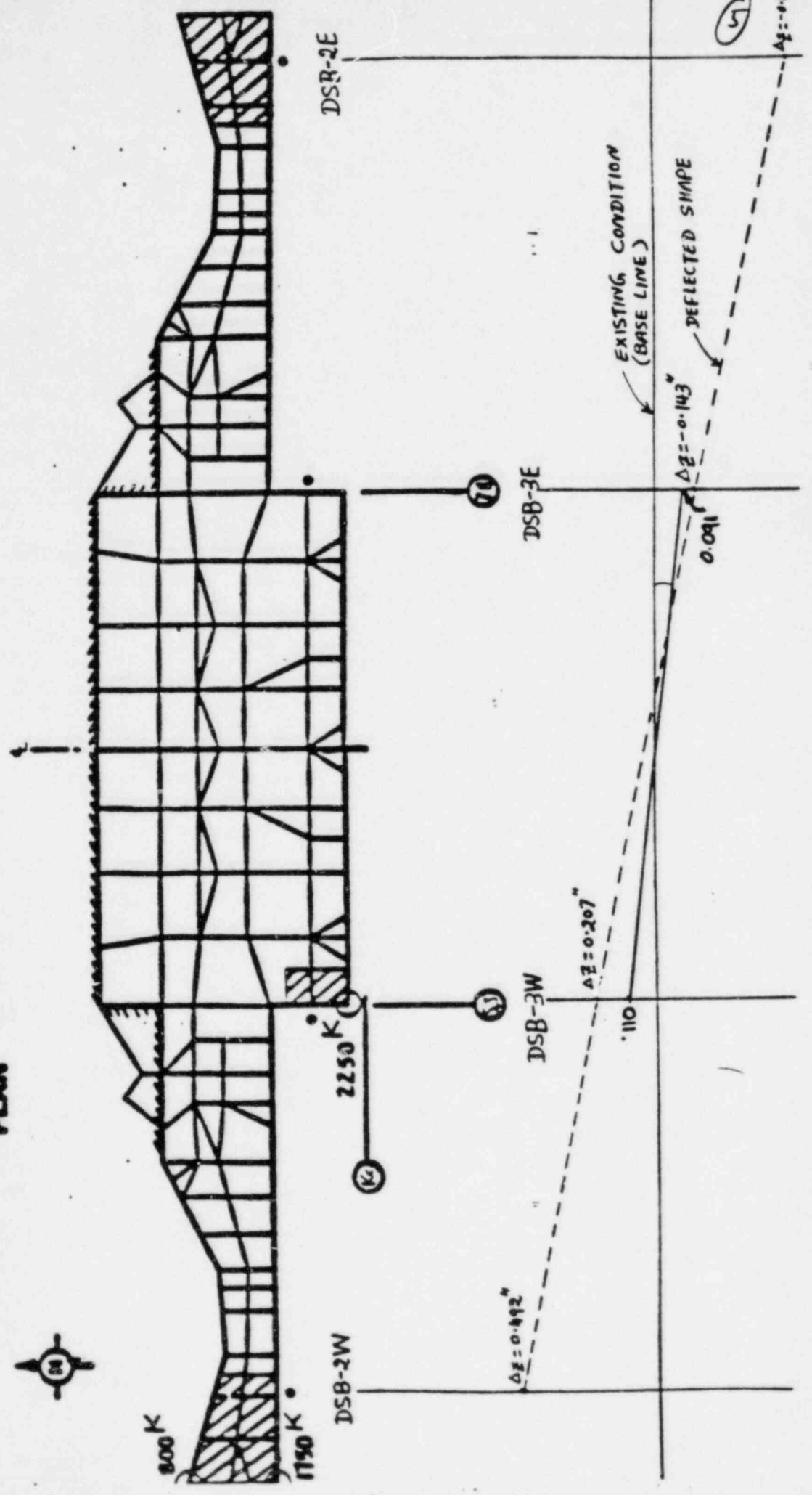


EXCAVATION



JACKING LOAD

**AUXILIARY BUILDING UNDERPINNING
CONSTRUCTION AREA
PLAN**



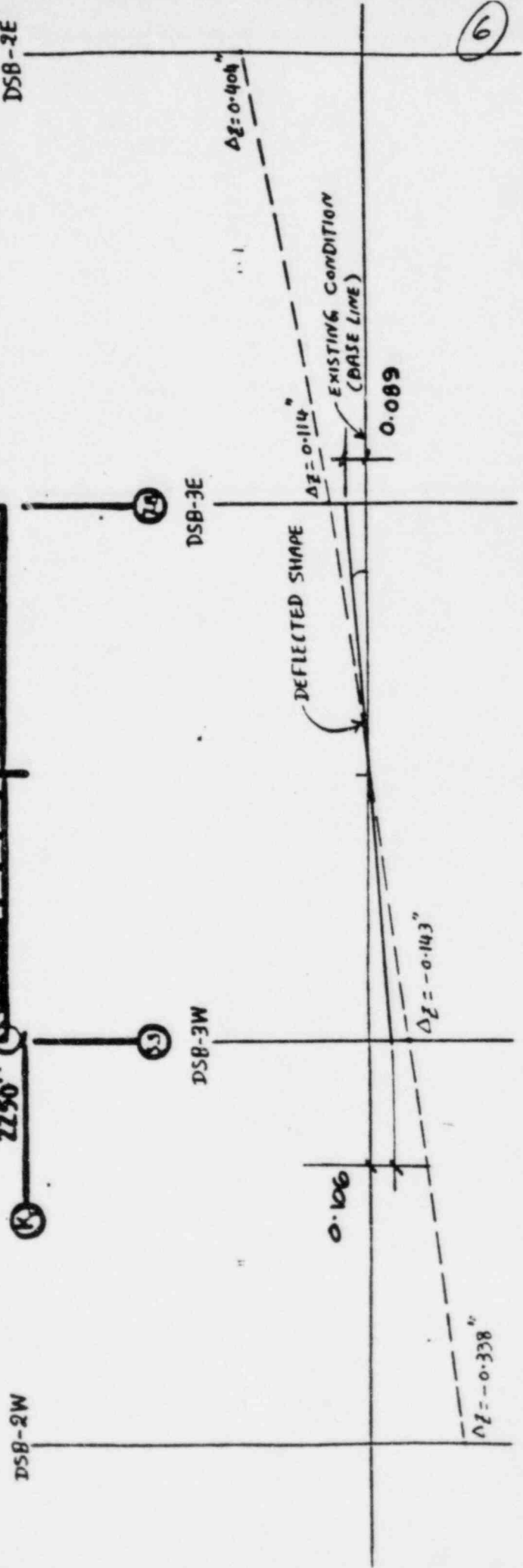
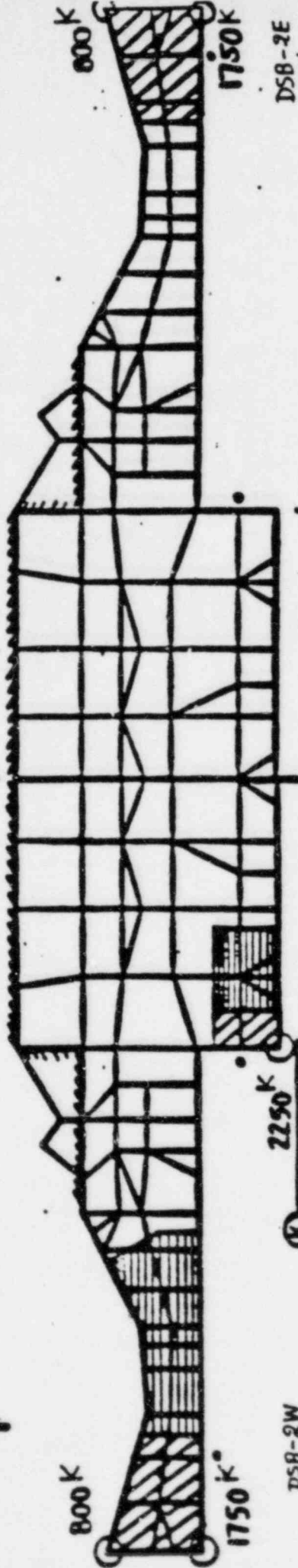
LEGEND



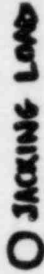
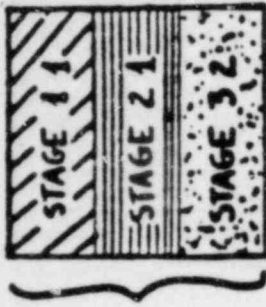
EXCAVATION

○ JACKING LOAD

ADJUTARY BUILDING UNDERPINNING
CONSTRUCTION AREA
PLAN

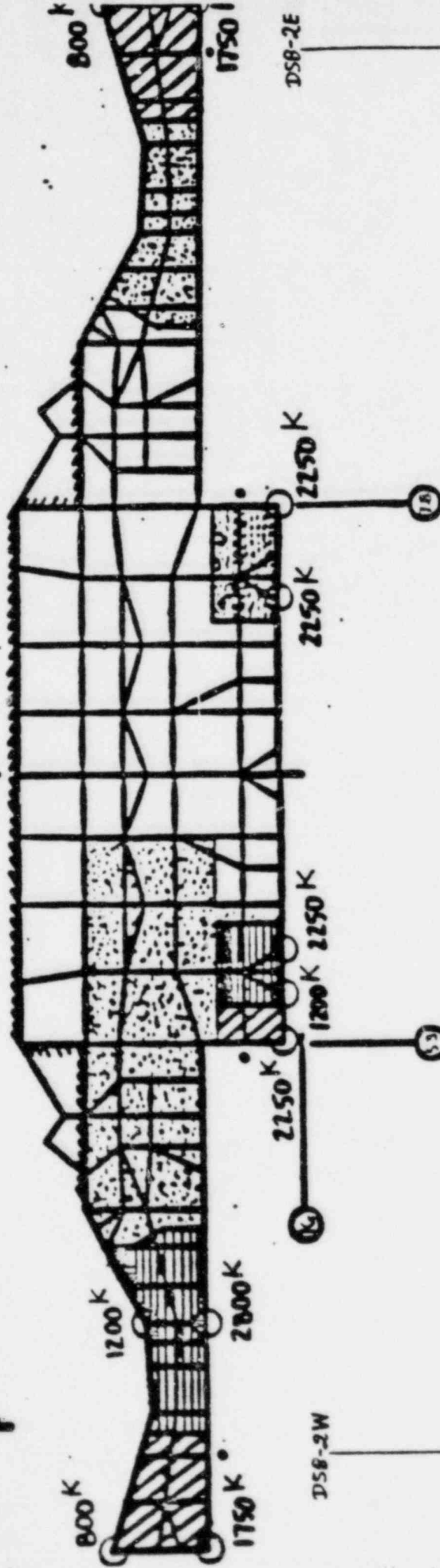


LEGEND



EXCAVATION

ADJUNCT BUILDING UNDERPINNING
CONSTRUCTION AREA
PLAN



DSB-2W

DSB-2E

MSB-3W

DSB-3E

$$\Delta Z = 0.117''$$

$$\Delta Z = 0.139''$$

$$\Delta Z = 0.223''$$

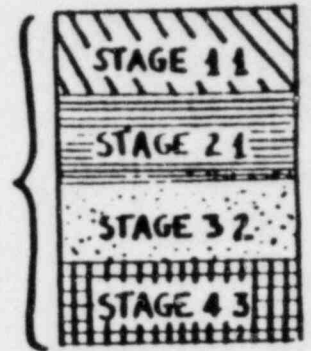
$$\Delta Z = 0.273''$$

DEFLECTED SHAPE

EXISTING CONDITION
(BASE LINE)

0.005

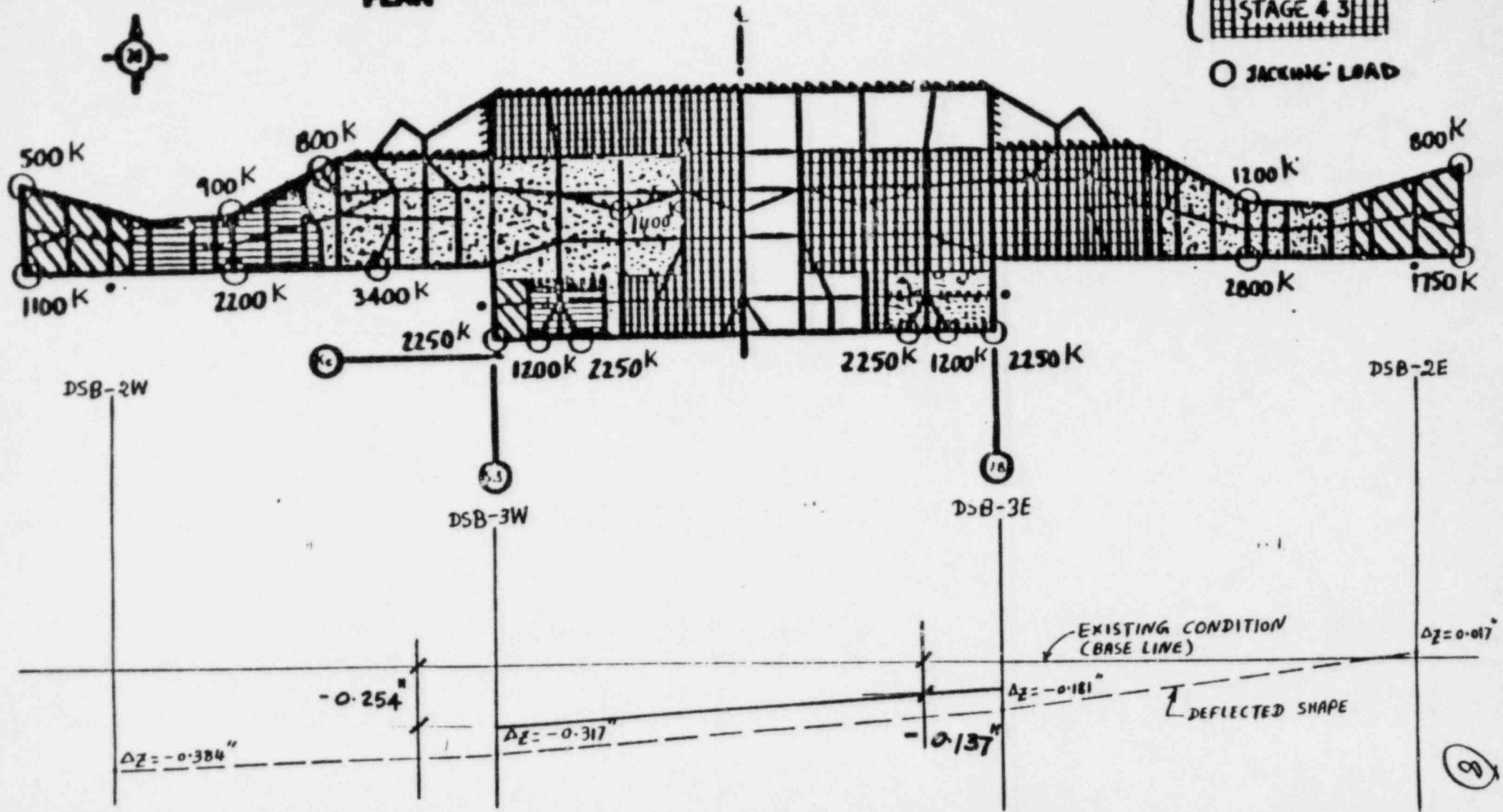
LEGEND



○ JACKING LOAD

AUXILIARY BUILDING UNDERPINNING
CONSTRUCTION AREA
PLAN

EXCAVATION



8

Attachment #2
DESIGN BASIS

9

OBJECTIVE

- NO INTOLERABLE STRESSES OR STRAINS IMPOSED

STRATEGY

- REDUCE POTENTIALLY HIGH LEVELS OF STRESS OR STRAIN PRIOR TO REMOVAL OF ANY SIGNIFICANT PORTION OF EXISTING SUBGRADE SUPPORT

TACTICS

- USE TEMPORARY SUPPORT
- INITIAL EXCAVATION FOR TEMPORARY SUPPORT WHICH MINIMIZES DISTURBANCE TO SUBGRADE SUPPORT.
- ACTIVATE EXISTING STRUCTURE STRENGTH TO REDUCE POTENTIALLY HIGH PRE-EXISTING STRESSES

CONDITIONS

- SOIL UNDER WINGS HAS INDETERMINATE AND HIGHLY VARIABLE STATE OF COMPACTNESS.
- SOIL UNDER CONTROL TOWER IS IN ADEQUATE STATE COMPACTNESS
- EPA TIPS HAVE SETTLED DIFFERENTIALLY WITH RESPECT TO CONTROL TOWER.
- CONTROL TOWER HAS SETTLED DIFFERENTIALLY WITH RESPECT TO MAIN AUXILLARY BUILDING.

DESIGN TERMS

SPECIFIED LOAD (SL)

- THE REACTION OF THE EXISTING STRUCTURE TO BE DEVELOPED AT THE UNDERPINNING SUPPORT POINTS BASED ON TRIBUTARY LOADS FROM EXISTING STRUCTURE AT THE COMPLETION OF THE INSTALLATION OF ALL THE TEMPORARY SUPPORT (END OF PHASE 3) VIZ: THE LOAD ON THE UNDERPINNING AT THAT POINT IN TIME

RESERVE CAPACITY LOAD (RCL)

- THE REACTION OF THE EXISTING STRUCTURE TO BE DEVELOPED AT UNDERPINNING SUPPORT POINTS IN EXCESS OF THE SPECIFIED LOAD REQUIRED FOR
 - CALCULATED TRANSIENT TRIBUTARY LOADS FROM THE EXISTING STRUCTURE
 - RESPONDING TO UNEXPECTED TRANSIENT LOADS FROM THE EXISTING STRUCTURE ADJUSTING EXISTING REACTIONS TO REDUCE HIGH STRESSES RESULTING FROM UNEXPECTED STRUCTURE AND/OR PIER
 - ACCELERATION OF PIER AGING PROCESS AND PROOF TESTING OF PIER FOR SPECIFIED LOADS OR REVERSE CAPACITY LOADS

SPECIFIED LOAD + TRANSIENT LOAD^{**} = PREDETERMINED LOAD^{**}

THESE 3 OF 9
1/4/64

* TRANSIENT LOAD < RESERVE CAPACITY · LOAD

** SPECIFIC LOAD DETERMINED BY STRUCTURAL ANALYSIS

DESIGN TERMS

ALLOWABLE UPWARD MOVEMENT (AUM)

relative to
start of each
jacking sequence

- THE AMOUNT OF ABSOLUTE UPWARD STRUCTURE MOVEMENT (AT DEEP SEATED BENCH MARK NEAREST JACKING LOCATION) ALLOWED DURING A JACKING OPERATION WITHOUT EVALUATION BY RESIDENT STRUCTURAL ENGINEER

LIFT-OFF LOAD

- THE JACKING FORCE REQUIRED TO FREE THE WEDGES BETWEEN THE JACKSTAND AND THE BEARING PLATE

LOCK-OFF LOAD

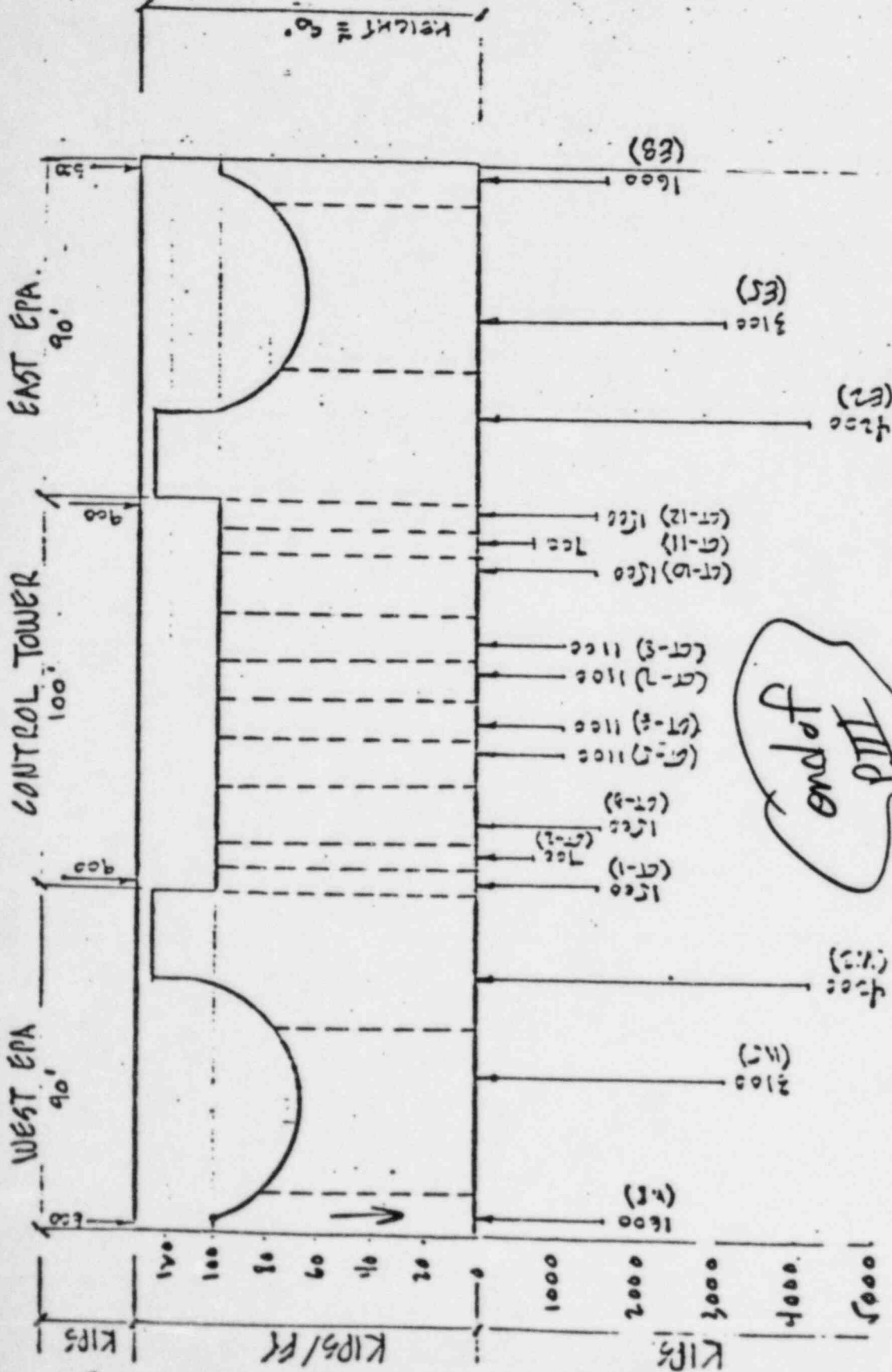
JUST BEFORE

THE JACKING FORCE AT THE TIME THE WEDGES WERE DRIVEN TIGHT.

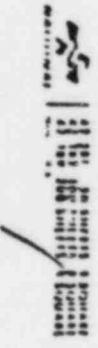
KEY OPERATIONS

- STEP 1 Put in Specified Load (SL) at E/W 8 grillage.
- STEP 2 After installation of E/W 8 grillage and jacking, put in a portion $\frac{1}{2}$ of Reserve Capacity (RCL) at E/W 8. $\frac{1}{2}$ Based on calculations.
- STEP 3 Put in SL plus all of RCL at CT 1/12.
- STEP 4 While putting in SL $\frac{1}{2}$ RCL at E/W 5, maintain/adjust E/W to values used in STEP 2.
- STEP 5 While putting SL at E/W 2 reduce E/W 5 and 8 to SL.

