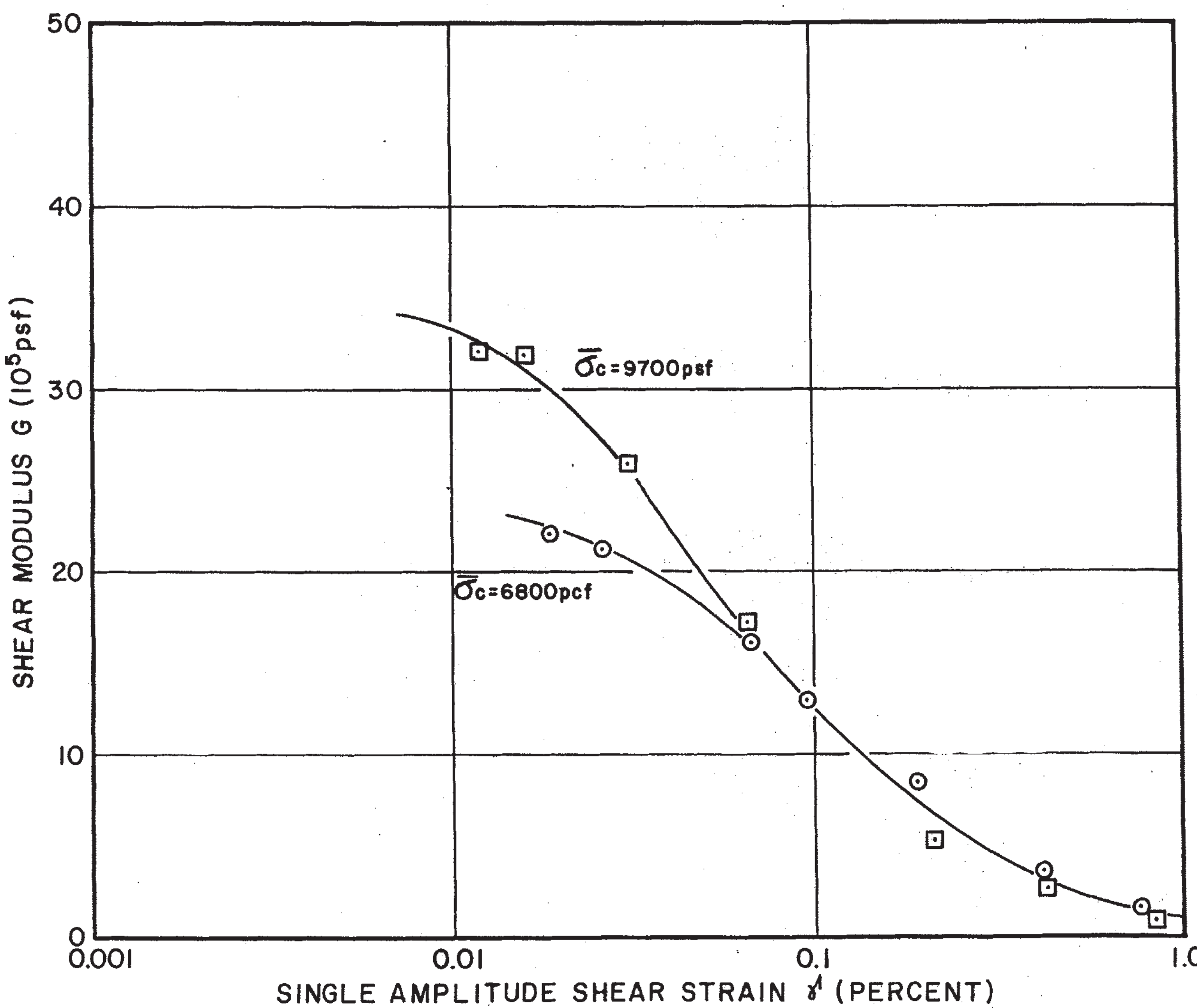
STRUCTURAL FILL BORROW

COMBINED BULK SAMPLE:

G-18 (ELEV. 663-654)
G-19 (ELEV. 673-663)
G-20 (ELEV. 657-647)

FOR 80% RELATIVE DENSITY (123 PCF), AT THE 10TH CYCLE



CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-302

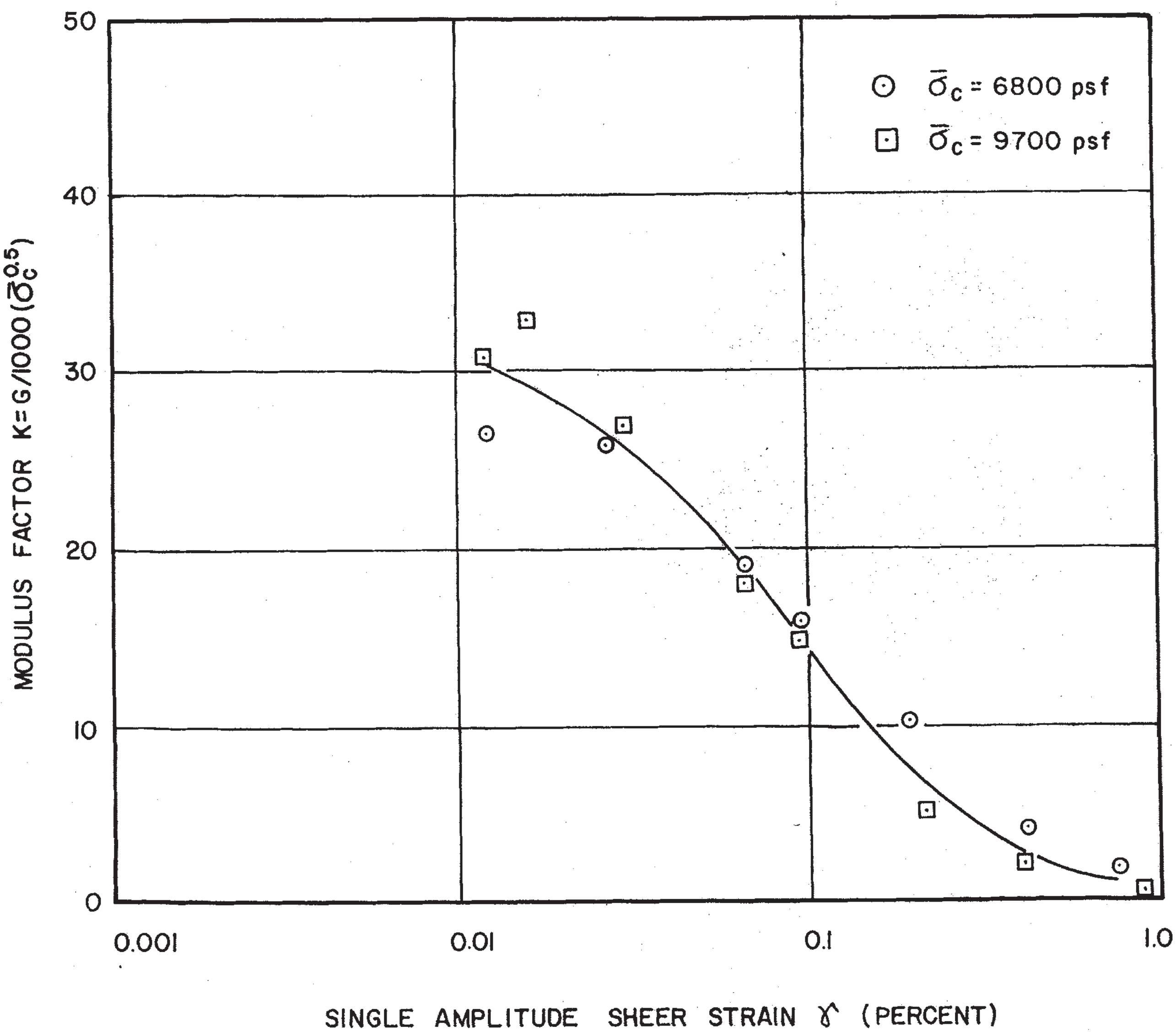
DYNAMIC TRIAXIAL COMPRESSION TESTS

STRUCTURAL FILL BORROW

COMBINED BULK SAMPLE:

G-18 (ELEV. 663-654)
G-19 (ELEV. 673-663)
G-20 (ELEV. 657-647)

FOR 80% RELATIVE DENSITY (123 PCF), AT THE 10TH CYCLE



CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-303

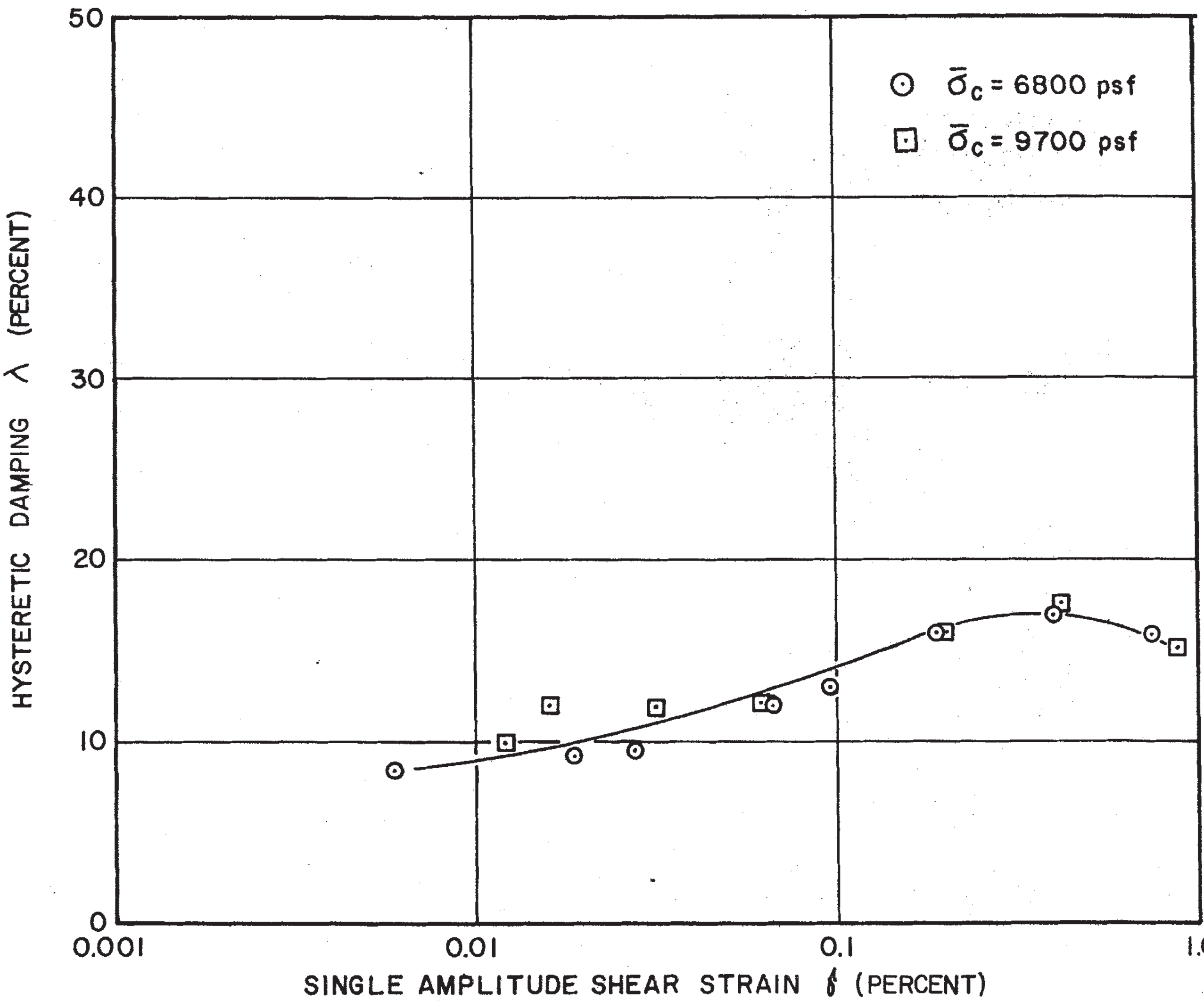
DYNAMIC TRIAXIAL COMPRESSION TESTS

STRUCTURAL FILL BORROW

COMBINED BULK SAMPLE:

G-18 (ELEV. 663-654)
G-19 (ELEV. 673-663)
G-20 (ELEV. 657-647)

FOR 80% RELATIVE DENSITY (123 PCF), AT THE 10TH CYCLE



CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-304

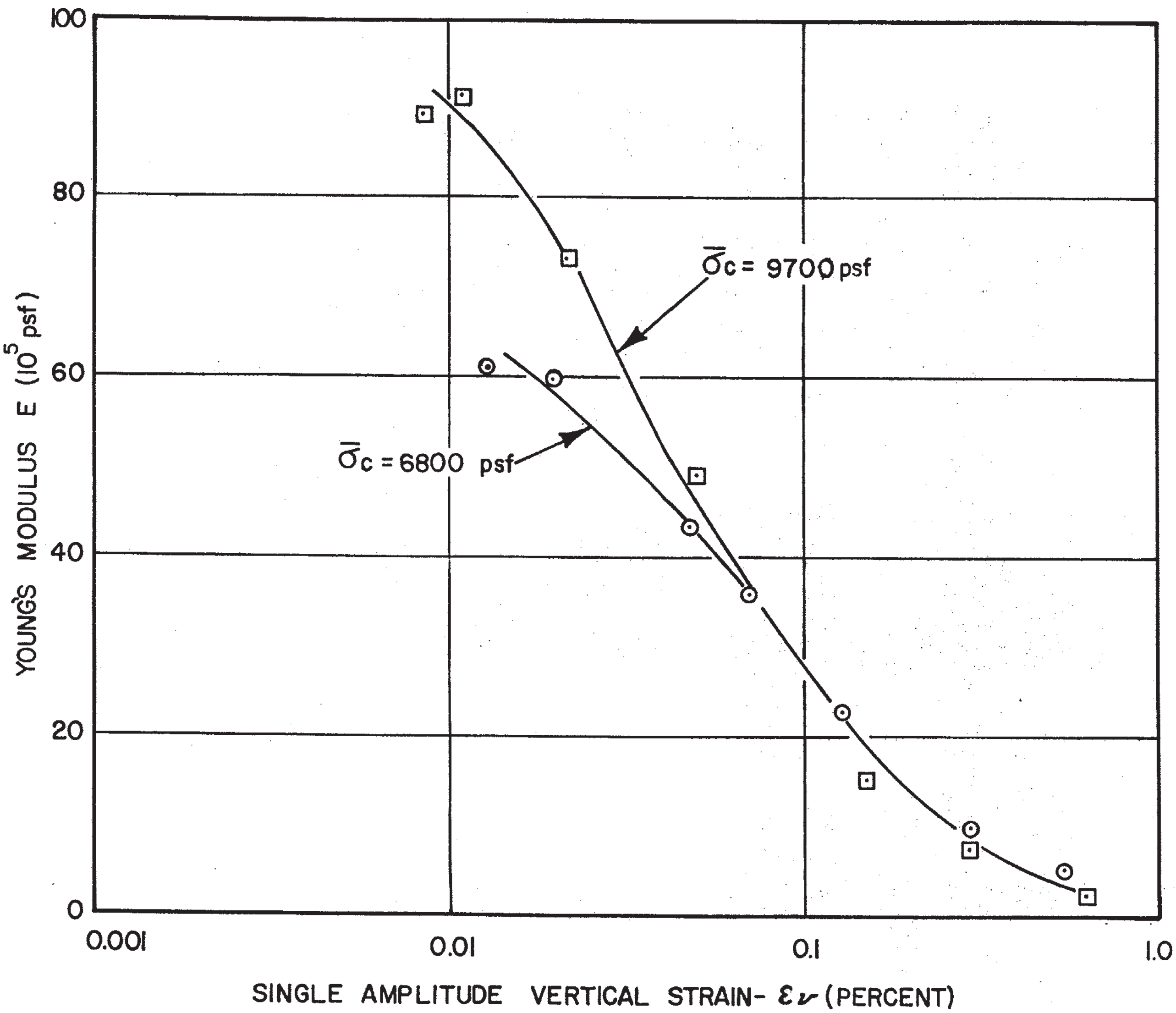
DYNAMIC TRIAXIAL COMPRESSION TESTS

STRUCTURAL FILL BORROW

COMBINED BULK SAMPLE:

G-18 (ELEV. 663-654)
G-19 (ELEV. 673-663)
G-20 (ELEV. 657-647)

FOR 80% RELATIVE DENSITY (123 PCF), AT THE 10TH CYCLE



CLINTON POWER STATION
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FIGURE 2.5-305

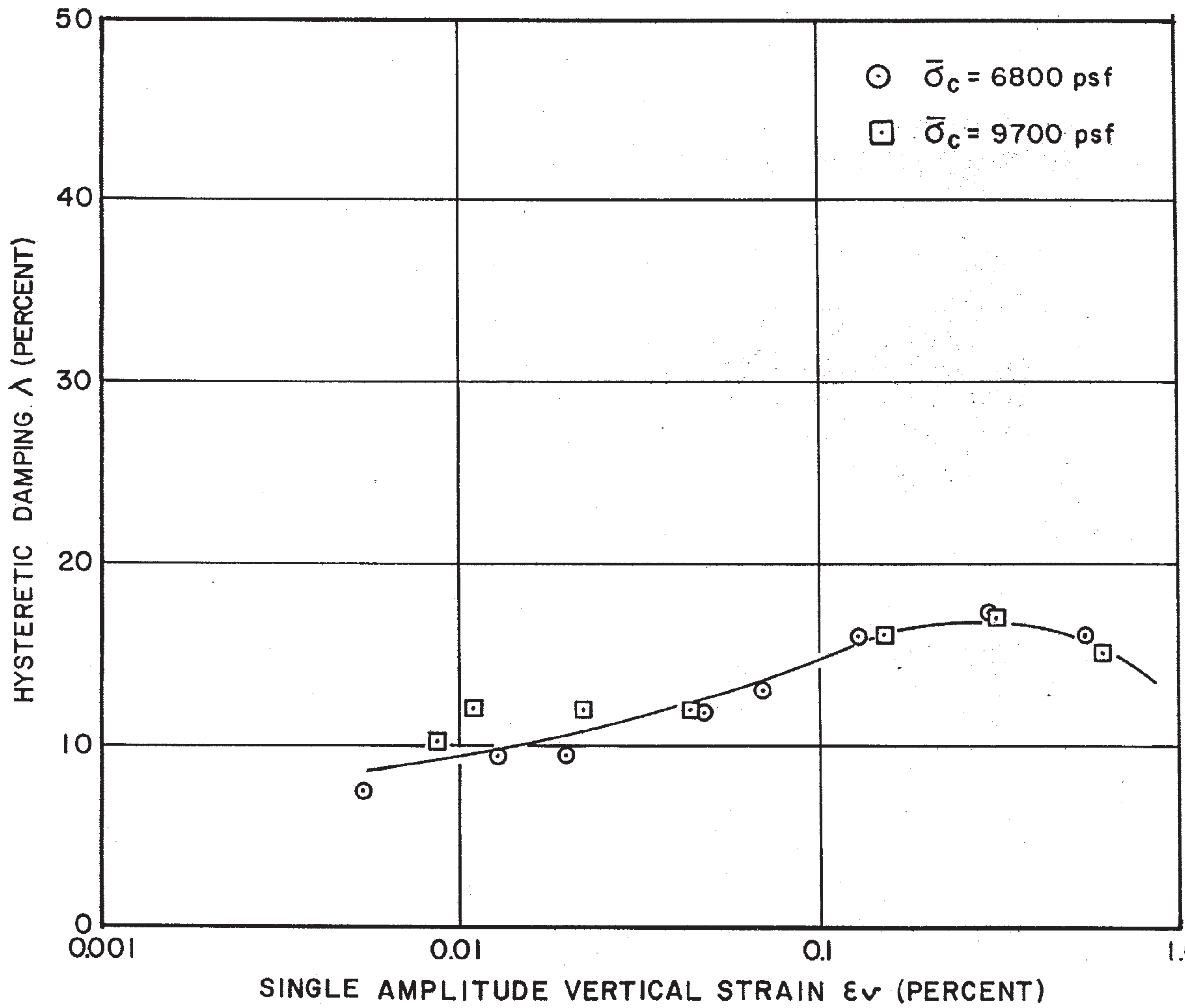
DYNAMIC TRIAXIAL COMPRESSION TESTS

STRUCTURAL FILL BORROW

COMBINED BULK SAMPLE:

G-18 (ELEV. 663-654)
G-19 (ELEV. 673-663)
G-20 (ELEV. 657-647)

FOR 80% RELATIVE DENSITY (123 PCF), AT THE 10TH CYCLE



CLINTON POWER STATION
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FIGURE 2.5-306

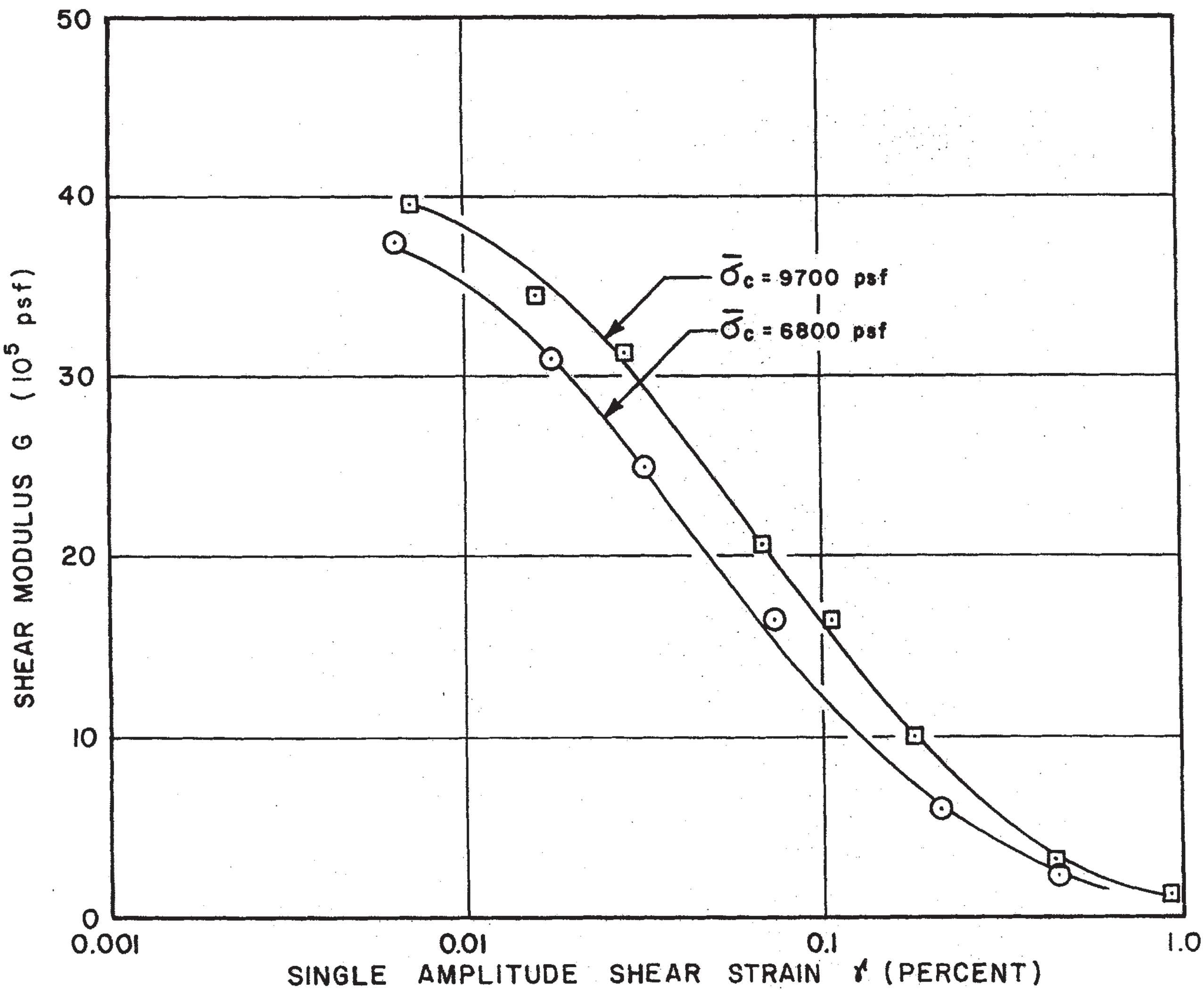
DYNAMIC TRIAXIAL COMPRESSION TESTS

STRUCTURAL FILL BORROW

COMBINED BORROW SAMPLE:

G-18 (ELEV. 663-654)
G-19 (ELEV. 673-663)
G-20 (ELEV. 657-647)

FOR 90% RELATIVE DENSITY (129 PCF), AT THE 10TH CYCLE



CLINTON POWER STATION
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FIGURE 2.5-307

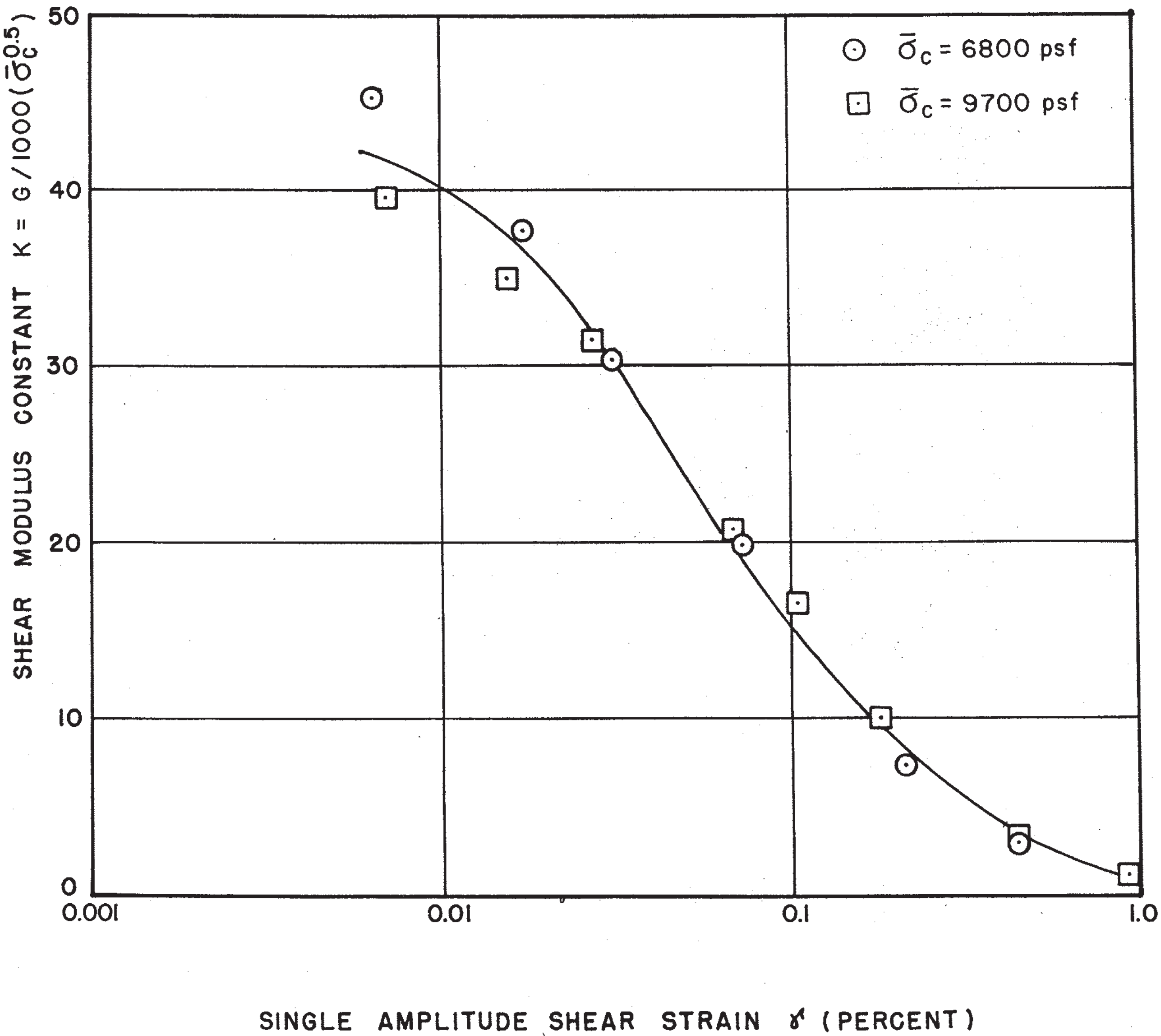
DYNAMIC TRIAXIAL COMPRESSION TESTS

STRUCTURAL FILL BORROW

COMBINED BORROW SAMPLE:

G-18 (ELEV. 663-654)
G-19 (ELEV. 673-663)
G-20 (ELEV. 657-647)

FOR 90% RELATIVE DENSITY (129 PCF), AT THE 10TH CYCLE



CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-308

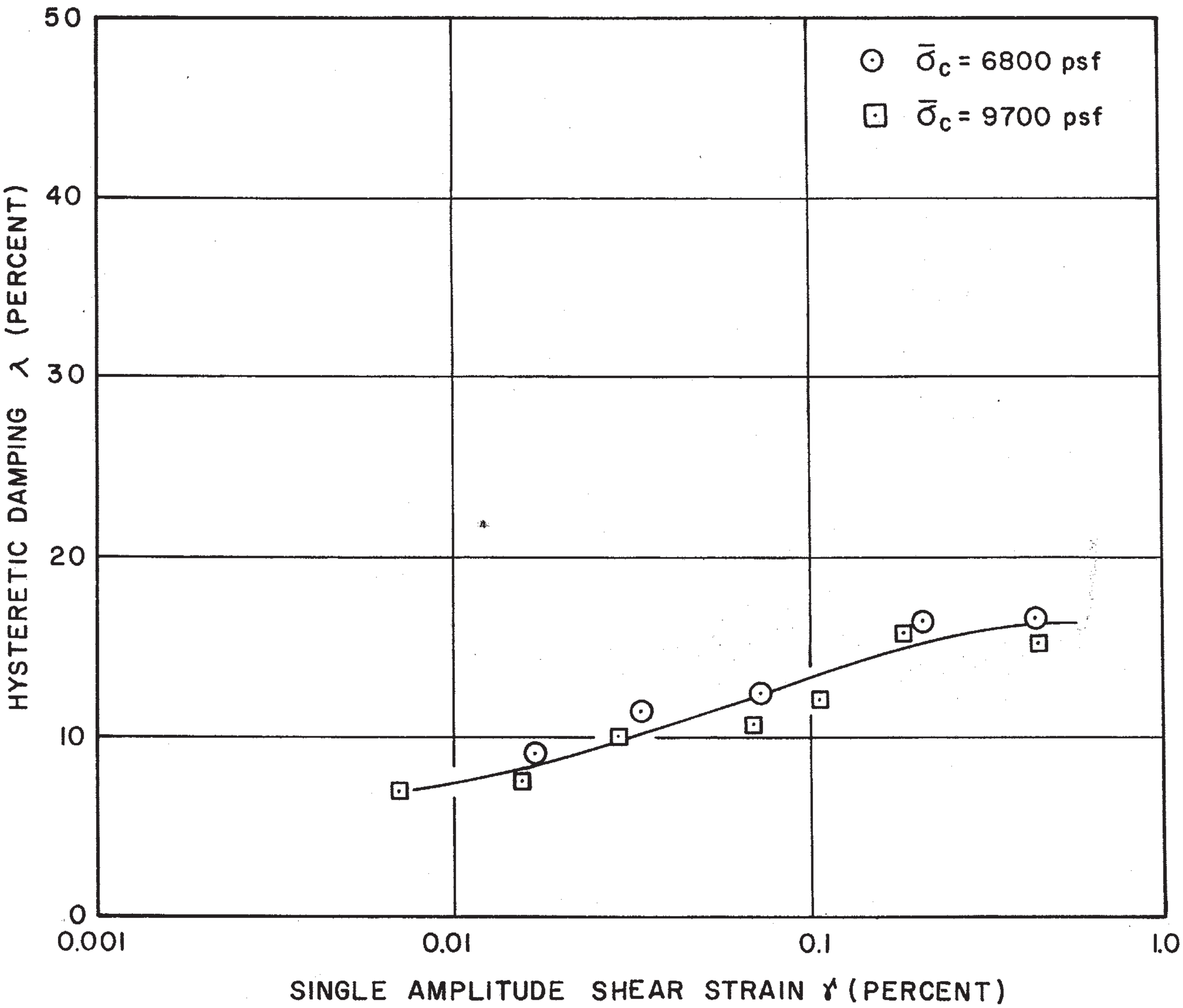
DYNAMIC TRIAXIAL COMPRESSION TESTS

STRUCTURAL FILL BORROW

COMBINED BORROW SAMPLE:

G-18 (ELEV. 663-654)
G-19 (ELEV. 673-663)
G-20 (ELEV. 657-647)

FOR 90% RELATIVE DENSITY (129 PCF), AT THE 10TH CYCLE



CLINTON POWER STATION
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FIGURE 2.5-309

DYNAMIC TRIAXIAL COMPRESSION TESTS

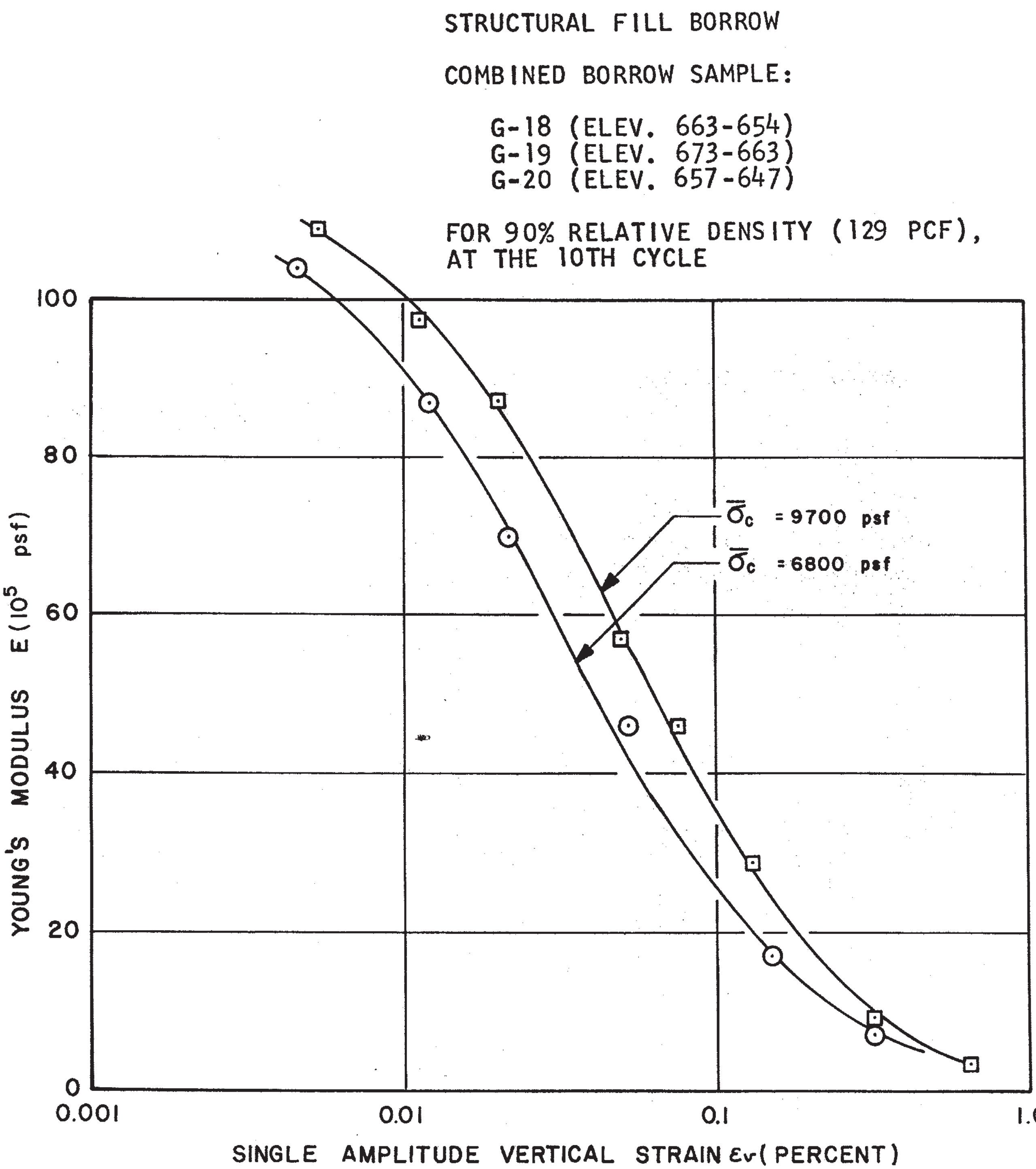

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FIGURE 2.5-310

DYNAMIC TRIAXIAL COMPRESSION TESTS

STRUCTURAL FILL BORROW

COMBINED BORROW SAMPLE:

G-18 (ELEV. 663-654)
G-19 (ELEV. 673-663)
G-20 (ELEV. 657-647)

FOR 90% RELATIVE DENSITY (129 PCF), AT THE 10TH CYCLE

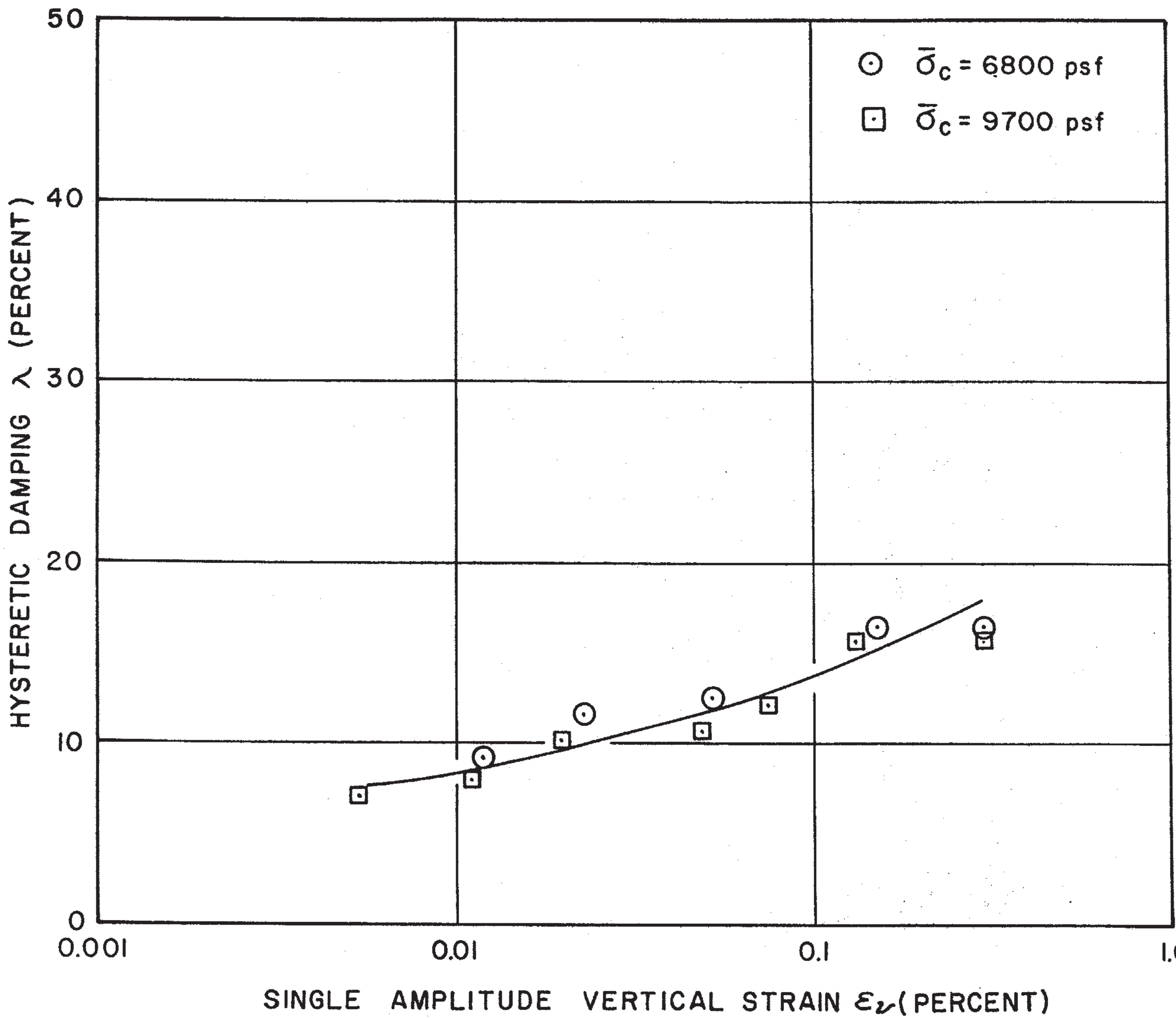

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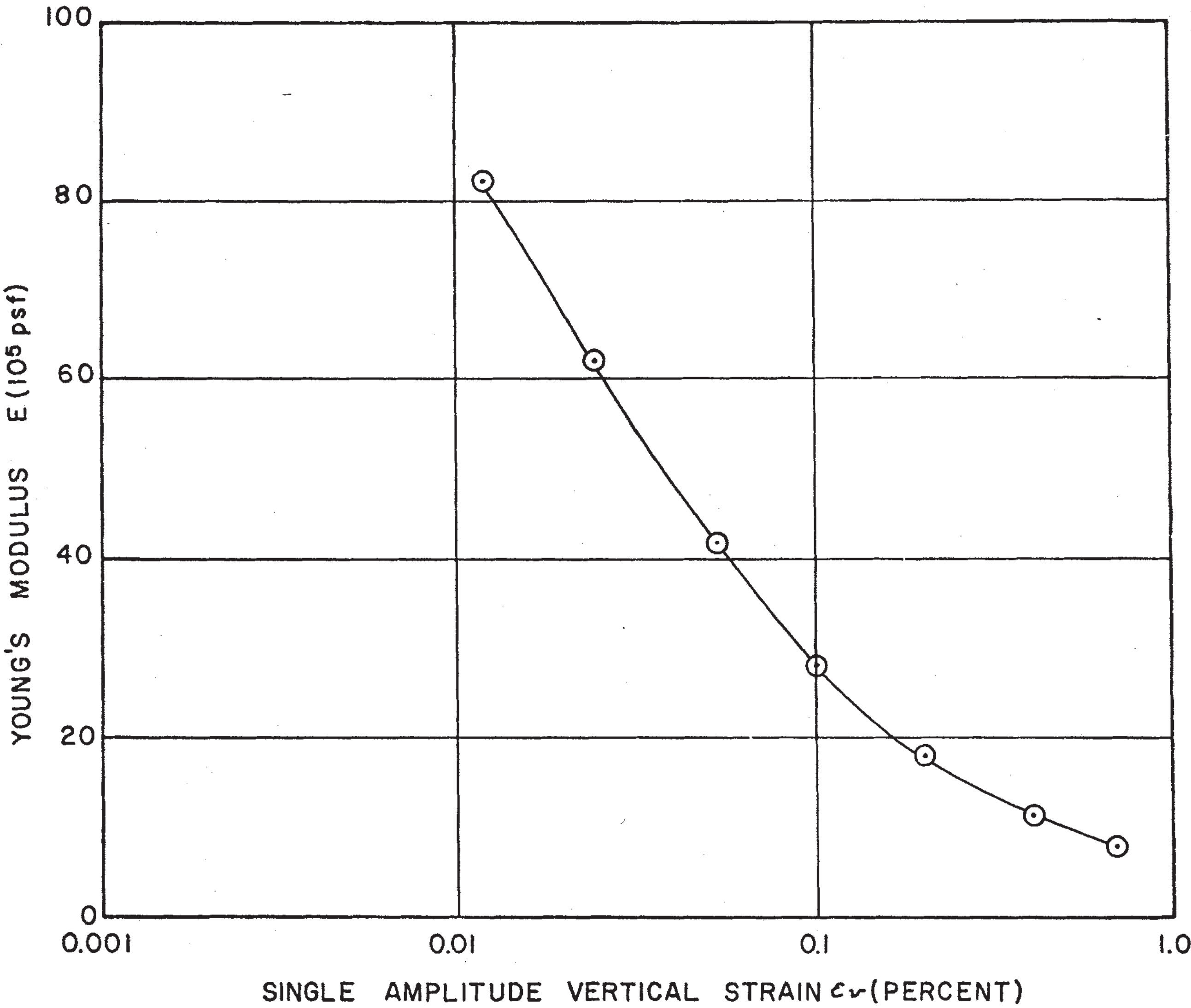
FIGURE 2.5-311

DYNAMIC TRIAXIAL COMPRESSION TESTS

BORING H-6 @ ELEVATION 619.3 FEET
GRAY FINE TO COARSE SANDY SILT WITH
SOME CLAY
(ILLINOIAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 8.6%
FIELD DRY DENSITY: 136 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE



CLINTON POWER STATION
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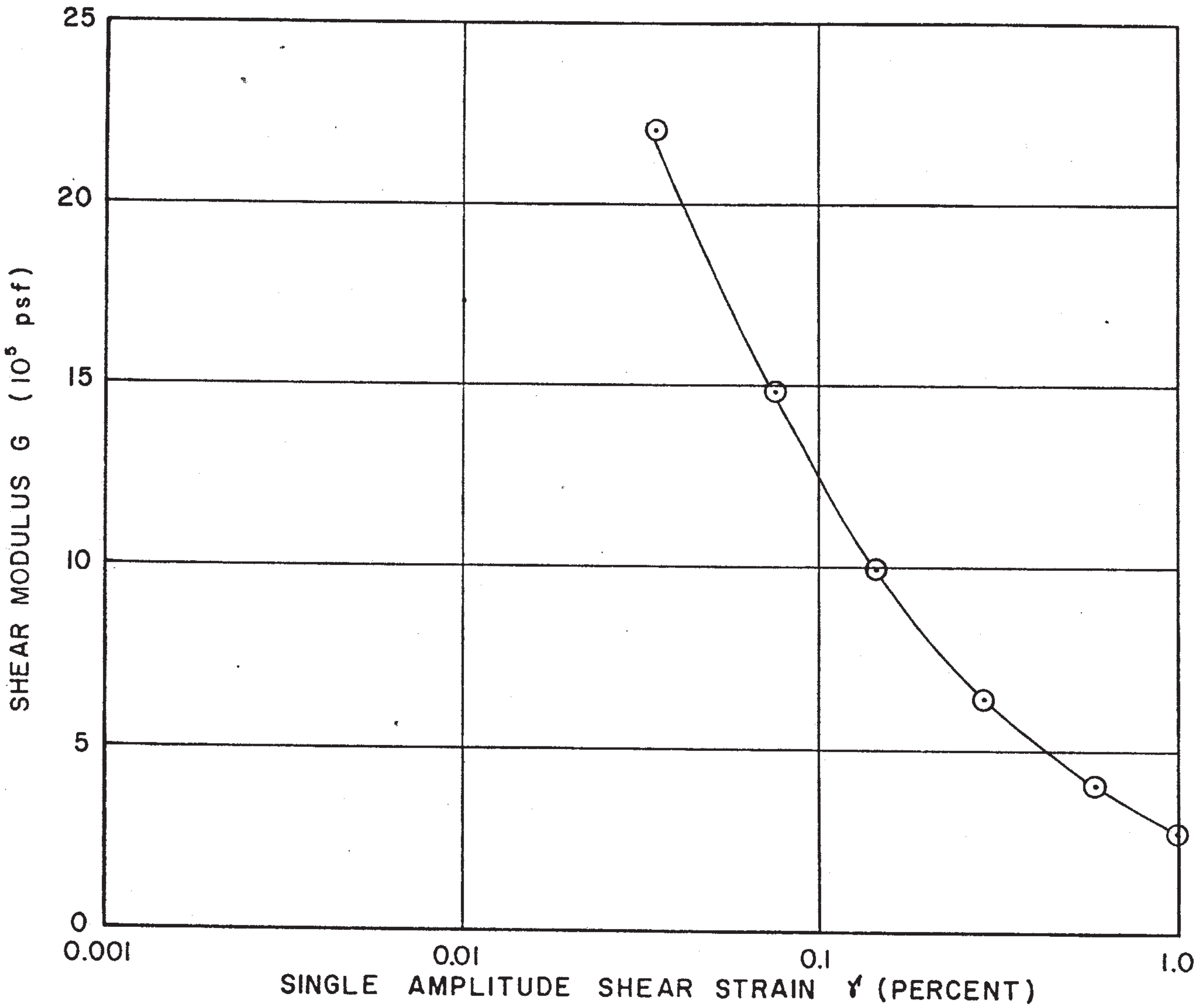
FIGURE 2.5-312

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-6)

(SHEET 1 of 4)

BORING H-6 @ ELEVATION 619.3 FEET
GRAY FINE TO COARSE SANDY SILT WITH
SOME CLAY
(ILLINOIAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 8.6%
FIELD DRY DENSITY: 136 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE



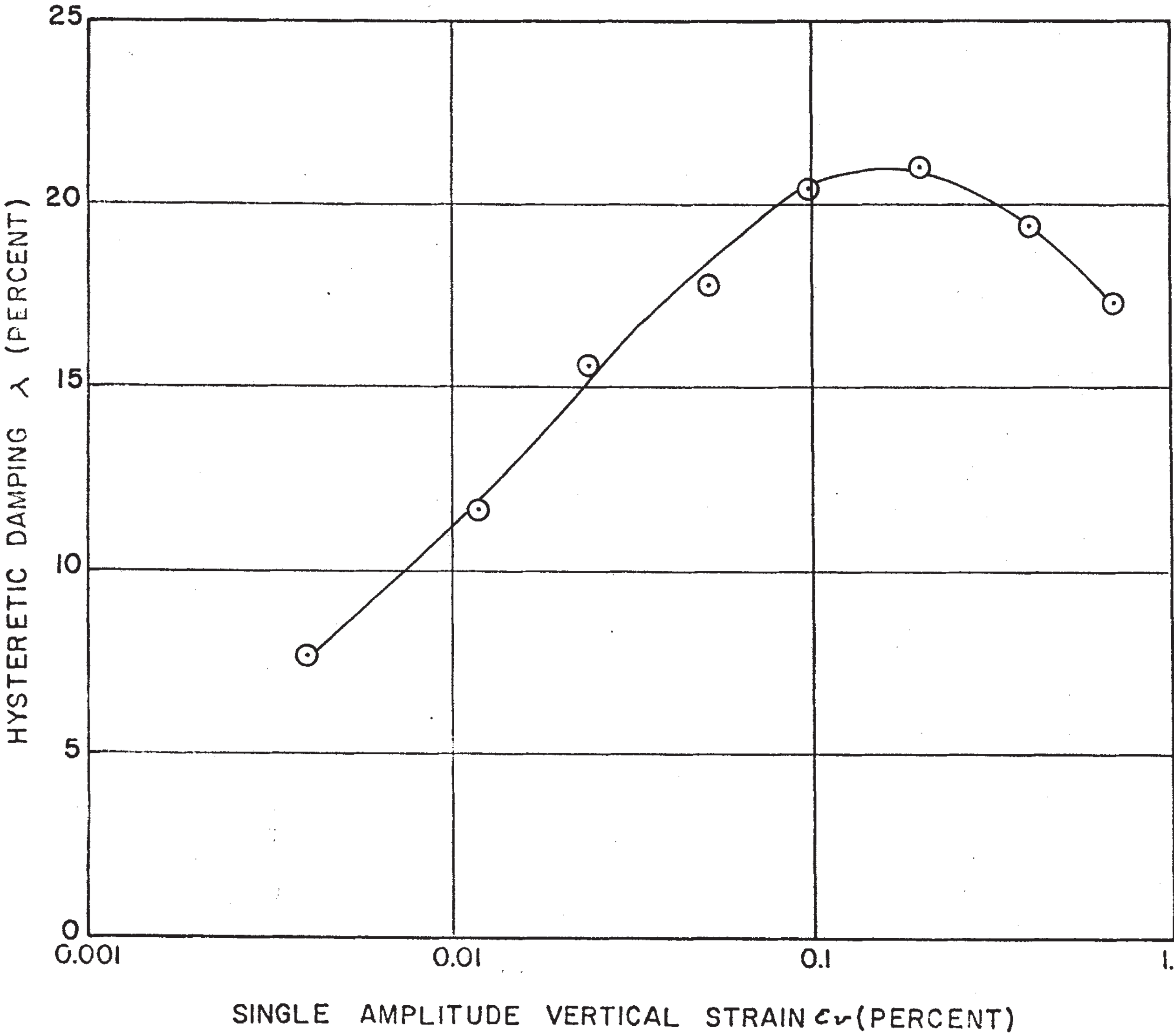
CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-312

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-6)

(SHEET 2 of 4)

BORING H-6 @ ELEVATION 619.3 FEET
GRAY FINE TO COARSE SANDY SILT WITH
SOME CLAY
(ILLINOIAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 8.6%
FIELD DRY DENSITY: 136 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE

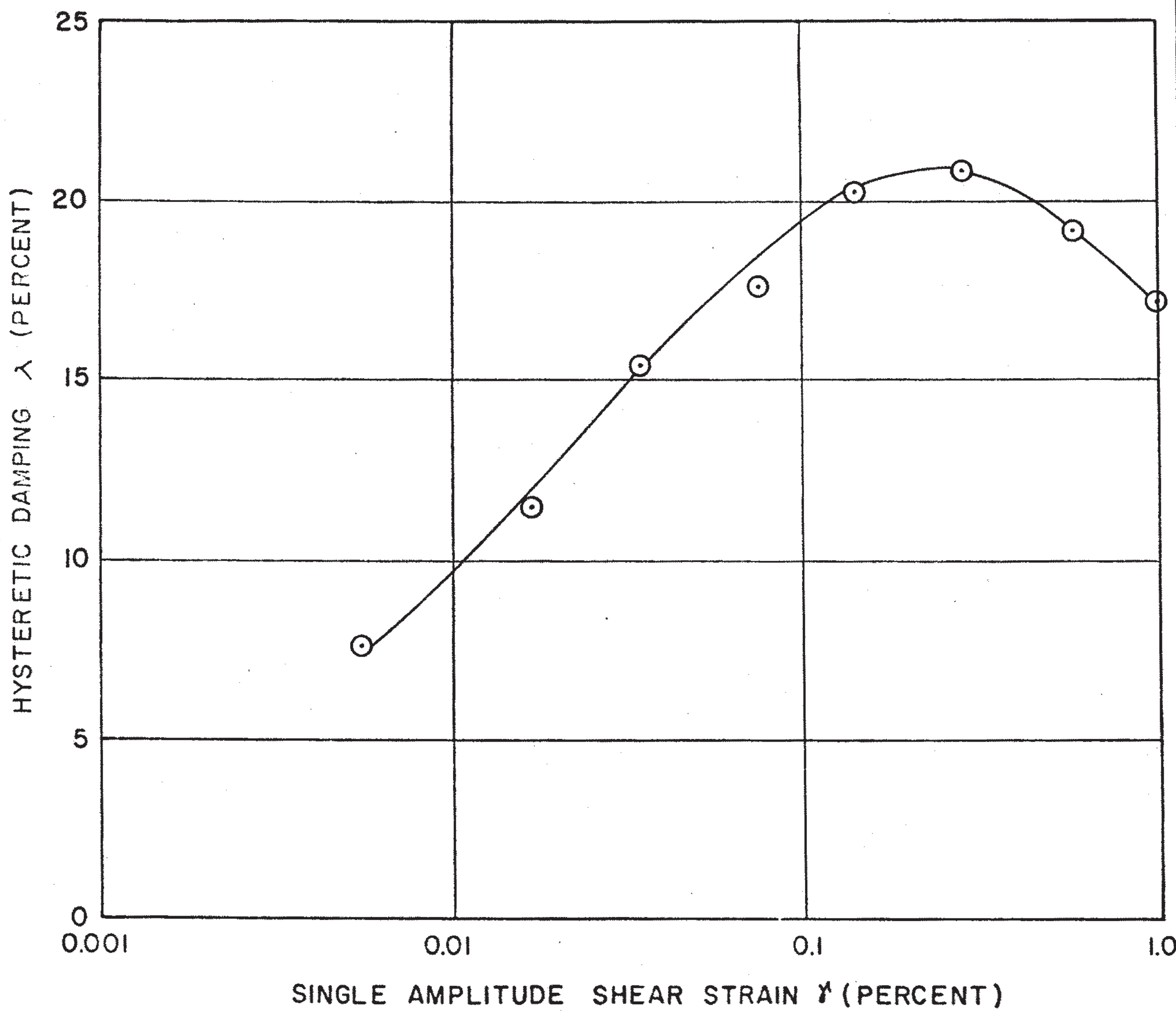


CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-312

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-6)
(SHEET 3 of 4)

BORING H-6 @ ELEVATION 619.3 FEET
GRAY FINE TO COARSE SANDY SILT WITH
SOME CLAY
(ILLINOIAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 8.6%
FIELD DRY DENSITY: 136 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE



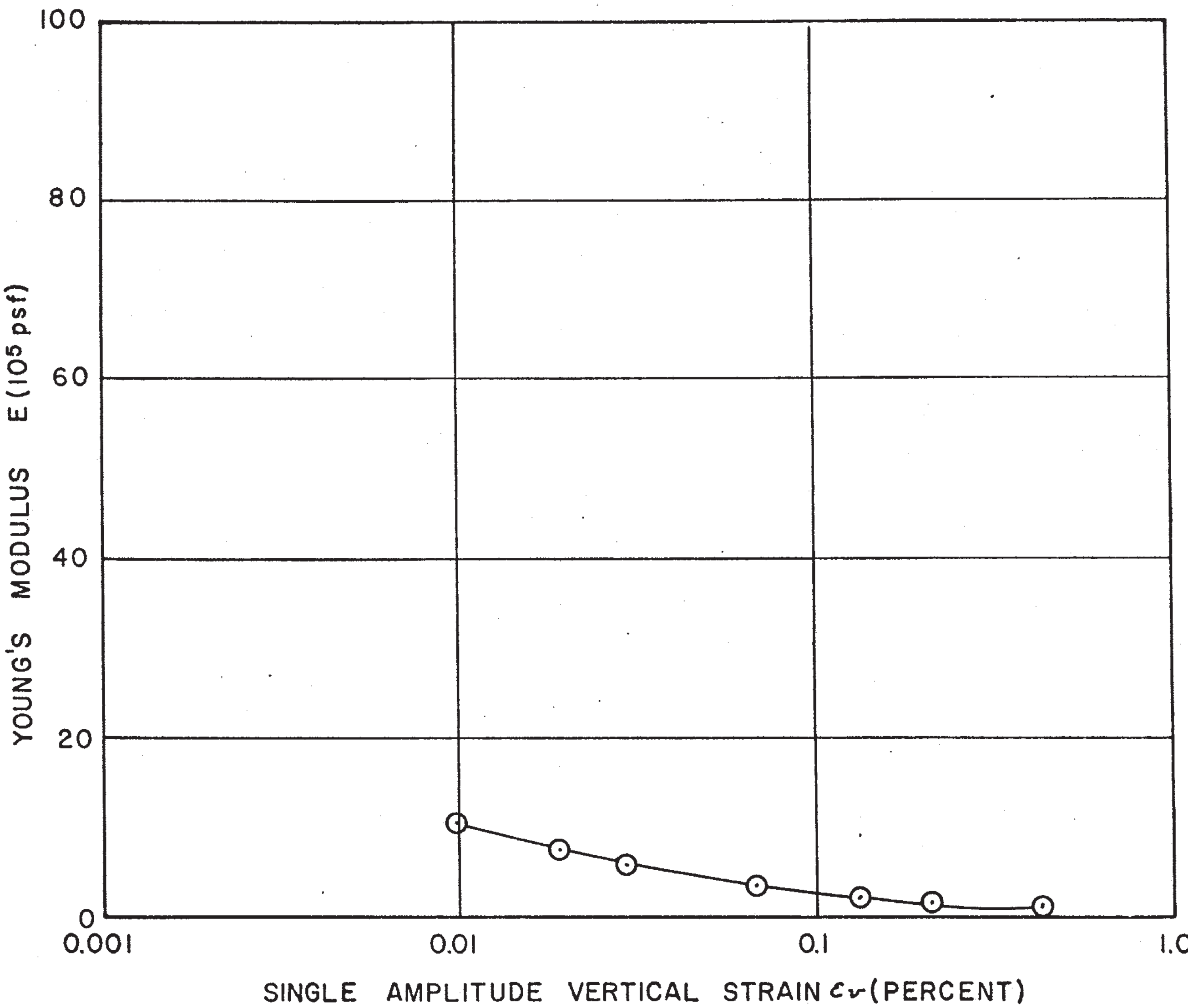
CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-312

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-6)

(SHEET 4 of 4)

BORING H-14 @ ELEVATION 635.3 FEET
GRAY FINE TO COARSE SANDY SILT WITH
SOME CLAY AND FINE GRAVEL
(ILLINOIAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 9.5%
FIELD DRY DENSITY: 140 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE



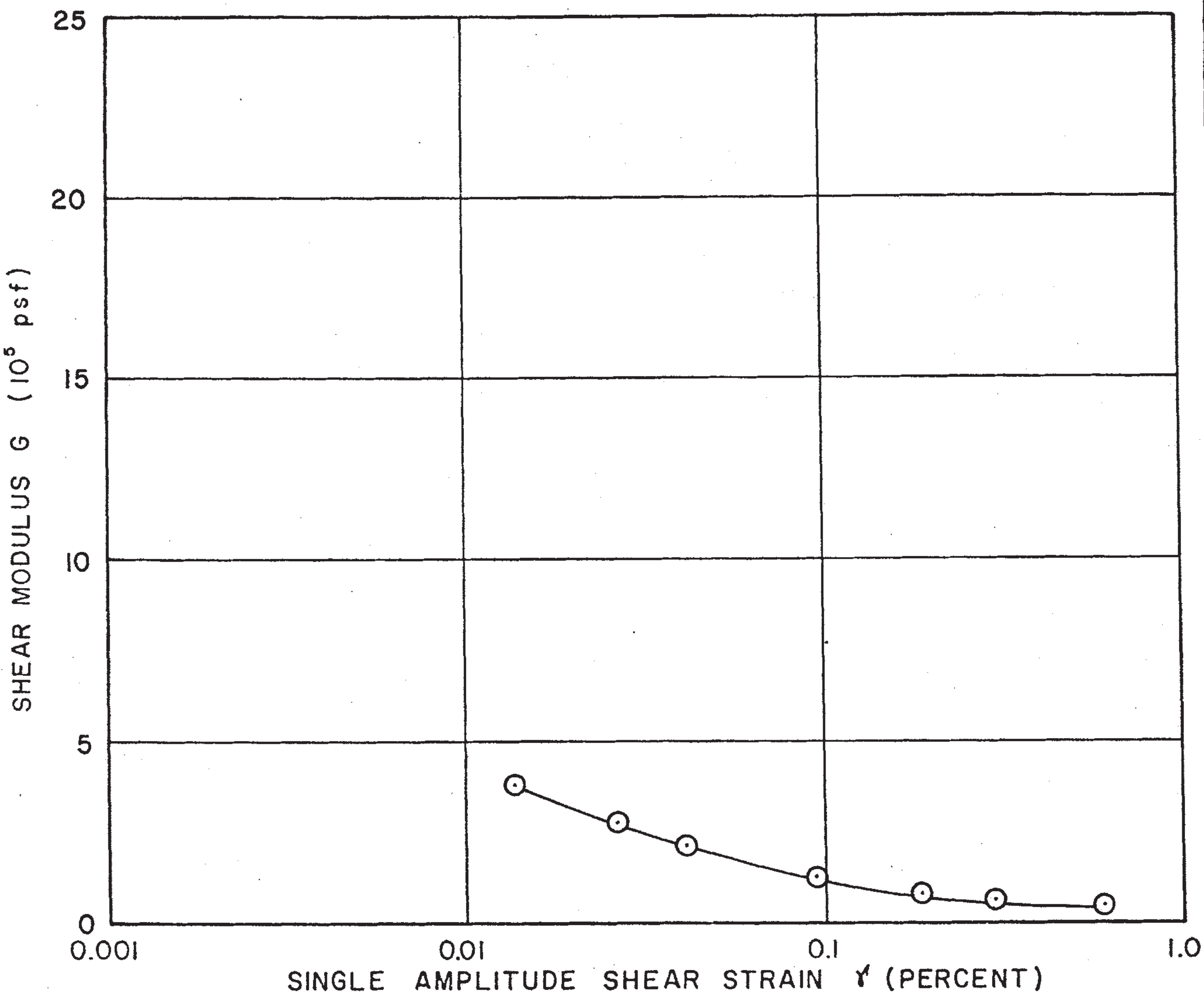
CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-313

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-14)

(SHEET 1 of 4)

BORING H-14 @ ELEVATION 635.3 FEET
GRAY FINE TO COARSE SANDY SILT WITH
SOME CLAY AND FINE GRAVEL
(ILLINOIAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 9.5%
FIELD DRY DENSITY: 140 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE



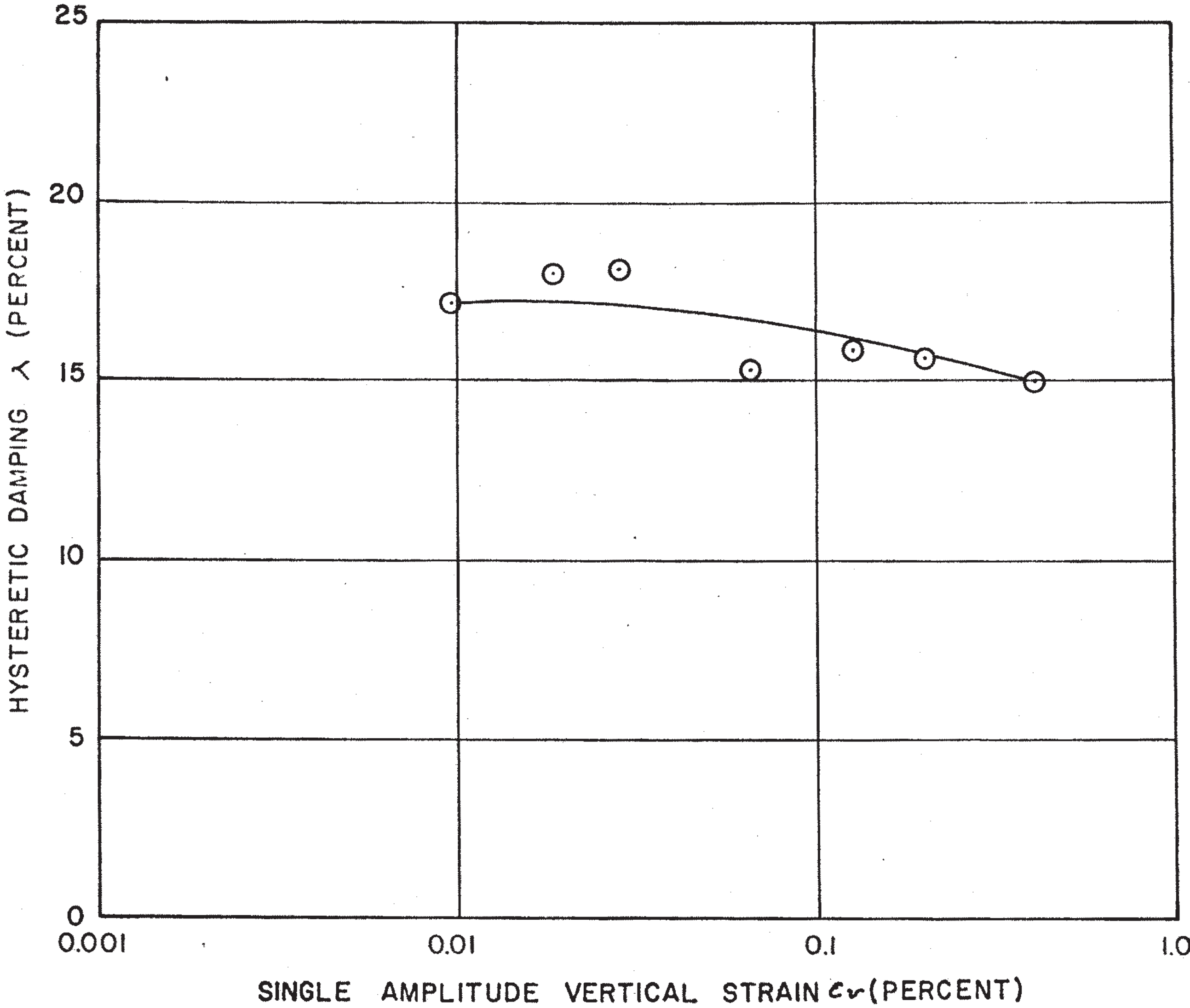
CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-313

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-14)

(SHEET 2 of 4)

BORING H-14 @ ELEVATION 635.3 FEET
GRAY FINE TO COARSE SANDY SILT WITH
SOME CLAY AND FINE GRAVEL
(ILLINOIAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 9.5%
FIELD DRY DENSITY: 140 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE