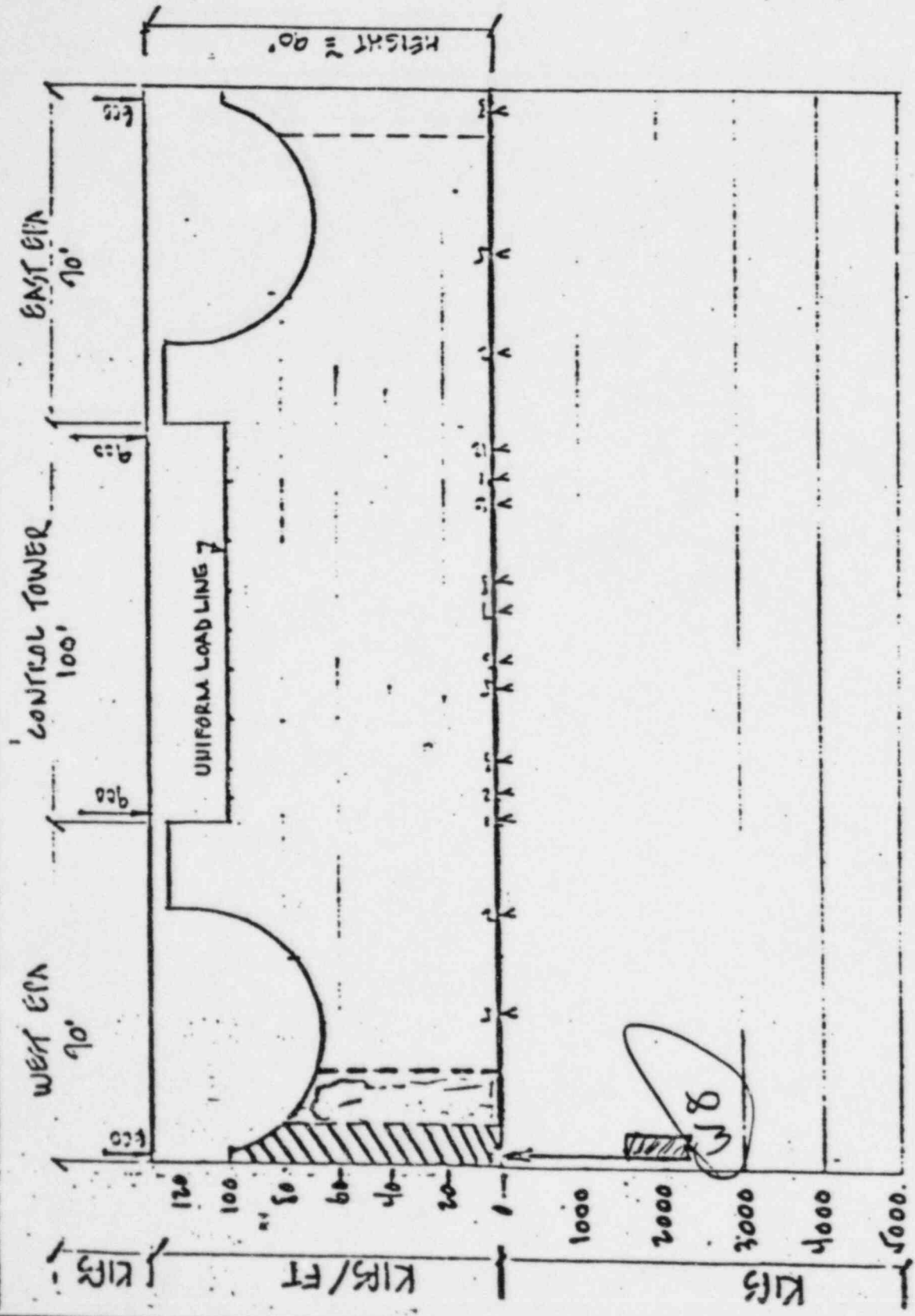
LOAD SCALES:
 1" = 2000 LBS
 1" = 60' / FT
 MIXTURE SCALE 1" = 40'-0"



PRIMARY LOADS/RECTIONS/TRIBUTARY ZONES - END PHASE III



LOAD SCALE
 1" = 2000 K
 1" = 60 K/FT
 1" = 10'-0"



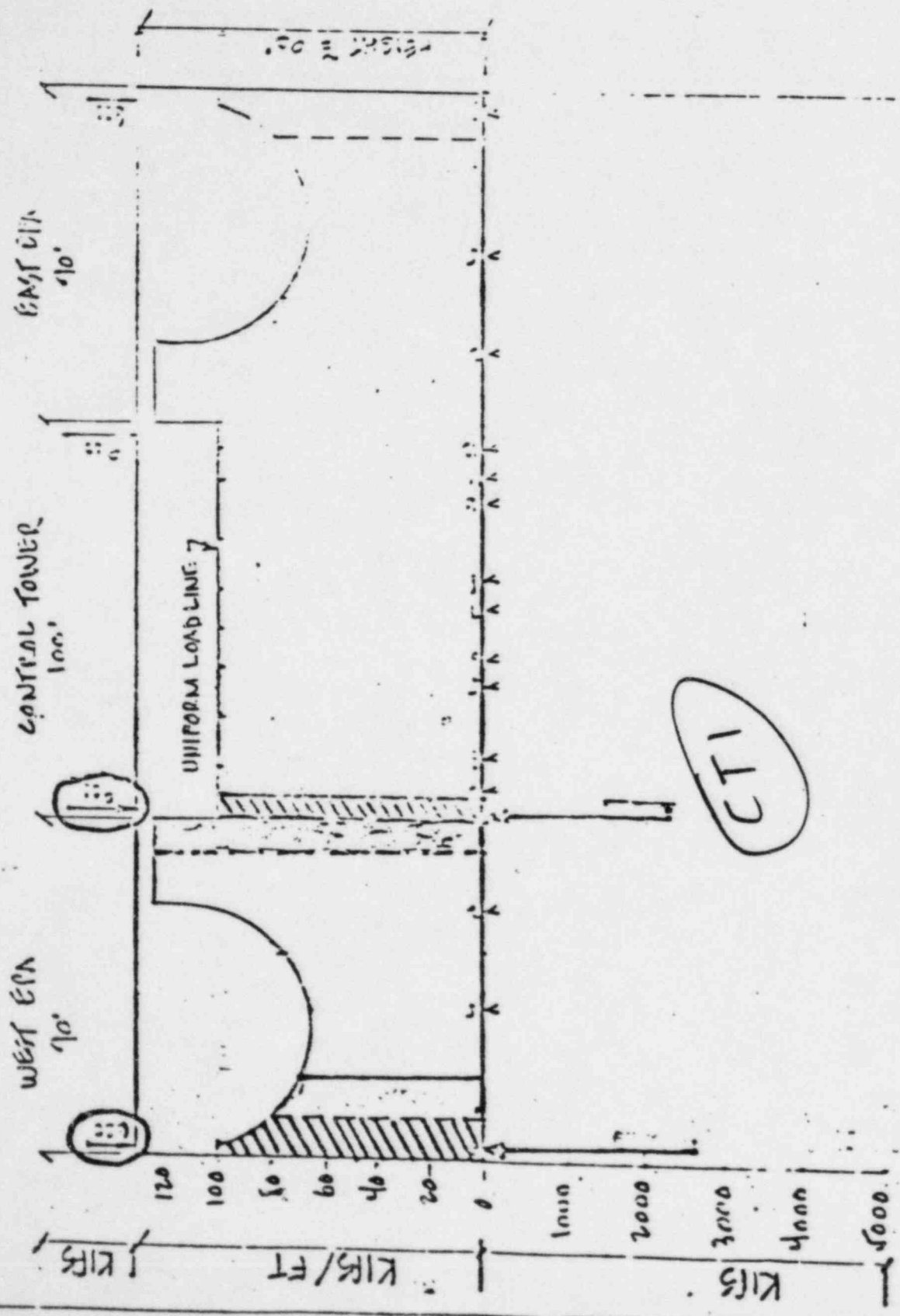
TRIBUTARY ZONE AT END OF PHASE III

TRIBUTARY ZONES - STEP I - PHASE III

PRIMARY LOADS / REACTIONS / TRIBUTARY ZONES - STEP I - PHASE III

Sheet 8 of 9
11/4/64

LOADS
= 100 LB/FT
= 100 LB/FT
= 100 LB/FT

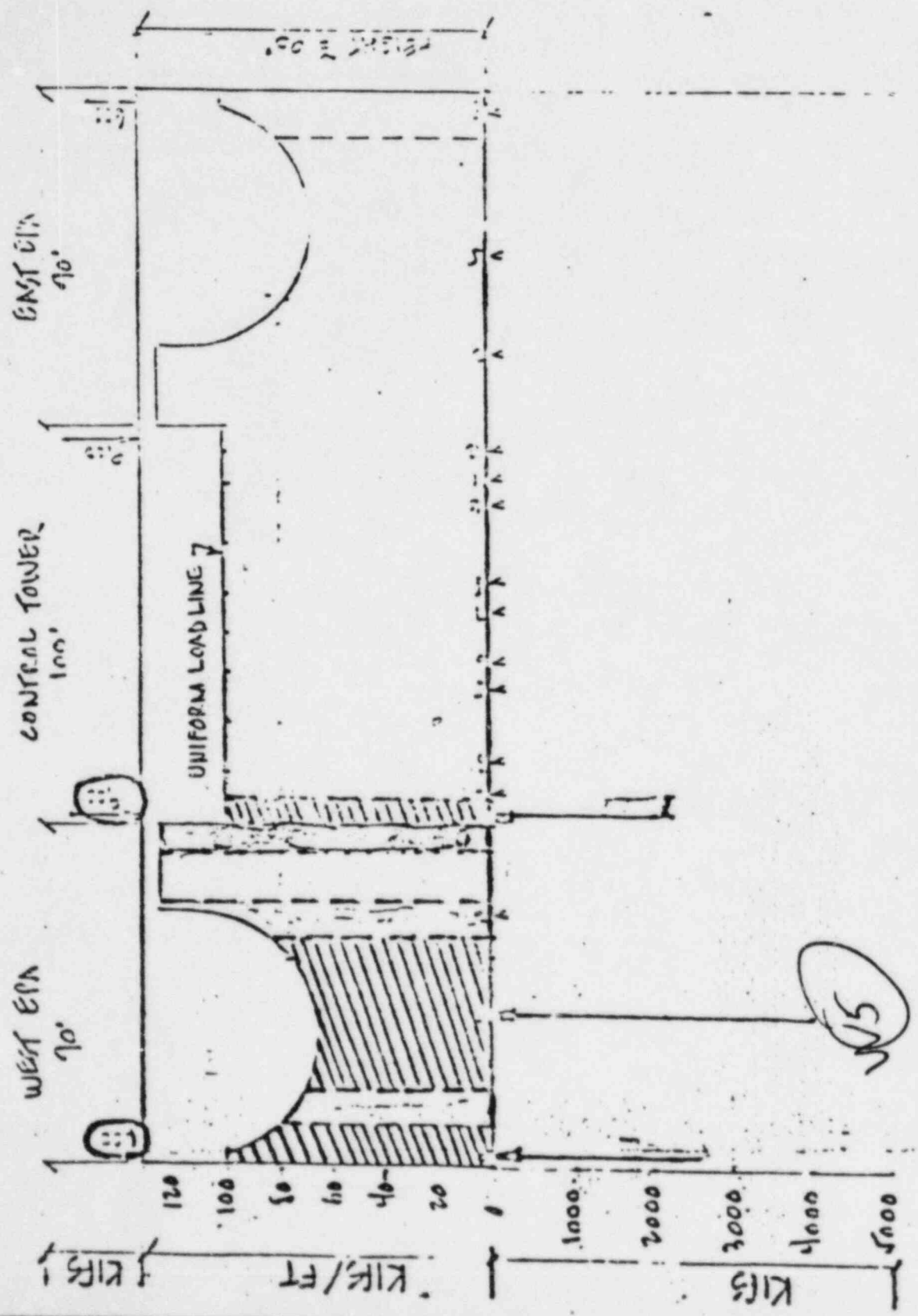


TRIBUTARY ZONE AT END OF PHASE III

PRIMARY LOADS/REACTIONS/ TRIBUTARY ZONES - STEP - PHASE III

Sheet 9 of 9
1/4/54

LOADS
= 100 LBS/FT
= 1000 LBS/FT
= 10000 LBS/FT



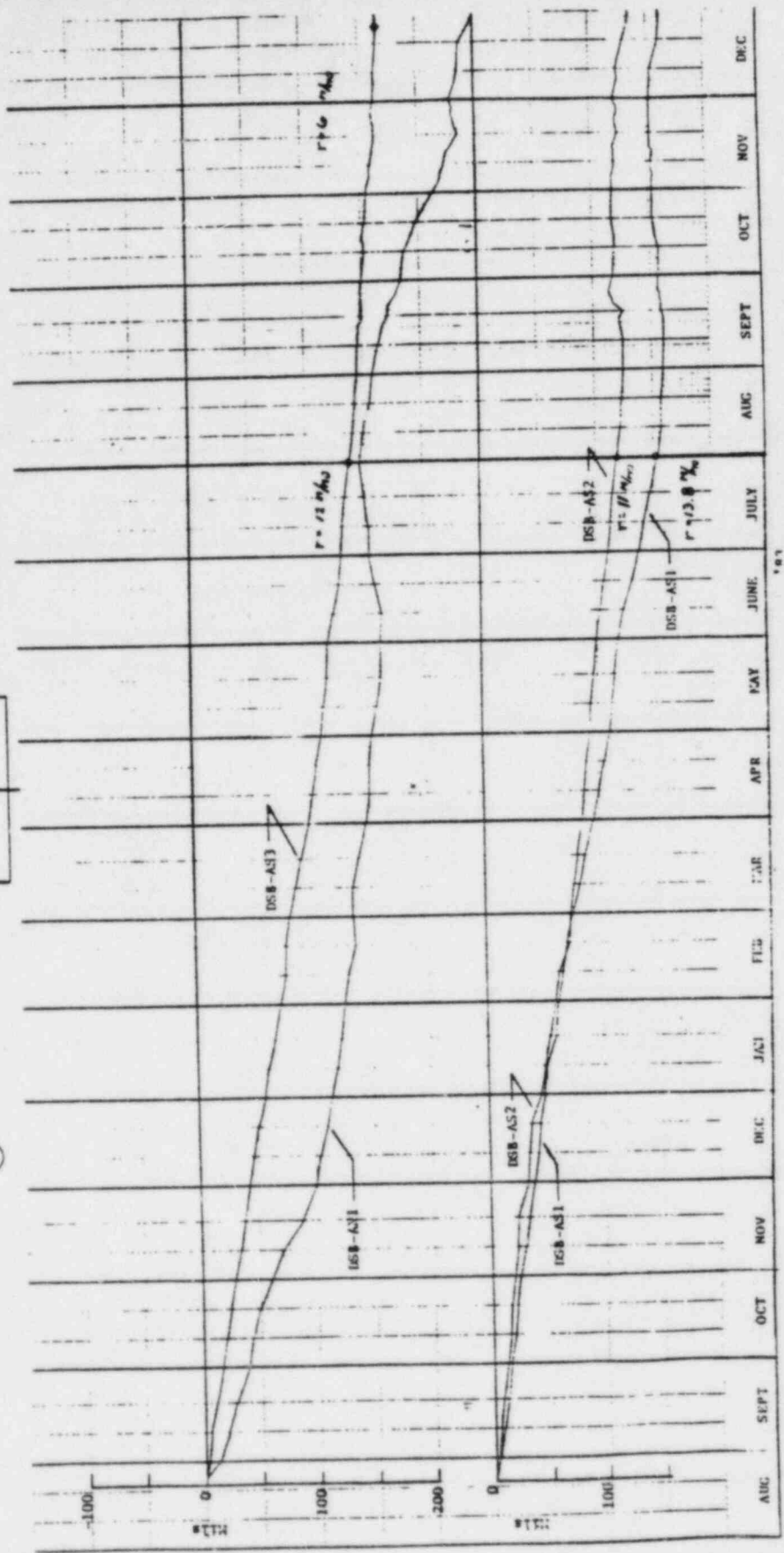
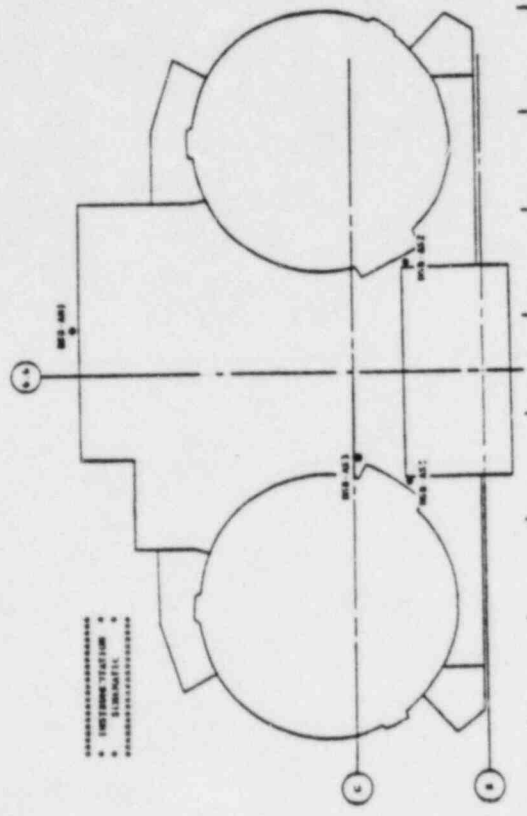
TRIBUTARY ZONE AT END OF PHASE III

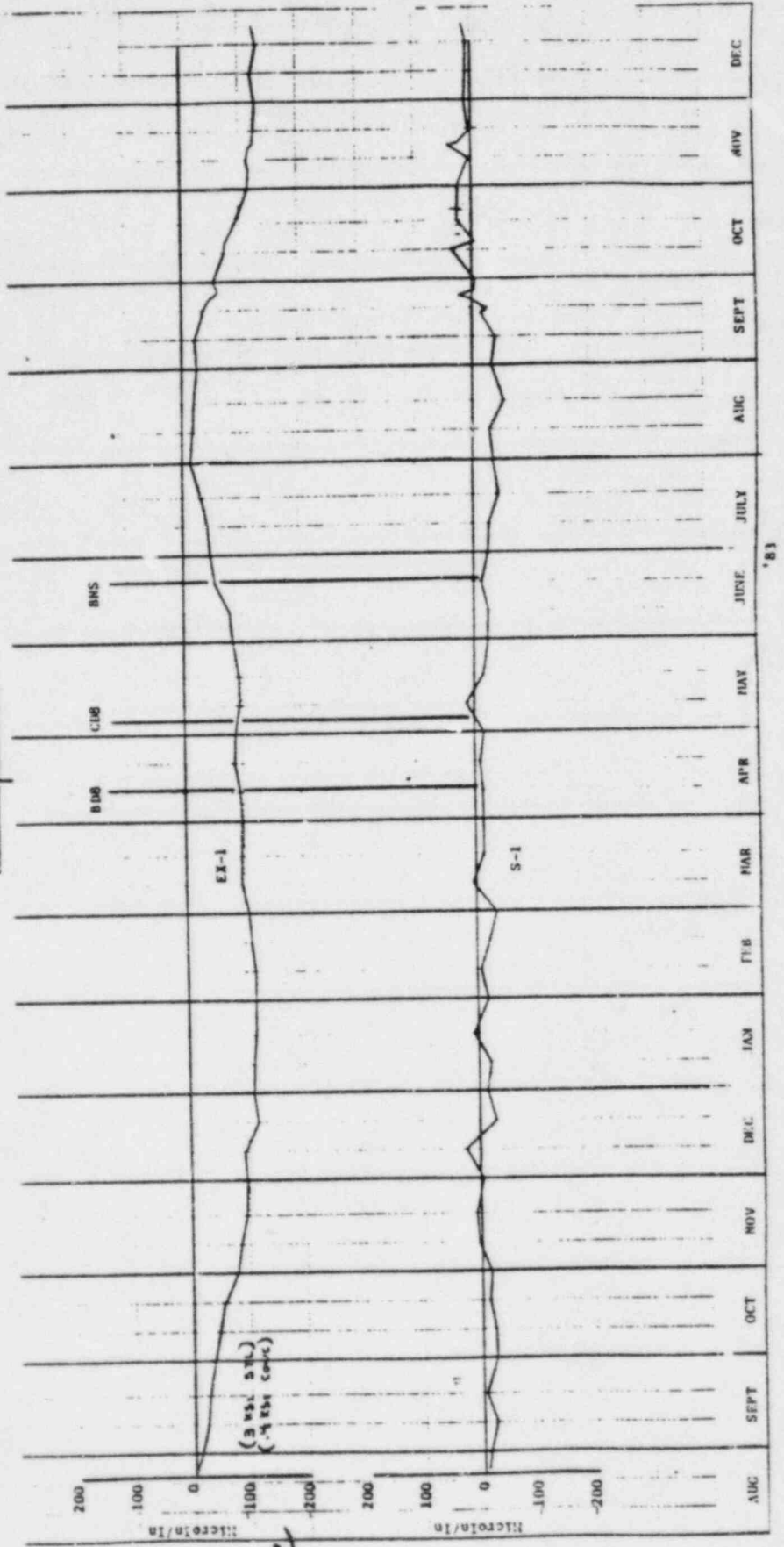
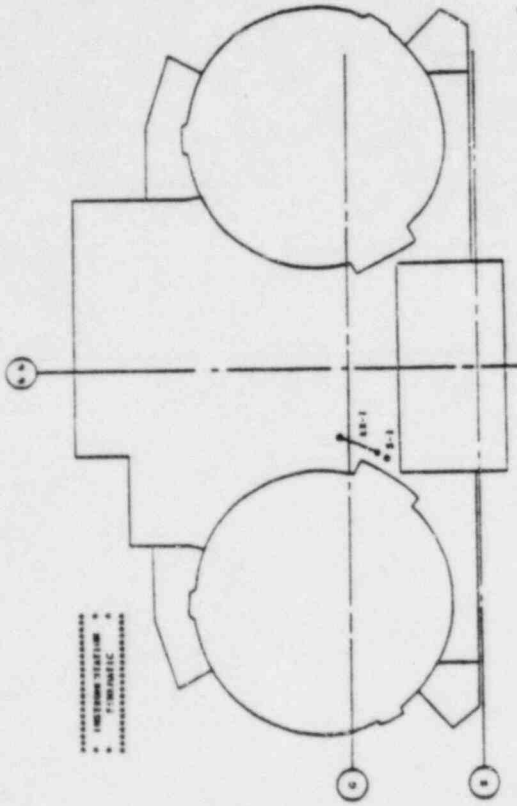
PRIMARY LOADS/REACTIONS/ TRIBUTARY ZONES - STEP 3 - PHASE III

Attachment #5

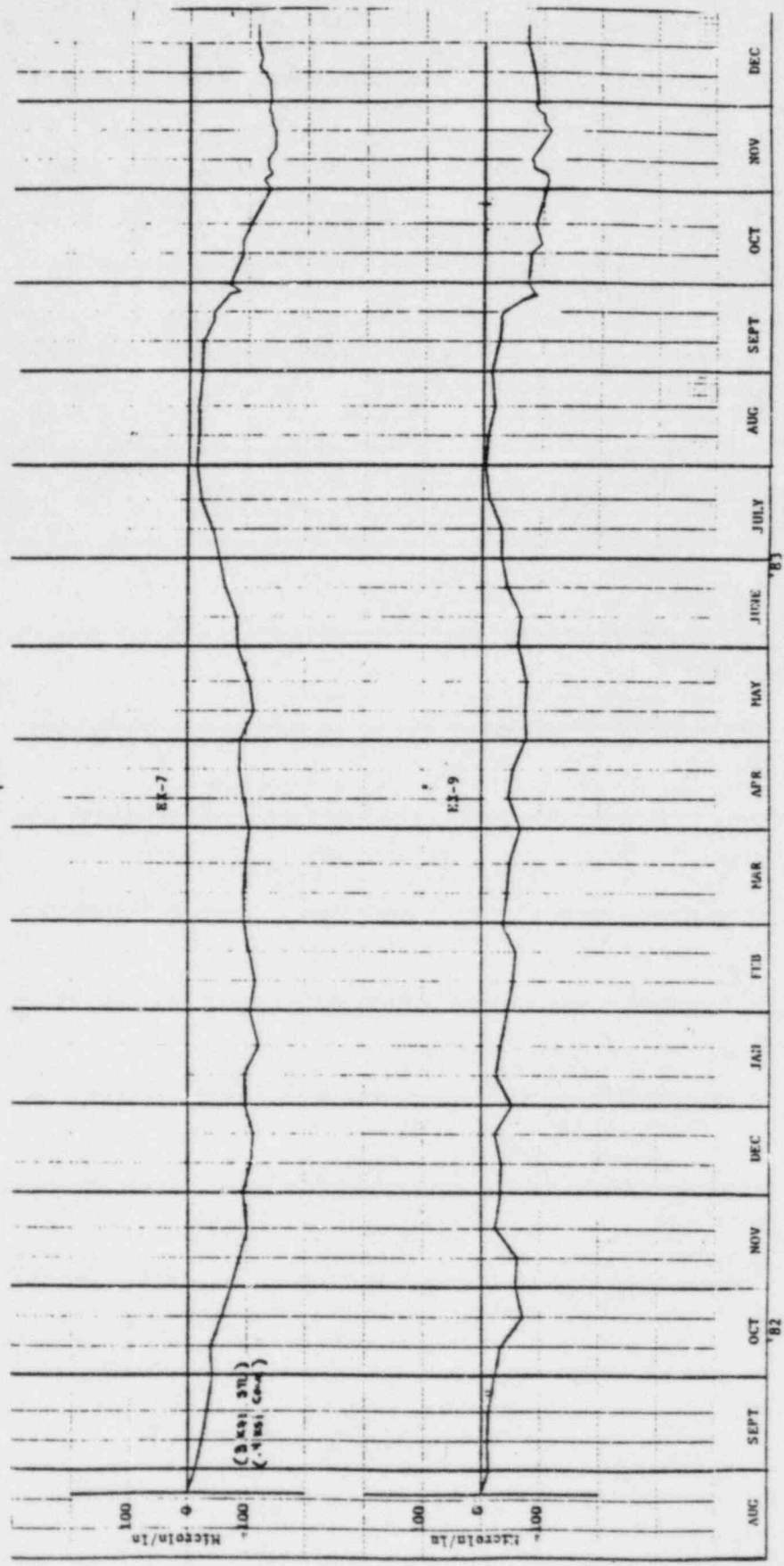
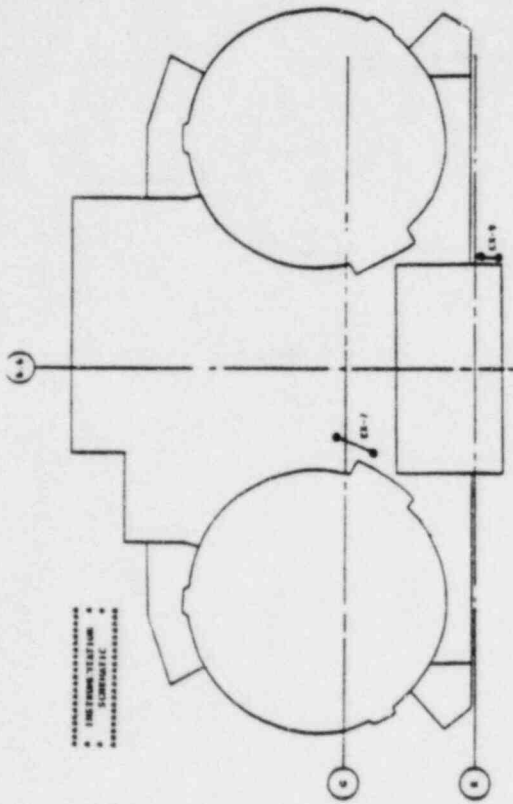
4/7/84

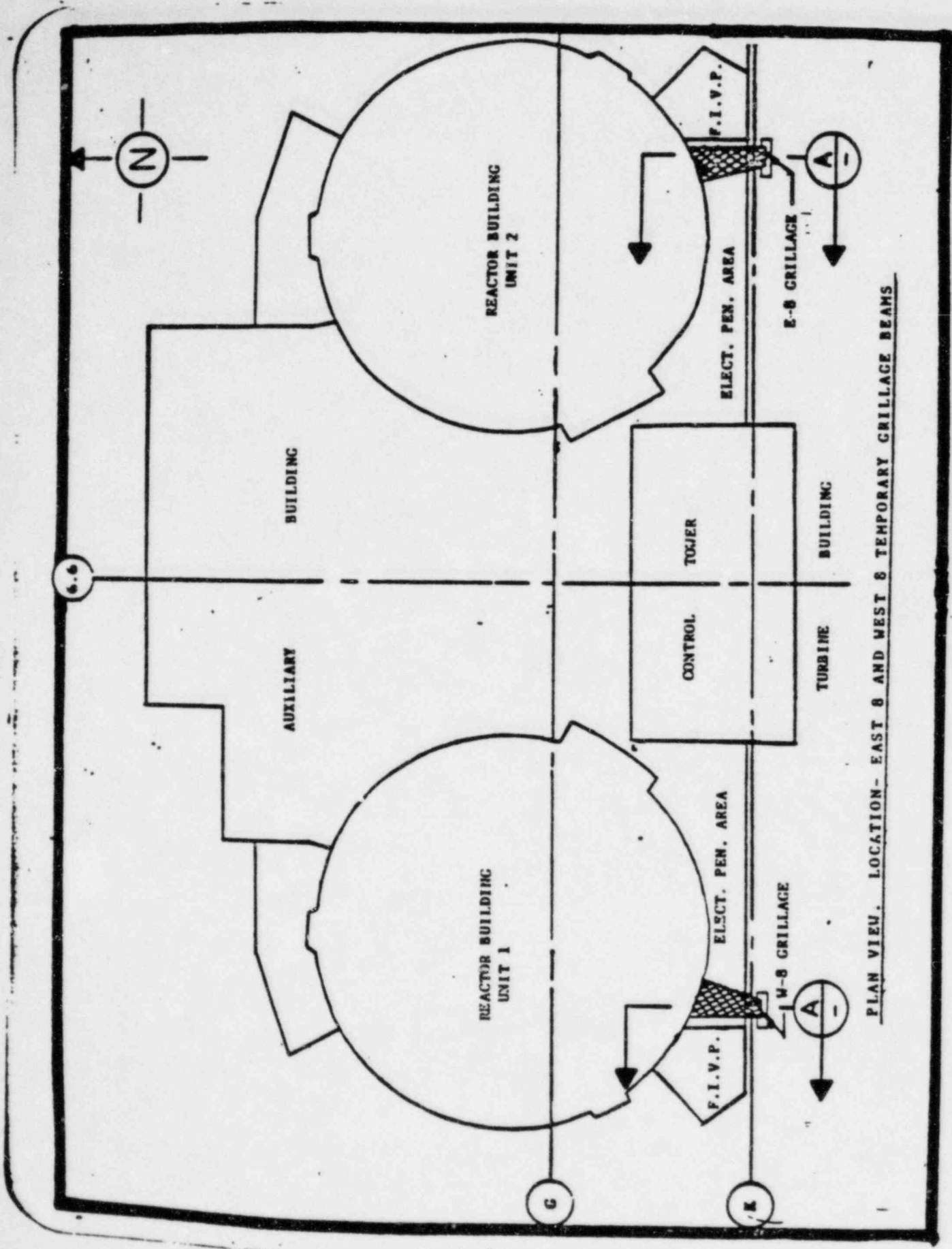
(10)



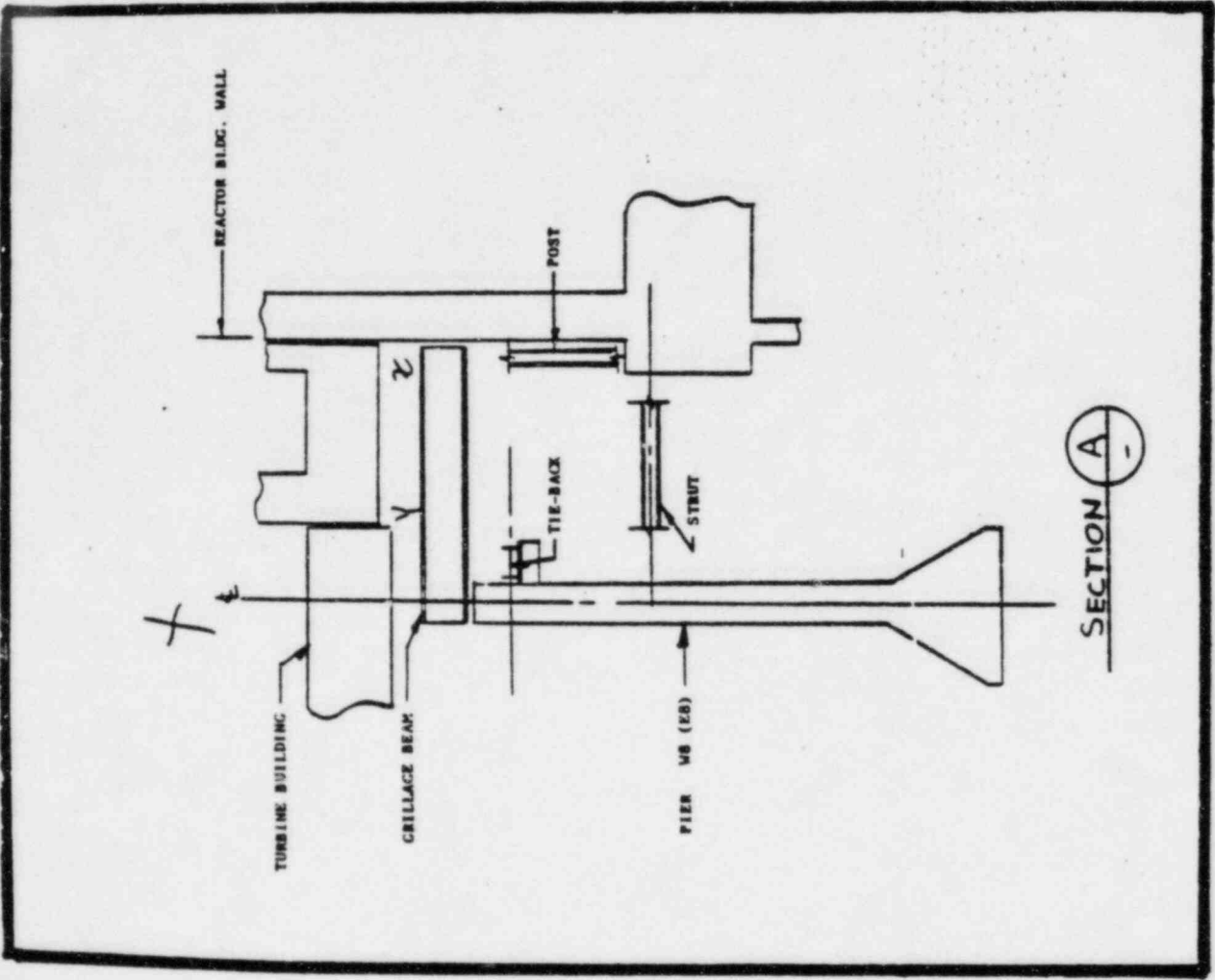


Compressive

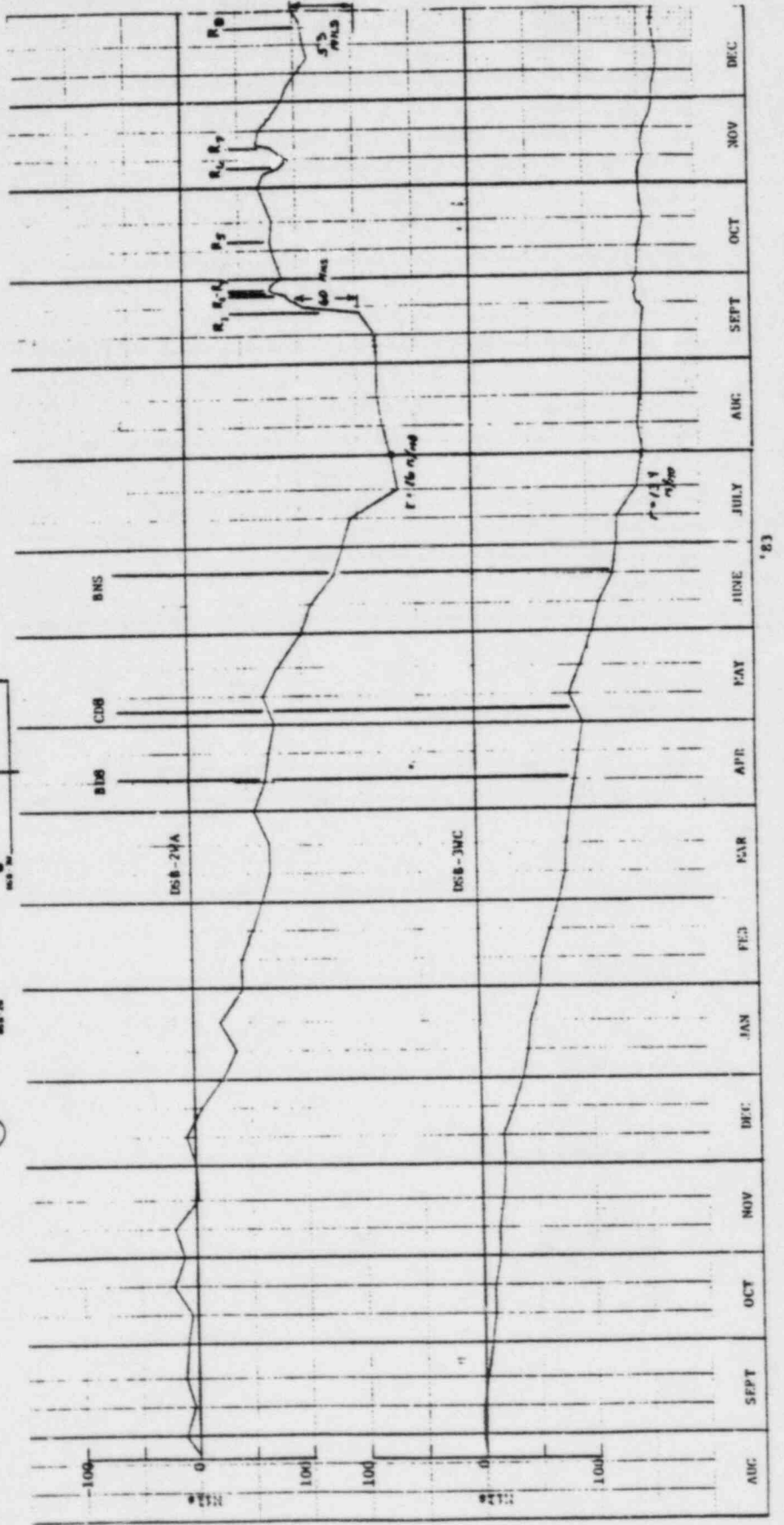
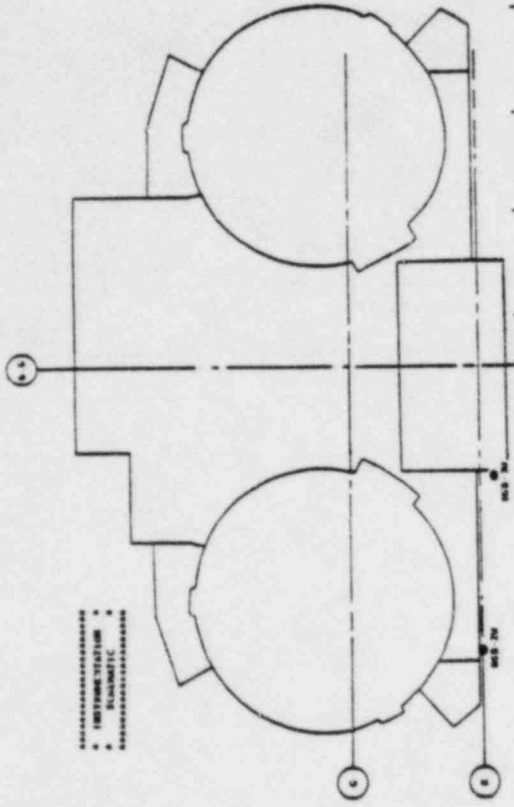




PLAN VIEW. LOCATION - EAST 8 AND WEST 8 TEMPORARY GRILLAGE BEAMS



SECTION A



JACKING HISTORY
 UNIT - 3
 GRILLAGE

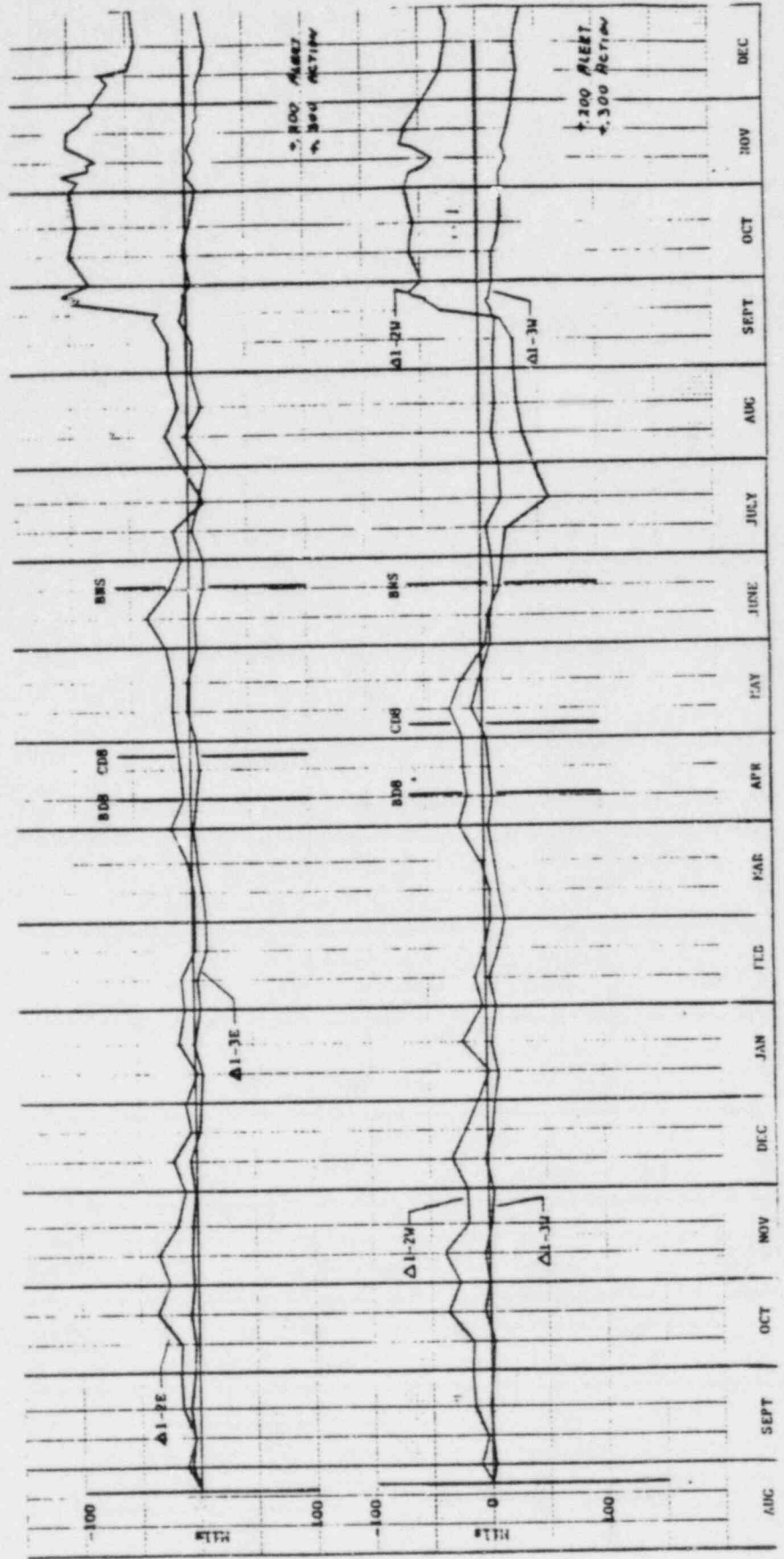
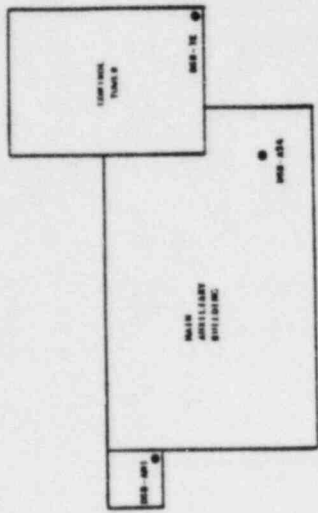
GRILLAGE 8
 JACK LOCATIONS
 X--TURB. BLDG SLAB
 Y--SOUTH EPA
 Z--NORTH EPA

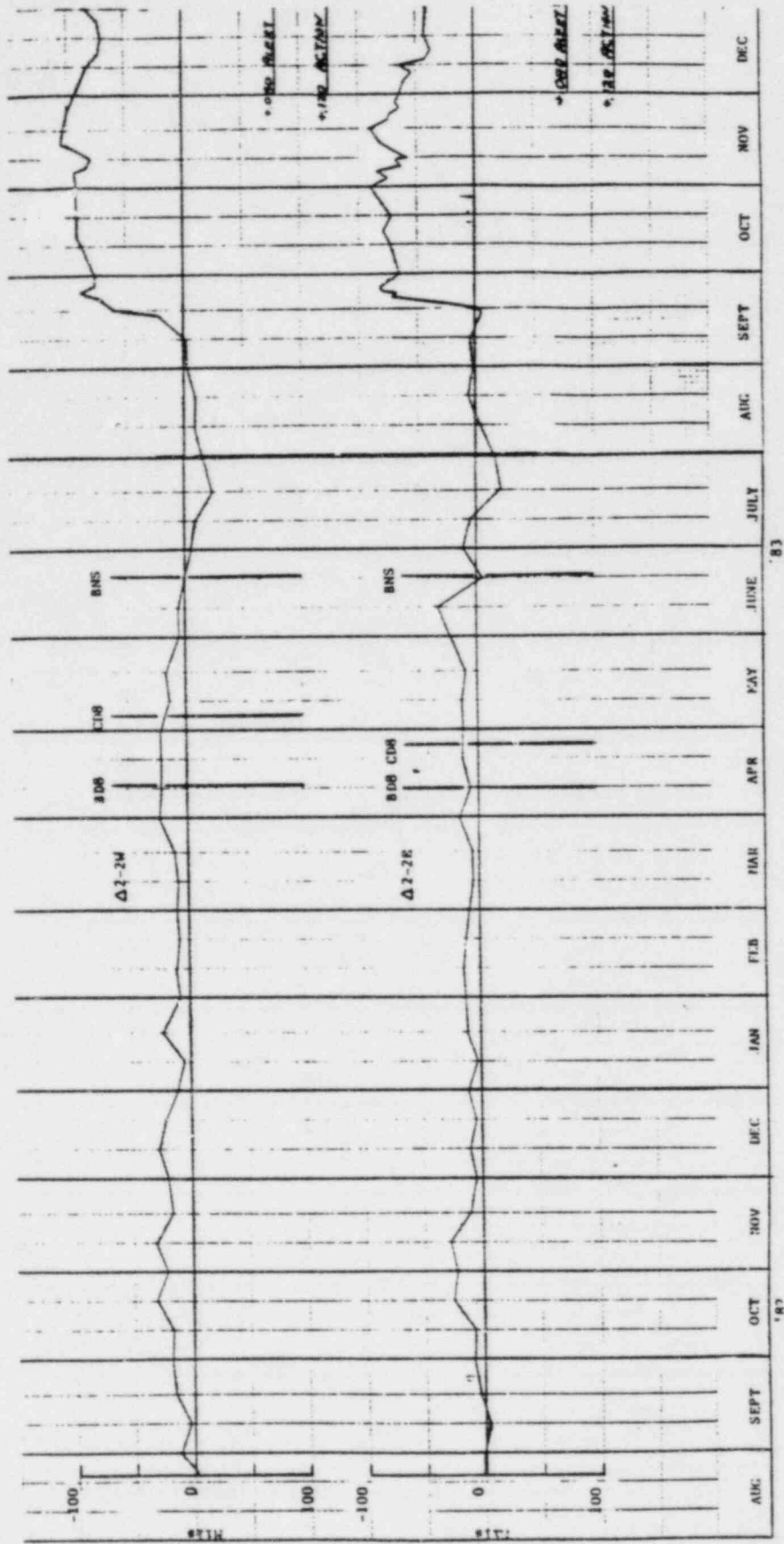
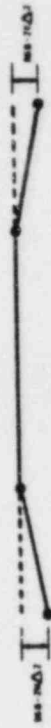
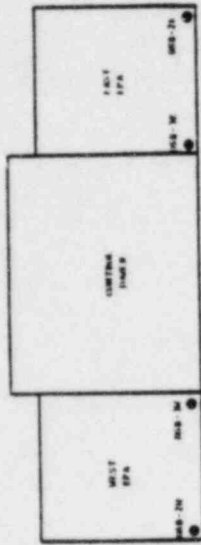
ACT. I.D. NO.	ACTIVITY	DATE INITIATED	DATE LOCKED-OFF	CAUSE	LIFT-OFF (ASL)			HOLD (ASL)			LOCK-OFF (ASL)		
					X	Y	Z	X	Y	Z	X	Y	Z
W-R ₁	Initial jacking of W-B grillage	9-19-83	9-23-83	-----	89.5	--	--	89.5	--	--	89.5	125	125
W-R ₂	First day re-jacking	9-24-83	9-24-83	Routine re-jacking	101.4	125	125	101.4	125	125	101.4	125	125
W-R ₃	Second day re-jacking	9-25-83	9-25-83	Routine re-jacking	112	125	125	112	125	125	112	125	125
W-R ₄	Third day re-jacking	9-26-83	9-26-83	Routine re-jacking	125	125	125	115	125	125	115	125	125
W-R ₅	Maintain bldg. elevation	10-13-83	10-13-83	Strain gages not within $\pm 20\%$ of lock-off	109.4	125.6	120.4	109.4	124.6	125	109.4	124.6	125
W-R ₆	Maintain bldg. elevation	11-7-83	11-9-83	10 mils/48 hrs.	113.3	134.8	134.1	113.3	125.0	125.0	113.3	125	125
W-R ₇	Maintain bldg. elevation	11-14-83	11-15-83	Strain gages not within $\pm 20\%$ of lock-off	128	118.4	116.6	110	125	125	110	125	125
W-R ₈	Maintain bldg. elevation	12-26-83	12-26-83	Strain gages not within $\pm 20\%$ of lock-off	85.6	136.8	120.4	110	125	120.4	110	125	120.4

JACKING HISTORY
EAST - B
GRILLAGE

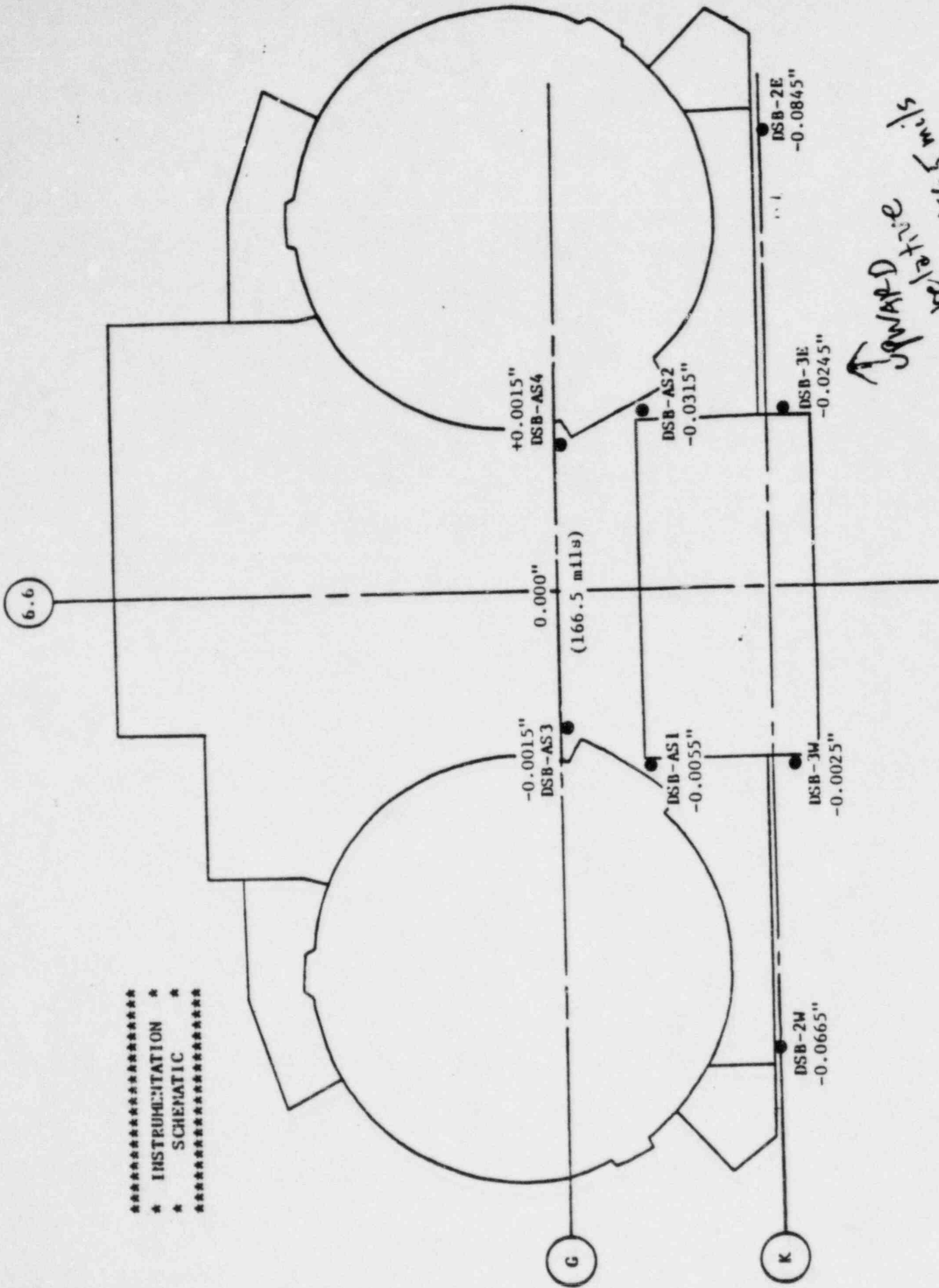
GRILLAGE 8
JACK LOCATIONS
X--TURB. BLDG SLAB
Y--SOUTH EPA
Z--NORTH EPA

ACT. I.D. NO.	ACTIVITY	DATE INITIATED	DATE LOCKED-OFF	CAUSE	LIFT-OFF (NSL)			HOLD (NSL)			LOCK-OFF (NSL)		
					X	Y	Z	X	Y	Z	X	Y	Z
E-R ₁	Initial jacking of E-8 grillage	9-20-83	9-24-83	-----	107.5	--	--	--	--	--	107.5	125	125
E-R ₂	Maintain bldg. elevation	9-25-83	9-27-83	11 mils/24hr@ EPA; 14 mils/24 hrs. @ T.B.	126	130.6	130.6	115	130.6	130.6	115	130.6	130.6
E-R ₃	Maintain bldg. elevation	10-14-83	10-14-83	Strain gages not within ±20% of lock-off	116.7	123.2	124.7	115	123.2	124.7	115	123.2	124.7
E-R ₄	Maintain bldg. elevation	11-3-83	11-5-83	10 mils/48hrs.	128.7	127.3	132.6	110	125	125	110	125	125
E-R ₅	Maintain bldg. elevation	11-7-83	11-9-83	10 mils/48 hrs.	131.3	133.5	146.4	110	125	125	110	125	125
E-R ₆	Maintain bldg. elevation	11-14-83	11-14-83	Strain gages not within ±20% of lock-off	134	119.1	136.6	110	125	125	110	125	125
E-R ₇	Maintain bldg. elevation	11-23-83	11-25-83	10 mils/48 hrs.	126.0	141.7	146.4	110	125	125	110	125	125
E-R ₈	Maintain bldg. elevation	11-27-83	11-29-83	16 mils/48 hrs.	136.6	141.7	150.3	115	141.7	149	115	135	135
E-R ₉	Maintain bldg. elevation	12-7-83	12-10-83	11 mils/48 hrs.	141.9	152.1	162.2	115	152.1	160.0	115	135	135
E-R ₁₀	Maintain bldg. elevation	12-12-83	12-15-83	11 mils/48 hrs.	144.6	158.3	158.2	115	158.3	151.0	115	135	135