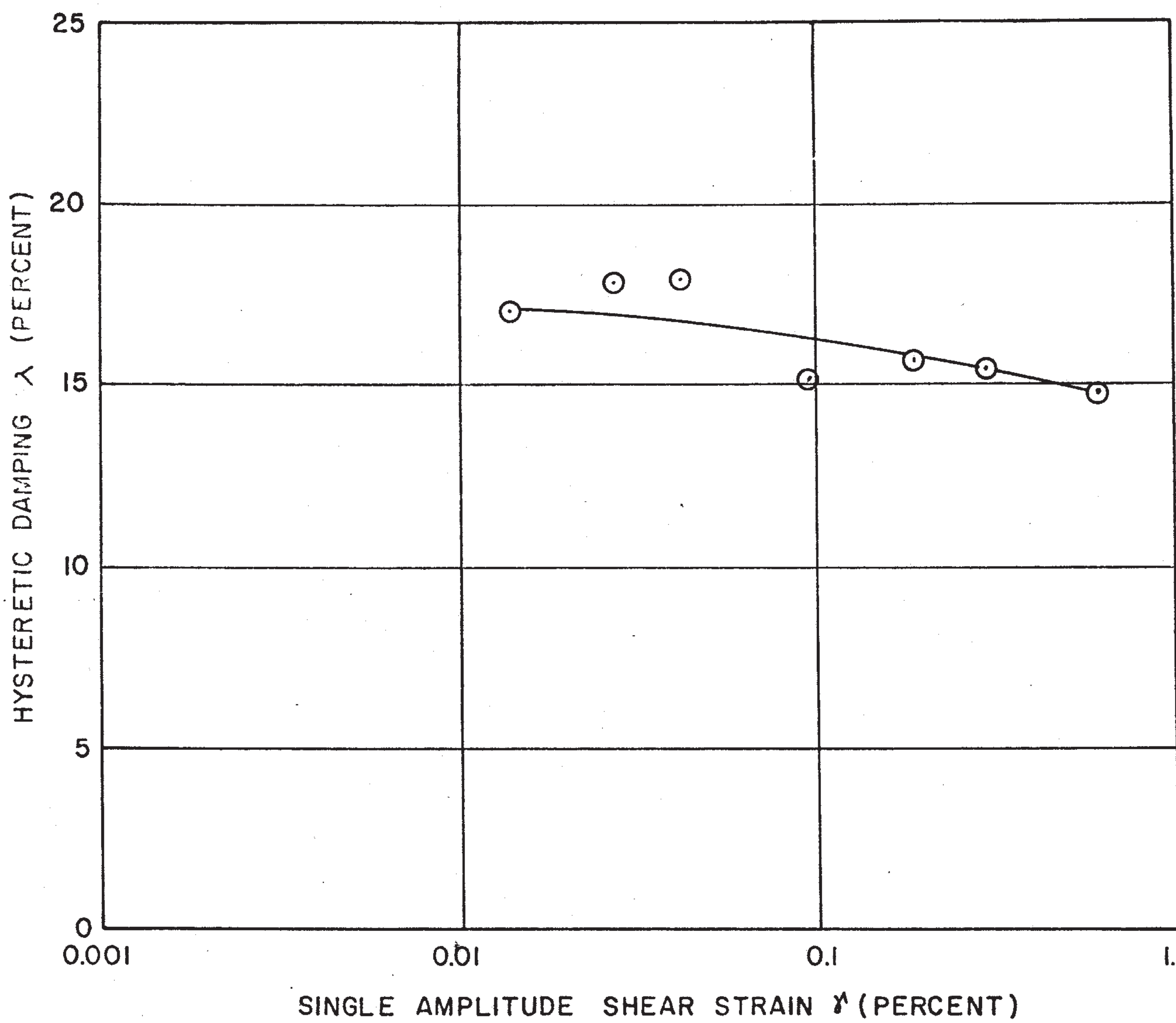
CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-313

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-14)

(SHEET 3 of 4)

BORING H-14 @ ELEVATION 635.3 FEET
GRAY FINE TO COARSE SANDY SILT WITH
SOME CLAY AND FINE GRAVEL
(ILLINOIAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 9.5%
FIELD DRY DENSITY: 140 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE



CLINTON POWER STATION
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FIGURE 2.5-313

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-14)

(SHEET 4 of 4)

BORING H-20 @ ELEVATION 706.8 FEET
GRAY FINE SANDY SILT WITH SOME CLAY
AND MEDIUM TO COARSE SAND AND GRAVEL
(WISCONSINAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 8.6%
FIELD DRY DENSITY: 136 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE

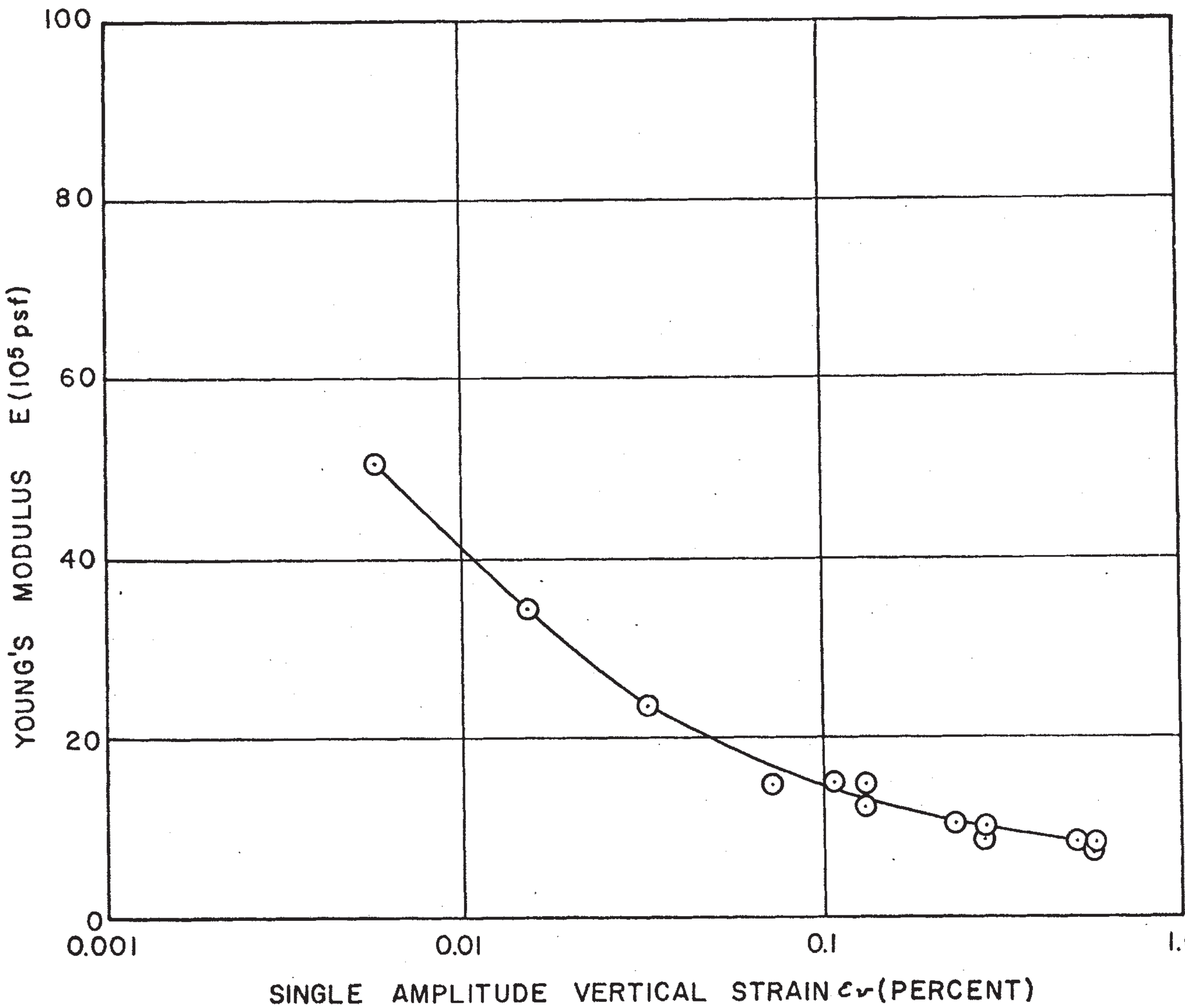

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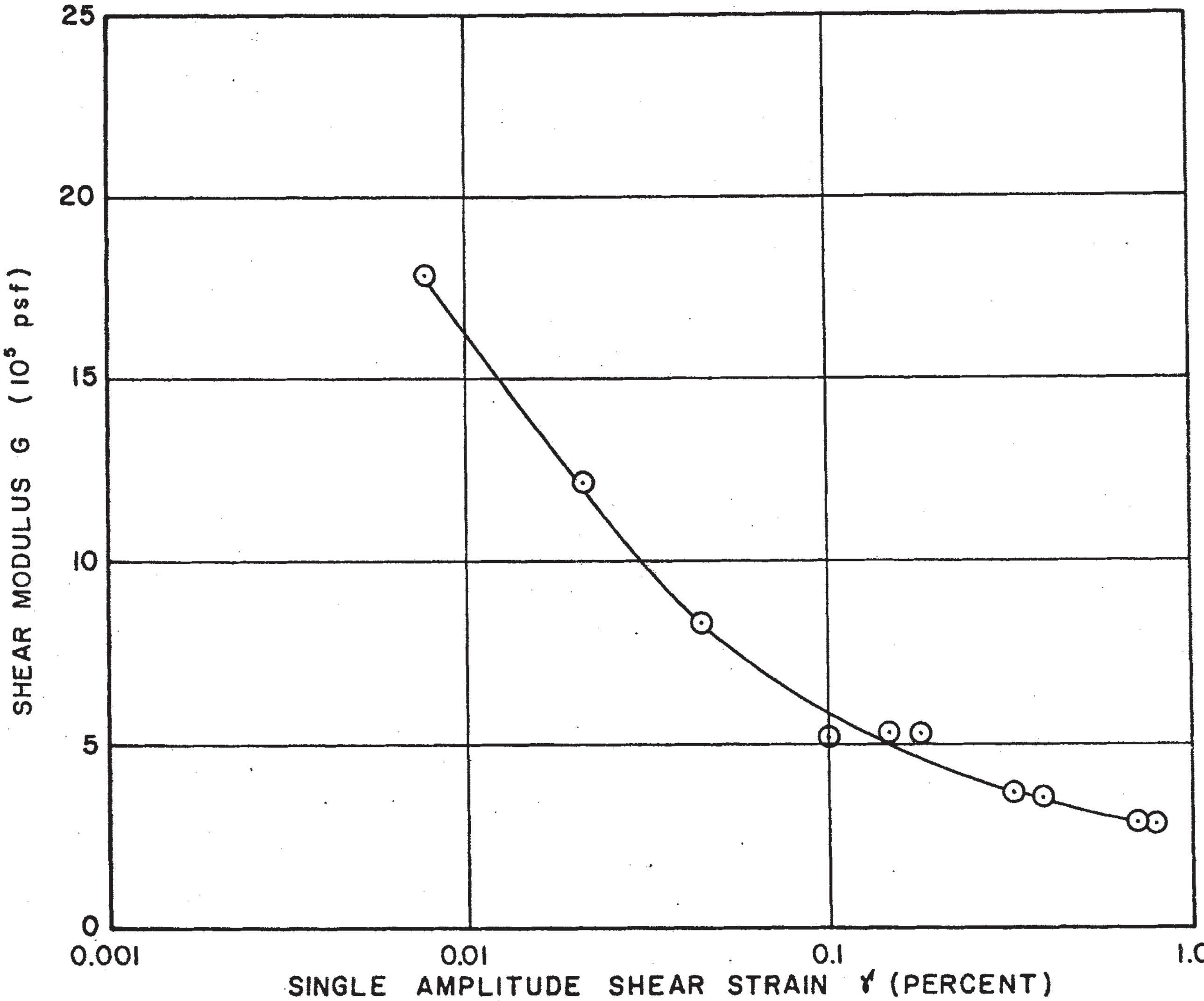
FIGURE 2.5-314

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-20)

(SHEET 1 of 12)

BORING H-20 @ ELEVATION 706.8 FEET
GRAY FINE SANDY SILT WITH SOME CLAY
AND MEDIUM TO COARSE SAND AND GRAVEL
(WISCONSINAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 8.6%
FIELD DRY DENSITY: 136 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE



CLINTON POWER STATION
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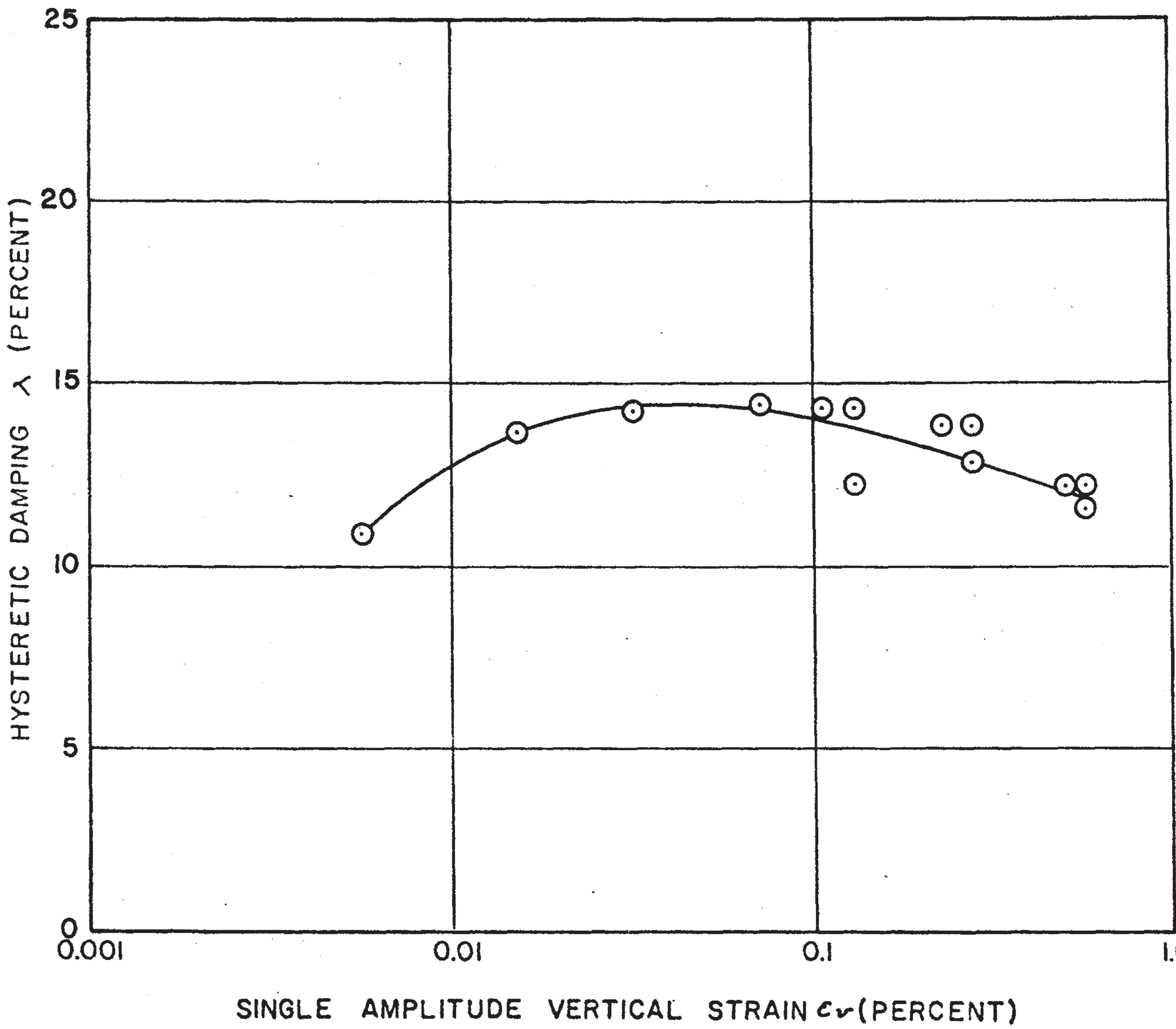
FIGURE 2.5-314

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-20)

(SHEET 2 of 12)

BORING H-20 @ ELEVATION 706.8 FEET
GRAY FINE SANDY SILT WITH SOME CLAY
AND MEDIUM TO COARSE SAND AND GRAVEL
(WISCONSINAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 8.6%
FIELD DRY DENSITY: 136 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE



CLINTON POWER STATION
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FIGURE 2.5-314

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-20)

(SHEET 3 of 12)

BORING H-20 @ ELEVATION 706.8 FEET
GRAY FINE SANDY SILT WITH SOME CLAY
AND MEDIUM TO COARSE SAND AND GRAVEL
(WISCONSINAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 8.6%
FIELD DRY DENSITY: 136 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE

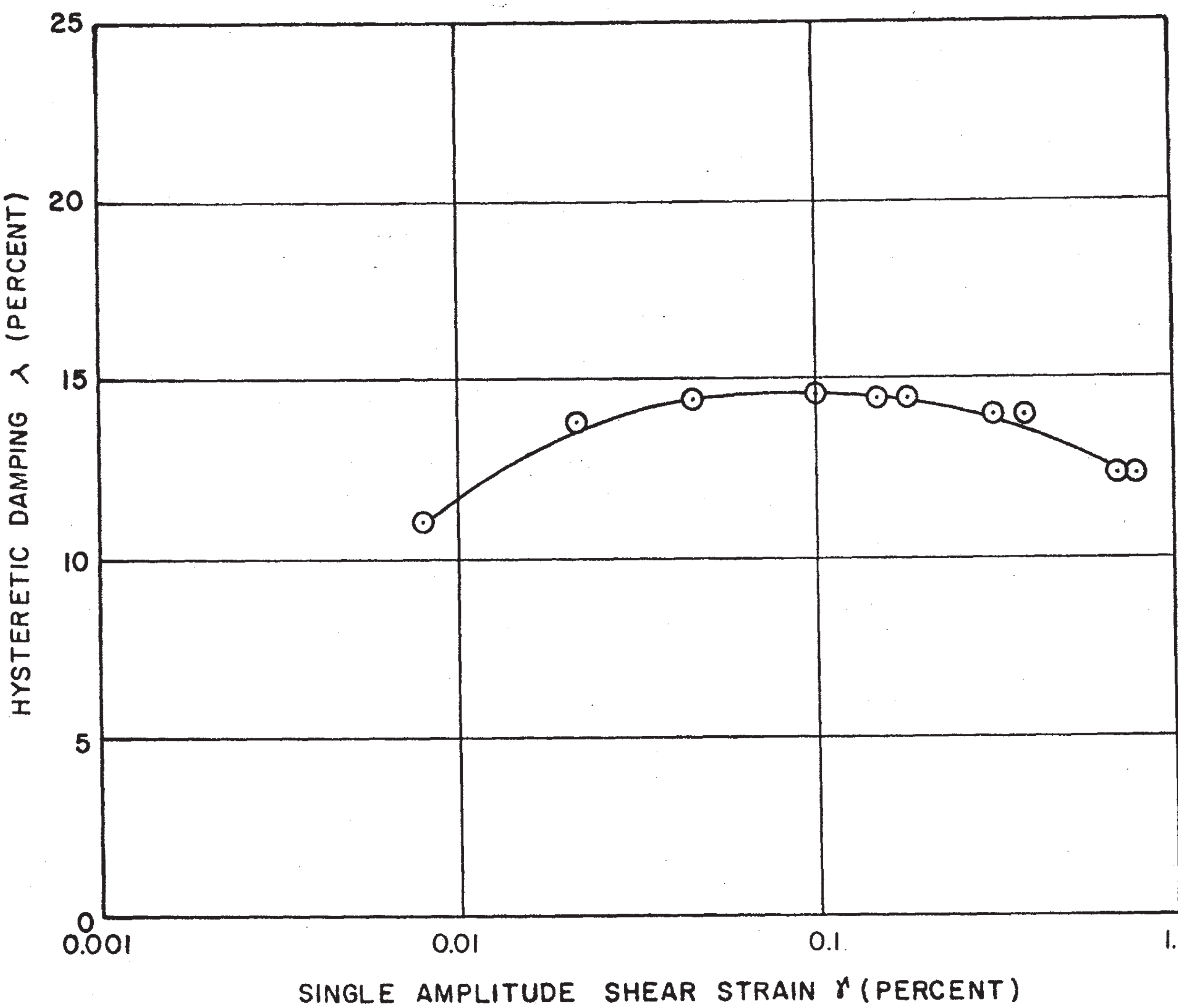

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FIGURE 2.5-314

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-20)

(SHEET 4 of 12)

BORING H-20 @ ELEVATION 686.8 FEET
DARK GRAY CLAYEY SILT WITH TRACES
OF FINE SAND
(INTERGLACIAL SOIL)
FIELD MOISTURE CONTENT:
FIELD DRY DENSITY:
TEST DATA OBTAINED FROM PITCHER SAMPLE

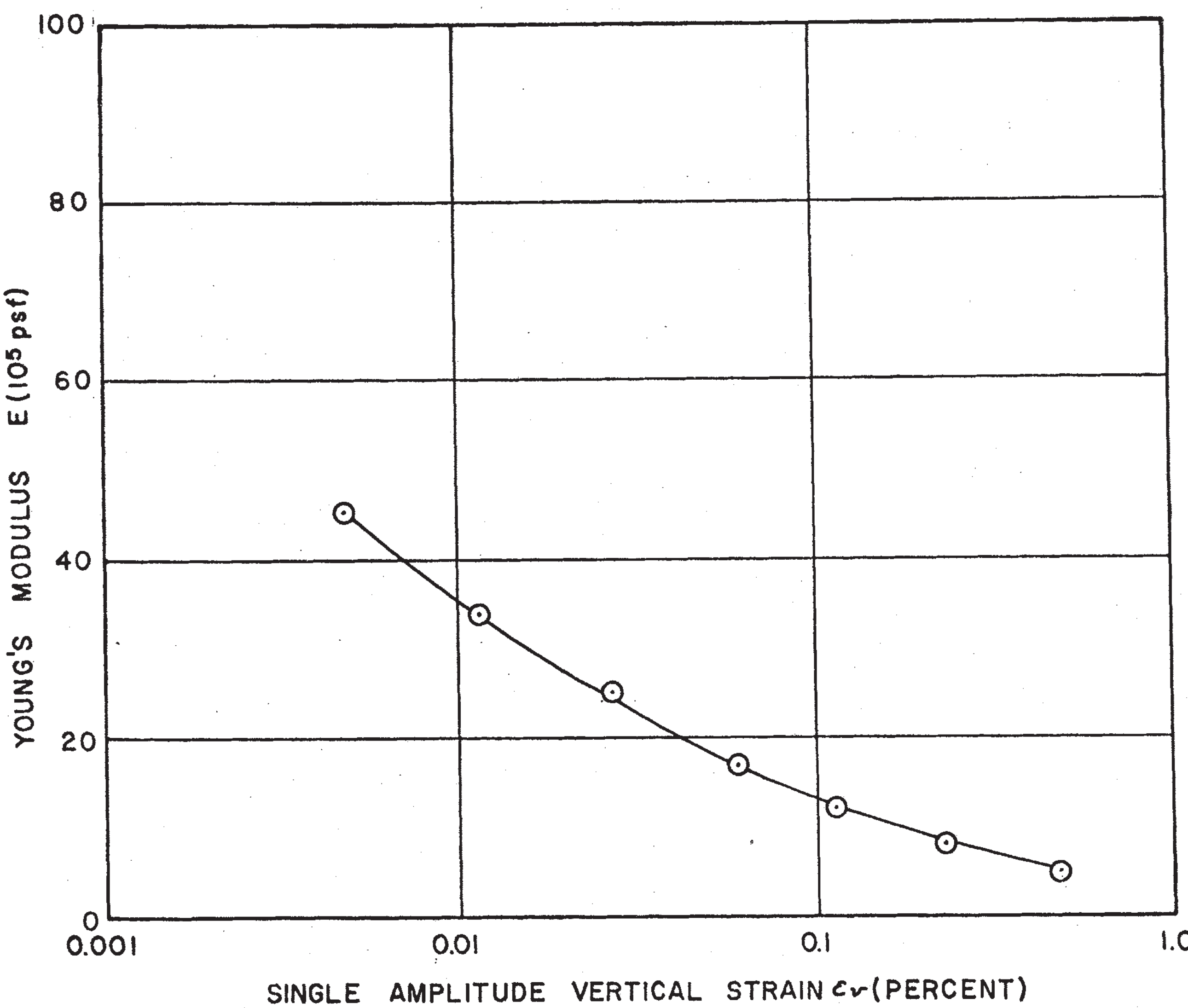

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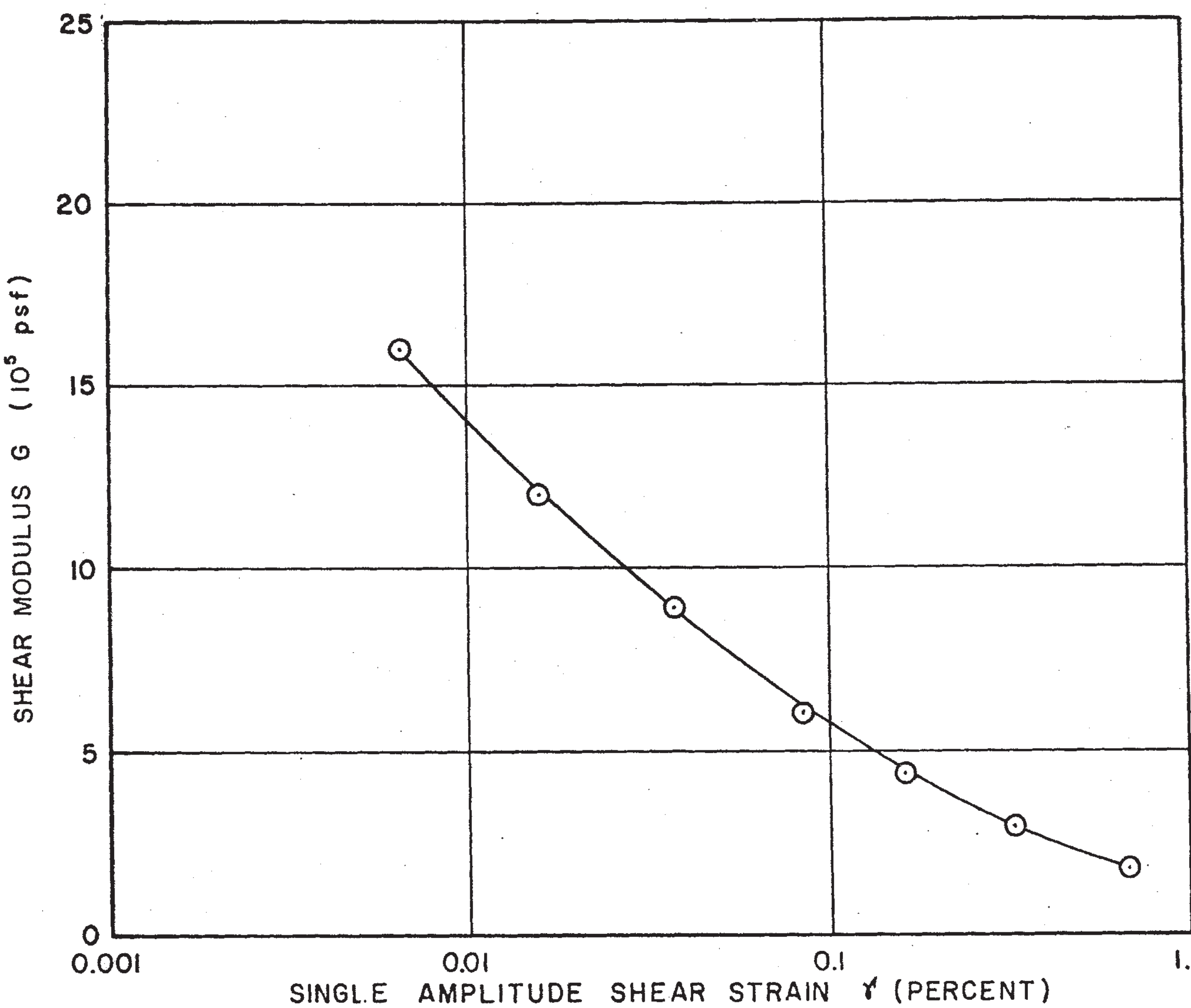
FIGURE 2.5-314

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-20)

(SHEET 5 of 12)

BORING H-20 @ ELEVATION 686.8 FEET
DARK GRAY CLAYEY SILT WITH TRACES
OF FINE SAND
(INTERGLACIAL SOIL)
FIELD MOISTURE CONTENT:
FIELD DRY DENSITY:
TEST DATA OBTAINED FROM PITCHER SAMPLE



CLINTON POWER STATION
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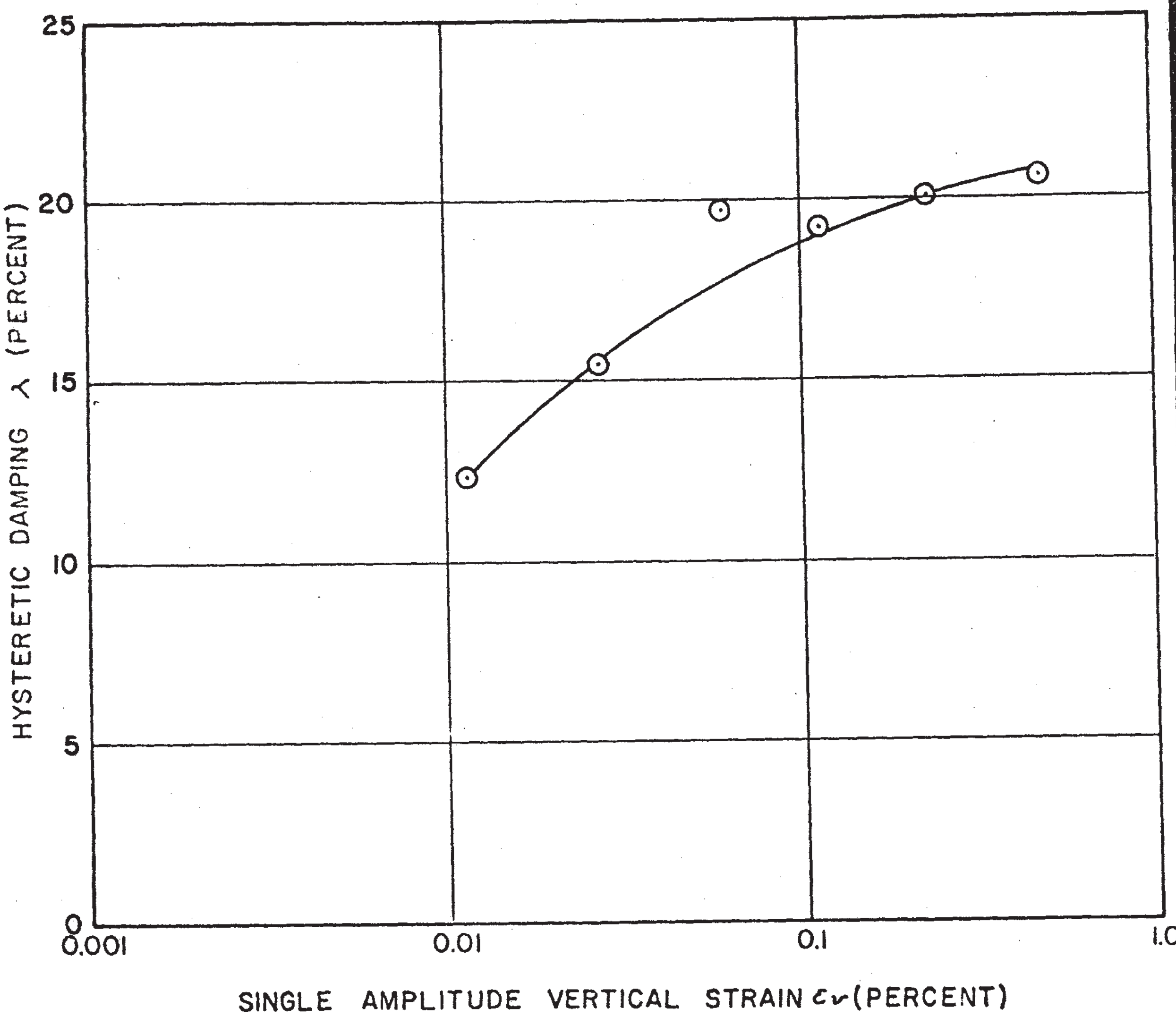
FIGURE 2.5-314

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-20)

(SHEET 6 of 12)

BORING H-20 @ ELEVATION 686.8 FEET
DARK GRAY CLAYEY SILT WITH TRACES
OF FINE SAND
(INTERGLACIAL SOIL)
FIELD MOISTURE CONTENT:
FIELD DRY DENSITY:
TEST DATA OBTAINED FROM PITCHER SAMPLE



CLINTON POWER STATION
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FIGURE 2.5-314

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-20)

(SHEET 7 of 12)

BORING H-20 @ ELEVATION 686.8 FEET
DARK GRAY CLAYEY SILT WITH TRACES
OF FINE SAND
(INTERGLACIAL SOIL)
FIELD MOISTURE CONTENT:
FIELD DRY DENSITY:
TEST DATA OBTAINED FROM PITCHER SAMPLE

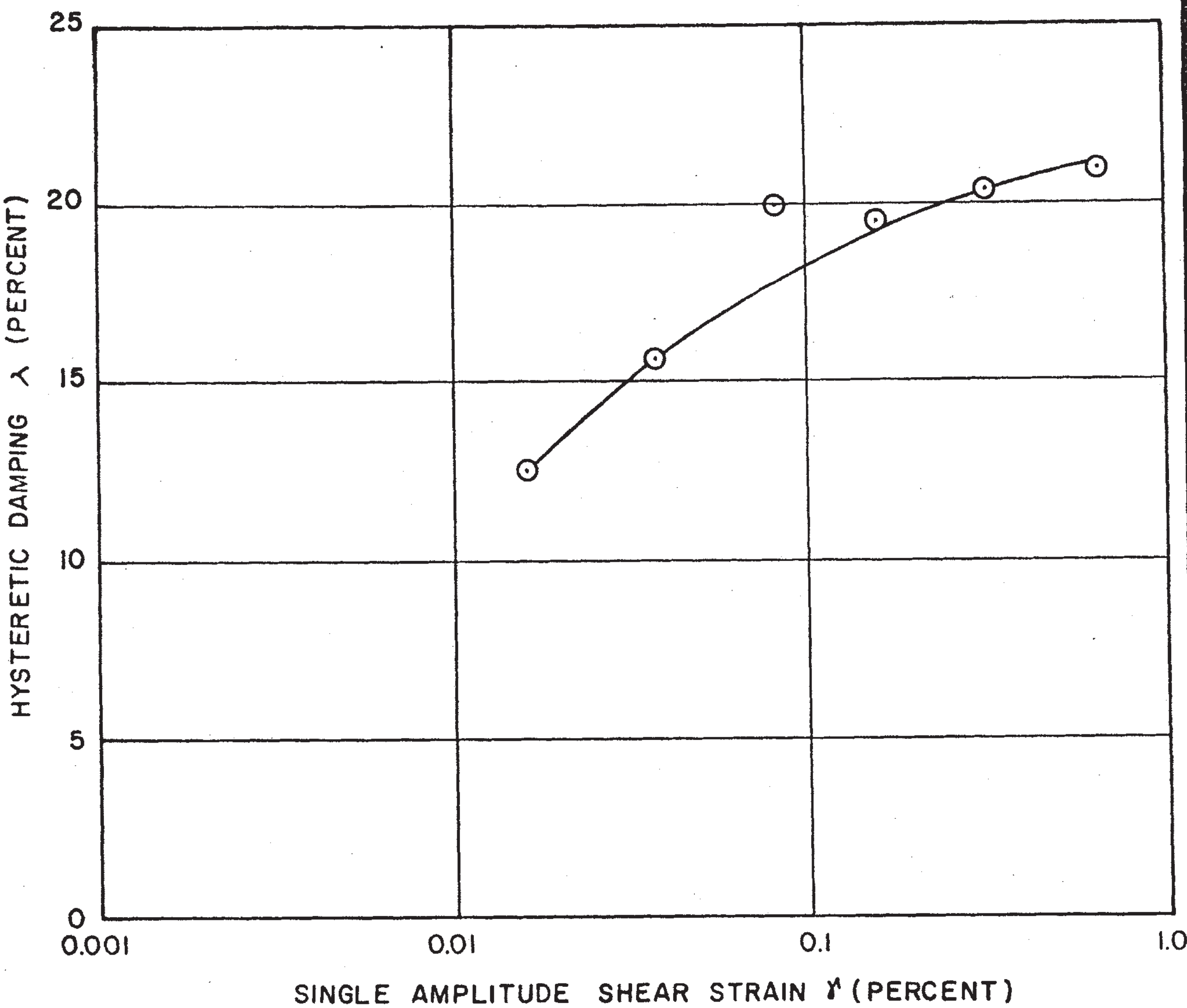

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FIGURE 2.5-314

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-20)
(SHEET 8 of 12)

BORING H-20 @ ELEVATION 672.3 FEET
GRAY FINE TO COARSE SANDY SILT WITH
SOME CLAY AND GRAVEL
(ILLINOIAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 10.5%
FIELD DRY DENSITY: 136 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE

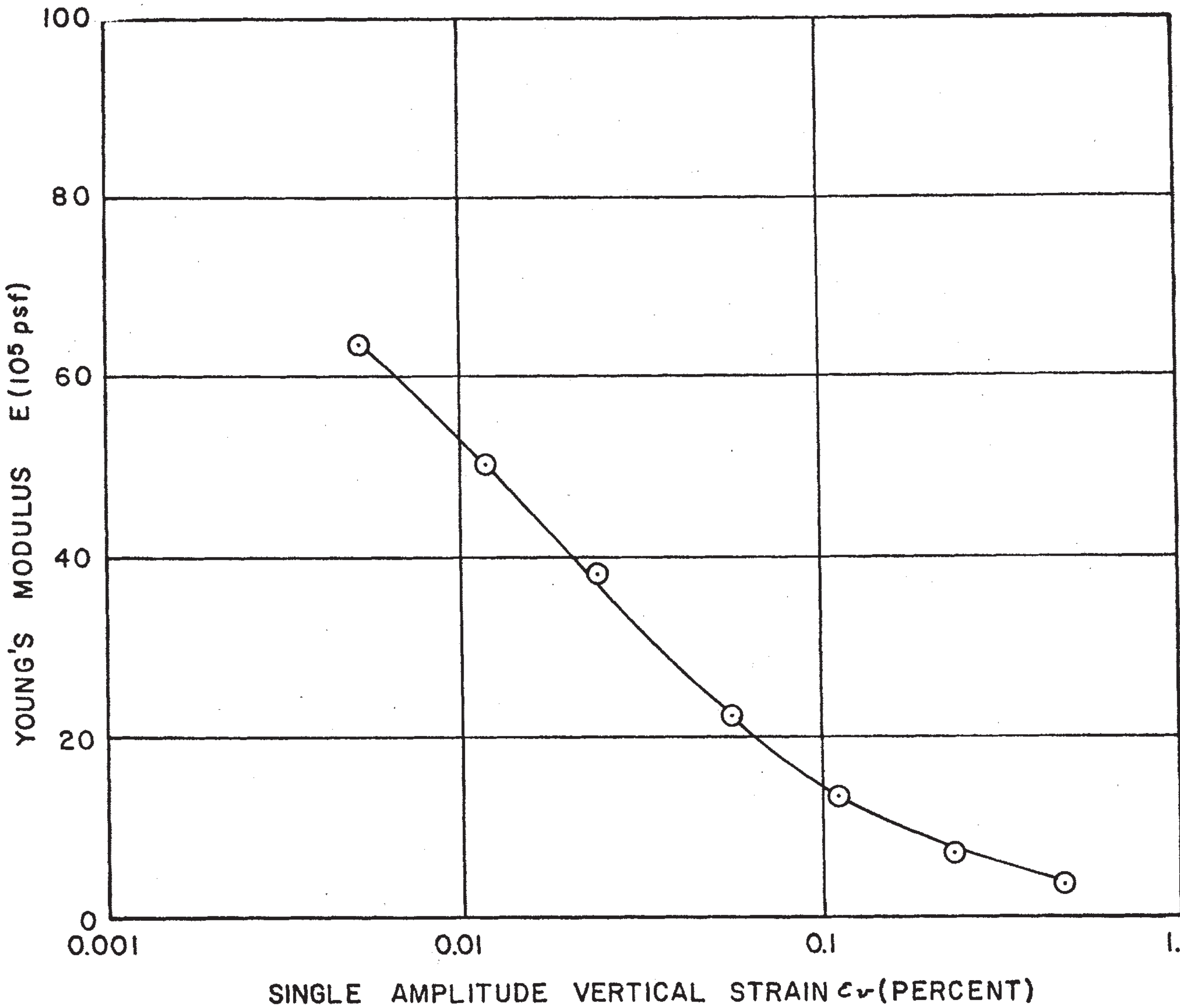

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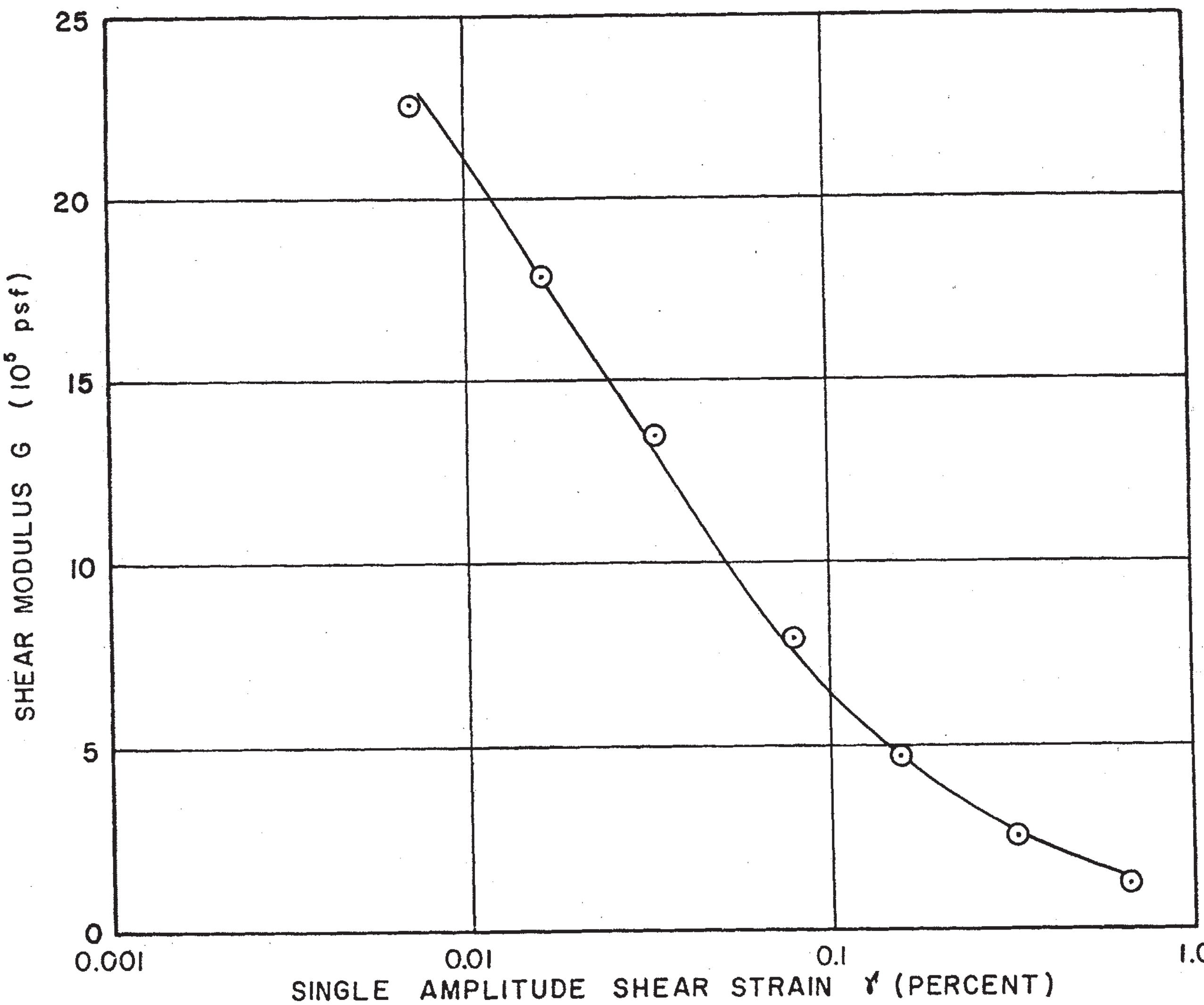
FIGURE 2.5-314

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-20)

(SHEET 9 of 12)

BORING H-20 @ ELEVATION 672.3 FEET
GRAY FINE TO COARSE SANDY SILT WITH
SOME CLAY AND GRAVEL
(ILLINOIAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 10.5%
FIELD DRY DENSITY: 136 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE



CLINTON POWER STATION
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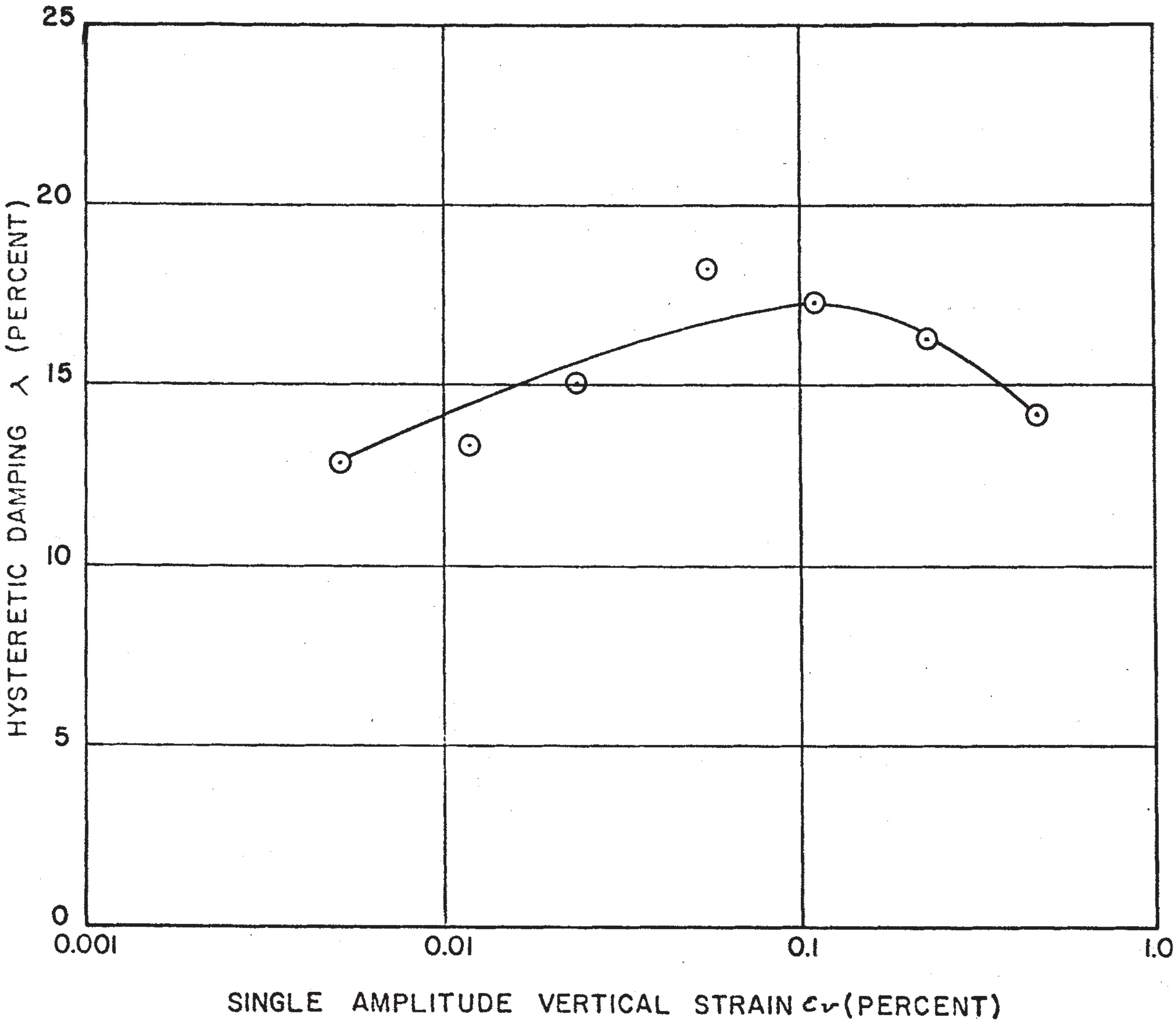
FIGURE 2.5-314

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-20)

(SHEET 10 of 12)

BORING H-20 @ ELEVATION 672.3 FEET
GRAY FINE TO COARSE SANDY SILT WITH
SOME CLAY AND GRAVEL
(ILLINOIAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 10.5%
FIELD DRY DENSITY: 136 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE



CLINTON POWER STATION
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FIGURE 2.5-314

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-20)

(SHEET 11 of 12)

BORING H-20 @ ELEVATION 672.3 FEET
GRAY FINE TO COARSE SANDY SILT WITH
SOME CLAY AND GRAVEL
(ILLINOIAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 10.5%
FIELD DRY DENSITY: 136 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE

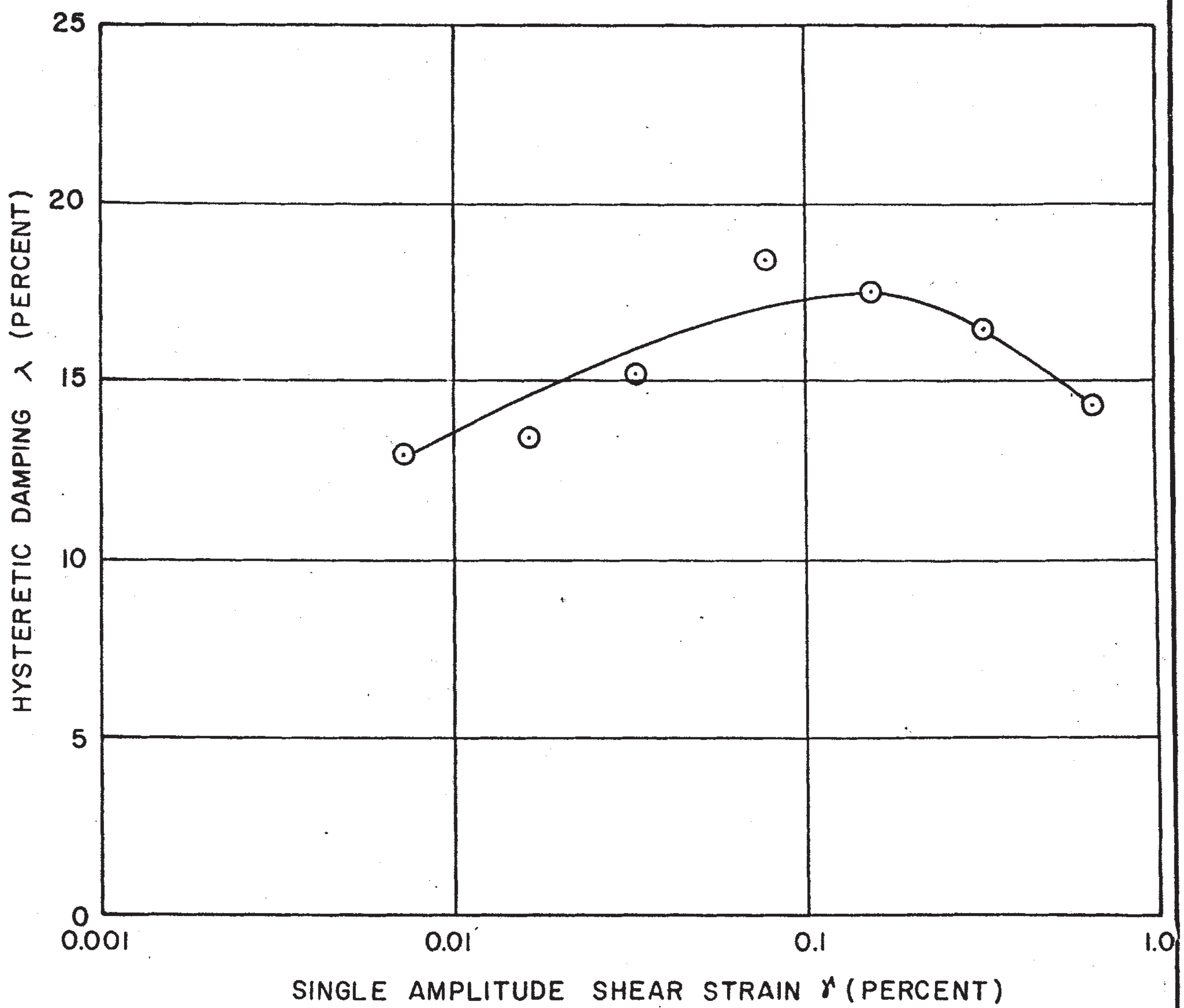

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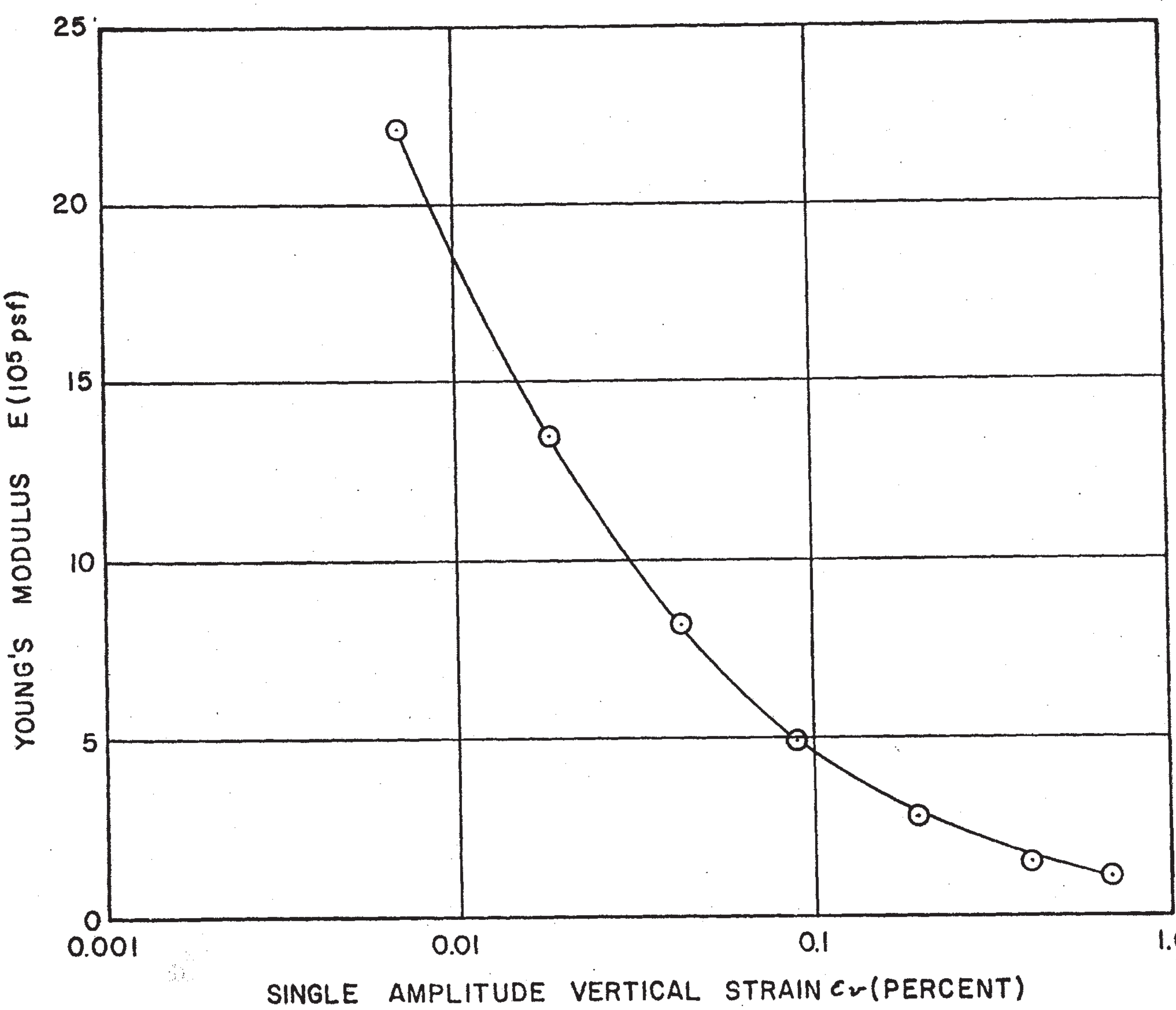
FIGURE 2.5-314

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-20)

(SHEET 12 of 12)

BORING H-23 @ ELEVATION 677.8 FEET
GRAY FINE TO COARSE SANDY SILT WITH
SOME CLAY AND FINE GRAVEL
(ILLINOIAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 9.1%
FIELD DRY DENSITY: 138 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE



CLINTON POWER STATION
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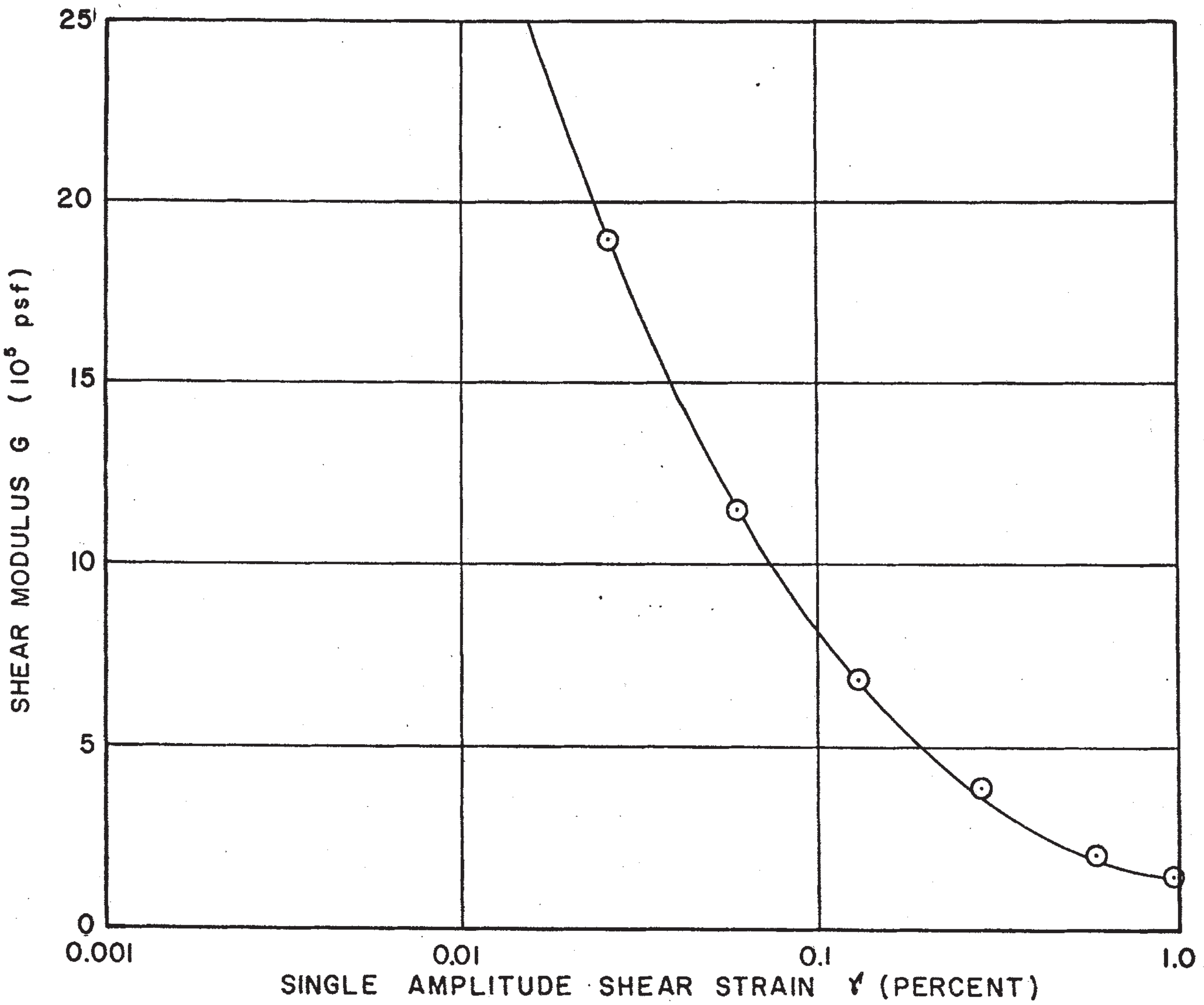
FIGURE 2.5-315

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-23)

(SHEET 1 of 4)

BORING H-23 @ ELEVATION 677.8 FEET
GRAY FINE TO COARSE SANDY SILT WITH
SOME CLAY AND FINE GRAVEL
(ILLINOIAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 9.1%
FIELD DRY DENSITY: 138 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE



CLINTON POWER STATION
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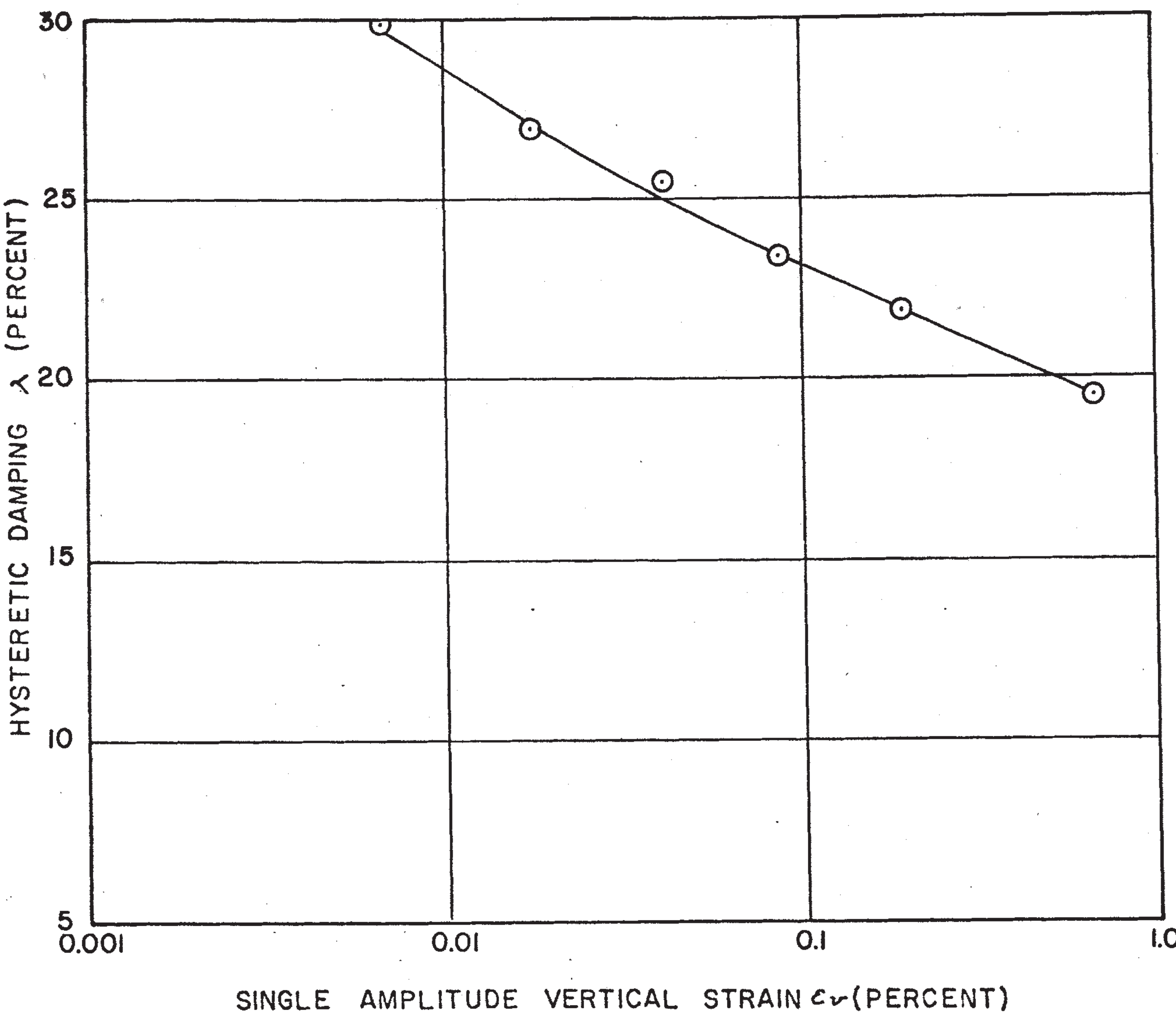
FIGURE 2.5-315

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-23)

(SHEET 2 of 4)

BORING H-23 @ ELEVATION 677.8 FEET
GRAY FINE TO COARSE SANDY SILT WITH
SOME CLAY AND FINE GRAVEL
(ILLINOIAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 9.1%
FIELD DRY DENSITY: 138 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE



CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT
FIGURE 2.5-315 DYNAMIC TRIAXIAL COMPRESSION TESTS (BORING H-23) (SHEET 3 of 4)

BORING H-23 @ ELEVATION 677.8 FEET
GRAY FINE TO COARSE SANDY SILT WITH
SOME CLAY AND FINE GRAVEL
(ILLINOIAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 9.1%
FIELD DRY DENSITY: 138 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE

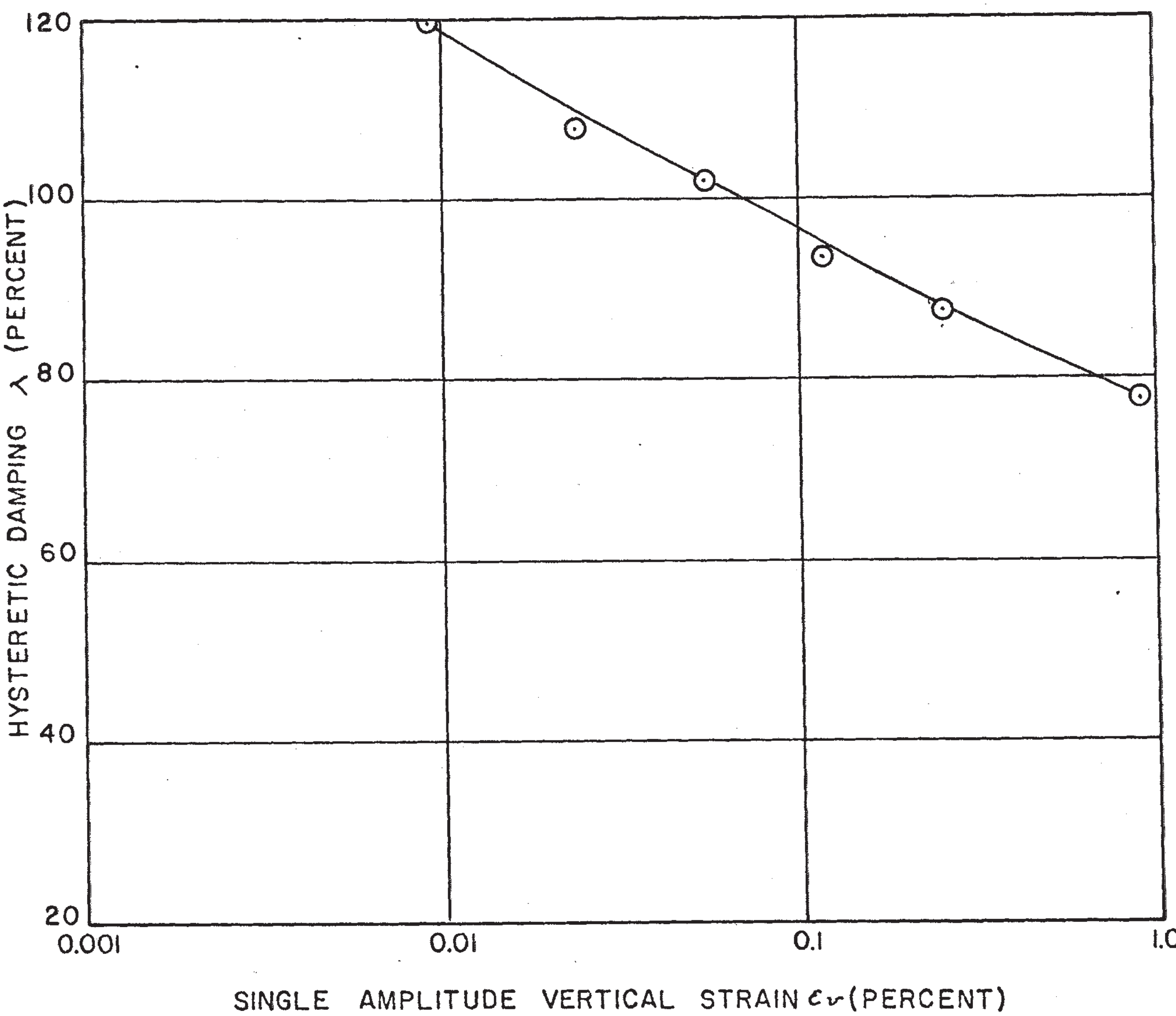


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FIGURE 2.5-315

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-23)

(SHEET 4 of 4)

BORING H-30 @ ELEVATION 638.5 FEET
DARK GRAY FINE TO COARSE SANDY SILT
WITH SOME GRAVEL AND TRACES OF CLAY
(ILLINOIAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 6.8%
FIELD DRY DENSITY: 145 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE

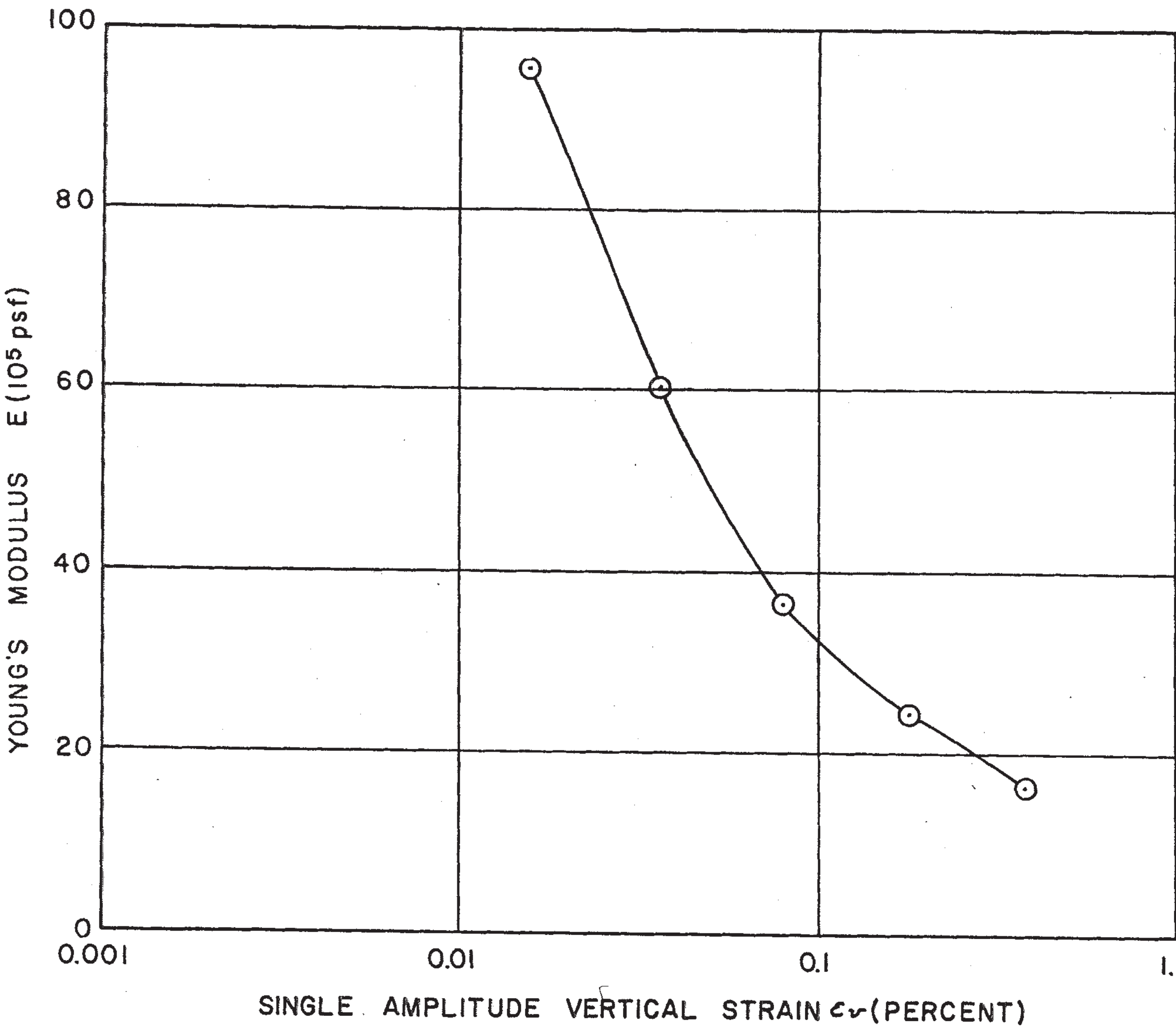

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FIGURE 2.5-316

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-30)