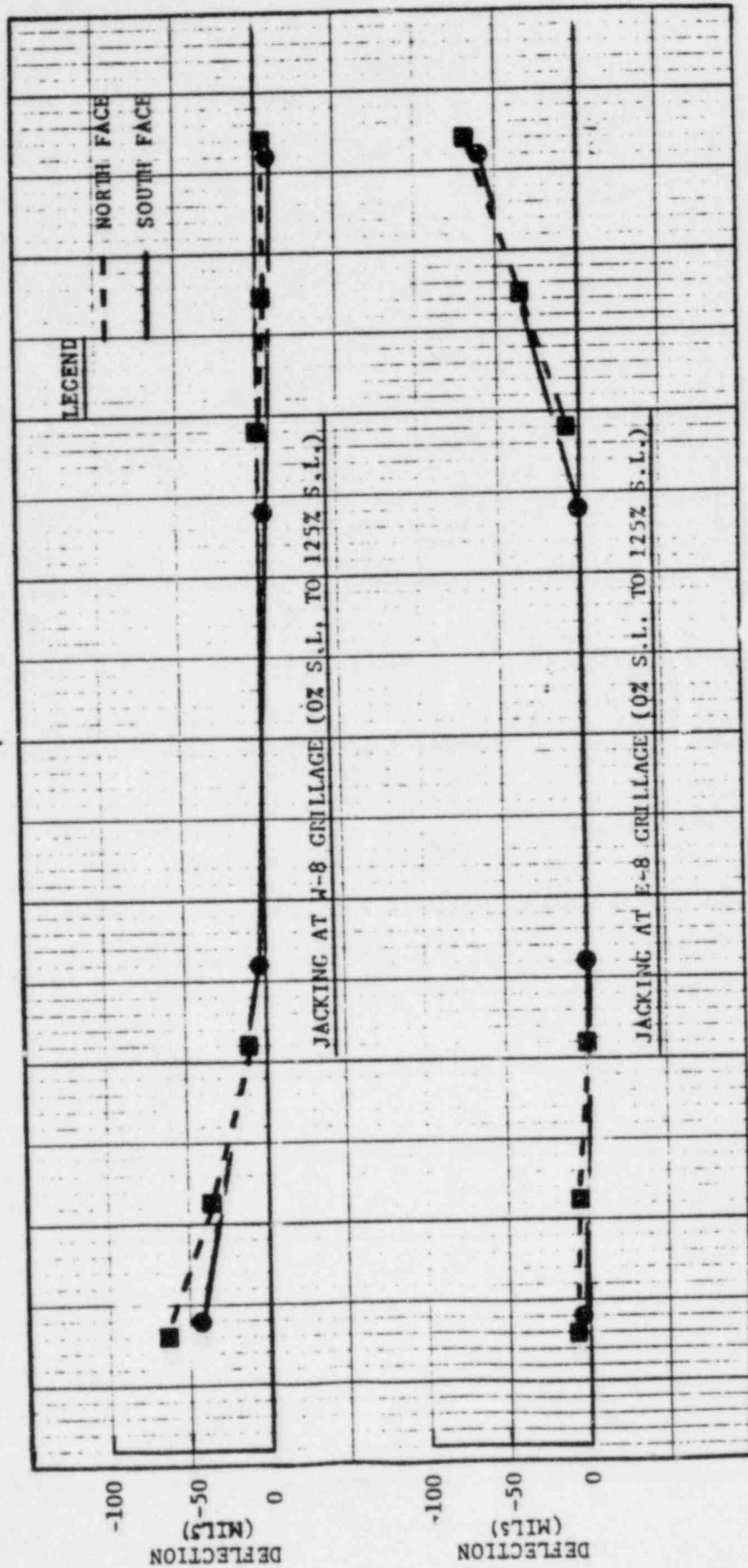


 * INSTRUMENTATION *
 * SCHEMATIC *



↑ FORWARD
 relative
 to 166.5 m/s

DECEMBER 30, 1983
 (Baseline of August 23, 1982)



CHANGES IN ELEVATION DURING JACKING

Attachment #4

CRACK MAPPING

1-4-84

(11)

We are presently monitoring approximately 1000 cracks in the Auxiliary Building south of Col. Line G. To date we have completed three full crack mappings. The baseline was completed 9/14/82. The next mapping was performed after the undermining of the EPA's and was completed 8/2/83. The third mapping was performed after the initial jacking of the Electrical Penetration Areas and was completed on 10/22/83. On 11/28/83, the Resident Structural Engineering group requested WJE to remeasure specific cracks after we had experienced the elevated lift-off loads on the East side. The cracks were chosen because they were the cracks which were reported to have changed in the previous mappings. A fourth full mapping requested by Resident Engineering is in progress. To date the East EPA was completed from 12/20/83 through 12/28/83. The remaining sections are scheduled for completion by 2/17/84.

Initial Jacking

Evaluation of the mappings performed immediately after initial jacking had shown that 23 cracks had changes in width and 21 new cracks were reported. The width changes which had occurred were 0.005 inches or less except for two cases. In both cases the reported changes were in floor slabs. After a field review, it was determined that the changes were attributable to fluctuations in measurements.

The observed changes in crack patterns and widths, were in general, consistent with previous patterns that indicate volume change movements. The width changes are within the estimated tolerance limits of 0.005 inches. All crack widths were below the alert limits.

GRILLAGE 8 REJACKING

After we had experienced elevated lift off loads when rejackng the grillages, we requested WJE to check the width of cracks which had been reported to have changed during initial jacking. Evaluation of this data indicated that all measured crack width changes were within the estimated tolerance of 0.005 inches.

CONCLUSION EAST EPA MAPPING COMPLETED 12/28/83

There are approximately 400 cracks which are monitored in the East EPA. The most recent crack mapping (completed 12/28/83) has shown that 18 of these cracks changed in width, 27 cracks increased in length and 11 new cracks were found, when compared to previous mapping.

All of the 18 cracks which changed in width, increased or decreased by 0.005 inches or less. These small changes can be attributable to variations in measurement. The length increases were approximately 1'-0" or less except for two cracks which increased by approximately 2'-0" and 3'-0". Only 3 of the 27 cracks which increased in length also increased in width.

Only two of the newly identified cracks were at the alert level of .010 inches. After further checking, it was determined that these cracks were present prior to this mapping. These cracks were identified on a previous report by Construction Technology Labs.

The observed crack changes which occurred were within the measurement tolerance. The crack changes do not indicate any structural distress in the slabs and walls of the East EPA due to jacking at East 8 Grillage.

Page 3

Mapping/WORK6

	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER
CRACK MAPPING					
INITIAL GRILLAGE JACKING	EAST WEST				
GRILLAGE RE-JACKING	EAST WEST				
	110% S.L.				
	125% S.L.				
	125% S.L.				

SUMMARY OF CRACK CHANGES FOR
INITIAL JACKING AT E/W 8 GRILLAGE

DESCRIPTION	NEW	INCREASED	DECREASED
Total number of cracks.	21	10	13
Number of cracks greater than 0.005" change.	0	1	1

As shown above, relatively few cracks were observed to have changed in width during the introduction of the initial jacking loads for the Grillages. Of the reported twenty-one (21) new cracks after initial jacking, eight (8) were determined to have existed before start of underpinning based on subsequent inspection.

SUMMARY OF SELECTED CRACK CHANGES FOR REJACKING AT
E/W 8 GRILLAGE

	INCREASED	DECREASED
Total number of crack changes.	6	7
Number of cracks greater than 0.005" change.	1	0

SUMMARY OF CRACK CHANGES FOR EAST EPA

	<u>NEW</u>	<u>INCREASED</u>	<u>DECREASED</u>	<u>ELONGATED</u>
Total No. of Cracks	11	9	9	28
No. of Cracks with Width Changes > 5 Mils	2*	0	0	0
% of Crack Width Changes > 5 Mils	18%	0	0	0
No. of Cracks which Elongated & Increased in Width	N/A	N/A	N/A	3
% of Cracks which Elongated and Increased in Width	N/A	N/A	N/A	11%

*Two new cracks were identified as alect level cracks on the N.F. of wall @ Col. Line K between Col. Lines 8.6 & 9.1 (area 191). These two cracks were identified on a CTL Report prior to baselining of cracks for the Auxiliar, Building. The two cracks are therefore not new cracks but existing cracks which were not identified during crack baselining.

Attachment #5

①

I Current State of Crack Mapping as of December 28, 1983

Wiss, Janney, Elstner (WJE) personnel have been monitoring crack locations, patterns and widths since August of 1982. To date they have completed three mappings and they are presently performing the forth.

WJE procedures presently require the mapping to be performed by an originating technician with a second technician performing a check of the mapping in the field. The whole process is overviewed by a Lead Engineer.

The building is broken into smaller units and assigned area numbers by WJE. Mappings of the areas are documented on standard forms. Mappings from several areas are combined to form a submittal which is given to Resident Engineering. The submittal is reviewed by Resident Engineering and then released through Document Control.

As of December 28, 1983, WJE had documented 990 cracks in the EPA and Control Tower Areas. The range of crack widths varied from approximately 3 mils up to 25 mils.

The maximum crack width was .025 inches. WJE had identified 3 cracks of this width which were located in floor slabs.

Table I shows the breakdown of the measurements for the Control Tower and EPA areas.

Mean Crack Width .0042 inches

Standard Deviation .0034 inches

It is our estimation that the accuracy at measurement is approximately .005 inches.

Listed in Attachment A are required crack mappings. There are twenty-one events which require crack mapping. Also listed is the option of Resident Engineering to request a mapping at any time. This would be based on our evaluation of a building movement indicated by instrumentation data. The requested mappings may be of a localized area or may be for the entire area based on our expected behavior of the structure.

Method of Monitoring and Evaluation

As an example of a portion monitoring and evaluation process, the following data from the grillage at W/8 is presented.

Before we started jacking, a discussion was held between B. Dhar, Vish Verma of Ann Arbor and John Darby. In that discussion they gave Resident Engineering deflection values that could be expected during the jacking. In addition, they outline the criteria we should use in evaluating the structure's response to the jacking loads. This information is given in REM-S-1115 (Attachment B).

These criteria were then included on the forms that the residents use for monitoring during the jacking operation. Copies of the actual records for the grillage W/8 jacking are given in Attachment C. This shows that we monitor the jacked structure, adjacent structures, and the grillage/pier system at least twice during each load increment. This information was evaluated when received and we did not proceed with jacking until we were satisfied with the behavior the building is exhibiting. If we had any doubts or questions, the situation was investigated and/or discussed with Project Engineering, FSO and Mergentime personnel until we were satisfied.

In addition, to the intensive review of the data during the jacking operation Resident Engineering receives readings from the instrumentation system every four hours. This data is reviewed by Resident Engineering when received. We are staffed to support this twenty-four hours a day. During our reviews we look for any changes occurring which appear to be out of the ordinary.

We maintain plots of selected instrumentation data. These plots are updated and reviewed daily in order to identify trends that the buildings may be exhibiting or any identifiable reaction that could be related to construction events.

Finally an evaluation is performed by Resident Engineering of the crack mappings after the mappings have been reviewed and released. During this process we identify the changes that had occurred from the previous mapping, the crack location and respective change is then placed on a sketch of the building (see Attachment D). The changes are reviewed for any

Not during actual jacking

distinguishable patterns. The data is tabulated and field reviews are performed if it is judged necessary to evaluate the change further. This information is then forwarded to our consultants for their review.

At times we may see a change in a single submittal that warrants discussion with our consultants. A complete report is not necessarily written by Resident Engineering. The information is forwarded to our consultant and the situation discussed. These discussions are documented in our daily reports.

CRACK SUMMARY FOR CONTROL TOWER AND EAST & WEST EPA's

TABLE I

CRACK WIDTH, IN.	(1000'S) HL	.005	.0075	.010	.0125	.015	.0175	.020	.025	.030	TOTAL CRACKS
TOTAL NO. OF CRACKS WITH INDICATED WIDTH	602	150	30	72	3	17	1	8	3	0	886
% OF TOTAL NO. OF CRACKS	67.9	16.9	3.4	8.1	0.3	1.9	0.1	0.9	0.3	0	

CRACK AREAS = 104 (NOT INCLUDED IN TOTAL NO. OF CRACKS)

MEAN CRACK WIDTH, \bar{x} = 0.0042

STANDARD DEVIATION OF CRACK WIDTH, σ = 0.0034

Attachment #7

③

SCHEDULED CRACK MAPPINGS

- a. Before the start of Phase 2 (Drawing 7220-C-1418) construction for first baseline measurements (mapping of existing cracks) in the electrical penetration areas of the auxiliary building.
- b. After soil support removal for placing pier E/W 8 grillage beams at the ends of the electrical penetration areas.
 - b.1. After completion of jacking at pier E/W 8 grillage beams to support the electrical penetration areas.
- c. After completion of the access drift from the utility access tunnel (UAT) to piers CT1 and CT12, and removal of soil support for excavation of piers CT1 and CT12.
- d. After completion of jacking above piers CT1 and CT12.
- e. After removal of soil support from the excavation of the drift north of pier E/W 5.
- f. After completion of jacking above E/W 5 grillage beams.
- g. After removal of soil support for excavation of piers CT3 and CT10.
- h. After completion of jacking for piers CT3 and CT10.

(Hold Items i through t inclusive)
- i. After removal of soil support due to excavation for piers CT5, 8, 13 and 15.
- j. After excavation of drift north of piers E/W 2.
- k. After completion of jacking above piers CT5, 8, 13 and 15.
- l. After completion of jacking above pier E/W 2 grillage beams.
- m. After removal of soil support because of excavation for piers CT6, 7, and 14.
- n. After completion of jacking for piers CT6, 7, and 14.
- o. After mass excavation between 5.3 to 5.9 and 7.2 to 7.8, down to El. 591'-0".
- p. After completion of excavation under the control tower and electrical penetration areas down to El 591'-0".

- q. After application of 50% of the permanent jacking loads.
- r. After application of 100% of the permanent jacking loads.
- s. At 7-day intervals following the application of 100% of permanent loads until lock-off time of the permanent jacking loads.
- t. After lock-off of the permanent jacking loads.
- u. At any other time as requested by the Bechtel resident structural engineer.

- q. After application of 50% of the permanent jacking loads.
- r. After application of 100% of the permanent jacking loads.
- s. At 7-day intervals following the application of 100% of permanent loads until lock-off time of the permanent jacking loads.
- t. After lock-off of the permanent jacking loads.
- u. At any other time as requested by the Bechtel resident structural engineer.

MIDLAND PROJECT
RESIDENT ENGINEER MEMORANDUM



RE S-1115
 DATE SEPT 16 1983
 SUBJECT BLDG. LIMITS WHEN MONITORING FOR W/B GRILLAGE JACKING
 REF PHONE CONVERSATION WITH B. DHAR, V. VERMA, K RAZDAN, 9/16/83
 AAO COORDINATION Date - Time - AAO Contact V. VERMA

THIS REM DOCUMENTS THE CRITERIA FORWARDED TO ME FROM PROJECT ENGINEERING FOR USE IN MONITORING THE TURBINE BLDG., FIVP AND EPA DURING INITIAL JACKING OF THE GRILLAGE AT W/B.

THE ANALYSIS OF THE EPA HAS SHOWN A 140 MIL DISPLACEMENT FOR 4000^K OF LOAD (UPLIFT). IT WAS INDICATED THAT THIS VALUE WAS CONSERVATIVE AND THAT A VALUE OF 160 MILS COULD BE UTILIZED. THIS LEADS TO A RELATIONSHIP OF 4 MILS DISPLACEMENT PER 100^K OF LOAD. THEREFORE WE WOULD HAVE THE FOLLOWING:

LOAD	THEORETICAL UPLIFT
SL = 1600 ^K	102 MILS
SL + ADD'L W/S LOAD = 2550 ^K	160 MILS
SL + REL = 4000 ^K	

24 MILS Project Engineering Comment.
 V.V. 10-14-83

JOB 7220

PROJ ENGR	ASST PE 1	ASST PE 1	ASST PE 1	ASST PE 1	ASST M. Swenberg	MECH	ELECT	CS	CIVIL SOILS, H. DHAR	PT	ARCH	OE	CIVIL ENGR PL	PROJ ENGR	PROJ. MGR	FIELD	CONST. COORD	FSUR	ADMIN	M. Fuller	FILE NO. 0186.1	RS 03201
					2				1				(CONT. PG 2)									

RESIDENT ENGINEER J. W. Daily 9/23/83

APPROVED
 DISAPPROVED
 With Comments.

AAO Review: Group Supervisor V.V. Verma
 Date 11/1/83

Comment added 11/8/83

DURING THE INITIAL JACKING OF THE GRILLAGE
AT W/B WE WILL UTILIZE THE FOLLOWING CRITERIA:

I. FOR EPA, ~~W/B~~, Δ_2 or absolute

changed {

LIMIT	ACTION
30 MILS	DROP LOAD TO 80% OF MARL AS REQUIRED BY PROCEDURE BUT WE ARE CLEARED TO PROCEED
40 MILS	HOLD FOR 24 HRS AND EVALUATE BLDG MOVEMENTS
50 MILS	" " " " " "
60 MILS	HOLD LOAD AND EVALUATE

IF ANY LIMIT ABOVE 30 MILS IS REACHED DURING THE JACKING ANN ARBOR WOULD BE CONTACTED AND THE MOVEMENTS EVALUATED BEFORE PROCEEDING WITH THE JACKING.

II. DSB-2W RELATIVE TO DSB-3W : 40 MILS

IF THE CHANGE IN THE RELATIVE DISPLACEMENT BETWEEN DSB-2W WITH RESPECT TO DSB-3W HITS 40 MILS JACKING SHOULD HOLD AT THAT POINT.

III CHANGE IN DSB-3W : 50 MILS DOWNWARD

JACKING OPERATIONS WILL HOLD IF THE CONTROL TOWER CORNER DISPLACES DOWNWARD 50 MILS.

IV FIVP RELATIVE DISPLACEMENT : 10 MILS

IF THE FIVP DISPLACES MORE THAN 9 MILS WITH RESPECT TO TURB. BLDG OR REACTOR BLDG, JACKING WILL HOLD UNTIL THE SITUATION IS EVALUATED.

V. TURB. BLDG. MAT

30 MILS FROM ACTIVATION of X JACKS

25 MILS FROM ACTIVATION of Y/Z JACKS

R S E MONITORING POINT
PIER W-B Z Jacks

Specified Load = 500 kips

DATE	PIER NO. / MONITORING POINT	JACKING LOADS (KIPS)	TIME ATTACHED	W J E		A ₂ of DSB-2W	Change in Δ ₂	F I V P DSB-1WF	Δ 4 of DSB-1WF	DSB-2WT		Δ A DSB-2WT from A ₁ baseline	Δ A DSB-2WT from Y ₁ baseline	LIMITS
				RUN NO.	TIME					1 X Jack	2 X Jacks			
9-18-85	Initial Load Transfer for													
	2nd line		8:00:35	2693	9:00:35	.005	0	.057	0	.093 ^a	.087	-.006	0	UC
	New Base Line		8:54:52	2694	9:54:52	.003	0	.057	0	.093 ^a	.087	-.006	0	UC
			9:48:33	2696	9:48:33	.002	-.001	.057	0	.086	.086	-.007	-.001	UC
			9:58:49	2697	9:58:49	.002	-.001	.057	0	.086	.086	-.007	-.001	UC
			10:24:42	2698	10:24:42	-.001	-.004	.056	-.001	.085	.085	-.008	-.002	UC
			10:37:19	2699	10:37:19	-.001	-.004	.055	-.002	.085	.085	-.008	-.002	UC
			11:04:33	2700	11:04:33	-.003	-.006	.053	-.004	.084	.084	-.009	-.003	UC
			11:18:33	2701	11:18:33	-.003	-.006	.053	-.004	.083	.083	-.010	-.004	UC
			11:44:32	2702	11:44:32	-.006	-.009	.052	-.005	.082	.082	-.011	-.005	UC
			11:54:50	2703	11:54:50	-.006	-.009	.052	-.005	.082	.082	-.011	-.005	UC
			12:08:13	2705	12:08:13	-.008	-.011	.050	-.006	.081	.081	-.012	-.006	UC
			12:46:17	2707	12:46:17	-.008	-.011	.049	-.007	.081	.081	-.012	-.006	UC
			13:08:04	2708	13:08:04	-.011	-.014	.049	-.008	.080	.080	-.013	-.007	UC
			13:19:15	2709	13:19:15	-.012	-.015	.049	-.008	.080	.080	-.013	-.007	UC
			13:45:58	2710	13:45:58	-.014	-.017	.048	-.009	.079	.079	-.014	-.008	UC
			14:02:28	2711	14:02:28	-.015	-.018	.049	-.008	.079	.079	-.015	-.009	UC
			14:08:14	2712	14:08:14	-.017	-.020	.045	-.009	.079	.079	-.014	-.008	UC
			14:28:02	2713	14:28:02	-.017	-.020	.048	-.009	.079	.079	-.014	-.008	UC
			16:00:14	2714	16:00:14	-.017	-.020	.049	-.008	.078	.078	-.015	-.009	UC
			17:00:08	2715	17:00:08	-.016	-.019	.049	-.008	.078	.078	-.014	-.008	UC
			20:00:11	2716	20:00:11	-.015	-.018	.049	-.008	.077	.077	-.014	-.008	UC
			21:20:11	2717	21:20:11	-.014	-.017	.049	-.008	.079	.079	-.014	-.008	UC
			23:08:22	2718	23:08:22	-.015	-.018	.049	-.008	.078	.078	-.015	-.009	UC
				2719			Limit ± .010							
				2720			Limit ± .010							