(SHEET 1 of 4)

BORING H-30 @ ELEVATION 638.5 FEET
DARK GRAY FINE TO COARSE SANDY SILT
WITH SOME GRAVEL AND TRACES OF CLAY
(ILLINOIAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 6.8%
FIELD DRY DENSITY: 145 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE

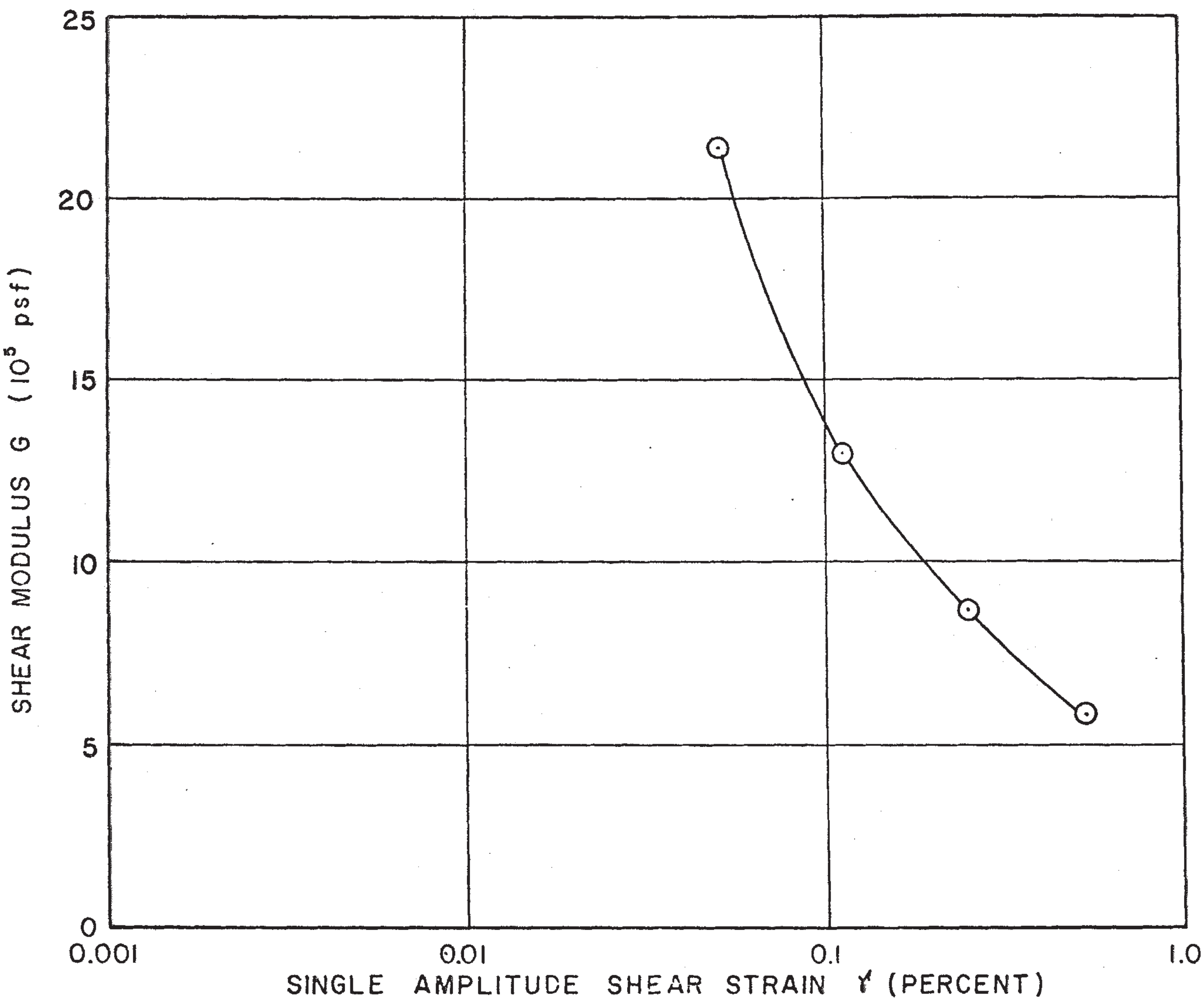

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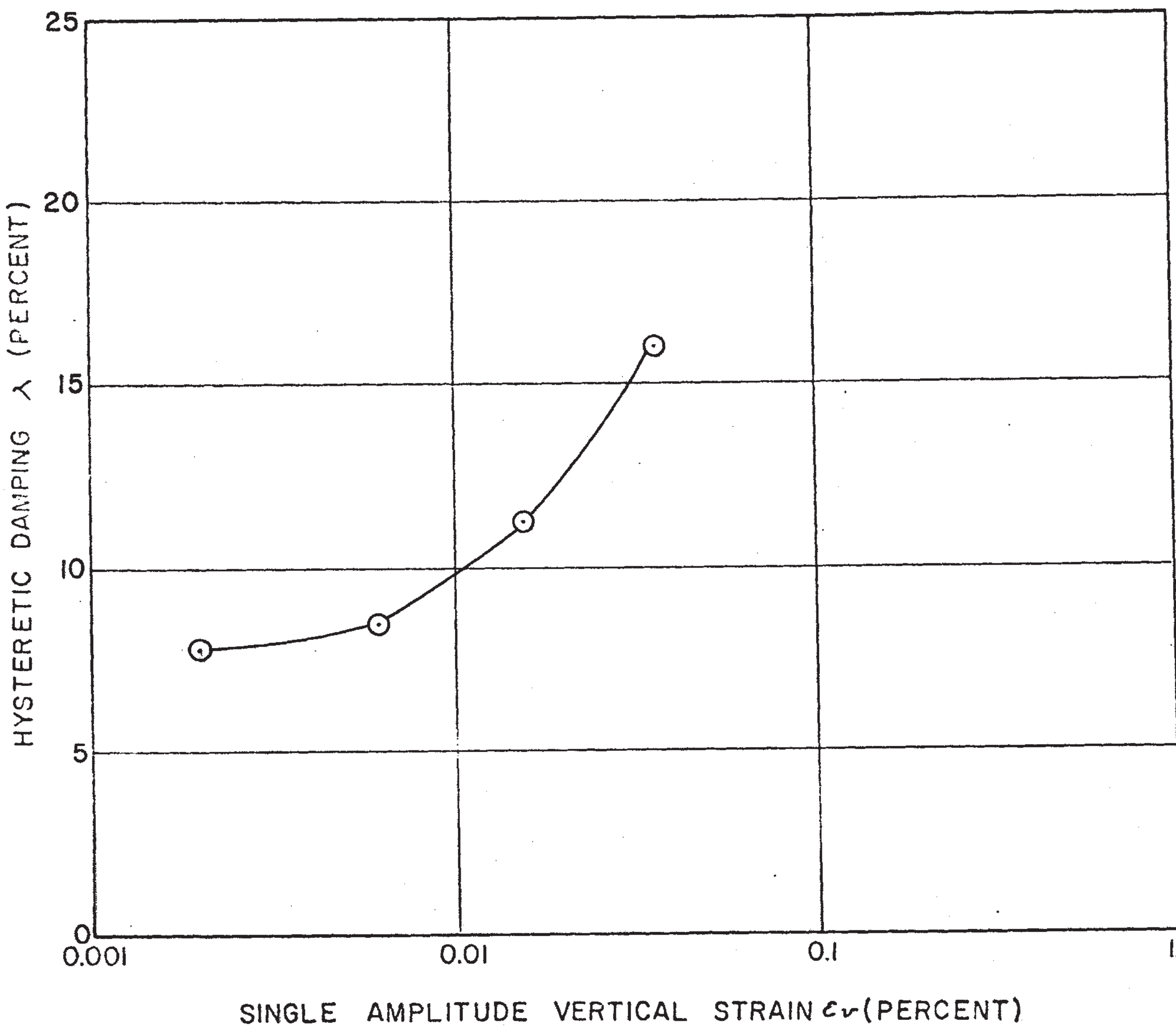
FIGURE 2.5-316

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-30)

(SHEET 2 of 4)

BORING H-30 @ ELEVATION 638.5 FEET
DARK GRAY FINE TO COARSE SANDY SILT
WITH SOME GRAVEL AND TRACES OF CLAY
(ILLINOIAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 6.8%
FIELD DRY DENSITY: 145 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE



CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-316

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-30)

(SHEET 3 of 4)

BORING H-30 @ ELEVATION 638.5 FEET
DARK GRAY FINE TO COARSE SANDY SILT
WITH SOME GRAVEL AND TRACES OF CLAY
(ILLINOIAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 6.8%
FIELD DRY DENSITY: 145 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE

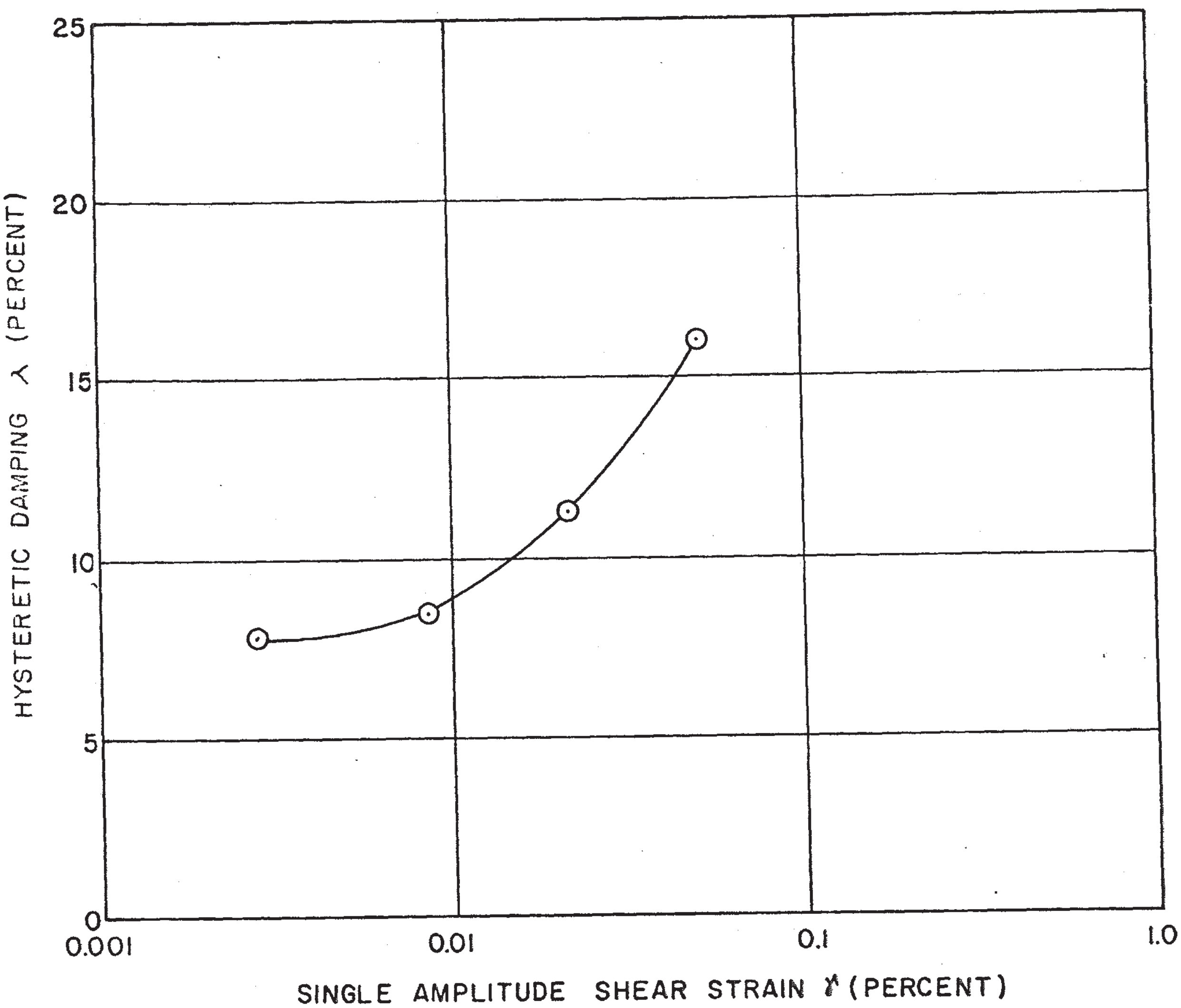


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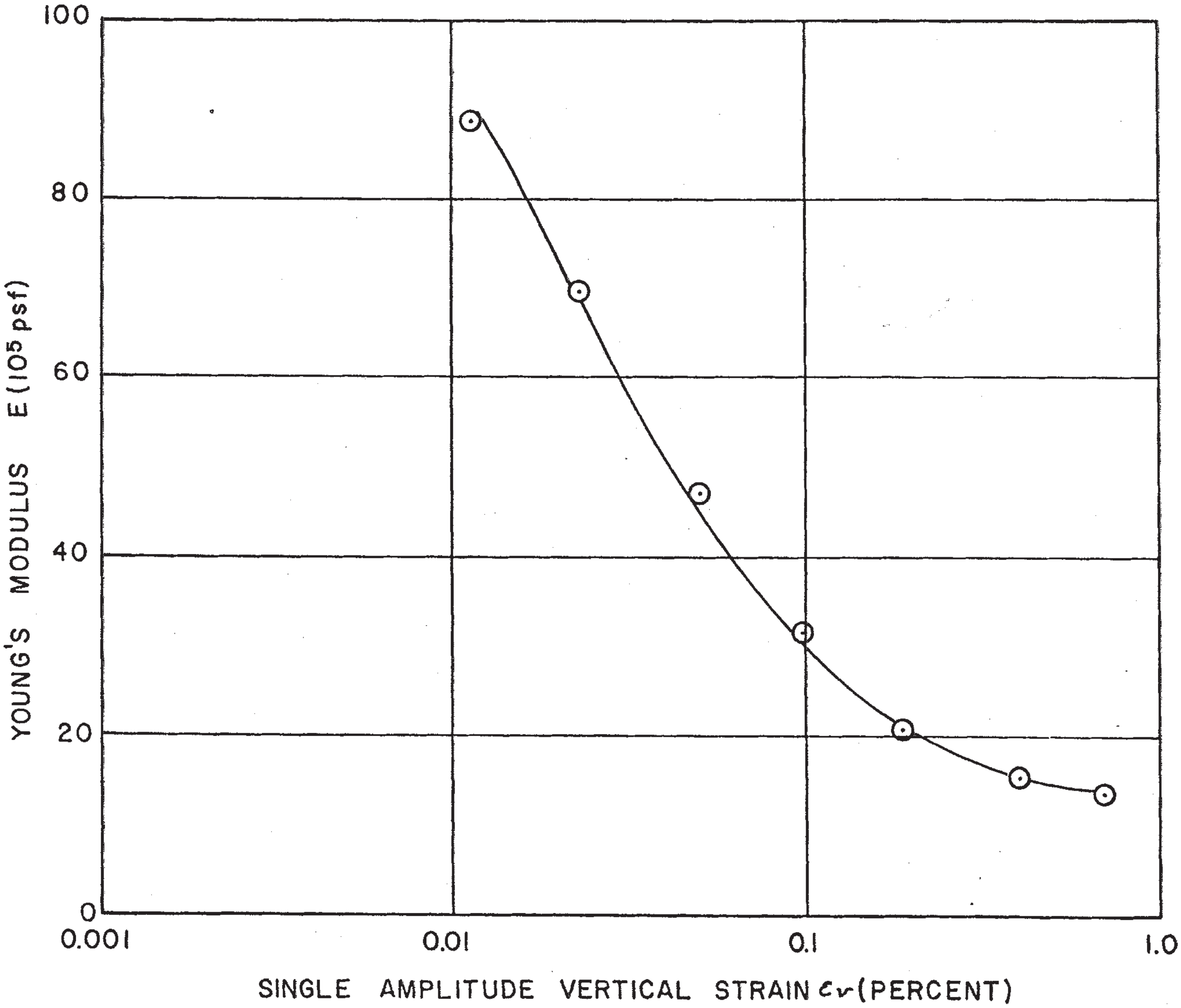
FIGURE 2.5-316

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-30)

(SHEET 4 of 4)

BORING H-36 @ ELEVATION 622.7 FEET
GRAY CLAYEY SILT WITH SOME FINE TO COARSE SAND AND GRAVEL
(ILLINOIAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 9.4%
FIELD DRY DENSITY: 137 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE



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UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-317

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-36)

(SHEET 1 of 4)

BORING H-36 @ ELEVATION 622.7 FEET
GRAY CLAYEY SILT WITH SOME FINE TO
COARSE SAND AND GRAVEL
(ILLINOIAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 9.4%
FIELD DRY DENSITY: 137 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE

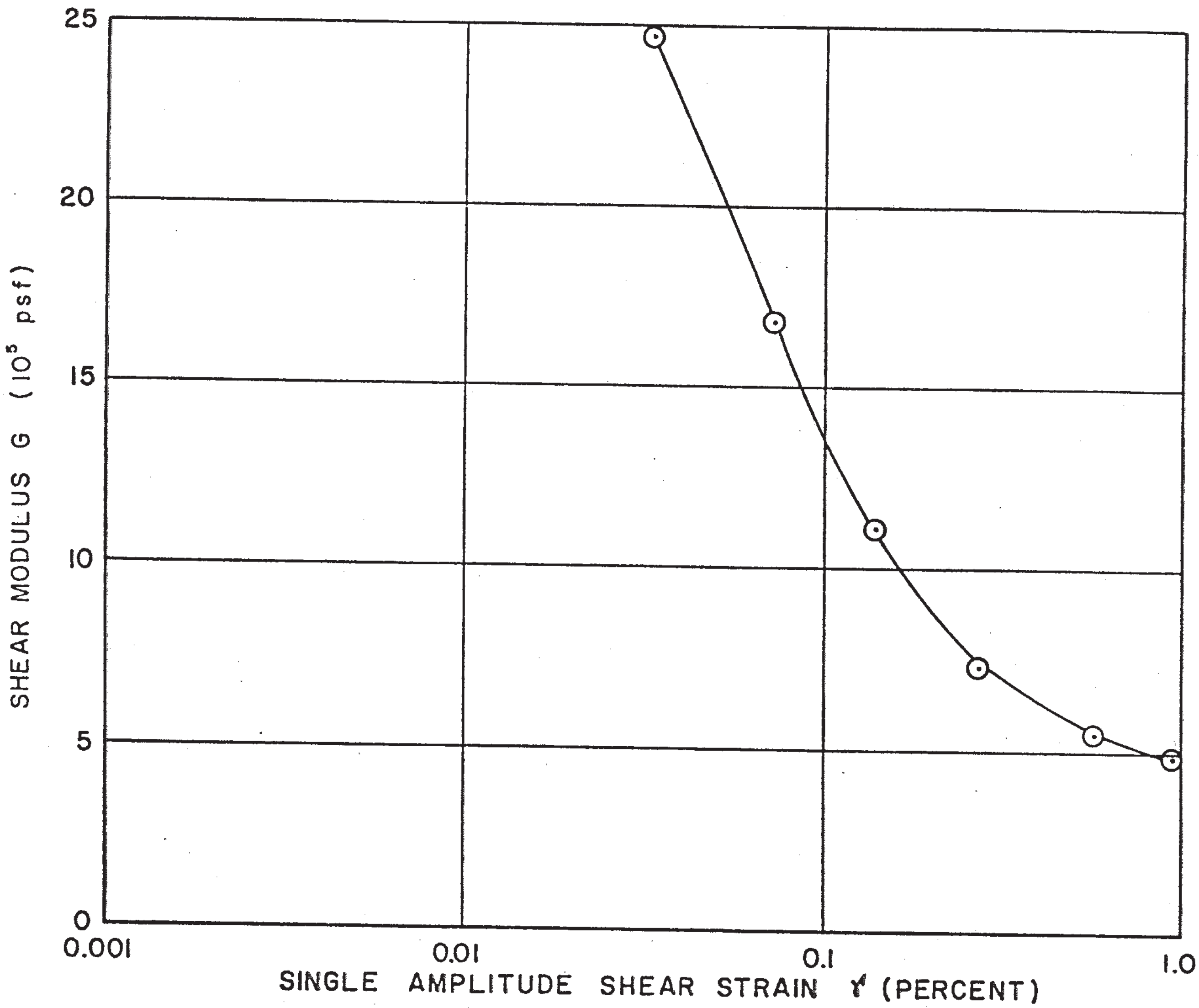

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FIGURE 2.5-317

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-36)

(SHEET 2 of 4)

BORING H-36 @ ELEVATION 622.7 FEET
GRAY CLAYEY SILT WITH SOME FINE TO
COARSE SAND AND GRAVEL
(ILLINOIAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 9.4%
FIELD DRY DENSITY: 137 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE

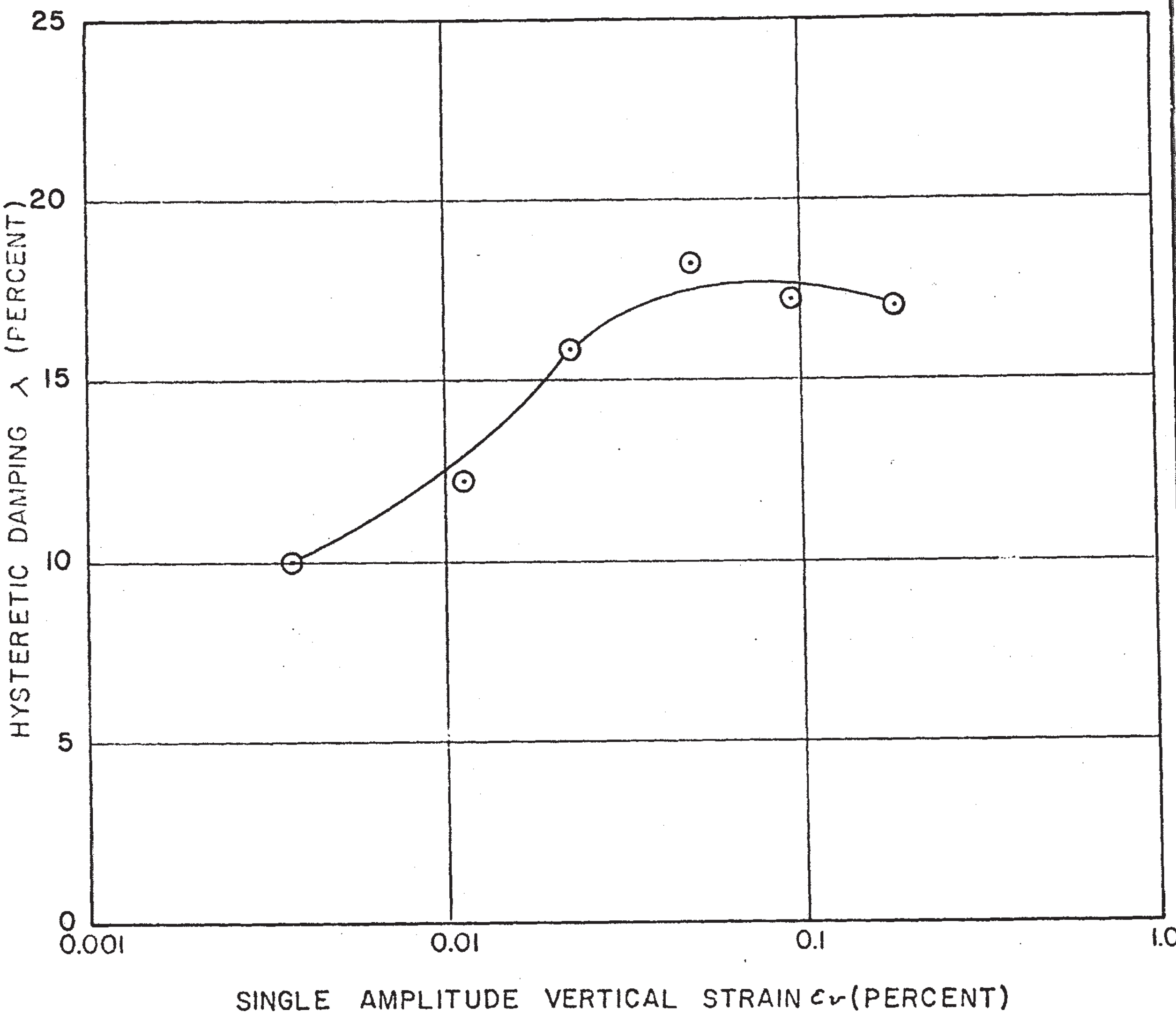

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FIGURE 2.5-317

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-36)
(SHEET 3 of 4)

BORING H-36 @ ELEVATION 622.7 FEET
GRAY CLAYEY SILT WITH SOME FINE TO
COARSE SAND AND GRAVEL
(ILLINOIAN GLACIAL TILL)
FIELD MOISTURE CONTENT: 9.4%
FIELD DRY DENSITY: 137 LBS./CU.FT.
TEST DATA OBTAINED FROM PITCHER SAMPLE

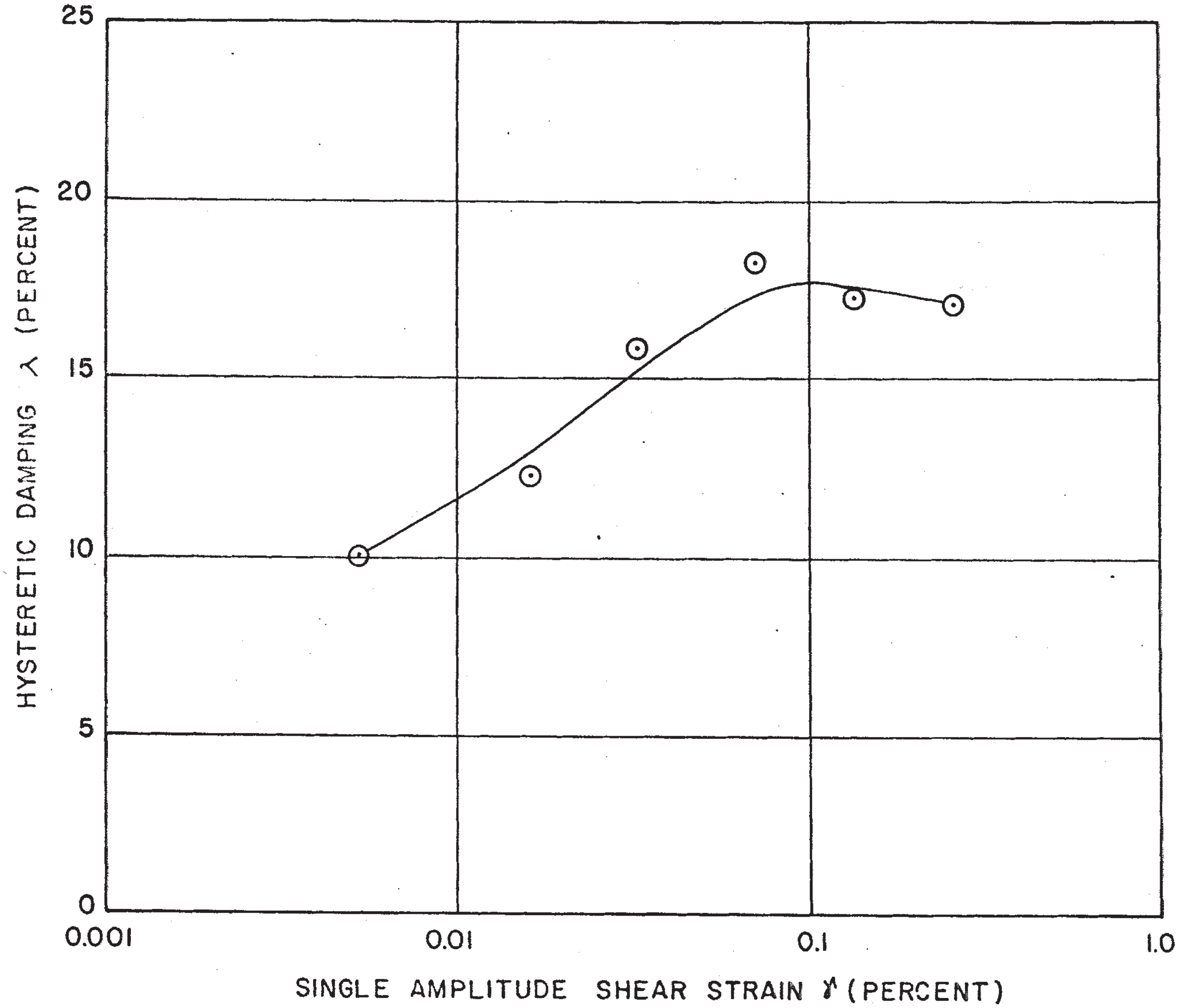

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FIGURE 2.5-317

DYNAMIC TRIAXIAL COMPRESSION TESTS
(BORING H-36)
(SHEET 4 of 4)

METHOD OF PERFORMING RESONANT COLUMN TESTS

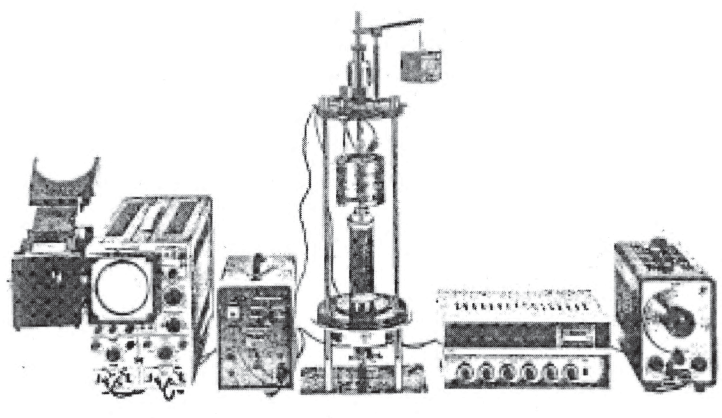

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Figure 2.5-318
Sheet 1 of 2

RESONANT COLUMN TESTS
(METHOD)

Method of Performing Resonant Column Tests

Resonant column tests are performed to determine the dynamic properties of soils under high frequency, small amplitude cyclic strains. The test is based on the fact that analytical solutions can relate the stiffness of the soil column to its resonant frequency. In the test the sample is excited by an oscillating device and the frequency is varied until the maximum response, or resonant frequency, is found.

The Dames and Moore resonant column apparatus subjects solid cylindrical samples to torsional oscillations. The sample base is fixed and the top of the sample is excited by a Hardin oscillator which is driven by a variable frequency sine wave generator. The response of the sample is measured by an accelerometer mounted in the oscillator and the output is displayed on an oscilloscope.

The equivalent linear shear modulus of the soil is obtained from the resonant frequency of the system after the manner suggested by Drnevich and Hardin ("Proposed Standard for Modulus and Damping of Soils by the Resonant Column Method", ASTM Committee D18.09, May 1974). The shear modulus of soils varies with the shear strain amplitude and thus actually varies along the radius of the sample but in calculating the shear modulus the average shear strain is taken to correspond to the cyclic shear strain developed two-thirds of the distance along the radius. The damping ratio at small strains may be computed from measurements of the logarithmic decrement which are obtained by subjecting the sample to a steady state oscillation and then shutting off the input voltage. The decay curve is retained on a recording oscilloscope and may be photographed to make a permanent record.

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Figure 2.5-318
Sheet 2 of 2

RESONANT COLUMN TESTS
(METHOD)

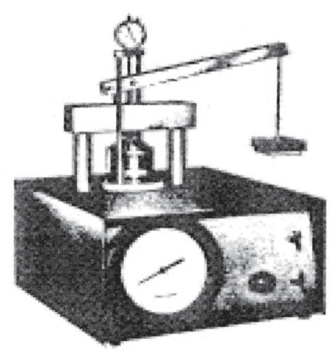

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Figure 2.5-319
Sheet 1 of 2

CONSOLIDATION TESTS
(METHOD)

Method of Performing Consolidation Tests

Consolidation tests are performed to evaluate the volume changes of soils subjected to increased loads. Time-consolidation and pressure-consolidation curves may be plotted from the data obtained in the tests. Engineering analyses based on these curves permit estimates to be made of the probable magnitude and rate of settlement of the tested soils under applied loads.

Each sample is tested within brass rings two and one-half inches in diameter and one inch is length. Undisturbed samples of in-place soils are tested in rings taken from the sampling device in which the samples were obtained. Loose samples of soils to be used in constructing earth fills are compacted in rings to predetermined conditions and tested.

In testing, the sample is rigidly confined laterally by the brass ring. Axial loads are transmitted to the ends of the sample by porous disks. The disks allow drainage of the loaded sample. The axial compression or expansion of the sample is measured by a micrometer dial indicator at appropriate time intervals after each load increment is applied. Each load is ordinarily twice the preceding load. The increments are selected to obtain consolidation data representing the field loading conditions for which the test is being performed. Each load increment is allowed to act over an interval of time dependent on the type and extent of the soil in the field.

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Figure 2.5-319
Sheet 2 of 2

CONSOLIDATION TESTS
(METHOD)

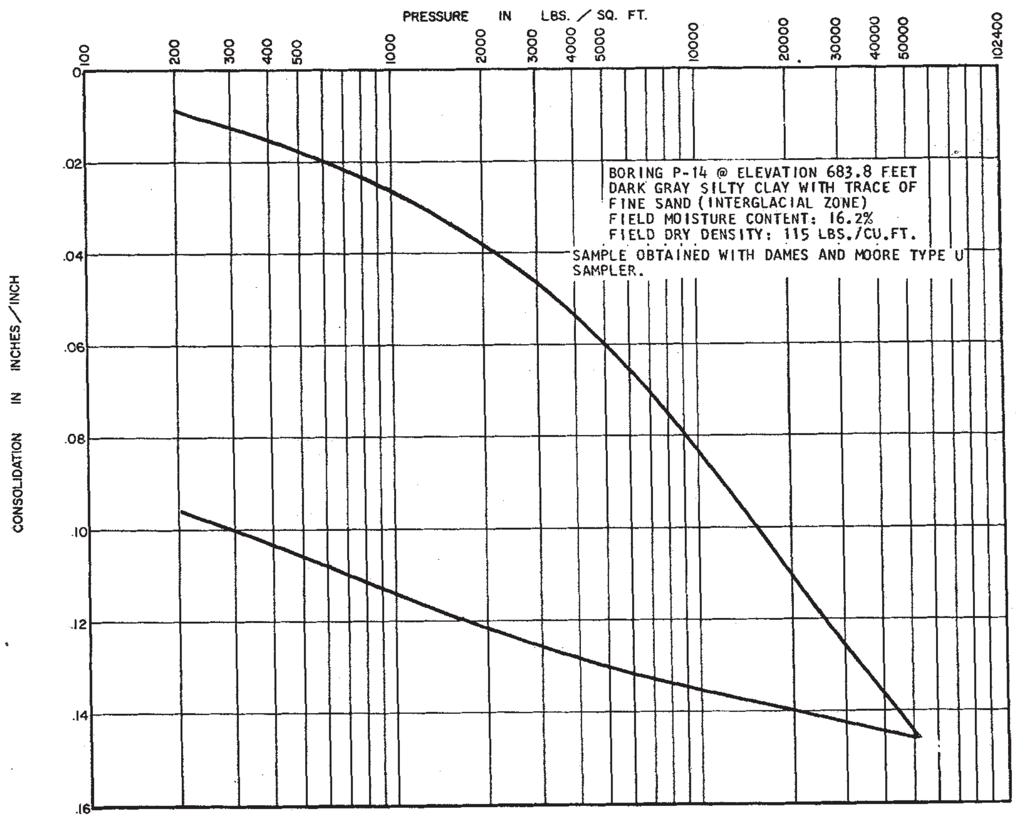

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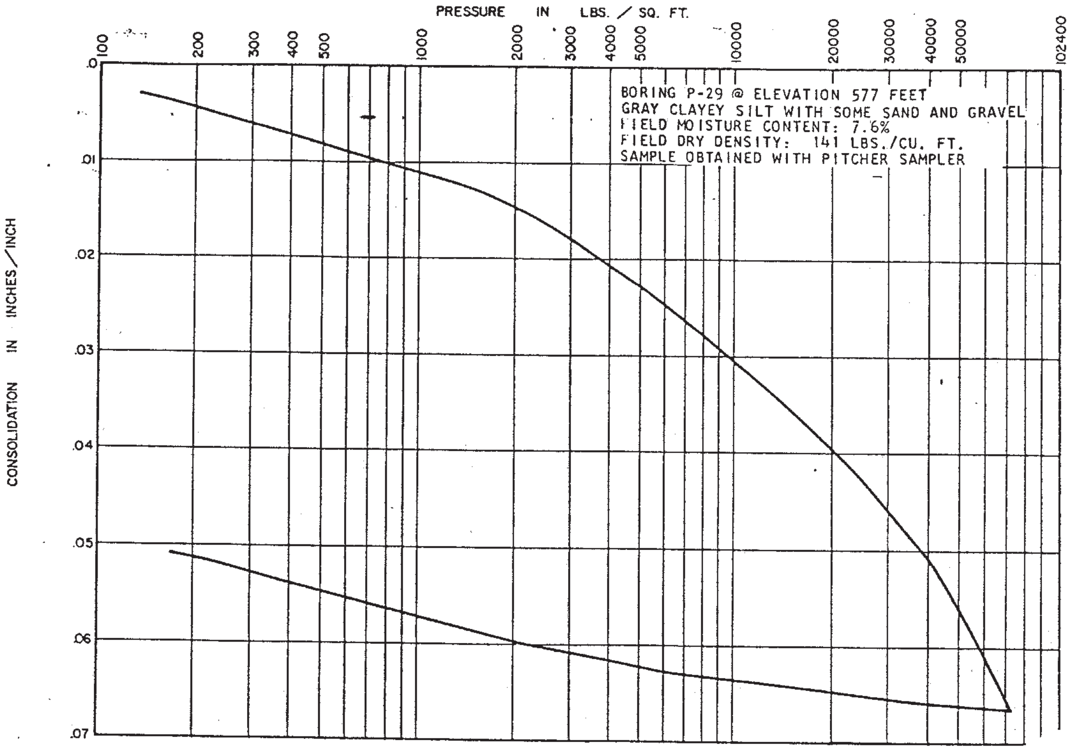
FIGURE 2.5-320

CONSOLIDATION TEST (BORING P-14)



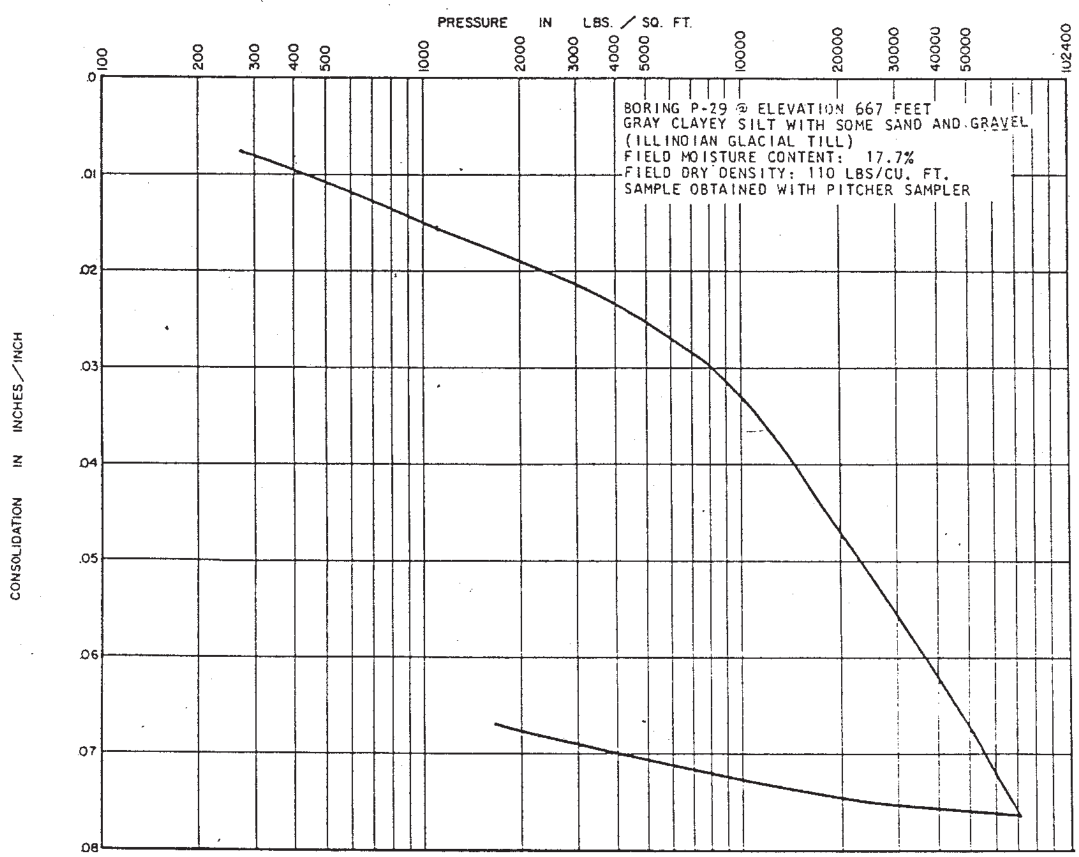


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FIGURE 2.5-321

CONSOLIDATION TEST (BORING P-29)

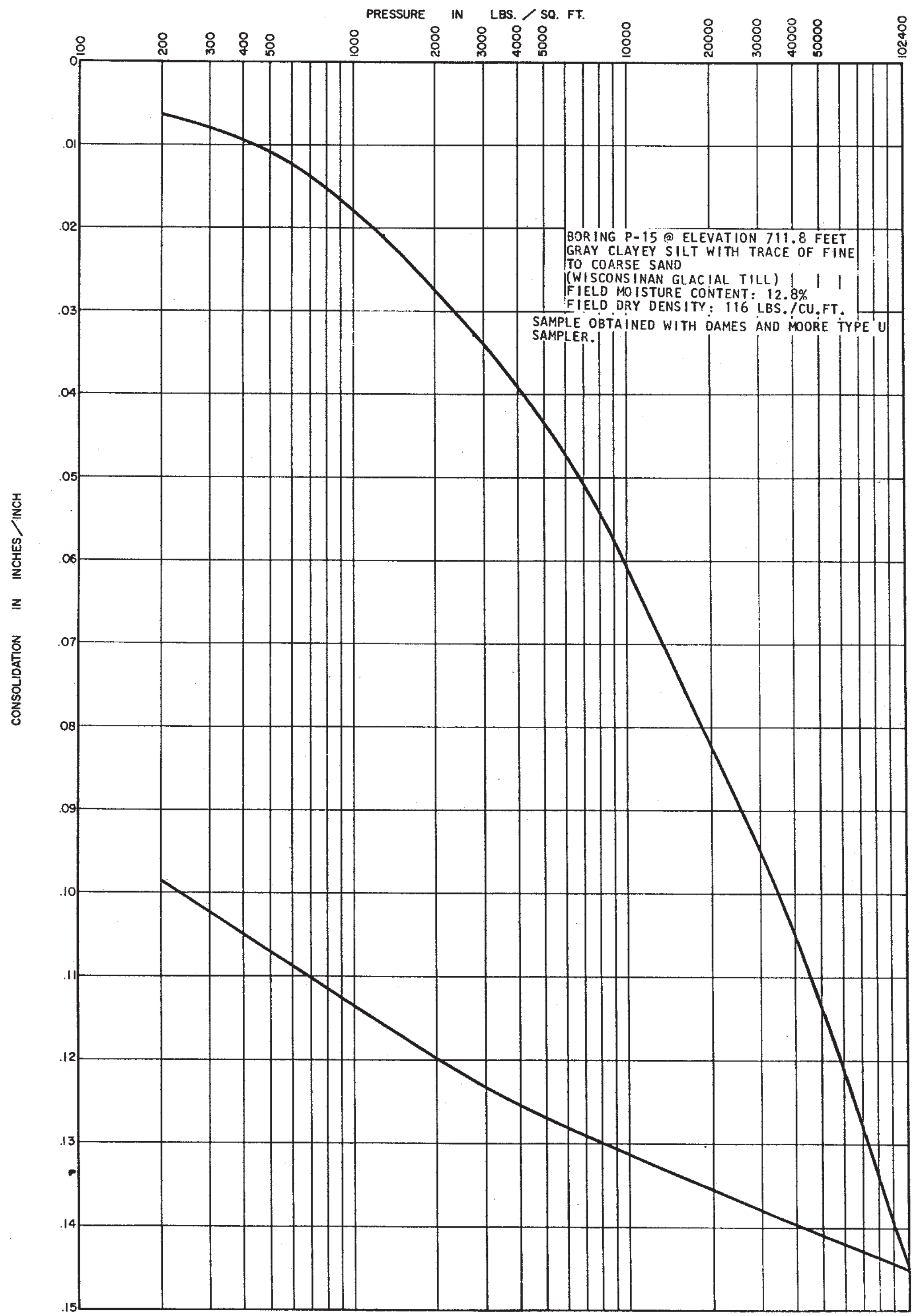

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FIGURE 2.5-322

CONSOLIDATION TEST (BORING P-15)

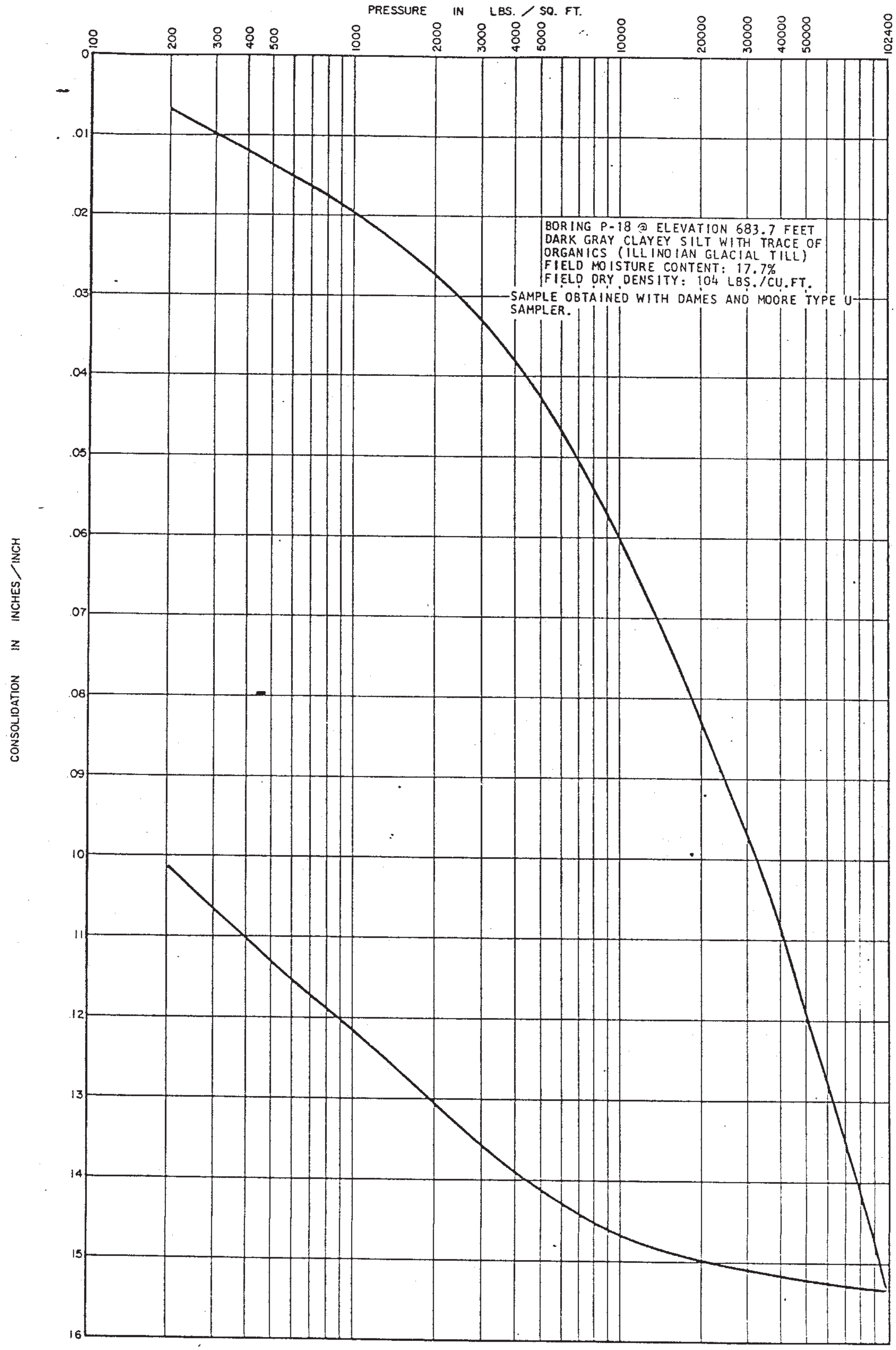

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FIGURE 2.5-323

CONSOLIDATION TEST (BORING P-18)

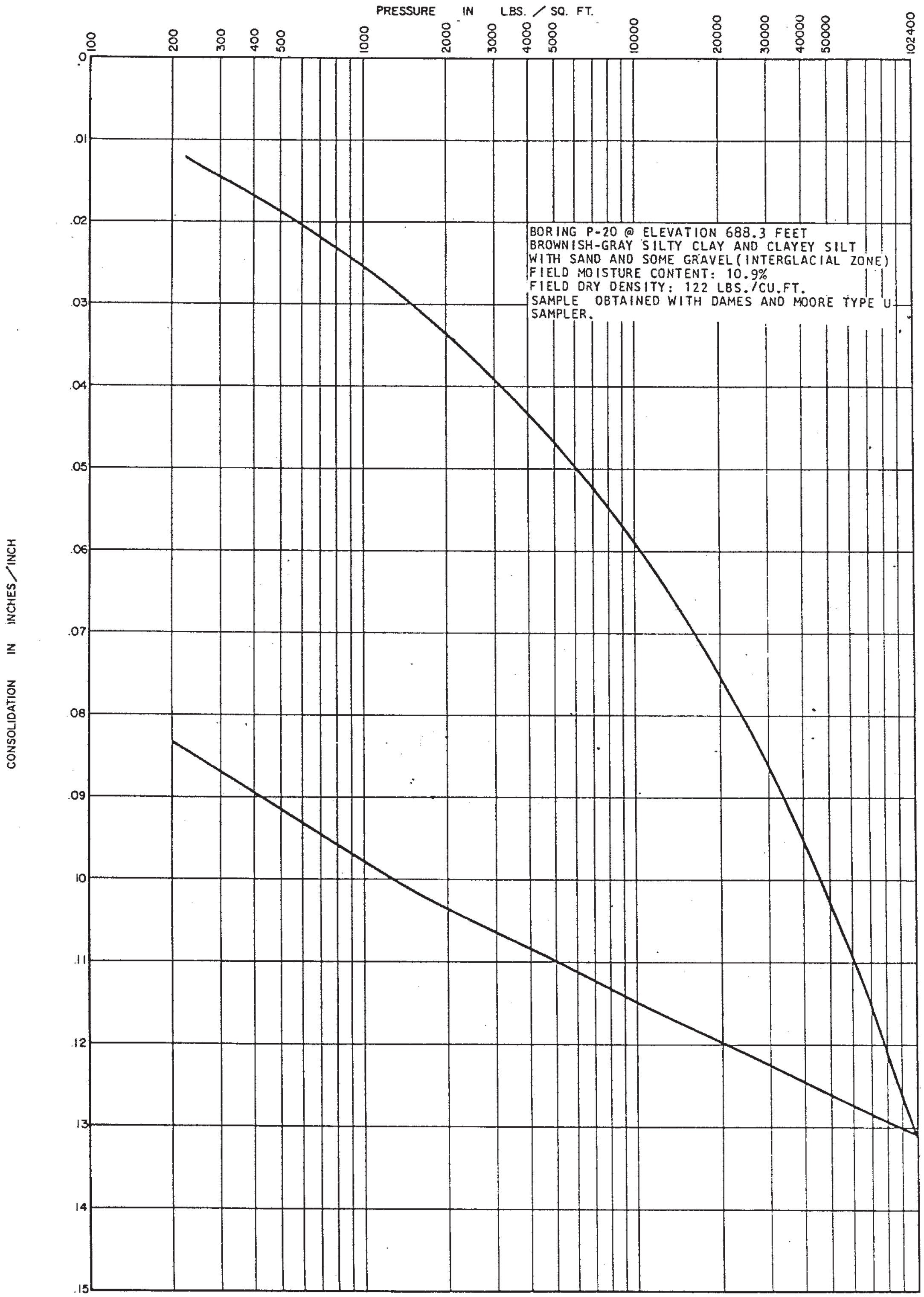

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FIGURE 2.5-324

CONSOLIDATION TEST (BORING P-20)

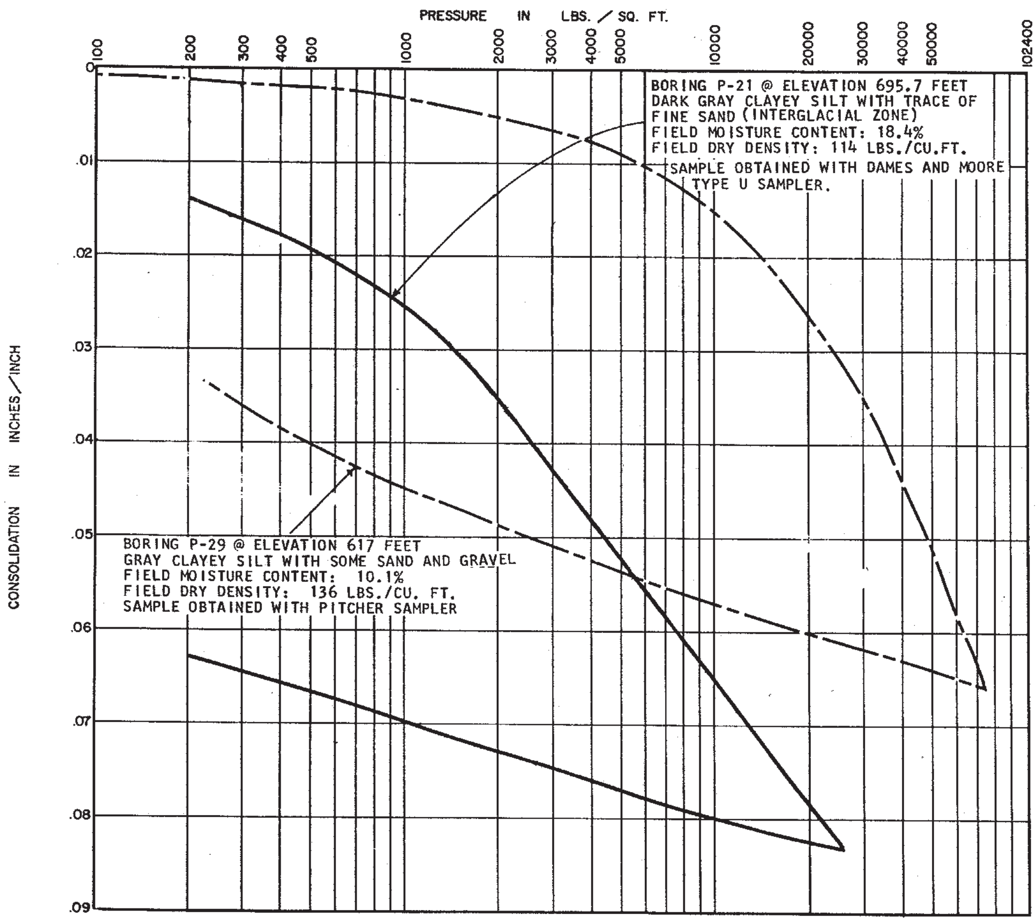

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FIGURE 2.5-325

CONSOLIDATION TEST (BORING P-21)

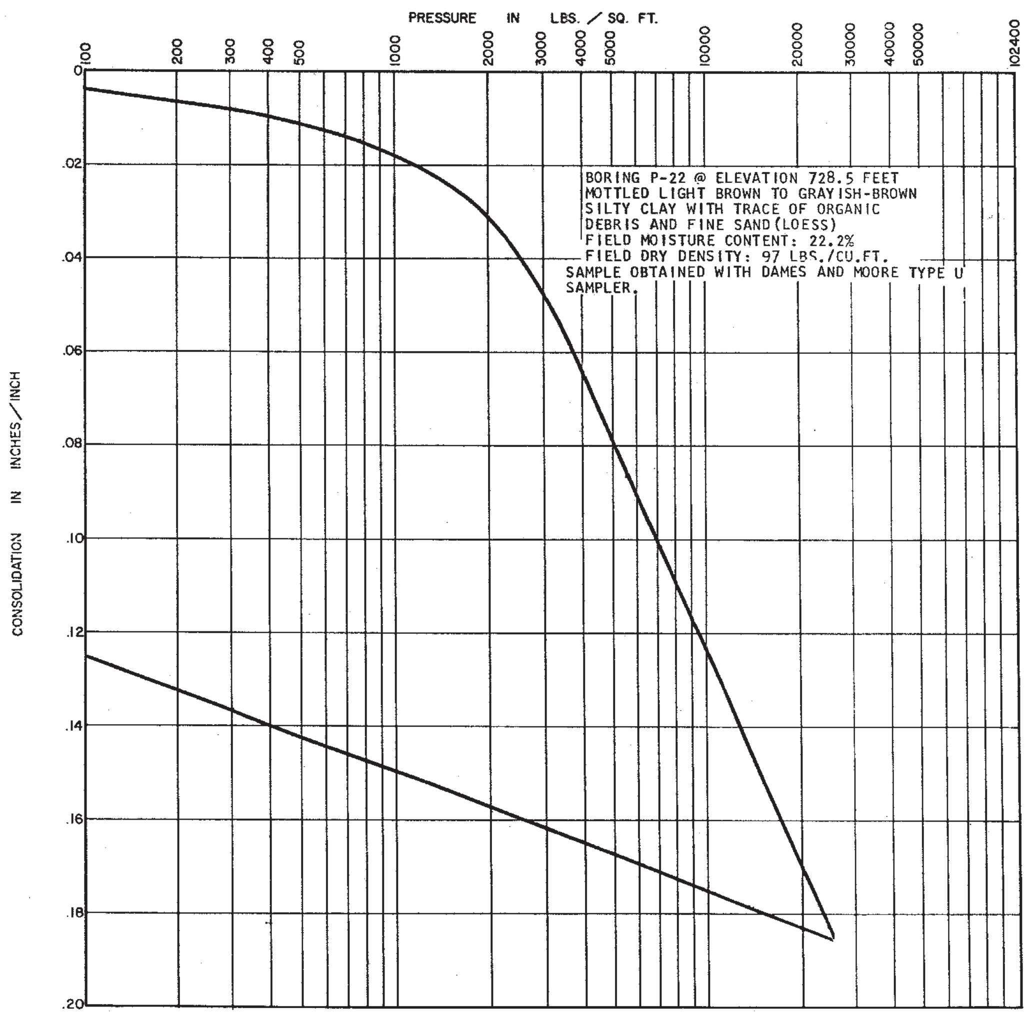

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FIGURE 2.5-326

CONSOLIDATION TEST (BORING P-22)

(SHEET 1 of 2)

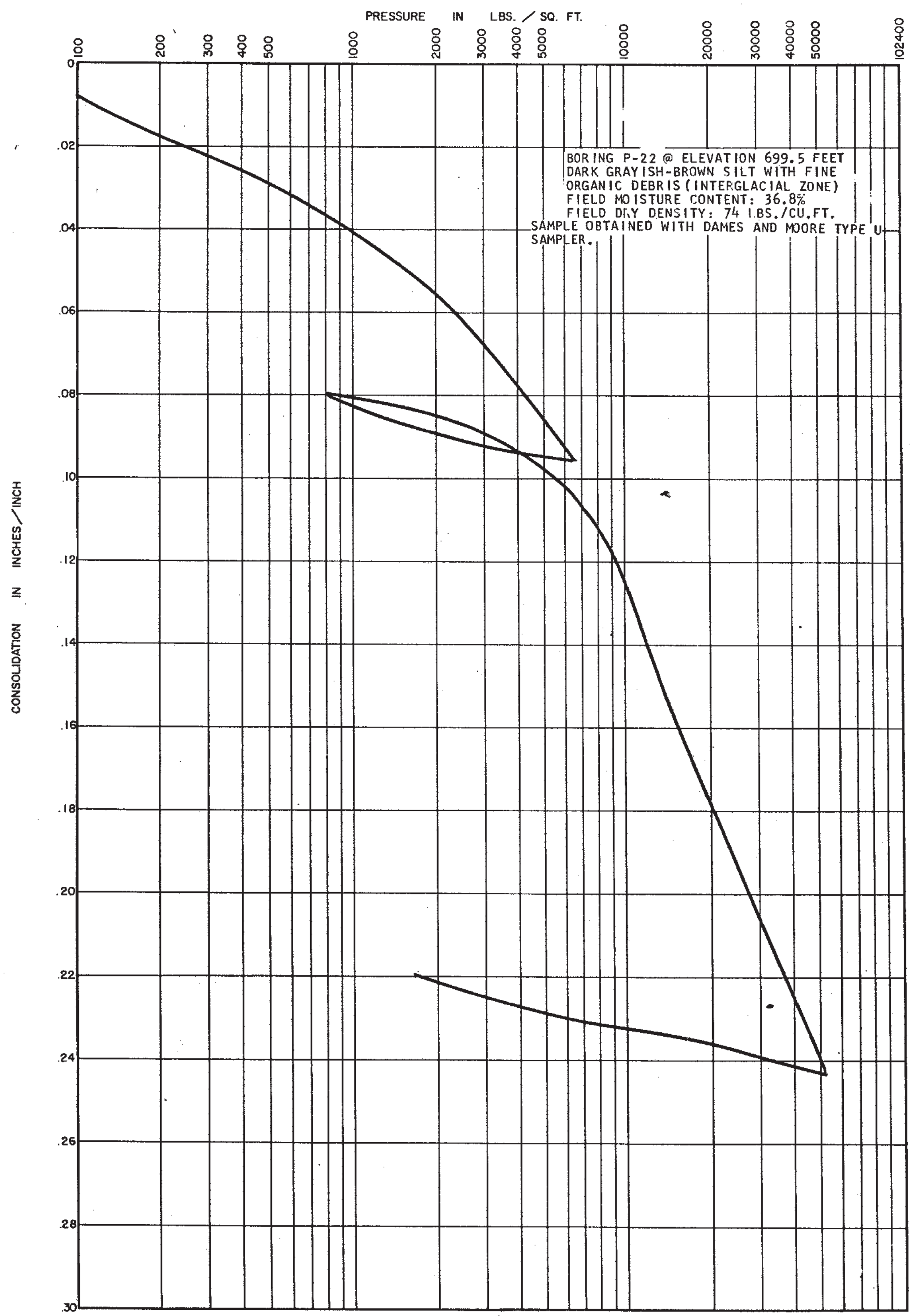

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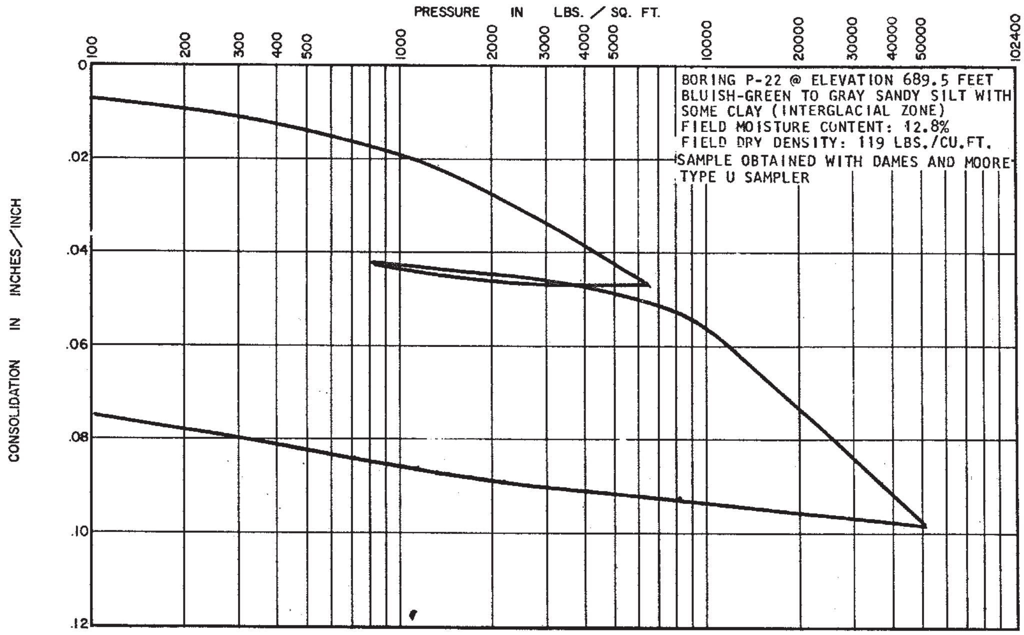
FIGURE 2.5-326

CONSOLIDATION TEST (BORING P-22)
(SHEET 2 of 2)



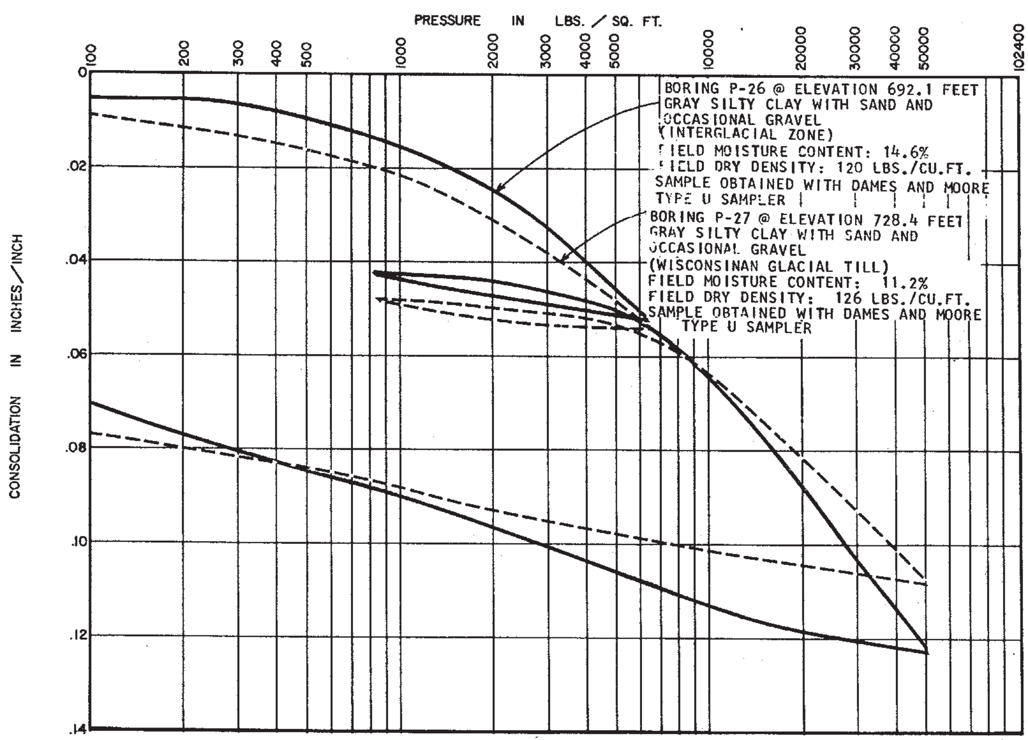


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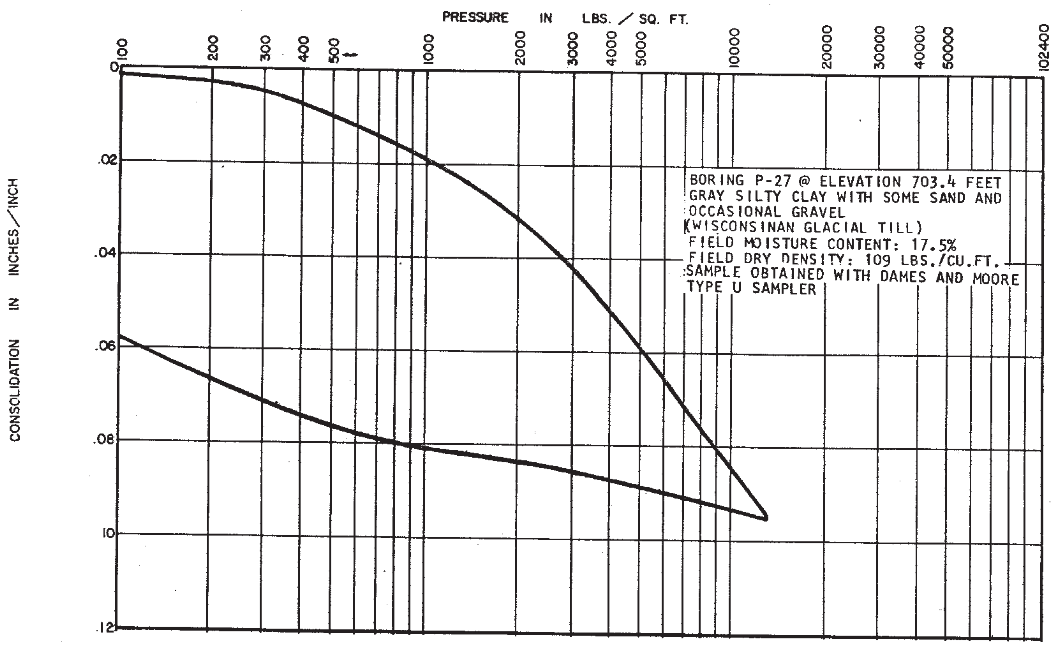
FIGURE 2.5-327

CONSOLIDATION TEST (BORINGS P-22, P-26 AND P-27)



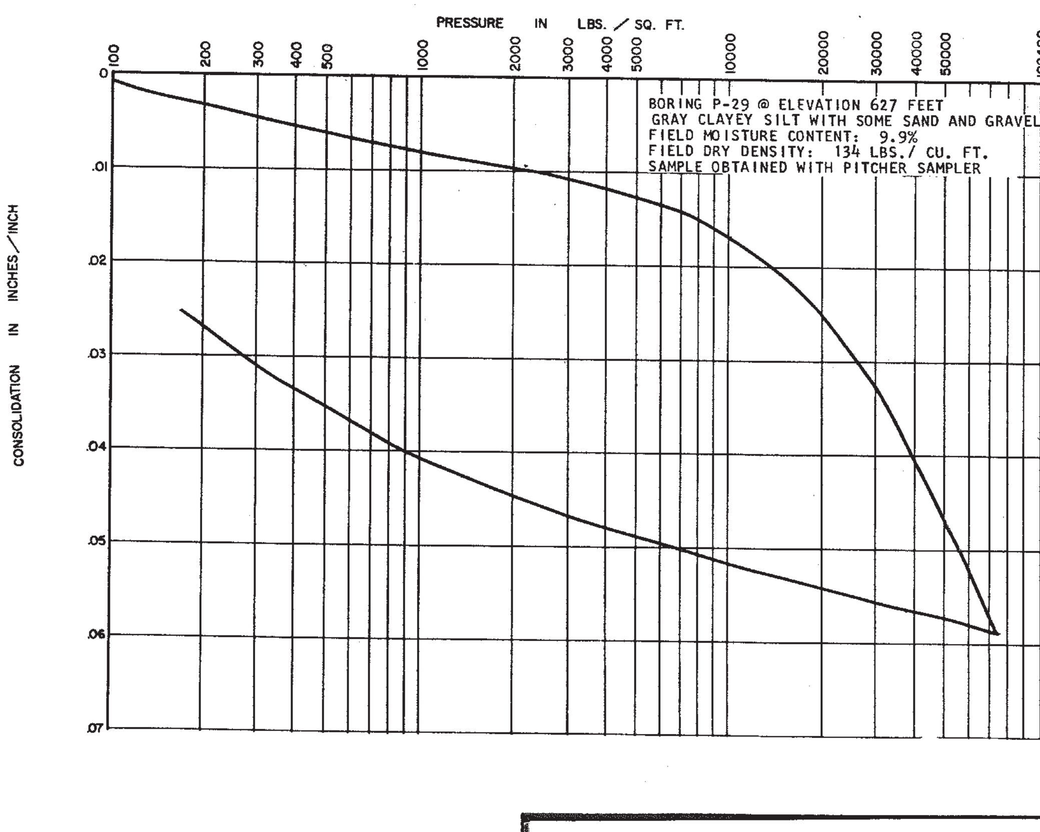


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FIGURE 2.5-328

CONSOLIDATION TEST (BORINGS P-27 AND P-29)

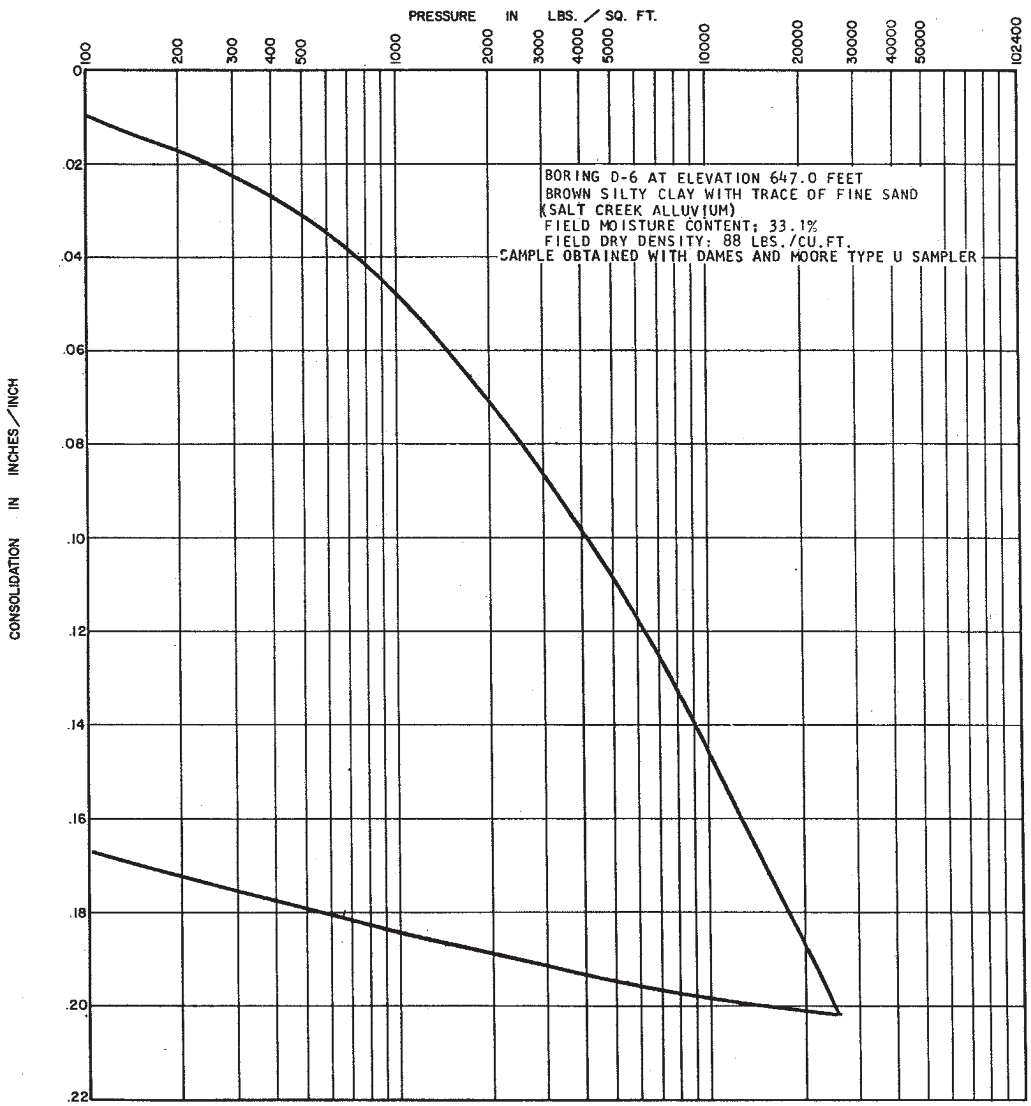

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FIGURE 2.5-329

CONSOLIDATION TEST (BORING D-6)

(SHEET 1 of 2)

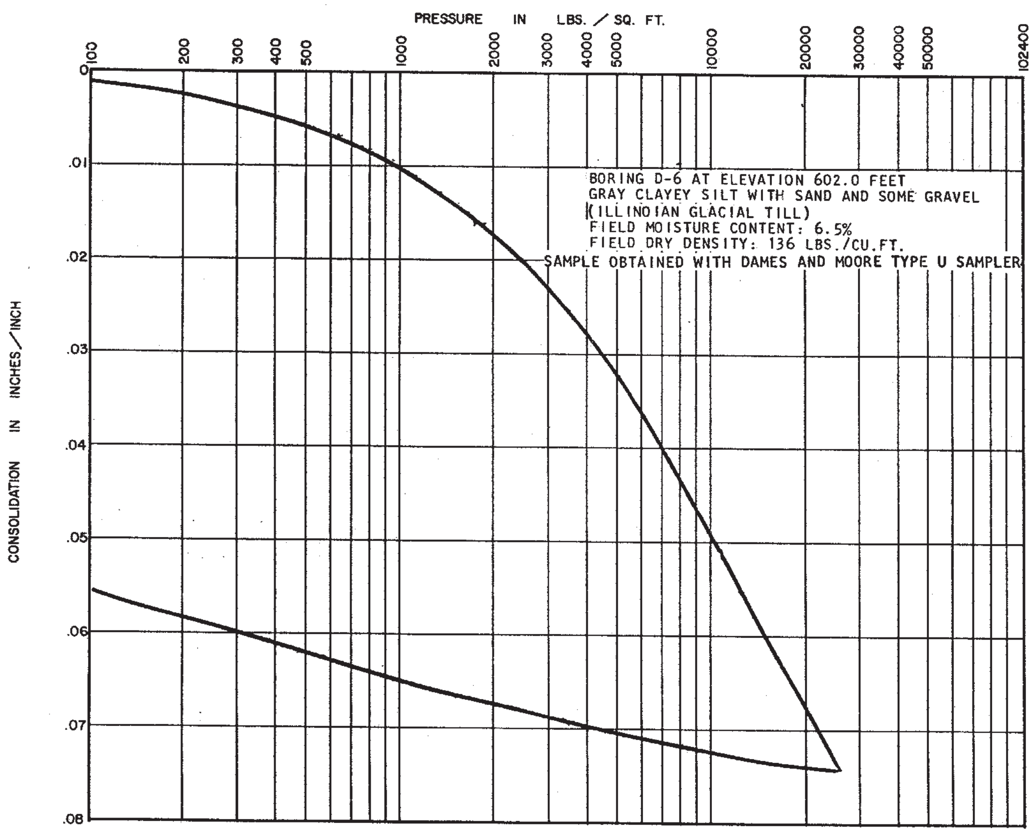

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FIGURE 2.5-329

CONSOLIDATION TEST (BORING D-6)

(SHEET 2 of 2)

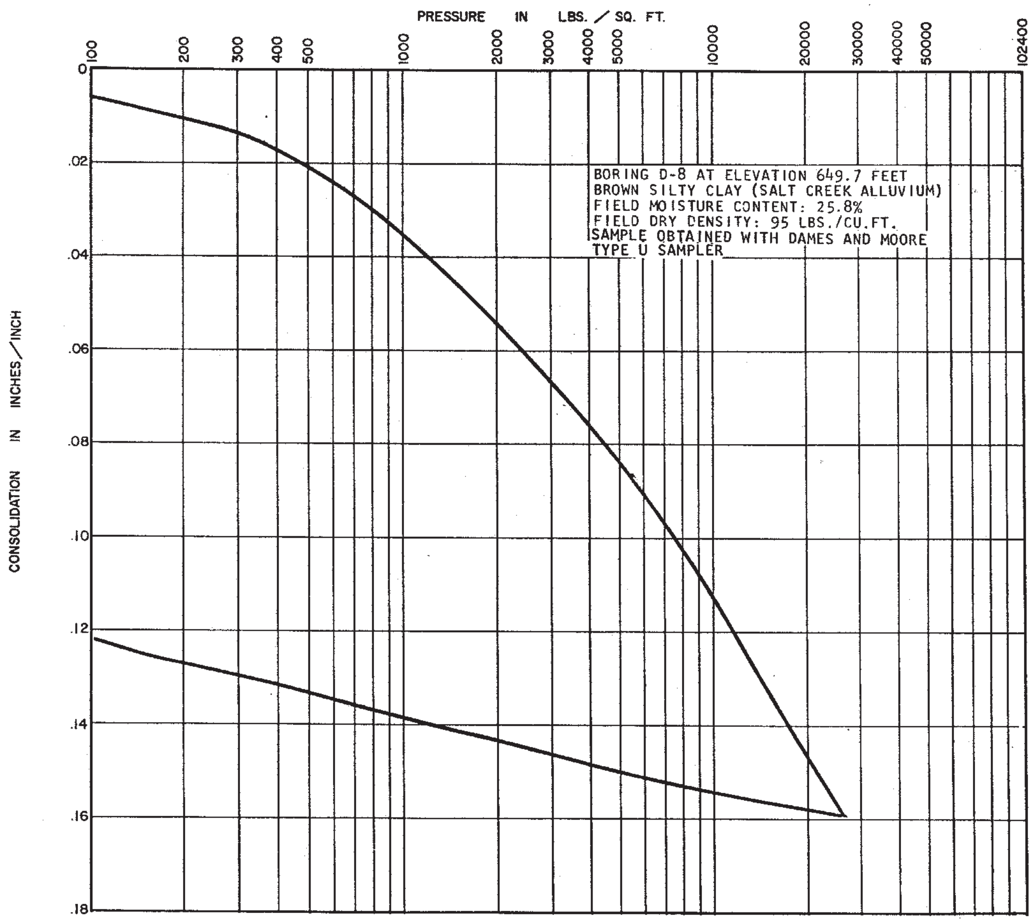

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FIGURE 2.5-330

CONSOLIDATION TEST (BORING D-8)

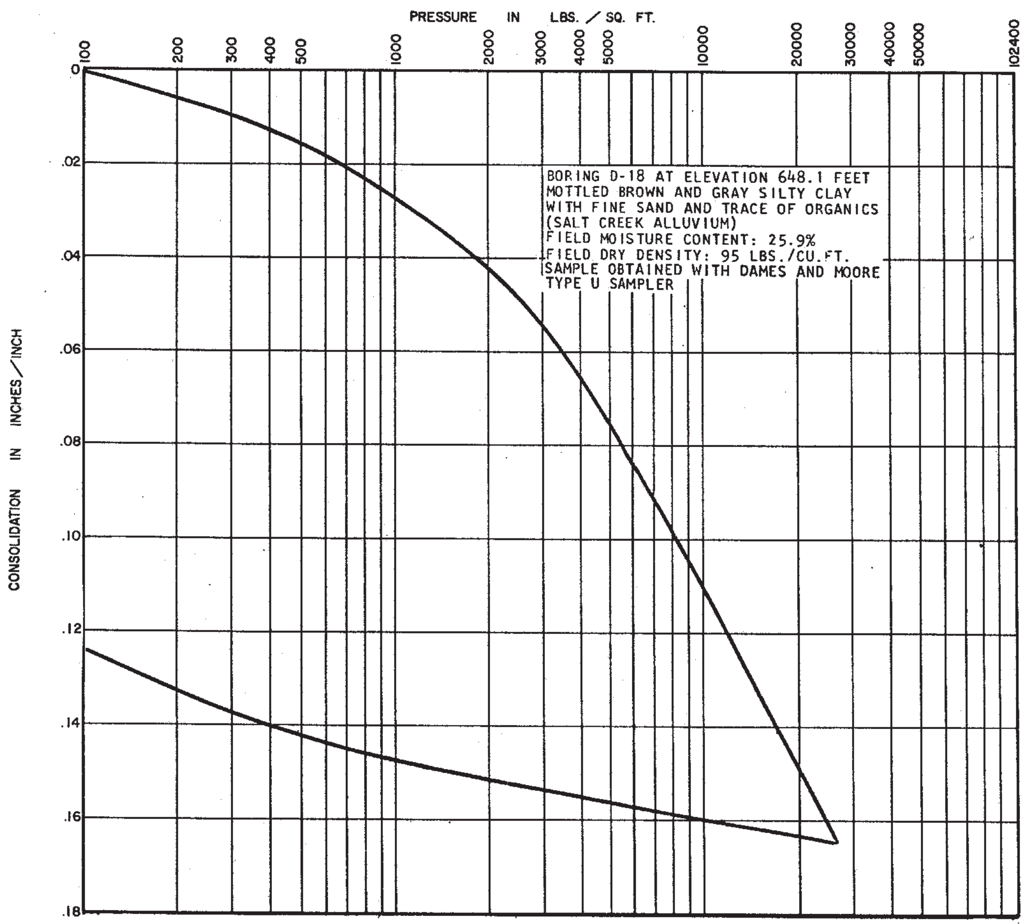

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FIGURE 2.5-331

CONSOLIDATION TEST (BORING D-18)

(SHEET 1 of 2)

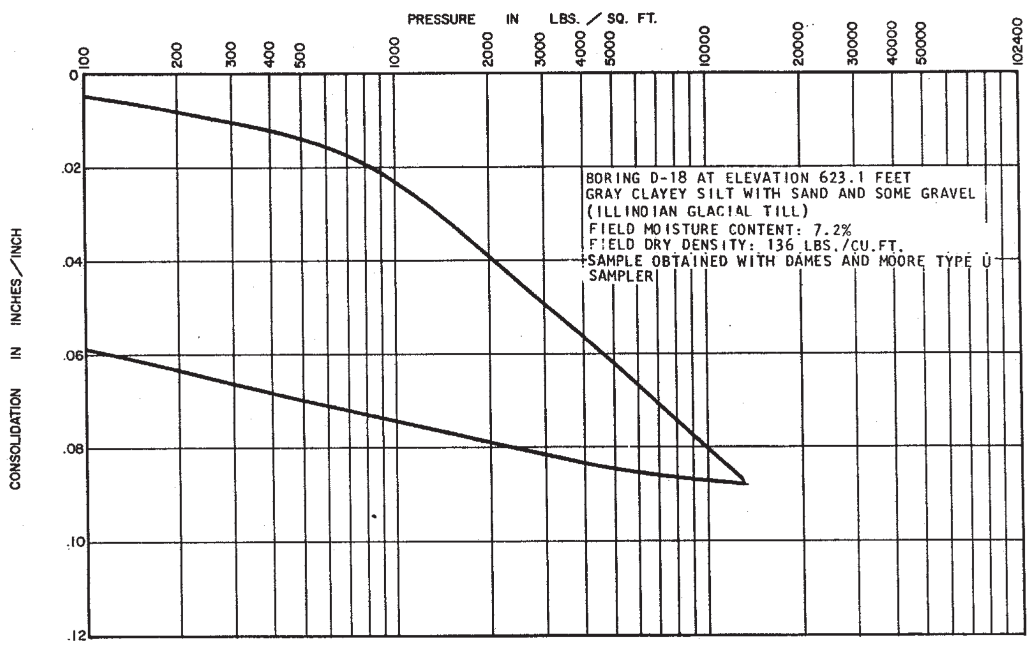

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FIGURE 2.5-331

CONSOLIDATION TEST (BORING D-18)

(SHEET 2 of 2)

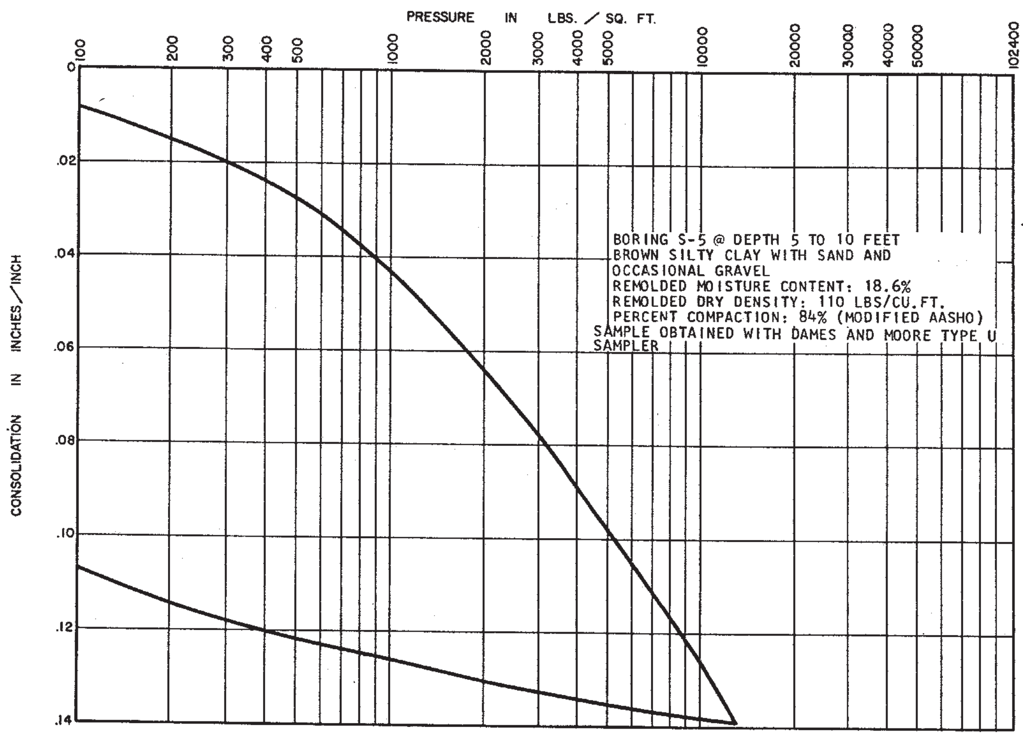

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FIGURE 2.5-332

CONSOLIDATION TEST (BORING S-5)
(SHEET 1 of 2)

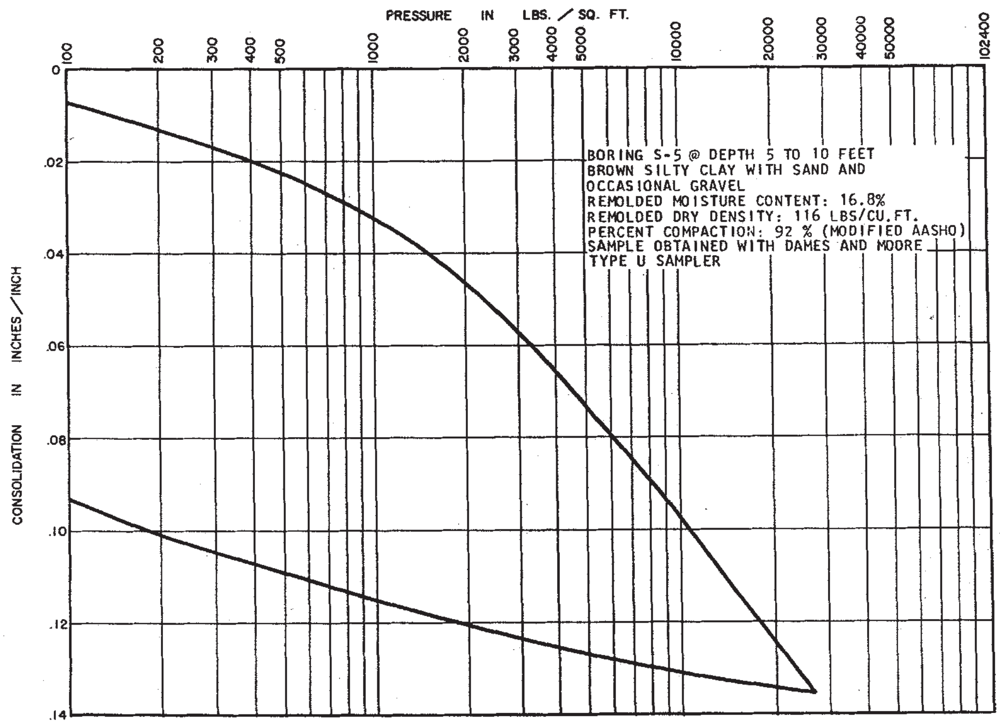

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FIGURE 2.5-332

CONSOLIDATION TEST (BORING S-5)
(SHEET 2 of 2)

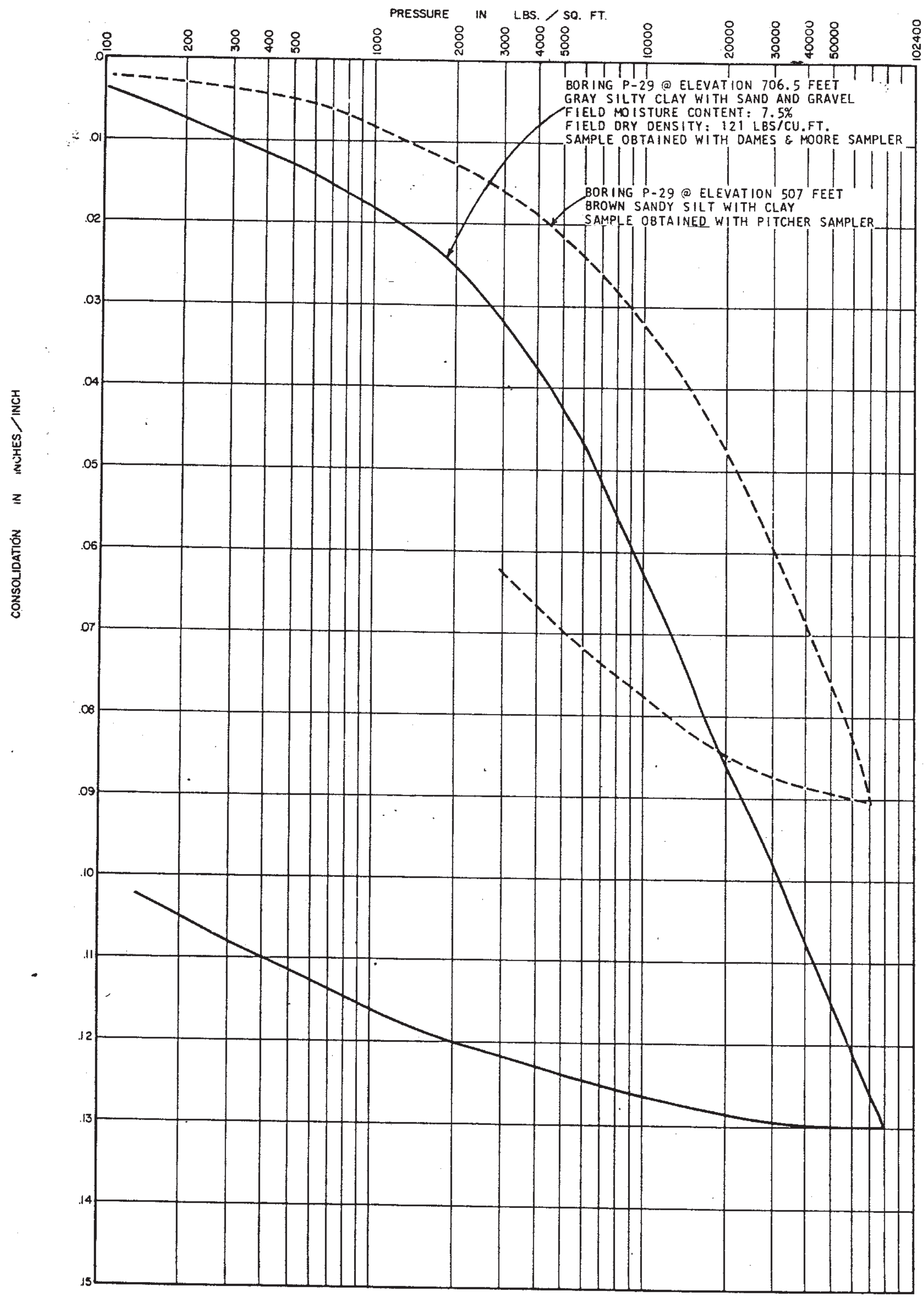

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FIGURE 2.5-333

CONSOLIDATION TEST (BORING P-29)

(SHEET 1 of 3)

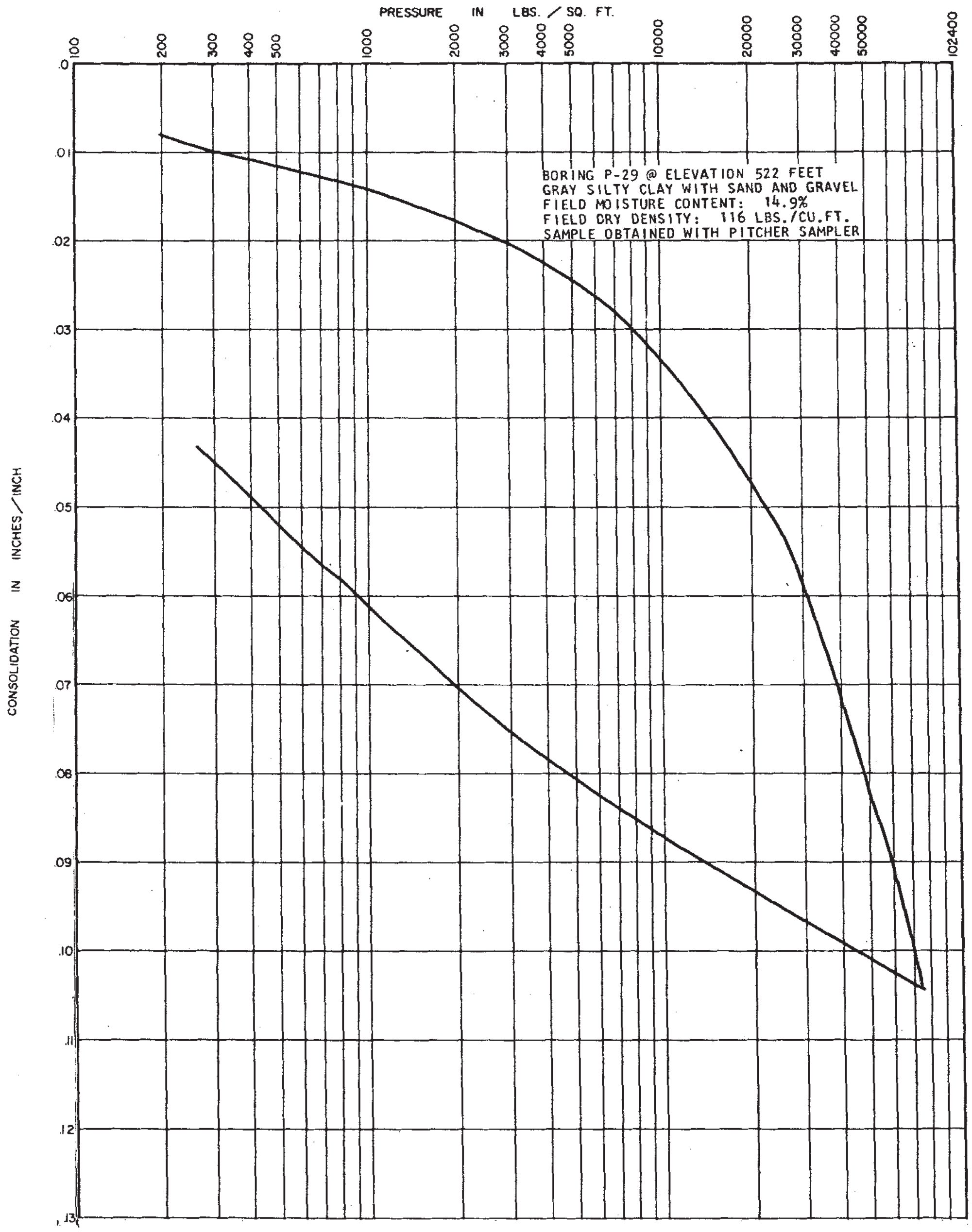

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FIGURE 2.5-333

CONSOLIDATION TEST (BORING P-29)
(SHEET 2 of 3)

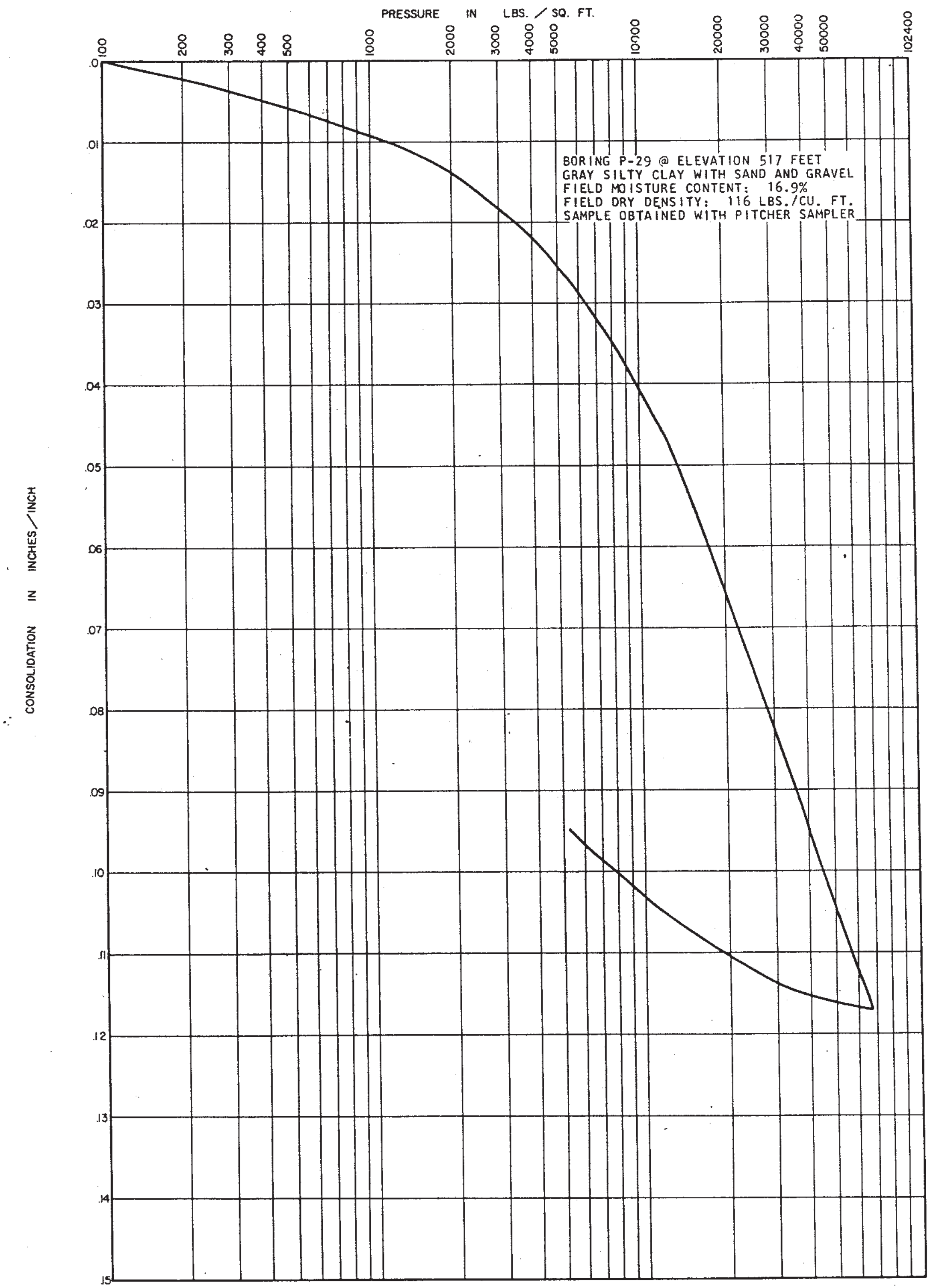

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FIGURE 2.5-333

CONSOLIDATION TEST (BORING P-29)

(SHEET 3 of 3)

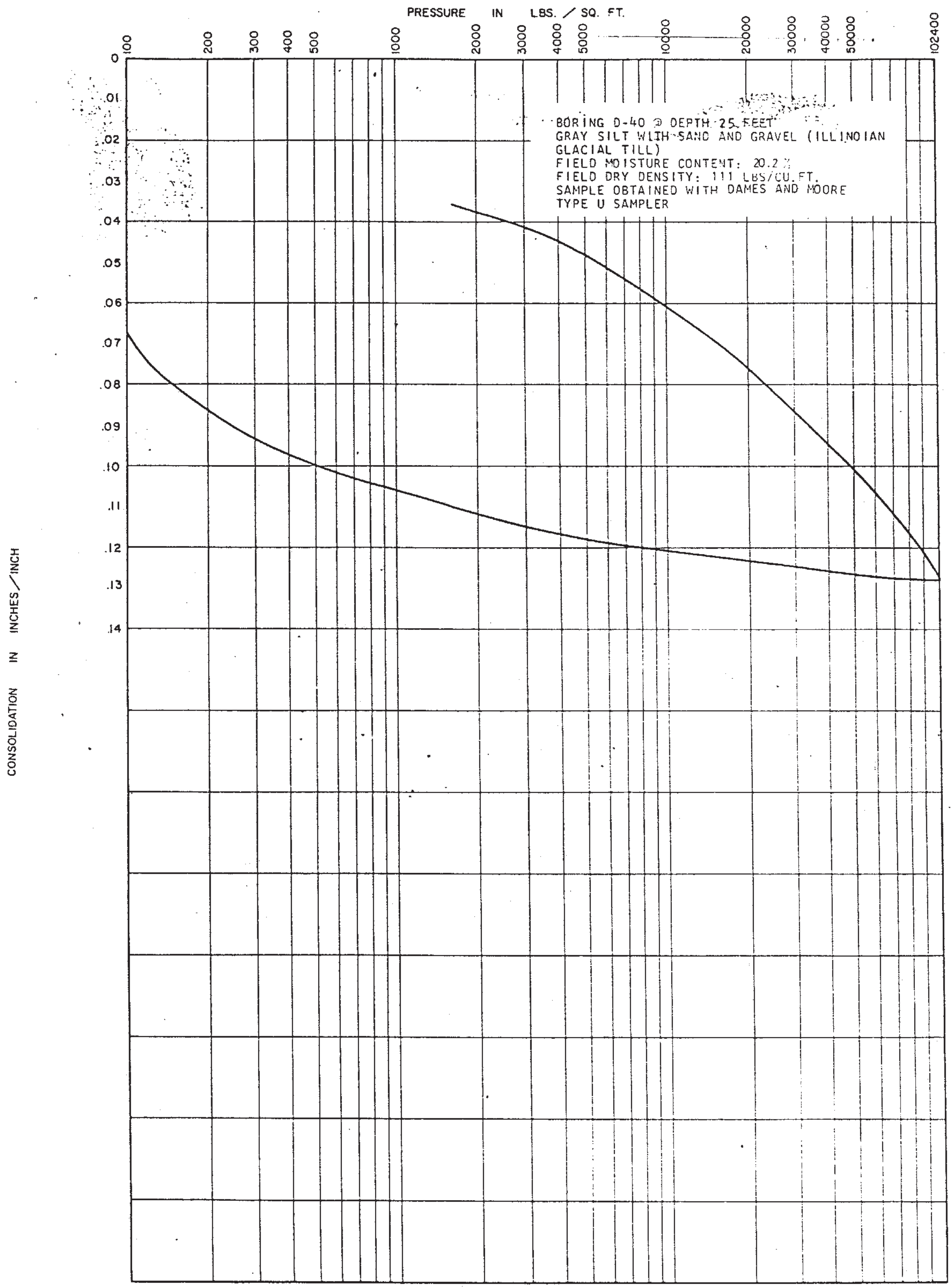

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FIGURE 2.5-334

CONSOLIDATION TEST (BORING D-40)

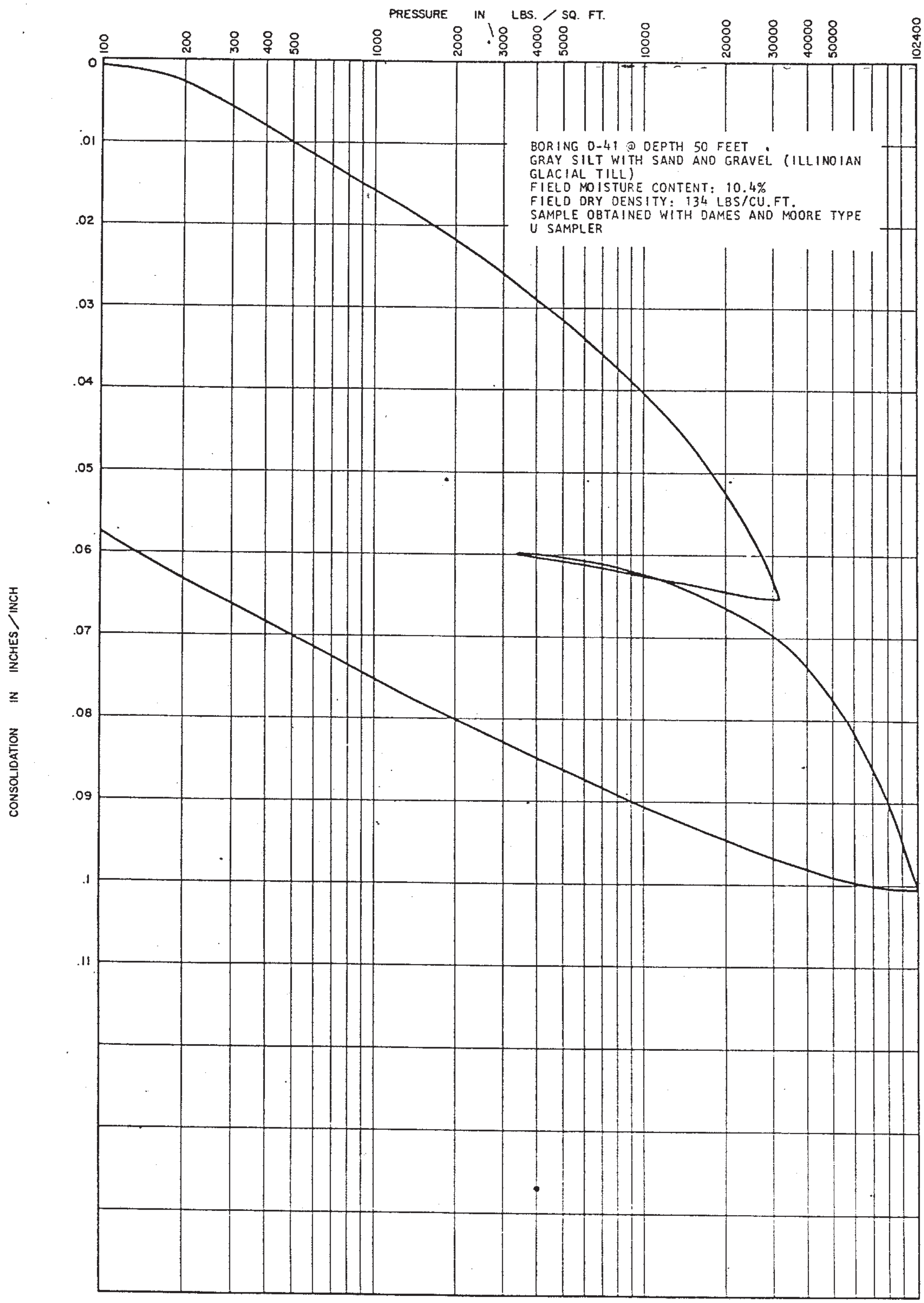

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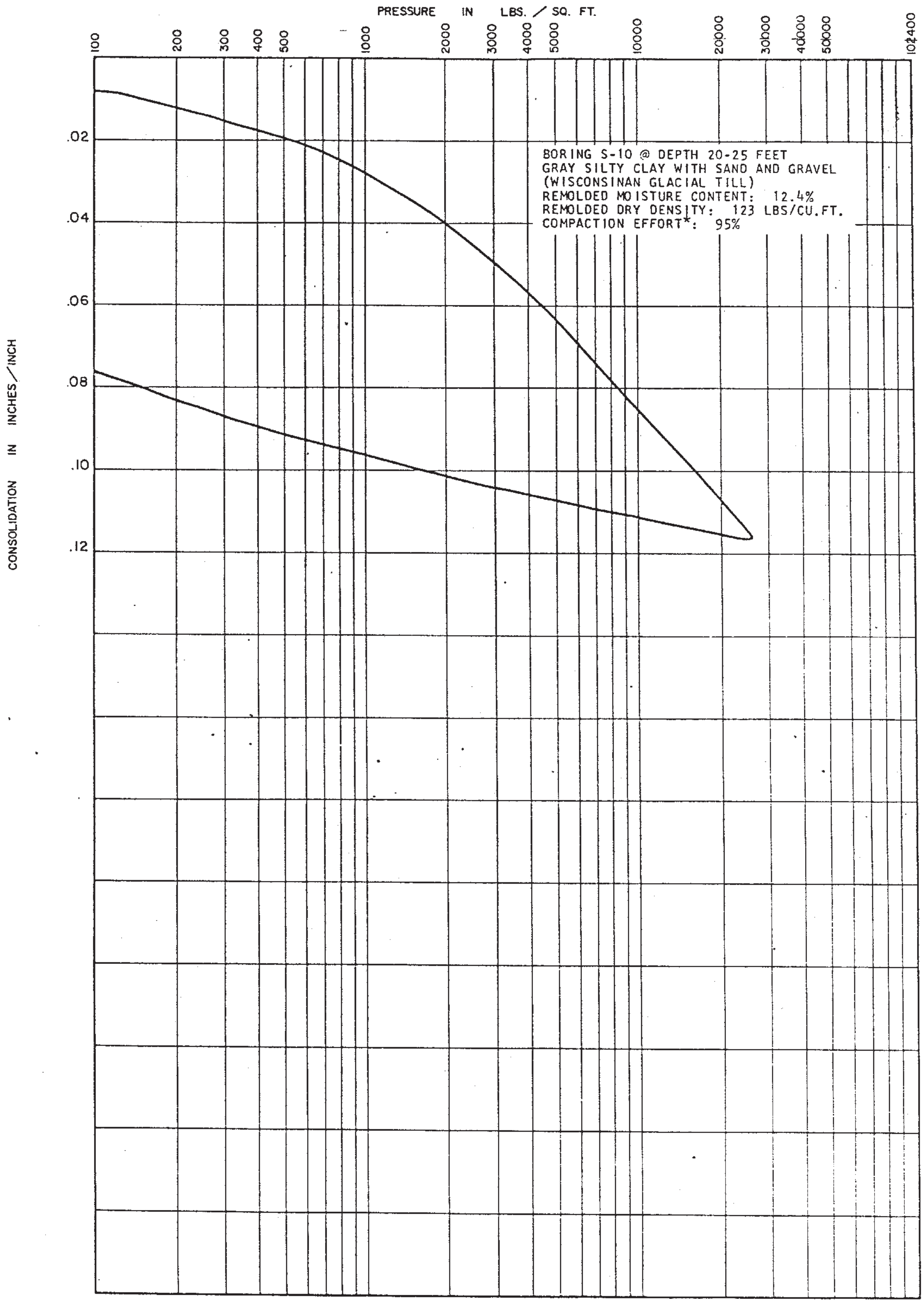
FIGURE 2.5-335

CONSOLIDATION TEST (BORING D-41)



* A.A.S.H.O. TEST DESIGNATION T-180

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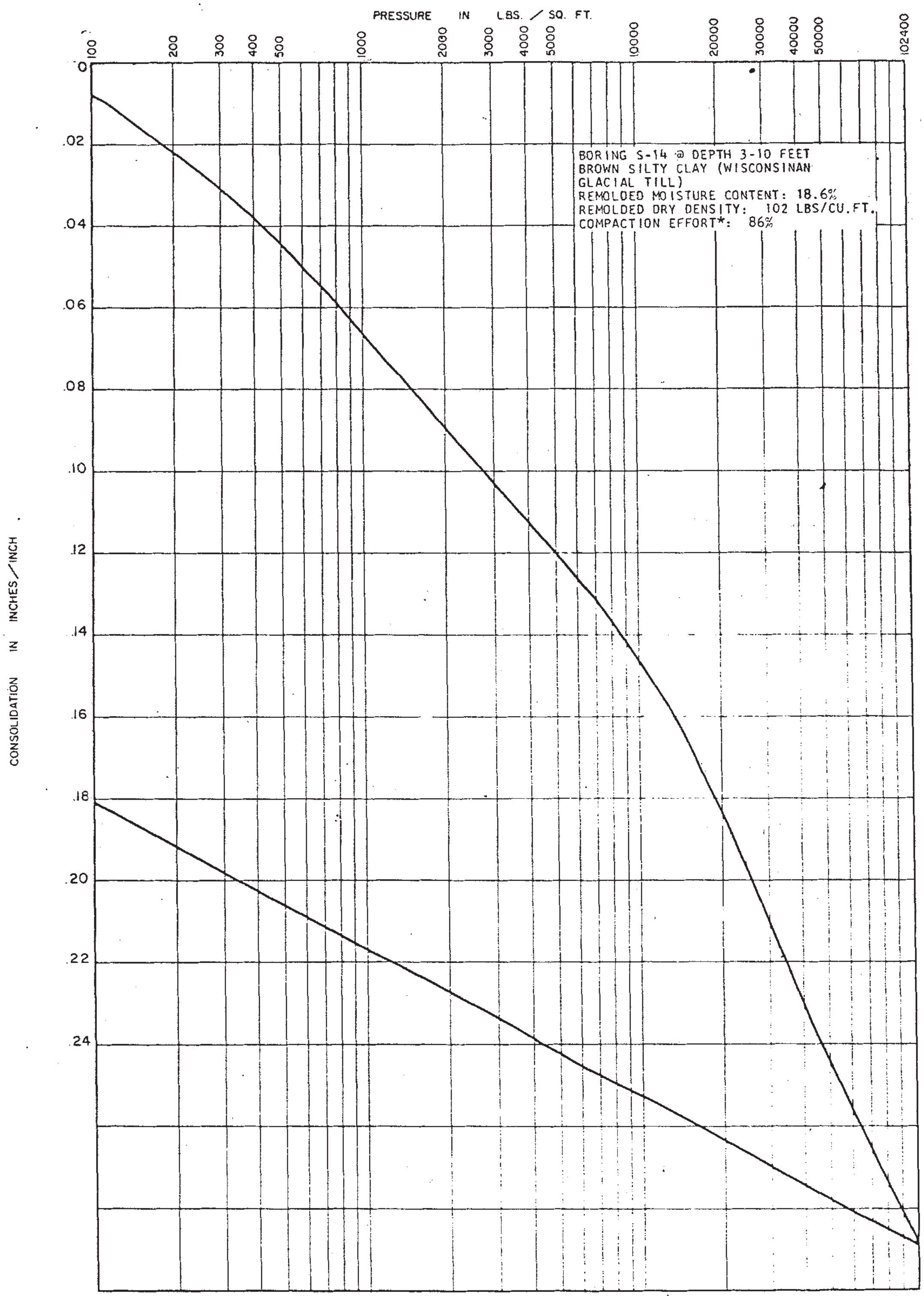
FIGURE 2.5-336

CONSOLIDATION TEST (BORING S-10)



* A.A.S.H.O. TEST DESIGNATION T-180

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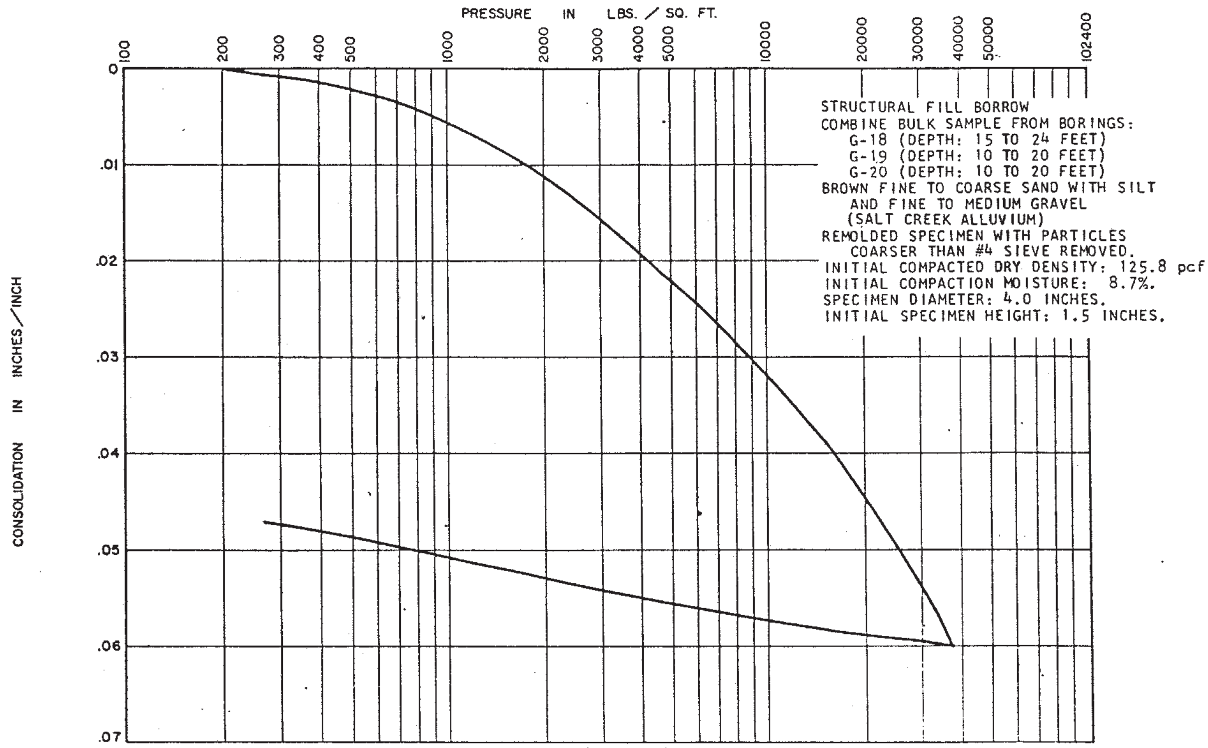
FIGURE 2.5-337

CONSOLIDATION TEST (BORING S-14)



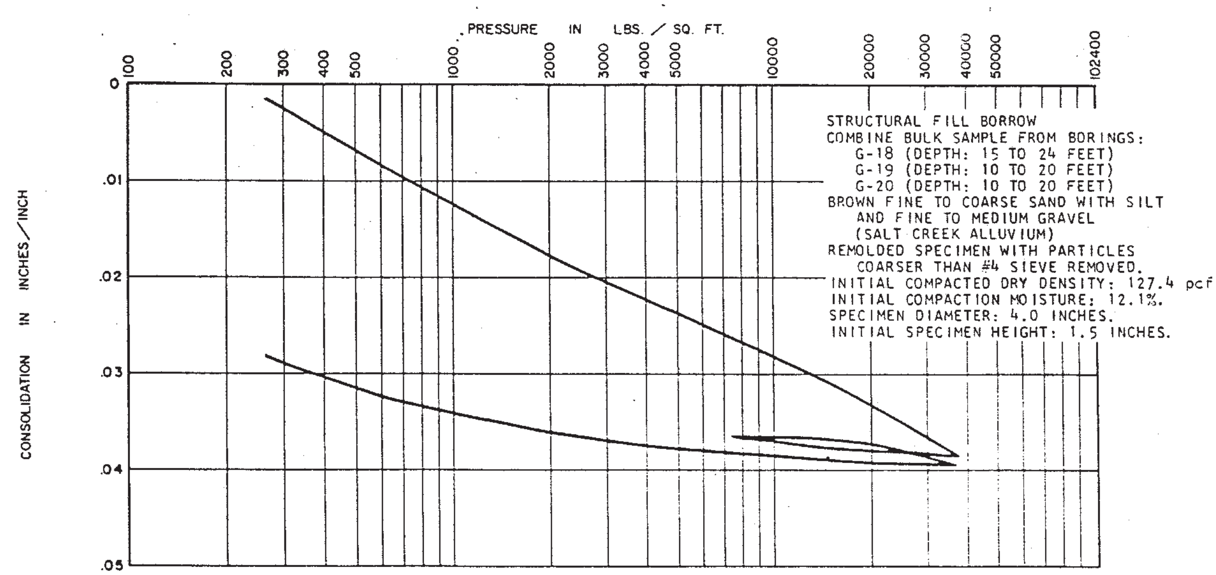


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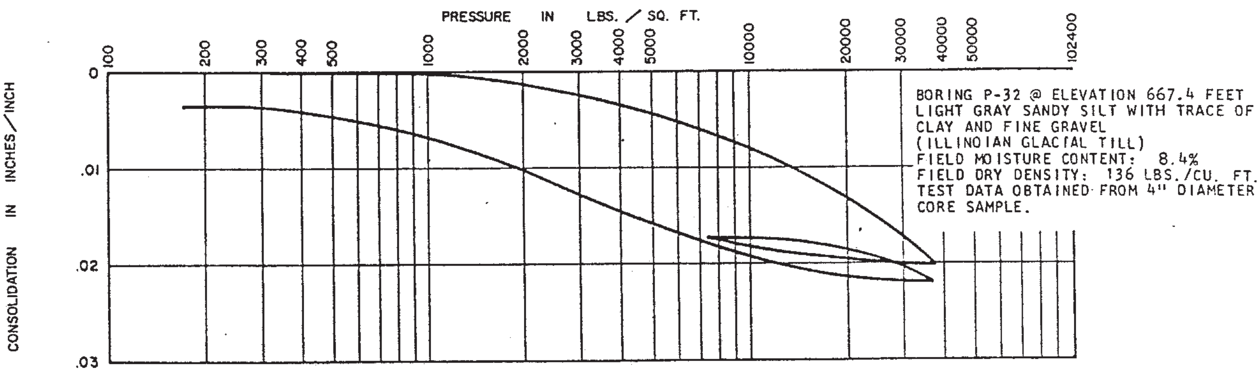
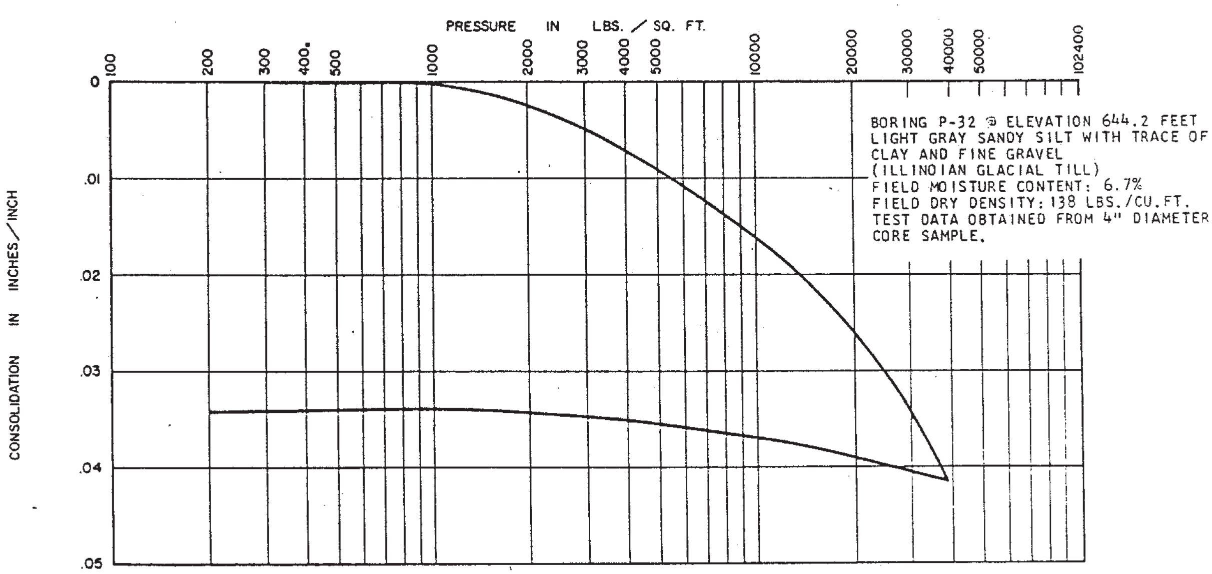
FIGURE 2.5-338

CONSOLIDATION TEST (BORINGS G-18, G-19 AND G-20)

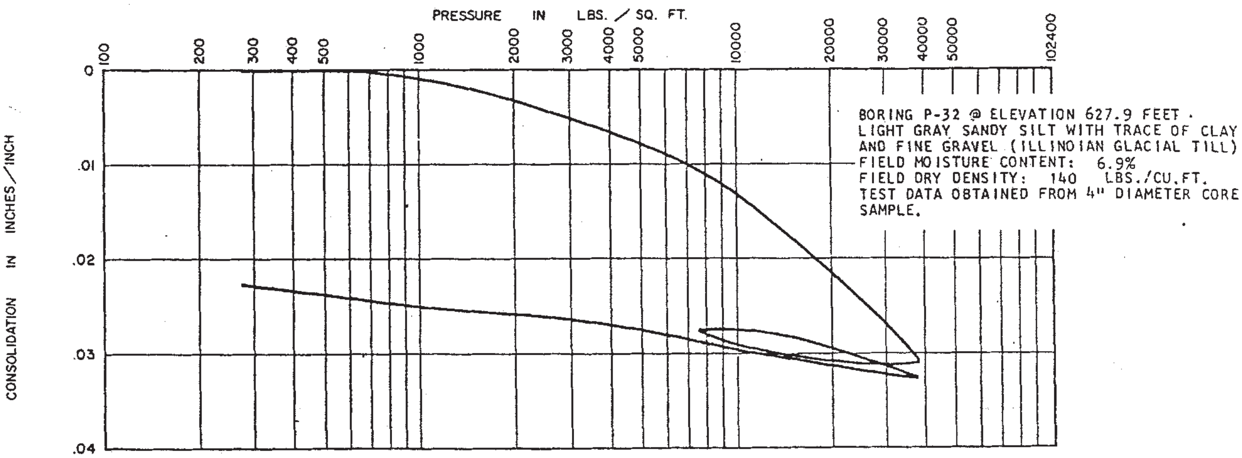


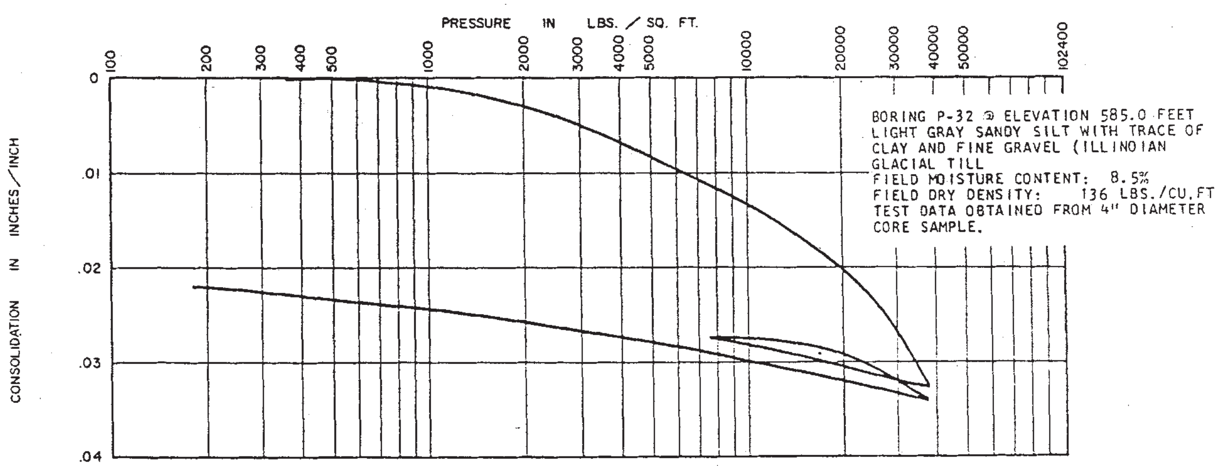


CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-339

CONSOLIDATION TEST (BORING P-32)
(SHEET 1 of 2)





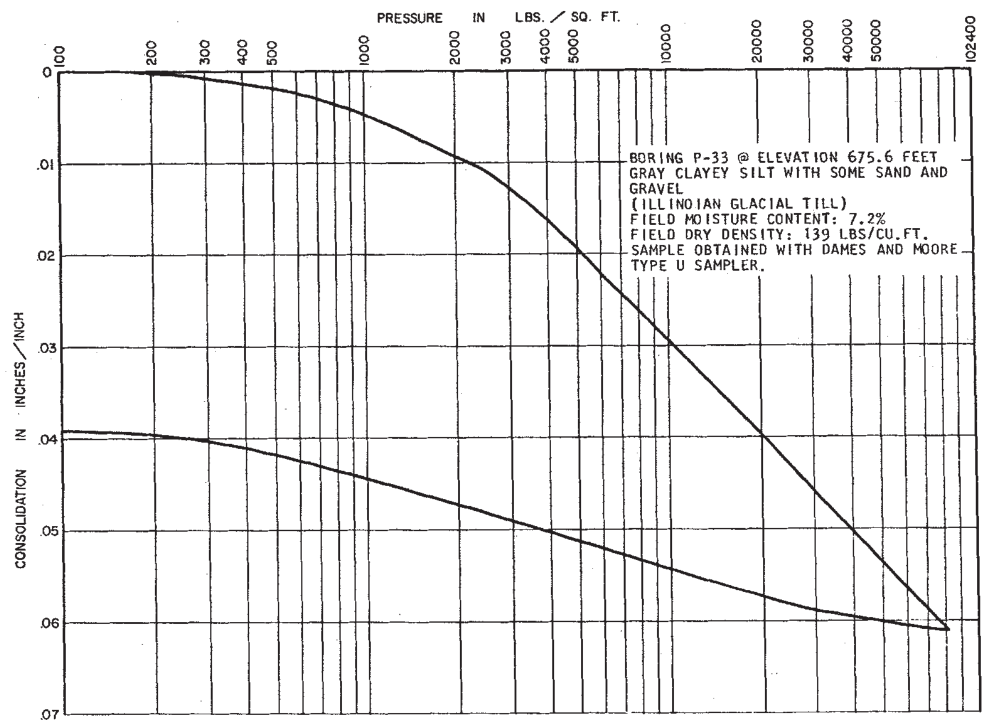
CLINTON POWER STATION

UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-339

CONSOLIDATION TEST (BORING P-32)

(SHEET 2 of 2)



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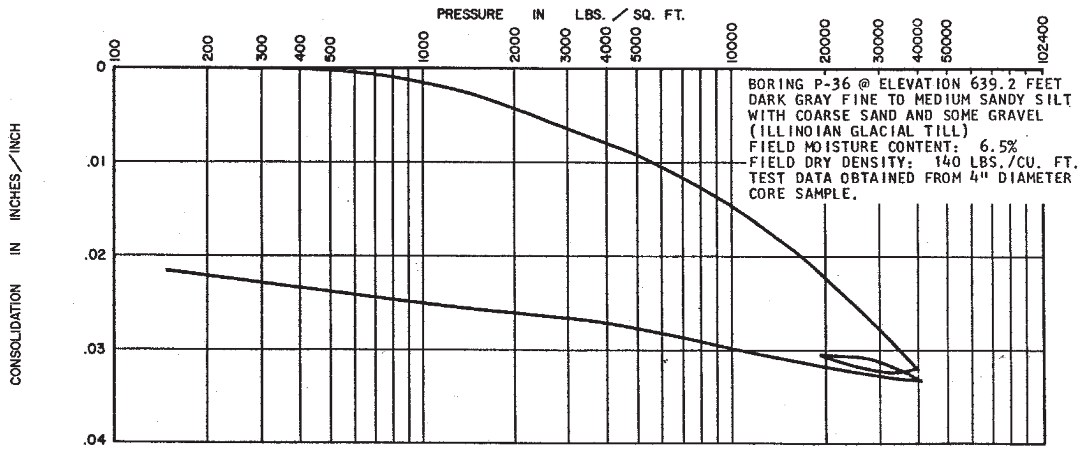
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-340

CONSOLIDATION TEST (BORING P-33)



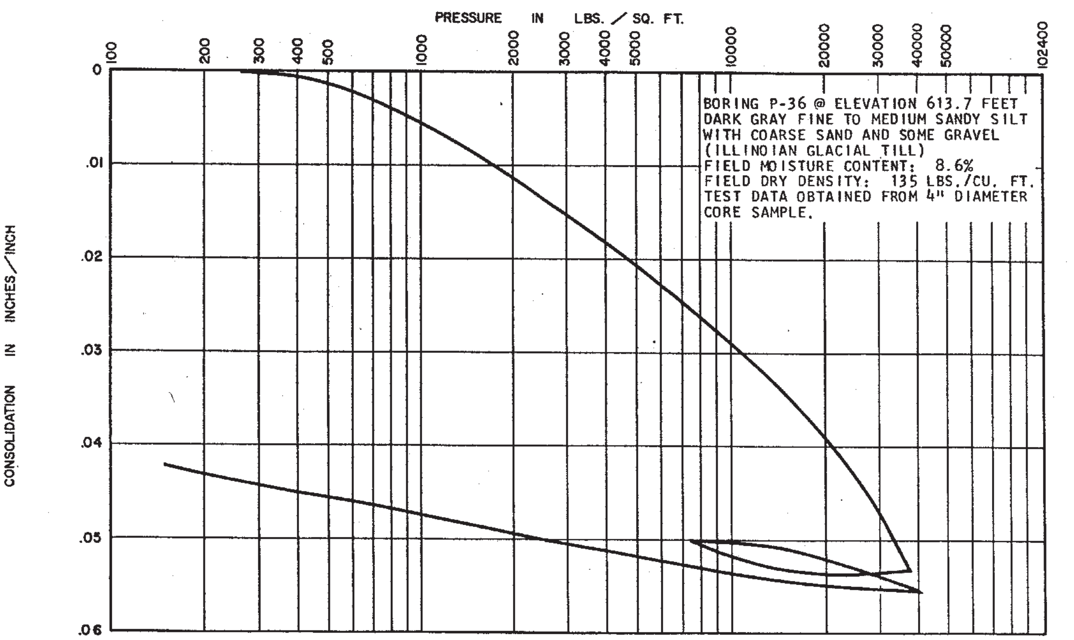


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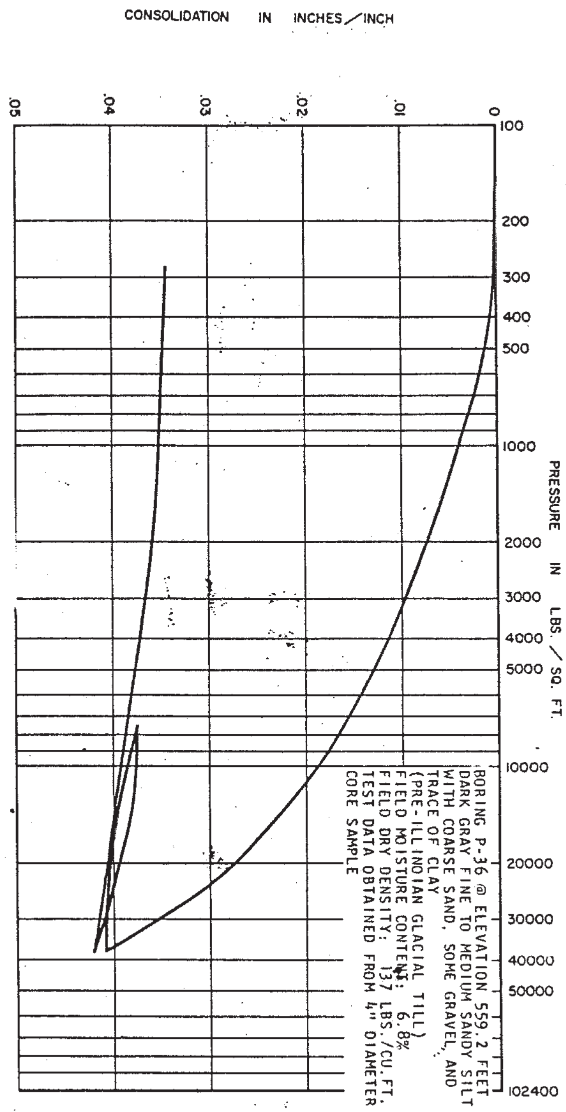
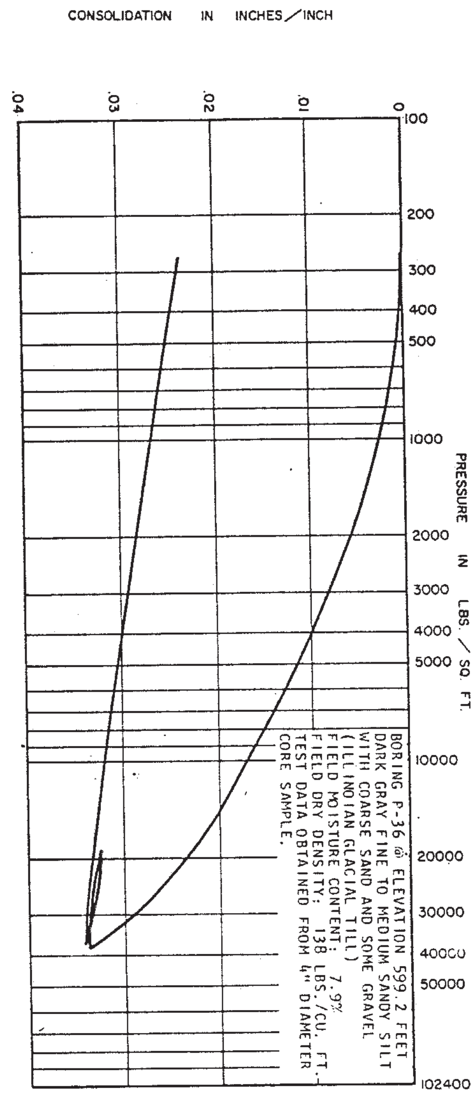
FIGURE 2.5-341