* from 9-17-85, 19:48:32 when 2nd reac. transfered

PIER AREA = 2592 IN²

R S E MONITORING FORM
W-B-y

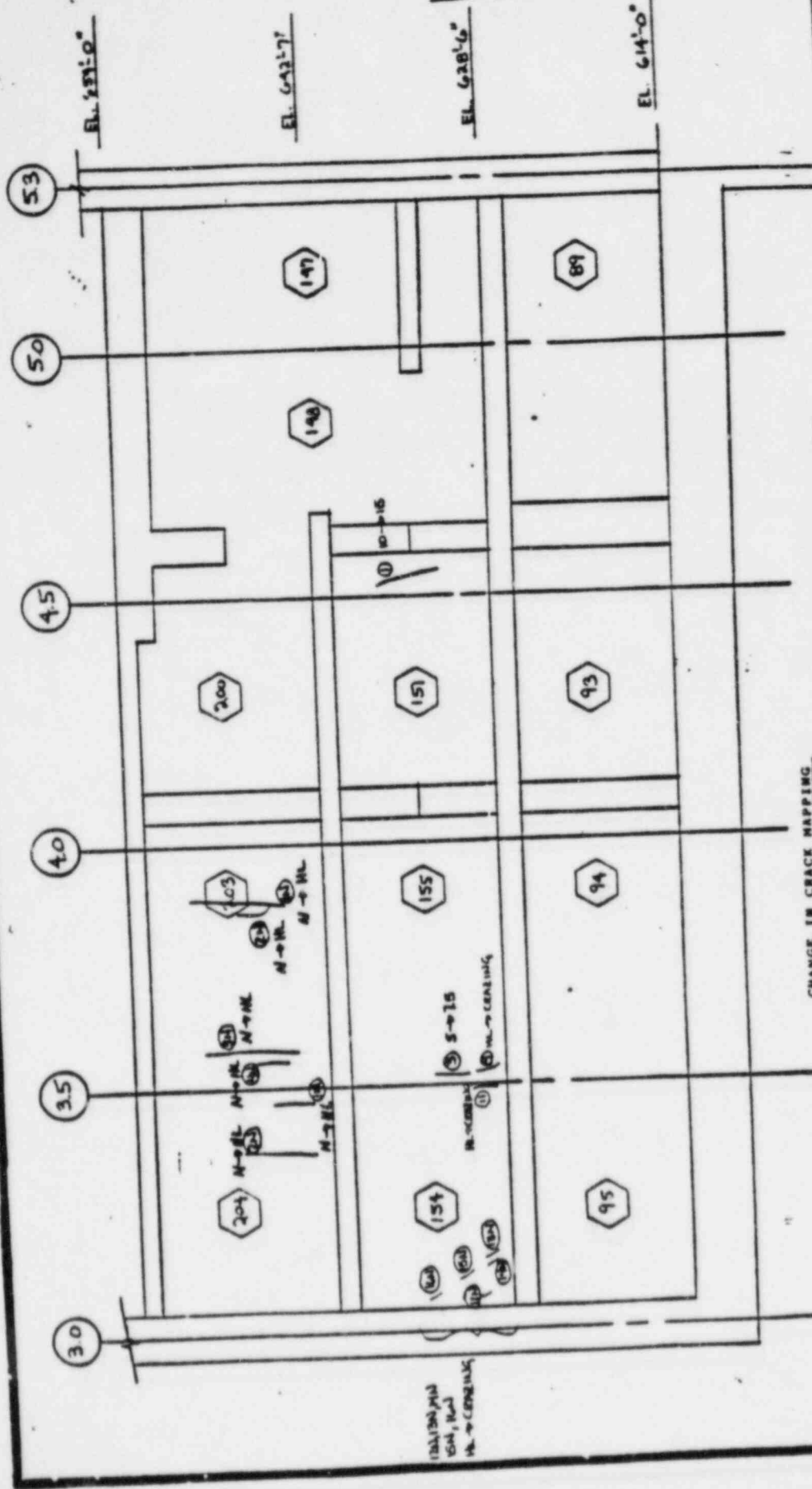
specified Load = 1,100 kips

DATE	INSTRUMENT NUMBER	INSTRUMENT TYPE	JACKETING LOAD (KIPS)	TIME ATTACHED	M J E RUN NO.	TIME	W-B-y A/A (in.)	W-B-y C.T. (in.)	W-B-y (in.)	STRAIN GAUGE, $\mu\text{in./in.}$			UPPER CARLSON METER (psi)			LOWER CARLSON METER (psi)			PIER SETT. (KIP)	INITIALS	REMARKS	
										P1	P2	P3	TOP EAST #1	TOP WEST #2	TOP AVG.	DOVT. WEST #3	DOVT. EAST #4	DOVT. AVG.				
9-18-63	2693	10	100	10:55	2693	10:55	156	140	0	0	0	192	-270	-251	596.8	-416	-171	-193.5	760.8	WC		
	2694	10	100	10:52	2694	10:52	155	140	0	0	0	-192	-269	-250.5	597.5	-410	-175	-192.5	758.2	WC		
	2696	10	100	9:41	2696	9:41	153	150	0	0	0	-209	-289	-251.5	651.9	-416	-198	-170	821.7	WC		
	2697	10	200	10:55	2697	10:55	151	150	0	0	0	-209	-289	-251.5	651.9	-416	-198	-170	821.7	WC		
	2700	10	300	11:04	2700	11:04	148	149	0	0	0	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2702	10	400	11:03	2702	11:03	145	145	0	0	0	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2703	10	500	11:16	2703	11:16	142	142	0	0	0	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2707	10	600	11:16	2707	11:16	141	141	0	0	0	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2708	10	660	11:08	2708	11:08	139	128	0.016	0.016	0.016	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2709	10	700	11:12	2709	11:12	135	129	0.017	0.017	0.017	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2710	10	770	11:12	2710	11:12	134	128	0.020	0.020	0.020	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2711	10	800	11:12	2711	11:12	131	128	0.024	0.024	0.024	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2712	10	830	11:12	2712	11:12	131	128	0.034	0.034	0.034	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2713	10	830	11:12	2713	11:12	130	128	0.034	0.034	0.034	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2714	10	830	11:12	2714	11:12	130	128	0.025	0.025	0.025	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2715	10	830	11:12	2715	11:12	130	128	0.025	0.025	0.025	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2716	10	830	11:12	2716	11:12	130	128	0.025	0.025	0.025	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2717	10	830	11:12	2717	11:12	130	128	0.025	0.025	0.025	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2718	10	830	11:12	2718	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2719	10	830	11:12	2719	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2720	10	830	11:12	2720	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2721	10	830	11:12	2721	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2722	10	830	11:12	2722	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2723	10	830	11:12	2723	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2724	10	830	11:12	2724	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2725	10	830	11:12	2725	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2726	10	830	11:12	2726	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2727	10	830	11:12	2727	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2728	10	830	11:12	2728	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2729	10	830	11:12	2729	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2730	10	830	11:12	2730	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2731	10	830	11:12	2731	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2732	10	830	11:12	2732	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2733	10	830	11:12	2733	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2734	10	830	11:12	2734	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2735	10	830	11:12	2735	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2736	10	830	11:12	2736	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2737	10	830	11:12	2737	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2738	10	830	11:12	2738	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2739	10	830	11:12	2739	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2740	10	830	11:12	2740	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2741	10	830	11:12	2741	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2742	10	830	11:12	2742	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2743	10	830	11:12	2743	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2744	10	830	11:12	2744	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2745	10	830	11:12	2745	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2746	10	830	11:12	2746	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2747	10	830	11:12	2747	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2748	10	830	11:12	2748	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2749	10	830	11:12	2749	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2750	10	830	11:12	2750	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2751	10	830	11:12	2751	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2752	10	830	11:12	2752	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2753	10	830	11:12	2753	11:12	129	128	0.026	0.026	0.026	-253	-348	-300.5	778.9	-526	-259	-192.5	1017.4	WC		
	2754	10	830	11:12	2754	11:12	129	12														

5

ATTACHMENT D
PAGE 3

Attachment #9



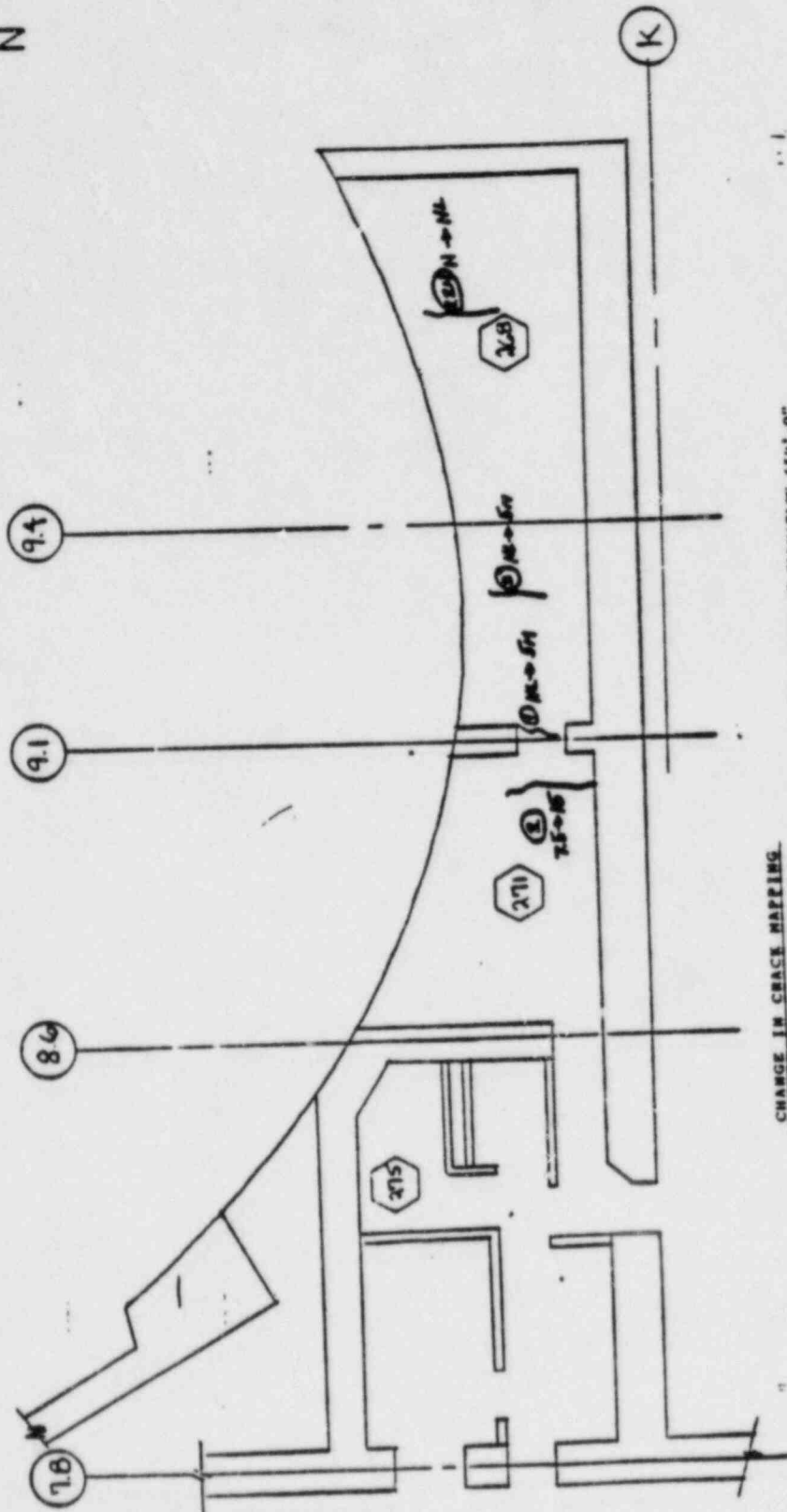
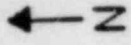
DATES MAPPED: 7/26/83 and 10/6/83
 DATE GRILLAGE JACKED: 9/18/83 LU
 AFTER INITIAL JACKING AT E/N 8/21/83

CHANGE IN CRACK MAPPING
 - WEST ELECTRICAL PENETRATION AREA - NORTH FACE OF WALL AT COLUMN LINE 4
 (ELEVATION 614'-0" TO ELEVATION 613'-0")

LEGEND:
 N = New Crack
 HL = Hair-line
 M = mil (.001 in.)

CRACK MAPPING
 N = New Crack
 HL = Hair-line
 M = mil (.001 in.)

ATTACHMENT D
pg 2 of 3



CHANGE IN CRACK MAPPING
AUXILIARY BUILDING - EAST ELECTRICAL PENETRATION AREA AT ELEVATION 859'-0"

LEGEND:
N - New crack
ML - Hair-line
M - mil (.001 in)

DATES MAPPED: 7/28/83 and 10/7/83
DATE GRILLAGE JACKED: 9/18/83 TO 9/24/83

AFTER INITIAL JACKING AT E/W 8 GRILLAGES

SUMMARY OF AUXILIARY BUILDING CRACK CHANGES

LOCATION	AREA	CRACK I.D. NO	CRACK MEASUREMENTS (1 MIL=.001 In.)						EVALUATION
			WIDTH CHANGE AFTER INITIAL JACKING			WIDTH CHANGE AFTER REJACKING			
			FROM	TO	> 5 MILS	FROM	TO	> 5 MILS	
West EPA Slab @ 628' 6"	146	9N	N	HL	No				Within Tolerance.
West EPA slab @ 659' 0"	238	#3	15	5	Yes				Crack #3 in area 238 is in floor topping with poorly defined worn off edges which could have lead to measurement dispersion. All other cracks within tolerance.
	238	#13N	N	HL	No				
	239	#1	15	10	No	10	5	No	
	239	#6	7.5	5	No				
	242	#8	15	10	No				
West EPA Slab @ 674' 6"	282	1	7.5	5	No				Within Tolerance.
West EPA North face of wall @ Col. Line K 614' -0" to 659' -0"	151	1	10	15	No				Both cracks within tolerance.
	154	3	5	7.5	No	7.5	5	No	
	203	#1N	N	HL	No				
	203	#2N	N	HL	No				
	203	#3N	N	HL	No				
	203	#4N	N	HL	No				
	204	#1N	N	HL	No				
204	#2N	N	HL	No					
South face of wall.	339	6	7.5	5	No				Within Tolerance.
East EPA Slab @659' -0"	268	#1	HL	5	No				Crack #2 in area 271 is in floor topping with poorly defined worn off edges which could have lead to measurement dispersion. All other cracks within tolerance.
		#3	HL	5	No				
		#22N	N	HL	No	5	10	No	
	271	#2	7.5	15	Yes				
East EPA Slab @674'6"	312	1	10	Crazing	N/A	10	5	No	Cracks were noted as crazing when mapped after initial jacking. Valves from 7/28/83 to 11/28/83 were within tolerance.
		#11	10	Crazing	N/A	10	7.5	No	
East EPA North face of wall @ Col. Line K 614' -0" to 659' -0"	187	2N	N	HL	No				Both cracks within tolerance.
	139	1N	N	HL	No				
Control Tower West face of wall @ Col. Line 7.8	66	2N	N	HL	No				All cracks within tolerance.
		3N	N	HL	No				
	70	14	7.5	5	No				

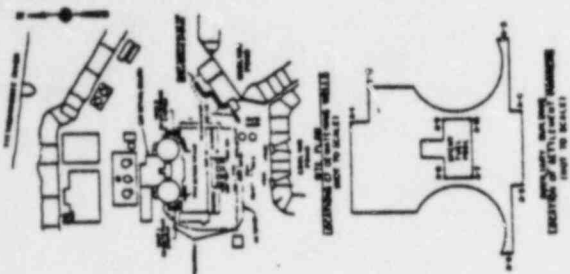
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Attachment #10

CONSUMERS POWER COMPANY MIDLAND PLANT UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT

Settlement vs Time
Auxiliary Building
(SE-G-418, Rev 4)
FSAR Figure 2E.1-1

12/82 Revision 47

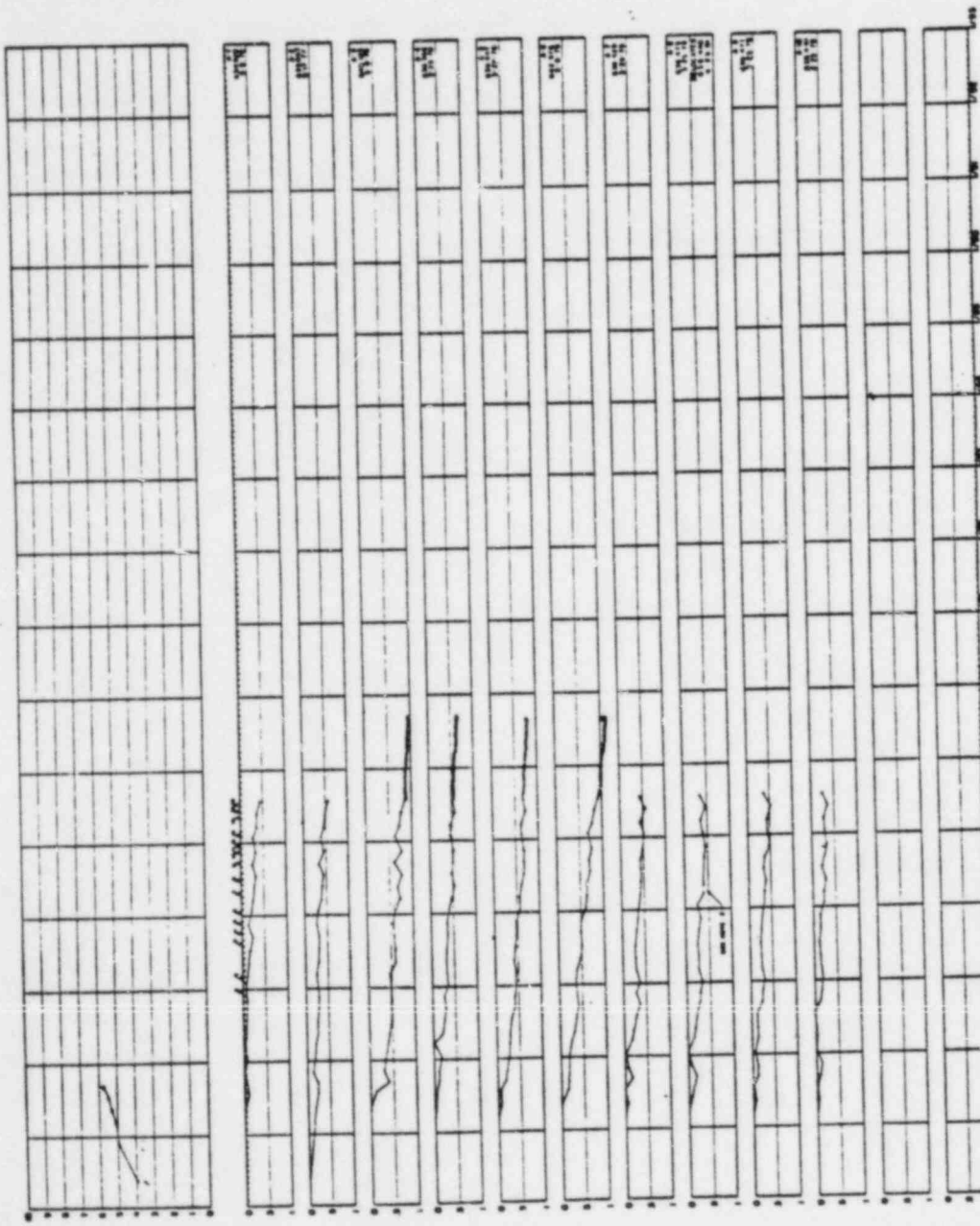


EXPLANATION

- 1 - 10 - SETTLEMENT CURVES
- 11 - 12 - INITIAL MAXIMUM SETTLEMENTS
- 13 - 14 - SET POINTS

NOTES

- 1. The 100% and 50% curves are based on the 100% and 50% curves shown in Figure 2E.1-1.
- 2. The 100% and 50% curves are based on the 100% and 50% curves shown in Figure 2E.1-1.



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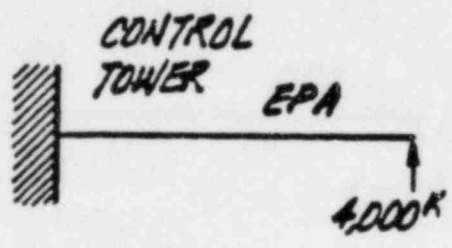
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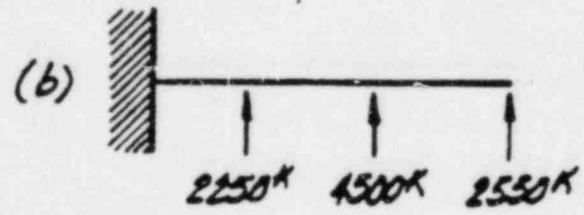
UPWARD MOVEMENT ESTIMATE

SUMMARY OF ANALYSES

1. EPA AS CANTILEVER BEAM (a)



$\Delta_2 = 158$ MILS
MODEL CONSIDERED TO BE REALISTIC FOR JACKING OF GRILLAGE.



$\Delta_2 = 166$ MILS
MODEL IGNORES MOVEMENT OF CONTROL TOWER DUE TO APPLIED LOAD.

CRITICAL LOADS FOR MAXIMUM Δ_2

2. FINITE ELEMENT MODEL

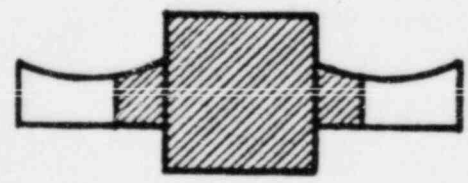
- (a) SOIL UNDER MAIN AUX. ($K = 5 \times 30$ KCF)
- (b) NO SOIL UNDER EPA

19 STAGES OF EXCAVATION & JACKING OPERATIONS CONSIDERED

$\Delta_2 = 126$ MILS
WHEN CT-1 & CT-12 EXCAVATED (RELATIVE TO START OF JACKING)

3. FINITE ELEMENT MODEL

- (a) SOIL UNDER MAIN AUX. ($K = 5 \times 30$ KCF)
- (b) SOIL UNDER CONTROL TOWER & PART OF EPA ($K = 5 \times 30$ KCF)
- (c) NO SOIL UNDER REST OF EPA



$\Delta_2 = 154$ MILS
WHEN CT-1 & CT-12 EXCAVATED (RELATIVE TO START OF JACKING)

PROPOSED Δ_2 LIMIT (UPWARD)

FACTORS: ACTUAL OBSERVATIONS
CALCULATIONS WITH FACTORS
15 mils SEATING LOSS
20 mils OBSERVED THERMAL MOVEMENT

ALERT LEVEL: 175 MILLS
ACTION LEVEL: 300 MILLS
REQUALIFY LEVEL: $\frac{2}{3}$ OF CAPACITY
(700-800 mils)

NRC MEETING ACTION ITEMS

1. To supply the NRC with a list of critical areas (areas of high stress during underpinning) in the Auxiliary Building. This list should be based on both upward as well as downward movement of the building.
2. Provide a list of locations where additional extensometers may be provided in the Auxiliary Building. The locations should be based on the following:
 - a. E-W direction of EPA Control Tower.
 - b. Slab at elevation 685' in Control Tower in connection with observed cracks.
 - c. At EPA/Control Tower roof level if cracking is observed: (The roofing should be removed in areas of high stress and inspected for cracking).
3. Provide a table showing rebar and concrete stresses, strains (for the element) and associated deflections at critical locations of the structure for the various construction stages of temporary underpinning.
4. Perform a survey of the entire EPA, CT, and Main Auxiliary Building to identify areas of cracking. 10 mills or larger cracks, must be identified. Areas having clusters of multiple cracks, smaller than 10 mills, should be identified. Drawings showing cracks, should be prepared. The drawings should show the pattern of cracking and also, inaccessible areas which could not be surveyed.

Based on this survey, an evaluation of any new cracks should be made and an explanation provided regarding the cause of these cracks based on past construction history and implications for future underpinning construction.

Subsequently, a meeting will be held with Region III/NRC, to discuss CPCo evaluation and any changes to the existing crackmapping program.

5. Indicate what C-200 actions will be taken if the Control Tower has a significant movement during excavation of CT1 and CT12 piers.
6. Provide a report evaluating the cause of the cracks discovered in the Control Tower slabs at elevation 685'.
7. Based on settlement readings from the beginning of monitoring (i.e. 1977), provide equivalent plots of Δ_1 , and Δ_2 , at 6 months intervals.

8. How far out of symmetry can the construction proceed between the East and West side underpinning? What are stresses and deflections for any unsymmetrical conditions allowed? Also, has the effect of cracking (i.e. twisting of EPA/CT, compared to the Main Auxiliary Building) has been considered?

9. After the above information is provided, NRC would discuss with CPCo, the following upward Δ_2 limits proposed by CPCo:

1. Alert = 0.175 inches

2. Action = .300 inches

The alert and action definitions are consistent with the present definitions in Specification C-200.

CPCo would also submit proposed values for upward Δ_1 , values in the Auxiliary Building.

10. In the interim, NRC recommended that the following upward limits be used:

Δ_1 (Control Tower) = .50 inches

Δ_2 = .100 inches

There is no limitation on jacking loads, provided they are within the capacity of the structure (the above criteria supersedes the present interim criteria, as contained in the CPCo letter dated being used).

Memorandum for: Pearl T. Smith, RIII
FOIA Coordinator

From: R.F. Warnick, Director, Office
of Special Cases

Subject: ^{Response} FOIA Request 84-24 Regarding
the Midland Nuclear Project

FOIA request 84-24 has been reviewed.

The below listed documents are submitted
in response to this FOIA. Please
reproduce them and return to me. A
total of 2 manhours of professional time
(1 - R.L.; 1 - J.H.) were spent in the retrieval
of these documents.

→ Insert 1

→ Insert 2

The above documents are all ^{the} documents that
existed at the time of this search, to the
best of my staff's knowledge.

Enclosure: Documents supplied by
R^{III} personnel

R.F. Warnick, Director
Office of Special Cases

cc:

A.B. Davis w/o enclosure

JJH:wt

Documents supplied / withheld by J.J. Harrison

1. Handwritten notes of J.J. Harrison, dated 11/28; 1 page - withheld
2. Memorandum, J.G. Koppler to Region III file; dated October 31, 1983; 2 pages, copy attached
3. Enforcement Action Notice dated October 20, 1983; 1 page, copy attached
4. Letter, M. Miller to S. Burns dated November 23, 1983; 13 pages, copy attached
5. Handwritten notes of J.J. Harrison, dated 11/16/83; ^{enforcement conference} 5 pages - withheld
6. CFCO handouts from Enforcement Conference; 5 pages; copy attached
7. Handwritten notes of J.J. Harrison dated 11/14/83, pre-enforcement conference telecon. 5 pages - withheld
8. Memorandum, W.H. Scholtz to J.A. Aulerud, dated October 19, 1983, forwarding proposed civil penalty package; 10 pages; copy attached
9. Handwritten notes of J.J. Harrison dated 10/24/83, debriefing on 10/25/83 meeting; 1 page - withheld
10. NRC list of CFCO concepts of approach to excavate below deep "Q" duct bank, no date; 1 page
11. Notice of Significant License Making, dated November 4, 1983; 1 page

(Insert 2)

~~FOIA 84-24~~

Documents supplied by R. B. Landsman

~~Landsman attachments~~

1. Meeting notes of October 25, 1983; two pages;
copy attached
2. Document prepared for November 15, 1983 meeting;
one page; copy attached
3. Meeting notes of November 15, 1983; 13 pages;
copy attached



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

October 31, 1983

Docket No. 50-329
Docket No. 50-330

MEMORANDUM FOR: Region III Files

FROM: James G. Keppler, Regional Administrator

SUBJECT: MIDLAND - MEETING WITH MESSRS. J. SELBY AND S. HOWELL

At the request of the NRC staff, Mr. J. Selby, President and Chief Executive Officer, and Mr. S. Howell, Executive Vice President of Consumers Power Company (CPCo) met on October 25, 1983 in Bethesda, Maryland with Mr. R. C. DeYoung, Director, Office of Inspection and Enforcement and Mr. James G. Keppler, Regional Administrator, Region III. The purpose of the meeting was for NRC management to discuss with CPCo the staff's perception of the need to include an independent audit of CPCo's management of the Midland project as part of CPCo's program of corrective actions at Midland. As a result of the discussions held, Mr. Selby agreed to include a proposal for an independent management audit in a plan of action which CPCo has been preparing for submittal to the NRC. This proposal would include for staff approval the nomination of an independent party to conduct the audit.