CONSOLIDATION TEST (BORING P-36)
(SHEET 1 of 3)





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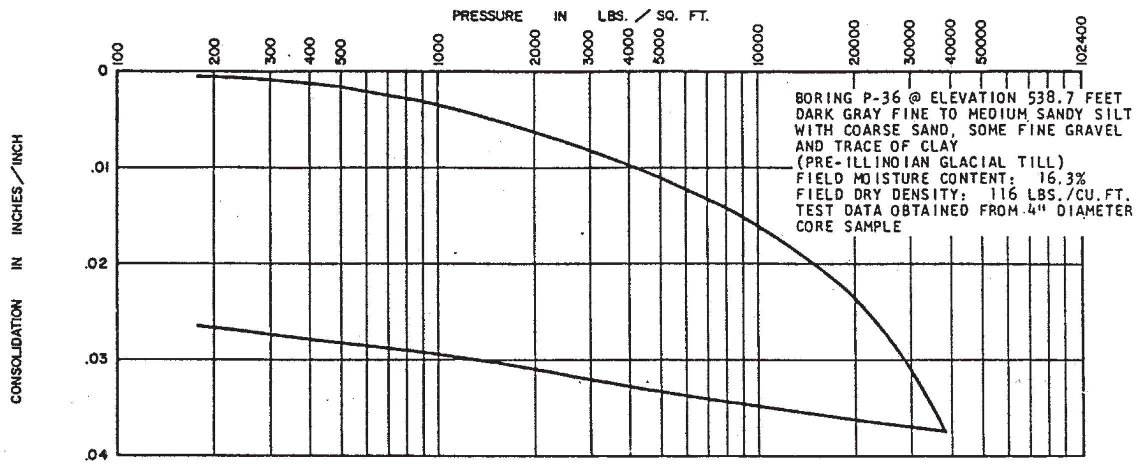
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-341

CONSOLIDATION TEST (BORING P-36)

(SHEET 2 of 3)



CLINTON POWER STATION
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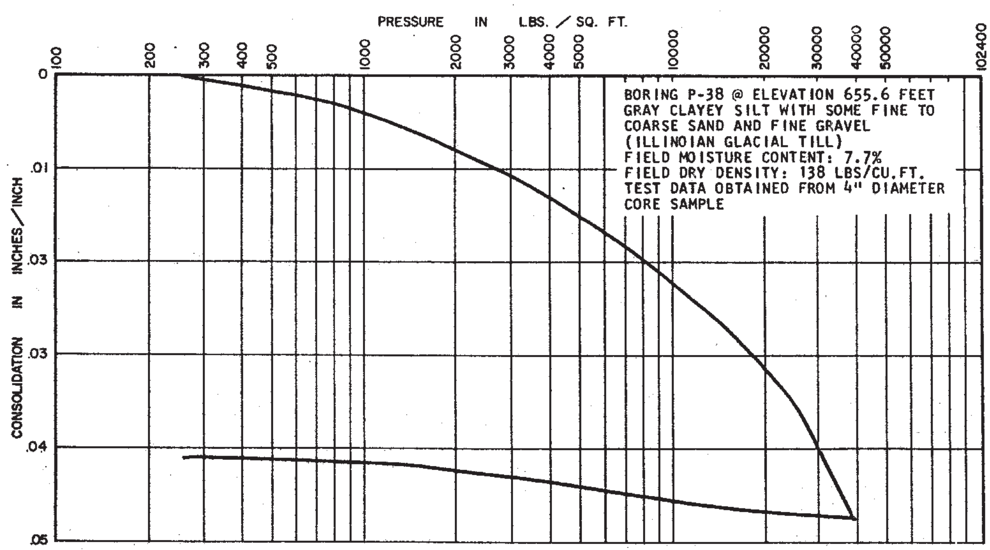
FIGURE 2.5-341

CONSOLIDATION TEST (BORING P-36)

(SHEET 3 of 3)



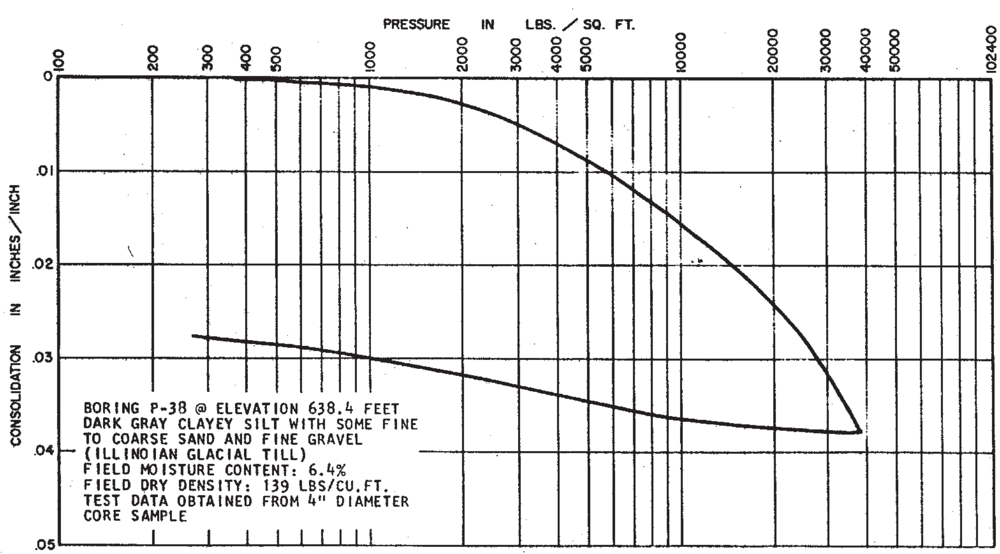


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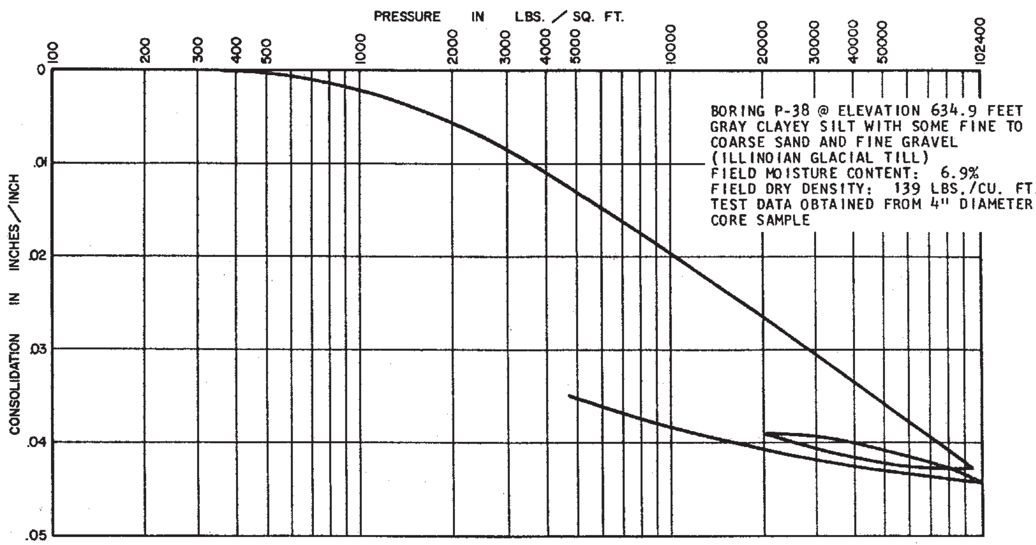
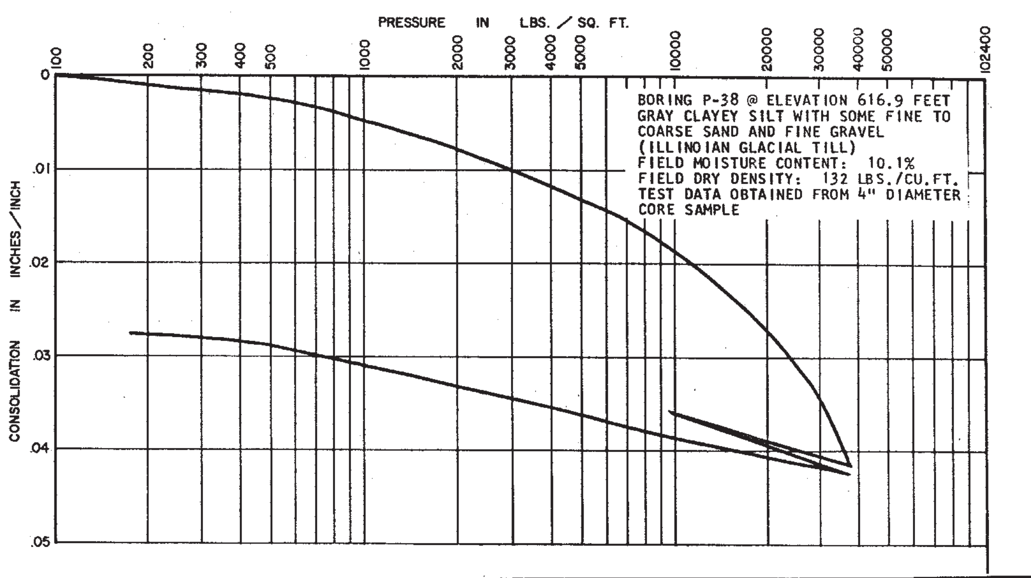
FIGURE 2.5-342

CONSOLIDATION TEST (BORING P-38)
(SHEET 1 of 5)





CLINTON POWER STATION
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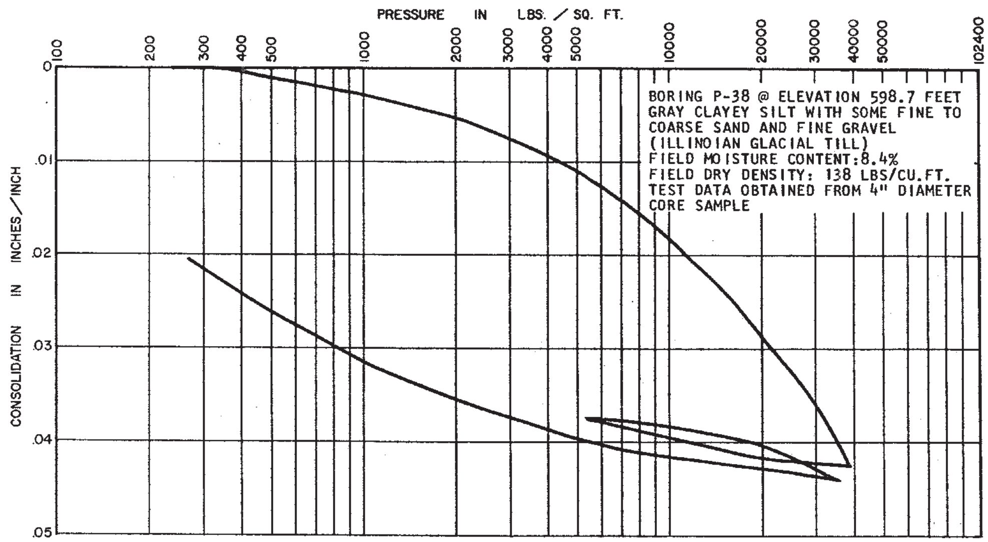
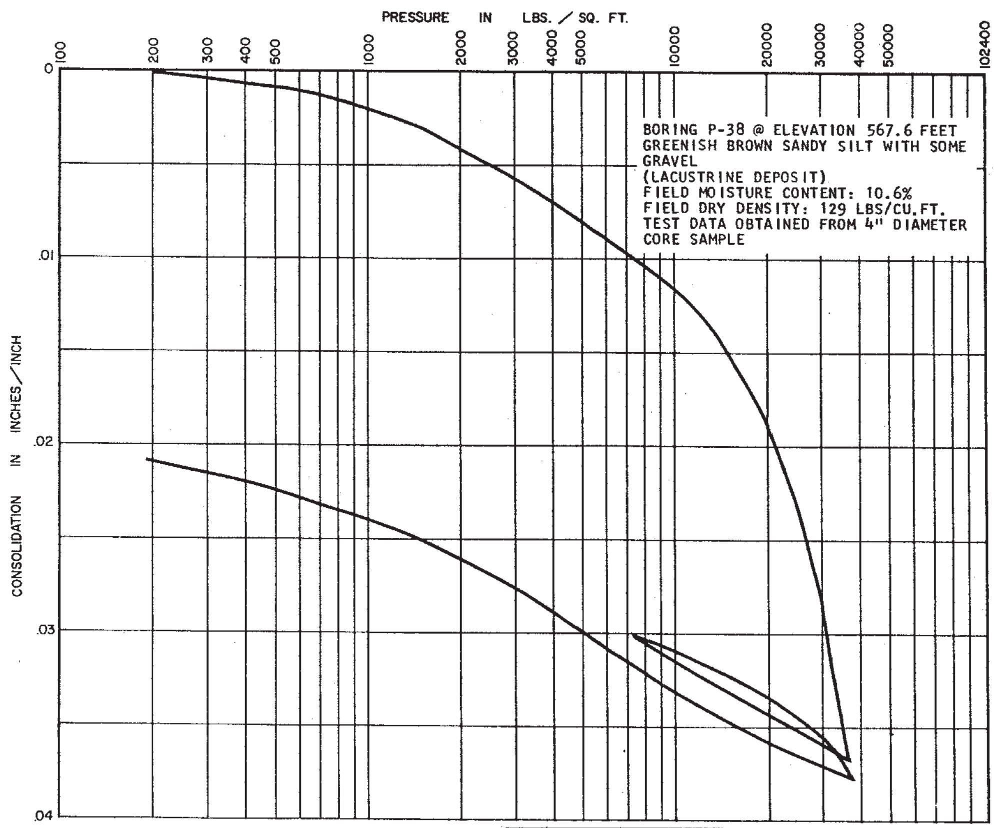
FIGURE 2.5-342

CONSOLIDATION TEST (BORING P-38)

(SHEET 2 of 5)





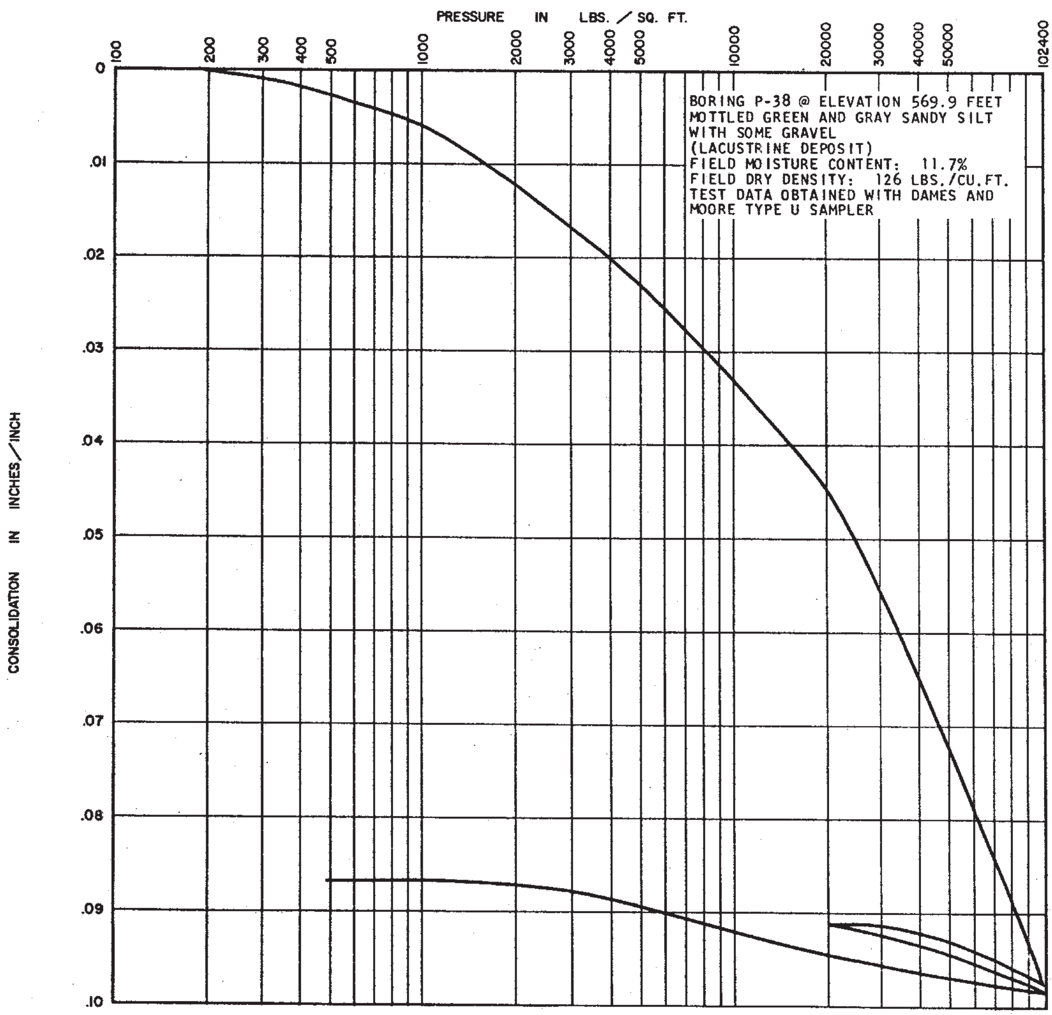
CLINTON POWER STATION

UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-342

CONSOLIDATION TEST (BORING P-38)

(SHEET 3 of 5)

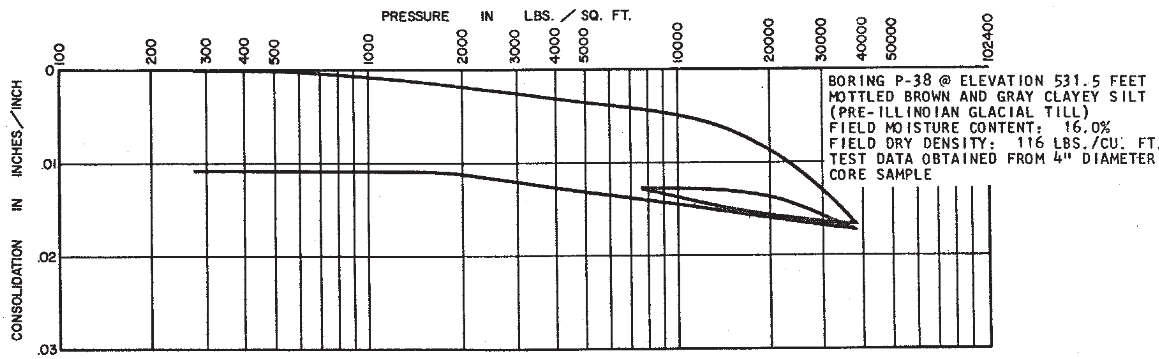


CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-342

CONSOLIDATION TEST (BORING P-38)

(SHEET 4 of 5)

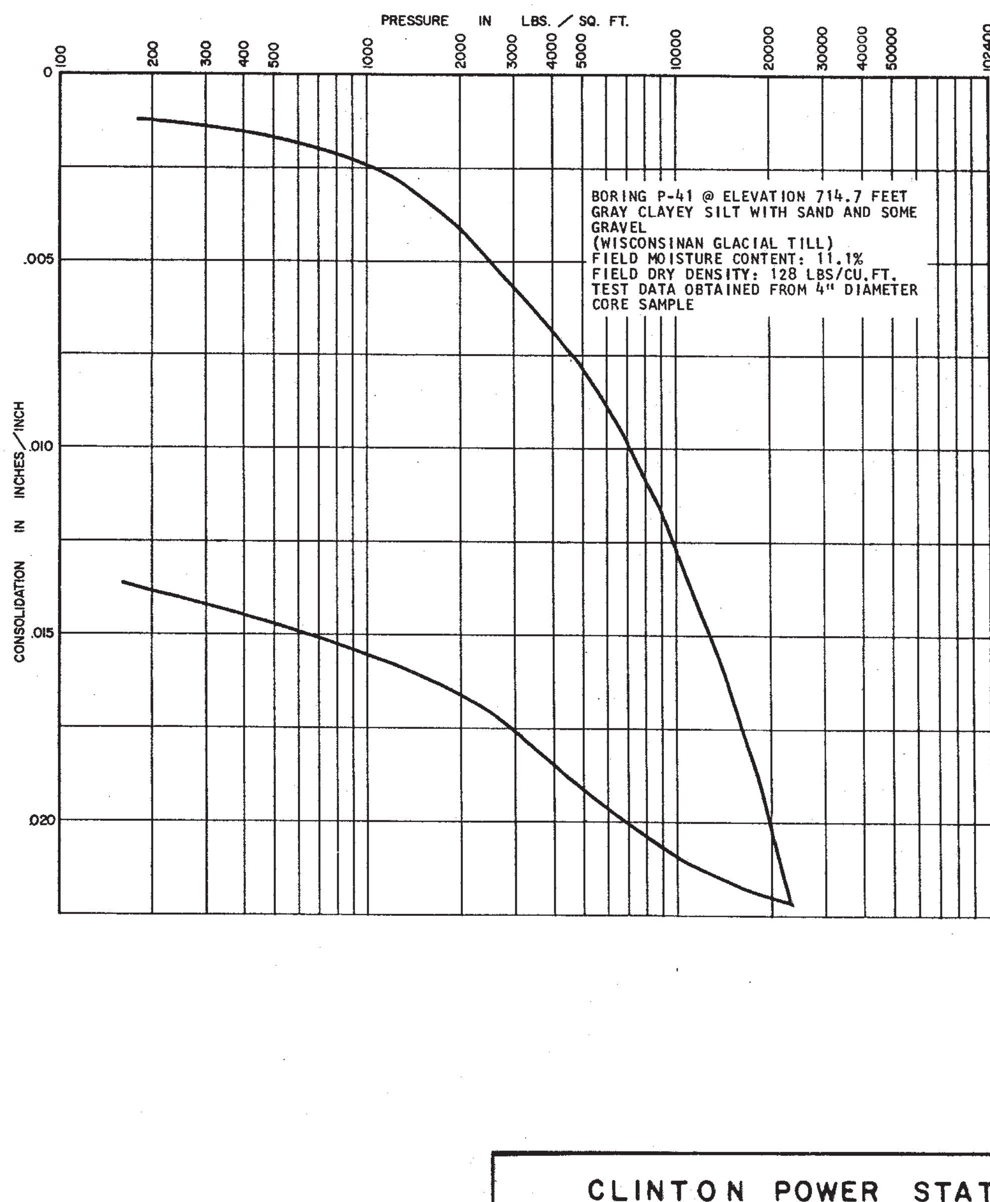


CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-342

CONSOLIDATION TEST (BORING P-38)

(SHEET 5 of 5)



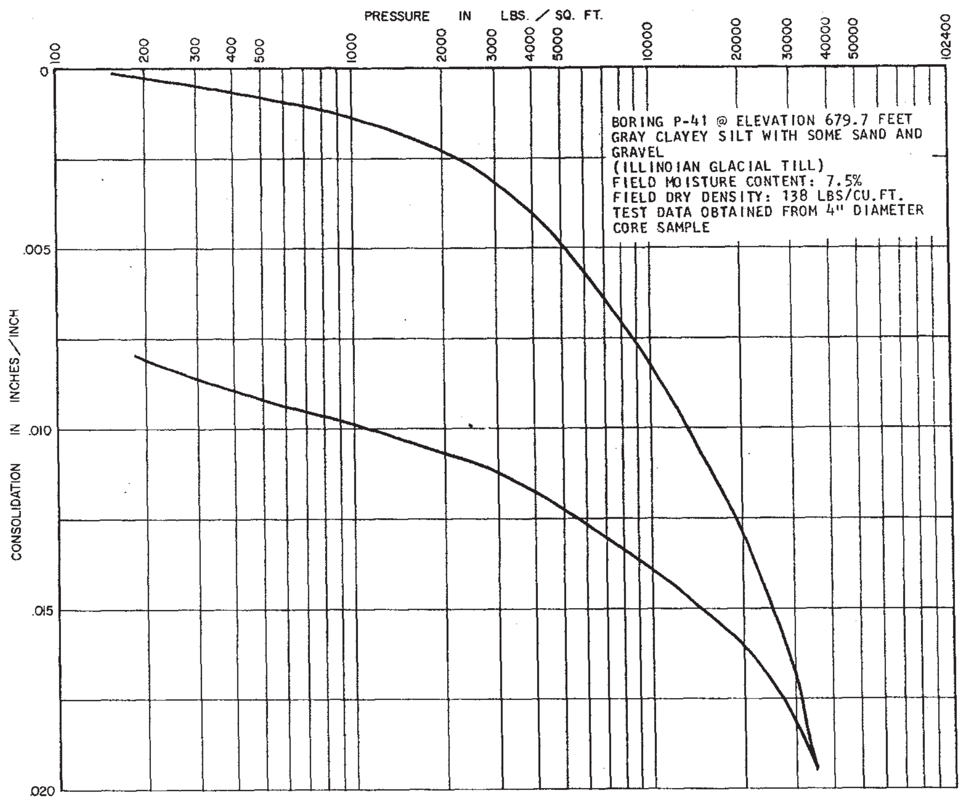
CLINTON POWER STATION

UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-343

CONSOLIDATION TEST (BORING P-41)

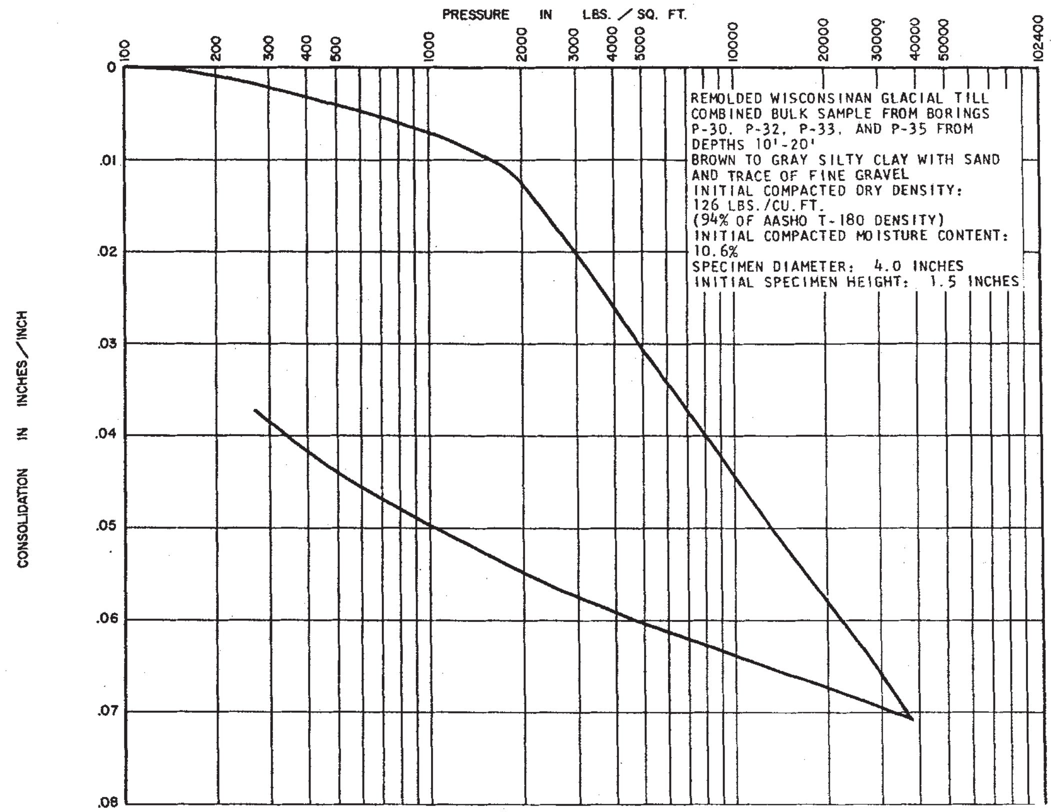
(SHEET 1 of 2)

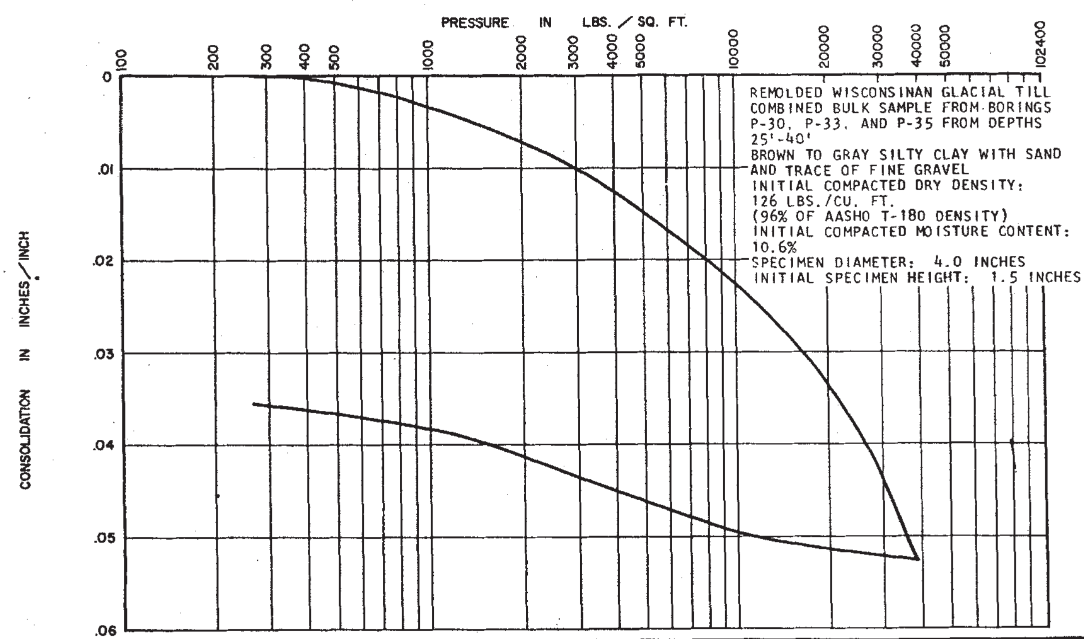


CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-343

CONSOLIDATION TEST (BORING P-41)
(SHEET 2 of 2)



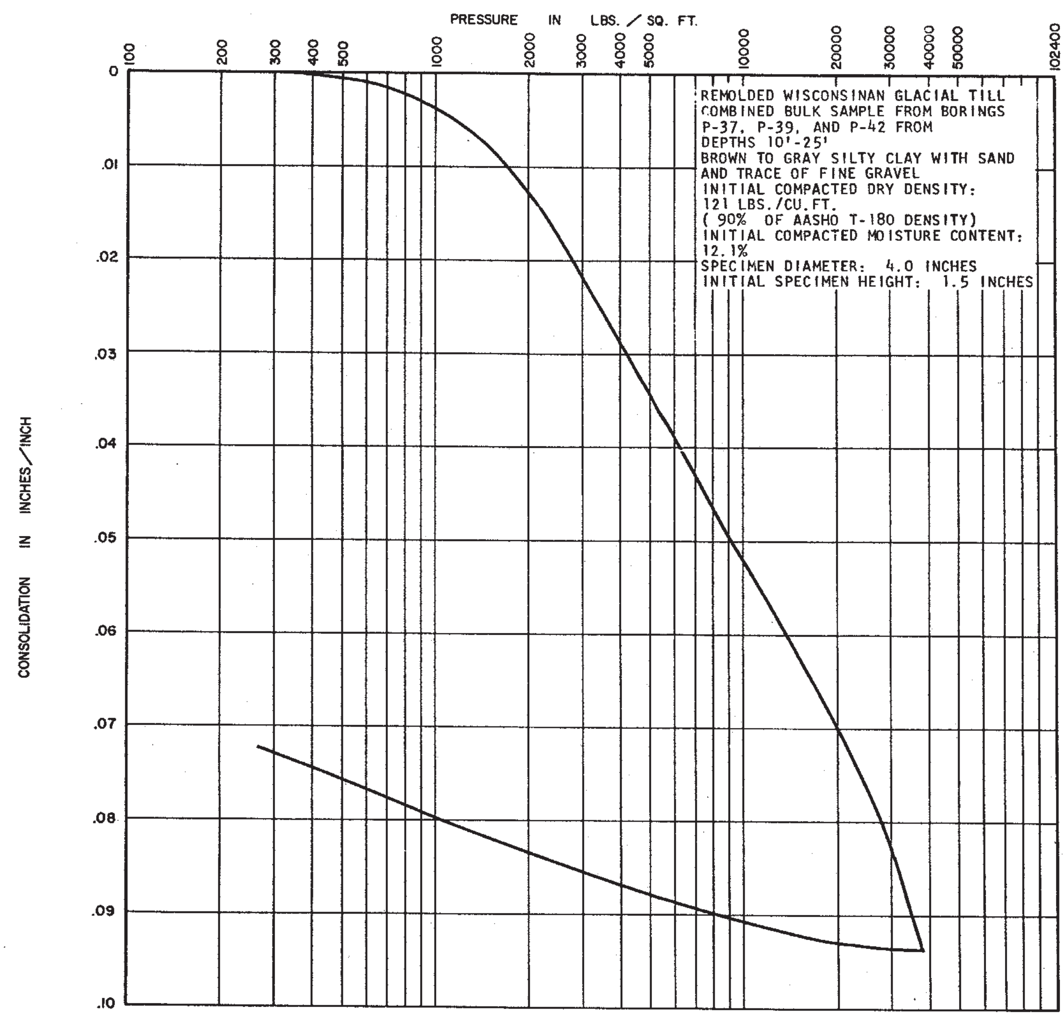


CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-344

CONSOLIDATION TEST (COMBINED BULK SAMPLE)

(SHEET 1 of 3)



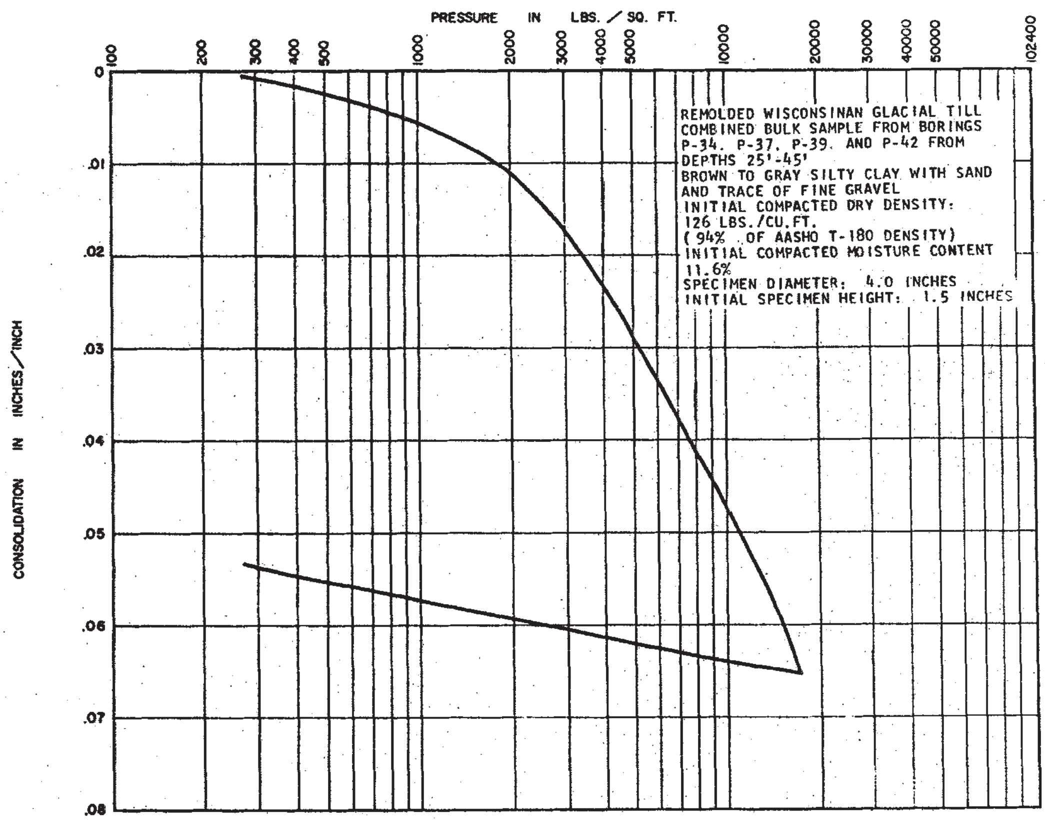
CLINTON POWER STATION

UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-344

CONSOLIDATION TEST (COMBINED BULK SAMPLE)

(SHEET 2 of 3)



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UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-344

CONSOLIDATION TEST (COMBINED BULK SAMPLE)

(SHEET 3 of 3)

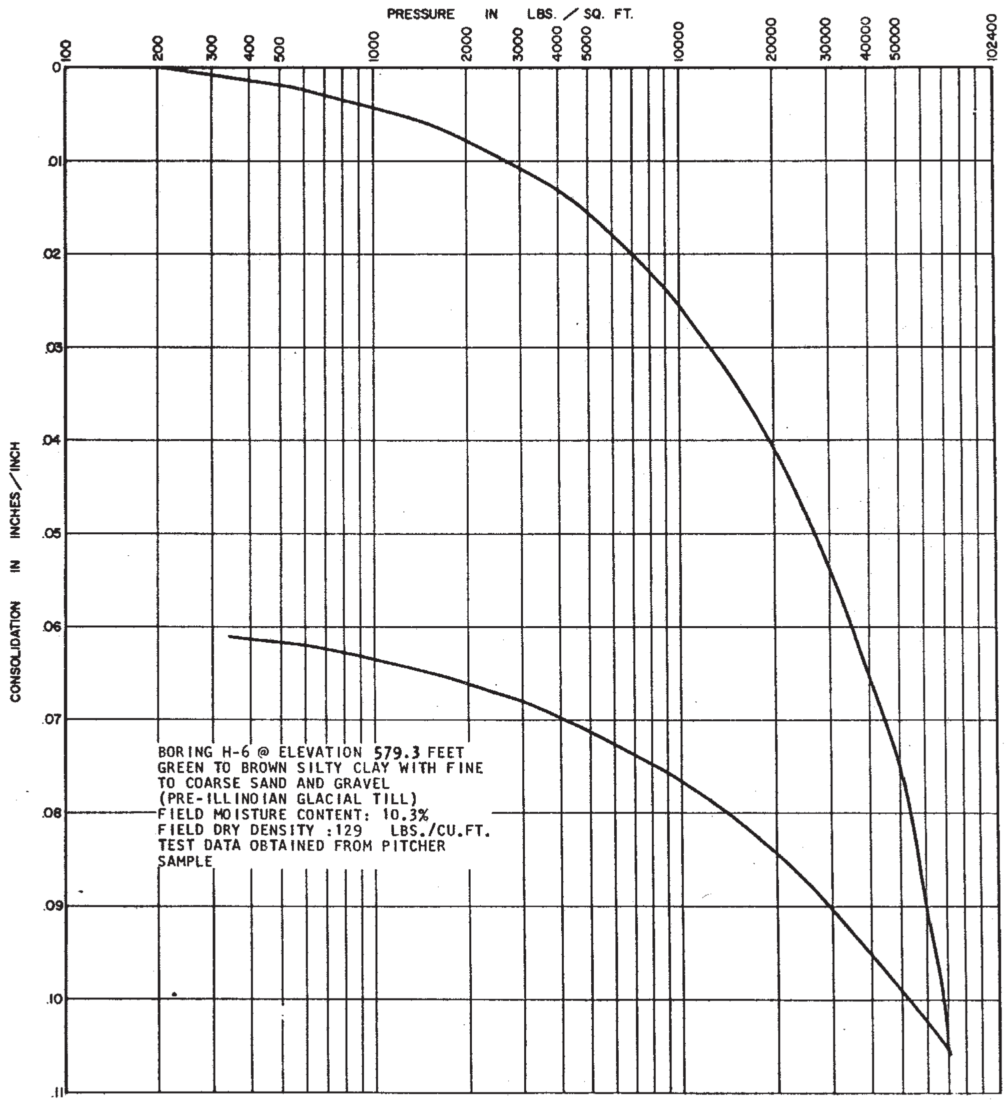

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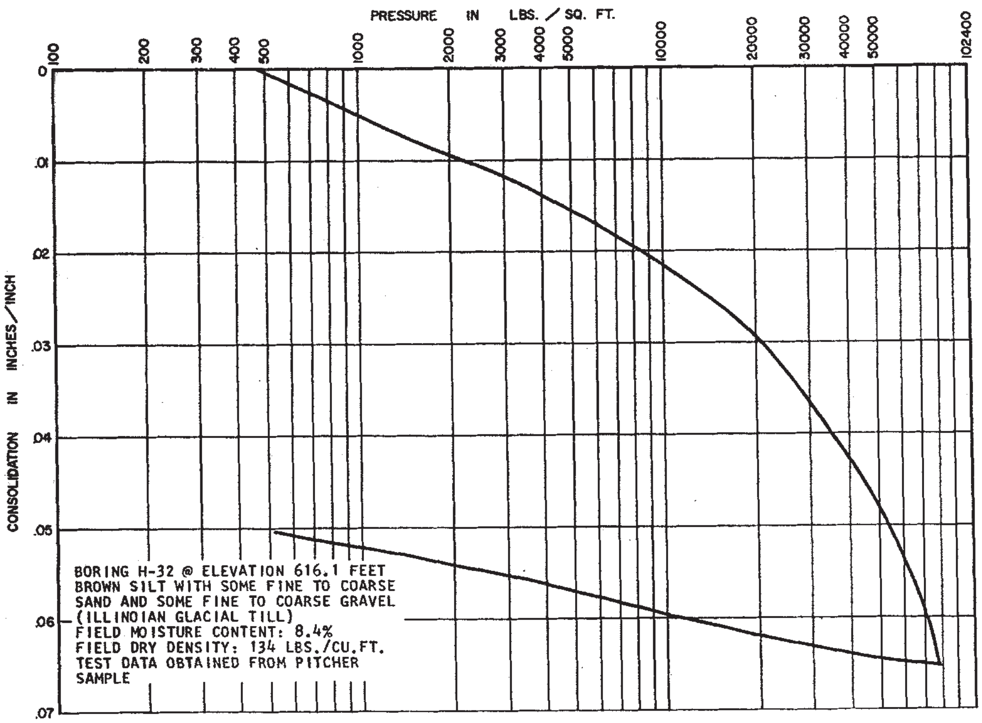
FIGURE 2.5-345

CONSOLIDATION TEST (BORING H-6)



CLINTON POWER STATION
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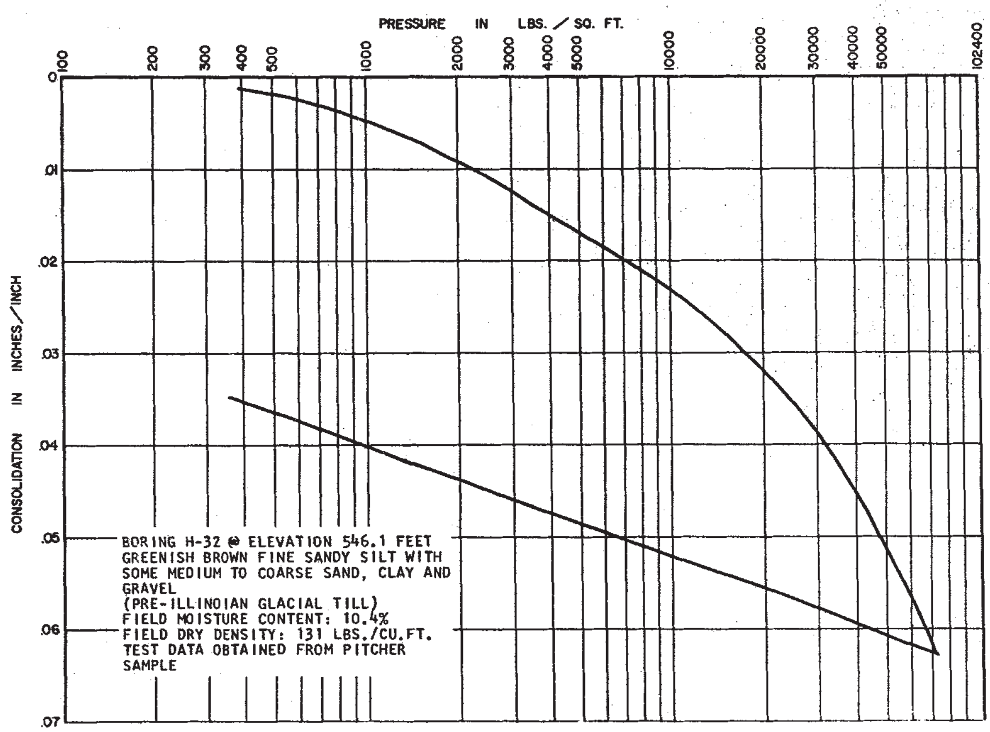
FIGURE 2.5-346

CONSOLIDATION TEST (BORING H-32)
(SHEET 1 of 2)

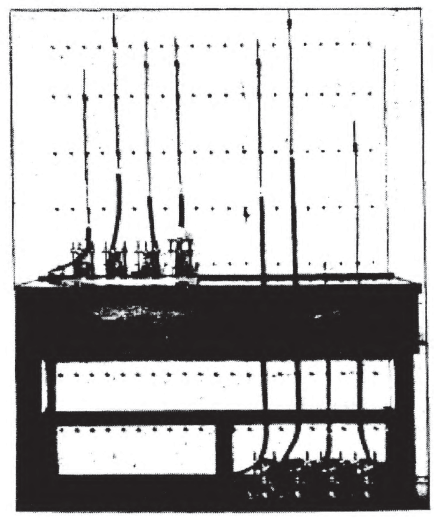


CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-346

CONSOLIDATION TEST (BORING H-32)

(SHEET 2 of 2)



CLINTON POWER STATION
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Figure 2.5-347
Sheet 1 of 2

PERCOLATION TEST (METHOD)

NOTES FOR FIGURE 2.5-347

Methods of Performing Percolation Tests

The quantity and the velocity of flow of water which will escape through an earth structure or percolate through soil are dependent upon the permeability of the earth structure or soil. The permeability of soil has often been calculated by empirical formulas but is best determined by laboratory tests, especially in the case of compacted soils.

A one inch length of the core sample is sealed in the percolation apparatus, placed under a confining load, or surcharge pressure, and subjected to the pressure of a known head of water. The percolation rate is computed from the measurements of the volume of water which flows through the sample in a series of time intervals. These rates are usually expressed as the velocity of flow in feet per year under a hydraulic gradient of one and at a temperature of 20 degrees Centigrade. The rate so expressed may be adjusted for any set of conditions involving the same soil by employing established physical laws. Generally, the percolation rate varies over a wide range at the beginning of the test and gradually approaches equilibrium as the test progresses.

During the performance of the test, continuous readings of the deflection of the sample are taken by means of micrometer dial gauges. The amount of compression or expansion, expressed as a percentage of the original length of the sample, is a valuable indication of the compression of the soil which will occur under the action of load or the expansion of the soil as saturation takes place.

Figure 2.5-347
Sheet 2 of 2

PERCOLATION TEST (METHOD)

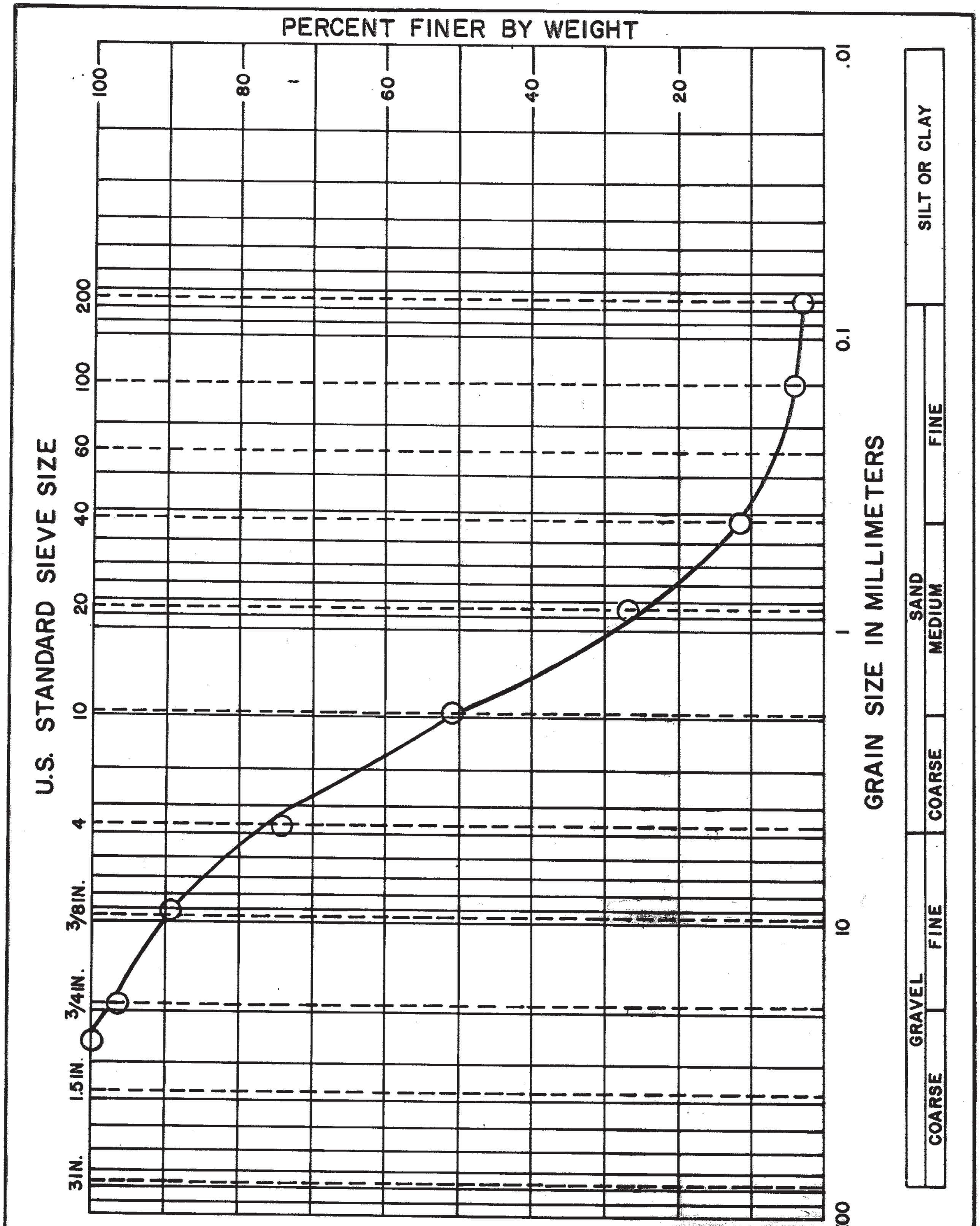

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FIGURE 2.5-348

PARTICLE SIZE ANALYSIS - TYPE B
MATERIAL - LIQUEFACTION SAMPLE

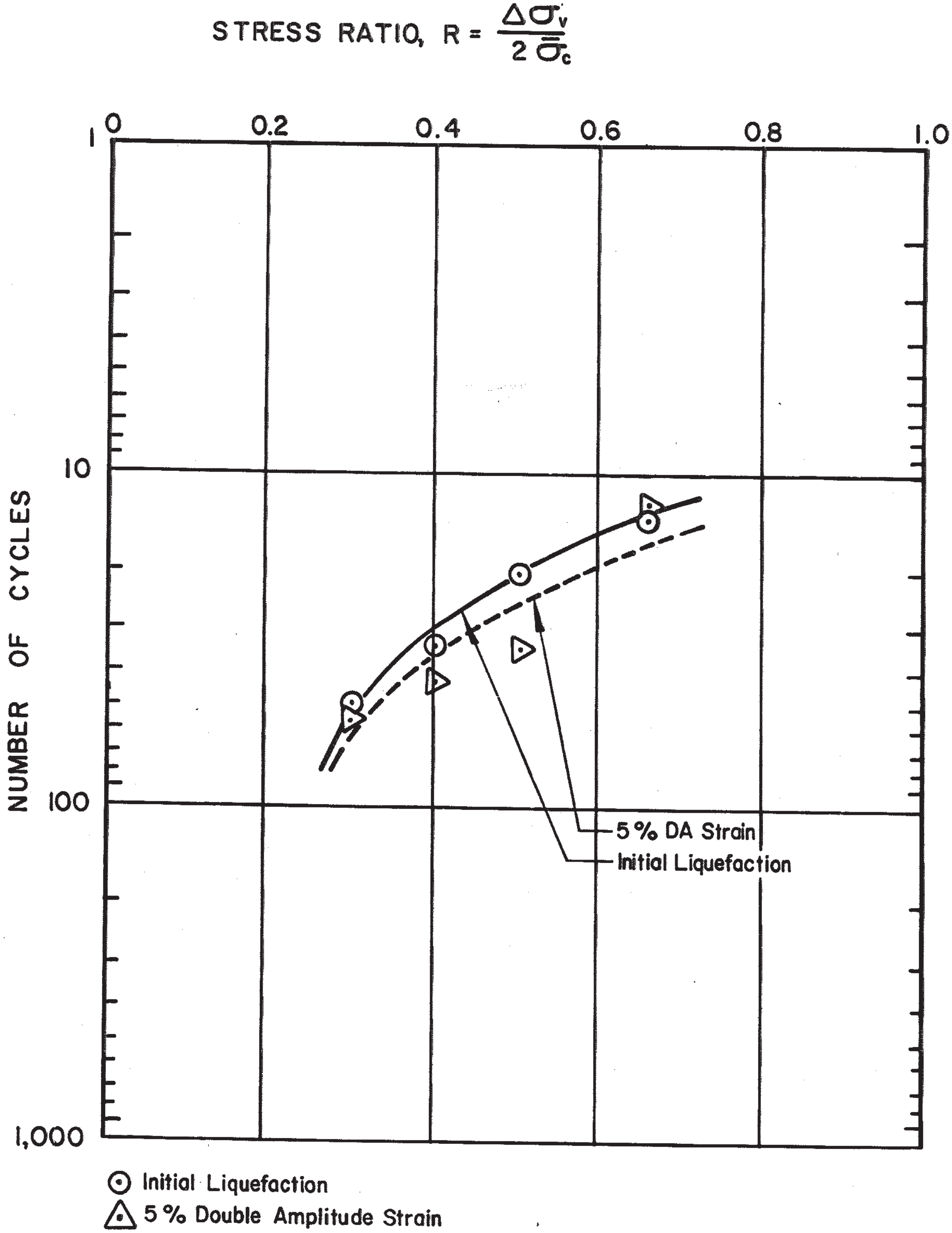

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FIGURE 2.5-349

LIQUEFACTION TESTS OF TYPE B MATERIAL

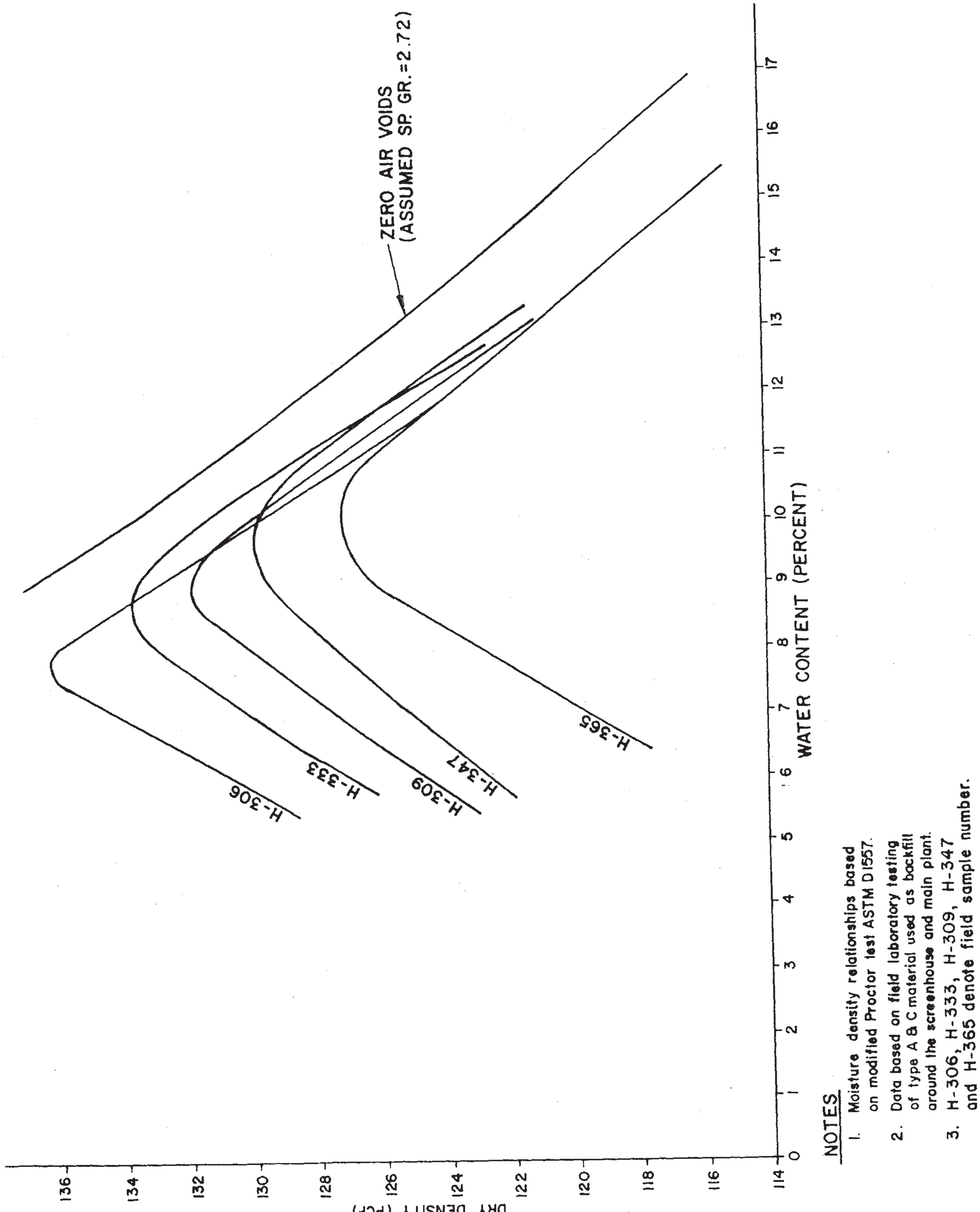

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FIGURE 2.5-350

TYPICAL MOISTURE-DENSITY RELATIONSHIPS - SCREEN HOUSE AND MAIN PLANT AREAS

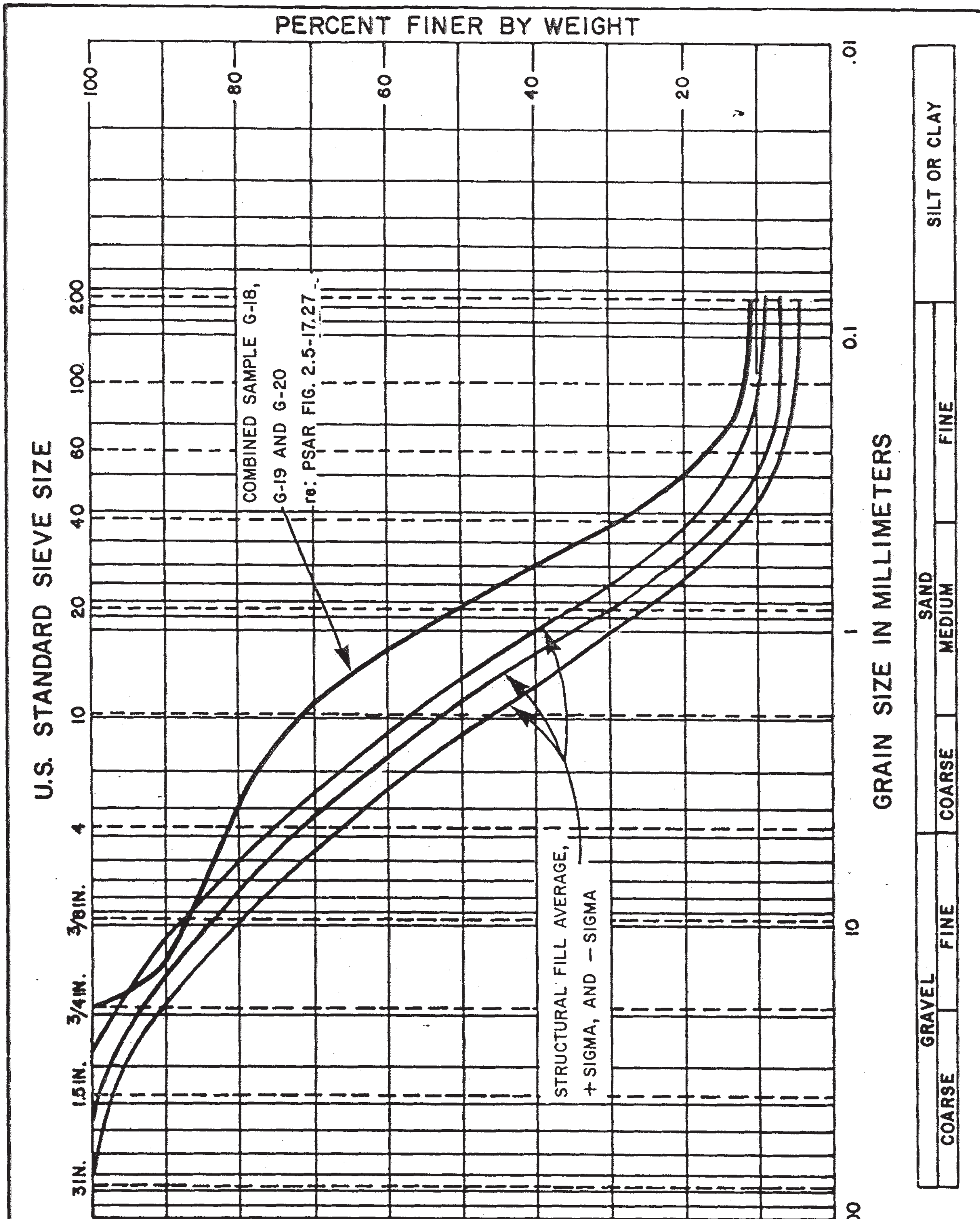

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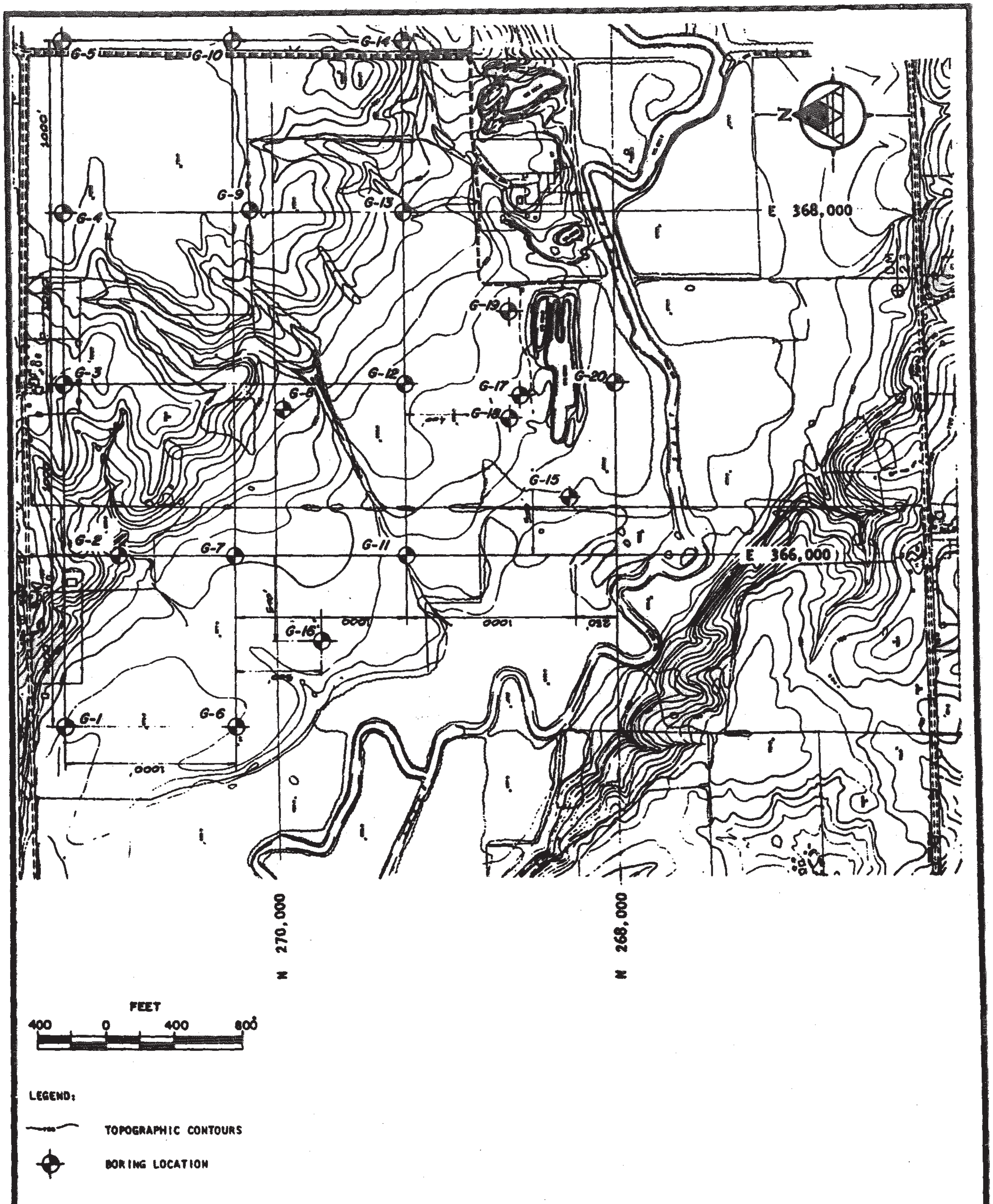
FIGURE 2.5-351

PARTICLE SIZE ANALYSIS - TYPE B MATERIAL - STATISTICAL AVERAGE GRADATION



NOTES:

1. SEE FIGURE 2.5-14 FOR LOCATION OF BORROW AREA.
2. REFER TO FIGURES 2.5-152 THROUGH 2.5-161 FOR LOGS OF BORINGS.

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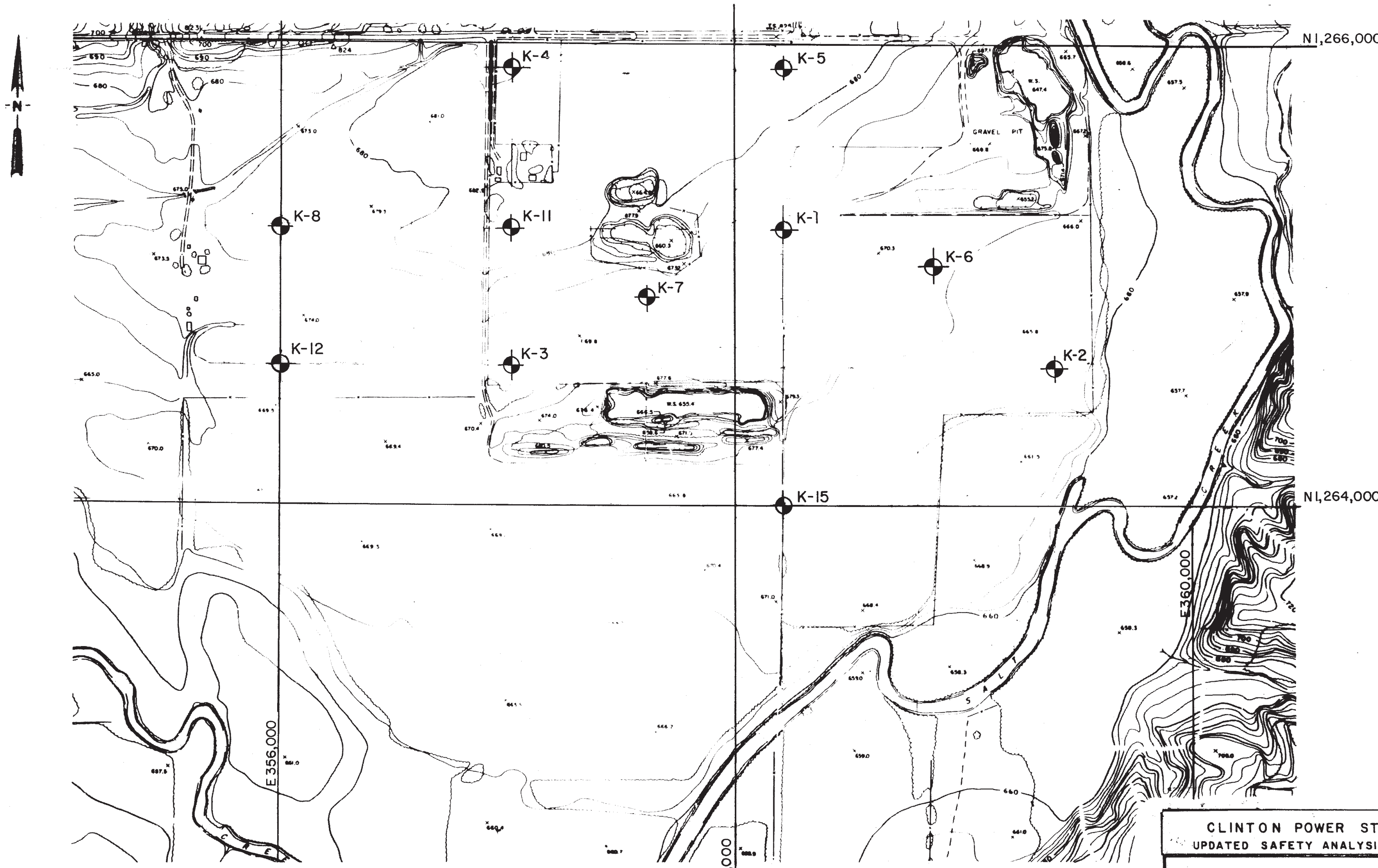
FIGURE 2.5-352

PLOT PLAN - PROPOSED BORROW AREA FOR STRUCTURAL FILL



NOTE

REFER TO FIGURES 2.5-243 THROUGH 2.5-253 FOR LOG OF BORINGS.

LEGEND

BORINGS

400 0 400

SCALE IN FEET

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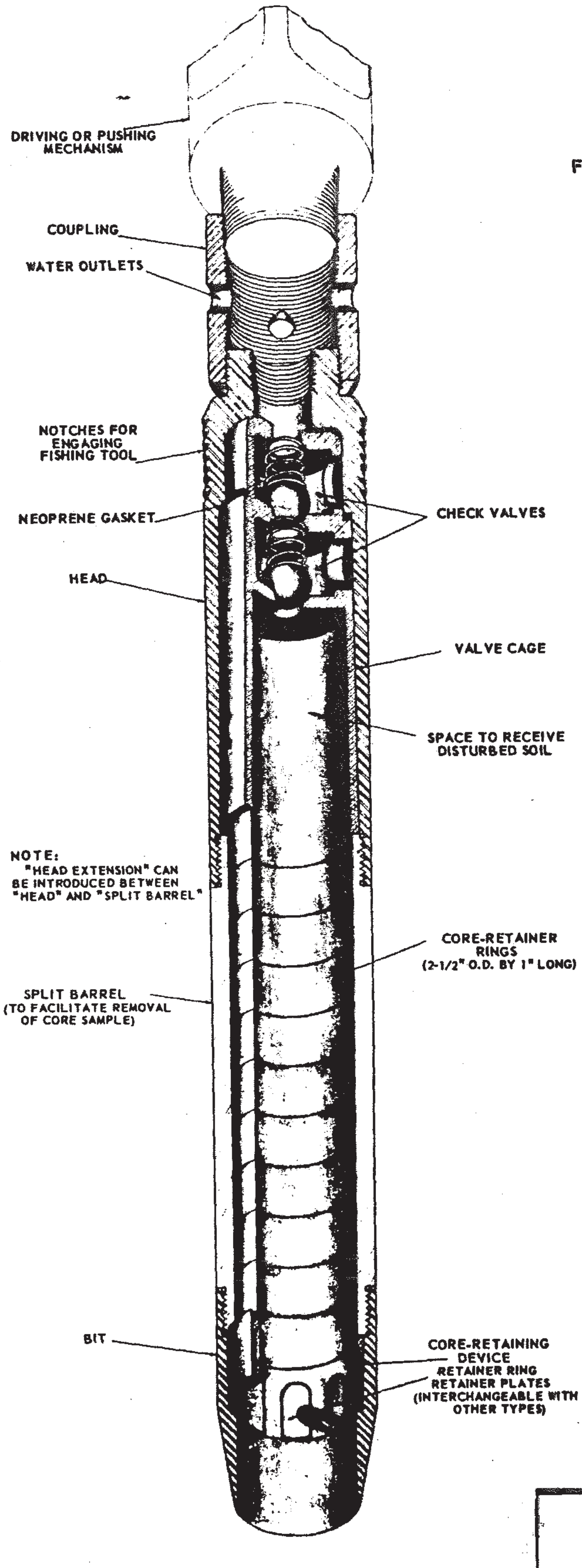
FIGURE 2.5-353

PLOT PLAN - TYPE B STRUCTURAL FILL BORROW AREA

SOIL SAMPLER TYPE U

FOR SOILS DIFFICULT TO RETAIN IN SAMPLER
U. S. PATENT NO. 2,318,062



ALTERNATE ATTACHMENTS

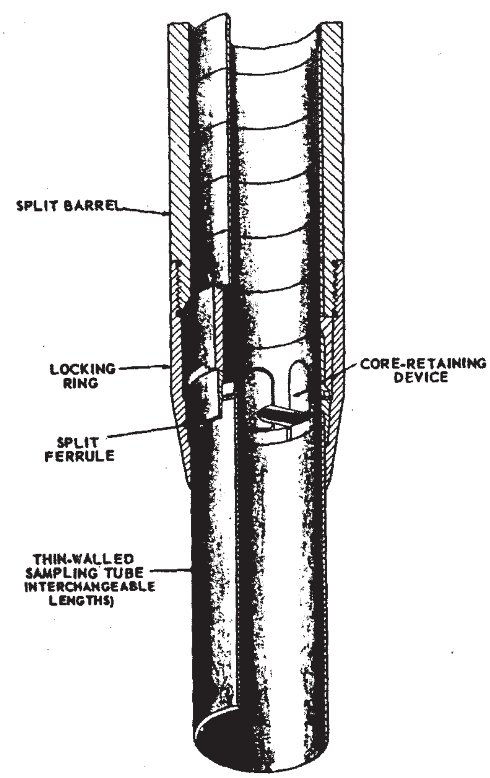


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FIGURE 2.5-354

DAMES AND MOORE U-TYPE SAMPLER

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			WOODWARD-CLYDE CONSULTANTS GRAPH SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTION	DAMES AND MOORE GRAPH SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTION	SARGENT & LUNDY ENGINEERS GRAPH SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTION
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (little or no fines)					GW	Well-graded gravels, gravel - sand mixtures, little or no fines.		GW	Well-graded gravels, gravel - sand mixtures, little or no fines.
				SP-GP GP-SP GP	Gravelly sand, sandy gravel, poorly graded gravel.		GP	Poorly-graded gravels, gravel - sand mixtures, little or no fines.		GP	Poorly-graded gravels, gravel - sand mixtures, little or no fines.
	More than 50% of coarse fraction RETAINED on No. 4 sieve	GRAVELS WITH FINES (appreciable amount of fines)		GM GP-GM	Sandy GRAVEL, with trace or some silt, silty GRAVEL.		GM	Silty gravels, gravel-sand-silt mixtures.		GM	Silty gravels, gravel-sand-silt mixtures.
							GC	Clayey gravels, gravel-sand-clay mixtures.		GC	Clayey gravels, gravel-sand-clay mixtures.
More than 50% of material is LARGER than No. 200 sieve size	SAND AND SANDY SOILS	CLEAN SAND (little or no fines)		SP SP-SM SW	Sand with trace silt.		SW	Well-graded sands, gravelly sands, little or no fines.		SW	Well-graded sands, gravelly sands, little or no fines.
							SP	Poorly-graded sands, gravelly sands, little or no fines.		SP	Poorly-graded sands, gravelly sands, little or no fines.
	More than 50% of coarse fraction PASSING No. 4 sieve	SANDS WITH FINES (appreciable amount of fines)		SM ML	Sand with some silt, silty sand, sandy silt.		SM	Silty sands, sand-silt mixtures.		SM	Silty sands, sand-silt mixtures.
				SC	Clayey SAND.		SC	Clayey sands, sand-clay mixtures.		SC	Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS	SILTS AND CLAYS	Liquid limit LESS than 50		ML	SILT, Clayey SILT.		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
				CL CL-ML	Silty clay.		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, clays, lean clays.		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
							OL	Organic silts and organic silty clays of low plasticity.		OL	Organic silts and organic silty clays of low plasticity.
More than 50% of material is SMALLER than No. 200 sieve size	SILTS AND CLAYS	Liquid limit GREATER than 50					MH	Inorganic silts, micaceous or diatomaceous fine sand or silty soils.		MH	Inorganic silts, micaceous or diatomaceous fine sand or silty soils.
				CH	CLAY (High plasticity)		CH	Inorganic clays of high plasticity, fat clays.		CH	Inorganic clays of high plasticity, fat clays.
							OH	Organic clays of medium to high plasticity, organic silts.		OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS							PT	Peat, humus swamp soils with high organic contents.		PT	Peat, humus, swamp soils with high organic contents.
					Topsoil						

NOTES:

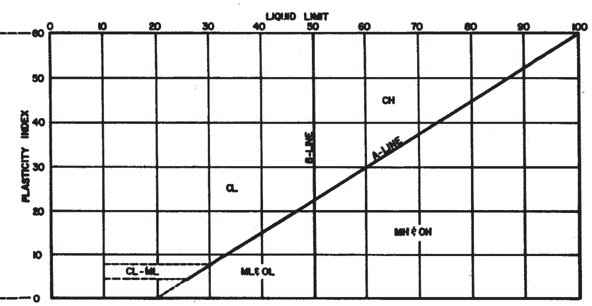
1. Woodward-Clyde Consultants presents only those materials encountered by their field study.
2. Dual symbols are used to indicate borderline classifications.
3. When shown on the boring logs, the following terms are used to describe the consistency of cohesive soils and the relative compactness of cohesionless soils.

CONSISTENCY OF COHESIVE SOILS			RELATIVE DENSITY OF GRANULAR SOILS	
NO. BLOWS/FT	UNCONFINED COMPRESSIVE STRENGTH (tsf)	CONSISTENCY	NO. OF BLOWS/FT	RELATIVE DENSITY
< 2	< 0.25	Very Soft	0-3	Very Loose
2-3	0.25-0.49	Soft	4-9	Loose
4-7	0.50-0.99	Medium	10-29	Medium
8-14	1.00-1.99	Stiff	30-49	Dense
15-30	2.00-4.00	Very stiff	50-80	Very Dense
>30	>4.00	Hard	>80	Extremely dense

MATERIAL SIZE	PARTICLE SIZE LOWER LIMIT MILLIMETERS	LOWER LIMIT SIEVE SIZE	UPPER LIMIT MILLIMETERS	UPPER LIMIT SIEVE SIZE
SAND				
FINE	.074	#200*	0.42	#40*
MEDIUM	0.42	#40*	2.00	#10*
COARSE	2.00	#10*	4.76	#4*
GRAVEL				
FINE	4.76	#4*	19.1	3/4"•
COARSE	19.1	3/4"•	76.2	3"•
COBBLES	76.2	3"•	304.8	12"•
BOULDERS	304.8	12"•	914.4	36"•

* U.S. STANDARD • CLEAR SQUARE OPENINGS

GRADATION CHART



PLASTICITY CHART

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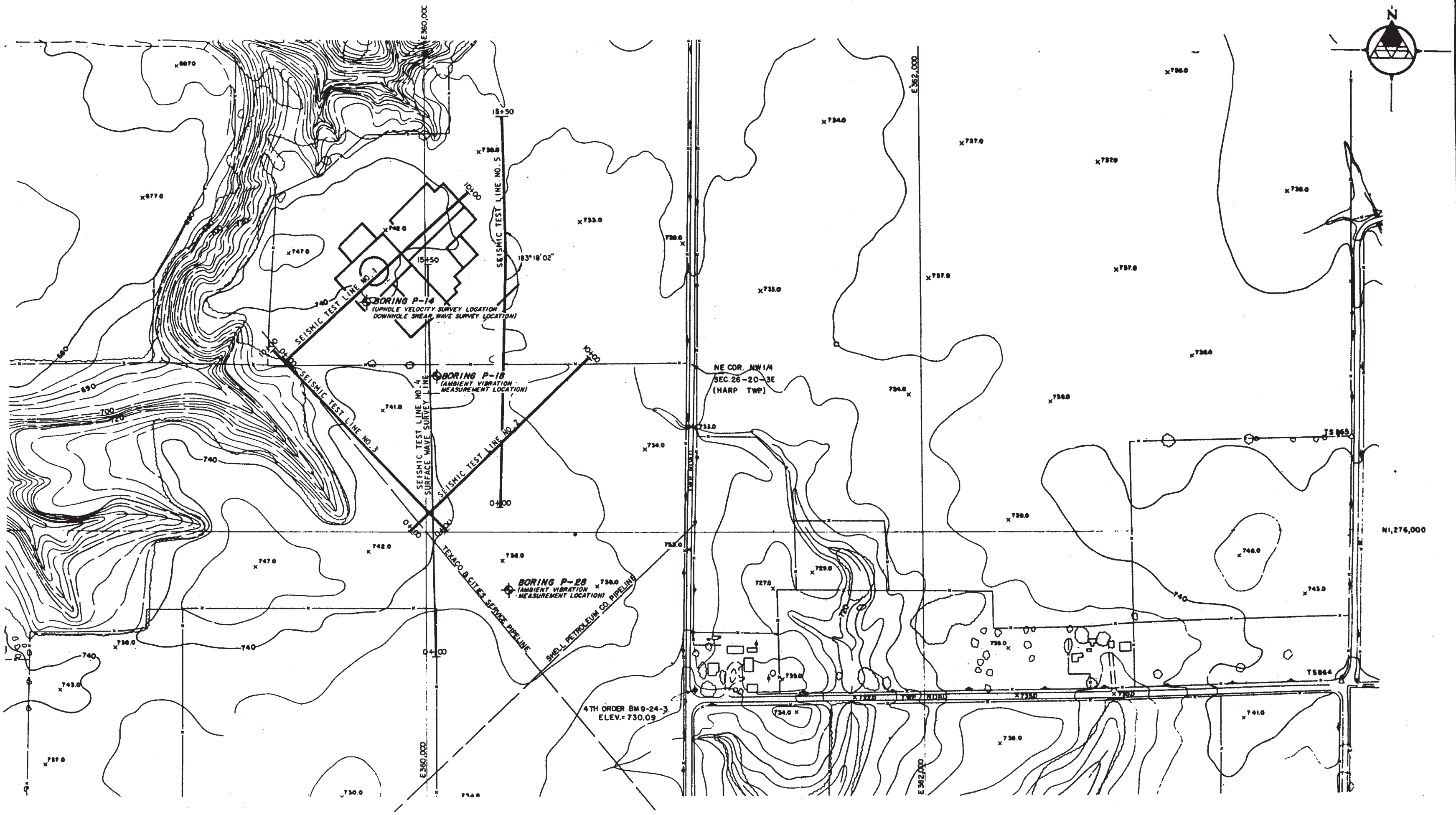
FIGURE 2.5-355

UNIFIED SOIL CLASSIFICATION SYSTEM



NOTES:

1. REFER TO FIGURES 2.5-359 THROUGH 2.5-363 FOR SEISMIC REFRACTION SURVEYS NO. 1 THROUGH NO. 5.
2. REFER TO FIGURE 2.5-366 FOR UPHOLE VELOCITY SURVEY IN BORING P-14.

LEGEND

740 TOPOGRAPHIC CONTOURS

BORING P-28 BORING LOCATION

FEET

100 0 100 200 300 400 500

CONTOUR INTERVAL 3 1/3 FEET

CLINTON POWER STATION

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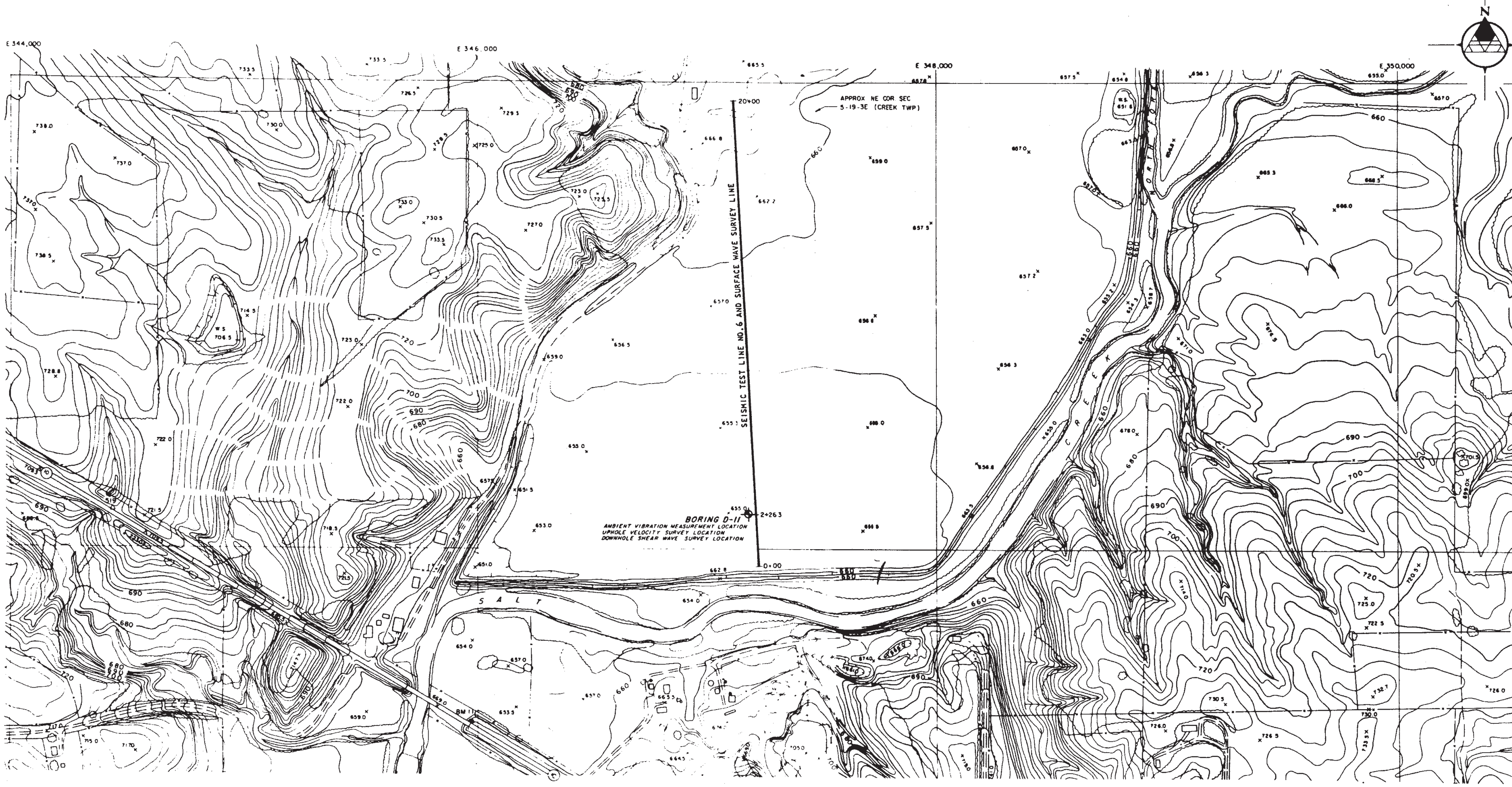
FIGURE 2.5-356

PLOT PLAN OF GEOPHYSICAL EXPLORATIONS STATION SITE



NOTES:

1. REFER TO FIGURE 2.5-364 FOR SEISMIC REFRACTION SURVEY LINE NO. 6.
2. REFER TO FIGURE 2.5-367 FOR UPHOLE VELOCITY SURVEY IN BORING D-11.

LEGEND

690 — TOPOGRAPHIC CONTOURS

BORING D-11 — BORING LOCATION

FEET

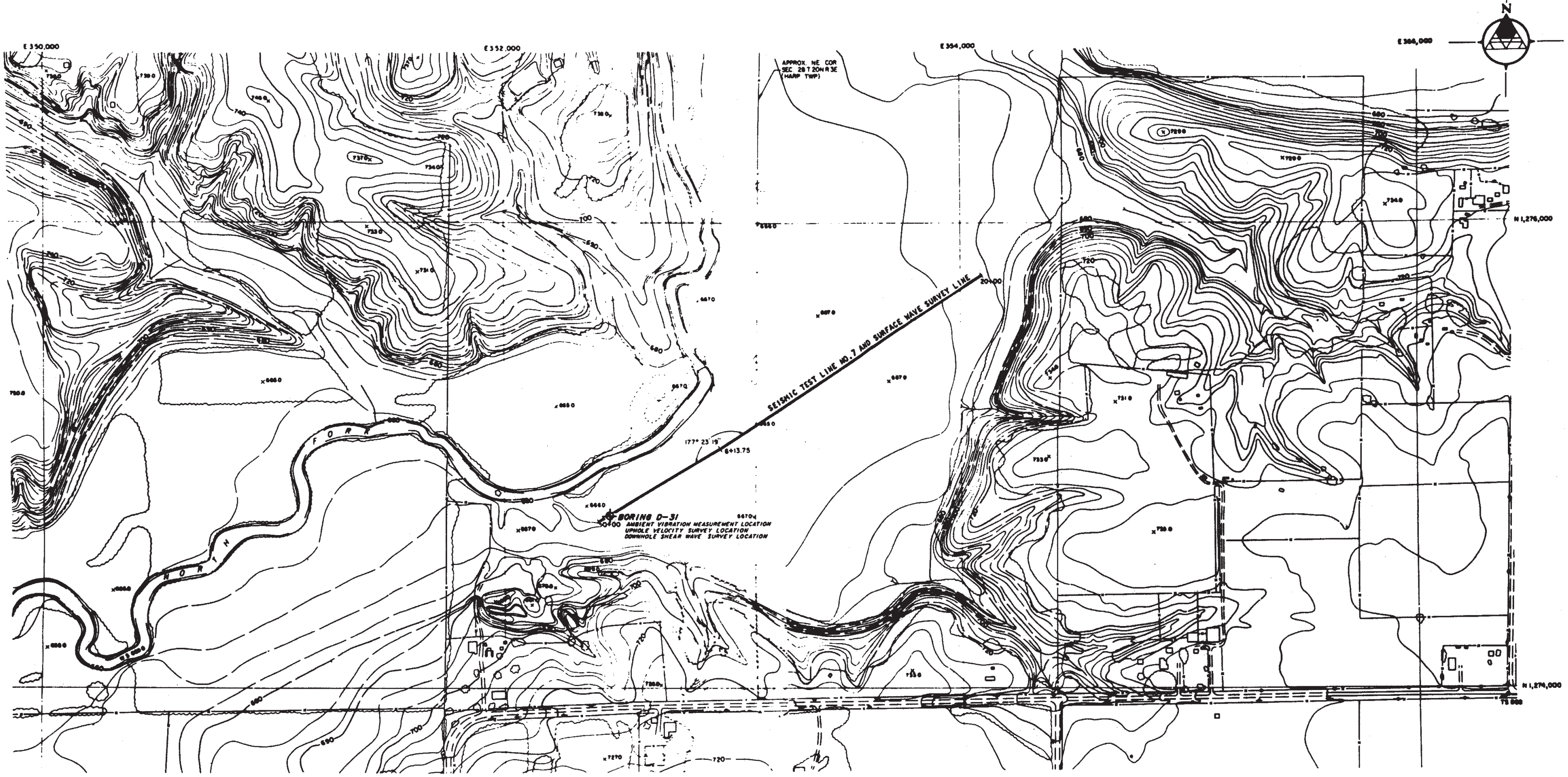
100 0 100 200 300 400 500

CONTOUR INTERVAL 3 1/3 FEET

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-357

PLOT PLAN OF GEOPHYSICAL EXPLORATIONS
DAM SITE



NOTES:

1. REFER TO FIGURE 2.5-364 FOR SEISMIC REFRACTION SURVEY LINE NO. 7.
2. REFER TO FIGURE 2.5-368 FOR UPHOLE VELOCITY SURVEY IN BORING D-31.

LEGEND

690 TOPOGRAPHIC CONTOURS

BORING D-31 BORING LOCATION

FEET

100 0 100 200 300 400 500

CONTOUR INTERVAL 3 1/3 FEET

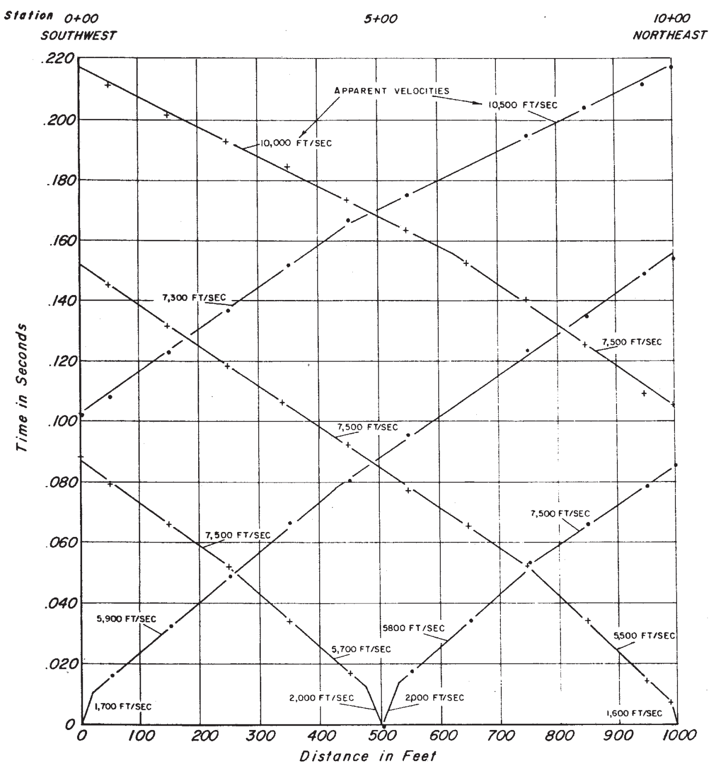
CLINTON POWER STATION

UPDATED SAFETY ANALYSIS REPORT

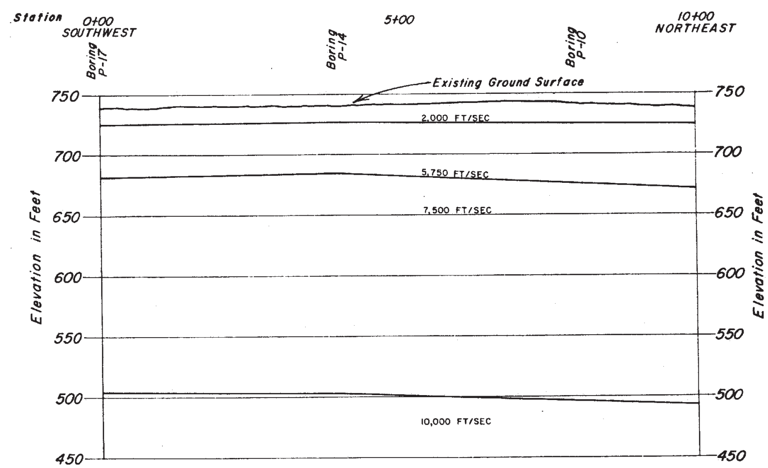
FIGURE 2.5-358

PLOT PLAN OF GEOPHYSICAL EXPLORATIONS ALONG NORTH FORK OF SALT CREEK

TIME-DISTANCE PLOT – SEISMIC LINE I



SUBSURFACE SECTION-SEISMIC LINE I



NOTES:

1. TIME DISTANCE PLOTS SHOW INFORMATION COLLECTED FROM SHOT POINTS MADE AT SEVERAL LOCATIONS ALONG A SEISMIC LINE, FOR CLARIFICATION, TWO PLOT SYMBOLS HAVE BEEN USED TO INDICATE THE ORIGIN OF THE ENERGY: FROM THE LEFT (.) FROM THE RIGHT (+).
2. THE SUBSURFACE SECTIONS SHOWN PRESENT OUR EVALUATION OF THE MOST PROBABLE SUBSURFACE CONDITIONS BASED UPON OUR INTERPRETATION OF PRESENTLY AVAILABLE DATA, SOME VARIATIONS FROM THESE CONDITIONS MUST BE EXPECTED.
3. REFER TO FIGURE 2.5-356 FOR LOCATION OF SEISMIC TEST LINE NO. 1.

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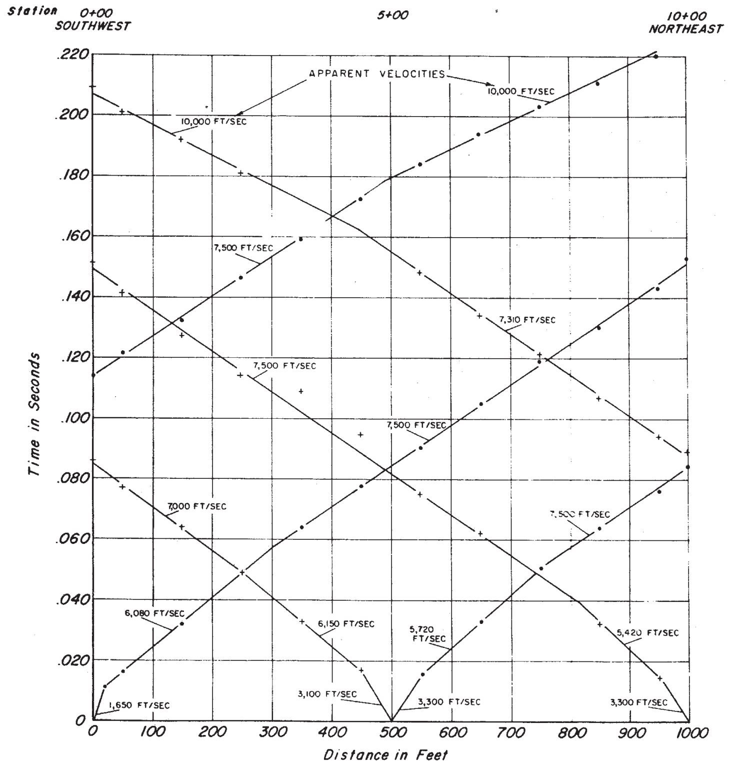
UPDATED SAFETY ANALYSIS REPORT

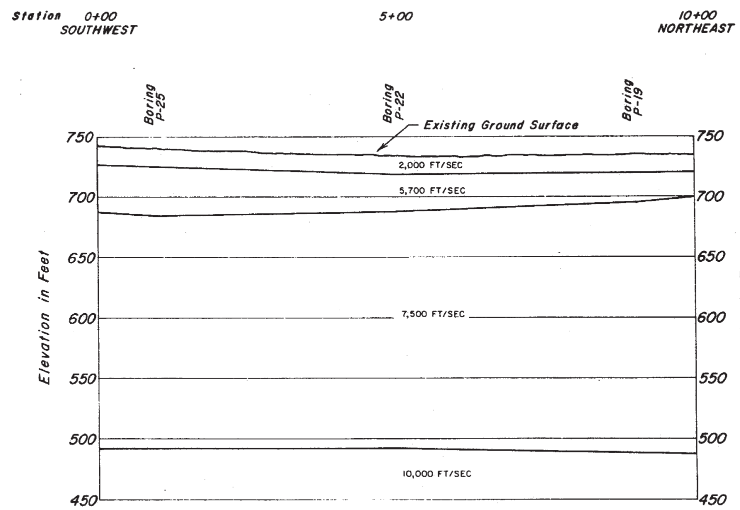
FIGURE 2.5-359

SEISMIC REFRACTION SURVEY LINE 1
STATION SITE

TIME-DISTANCE PLOT – SEISMIC LINE 2



SUBSURFACE SECTION–SEISMIC LINE 2



NOTES:

1. TIME DISTANCE PLOTS SHOW INFORMATION COLLECTED FROM SHOT POINTS MADE AT SEVERAL LOCATIONS ALONG A SEISMIC LINE, FOR CLARIFICATION, TWO PLOT SYMBOLS HAVE BEEN USED TO INDICATE THE ORIGIN OF THE ENERGY: FROM THE LEFT (.) FROM THE RIGHT (+).
2. THE SUBSURFACE SECTIONS SHOWN PRESENT OUR EVALUATION OF THE MOST PROBABLE SUBSURFACE CONDITIONS BASED UPON OUR INTERPRETATION OF PRESENTLY AVAILABLE DATA, SOME VARIATIONS FROM THESE CONDITIONS MUST BE EXPECTED.
3. REFER TO FIGURE 2.5-356 FOR LOCATION OF SEISMIC TEST LINE NO. 2.

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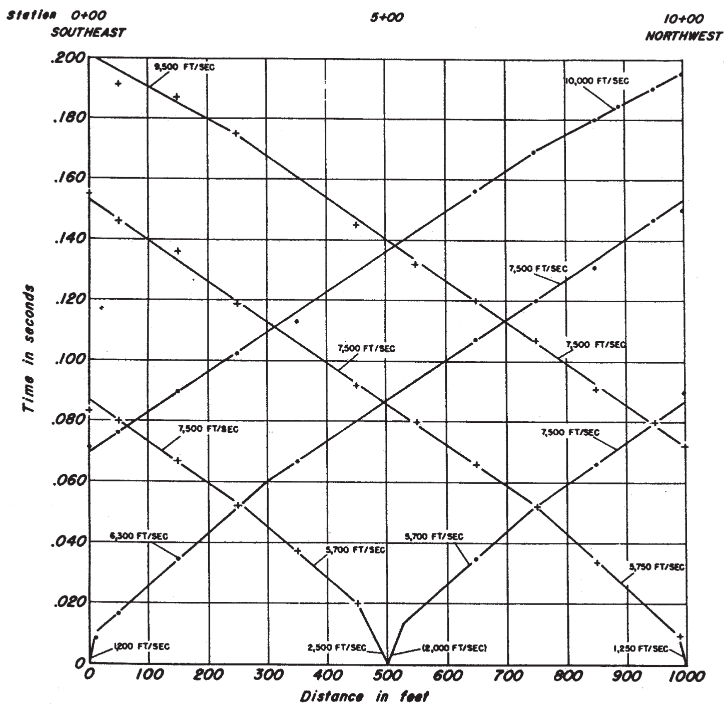
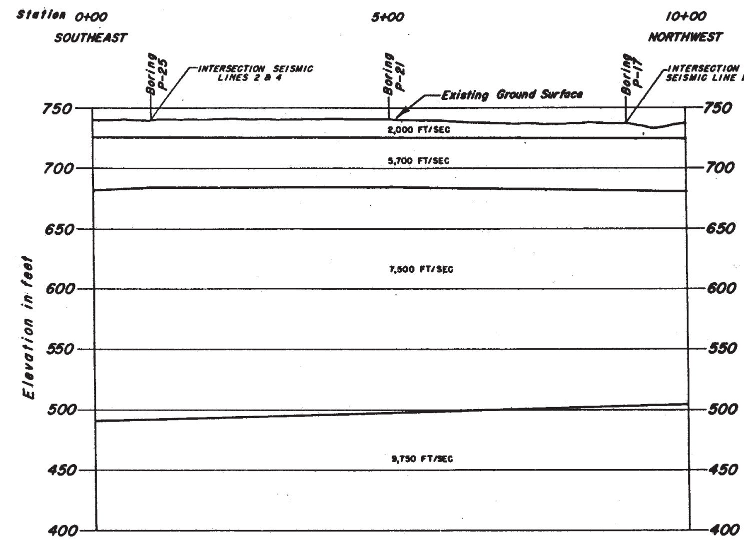
FIGURE 2.5-360

SEISMIC REFRACTION SURVEY LINE 2
STATION SITE

TIME-DISTANCE PLOT - SEISMIC LINE 3



SUBSURFACE SECTION-SEISMIC LINE 3



NOTES:

1. TIME DISTANCE PLOTS SHOW INFORMATION COLLECTED FROM SHOT POINTS MADE AT SEVERAL LOCATIONS ALONG A SEISMIC LINE, FOR CLARIFICATION, TWO PLOT SYMBOLS HAVE BEEN USED TO INDICATE THE ORIGIN OF THE ENERGY: FROM THE LEFT (.) FROM THE RIGHT (+).
2. THE SUBSURFACE SECTIONS SHOWN PRESENT OUR EVALUATION OF THE MOST PROBABLE SUBSURFACE CONDITIONS BASED UPON OUR INTERPRETATION OF PRESENTLY AVAILABLE DATA, SOME VARIATIONS FROM THESE CONDITIONS MUST BE EXPECTED.
3. REFER TO FIGURE 2.5-356 FOR LOCATION OF SEISMIC TEST LINE NO. 3.

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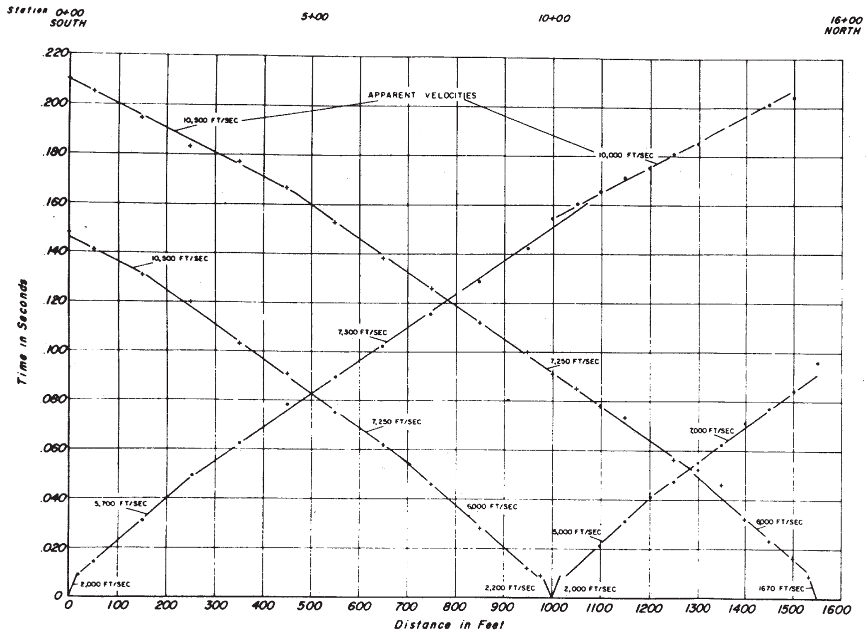
UPDATED SAFETY ANALYSIS REPORT

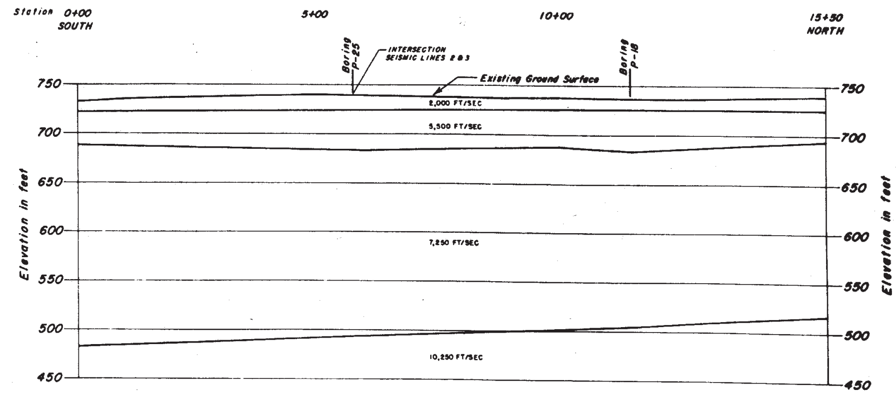
FIGURE 2.5-361

SEISMIC REFRACTION SURVEY LINE 3
STATION SITE

TIME-DISTANCE PLOT – SEISMIC LINE 4



SUBSURFACE SECTION – SEISMIC LINE 4



NOTES:

1. TIME DISTANCE PLOTS SHOW INFORMATION COLLECTED FROM SHOT POINTS MADE AT SEVERAL LOCATIONS ALONG A SEISMIC LINE, FOR CLARIFICATION, TWO PLOT SYMBOLS HAVE BEEN USED TO INDICATE THE ORIGIN OF THE ENERGY: FROM THE LEFT (.) FROM THE RIGHT (+).
2. THE SUBSURFACE SECTIONS SHOWN PRESENT OUR EVALUATION OF THE MOST PROBABLE SUBSURFACE CONDITIONS BASED UPON OUR INTERPRETATION OF PRESENTLY AVAILABLE DATA, SOME VARIATIONS FROM THESE CONDITIONS MUST BE EXPECTED.
3. REFER TO FIGURE 2.5-356 FOR LOCATION OF SEISMIC TEST LINE NO. 4.

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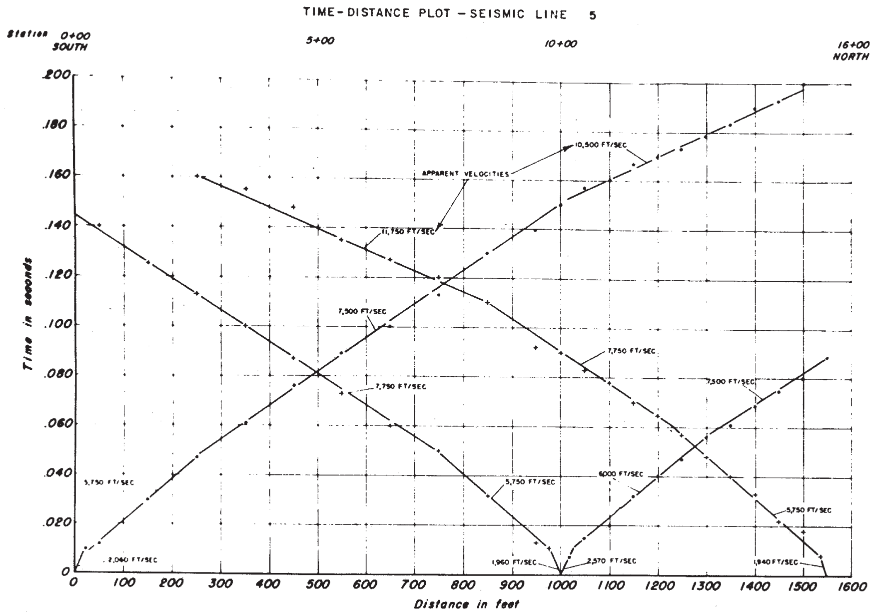
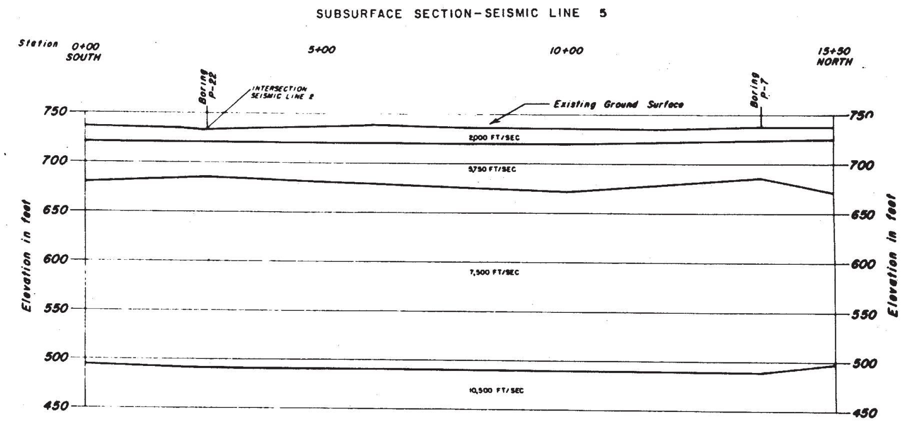
FIGURE 2.5-362

SEISMIC REFRACTION SURVEY LINE 4 - STATION SITE





NOTES:

1. TIME DISTANCE PLOTS SHOW INFORMATION COLLECTED FROM SHOT POINTS MADE AT SEVERAL LOCATIONS ALONG A SEISMIC LINE, FOR CLARIFICATION, TWO PLOT SYMBOLS HAVE BEEN USED TO INDICATE THE ORIGIN OF THE ENERGY: FROM THE LEFT (.) FROM THE RIGHT (+).
2. THE SUBSURFACE SECTIONS SHOWN PRESENT OUR EVALUATION OF THE MOST PROBABLE SUBSURFACE CONDITIONS BASED UPON OUR INTERPRETATION OF PRESENTLY AVAILABLE DATA, SOME VARIATIONS FROM THESE CONDITIONS MUST BE EXPECTED.
3. REFER TO FIGURE 2.5-356 FOR LOCATION OF SEISMIC TEST LINE NO. 5.

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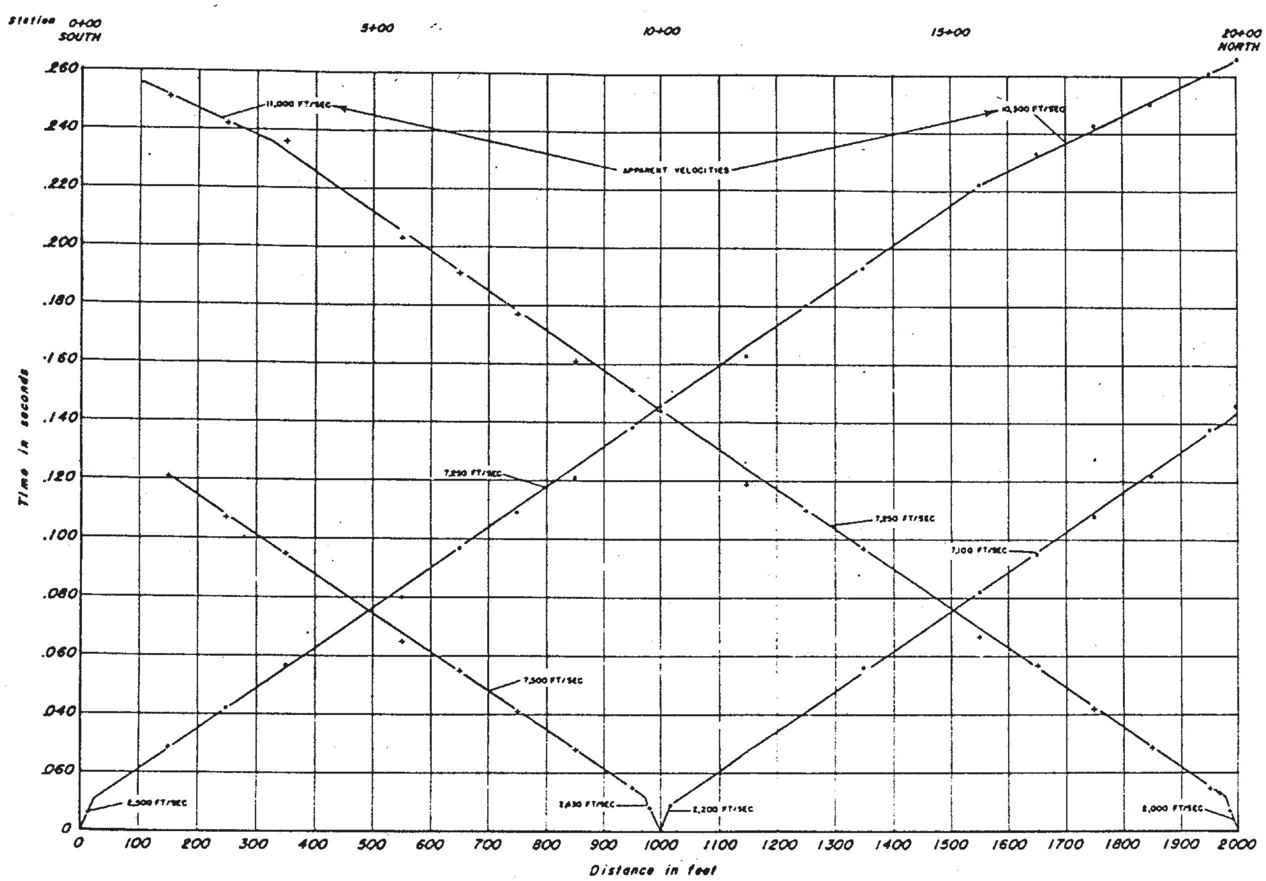
UPDATED SAFETY ANALYSIS REPORT

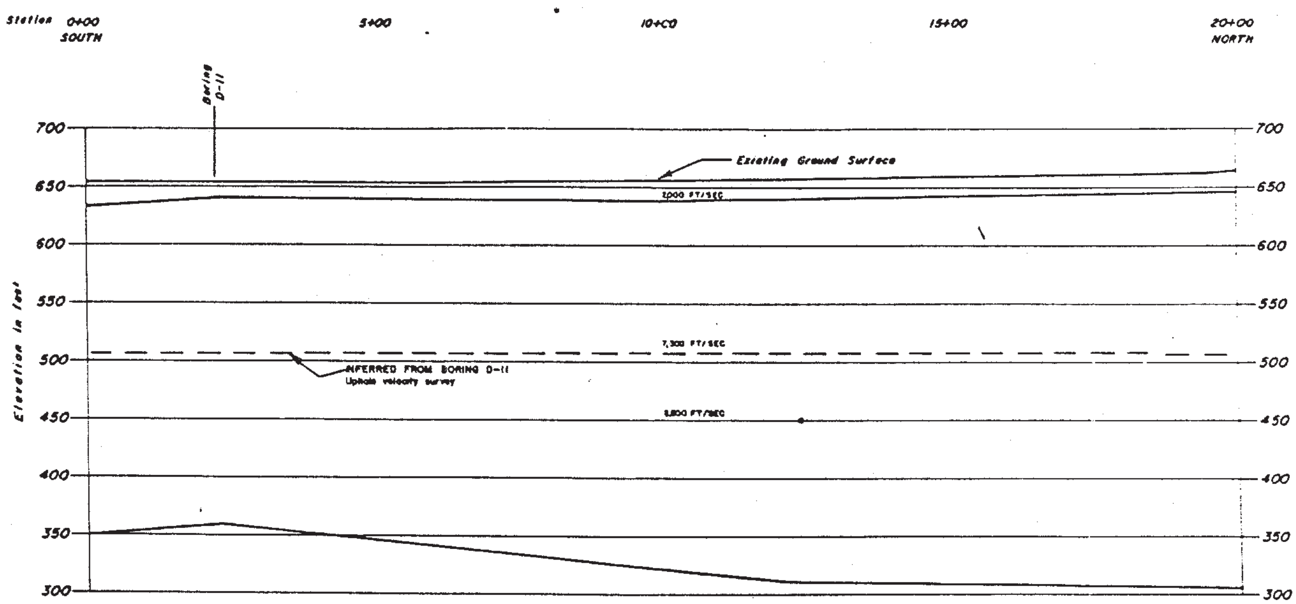
FIGURE 2.5-363

SEISMIC REFRACTION SURVEY LINE 5 -
STATION SITE

TIME-DISTANCE PLOT - SEISMIC LINE 6



SUBSURFACE SECTION-SEISMIC LINE 6



NOTES:

1. TIME DISTANCE PLOTS SHOW INFORMATION COLLECTED FROM SHOT POINTS MADE AT SEVERAL LOCATIONS ALONG A SEISMIC LINE, FOR CLARIFICATION, TWO PLOT SYMBOLS HAVE BEEN USED TO INDICATE THE ORIGIN OF THE ENERGY: FROM THE LEFT (.) FROM THE RIGHT (+).
2. THE SUBSURFACE SECTIONS SHOWN PRESENT OUR EVALUATION OF THE MOST PROBABLE SUBSURFACE CONDITIONS BASED UPON OUR INTERPRETATION OF PRESENTLY AVAILABLE DATA, SOME VARIATIONS FROM THESE CONDITIONS MUST BE EXPECTED.
3. REFER TO FIGURE 2.5-357 FOR LOCATION OF SEISMIC TEST LINE NO. 6.

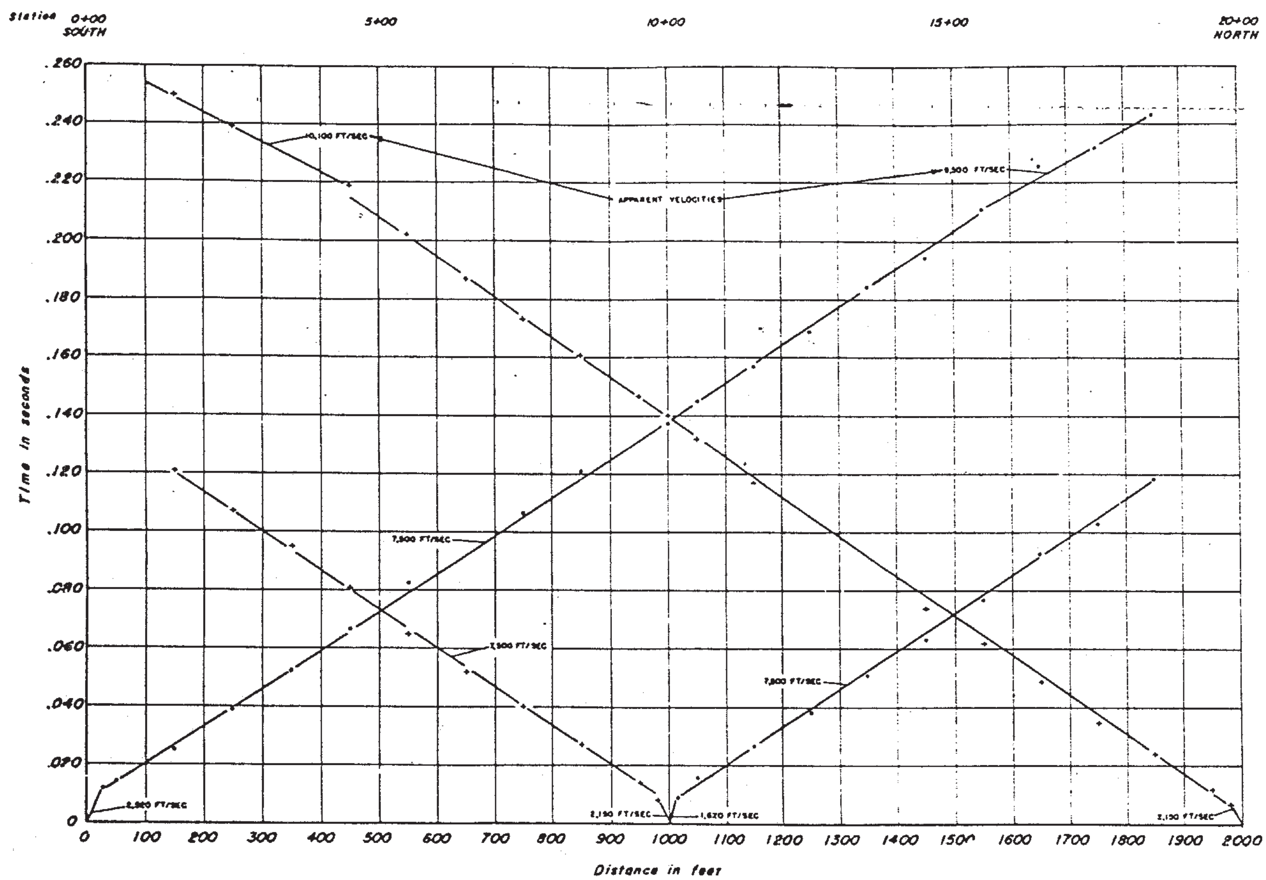
CLINTON POWER STATION

UPDATED SAFETY ANALYSIS REPORT

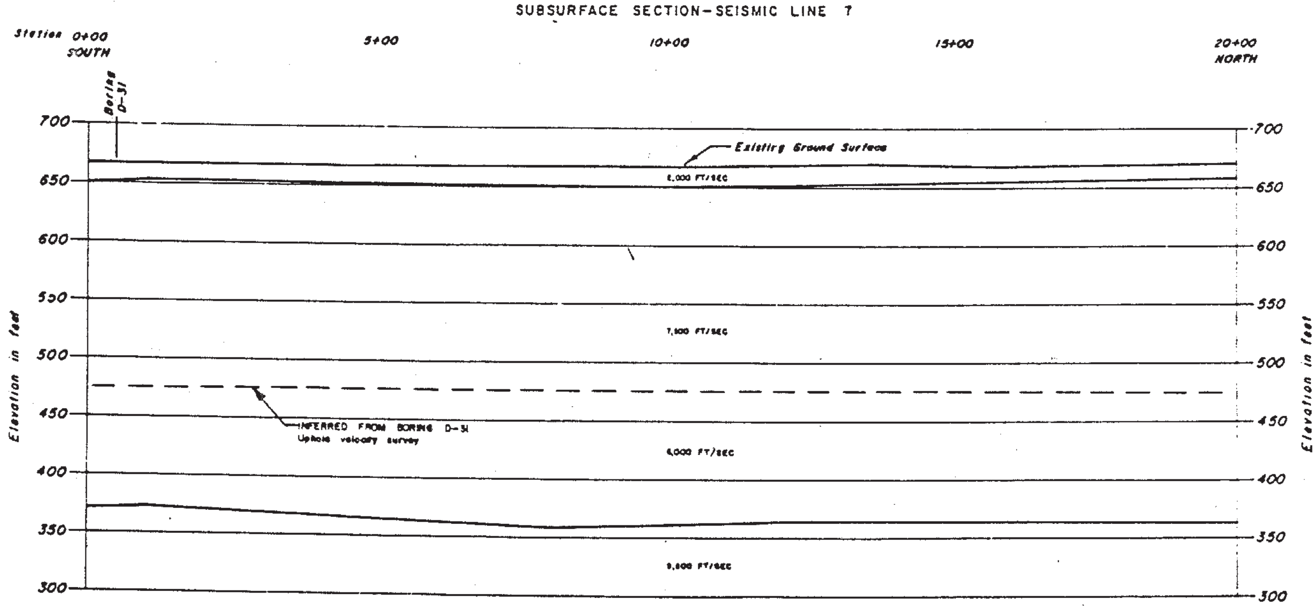
FIGURE 2.5-364

SEISMIC REFRACTION SURVEY LINE 6 - DAM SITE

TIME-DISTANCE PLOT – SEISMIC LINE 7



SUBSURFACE SECTION – SEISMIC LINE 7



NOTES:

1. TIME DISTANCE PLOTS SHOW INFORMATION COLLECTED FROM SHOT POINTS MADE AT SEVERAL LOCATIONS ALONG A SEISMIC LINE, FOR CLARIFICATION, TWO PLOT SYMBOLS HAVE BEEN USED TO INDICATE THE ORIGIN OF THE ENERGY: FROM THE LEFT (.) FROM THE RIGHT (+).
2. THE SUBSURFACE SECTIONS SHOWN PRESENT OUR EVALUATION OF THE MOST PROBABLE SUBSURFACE CONDITIONS BASED UPON OUR INTERPRETATION OF PRESENTLY AVAILABLE DATA, SOME VARIATIONS FROM THESE CONDITIONS MUST BE EXPECTED.
3. REFER TO FIGURE 2.5-358 FOR LOCATION OF SEISMIC TEST LINE NO. 7.

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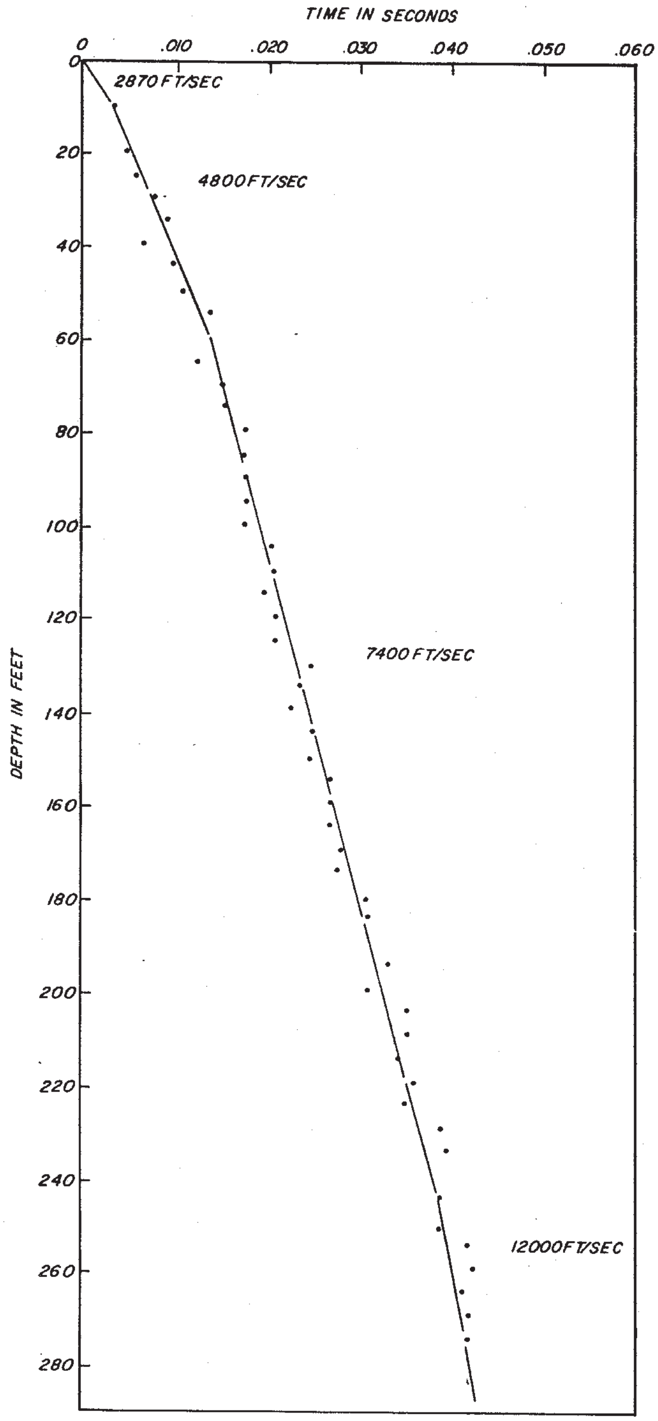
FIGURE 2.5-365

SEISMIC REFRACTION SURVEY LINE 7 - SECTION E-E' ALONG NORTH FORK OF SALT CREEK

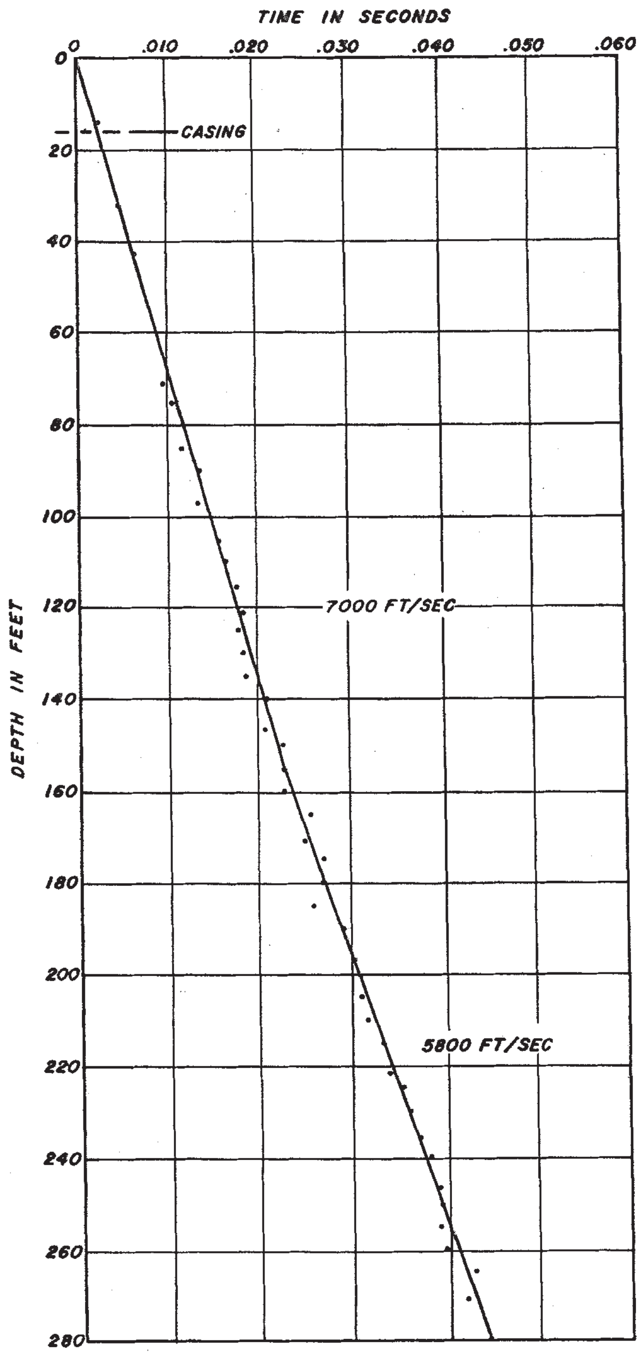


NOTE:
REFER TO FIGURE 2.5-356 FOR LOCATION OF BORING P-14.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-366

UPHOLE (COMPRESSIONAL) VELOCITY SURVEY - BORING P-14, STATION SITE

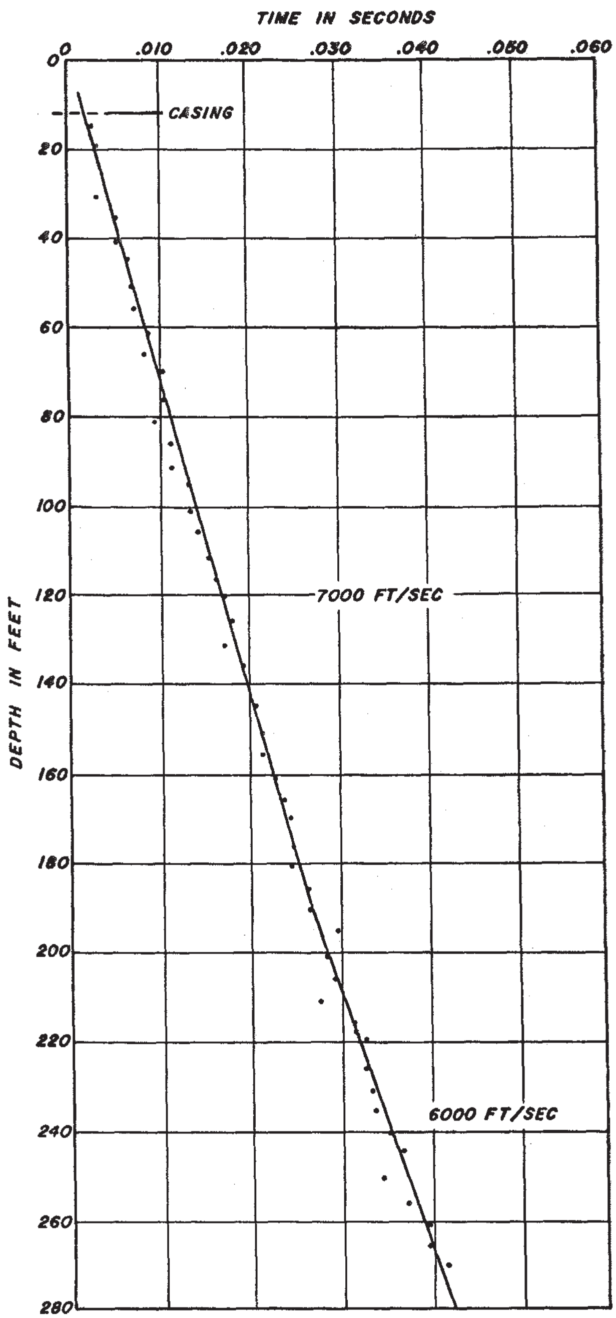


NOTE:
REFER TO FIGURE 2.5-357 FOR LOCATION OF BORING D-11.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-367

UPHOLE (COMPRESSIONAL) VELOCITY SURVEY - BORING D-11A, DAM SITE

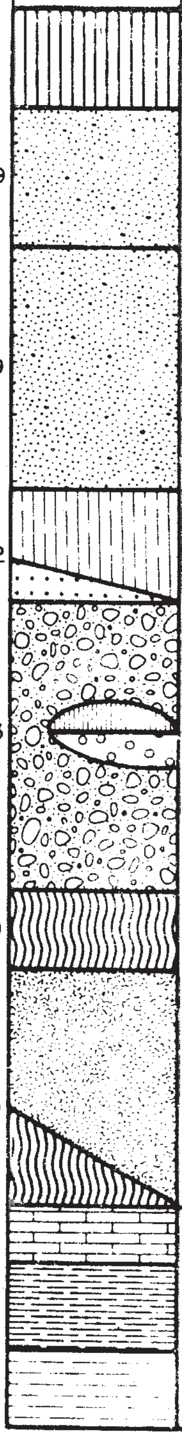


NOTE:
REFER TO FIGURE 2.5-358 FOR LOCATION OF BORING D-31.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-368

UPHOLE (COMPRESSIONAL) VELOCITY SURVEY - BORING D-31 SECTION E-E' ALONG NORTH FORK OF SALT CREEK

AVERAGE THICKNESS IN FEET (NOT TO SCALE)	GRAPHIC COLUMN	UNIT DESCRIPTION		COMPRESSIONAL WAVE VELOCITY FT/SEC	POISSONS RATIO	SHEAR WAVE VELOCITY FT/SEC	UNIT WEIGHT (pcf) DRY	UNIT WEIGHT (pcf) WET
7		OVERBURDEN	LOESS, weathered; overlain by organic topsoil	2000	0.37	900	110	130
9		OVERBURDEN	WISCONSINAN GLACIAL TILL, weathered to brown, moist					
19		OVERBURDEN	WISCONSINAN GLACIAL TILL, unweathered	5700	0.48	1100	115	135
12		OVERBURDEN	INTERGLACIAL ZONE; local ALLUVIAL DEPOSITS					
113		OVERBURDEN	ILLINOIAN GLACIAL TILL; local OUTWASH AND LACUSTRINE DEPOSITS	7500	0.46	2100	135	147
10		OVERBURDEN	LACUSTRINE DEPOSIT (Yarmouthian)					
65		OVERBURDEN	PRE-ILLINOIAN GLACIAL TILL locally underlain by PRE-ILLINOIAN LACUSTRINE DEPOSIT					
5		BEDROCK	LIMESTONE	10,500	0.29	5700	155	160
15		BEDROCK	SHALE					
		BEDROCK	SILTSTONE					

NOTE:

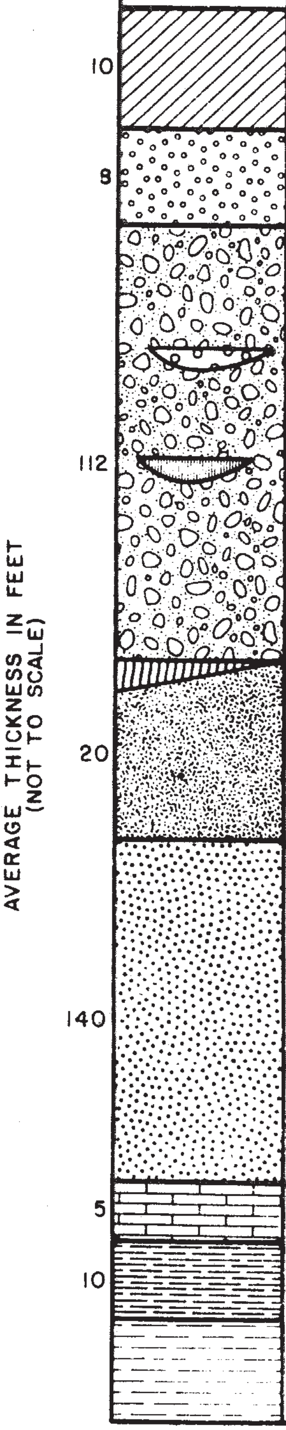
REFER TO LEGEND ON FIGURES 2.5-275 AND 2.5-276 FOR DETAILED DESCRIPTION OF OVERBURDEN UNITS.