Messrs. Selby and Howell requested that CPCo be given the opportunity to further state their position with respect to the alleged violation of the construction permit conditions reflecting the Licensing Board's April 30, 1982 remedial soils order. An enforcement conference on this matter was held in Region III on October 11, 1983. Messrs. DeYoung and Keppler agreed to hold a second enforcement conference to consider this matter. The enforcement conference was subsequently scheduled to be held on November 4, 1983.

James G. Keppler
Regional Administrator

cc: See Attached Distribution List

~~8311040098~~

cc:

DMB/Document Control Desk (RIDS)
Resident Inspector, RIII
The Honorable Charles Bechhoefer, ASLB
The Honorable Jerry Harbour, ASLB
The Honorable Frederick P. Cowan, ASLB
The Honorable Ralph S. Decker, ASLB
William Paton, ELD
Michael Miller
Ronald Callen, Michigan
 Public Service Commission
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Colonel Steve J. Gadler (P.E.)
Howard Levin (TERA)
Billie P. Garde, Government
 Accountability Project
Lynne Bernabei, Government
 Accountability Project
Stone and Webster Michigan, Inc.

821
1-1-83
October 20, 1983
EN 83-69

JZ

OFFICE OF INSPECTION AND ENFORCEMENT
NOTIFICATION OF SIGNIFICANT ENFORCEMENT ACTION

Licensee: Consumers Power Company
Midland Nuclear Power Plant, Units 1 and 2
Docket Nos. 50-329 and 50-330

Subject: PROPOSED IMPOSITION OF CIVIL PENALTY - \$100,000

This is to inform the Commission that a Notice of Violation and Proposed Imposition of Civil Penalty in the amount of One Hundred Thousand Dollars (\$100,000) will be issued on or about October 26, 1983 to Consumers Power Company. This action is based on excavation and fireline relocation activities performed by the licensee in "Q" soils without prior NRC authorization.

It should be noted that the licensee has not been specifically informed of the enforcement action. The Regional Administrator has been authorized by the Director of the Office of Inspection and Enforcement to sign this action. The schedule of issuance and notification is:

Mailing of Notice October 26, 1983
Telephone Notification of Licensee October 26, 1983

A news release has been prepared and will be issued about the time the licensee receives the Notice. The State of Michigan will be notified.

The licensee has thirty days from the date of the Notice in which to respond. Following NRC evaluation of the response, the civil penalty may be remitted, mitigated, or imposed by Order.

Contact: G. Klingler, IE 24923 J. Axelrad, IE 24909

<u>Distribution:</u>		Phillips	EW	Willste
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PRELIMINARY INFORMATION - NOT FOR PUBLIC DISCLOSURE UNTIL OCTOBER 26, 1983

8310210030

12-1-83
10:30
97

Harrison

ISHAM LINCOLN & BEALE
ATTORNEYS AT LAW

EDWARD S. ISHAM 1872-1902
ROBERT T. LINCOLN 1872-1889
WILLIAM G. BEALE 1885-1923

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WASHINGTON OFFICE
1100 CONNECTICUT AVENUE N.W.
SUITE 840
WASHINGTON, D.C. 20006
202 833 9736

BY MESSENGER

November 23, 1983

Steven Burns, Esq.
Nuclear Regulatory Commission
OELD
Bethesda, Maryland

Dear Steve:

Enclosed, as promised, is a memorandum setting forth my presentation on behalf of Consumers Power Company at the recent enforcement conference in Chicago. If you have any additional questions, please feel free to contact me,

Sincerely,

Michael J. Miller

Michael I. Miller

MIM:es

enc. 4 copies of memorandum

cc Stephen H. Lewis, Esq.
Region III
w/ 4 copies of memorandum
By Messenger

8312020225

MEMORANDUM

To: Richard C. DeYoung
James G. Keppler

From: Michael I. Miller

Date: November 22, 1983

Re: Consumers Power Company Midland Nuclear Power Plant:
Alleged Violation of April 30, 1982 ASLB Order.

This memorandum is a written version of the remarks I made at the enforcement conference on Tuesday, November 15, 1983. Since I did not read from a prepared text this memorandum will vary in small ways from my oral remarks. I have included citations to the ASLB transcript and attachments to the two investigation reports authored by the Office of Investigations.*

There was a significant difference in the conclusions reached by the Office of Investigations reports. The June report basically concluded that it was not possible to determine whether a violation of the Board's order had taken place. The September report, however, concludes that there was indeed a violation of the Board order and that the circumstances indicate a "possible ... careless disregard of regulatory requirements" by Consumers Power Company ("CPCo"). The Company is concerned both about the conclusion of violation and the use of the words "careless disregard" since that phrase denotes willfulness under the NRC's Enforcement Policy.

* References to the ASLB hearing transcript are designated "(Tr.p. __)". References to the attachments dated June 2, 1983 OI report and the September 12, 1983 OI report are designated "(Attach. __, Report No. 1)" and "(Attach. __, Report No. 2)" respectively.

8312020229

The investigation was reopened in order to further investigate two matters.

1. Certain statements attributed to a man named John Donnell, a former Babcock & Wilcox Company employee on loan to MPQAD, the Midland site quality assurance organization, during the first 7 months of 1982. It was asserted that Donnell had stated that he knew Dr. Landsman had prohibited the excavation under the deep-Q duct bank; that the excavation went forward in knowing disregard at Dr. Landsman's direction; and that he was terminated because he had told some unidentified CPCo manager that the excavation was contrary to Dr. Landsman's direction.

2. The reopened investigation also looked further into the circumstances surrounding the meeting which took place at the Midland site on May 20, 1982 which was attended by representatives of NRR, Region III, CPCo and Bechtel.

It is CPCo's position that the reopened investigation regarding Mr. Donnell adds nothing to the facts regarding the violation of the Board order. Mr. Donnell's observations were reported by Dr. Landsman and Mr. R. Cook of Region III. The OI investigators assigned to interview Mr. Donnell, Mr. Walker and Mr. Galanti, had only a passing familiarity with the subject matter of the investigation. While they received approximately a 2 hour orientation by Mr. Weil and therefore had some familiarity with the factual circumstances surrounding the excavation under the deep-Q duct bank, the investigators had no familiarity with the Licensing Board's April 30, 1982 order nor with CPCo's excavation

permit system. John Donnell's testimony has not yet been taken. It is scheduled for December 3, 1983. However, his deposition has been taken by CPCo with the NRC Staff lawyers in attendance. At his deposition Mr. Donnell did not corroborate the statements attributed to him by Dr. Landsman and Mr. Cook and verified that in fact he signed the excavation permit for the excavation under the deep-Q duct bank which is alleged to be a violation of the Board's order (Attach. 6, Report No. 1). Donnell stated emphatically that had he believed the excavation was a violation of the Board Order he never would have signed the permit (for a discussion of the excavation permit system see infra pp. 8-9).

The supplemental OI investigation did not turn up any major new facts with respect to the May 20, 1982 meeting.

The facts as disclosed on the record before the Licensing Board indicates that the NRC was sending mixed signals to CPCo regarding excavations in and around the deep-Q duct bank. These excavations are a part of the freeze wall which has been installed at the Midland site as a temporary construction feature. The freeze wall consists of pipes through which refrigerant is passed. The soil down to the impervious till layer is frozen and the flow of ground water through the site is intercepted. Once the ground water flow is intercepted the excavation for underpinnings under the auxiliary building can be made dry. The freeze wall intercepts safety related underground utilities at 4 locations. At each of those locations a protection method had to be devised which did not compromise the integrity of

the freeze wall while protecting the underground utility from damage resulting from the heaving of the frozen soil.

The freeze wall was first proposed by CPCo to the Staff in mid-1981 and by November 16, 1981 the Staff had formally approved installation of the freeze wall hardware. That approval was the subject of Staff testimony on December 1, 1981 and at that time Mr. Hood, NRC Project Manager, testified that approval of installation was approval of all activities short of turning the freeze wall on (Tr. p. 5489). The Company and the Staff continued their discussion regarding activation of the freeze wall primarily centering on the protection of underground utilities after activation where those utilities intercept the freeze wall. In January 1982 CPCo made a further submittal to the staff which indicated an approximate one foot gap beneath the two duct banks (Attach. 14, Report No. 1) The design concept for protection of the underground utilities was presented in schematic form. The NRC thereupon authorized activation of the freeze wall as well. Thus, as of February, 1982 specific NRC approval had been granted for both installation and activation of the freeze wall thereby exempting those activities from the scope of the April 30, 1982 order.

Following the issuance of the Board's April 30 order, CPCo sought to establish the precise limits of the Staff's prior approval of soils related activities. To that end it sent a letter to the Staff dated May 10, 1982, describing, among other matters, the activities for which the Company believed prior approval had been obtained with respect to the freeze wall (Attach. 3, Report No. 1). The letter included the freezwall

activities "utility protection" and "soil removal".

After the February 1982 approval letter from the Staff, work proceeded on all 4 utility crossings. In each instance, field conditions dictated that changes be made in the precise method by which utility protection could be achieved although the concept as described in CPCo's January submittal was honored. For all of the crossing except the deep-Q duct bank, construction associated with utility protection was substantially completed within six weeks after April 30 (See Tr. pp. 21960-964). For each of these 3 crossings a concrete base mat was poured at the bottom of the excavation and a surcharge was applied to the concrete base mat to prevent differential settlement. (This arrangement is shown in the Bechtel drawings which were distributed at the enforcement conference.)

With respect to the deep-Q duct bank, it was discovered that the elevation of the duct bank was about 11 feet lower than anticipated so that the design concept of a one foot gap under the duct bank and angled refrigeration pipes could not be accomplished. As of May 20, 1982 the duct bank had been exposed and the NRC had been apprised of CPCo's intention to excavate underneath the duct bank to the till layer and pour a 9 foot plug of concrete to act as a barrier to ground water in that location.

On May 20, at the request of Dr. Landsman, an informal meeting was held at the Midland site. In addition to Dr. Landsman two representatives of NRR were present, Darl Hood and Joseph Kane. They were present at Midland because of an ACRS subcommittee

meeting on site that day. The impromptu nature of the meeting caused Mr. Hood to be concerned about the lack of public notice which is required for such meetings by NRC policy. Accordingly he requested that no one publish minutes of the meeting and the primary documentary source regarding the subjects discussed at the meeting are the handwritten, uncirculated notes of a Bechtel employee (Attach. 5, Report No. 2)

The May 20 meeting discussed a number of other subjects beyond the 4 utility crossings. With specific reference to the excavation under the deep-Q duct bank Mr. Kane expressed his concern that excavation and back fill with concrete would create a "hard spot" which could result in differential settlement affecting the utility. Similar concerns were expressed with respect to the other 3 utility crossings which were then complete but the NRC Staff gave no indication that these 3 utility crossings were not in compliance with regulatory requirements. At Dr. Landsman's exit interview on May 21 he announced that he had discovered no items of noncompliance during his inspection on the preceding day (Attach. 9, Report No. 1).

While recollections of the various participants in the meeting vary, it seems clear that Dr. Landsman in fact stated that there was to be no excavation under the deep-Q duct bank until NRR approval had been obtained. That admonition was apparently repeated at the May 21 meeting and is recorded in a somewhat confusing manner in CPCo's minutes of the exit interview. Thus, fairly summarized, the May 20 meeting

resulted in CPCo being aware that the NRC was concerned about the concrete back fill under the deep-Q duct bank and that the Company had been directed not to proceed with the excavation until NRR approval took place.

The May 20 meeting was followed by a letter from NRR to CPCo dated May 25, 1982 (Attach. 4, Report No. 1). Mr. Hood has testified that he took account of the discussions of the May 20 meeting in the May 25 letter and that he specifically intended the letter as a "warning" to CPCo not to excavate under the deep-Q duct bank (Tr. p. 21797-98). There is no specific reference to the deep-Q duct bank in the May 25 letter. Both soil removal and utility protection activities are specifically confirmed as having been authorized prior to April 30. Yet as of May 20 the only soil removal and utility protection yet to be done with respect to the freeze wall was the excavation under the deep-Q duct bank. Mr. Hood has testified that his disapproval of the activity "related work in support of the freeze wall" was intended by him to document the fact that the Staff had not approved the excavation under the deep-Q duct bank. With hindsight, it is now apparent that after receipt of the May 25 letter there was confusion between what the NRC Staff intended and what CPCo upper management (particularly Mr. Mooney, CPCo's soils project manager) understood had been approved.

This lack of understanding between CPCo and the NRC staff continued at a design audit conducted in Ann Arbor in late July, 1982. CPCo prepared the agenda for the design audit and included as one item all of the freeze wall crossings.

CPCo indicated that the status of these freeze wall crossings was "confirmatory" thereby acknowledging that CPCo still owed the NRC Staff documentation regarding the concrete back fill at the 4 utility crossings. At the conclusion of the design audit, James Knight of NRR announced that there were no further open items. However, in SSER No. 2 issued in October 1982 the design modifications and back fill of the utility crossings are shown as an open item. The FSAR documentation of the freeze wall crossing is shown as a confirmatory item. These comments in the SSER relate to all 4 crossings including the 3 which were completed between April 30 and May 20, but which have never been asserted to be a violation of the Board order. The notes of the July design audit prepared by Mr. Hood were sent out after the SSER was published and state that the entire freeze wall crossing matter is a confirmatory item (Attachment 16, Report No. 1). In statements given to Mr. Pawlik of the OI, Mr. Hood was reported as saying the issue was an "open confirmatory" issue and Mr. Kane was reported as saying that the issue was a "confirmatory" issue. At the hearings in November, Mr. Hood deleted the word "confirmatory" in his statement and Mr. Kane changed the word "confirmatory" to the word "open" (Tr. pp. 21570-72).

All of the foregoing activity and the communication to and from the NRC Staff involved Mr. Mooney of CPCo, its soils project manager and his assistant, John Schaub. Thus, as of May 25, 1982 and thereafter these men believed that the NRC had indicated its approval of the excavation under the deep-Q duct bank.

Because of problems encountered in excavations and drilling during the first quarter of 1982, CPCo was developing an excavation permit system in the time period from April to early June, 1982. The excavation permit system requires that a representative of CPCo sign the permit, signifying that all necessary NRC approval had been obtained. Mr. Robert Wheeler, CPCo remedial soils section head, was the responsible official for signing off on behalf of CPCo construction. Mr. Wheeler was very conscious of the April 30 order and its requirement for explicit NRC approval. Between April 30 and June 11, 1982 he sought and obtained Dr. Landsman's specific approval for every excavation request or permit at the Midland site. On June 11 Dr. Landsman approved the excavation permit procedure and further stated to Mr. Wheeler that he did not wish to look at all excavation permits prior to the excavation beginning. Dr. Landsman stated in substance, as understood by Mr. Wheeler, that minor excavation could go ahead without prior approval but that he wanted to review excavation permits for major excavations such as the service water pump structure underpinning prior to such an excavation commencing. Mr. Wheeler interpreted Dr. Landsman's approval of minor excavations as extending to all routine non-drilled excavations. Dr. Landsman's understanding of his approval was that it was limited to minor excavations for work that had been previously approved by the NRC. (See Tr. PP. 21933-934). Dr. Landsman stated that he never expressed this limitation to Mr. Wheeler since it was obvious (Tr. p. 21938)

The May 7, 1982 Board order specifically authorizes oral approvals of excavations but directs that any oral approvals be documented by the Staff. Dr. Landsman did not document his June 11, 1982 approval of minor excavations. The only documentation is a handwritten note to the file prepared by Mr. Wheeler on June 11, 1982 (Attach. 10, Report No. 1). On the basis of his understanding of that agreement Mr. Wheeler, through subordinates, authorized the excavation under the deep-Q duct bank and the other excavation which is claimed to be a violation of the Board order, the fire line relocation. It is worth noting that on two occasions after June 11 Dr. Landsman was requested by Mr. Wheeler to review excavation permits for "minor" excavations, Dr. Landsman declined to do so.

No matter what criteria are applied to these excavations they can only be regarded as minor. The excavation under the deep-Q duct bank involves the removal of a minimal quantity of soil especially when compared to the major excavations contemplated at the site. On that basis the fire line relocation excavation would similarly be characterized as minor. If the determination of a major or a minor excavation was to be based on its safety significance, there are strong indications that the safety significance of both these excavations was minimal. The excavation under the deep-Q duct bank has been in place for almost 18 months. No back fill of any sort has been placed in the excavation. There is no indication that the Staff would want the excavation to be refilled with soil although such

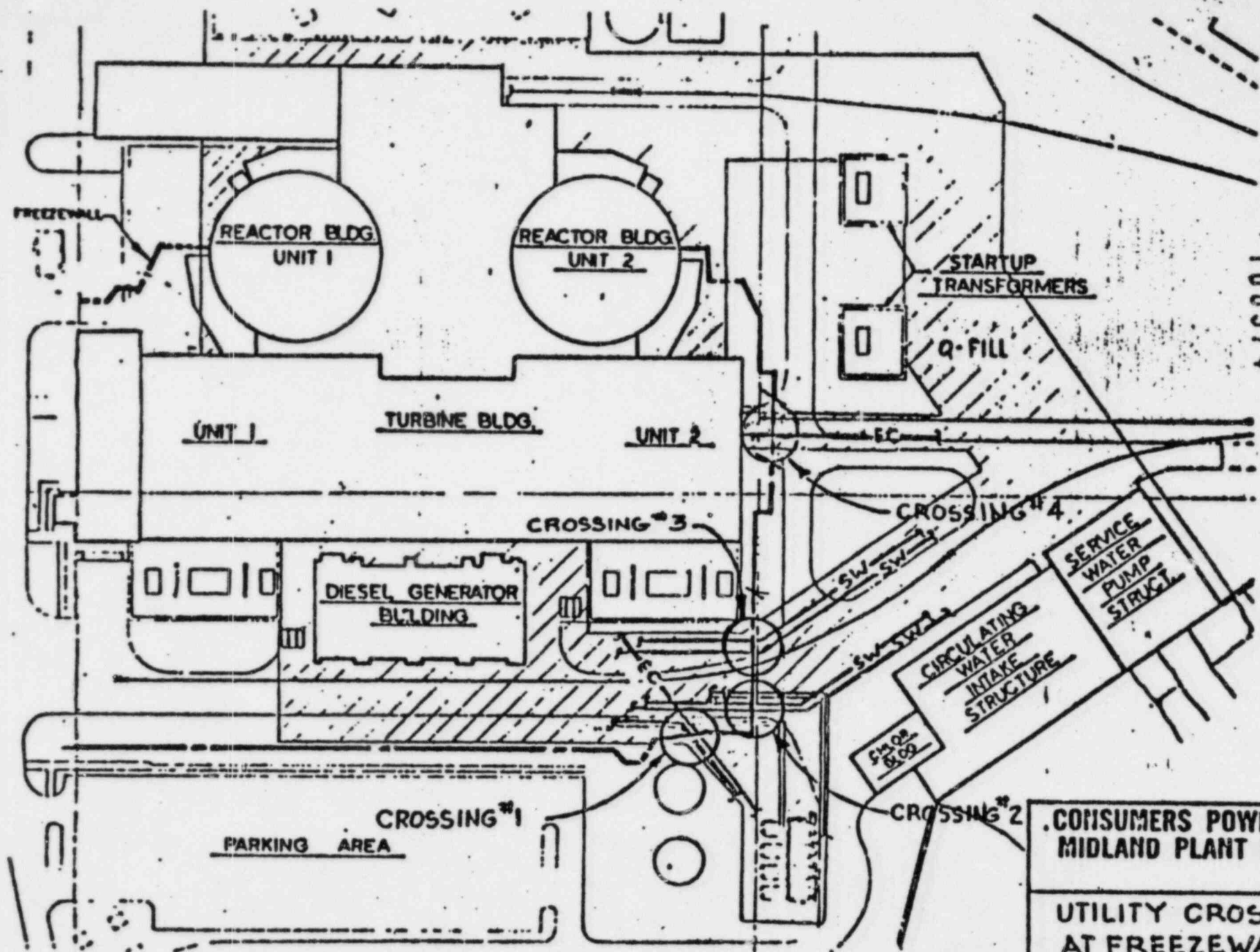
a procedure would restore the excavation to its May 20, 1982 condition and could be accomplished quite easily. Similarly no reversal of the fire line relocation has been directed.

At two significant management levels of CCo, at which the Staff position with respect to excavation under the deep-Q duct bank could have been clarified there were missed communications. Mr. Mooney believed that the excavation had been specifically authorized by the NRC Staff. In this connection it is worth noting that Mr. Kane, although expressing his belief that the Board order has been violated nonetheless stated that he believed that Mr. Mooney was honest and a man of integrity (Tr. pp. 21875-77). Mr. Mooney testified that had he realized the NRC Staff had misgivings about the excavation he would have taken steps to make certain it did not occur. Similarly Mr. Wheeler was charged with the responsibility of determining whether NRC approval for excavation had been obtained and authorized both excavations on the basis of an undocumented oral approval for minor excavations which, in retrospect, was ambiguous.

The second OI investigation report was accompanied by a memorandum to Mr. Keppler from Mr. Hayes. That memorandum uses legal terminology to describe CCo's culpability. CCo is characterized as negligent. Viewed from the perspective of December, 1983 with two exhaustive investigations and 7 days of hearings devoted to this issue, it seems clear that the Company bears a burden for failing to have a clear understanding of the

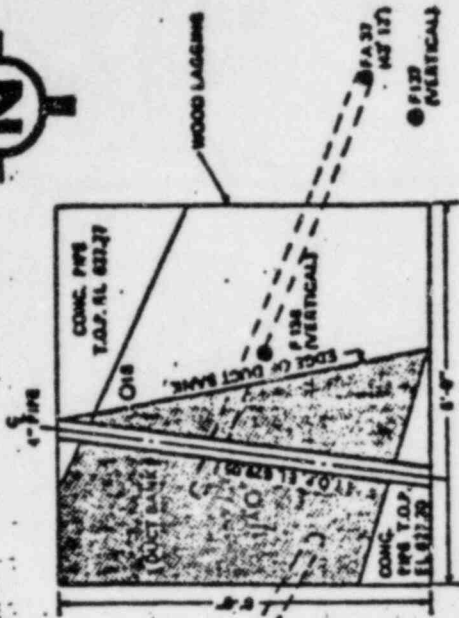
Staff's position. It should have sought further clarification of the Staff position with respect to the deep-Q duct bank. It is also clear that in at least two respects the Staff contributed to missed communications which resulted in the alleged order violation. Could Mr. Hood have expressed himself more clearly in his May 25 letter? He conceded as much in his testimony (Tr. p. 21811). Should Dr. Landsman have documented his oral approval of minor excavations on June 11, 1982? The Board order of May 7 answers that question in the affirmative.

It is CPCo's position that because of the June 11, 1982 approval of minor excavations by Dr. Landsman there was no violation of the Licensing Board's April 30 order. Moreover, because of the ambiguities in the May 25, 1982 letter from NRR to CPCo, Mr. Mooney believed that all the excavations were within the scope of pre-April 30 approvals. Similar considerations lead to the conclusion that there was no violation of Dr. Landsman's May 20 directive. There was no possible motive for violating the Board order, nor is there any objective evidence of willfulness, nor was there any safety significance to the excavations. Escalated enforcement action seems inappropriate.