CLINTON POWER STATION

UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-369

TYPICAL GEOLOGIC PROFILE SHOWING GEOPHYSICAL PROPERTIES - STATION SITE



	UNIT DESCRIPTION	COMPRESSIONAL WAVE VELOCITY FT/SEC	POISSONS RATIO	SHEAR WAVE VELOCITY FT/SEC	UNIT WEIGHT (pcf) DRY	UNIT WEIGHT (pcf) WET
OVERBURDEN	SALT CREEK ALLUVIUM; overlain by organic topsoil	2000	0.37	900	100	122
OVERBURDEN	ILLINOIAN GLACIAL TILL; local OUTWASH AND LACUSTRINE DEPOSITS	7300	0.46	2000	135	145
OVERBURDEN	PRE-ILLINOIAN LACUSTRINE AND GLACIAL TILL DEPOSITS present locally					
OVERBURDEN	BEDROCK VALLEY OUTWASH DEPOSIT (Pre-Illinoian Mahomet Valley Deposit)	5800	0.45	1750	109	127
BEDROCK	LIMESTONE	10,500	0.29	5700	155	160
BEDROCK	SHALE					
BEDROCK	SILTSTONE					

NOTE:

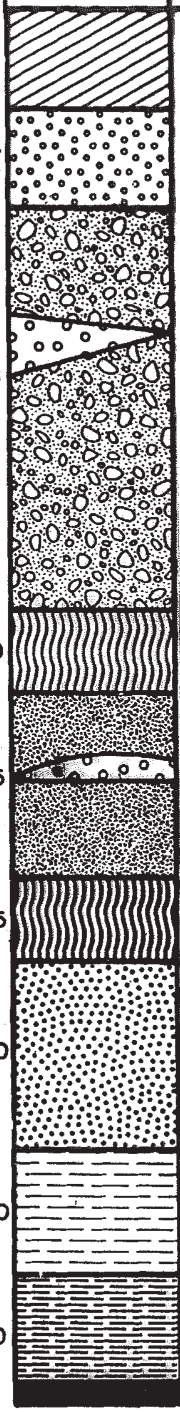
* VALUES ARE ESTIMATED

REFER TO BORING D-11 AND LEGEND ON FIGURE 2.5-277 FOR DETAILED DESCRIPTION OF OVERBURDEN UNITS.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-370

TYPICAL GEOLOGIC PROFILE SHOWING GEOPHYSICAL PROPERTIES - DAM SITE



Average Thickness in Feet (Not to Scale)		Unit Description	Compressional Wave Velocity FT/SEC	Poissons Ratio	Shear Wave Velocity FT/SEC	Unit Weight (pcf) Dry	Unit Weight (pcf) Wet
7 7	OVERBURDEN	SALT CREEK ALLUVIUM; overlain by organic topsoil	2000	0.37	900	105	125
81	OVERBURDEN	ILLINOIAN GLACIAL TILL local OUTWASH AND LACUSTRINE DEPOSITS	7500	0.46	2100	132	145
10	OVERBURDEN	LACUSTRINE DEPOSIT (Yarmouthian)					
65	OVERBURDEN	PRE-ILLINOIAN GLACIAL TILL; local OUTWASH DEPOSITS					
25	OVERBURDEN	PRE-ILLINOIAN OUTWASH AND ALLUVIAL DEPOSIT					
110	OVERBURDEN	BEDROCK VALLEY OUTWASH DEPOSIT (Pre-Illinoian Mahomet Valley Deposit)	6000	0.45	1800	106	124
20	BEDROCK	SILTSTONE	10,000	0.28 TO 0.30	5300 TO 5500	155	160
30	BEDROCK	SHALE					
	BEDROCK	COAL					

NOTE:

* VALUES ARE ESTIMATED

REFER TO LEGEND ON FIGURE 2.5-278 FOR DETAILED DESCRIPTION OF OVERBURDEN UNITS.

CLINTON POWER STATION
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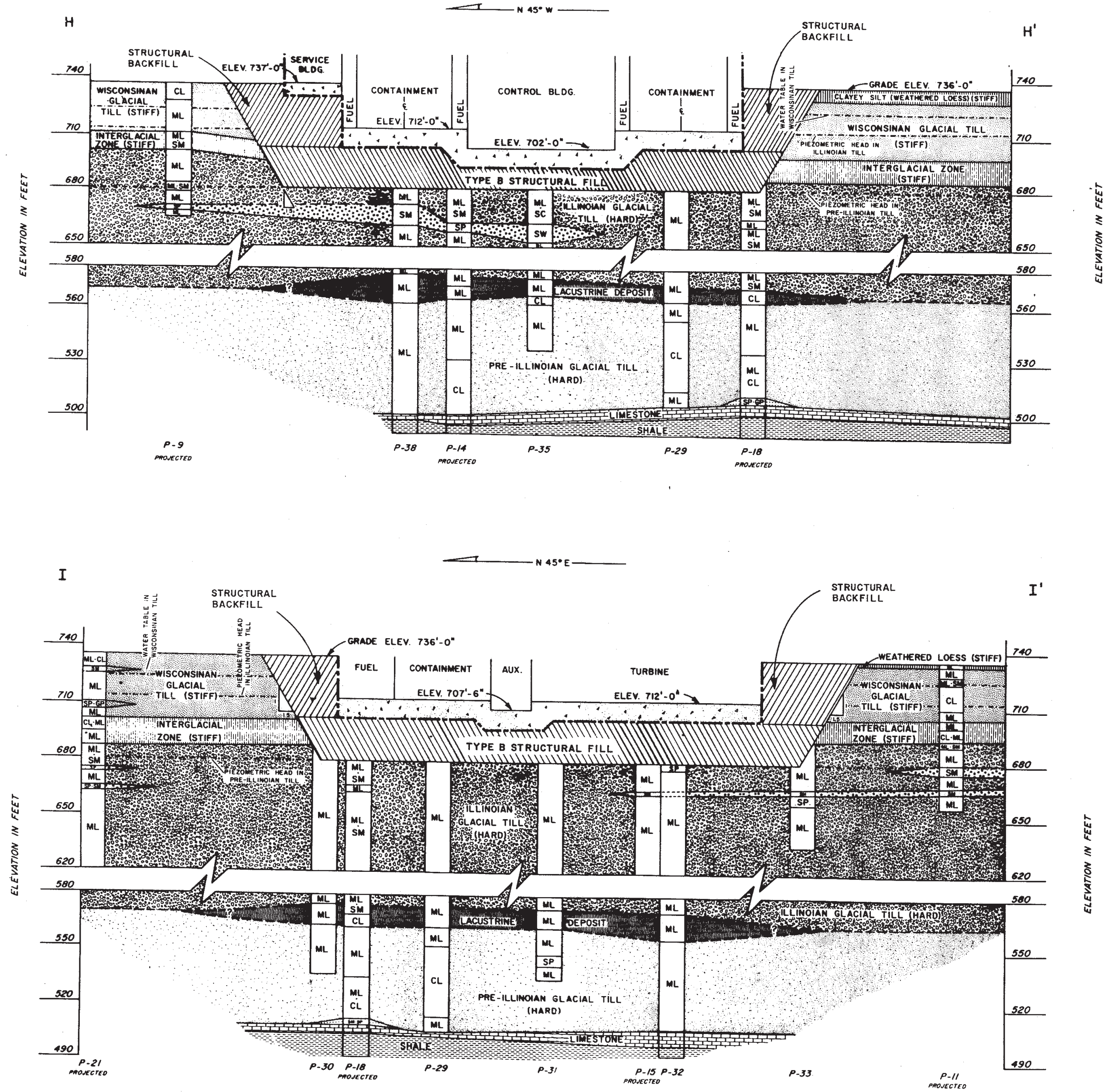
FIGURE 2.5-371

TYPICAL GEOLOGIC PROFILE SHOWING GEOPHYSICAL PROPERTIES - SECTION E-E' ALONG NORTH FORK OF SALT CREEK



LEGEND

- TYPE B GRANULAR STRUCTURAL BACKFILL
- TYPE B GRANULAR STRUCTURAL FILL
- CONCRETE

QUATERNARY

- WISCONSINAN
  - LOESS - BROWN TO MOTTLED BROWN AND GRAY CLAYEY SILT OR SILTY CLAY WITH TRACE OF FINE SAND; WEATHERED
  - WISCONSINAN GLACIAL TILL - BROWNISH-GRAY TO GRAY CLAYEY SILT OR SILTY CLAY WITH SAND AND GRAVEL; CONTAINS IRREGULAR AND DISCONTINUOUS LENSES OF SAND AND SILT THROUGHOUT (GLACIAL OUTWASH AND POSSIBLY LOCAL LACUSTRINE DEPOSITS)
- SANGAMONIAN
  - INTERGLACIAL ZONE - INCLUDES DARK GRAY TO GRAY ORGANIC CLAYEY SILT OR SILTY CLAY (COLLUVIAL SOILS). GREENISH TO BLUISH-GRAY CLAYEY SILT WITH SAND AND GRAVEL (REWORKED AND WEATHERED ILLINOIAN GLACIAL TILL)
- ILLINOIAN
  - ILLINOIAN GLACIAL TILL - BROWNISH-GRAY TO GRAY CLAYEY SILT WITH SAND AND GRAVEL TO VERY SANDY SILT OR SILTY SAND WITH SOME CLAY AND GRAVEL; INTERBEDDED OUTWASH DEPOSITS IN UPPER HORIZONS.
  - SAND - IRREGULAR, DISCONTINUOUS LAYERS OF ALLUVIAL SAND AND GRAVEL (GLACIAL OUTWASH AND DEPOSITS)
- YARMOUTHIAN
  - LACUSTRINE DEPOSIT - BROWNISH-GRAY TO BLACK AND GRAY CLAYEY SILT TO SILT, ORGANIC IN ZONES; INCLUDES GREENISH TO BLUISH-GRAY CLAYEY SILT WITH SAND AND GRAVEL (REWORKED AND WEATHERED PRE-ILLINOIAN GLACIAL TILL); ASSIGNMENT TO YARMOUTHIAN GLACIAL STAGE IS TENTATIVE
- KANSAN
  - PRE-ILLINOIAN GLACIAL TILL - GRAYISH-BROWN TO BROWN SILTY CLAY AND CLAYEY SILT WITH SOME SAND AND GRAVEL; BROWN COLOR AND RELATIVELY HIGH CLAY CONTENT IS CHARACTERISTIC; TENTATIVELY ASSIGNED TO KANSAN GLACIAL STAGE ON THE BASIS OF CLAY ANALYSIS BY ILLINOIS STATE GEOLOGICAL SURVEY

PENNSYLVANIAN

- BEDROCK - INTERBEDDED LAYERS OF LIMESTONE, SHALE AND SILTSTONE ASSIGNED TO THE McLEANSBORO GROUP, MODESTO FORMATION ON THE BASIS OF SPORE ANALYSIS OF THE COAL ENCOUNTERED IN BORING D-31
- LIMESTONE - GREENISH-GRAY, GRAY AND BROWN, FINE TO COARSELY CRYSTALLINE, SILTY, THIN BEDDED TO MASSIVE, NUMEROUS SHALE PARTINGS IN ZONES, FOSSILIFEROUS
- SHALE - GRAY TO DARK GRAY SHALE, CARBONACEOUS TO CALCAREOUS; CLAYEY IN ZONES, EXPANSIVE, SLICKENSIDES; OCCASIONAL CONCRETION

NOTES:

1. REFER TO FIGURES 2.5-271 AND 2.5-374 FOR LOCATION OF SUBSURFACE SECTIONS.
2. REFER TO FIGURES 2.5-26, 2.5-27, 2.5-29, 2.5-30, 2.5-34, 2.5-37, 2.5-45 THROUGH 2.5-49, 2.5-51 AND 2.5-55 FOR LOG OF BORINGS.
3. FOR DETAILED WATER LEVEL DATA REFER TO FIGURE 2.4-36.
4. STRATIGRAPHIC NOMENCLATURE OF THE QUATERNARY DEPOSITS USED IN THE FSAR TEXT DIFFERS FROM THAT USED ON THIS FIGURE AND ON THE BORING LOGS, AND IS CROSS REFERENCED ON FIGURE 2.5-274.
5. STRUCTURAL BACKFILL FOR THE MAIN PLANT CONSISTS OF TYPE B GRANULAR MATERIAL EXCEPT ON THE NORTH AND WEST SIDES OF UNIT 1. IN THESE AREAS, AND ABOVE APPROXIMATE ELEVATION 720 FEET, TYPES A & C COHESIVE MATERIAL WAS USED AS STRUCTURAL BACKFILL.

FEET

50 0 50 100

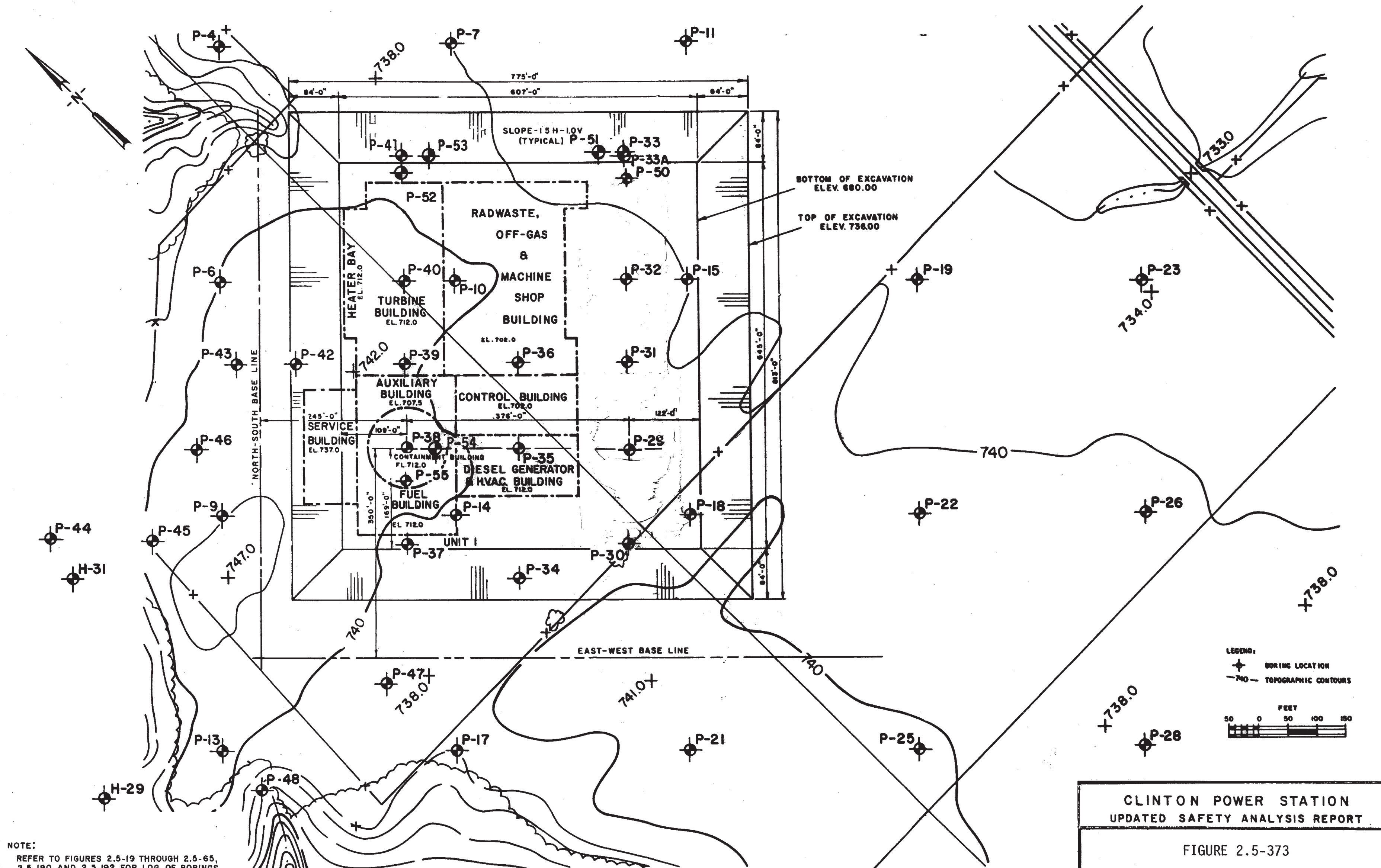
HORIZONTAL SCALE

CLINTON POWER STATION

UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-372

GEOLOGIC SECTIONS H-H' AND I-I' - STATION SITE

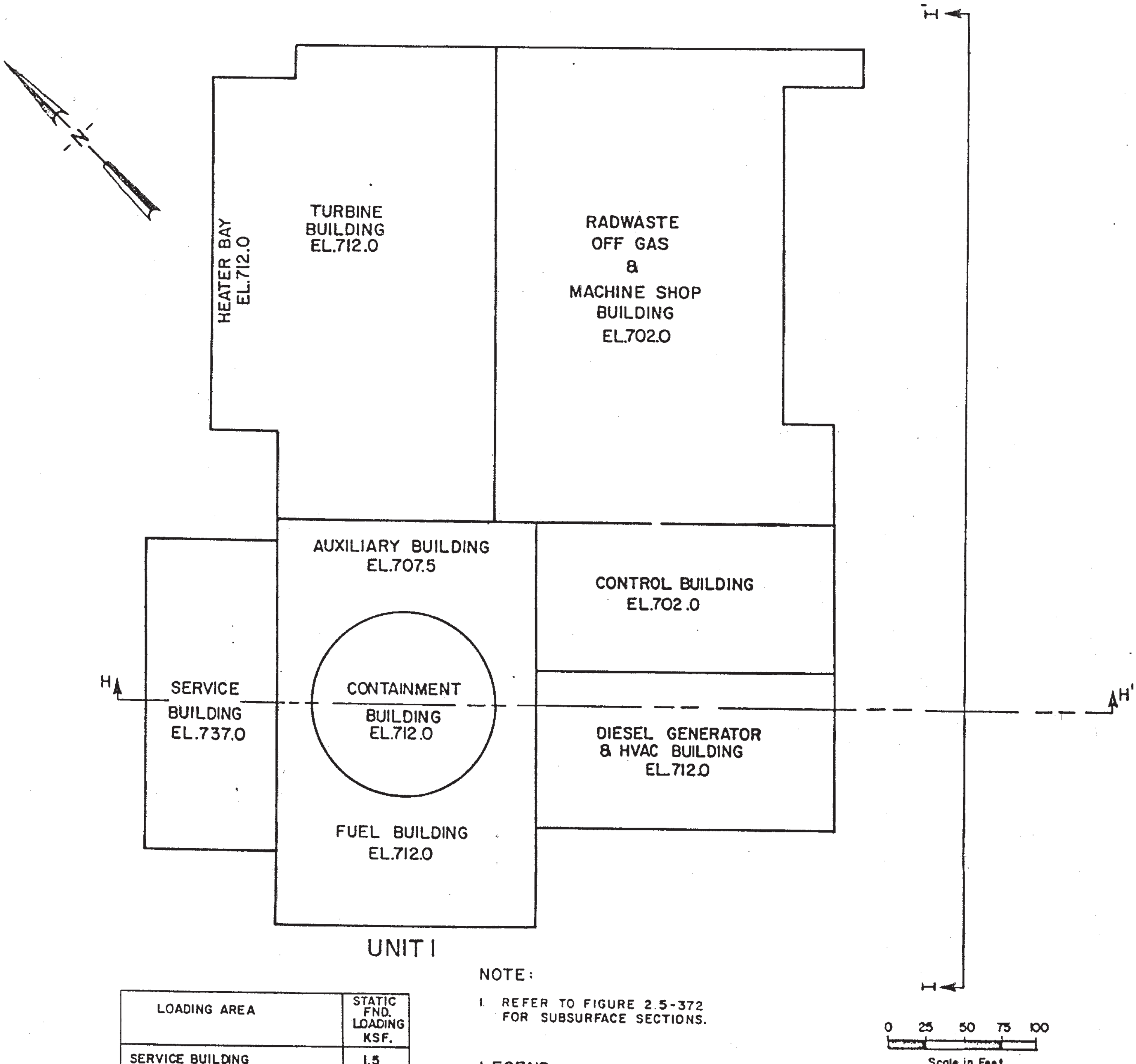


NOTE:
REFER TO FIGURES 2.5-19 THROUGH 2.5-65, 2.5-190 AND 2.5-192 FOR LOG OF BORINGS.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-373

BORING LOCATION PLAN



NOTE:

1. REFER TO FIGURE 2.5-372 FOR SUBSURFACE SECTIONS.

LEGEND:

---- INDICATES SUBSURFACE SECTION LOCATION.

LOADING AREA	STATIC FND. LOADING KSF.
SERVICE BUILDING	1.5
FUEL BUILDING	6.5
CONTAINMENT BLDG.	6.5
AUXILIARY BLDG.	6.5
TURBINE BLDG.	5.7
DIESEL GEN. & H.V.A.C. BLDG.	4.7
CONTROL BLDG.	4.7
RADWASTE BLDG.	4.8
MACHINE SHOP	4.8
OFF-GAS BLDG.	4.8

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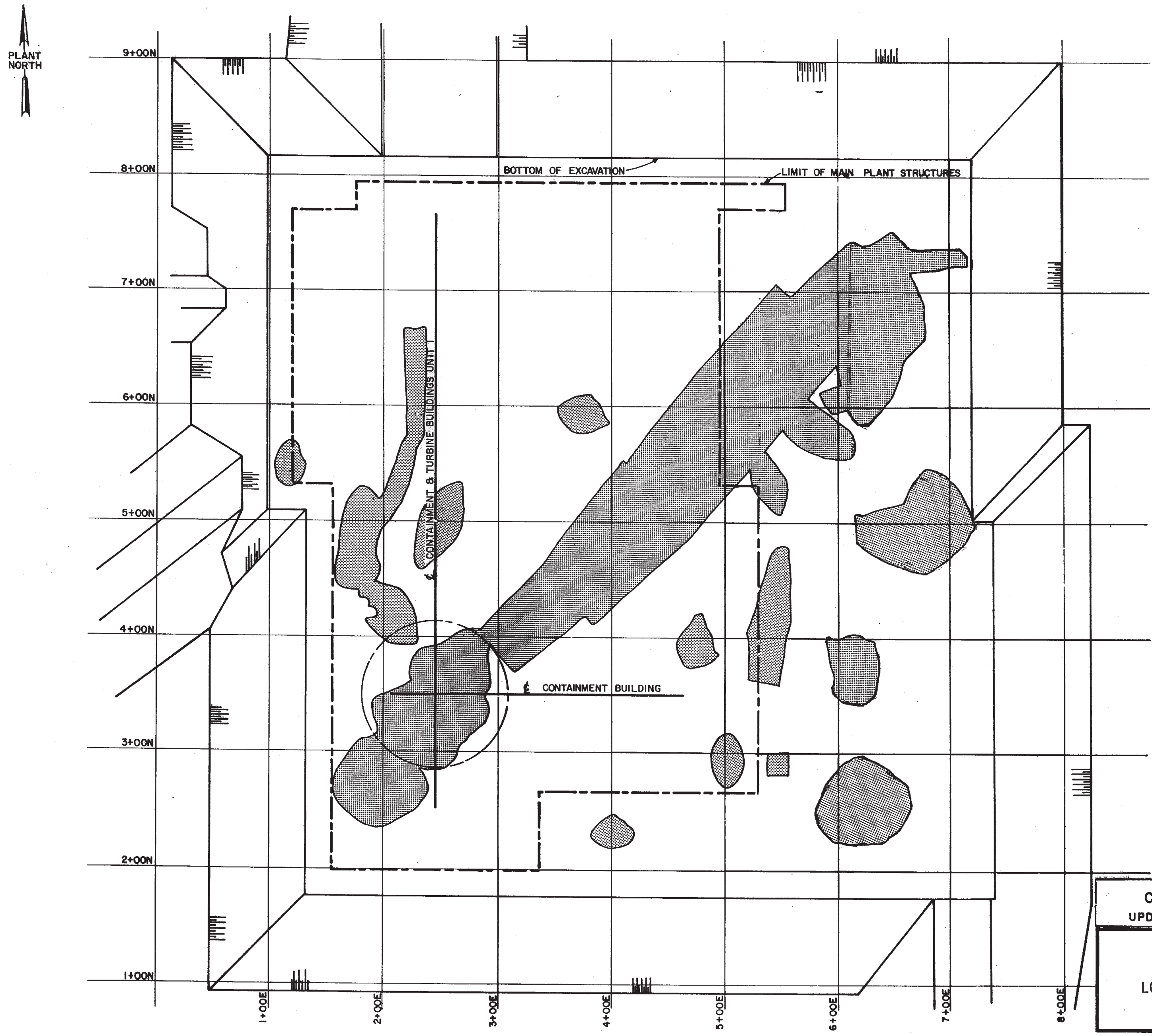
FIGURE 2.5-374

STATION PLOT PLAN - FOUNDATION LOADING

REV. 3 SEPT. 1991



LEGEND

AREAS OF FLYASH MIXTURE PLACEMENT

1+00N MAIN PLANT COORDINATES

NOTES

1. DRAWING PRODUCED FROM BALDWIN ASSOCIATES QUALITY CONTROL RECORDS FOR FLYASH MIXTURE PLACEMENT.
2. FLYASH MIXTURE, CONSISTING OF SAND, CEMENT AND FLYASH, PREPARED AND PLACED IN ACCORDANCE WITH S & L SPECIFICATION K-2942.

50 0 50

SCALE IN FEET

CLINTON POWER STATION

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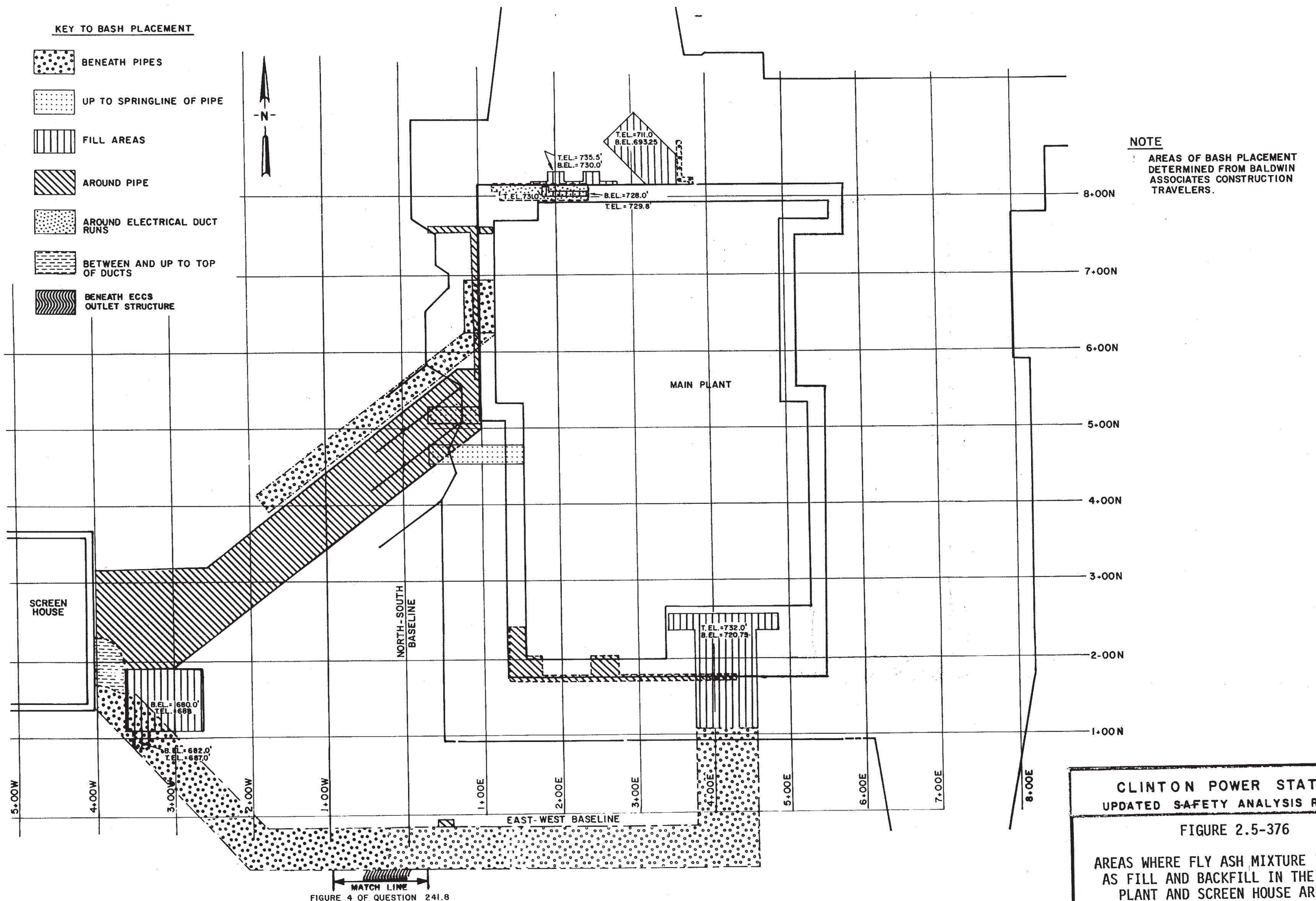
FIGURE 2.5-375

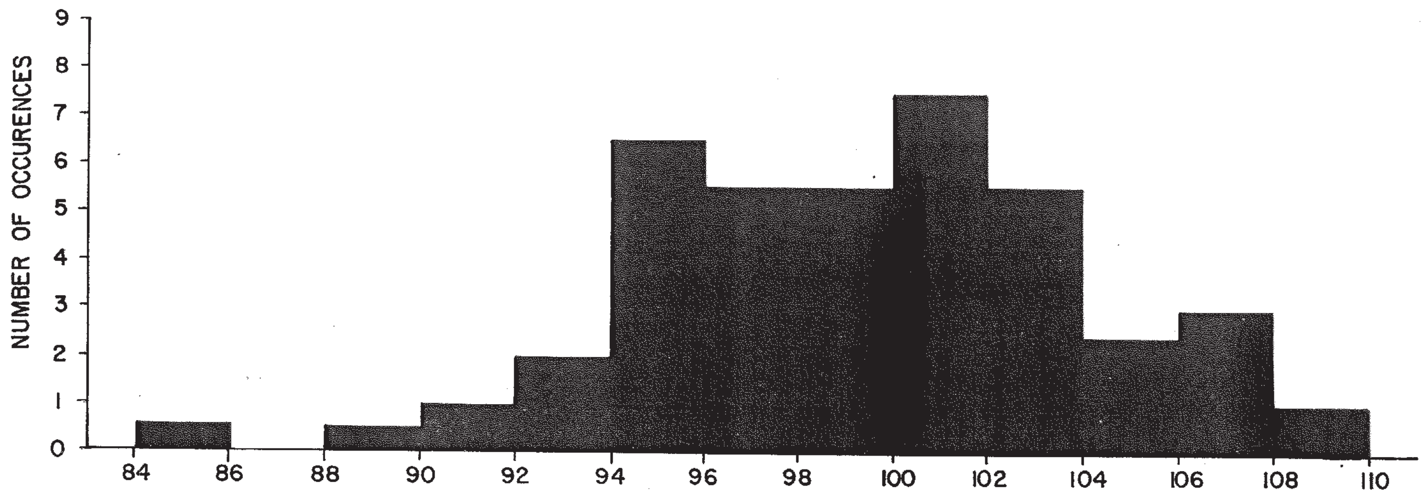
LOCATION OF FLY ASH MIXTURE IN MAIN PLANT SUBGRADE



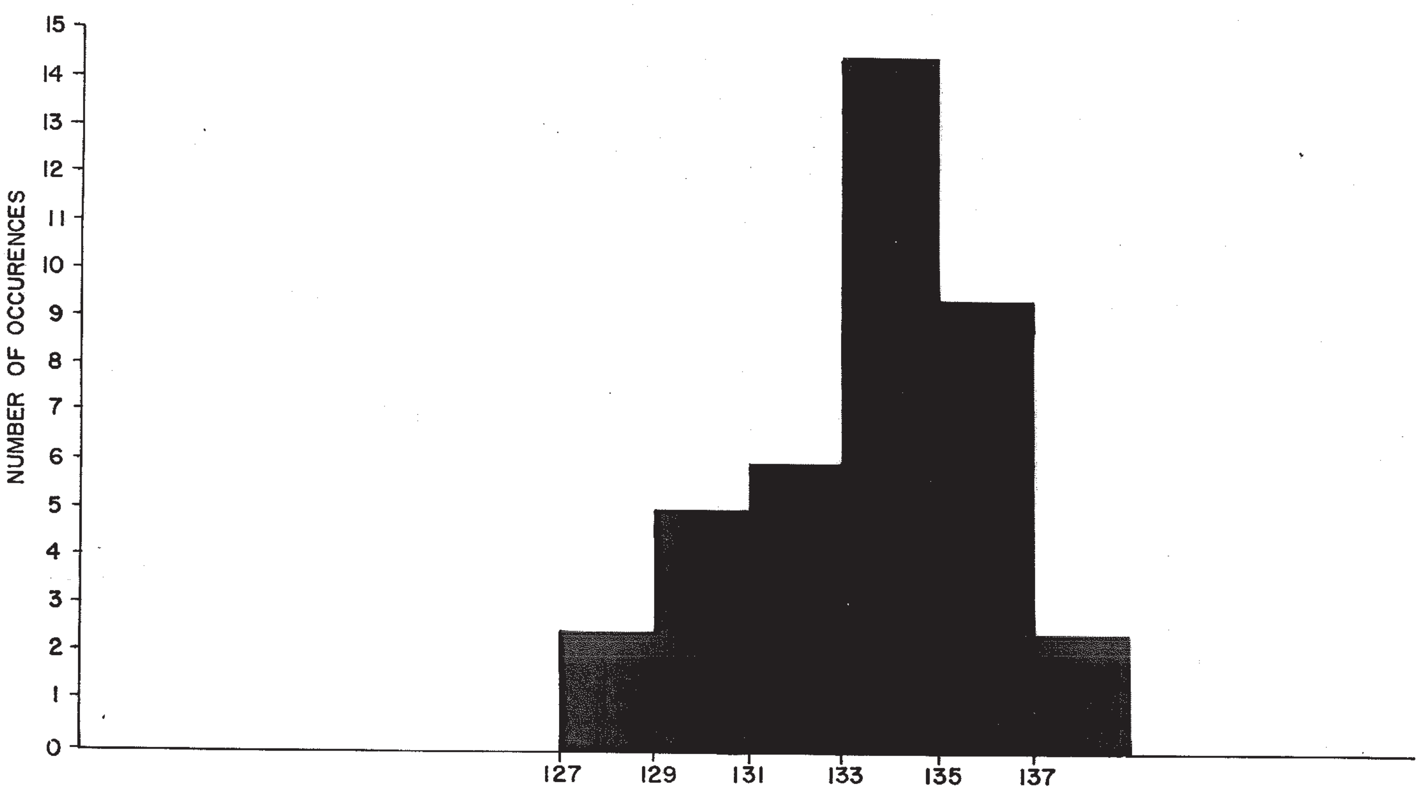
CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-376

AREAS WHERE FLY ASH MIXTURE IS USED AS FILL AND BACKFILL IN THE MAIN PLANT AND SCREEN HOUSE AREAS



MINIMUM DRY UNIT WEIGHT
AVERAGE MINIMUM DRY UNIT WEIGHT = 98.9 PCF



MAXIMUM DRY UNIT WEIGHT
AVERAGE MAXIMUM DRY UNIT WEIGHT = 133.1 PCF

NOTES

1. Relative density test-data based on ASTM D2049.
2. Number of occurences based on average of two pounds per cubic foot range.

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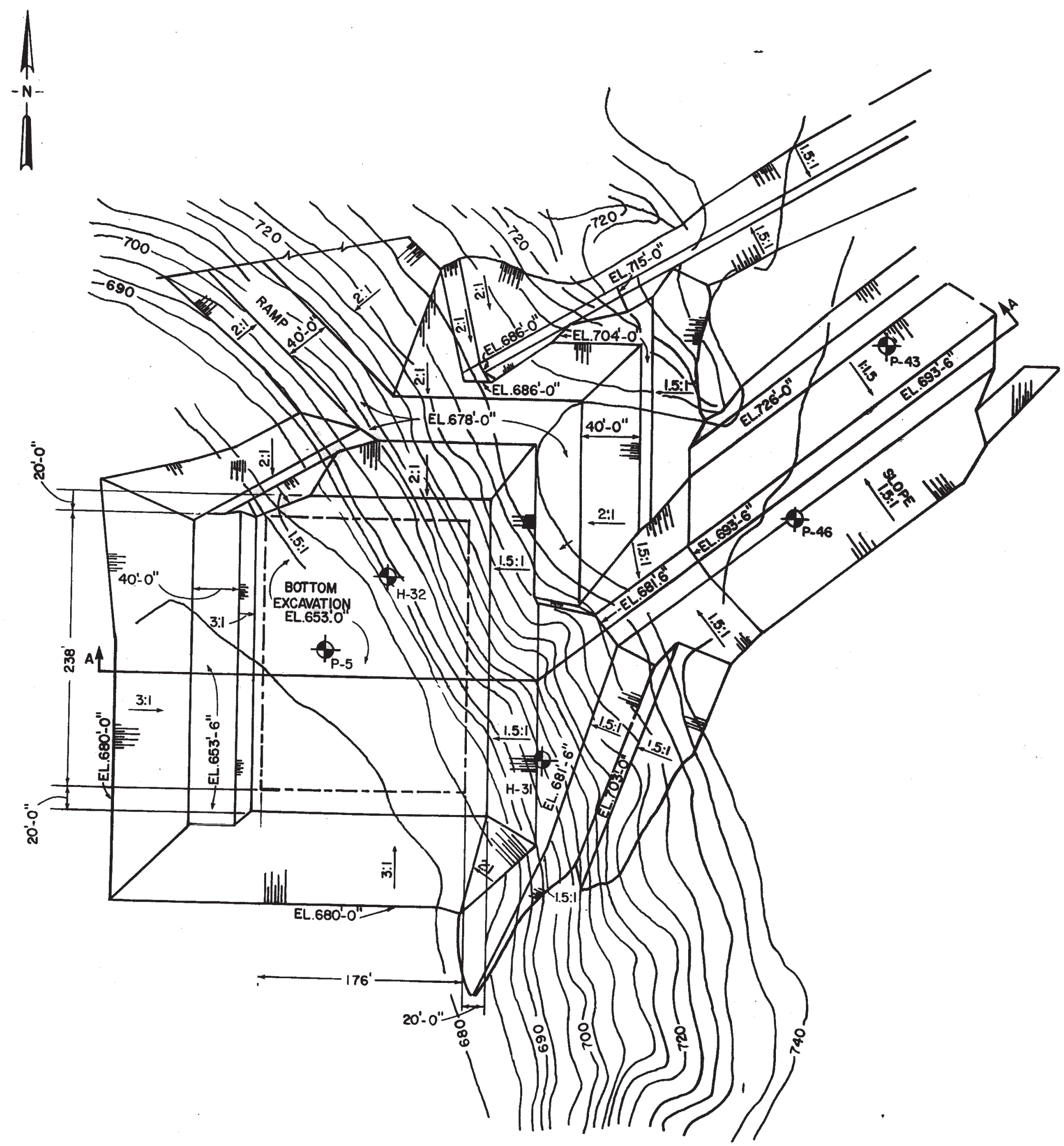
FIGURE 2.5-377

POWER BLOCK RELATIVE DENSITY TEST SUMMARY



NOTE

See Figure 2.5-379 for section through screen house.

LEGEND

Borings

0 100 200
Scale in Feet

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FIGURE 2.5-378

EXCAVATION PLAN FOR CIRCULATING WATER SCREEN HOUSE

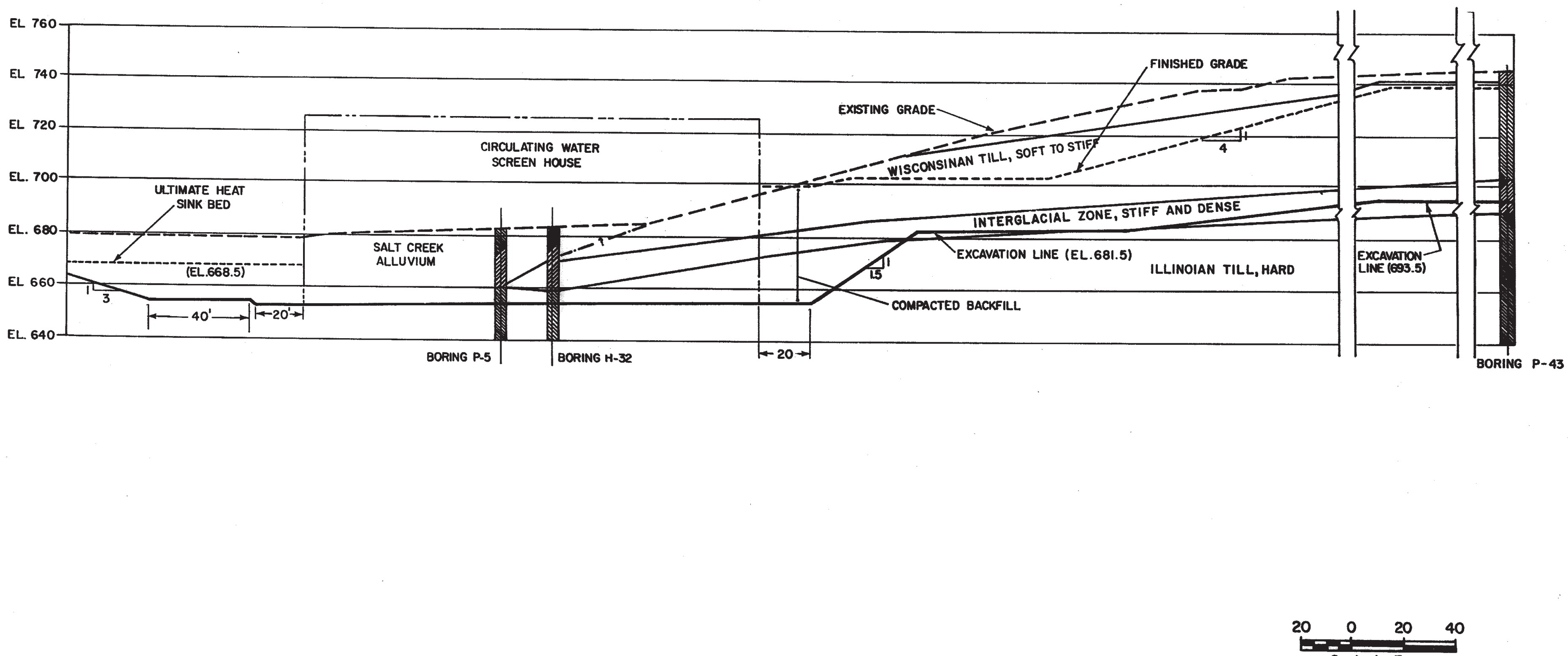

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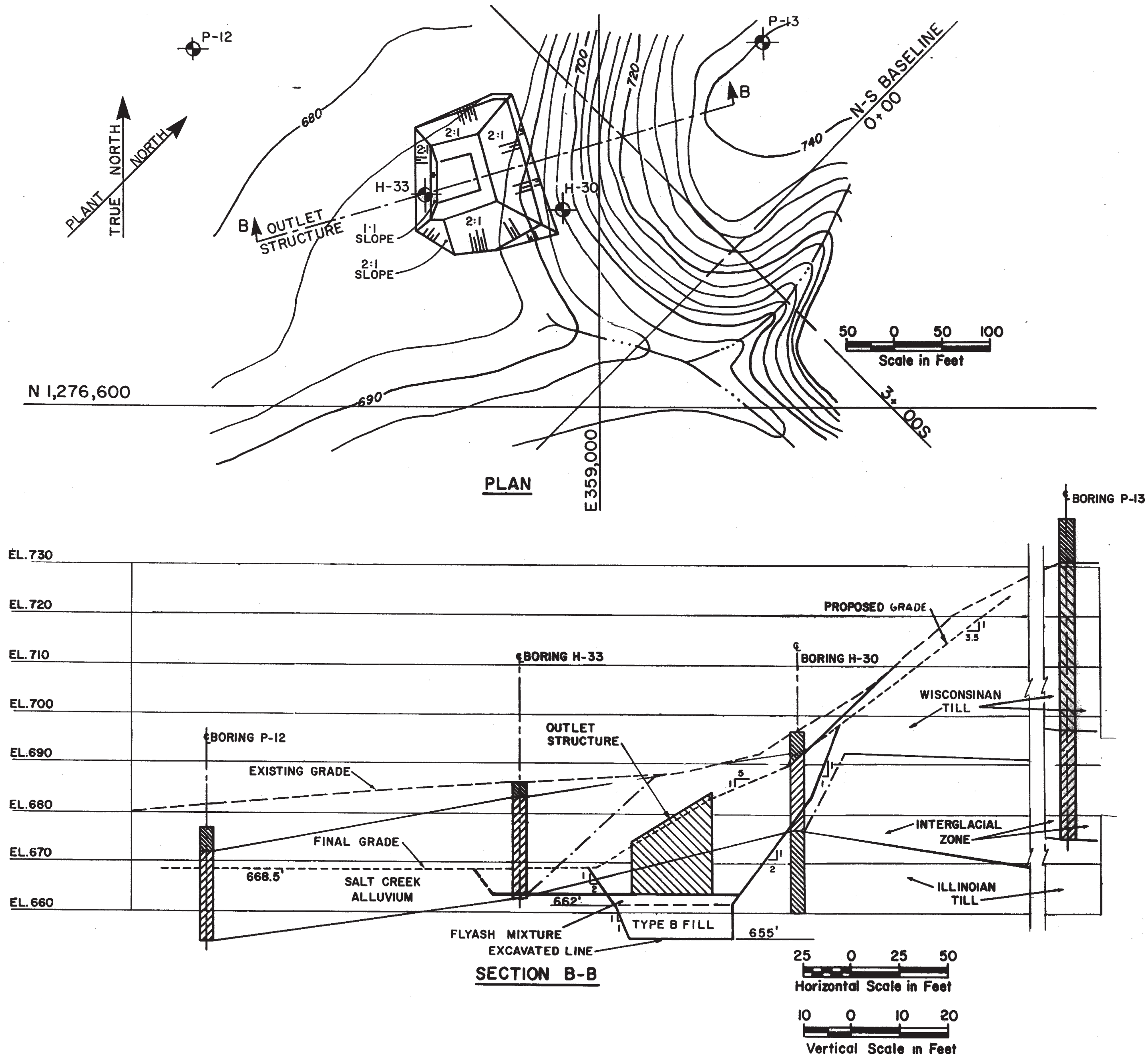
FIGURE 2.5-379

SECTION THROUGH CIRCULATING WATER SCREEN HOUSE SHOWING EXCAVATION LINE

FIGURE 2.5-380

HAS BEEN DELETED



LEGEND

Borings

NOTE

1. The soil profile shows the projection of Borings P-12, H-30 and P-13 along the center line of the outlet structure.

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FIGURE 2.5-381

EXCAVATION PLAN AND SECTION FOR OUTLET STRUCTURE

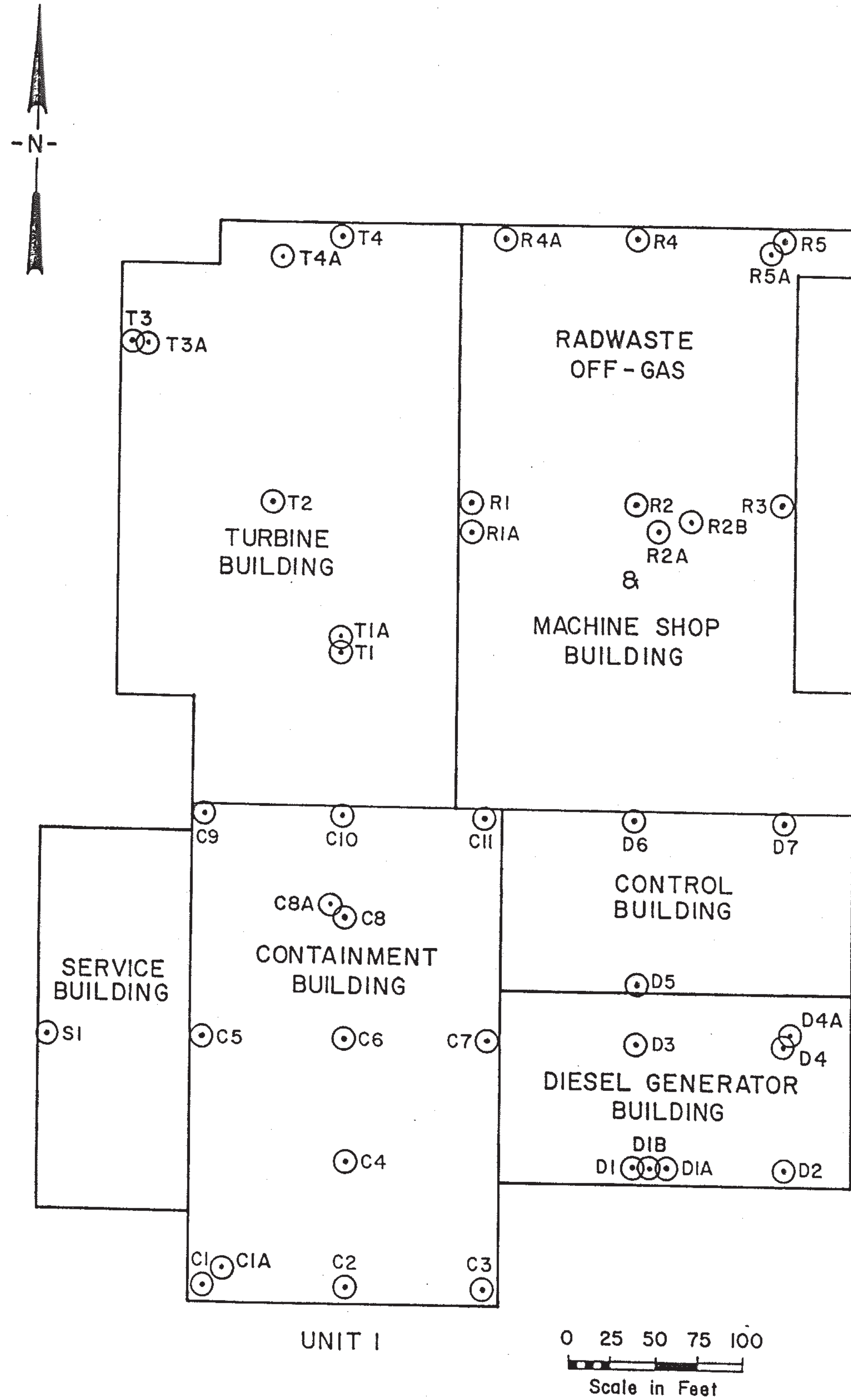

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FIGURE 2.5-382

LOCATIONS OF SETTLEMENT MONUMENTS - MAIN PLANT

NOTE

1. ⊙C1 SETTLEMENT MONUMENT LOCATION.

Figure 2.5-383
Deleted

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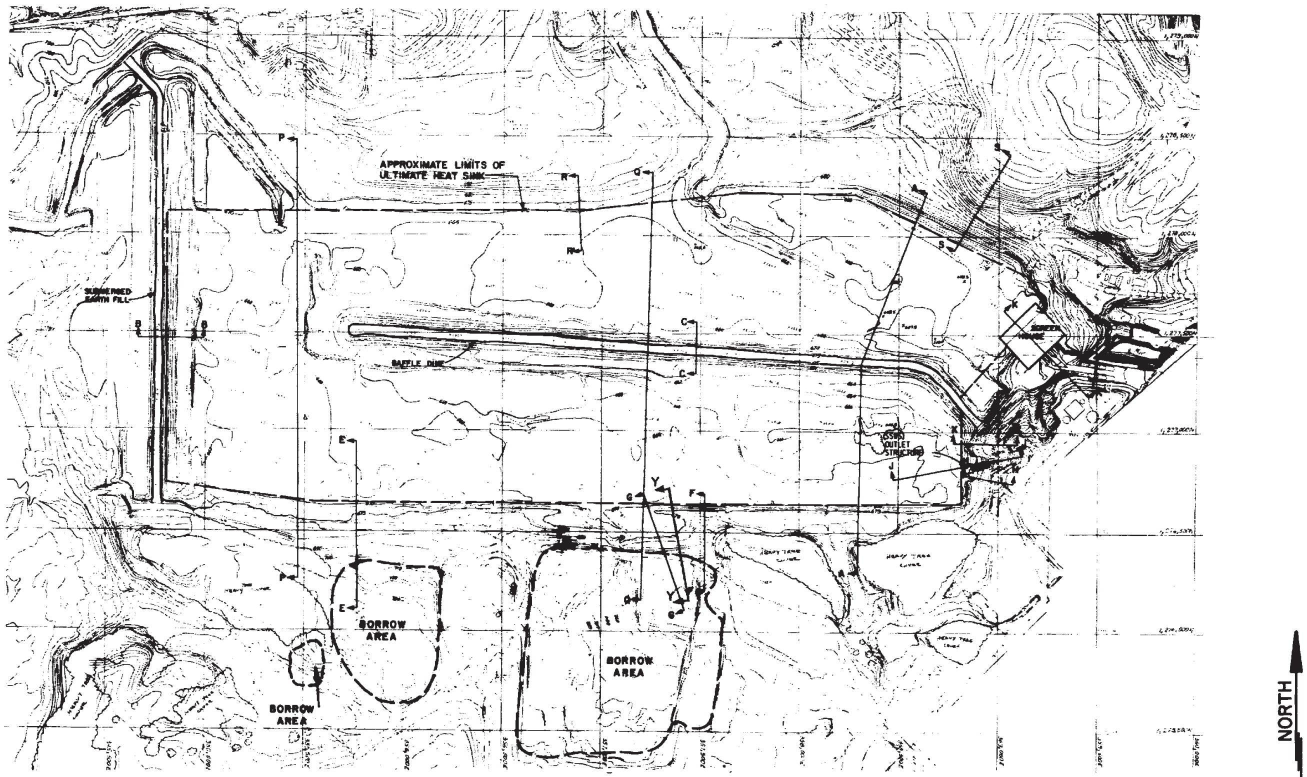
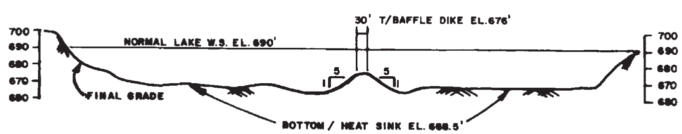


0 500
SCALE IN FEET



SECTION A-A

0 100 200
SCALE IN FEET

LEGEND

SECTIONS

BORROW AREA

NOTE

1. FOR SECTIONS SEE FIGURE 2.5-385.

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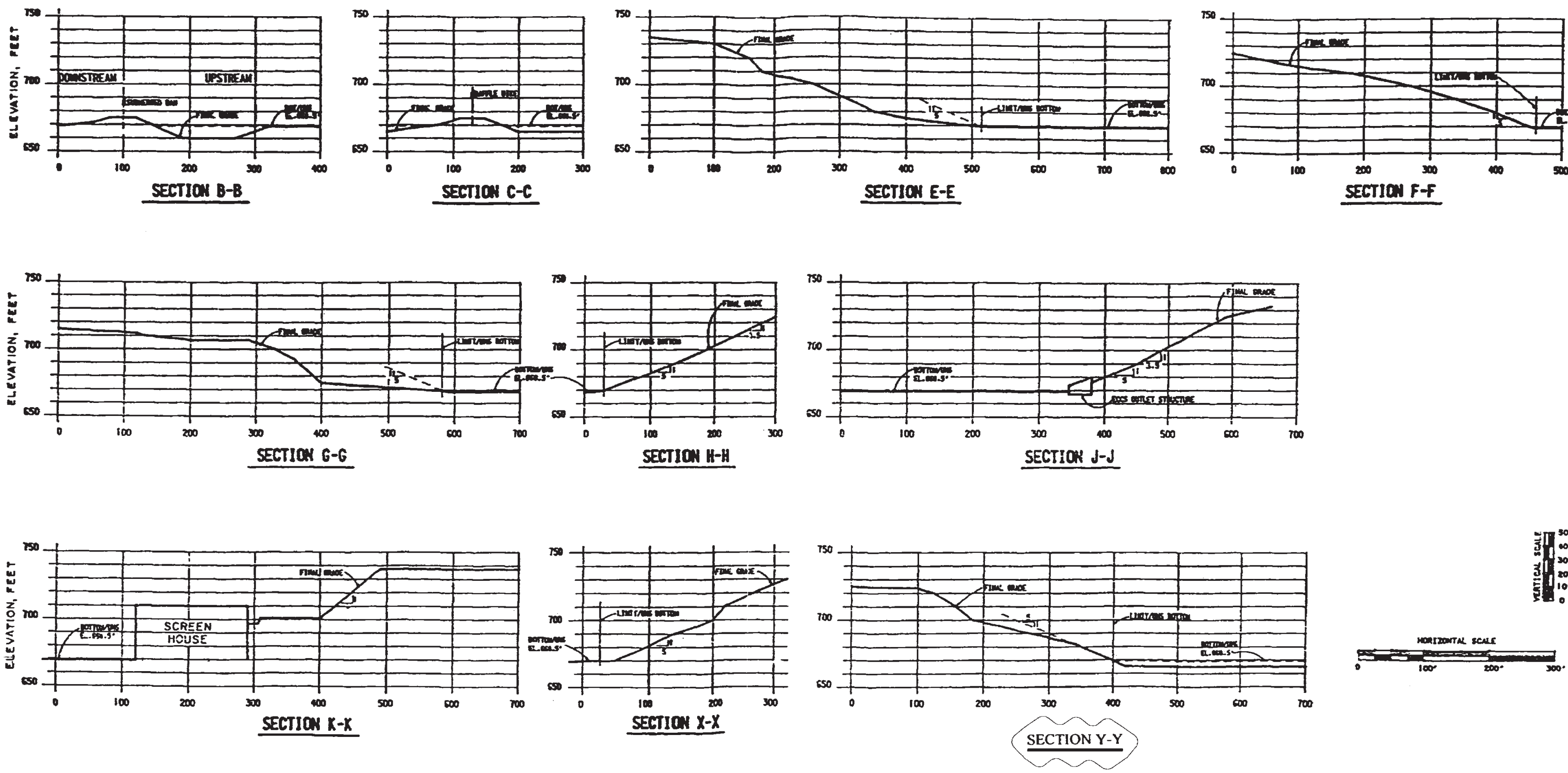
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-384

ULTIMATE HEAT SINK



FOR LOCATION OF SECTIONS,
SEE FIGURE 2.5-384.

NOTE:
HORIZONTAL AND VERTICAL SCALES
ARE DISTORTED

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FIGURE 2.5-385

SECTIONS - ULTIMATE HEAT SINK

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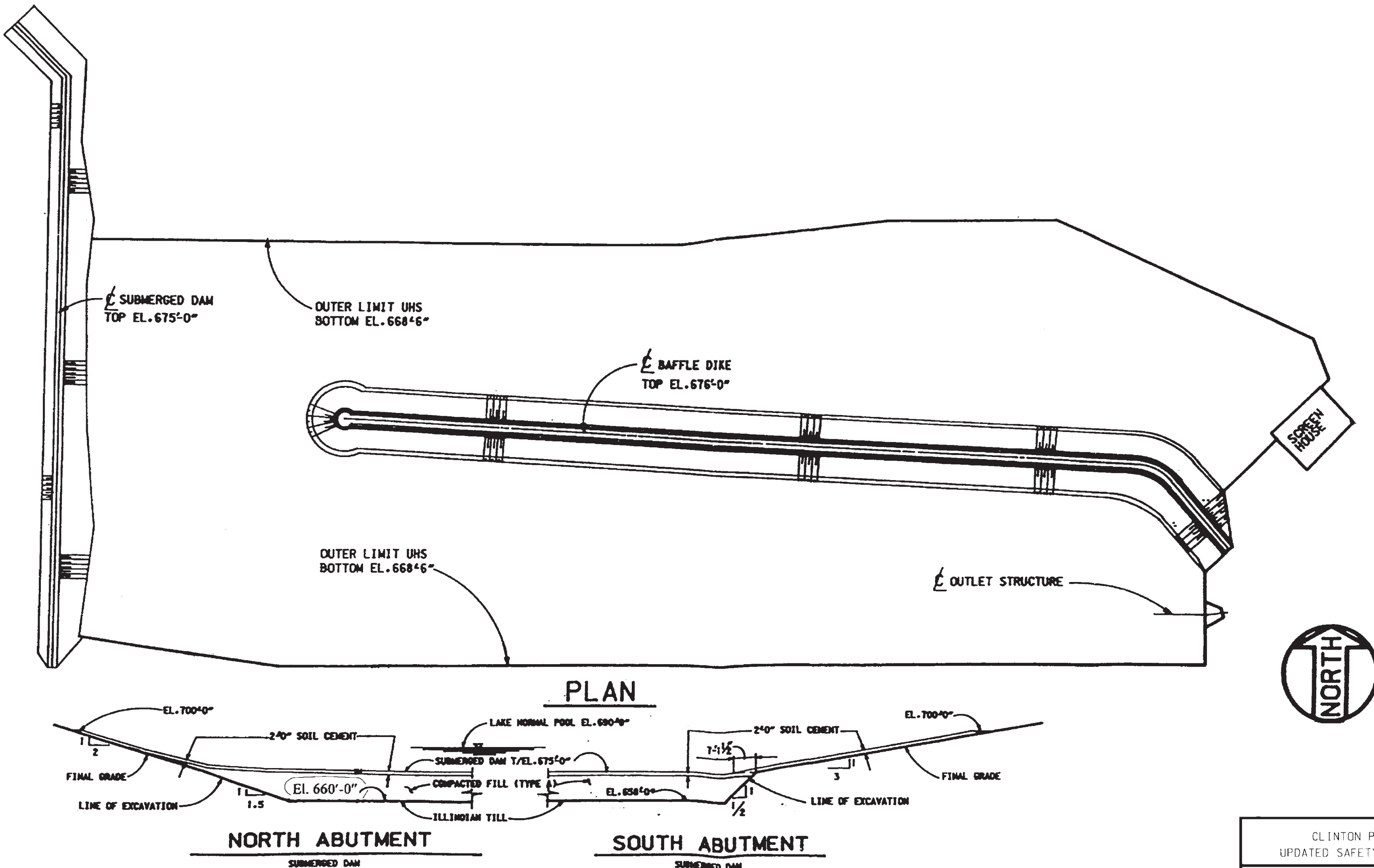

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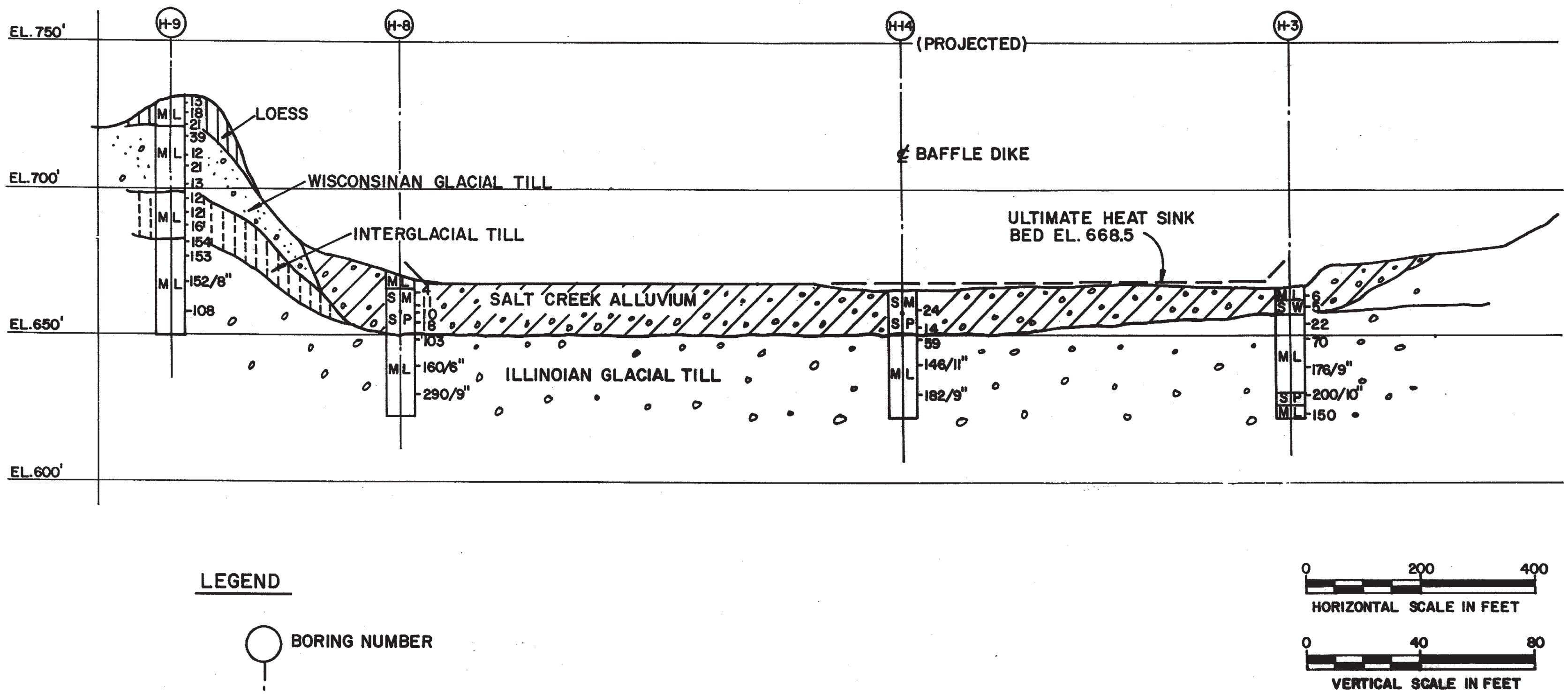
FIGURE 2.5-386
PLAN AND SECTIONS FOR SUBMERGED EARTH FILL AND BAFFLE DIKE