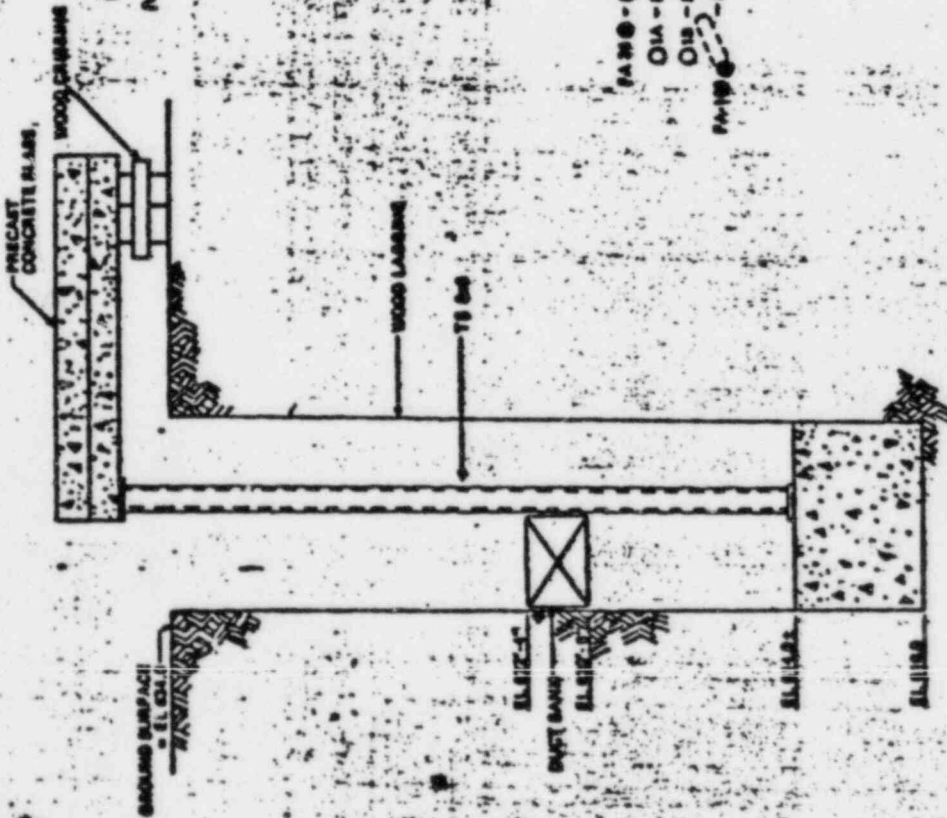


108574

CONSUMERS POWER COMPANY
 MIDLAND PLANT UNITS 1 &
 UTILITY CROSSINGS
 AT FREEZEWALL
 FIGURE 1



PLAN
SCALE 1"=2'

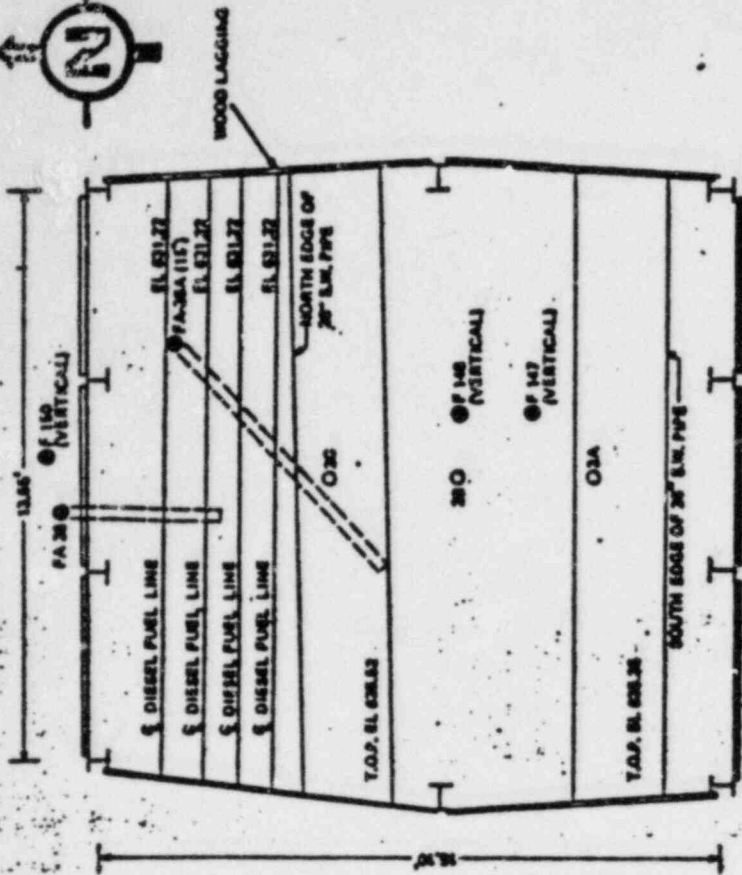
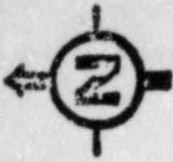


SECTION
SCALE 1"=2'

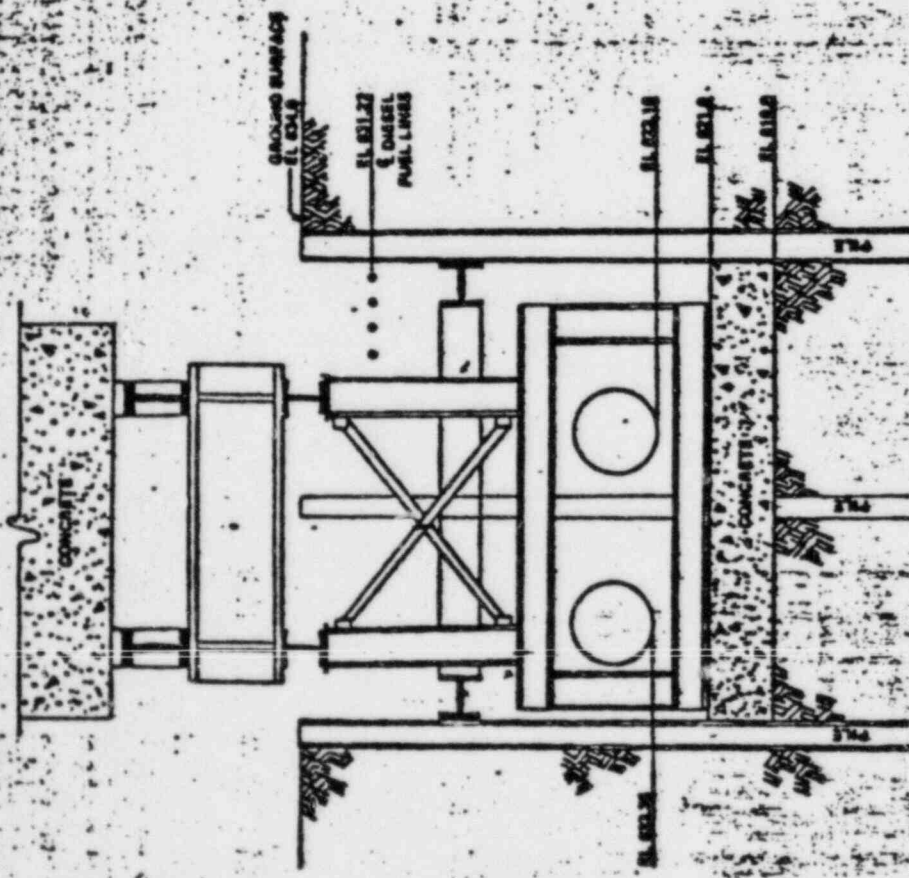
EXPLANATION:

- PA-30 - FREEZE ELEMENT
- Q1A - MONITORING POINT ON DUCT BANK
- Q1B - MONITORING POINT ON MUD MAT
- PA-19 - FREEZE ELEMENT ON BATTER

BECHTEL ANN ARBOR	
MIDLAND POWER PLANT	
CROSSING 1	
7220	BRAYNA, MI. REL.
7220	FIGURE 2



PLAN
SCALE 1"=3'

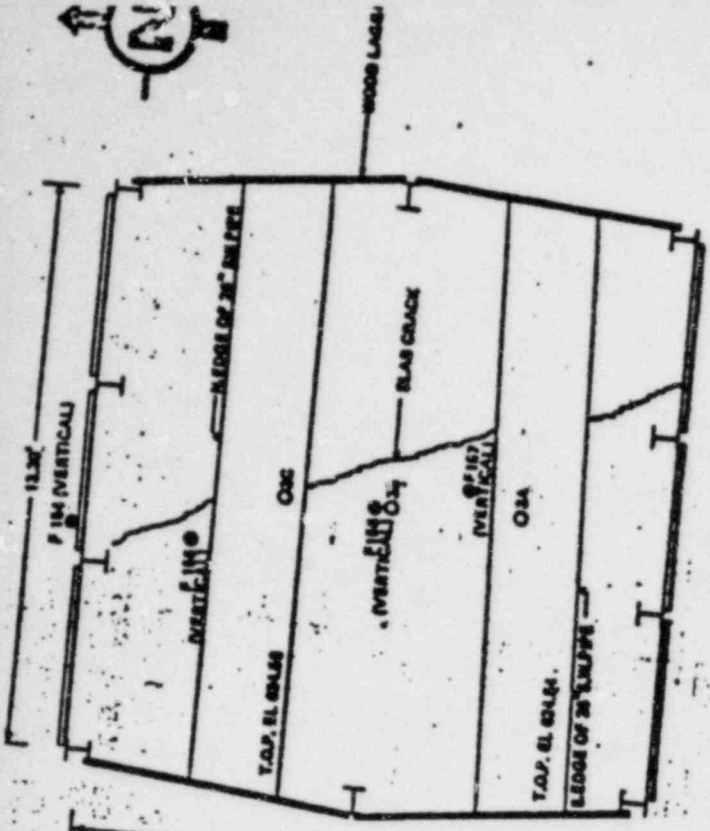


SECTION
NOT TO SCALE

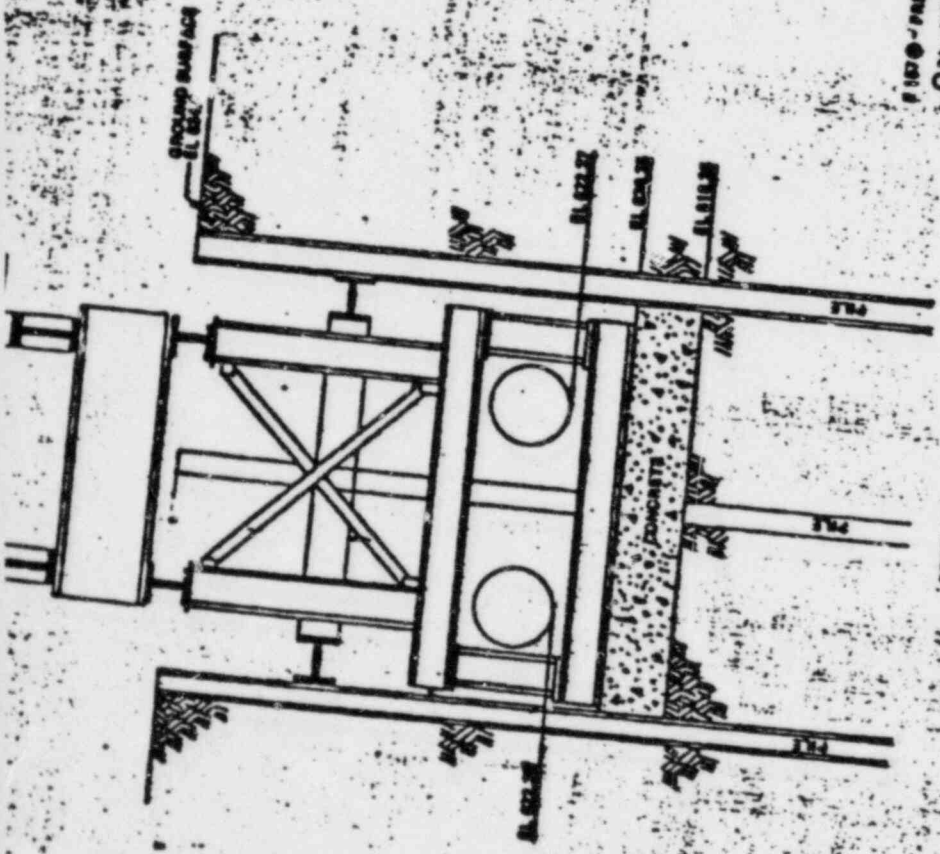
EXPLANATION

- PA 28 - FREEZE ELEMENT
- Q 3A - MONITORING POINT ON SOUTH PIPE
- Q 3B - MONITORING POINT ON MUD MAT
- Q 3C - MONITORING POINT ON NORTH PIPE
- PA 28A - FREEZE ELEMENT ON BATTER

BECHTEL LIME ARBOR	
MIDLAND POWER PLANT	
CROSSING 2	
JOB NO.	DRAWING NO.
7220	FIGURE 3.
R.L.V.	



PLAN
SCALE 1/8" = 1'-0"



EXPLANATION

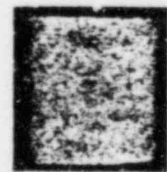
- F 154 - FREEZE ELEMENT
- 24 - MONITORING POINT ON SOUTH PIPE
- 28 - MONITORING POINT ON MERMAT
- 30 - MONITORING POINT ON NORTH PIPE

BECHTEL AND ASSOCIATES	
MIDLAND POWER PLANT	
CROSSING 3	
7220	BEARING NO. 111
FIGURE 4	

BECHTE
JAMES L. BECHTE
MIDLAND POWER
CROSSING 4



7220
FIGURE



Harrison

October 19, 1983

MEMORANDUM FOR: Jane A. Axelrad, Director, Enforcement Staff, IE
FROM: W. H. Schultz, Enforcement Coordinator, Region III
SUBJECT: CONSUMERS POWER COMPANY - MIDLAND PROPOSED CIVIL PENALTY

The enclosed documents proposing civil penalty action under the NRC Enforcement Policy are forwarded for your review and concurrence.

On July 28, 1982, an NRC inspector determined that the licensee had excavated soil material from below the deep "Q" duct bank and initiated fireline relocation activities in "Q" soils without prior NRC authorization. Further, the excavation of soil material below the deep "Q" duct bank was contrary to previous directives of the NRC staff which instructed the licensee that such excavation was not authorized. (OI Investigation Report No. 3-82-061) These actions violated paragraph 2.G. of the Midland Construction Permits, as amended on May 26, 1982.

Based on the Enforcement Policy, we have classified this violation as a Severity Level III and have developed the enforcement package proposing a \$100,000 civil penalty. To emphasize the severity of the violation and the need for CPCo management to ensure that steps are taken to preclude future recurrence of this violation we have concluded that a \$100,000 civil penalty is appropriate. An Enforcement Conference was held on October 11, 1983, in Region III, between Consumers Power Company and the NRC Staff to discuss the violation.

In view of the history of significant problems experienced during the construction of the Midland nuclear facility and the failure of CPCo management to prevent the recurrence of such problems, Region III is considering an Order which will require the licensee to have an independent comprehensive

~~8401180037~~
12pp

management review conducted. That proposed order will follow for your review.

W. H. Schultz
Enforcement Coordinator

Attachments:

- 1. Dft ltr to licensee w/Notice of Violation and Proposed Imposition of Civil Penalty

cc w/attachments:

James Lieberman, ELD
Regional Enforcement
Coordinators, RI, RII, RIV, RV

RIII JAA
Gardner/db
10/23/83
11

RIII
Landsman

RIII JAA
Harrison
10/11/83

RIII RFW
Warnick
10/11/83

RIII LHZ
Lewis
10/11/83

RIII WVS
Schultz
10-17-83

RIII J
Davis
10/17

RIII JK
Keppler
10/18/83

DRAFT

Docket No. 50-329

Docket No. 50-330

Consumers Power Company

ATTN: Mr. John D. Selby

President

212 West Michigan Avenue

Jackson, MI 49201

Gentlemen:

This refers to the investigation conducted by the Office of Investigation during the period January 3 through August 8, 1983, of activities at the Midland Nuclear Plant authorized by NRC Construction Permits No. CPPR-81 and No. CPPR-82.

This investigation revealed that Consumers Power Company (CPCo) had excavated soil material from below the deep "Q" duct bank and initiated fireline relocation activities in "Q" soils without prior NRC authorization. Further, the excavation of soil material below the deep "Q" duct bank was contrary to previous directives of the NRC staff which instructed the licensee that such excavation was not authorized. These actions violated paragraph 2.G. of the Midland Construction Permit, as amended on May 26, 1982.

DRAFT

After consultation with Director of the Office of Inspection and Enforcement, I have been authorized to issue the enclosed Notice of Violation and Proposed Imposition of Civil Penalty in the amount of \$100,000 to emphasize the need for you to construct your facility in accordance with the Construction Permit. The violation in the Notice has been categorized as a Severity Level III violation as described in the General Policy and Procedure for NRC Enforcement Actions (Appendix C to 10 CFR Part 2). A civil penalty of \$100,000 is being proposed because of the significance of the management breakdown discussed above.

In your response to this letter, please follow the instructions in the Notice. Your response should specifically address corrective actions you have taken or plan to take to improve management effectiveness for ensuring that Construction Permit requirements are met. Your written reply to this letter and the results of future inspections will be considered in determining whether further enforcement action is appropriate.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosures will be placed in the NRC's Public Document Room.

DRAFT

The response directed by this letter and the enclosed Notice are not subject to the clearance procedure of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, PL 96-511.

Sincerely,

James G. Keppler

Regional Administrator

Enclosure:

Notice of Violation and

Proposed Imposition of Civil

Penalty

cc w/encl:

DMB/Document Control Desk (RIDS)

Resident Inspector, RIII

The Honorable Charles Bechhoefer, ASLB

The Honorable Jerry Harbour, ASLB

The Honorable Frederick P. Cowan, ASLB

The Honorable Ralph S. Decker, ASLB

William Paton, ELD

Michael Miller

Ronald Callen, Michigan

Public Service Commission

Myron M. Cherry

Barbara Stamiris

Mary Sinclair

Wendell Marshall

Colonel Steve J. Gadler (P.E.)

Howard Levin (TERA)

Billie P. Garde, Government

Accountability Project

Lynne Bernabei, Government

Accountability Project

NOTICE OF VIOLATIONANDPROPOSED IMPOSITION OF CIVIL PENALTY

Consumers Power Company

Docket No. 50-329

Midland Energy Center

Docket No. 50-330

Midland, Michigan

Construction Permit No. CPPR-81

Construction Permit No. CPPR-82

EA 83-

On July 28, 1982, an NRC inspector determined that the licensee had excavated soil material from below the deep "Q" duct bank, and had initiated fireline relocation activities in "Q" soils without prior NRC authorization. These actions violated paragraph 2.G. of the Midland Construction Permits, as amended on May 26, 1982.

To emphasize the need for the licensee to construct its facility in accordance with the Construction Permits, we propose to impose a Civil Penalty in the amount of \$100,000. In accordance with General Policy and Procedure for NRC Enforcement Actions (10 CFR Part 2, Appendix C) 47 FR 9987 (March 9, 1982), and pursuant to Section 234 of the Atomic Energy Act of 1954, as amended ("Act"), 42 U.S.C. 2282, PL 96-295, and 10 CFR 2.205, the particular violation and the associated civil penalty is set forth below.

Construction Permits No. CPPR-81 and No. CPPR-82, paragraph 2.G.(1) and 2.G.(1)a state, in part, "The applicant shall obtain explicit prior approval from the NRC staff...before proceeding with the following soils-related activities...any placing, compacting, excavating, or drilling soil materials around safety-related structures and systems."

Contrary to the above, the licensee excavated soil material below the deep "Q" duct bank on July 23, 1982, and initiated fireline relocation activities in "Q" soils on July 27, 1982, without prior NRC authorization. Further, the excavation of soil material below the deep "Q" duct bank was contrary to previous directives of the NRC staff on May 20, 21, and 26, 1982 which instructed the licensee that such excavation was not authorized.

This is a Severity Level III violation (Supplement II) (Civil Penalty - \$100,000).

Pursuant to the provisions of 10 CFR 2.201, Consumers Power Company is hereby required to submit to the Director, Office of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555 and a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region III, 799 Roosevelt Road, Glen Ellyn, IL 60137, within 30 days of the date of this Notice a written statement or explanation, including for the alleged violation; (1) admission or denial of the alleged violation; (2) the reasons for the violation, if admitted; (3) the corrective steps which have been taken and the results achieved; (4) the corrective steps which will be taken to avoid

further violations; and (5) the date when full compliance will be achieved. Consideration may be given to extending the response time for good cause shown. Under the authority of Section 182 of the Act, 42 U.S.C. 2232, this response shall be submitted under oath or affirmation.

Within the same time as provided for the response required above under 10 CFR 2.201, Consumers Power Company may pay the civil penalty in the amount of \$100,000 or may protest imposition of the civil penalty in whole or in part by a written answer. Should Consumers Power Company fail to answer within the time specified, the Director, Office of Inspection and Enforcement will issue an order imposing the civil penalty proposed above. Should Consumers Power Company elect to file an answer in accordance with 10 CFR 2.205 protesting the civil penalty such answer may: (1) deny the violation listed in the Notice, in whole or in part; (2) demonstrate extenuating circumstances; (3) show error in this Notice; or (4) show other reasons why the penalty should not be imposed. In addition to protesting the civil penalty, in whole or in part, such answer may request remission or mitigation of the penalty. In requesting mitigation of the proposed penalty, the five factors contained in Section IV(B) of 10 CFR Part 2, Appendix C, should be addressed. Any written answer in accordance with 10 CFR 2.205 should be set forth separately from the statement or explanation in reply pursuant to 10 CFR 2.201, but may incorporate statements or explanations by specific reference (e.g., citing page and paragraph numbers) to avoid repetition. Consumers Power Company's attention is directed to the other provisions of 10 CFR 2.205, regarding the procedures for imposing a civil penalty.

DRAFT

Upon failure to pay any civil penalty due, which has been subsequently determined in accordance with the applicable provisions of 10 CFR 2.205, this matter may be referred to the Attorney General, and the penalty unless compromised, remitted, or mitigated, may be collected by civil action pursuant to Section 234c of the Act, 42 U.S.C. 2282.

FOR THE NUCLEAR REGULATORY COMMISSION

James G. Keppler

Regional Administrator

CONCEPTS OF APPROVAL

- First - Schaub got approval from Kane at May 20, 1982, meeting - using commercial risk basis
- Second - Schaub got approval from Hood and Kane at July 27 - 30, 1982, audit in Ann Arbor - using temporary backfill basis
- Third - Mooney got approval from May 25, 1982, NRC letter
- Fourth - Wheeler got approval from Landsman at June 11, 1982, hallway meeting
- Fifth - CPCo got approval from November 12, 1982, NRC letter (July 27 - 30, 1982 audit summary) - using confirmatory item basis
- Sixth - CPCo got approval from Knight at July 1982 audit when he said - No open items remain
- Seventh - Mooney got approval from February 12, 1982, NRC letter which approved CPCo's January 6, 1982, submittal of a "concept"
- Eighth - Wheeler got approval from Landsman declining to review the two permits



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

Jay

November 14, 1983

NOTICE OF SIGNIFICANT LICENSEE MEETING

Name of Licensee: Consumers Power Company

Name of Facility: Midland Nuclear Plant, Units 1 and 2

Docket Nos.: 50-329; 50-330

Date and Time of Meeting: Wednesday, November 16, 1983 at 9:00 a.m. (CST)

Location of Meeting: Holiday Inn-O'Hare
3801 N. Mannheim Rd.
Schiller Park, IL

Purpose of Meeting: Enforcement Conference to re-review the Office of Investigation Report and IE Enforcement Actions on the Alleged Violation of the ASLB Order on Remedial Soils

NRC Attendees:

R. C. DeYoung, Director, Office of Inspection and Enforcement
James G. Keppler, Regional Administrator, RIII
J. Lieberman, Director, Division of Regional Operations and Enforcement, ELD
Others from RIII, IE, NRR, as appropriate

Licensee Attendees:

J. Selby, President and Chairman of the Board
S. Howell, Executive Vice President
Others as designated by the licensee

NOTE: Attendance by NRC personnel at the meeting should be made known by November 15, 1983, via telephone call to J. J. Harrison, Region III, FTS 388-5635

Distribution:

R. C. DeYoung, Director, Office of Inspection and Enforcement
E. L. Jordan, Director, Division of Emergency Preparedness and Engineering Response, IE
J. M. Taylor, Director, Division of Quality Assurance, Safeguards, and Inspection Programs, IE
J. A. Axelrad, Director, Enforcement Staff
E. G. Eisenhut, Director, Division of Licensing, NRR
E. G. Adensam, Chief, Licensing Branch No. 4
R. L. Tedesco, Assistant Director for Licensing, NRR

~~844185048~~

call June of AM / 11/28

Conference Call 3

DeYoung
Hassell
wright
J. Axelrod
RTI
Keppel
Lewis
Davis
Wannick
Landman
Wet
AA

- One sided story on _____
- RTI perspective, ... using a ...
 - Striping
 - maybe more
- Landman / ASLB
close to WDAK
- Mitigation, not as clear as it appears
to be
- 100K
50K
40K
0
- WDAK: - based on preponderance of evidence

- May 20, 1982 - meeting circumstances
 - Landsman stated "do not dig under the deep G duct Bank. without NRC approval."

- The NRC sending mixed meeting signals to the Company (CPCO)
- Not a ASLB order violation or C.P. condition violation

- D. Hood - NRC testimony - start of "turning it on" ^{response} to Judge Hoover.

- 1/82 letter 2/82 approval to turn-on freeze well

- 5/10/82 meeting - certain CPCO understanding freeze well - soil removal / utility protection - was approved prior to by NRC

- 5/20/82 (informal meeting 1.5 hrs) not meeting minutes

- R.L. concerned design problems,
- D. Hood requested no meeting minutes be taken on either side

(J. Files handles the notes)
Conceptually confusing
! one & what the same!

Utility crossings:
1-3 ^{were in the air} prior to 5/20 ^{completed} (before 5/20 meeting)
4 complete except, ^{excavate} down to till

• Backfill material (concrete) differential settlement issue CPCO still over staff a response!

* 5/21/82 Exit meeting on 5/21 R.L. 1.5 hrs of noncompliance

J. Coyle
J. Shales
Telecon with
Ross on 5/15/82
end on letter

May 25 82 Letter (D. Hood ^{field} as takes warning not
to dig under Deep Q Duct Base ??) freeze
well approval - (1) soil removal (2) utility
protection. Hood was aware of 5/21 meeting
but did not include any "prohibitions"

• June 11, 82 approval to CFCO B. Water
verbally in hallway by R. Landman.

• May 21, 82 exit no items of noncompliance
on crossing 1-2
'Do Not Dig'

??
Prior to
permit
issuance

• June 11, 82 (Excavation Permit issue F. & C. Co.)
approved by Ross

• Bob Wheeler ^{ASLB (meeting in New York)} excavation
ASLB all permits to Ross
to review for approval. Ross stated
I do not want to review for
minor excavations, ^{only} only major such
as the SWPS - Ross testified
he did agree with Wheeler - did
not want to review for "pre-approved
work". following the June 11, 82 meeting
Bob turn presented permits to Ross:
and Ross did not review because
of other pending activities.

Miscommunication between CFCO () and excavation

• ASLB on 5/15/82 telecon w/ parties
"Explicit approval may be
oral or written"

Wheeler
Major

Minor - No drilling, small amount of
retrofit
- Safety significant - freeze well

J. Knight states "no open items"

(4)

Installation is reversible / temporary.

- closed } • July 29, 92. A² Bechtel Design audit, soils (CPC 11/92)
- open } • Oct 92 - 55ER ~~draft~~ ^{cover} letter "nothing contained constitutes open"
- Kane/Hood statement should have been given as confirmatory. (Charge during hearing)

AI Report Differences

(1) Donnell issue

(2) ^{June 11 meeting,} Major / minor approval

excavate below curb level - m.s.

(3) ~~May 25 letter~~ ^{from May 21 meeting} ~~excavate below curb level - m.s.~~

(4) ~~June 11 meeting (see above)~~

• Date of excavation 7/28/92 to 6/82

• Fill ~ 1000 cu yd of material removed (8' dia x 75' - 100' long) CPC testified 800 - 1200 cu yd.

M. McVee Consulting statement

• J. Kane - statement on Mooney

• Wheeler - understanding with Ross Lands

• Negligence - needs clarification, as not when communication - was the NRC staff also negligent -

Hood - this letter not clear

Landsman - documentation of all relevant ALB requests

NRC staff bears some responsibility!

- Violation of Landsman's statement, not the Board!

- Landsman's testified "deliberate"
- Review ASCO Final Record

(5)

Submitt

- (1) No Motive
- (2) No Willfulness
- (3) No Evidence of Careless disregard
- (4) No effect on safety
- (5) Stopped at a full understanding of NRC concerns - Remains in same state.
- (6) 18 months old
- (7) ASLB Order - Finding of violation not justified
- (8) Civil Penalty not justified

WRC Staff - Violation - Poor Management
Level III, Age }
circumstances }
Management Audit }
100K mitigate Amount }

* Landowner / User take exception to CPCs on some issues

- Work Authorization Permit Procedure

CONF. Call

11/14

- 3 NRC people who could have given approval to dig (1) Deep Duct '0" Bank (2) fire line, none did! (Lankman/Kane/Kane)
 - NO Explicit Approval
 - Verbal ??
- Schaub in A² on 7/92 from J. Kane, CPCO contends that written approval was given
- Schaub testifies he was not involved in obtaining the NRC approval chain results.
- May 25, 92, NRC letter, Mooney claims approval by Mr. Wood during May 20, 92 meeting.
- Wood states 5/25/92 letter was clear
- May 20, 92, ~~letter~~ - Lankman "Do not dig" Mooney and Schaub present
- Mooney believes stuff understood 5/20 meeting w/ L. to Dig. Connecting backfill and CPCO meeting notes "...Do not Dig" Fisher/Horn/Saw
- Lankman, Kane, Hawk - no way could CPCO ~~draw~~ ^{come have} a conclusion of approval to dig.

Written - 3 NRC people (K, L, L) NO

- May 25, 92 letter - CPCO provided approval response to 1/2/92 indicates "6-12" below duct bank (discovers lower than thought 35' versus 22") "concept" approval
- NRC states not true, letter is clear
- CPCO additional excavation 10' below duct bank
- Concrete backfill concern, NRC does not a CPCO submitted to correct to date

(2)

- Concept vs. Actual Design - up sat Reg. process.
- Wheeler - claims, meeting, 6/11/82, informal in hallway, each excavated by Lewisman states not minor
 could NOT be minor - Lewisman minor, i.e. fence-post whether handwritten note - scribbled on paper
- Sibbald / Murray - condemn Design changes - Wheeler states no both are wrong.
- J. Kane - gave CPCO permission to dig at Commercial risk.
- NRC sends CPCO summary of NRC July, 82 date = 7/20/82, attached was list of open items (agenda) classification - "Deep Dist @ Bore" "C" = CPCO agenda items, draft SSER 7/82 - Mr. Knight indicates we move open items, SSER
- no draft SSER could be informed as approval of staff
- Wheeler package of Material (Excavate Permit) Lewisman depends on it
- CPCO Knowledge of position:
 - 5/20 meeting (Mooney / Schaefer) filling notes
 - 5/21 exit meeting (Mooney) (Horn notes) (Sera notes)
 -

(3)

- first OI Report
 sevo }
 Horn } evidence
 fisher }
- NRC NO explicit permission!

ASUB Hearing Recs / time
 P, +, + on the record in view
 of the Subject.

Mr. Howell "... did not take issue with
 facts ..." Basis for factors relating to
 enforcement action, any thing that may
 be a weight factor on NRC action.

10/25

JGK & DeYoung
meeting with

Selby and Howell

- Summit program shortly present plan
of action to improve operation, include
mgmt audit. NRC to approve from

Scope somewhat open

- Civil Penalty - Case to be reviewed
because Company felt intimidated

Mr. DeYoung: to review, schedule, coordinate
with RT staff

followed with CPCs and smaller NRC
staff present

- 12/16
- CP - ? Age / mgt audit
 - E/N - 100K ?
 - ASUB - Actions (view of ³HEARING Bd)
 - Mgt. Audit - Order
 - Mitigation factors: ???????
 - Age
 - Safety Significance
 - Mgt. Audit
 - Corrective Action
 - Work Auth. Proc
 - S&W Overview
-

NOV (401C)
 ↓
 Corrective Action - as part of we expect you to:
 propose mgt. audit - Independent
 ↓ NRC approval (Assessment to assure broad corrective action)
 Conf. Acta

Meeting w/ S. Howell

1/4/84

- Mechanics of order

Timing

- Daylong to Issue - E/W
5 day wait for Commission
1/4/84 - 1/12/84
- Issue 1/12/84
- Press Release 1/17/85 (FAX)

(1/13/ TV Interviews) Keppeler on Midland

- GAP, B. Garce letter ^{1/13/85} response issued ?
contents ?? ;
 - No public meeting
 - No awaiting for comments beyond our normal decision making process.
- Candidate Companies (min.)
 - Ebasco
 - TERA
 - Booz - Allen
 - Torrey - Pines
 - ChesAP, McCormick & Pugh.

• Plan

Candidate Company (i.e.)

- (1) Scope
- (2) Qualifications - Independence / Competency
- (3) Report, milestones
- (4) follow-up

- Scope -
Validate CPCo effort,
Review some / other areas

- Duration - 10 people

30-45 days

CPCo - ~ 8 people (50 part-time)

5 months

- Test Cases - "solve misunderstandings"
unofficial

of problems areas for last year

- overall plan - public meeting (observation)
(Management Approach)

- Presented by CPCo to Consultant
public meeting w/ NRC (following company approval)

Enforcement Conference

10/11

Violation of a Construction Permit -
 paragraph 2. G., as amended on May 2, 1983.
 This amendment incorporates into the Construction
 Permit the April 30, 1982, ASLB order
 (modified on May 7, 1982).

This violation is considered a Severity
 Level III, a significant violation under
 the current NRC Enforcement Policy. A
 Staff review concluded a severity level
 II was not warranted because of the
 lack of safety significance.

Cause is attributed to poor management
 and poor communications, one of many examples
 of miscircumstances / miscommunications.

The staff believes tough enforcement action
 is necessary to obtain proper licensee
 management attention and obtain necessary
 corrective action. The staff is therefore proposing
 a \$100,000 dollar civil penalty.

(contemplating)

(2)

Additionally - The staff is considering issuing some type of a management audit or independent appraisal ^(annual) via an order ("Cause" or "Confirmatory").

The basis for such an order would be:

- (1) Violation of AELB order / Constitution
Part -
- (2) SALP 3 Recommendation for 50.10 order
to "thoroughly review the performance of construction, engineering, and general administrative functions in the following areas:
- ..."
- (3) The long list of Historical problems and lack of effective corrective action at midline
- (4) Obvious communication problems:
w/ NAC
w/ Jackson - site
w/ Bechtel
- (5) Confidence Builder for NAC and Project

(3)

The Licensee shall develop a listing of firms to perform this evaluation to include the following criteria:

- (1) Independence
- (2) Competence
- (3) Qualifications of the appraisal team
- (4) Schedule with milestones for plan implementation

to the NRC for concurrence / approval.

The evaluation (management audit) program shall consist of the following:

- (1) Prepare a comprehensive plan of action and submit to the Regional Administration for review and approval.
- (2) The appraisal shall consist of evaluating:
 - organization responsibilities, Responsibilities
 - Management controls - support
 - ~~Proper~~ Staffing ~~staffing~~ with qualified ind.
 - Staffing ~~levels~~
 - Communications systems and practices: at both at and between the corporate ^{and} and the facility; and the attitude ~~attitude~~ and the Management total dedication ~~attitude~~ Quality
- (3) Provide direction to make recommendations for changes in the areas on evaluation, including root causes
- (4) Provide a system for audit ^{follow} representatives aiming at assuring conformance to requirements and continued adherence to changes.
- (5) follow-up by independent auditor

NRC - overview process - dependent on outcome.
Review Report / approve?

(5)

Subsequent to the evaluation:

The licensee shall promptly submit the report to the Regional Administrator. In addition, the licensee shall within 30 days of receipt of this evaluation, consider each recommendation and respond as to actions being taken to be taken.

The licensee should consider using its own initiative in investigating the areas of management analysis performed. This will leave the NRC with two basic positions as far as action:

(1) None

(2) Compensatory Order

No CPCO action would give us only one action:

(1) Show Cause Order

Notes:

10/11/83

• Advise ^{ASB} leaving board on Oct 31, 1983

• CPCo to review:

- Chronology

- Mooney

• Board Order - 4/30/82,

- explicit approval for that not previously issued

- called in used to ASB
NRC approval - ASB on ASB
oral / written

• Work Permit ^{system} procedure ^(note to system) - to cover other things

- Expected ASB to approve all ^{remedial work} - May 10, 82 ^{Response time}

⊖ concept: Order to resolve compliance problems

- June to Aug 82 - did not understand Region's concerns; until Aug. to understand

- Late July, ^(meeting pref.) did not know of any ^{NRC} concerns!

- Ross found excavation - Violation stopped work

- Aug 11 RTI concern

Keppeler

???



???

Aug 12, 82 Work Authorization Procedures proposed
185226

major/minor -

Cont'd

- Huges letter does not cover:

- Character of work
- Detailed procedures
- Frequency of work
- If considered between other jobs
CPCO - NBC (CPCO - NRE)
- Not willful

proposed to review
insufficiently detailed to ...

- Over 1 year old - issue - "every year"

- Mgt. Audit question -

- understanding
- fact of CPCO plans/actions
- Rehearsing of events / historically
- Got on w.d. now, the present

4/2 - Allow 6 weeks approval of activities
solid proposal = file to order _____

freeze wall monitoring pits - new 5'20
Steel set -

conts:

May 20, 92, meeting to discuss excavations.
CFC left meeting with understanding.

May 25, 92 - Not noted as a concern, assumed
freeze wall approval was refused

* Minute Meeting Notes: - issue

Discovery - on violation of Base O -

Document Name:
CONSUMERS CONFIRMATORY ORDER

Requestor's ID:
SHERYL

Author's Name:
Lieberman

Document Comments:
Midland Plant Units 1 and 2

UNITED STATES
NUCLEAR REGULATORY COMMISSION

In the Matter of) Docket Nos. 50-329
) 50-330
CONSUMERS POWER COMPANY)
(Midland Plant Units 1 and 2))

CONFIRMATORY ORDER

I

Consumers Power Company (the licensee) is the holder of construction permits CPPR-81 and CPPR-82 issued by the Atomic Energy Commission (now the Nuclear Regulatory Commission, hereafter Commission), which authorize the construction of the Midland Plant, Units 1 and 2 (the facility). The facility is under construction in Midland, Michigan.

II

Since the start of construction, the facility has experienced significant quality assurance (QA) problems. Although the licensee took corrective actions in each case, problems continued to be experienced in the implementation of its QA program.

On October 6, 1983, the Director of Inspection and Enforcement, issued a confirmatory order modifying the construction permits which required that the licensee adhere to the Construction Completion Program² (CCP), dated August 26, 1983 for the duration of the construction of the facility. An important aspect of the CCP is the third party overview by Stone and

- 2 -

Webster Engineering Corporation which is required until the Regional Administrator, Region III, finds that the overview is no longer necessary to provide reasonable assurance that the facility can be constructed in accordance with Commission requirements. One element, in any, decision regarding the relaxation of the overview requirement will be a finding of confidence in the ability of the licensee's management to properly construct the facility in accordance with Commission requirements without a third party overview. Such a finding cannot be currently made.

III

Given the history of construction at the site, it is apparent that traditional regulatory means have been ineffectual in obtaining the necessary attention to detail and high quality standards necessary to completing the construction of this facility. The CCP with the independent overview effort, if properly carried out, will provide the necessary assurance that activities will be carried out. In view of the history to date, the Director has found that a management audit is required as a condition of any continued construction without a third party overview

The licensee, in a meeting on October 25, 1983, ^{and on November 16, 1983,} with the Director of the Office of Inspection and Enforcement and the Regional Administrator, Region III, agreed to submit an audit program to the Commission. Accordingly, I find that the public health, safety and interests requires that the licensee agreement be formalized by an Order.

IV

In view of the foregoing, pursuant to Section 103 and 161(i) of the Atomic Energy Act of 1954, as amended, and the Commission's regulations in 10 CFR Part 2 and 10 CFR Part 50, IT IS HEREBY ORDERED THAT:

Within 90 days of this Order, the licensee shall submit to the Region III Administrator for review and approval, a comprehensive plan of action that will include an independent appraisal of site and corporate management organizations and functions, and recommendations where necessary for improvements in communications, management controls, and oversight for the purpose of assuring that regulatory requirements are complied with. Upon approval of the plan, the plan shall be implemented and the scheduled dates for completion on the milestones shall not be extended without good cause and the concurrence of the Region III Administrator.

The plans shall include at least the elements itemized below:

- (1) An appraisal conducted by a recognized management consultant organization retained by the licensee to evaluate current organizational responsibilities, management controls, communications systems and practices both at the Midland site and between the corporate office and the site [^]. The evaluation shall also include a review of the licensee's site and corporate construction management and supervisors, (above first level), involved in the Midland project to determine their

A E
NRC

Limited to
will meet SAT? no
SAT? SOIL
RECOMM.

Quality of work activities

attitudes toward the importance of safety and meeting regulatory requirements, and their capability and competency for managing construction activities consistent with regulatory requirements.

- (2) The organization shall certify that it has not worked for the licensee or on the Midland project for any of the licensee's contractors or subcontractors within the past 10 years. Each professional employee of the organization and of any consultants used by the organization shall certify that the employee has not been previously employed by the licensee or associated with the Midland project, that members of the household of the employees or their immediate relatives have not been employed by the licensee or associated with the Midland project, and that the employee does not receive more than 5% of his or her gross income from securities issued by the licensee. Deviations from this requirement must be approved by the Region III Administrator.
- (3) The organization shall be directed to make recommendations for changes in the aforementioned areas that will provide assurance that the licensee will implement NRC requirements.
- (4) A description of the appraisal program, the qualifications of the appraisal team, a discussion of how the appraisal is to be documented, and a schedule with appropriate milestones

for implementation of the plan. The schedule shall provide that recommendations be submitted no later than 4 months following approval of the plan.

The licensee shall direct the organization to submit to the Region III Administrator a copy of the evaluation or recommendation required by item (1) above, and any drafts thereof, at the same time they are sent to the licensee or any of its employees or contractors. Prior notice shall be given the Administrator of any meeting between the licensee and the organization to discuss the results, recommendations, or progress made on the appraisal. In addition, the licensee shall consider the recommendation made in item (1) and provide to the Region III Administrator, within 30 days of receipt of the evaluation, an analysis of each such recommendation and the action to be taken in response to the recommendation. The licensee shall also provide a schedule for accomplishing these actions.

The Administrator of Region III may relax or terminate in writing any of the preceding conditions for good cause.

V

The licensee may request a hearing on this Order within 25 days of the date of this Order. Any request for hearing shall be submitted to the Director, Office of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C., 20555. A copy of the request shall also be sent to the Executive Legal Director at the same address and to the Regional Administrator, NRC Region III, 799 Roosevelt Road, Glen Ellyn, Illinois, 60137.

If a hearing is to be held concerning this Order, the Commission will issue an order designating the time and place of hearing. If a hearing is held, the issue to be considered at such hearing shall be whether this Order should be sustained.

This Order shall become effective upon the licensee's consent or upon expiration of the time within which the licensee may request a hearing or, if a hearing is requested by the licensee, on the date specified in an Order issued following further proceedings on this Order.

FOR THE NUCLEAR REGULATORY COMMISSION

Richard C. DeYoung, Director
Office of Inspection and Enforcement

Dated at Bethesda, Maryland
this day of November, 1983.

IV

In view of the foregoing, pursuant to Sections 103 and 161(1) of the Atomic Energy Act of 1954, as amended, and the Commission's regulations in 10 CFR Part 2 and 10 CFR Part 50, IT IS HEREBY ORDERED THAT:

Within 30 days of this Order, the licensee shall submit to the Region III Administrator for review and approval, a comprehensive plan of action that will include an independent appraisal of site and corporate management organizations and functions, and recommendations where necessary for improvements in communications, management controls, and oversight for the purpose of assuring that regulatory requirements are complied with. Upon approval of the plan, the plan shall be implemented and the scheduled dates for completion of the milestones shall not be extended without good cause and the concurrence of the Region III Administrator.

The plan shall include at least the elements itemized below:

- (1) An appraisal conducted by a recognized management consultant organization retained by the licensee to evaluate current organizational responsibilities, management controls, communications systems and practices both at the Midland site and between the corporate office and the site. The evaluation shall also include a review of the licensee's site and corporate construction management and supervisors, above first level, involved in the Midland project to determine their attitudes toward the importance of safety and meeting regulatory requirements and their capability and competency for managing construction activities consistent with regulatory requirements.

- (2) The organization shall certify that it has not worked for the licensee or on the Midland project for any of the licensee's contractors or subcontractors within the past 10 years. Each Professional employee of the organization and of any consultants used by the organization shall certify that the employee has not been previously employed by the licensee or associated with the Midland project, that members of the household of the employees or their immediate relatives have not been employed by the licensee or associated with the Midland project, and that the employee does not receive more than 5% of his or her gross income from securities issued by the licensee. Deviations from this requirement must be approved by the Region III Administrator.
- (3) The organization shall be directed to make recommendations for changes in the aforementioned areas that will provide assurance that the licensee will implement NRC requirements.
- (4) A description of the appraisal program, the qualifications of the appraisal team, a discussion of how the appraisal is to be documented, and a schedule with appropriate milestones for implementation of the plan. The schedule shall provide that recommendations be submitted no later than 4 months following approval of the plan.

The licensee shall direct the organization to submit to the Region III Administrator a copy of the evaluation or recommendation required by item (1) above, and any drafts thereof, at the same time they are sent to the licensee or any of its employees or contractors. Prior notice shall be give the Administrator

[REDACTED]

of any meeting to discuss the results, recommendations, or progress made on the appraisal. In addition, the licensee shall consider the recommendations made in item (1) and provide to the Region III Administrator, within 30 days of receipt of the evaluation an analysis of each such recommendation and the action to be taken in response to the recommendations. The licensee shall also provide a schedule for accomplishing these actions.

The Administrator of Region III may relax or terminate in writing any of the preceding conditions for good cause.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of) Docket Nos. 50-329
) 50-330
CONSUMERS POWER COMPANY)
(Midland Plant, Units 1 and 2))

CONFIRMATORY ORDER

I

Consumers Power Company (the licensee) is the holder of construction permits CPPR-81 and CPPR-82 issued by the Atomic Energy Commission (now the Nuclear Regulatory Commission, hereafter Commission), which authorize the construction of the Midland Plant, Units 1 and 2 (the facility). The facility is under construction in Midland, Michigan.

II

Since the start of construction, the facility has experienced significant quality assurance (QA) problems. Although the licensee took corrective actions in each case, problems continued to be experienced in the implementation of its QA program.

On October 6, 1983, the Director of Inspection and Enforcement, issued a "Confirmatory Order for Modification of the Construction Permits" which required that the licensee adhere to the Construction Completion Program (CCP), dated August 26, 1983, for the duration of the construction of the facility. 48 FR 46673 (Oct. 13, 1983). As more fully described in that order, the development of such a program was necessary to verify the adequacy of prior construction and to insure the adequacy of future construction in view of the identification of widespread QA problems in late 1982, the facility's history of QA problems, and the ineffectiveness of previous corrective actions to fully resolve these problems. An important aspect of the CCP is the third party overview by Stone and Webster Engineering Corporation which is required until the Regional Administrator, Region III, finds that the overview is no longer necessary to provide reasonable assurance that the facility can be constructed in accordance with Commission requirements. One element in any decision regarding the relaxation of the overview requirement will be a finding of confidence in the ability of the licensee's management to properly construct the facility in accordance with Commission requirements without a third party overview. Such a finding cannot now be made.

O.K.

~~unless
relaxed
by R.A.~~

III

On December 6, 1979, the Director of the Office of Inspection and Enforcement and the Director of the Office of Nuclear Reactor Regulation issued jointly an Order Modifying Construction Permits for the Midland plant. The order was based in part on a breakdown in quality assurance related to soils work at the Midland plant which had led to excessive settlement of the facility's diesel generator building. The licensee demanded a hearing on the order, and the proceeding on the order was eventually consolidated with the proceeding on Consumers Power Company's application for operating licenses for the Midland plant. During the course of the proceeding, the Atomic Safety and Licensing Board issued an order that authorized the Director of the Office of Nuclear Reactor Regulation to amend the Midland construction permits to incorporate certain limitations on remedial soils work at Midland. See Consumers Power Co. (Midland Plant, Units 1 & 2), LBP-82-35, 15 NRC 1060, 1072-73 (April 30, 1982). In accordance with the board's order, the construction permits were amended on May 26, 1982, to include the board-ordered conditions.

Among the restrictions imposed by the board's order and the permit amendment was a condition that the licensee "shall obtain explicit prior approval from the NRC staff...before proceeding with the following soils-related activities...: any placing, compacting, excavating, or drilling soil materials around safety-related structures and systems."

Construction Permit Nos. CPPR-81 & CPPR-82, ¶ 2.G.(1) & 2.G.(1)a.;
 compare LBP-82-35, supra, 15 NRC at 1072-73. On July 28, 1982, an NRC
 inspector discovered that the licensee had excavated soil from below the
 deep "Q" duct bank and had initiated relocation of the fireline in "Q"
 soils without prior NRC authorization. Excavation below the deep "Q"
 duct bank had begun on July 23rd and relocation of the fireline had begun
 on July 27th. Neither activity had received explicit prior approval from
 the NRC staff as required by the construction permits. In fact, exca-
 vation of soil material below the deep "Q" duct bank was contrary to
 prior directives of the NRC staff which instructed the licensee that such
 excavation was not authorized. Thus, excavation of the deep "Q" duct
 bank and relocation of the fireline by the licensee constituted violations
 of the construction permits.

IV

The history at this site demonstrates that management has not been
 effective in providing the attention to detail and high quality standards
 necessary to the proper construction of this facility. In view of this
 history, including the violation identified in section III of this order,
 I have determined that a management appraisal is required at this time. The
 licensee, in a meeting on October 25, 1983, with the Director of the
 Office of Inspection and Enforcement and the Regional Administrator,
 and in a subsequent meeting on January 4, 1984 with ~~the~~ the Reg'io
 Region III, [^] agreed to submit an audit program to the ~~Commission~~. It is
 appropriate to confirm the licensee's commitment by order.

Regional Administrator for his approval. ↙

~~III management~~
 Administrator ↘

In view of the foregoing, pursuant to Sections 103, 161(1), 161(o) and 182 of the Atomic Energy Act of 1954, as amended, and the Commission's regulations in 10 CFR Part 2 and 10 CFR Part 50, IT IS HEREBY ORDERED THAT:

Within 30 days of the effective date of this Order, the licensee shall submit to the Region III Administrator for review and approval, a plan for an independent appraisal of site and corporate management organizations and functions, that would develop recommendations where necessary for improvements in management communications, controls, and oversight. Upon approval of the plan, the plan shall be implemented and the scheduled milestone completion dates shall not be extended without good cause and the concurrence of the Region III Administrator.

The plan shall include at least the elements itemized below:

- (1) ^{A description of the scope of} ~~An appraisal~~ ^{to be} conducted by an independent management consultant organization retained by the licensee to evaluate the licensee's ~~staffing and~~ current organizational responsibilities, management controls, communications systems and practices both at the Midland site and between the corporate office and the site. ~~The appraisal shall~~

scope of the appraisal should be supplied

~~project to determine their capability and competency for managing construction activities consistent with regulatory requirements.~~

(3) ~~(2)~~ ^{management consultant}
The ~~organization~~ shall certify that it has not conducted management reviews for the Midland Project on behalf of the licensee or its contractors. The organization shall also disclose any ^{ownership by and any} past associations with the licensee's contractors on the Midland Project or with the licensee. Each professional employee of the organization or any of its consultants, involved in the appraisal, shall certify that the employee or members of the households of the employee, or the immediate relatives of the employee, has not been employed by the licensee or its ^a principal contractors, or associated with the Midland project. If such employment or association has occurred, the organization shall make available to NRC documentation concerning such employment or association.

(4) ~~(3)~~ ^{management consultant}
The ~~organization~~ shall be directed to make recommendations ^{improvements where necessary in management communications, controls} for ~~changes in the aforementioned areas~~ that will provide ^{and oversight} greater assurance that the licensee ^{is able to complete the facility} will implement NRC requirements.

in accordance with NRC requirements.

a description of

(2) ~~(4)~~ The plan shall include ~~a description of the appraisal program,~~ the qualifications of the appraisal team, a discussion of how the appraisal is to be documented, and a schedule with appropriate milestones.

~~Staffing to determine~~
~~include a review of the licensee's site and corporate construction~~
~~management and supervisory personnel involved in the Midland project~~
~~to determine their capability and competency for managing~~
~~construction activities consistent with regulatory requirements.~~

- (2) A description of the appraisal program, the qualifications of the appraisal team, a discussion of how the appraisal is to be documented, and a schedule with appropriate milestones.
- (3) The provision of recommendations for changes in the aforementioned areas that will provide assurance that the licensee will implement NRC requirements.

independent
standards
not
stated

The licensee shall direct the approved organization to submit to the Region III Administrator a copy of the report of the appraisal and recommendations resulting from the appraisal, and any drafts thereof, at the same time they are sent to the licensee or any of its employees or contractors. Prior notice shall be given the Administrator of any meeting between the licensee and the organization to discuss the results, recommendations, or progress made on the appraisal. In addition, the licensee shall consider the recommendations resulting from the appraisal and provide to the Region III Administrator an analysis of each such recommendation and the action ^{proposed} to be taken in response to the recommendation. The licensee shall also provide a schedule for accomplishing these actions.

implementation
after
approval
by
R.I.F.

~~Upon the approval~~
 These actions shall not be implemented until approved, in writing, by the Regional Administrator

The Administrator of Region III may relax or terminate, in writing, any of the preceding conditions for good cause.

VI

The licensee may request a hearing on this Order within 30 days of its issuance. Any request for hearing shall be submitted to the Director, Office of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C., 20555 within 25 days of the date of this order. A copy of the request shall also be sent to the Executive Legal Director at the same address and to the Regional Administrator, NRC Region III, 799 Roosevelt Road, Glen Ellyn, Illinois 60137.

If a hearing is to be held concerning this Order, the Commission will issue an order designating the time and place of hearing. If a hearing is held, the issue to be considered at such hearing shall be whether this Order should be sustained.

This Order shall become effective upon the licensee's consent or upon expiration of the time within which the licensee may request a hearing or, if a hearing is requested by the licensee, on the date specified in an Order issued following further proceedings on this Order.

FOR THE NUCLEAR REGULATORY COMMISSION

Richard C. DeYoung, Director
Office of Inspection and Enforcement

Dated at Bethesda, Maryland
this day of January, 1984.