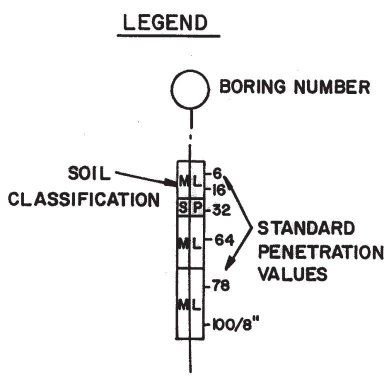


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FIGURE 2.5-387

SOIL PROFILE - ULTIMATE HEAT SINK
SECTION P-P

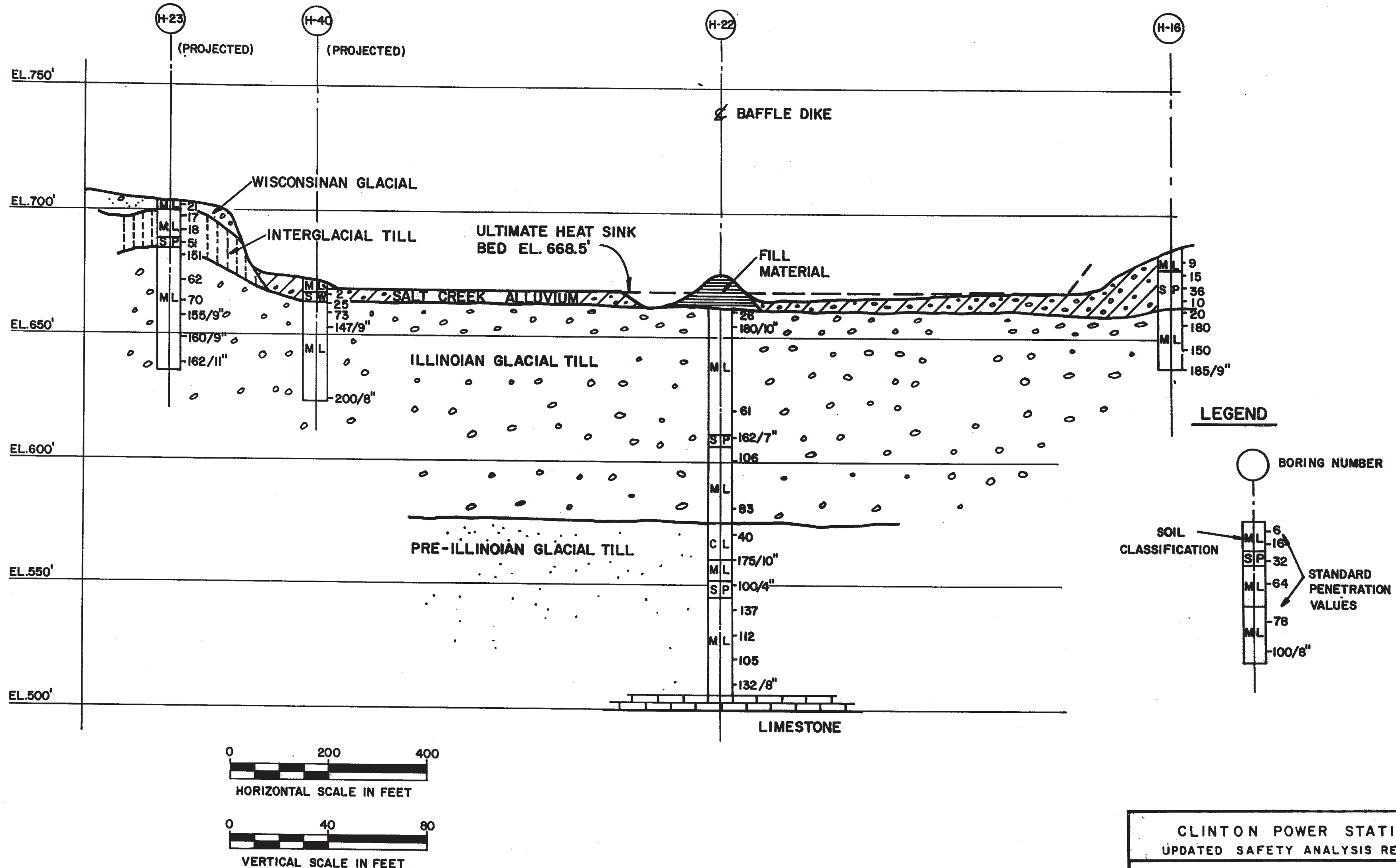

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FIGURE 2.5-388

SOIL PROFILE - ULTIMATE HEAT SINK
SECTION Q-Q

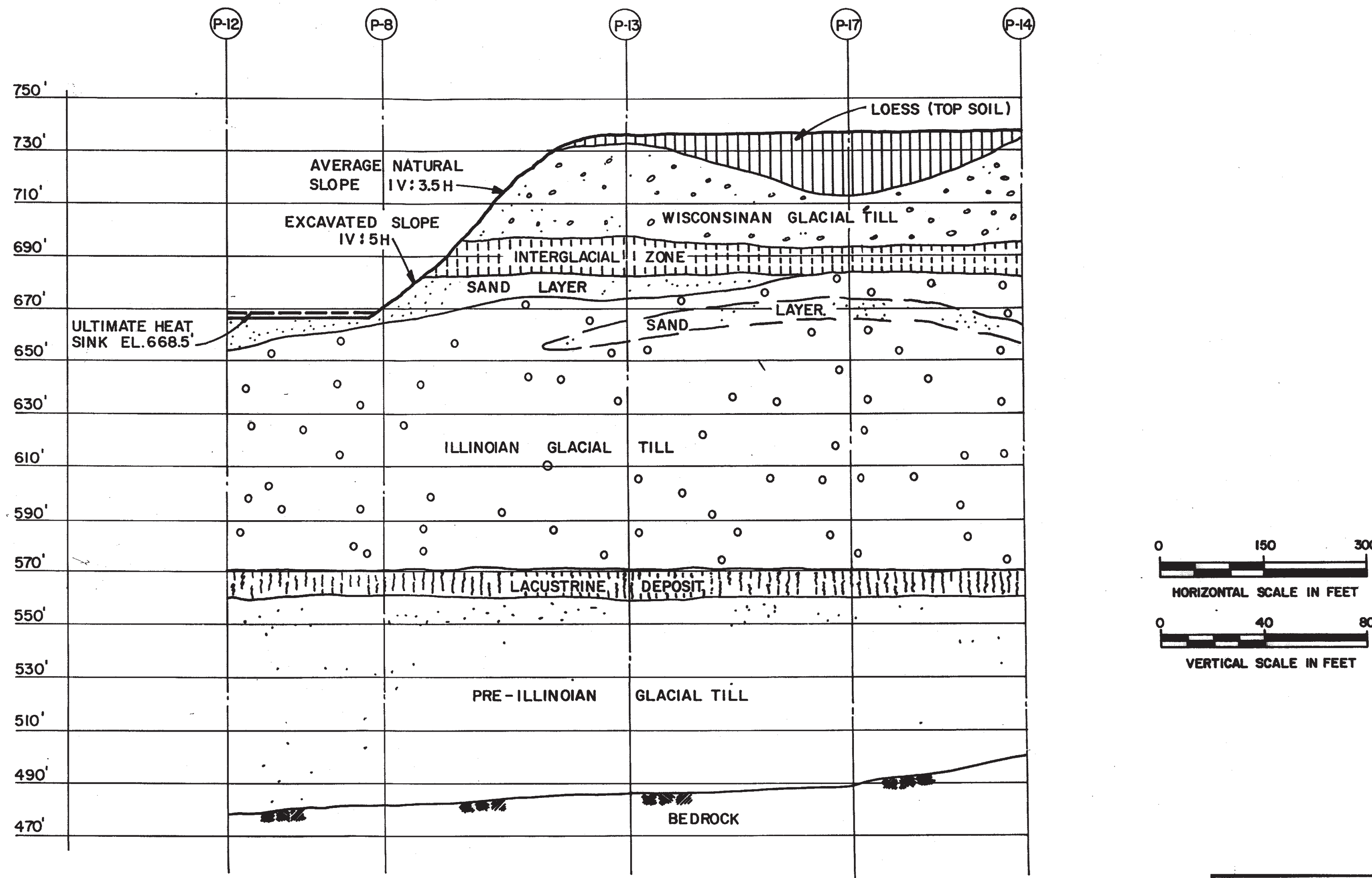

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FIGURE 2.5-389

SOIL PROFILE - ULTIMATE HEAT SINK
SECTION X-X

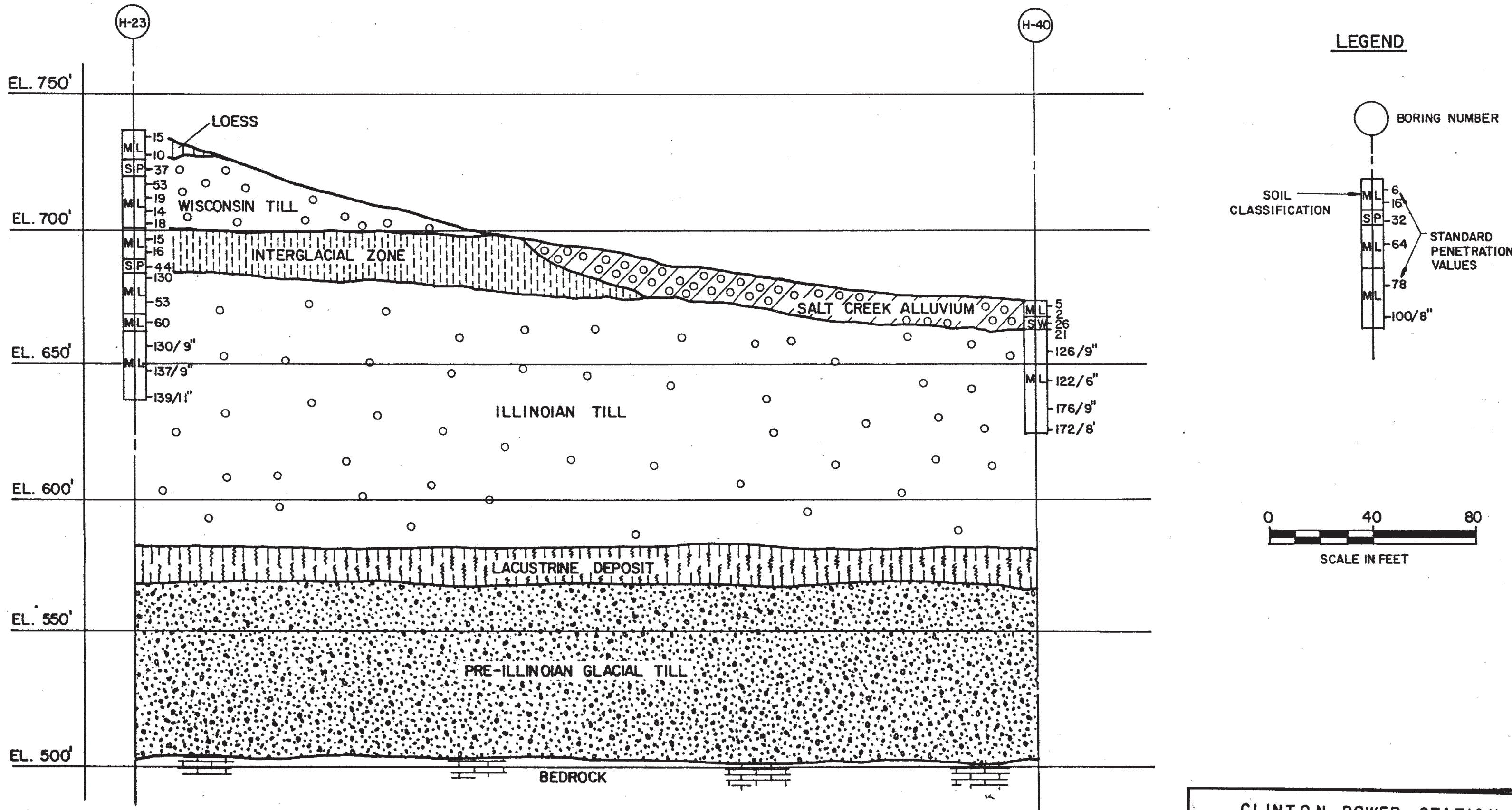

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FIGURE 2.5-390

SOIL PROFILE - ULTIMATE HEAT SINK SECTION Y-Y

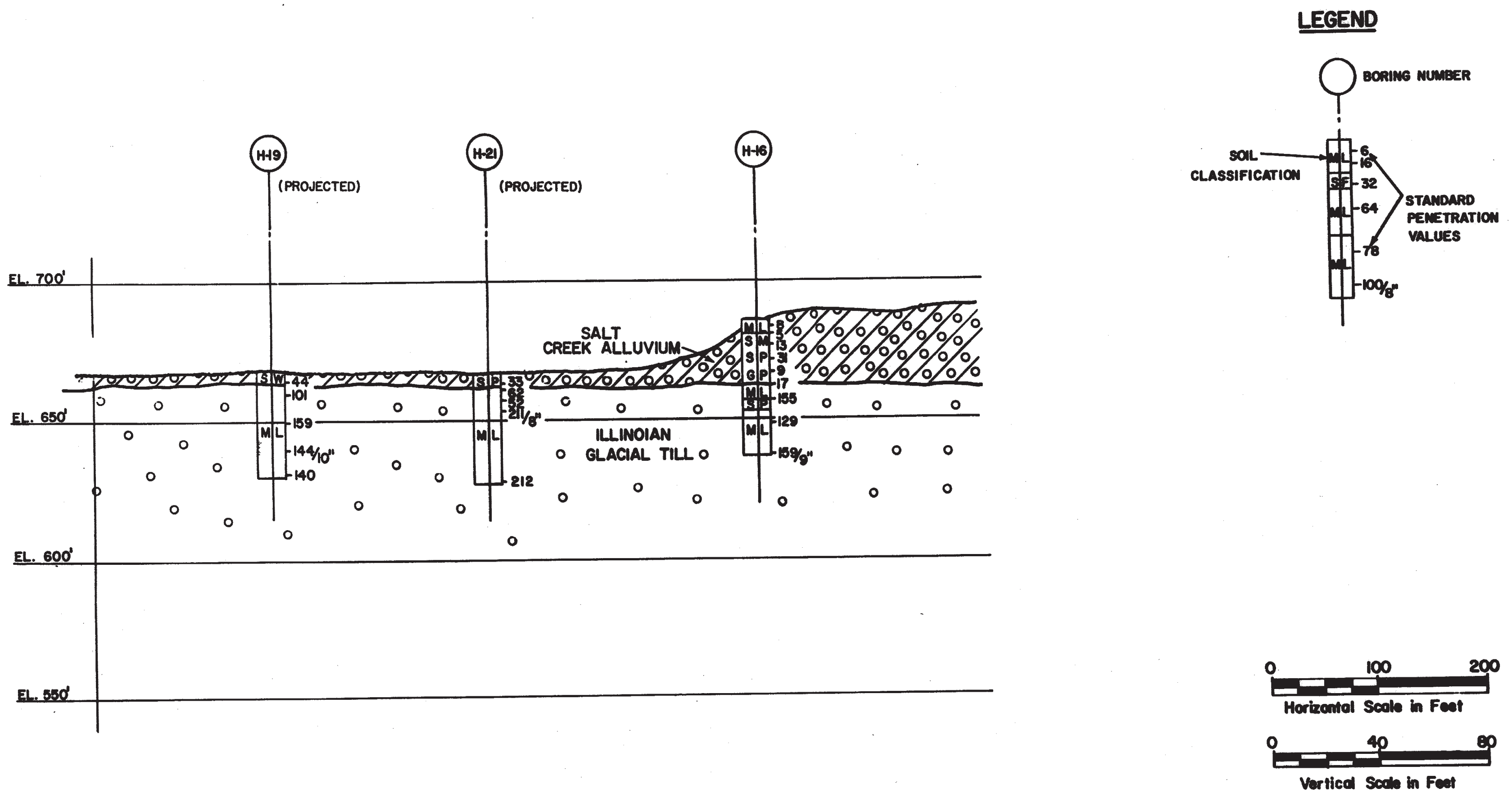

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FIGURE 2.5-391

SOIL PROFILE - ULTIMATE HEAT SINK
SECTION R-R

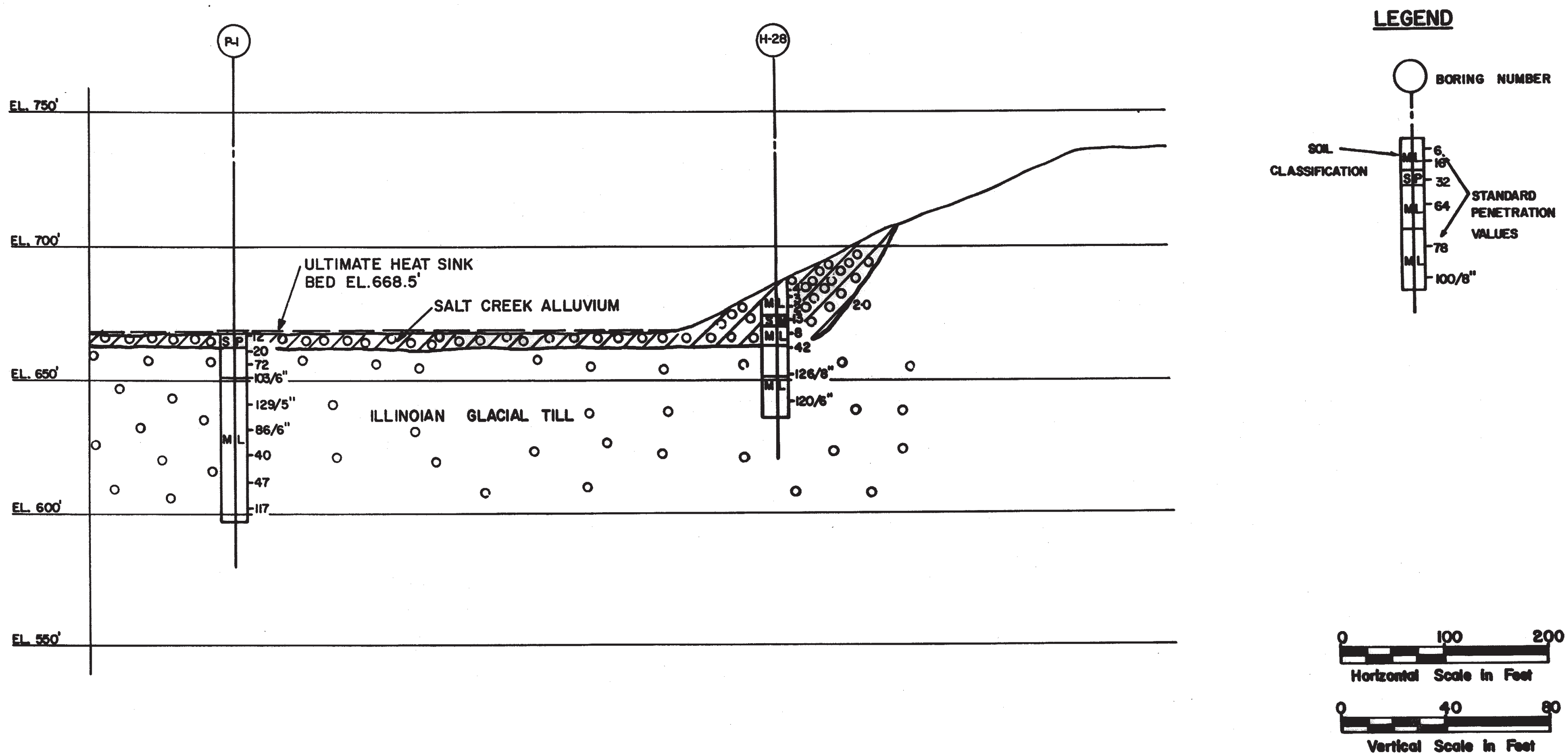

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FIGURE 2.5-392

SOIL PROFILE - ULTIMATE HEAT SINK
SECTION S-S

#	DESCRIPTION	SOIL DATA		
		DENSITY (PCF)	C' (PSF)	Ø'
1	COMPACTED WISCONSINAN TILL	130	1300*	0*
2	SALT CREEK ALLUVIUM	120	400	0
3	SAND DRAINAGE BLANKET	125	0	30
4	SALT CREEK ALLUVIUM (SAND)	125	0	33
5	ILLINOIAN TILL	140	4000	0
6	DUMMY LAYER	0	0	0
7	DUMMY LAYER	0	0	0

* THESE VALUES ARE TOTAL STRENGTH PARAMETERS

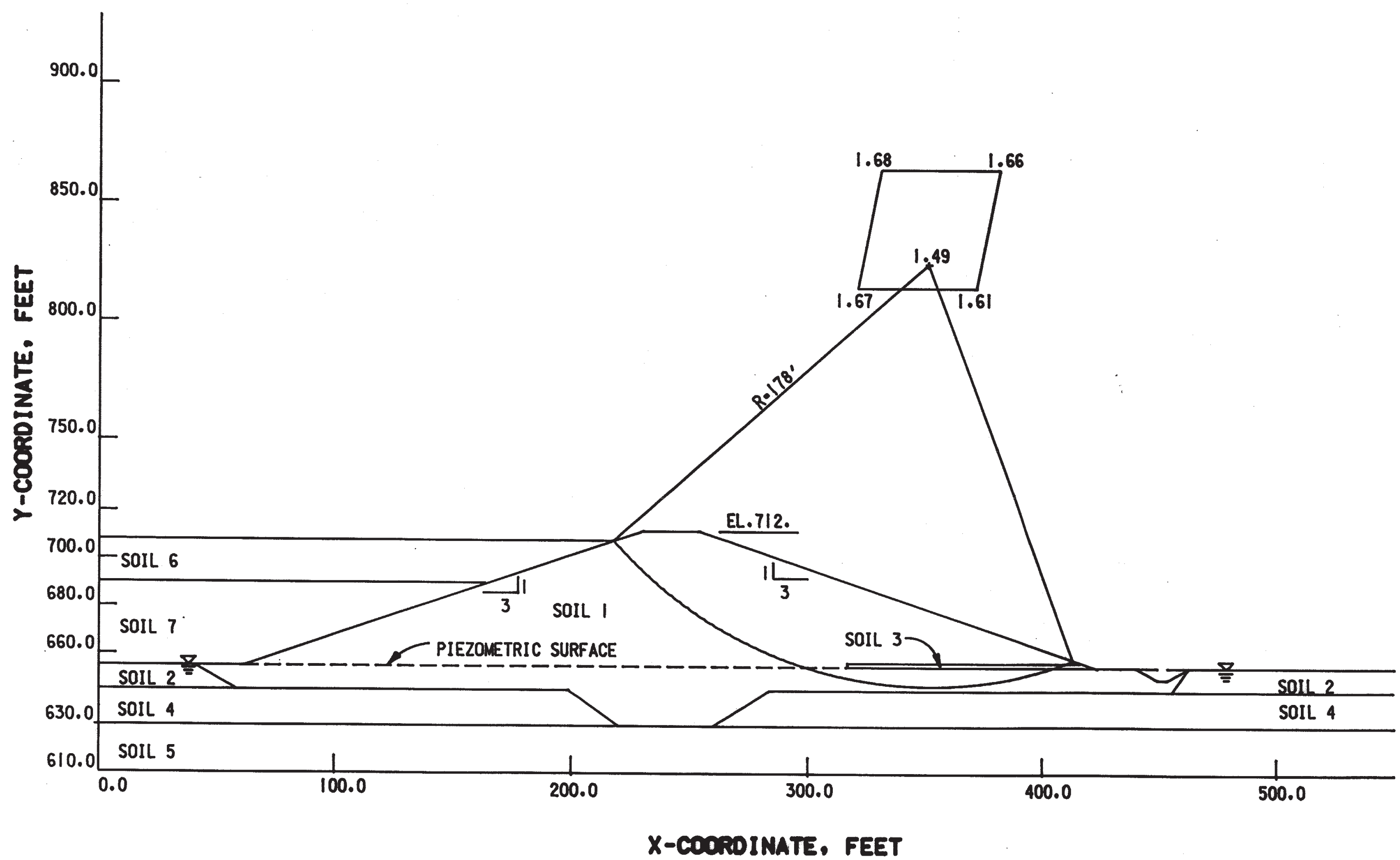

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FIGURE 2.5-393

STABILITY ANALYSIS - END OF CONSTRUCTION CONDITION - MAIN DAM

#	DESCRIPTION	SOIL DATA		
		DENSITY (PCF)	C' (PSF)	Ø'
1	COMPACTED WISCONSINAN TILL	130	200	33
2	SALT CREEK ALLUVIUM	120	400	0
3	SAND DRAINAGE BLANKET	125	0	30
4	SALT CREEK ALLUVIUM (SAND)	125	0	33
5	ILLINOIAN TILL	140	4000	0
6	DUMMY LAYER	0	0	0
7	WATER	62.4	0	0

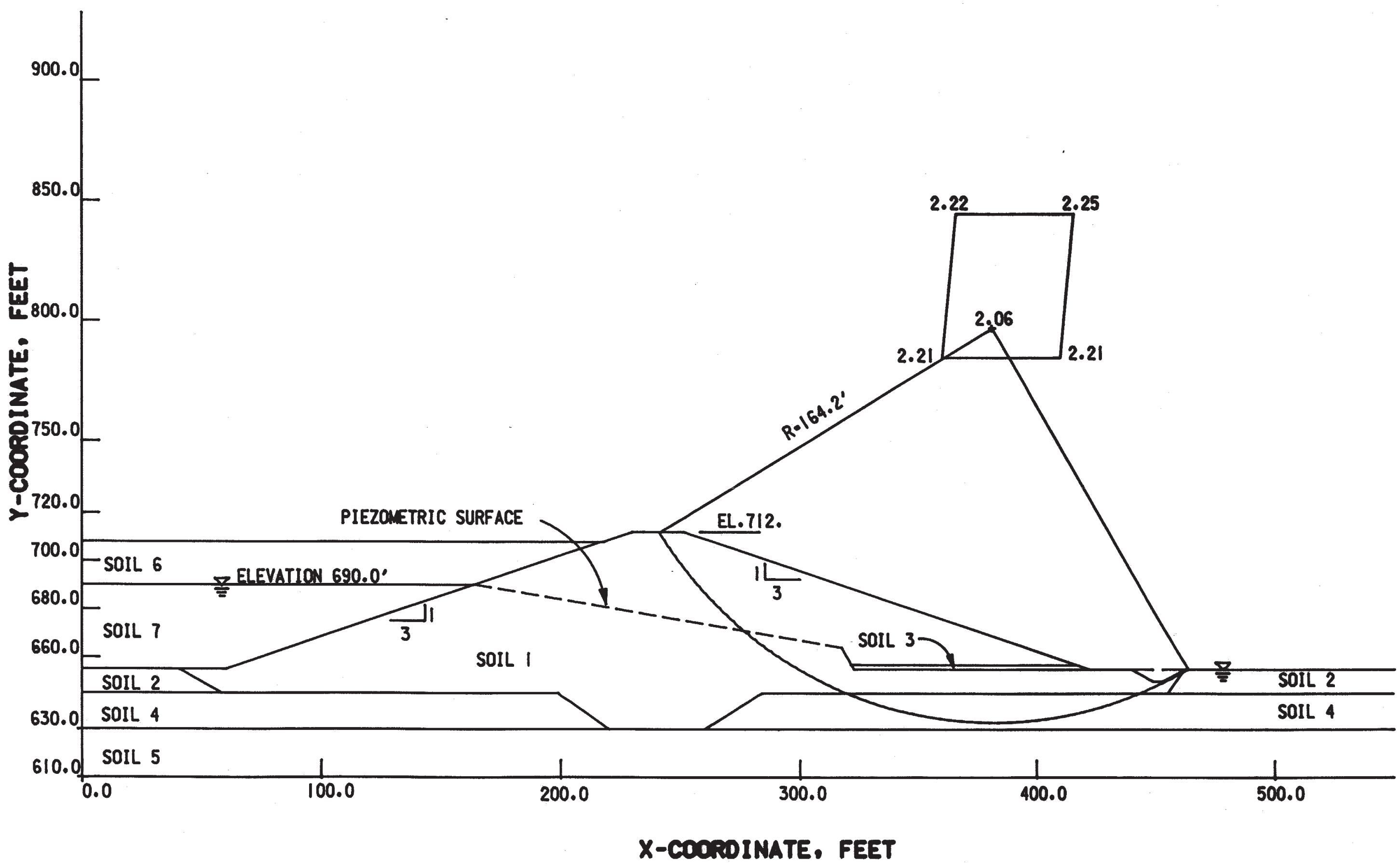

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FIGURE 2.5-394

STABILITY ANALYSIS - NORMAL POOL CONDITION - MAIN DAM

#	DESCRIPTION	SOIL DATA		
		DENSITY (PCF)	C′ (PSF)	ø′
1	COMPACTED WISCONSINAN TILL	130	200	33
2	SALT CREEK ALLUVIUM	120	400	0
3	SAND DRAINAGE BLANKET	125	0	30
4	SALT CREEK ALLUVIUM (SAND)	125	0	33
5	ILLINOIAN TILL	140	4000	0
6	DUMMY LAYER	0	0	0
7	WATER	62.4	0	0

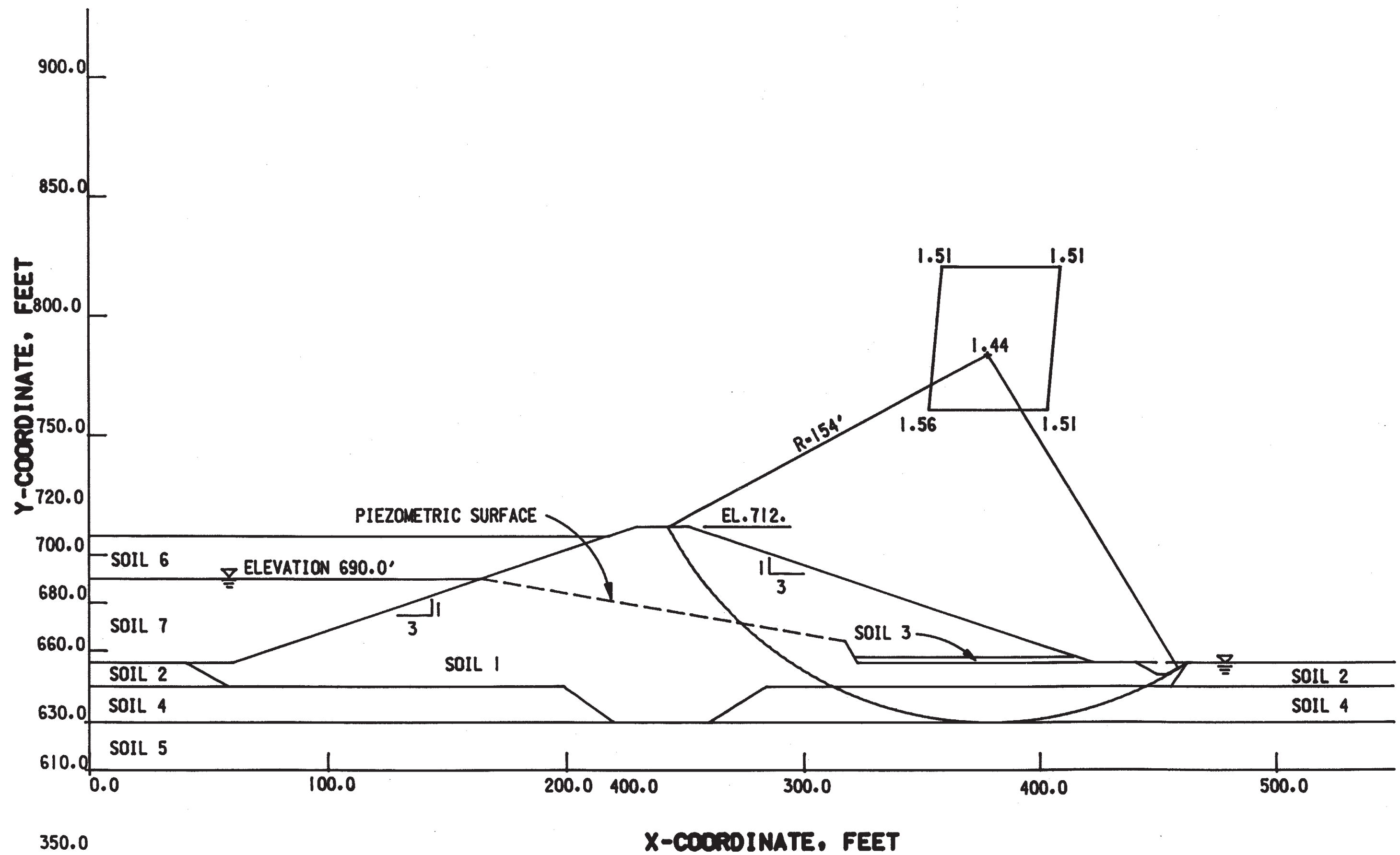

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FIGURE 2.5-395

STABILITY ANALYSIS - NORMAL POOL WITH 0.1g EARTHQUAKE LOADING CONDITION - MAIN DAM

#	DESCRIPTION	SOIL DATA		
		DENSITY (PCF)	C′ (PSF)	ϕ′
1	COMPACTED WISCONSINAN TILL	130	200	33
2	SALT CREEK ALLUVIUM	120	400	0
3	SAND DRAINAGE BLANKET	125	0	30
4	SALT CREEK ALLUVIUM (SAND)	125	0	33
5	ILLINOIAN TILL	140	4000	0
6	WATER	62.4	0	0
7	WATER	62.4	0	0

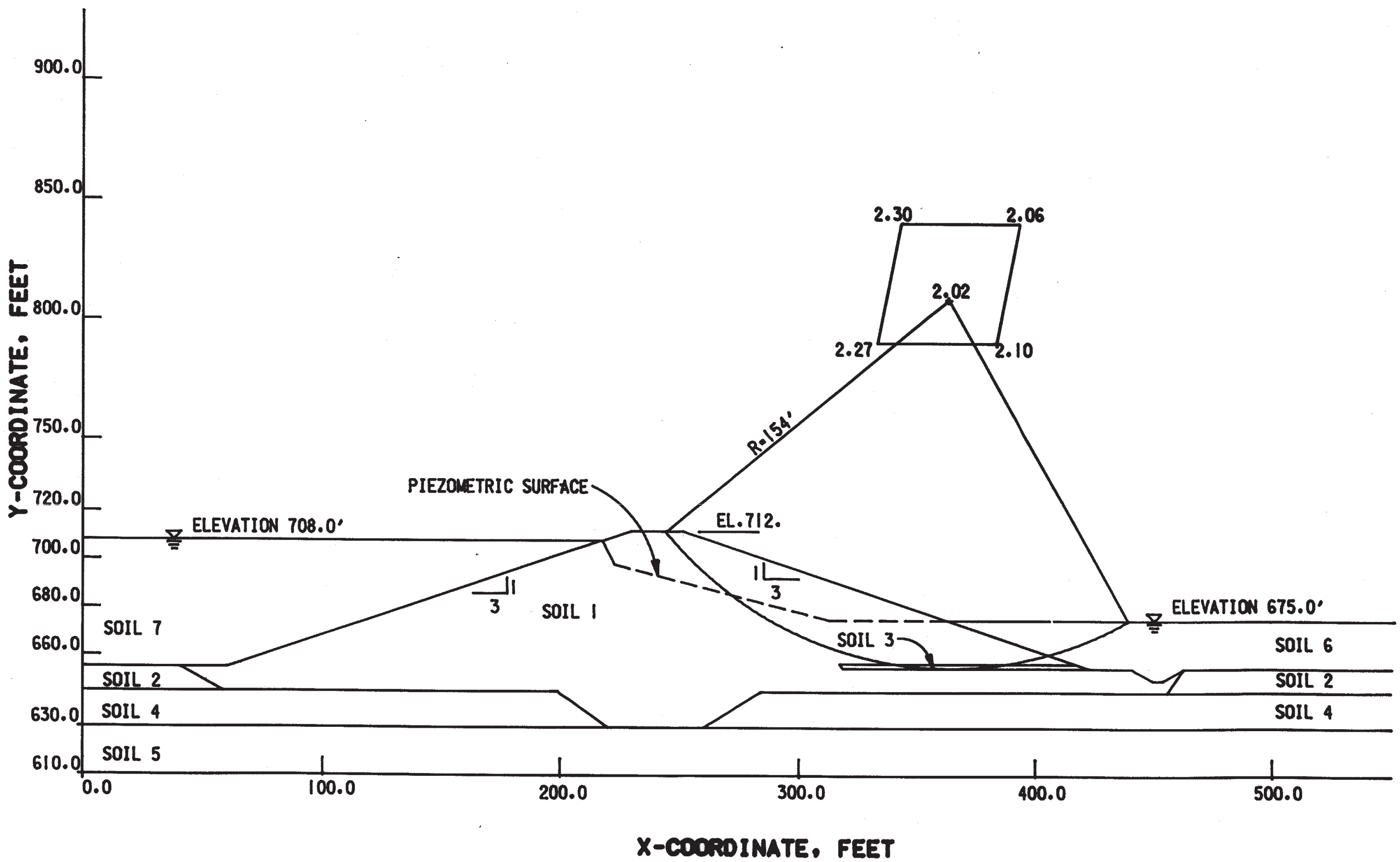

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FIGURE 2.5-396

STABILITY ANALYSIS - MAXIMUM POOL CONDITION - MAIN DAM

#	DESCRIPTION	SOIL DATA		
		DENSITY (PCF)	C′ (PSF)	ø′
1	COMPACTED WISCONSINAN TILL	130	200	33
2	SALT CREEK ALLUVIUM	120	400	0
3	SAND DRAINAGE BLANKET	125	0	30
4	SALT CREEK ALLUVIUM (SAND)	125	0	33
5	ILLINOIAN TILL	140	4000	0
6	DUMMY LAYER	0	0	0
7	DUMMY LAYER	0	0	0

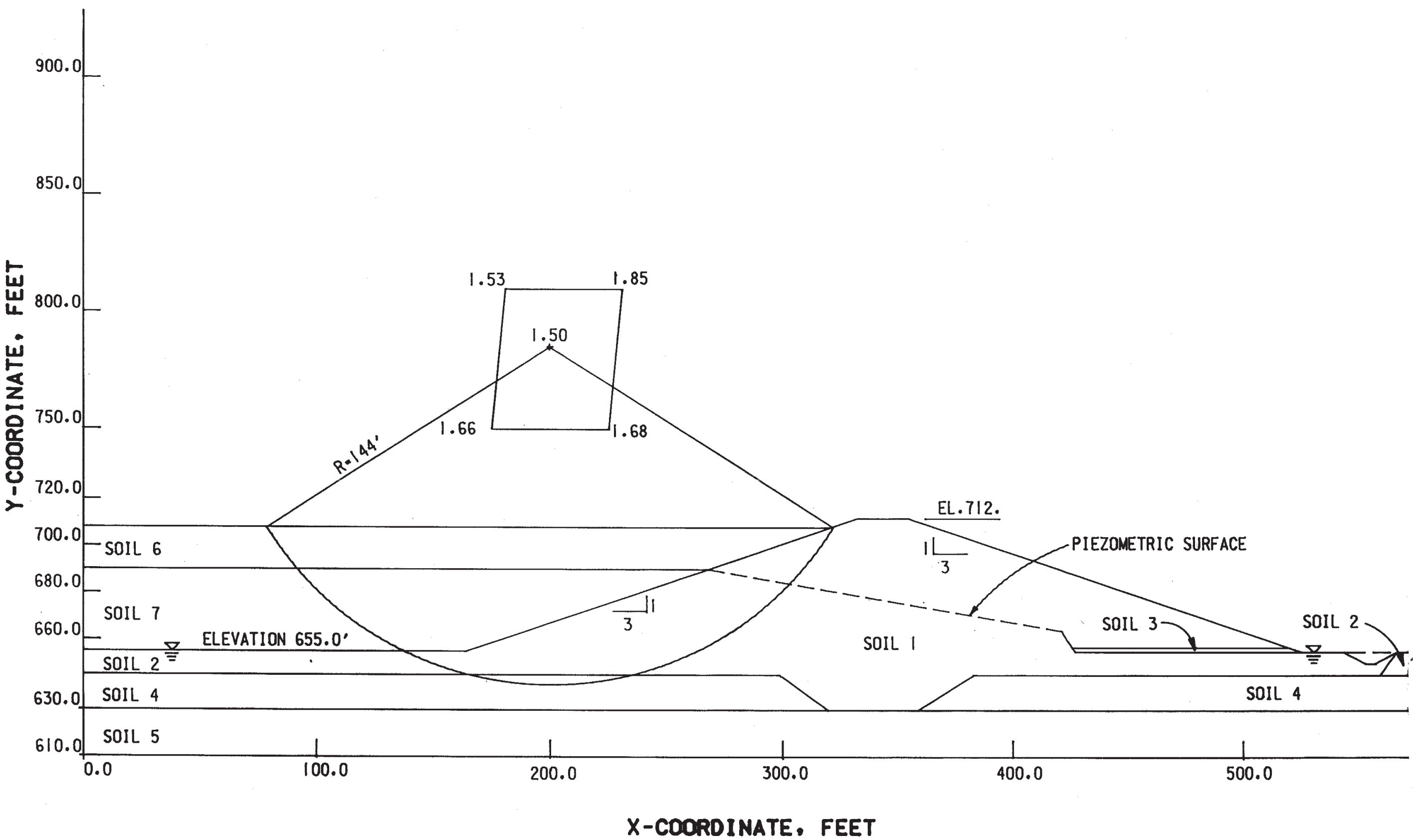

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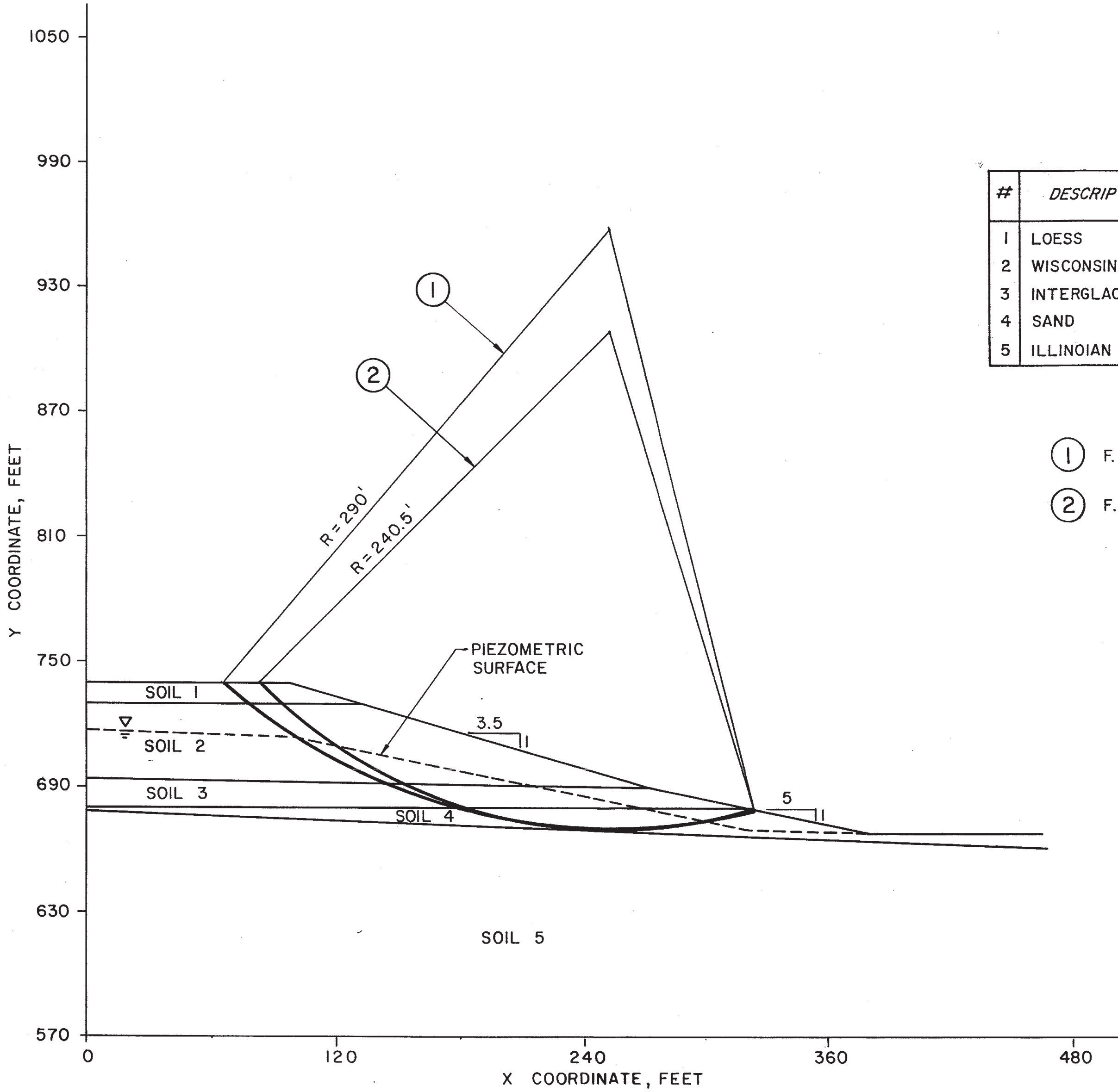
FIGURE 2.5-397

STABILITY ANALYSIS - RAPID DRAWDOWN CONDITION - MAIN DAM



#	DESCRIPTION	SOIL DATA		
		$\gamma_{(PCF)}$	$C'_{(PSF)}$	ϕ'
1	LOESS	120.0	0	20
2	WISCONSIN TILL	137.0	600	30
3	INTERGLACIAL	131.0	600	30
4	SAND	125.0	0	38
5	ILLINOIAN TILL	150.0	0	47

1 F.S: 1.24 (PSEUDO)

2 F.S: 2.60 (STATIC)

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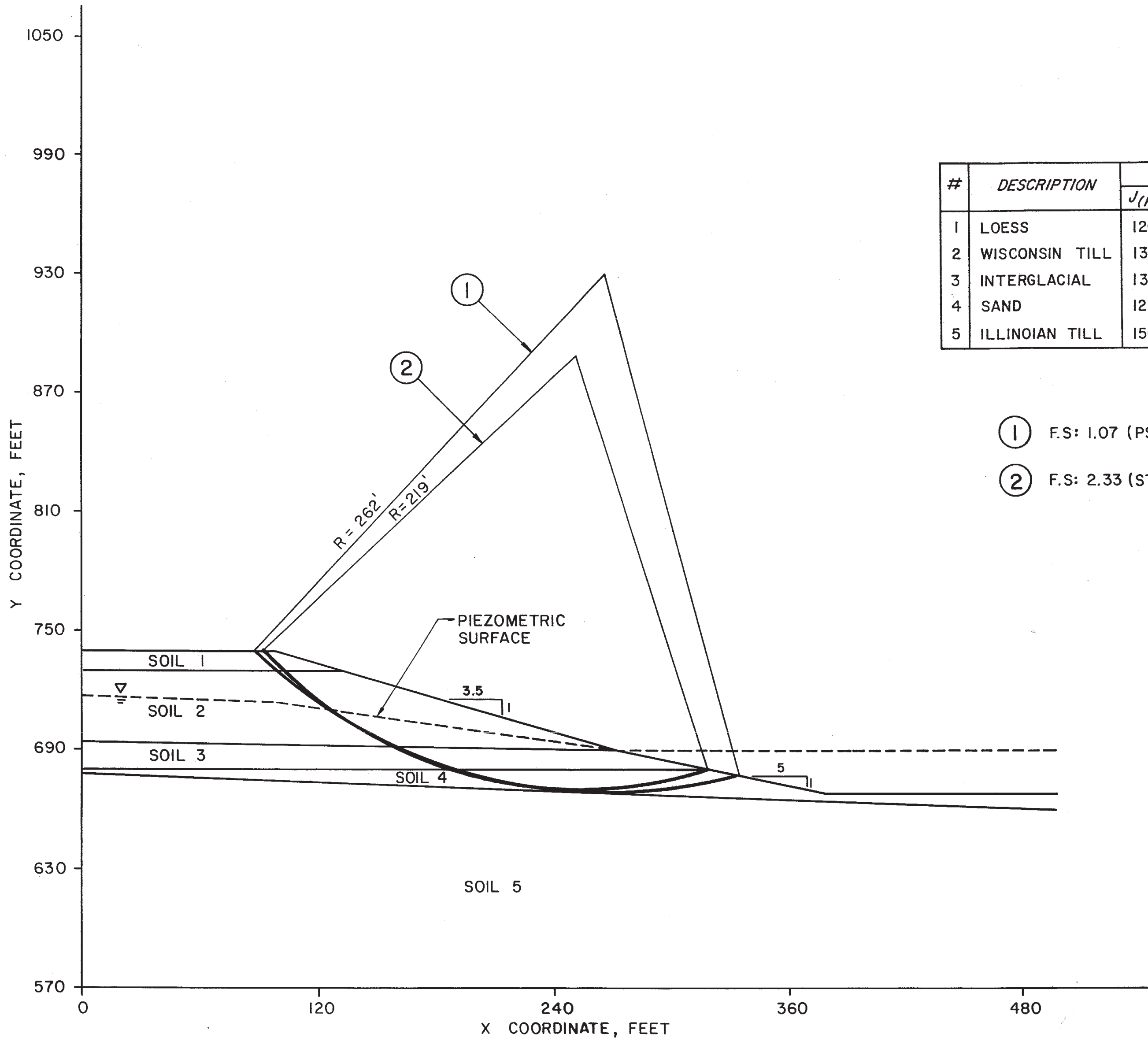
FIGURE 2.5-398

STABILITY ANALYSIS - END OF CONSTRUCTION CONDITION - SECTION X-X, ULTIMATE HEAT SINK



#	DESCRIPTION	SOIL DATA		
		γ (PCF)	C' (PSF)	ϕ'
1	LOESS	120.0	0	20
2	WISCONSIN TILL	137.0	600	30
3	INTERGLACIAL	131.0	600	30
4	SAND	125.0	0	38
5	ILLINOIAN TILL	150.0	0	47

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FIGURE 2.5-399

STABILITY ANALYSIS - FULL COOLING LAKE CONDITION - SECTION X-X, ULTIMATE HEAT SINK

#	DESCRIPTION	SOIL DATA		
		DENSITY (PCF)	C' (PSF)	Ø'
1	COMPACTED WISCONSINAN TILL(FILL)	135	400	29
2	SAND AND GRAVEL	120	0	38
3	WISCONSINAN TILL	139	600	30
4	WATER	62.4	0	0

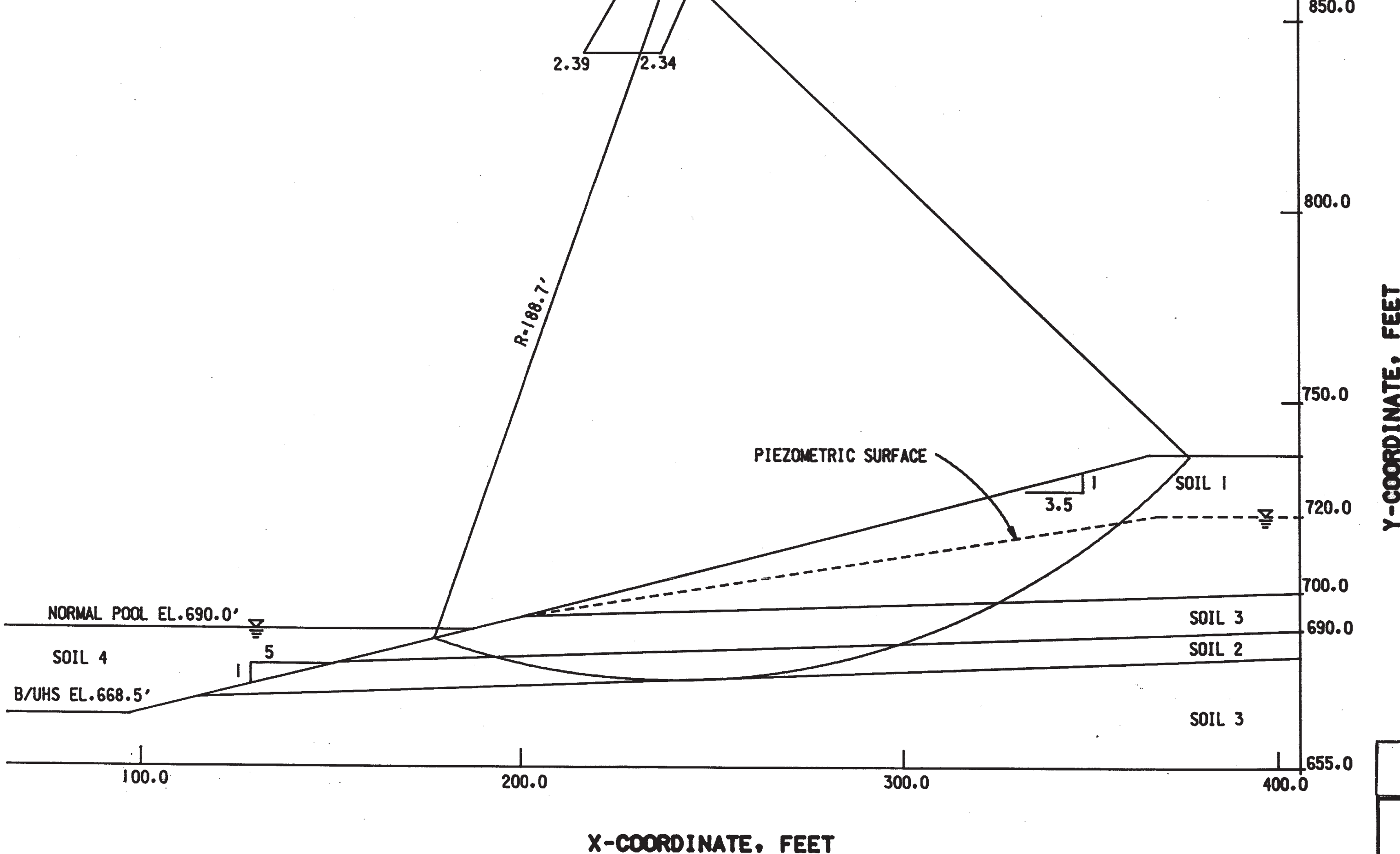

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FIGURE 2.5-400

STABILITY ANALYSIS - FULL COOLING LAKE CONDITION - SECTION H-H', ULTIMATE HEAT SINK

#	DESCRIPTION	SOIL DATA		
		DENSITY (PCF)	C' (PSF)	Ø'
1	COMPACTED WISCONSINAN TILL(FILL)	.35	400	29
2	SAND AND GRAVEL	120	0	38
3	WISCONSINAN TILL	139	600	30
4	WATER	62.4	0	0

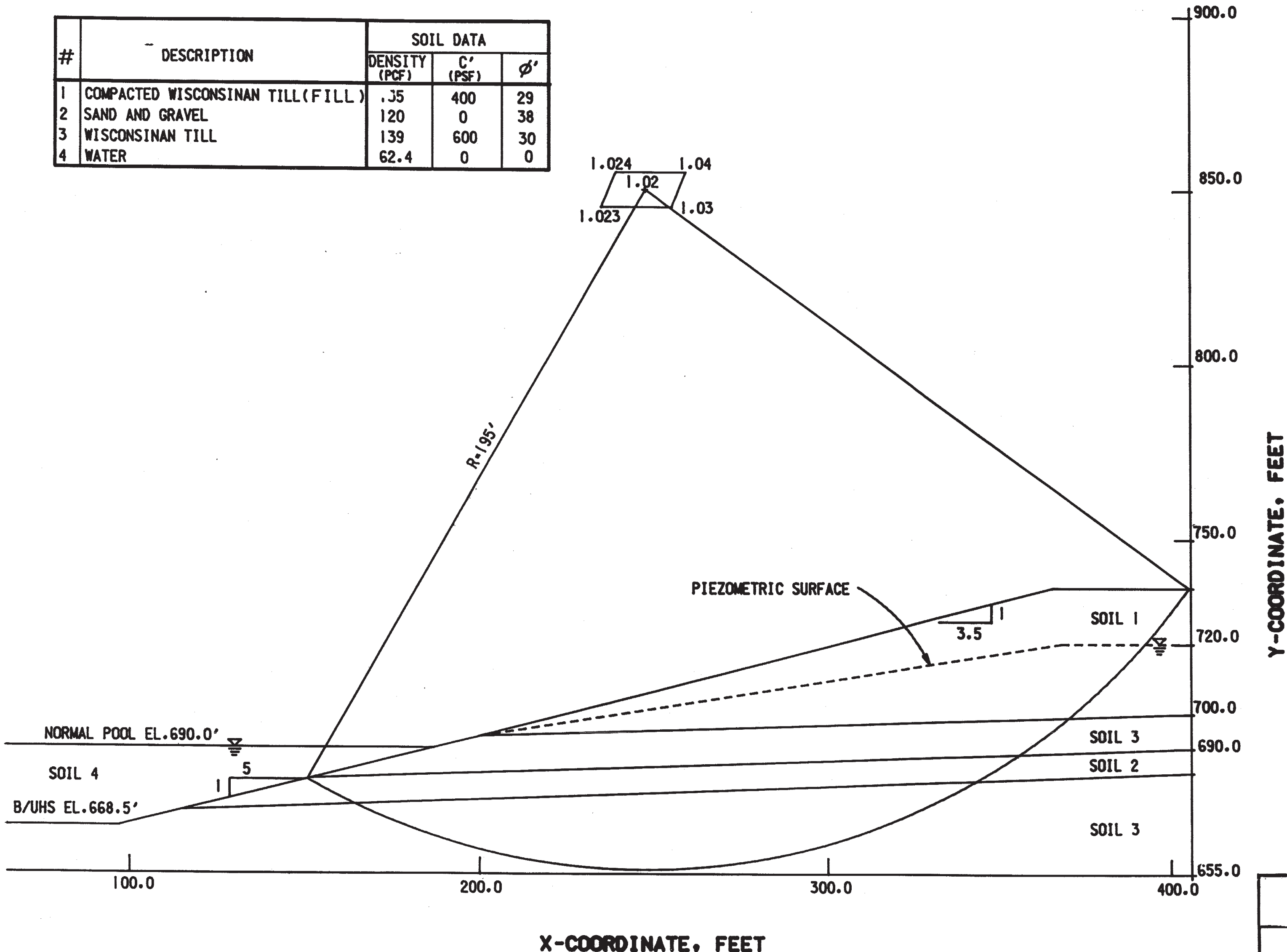

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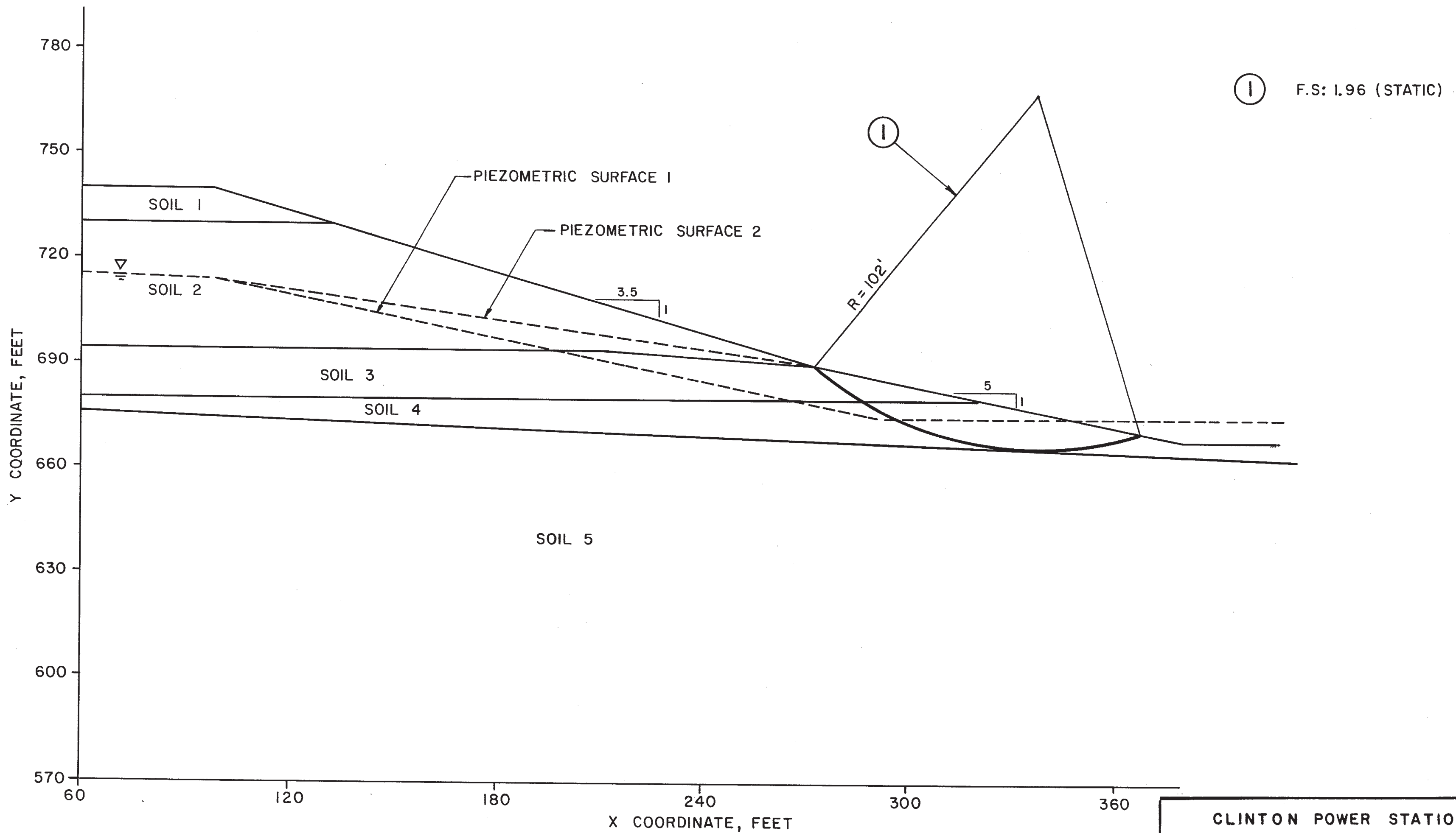
FIGURE 2.5-401

STABILITY ANALYSIS - FULL COOLING LAKE WITH 0.25g EARTHQUAKE LOADING CONDITION - SECTION H-H, ULTIMATE HEAT SINK



NOTE

SEE FIGURE 2.5-398
FOR SOIL DATA

CLINTON POWER STATION
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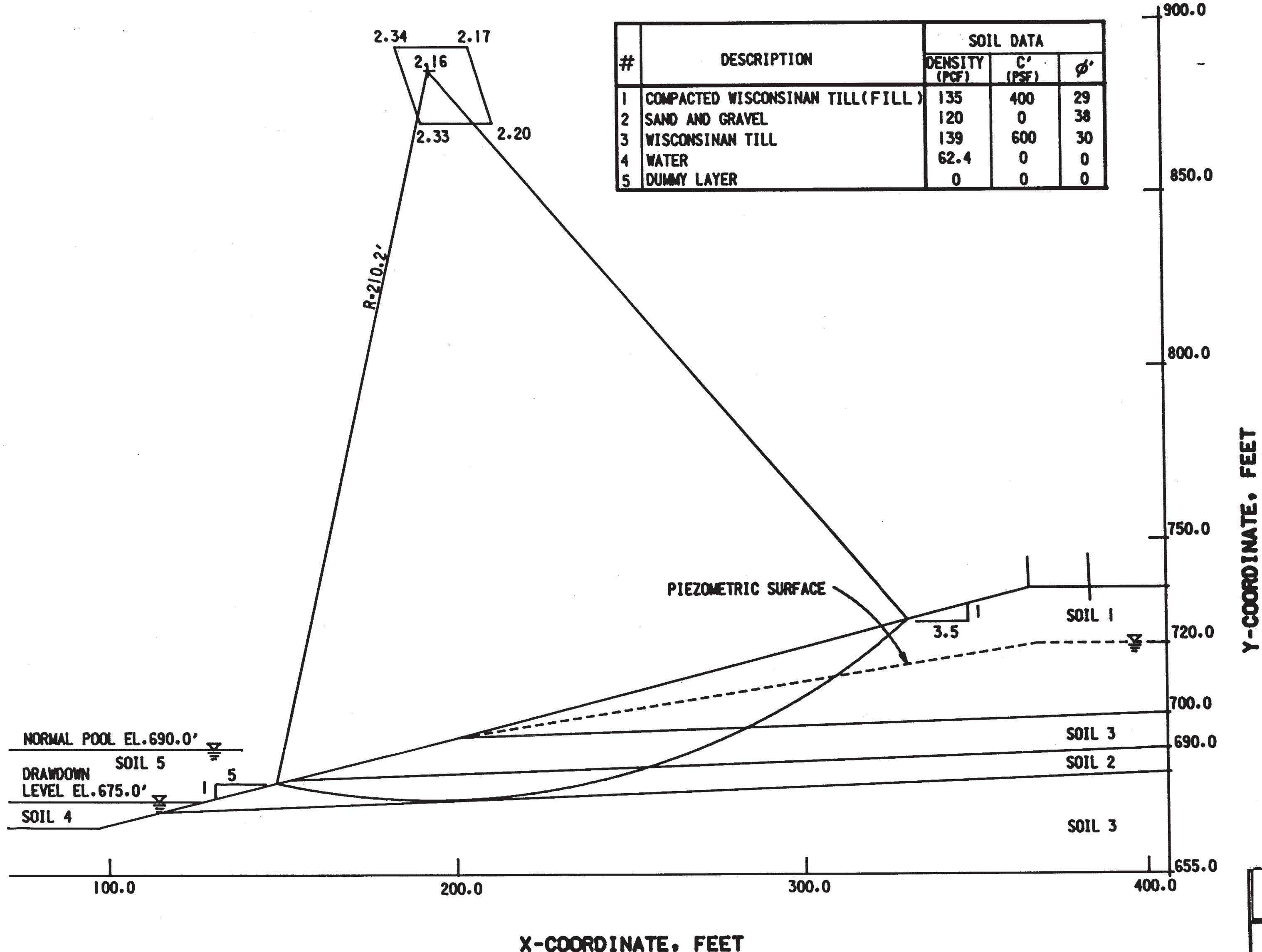
FIGURE 2.5-402

STABILITY ANALYSIS - EMPTY COOLING LAKE CONDITION SECTION X-X, ULTIMATE HEAT SINK



#	DESCRIPTION	SOIL DATA		
		DENSITY (PCF)	C' (PSF)	ϕ'
1	COMPACTED WISCONSINAN TILL (FILL)	135	400	29
2	SAND AND GRAVEL	120	0	38
3	WISCONSINAN TILL	139	600	30
4	WATER	62.4	0	0
5	DUMMY LAYER	0	0	0

CLINTON POWER STATION
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FIGURE 2.5-403

STABILITY ANALYSIS - EMPTY COOLING LAKE CONDITION SECTION H-H, ULTIMATE HEAT SINK

TRIAXIAL COMPRESSION TESTS

CONSOLIDATED UNDRAINED WITH PORE PRESSURE MEASUREMENTS

KEY	BORING	ELEVATION	SOIL TYPE	BLOW COUNTS/FT.	DRY DENSITY IN PCF
1	H-20	721.8	SP	85	130.3
2	H-38	712.9	ML	20	123.5
3	D-48	709.3	CL	9	123.0
4	H-23	707.3	ML	14	121.4
5	D-48	704.3	CL	21	123.8
6	D-48	689.3	CL	17	108.8

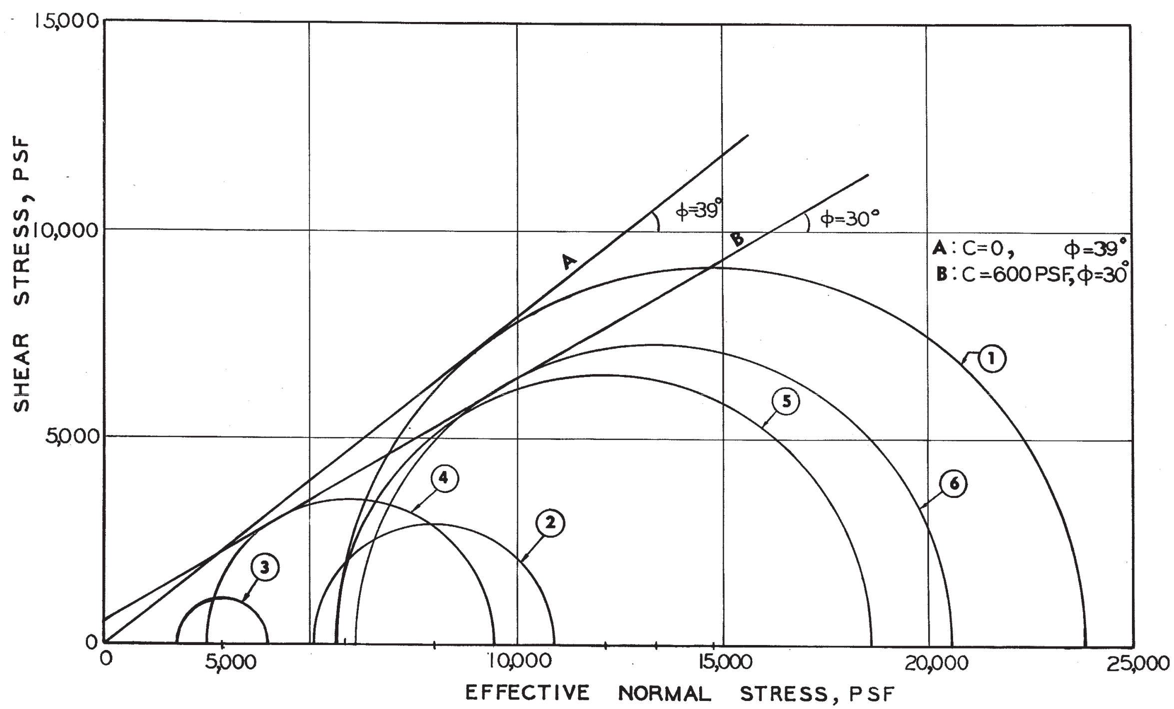

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FIGURE 2.5-404

MOHR CIRCLES - WISCONSINAN GLACIAL TILL

TRIAXIAL COMPRESSION TESTS

CONSOLIDATED-UNDRAINED WITH PORE PRESSURE MEASUREMENTS

TEST NO.	BORING NO.	ELEVATION	SOIL TYPE	BLOW COUNT/FT.	DRY DENSITY IN PCF
7	H-23	692.3	ML	15	103
8	H-38	687.9	ML	8	–

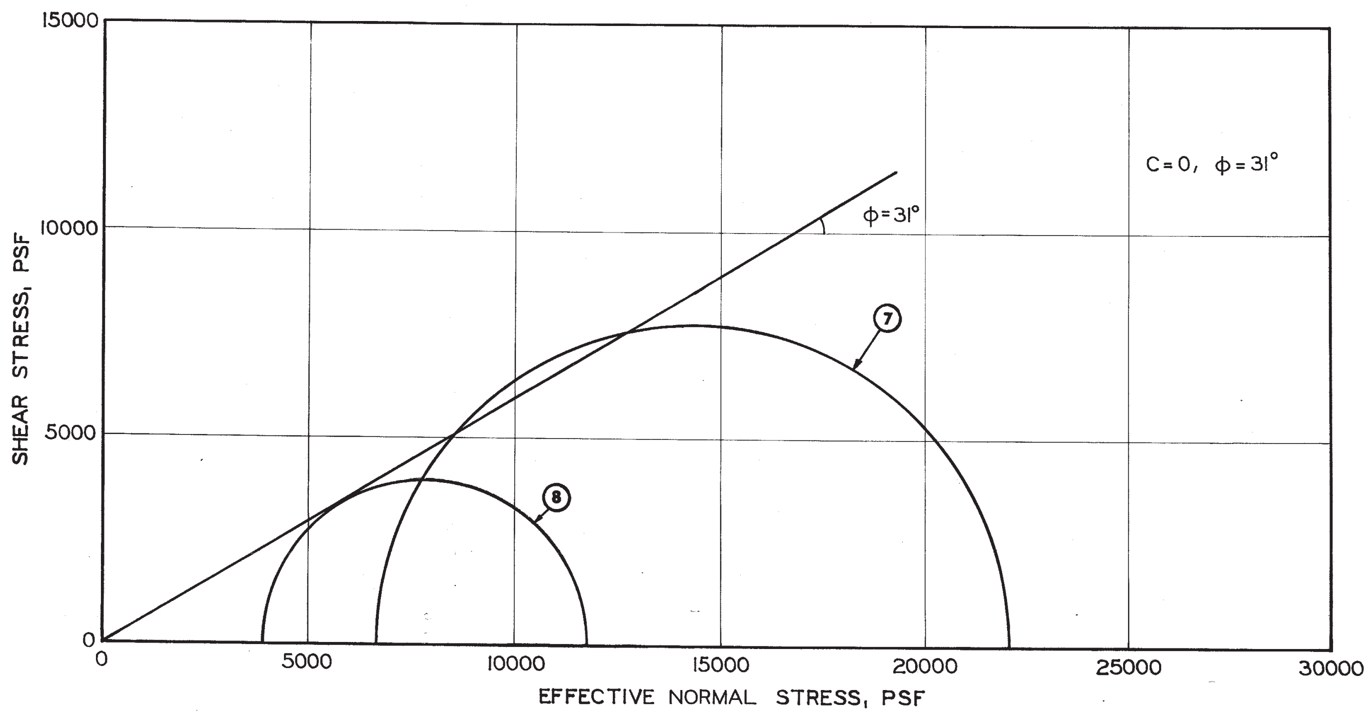

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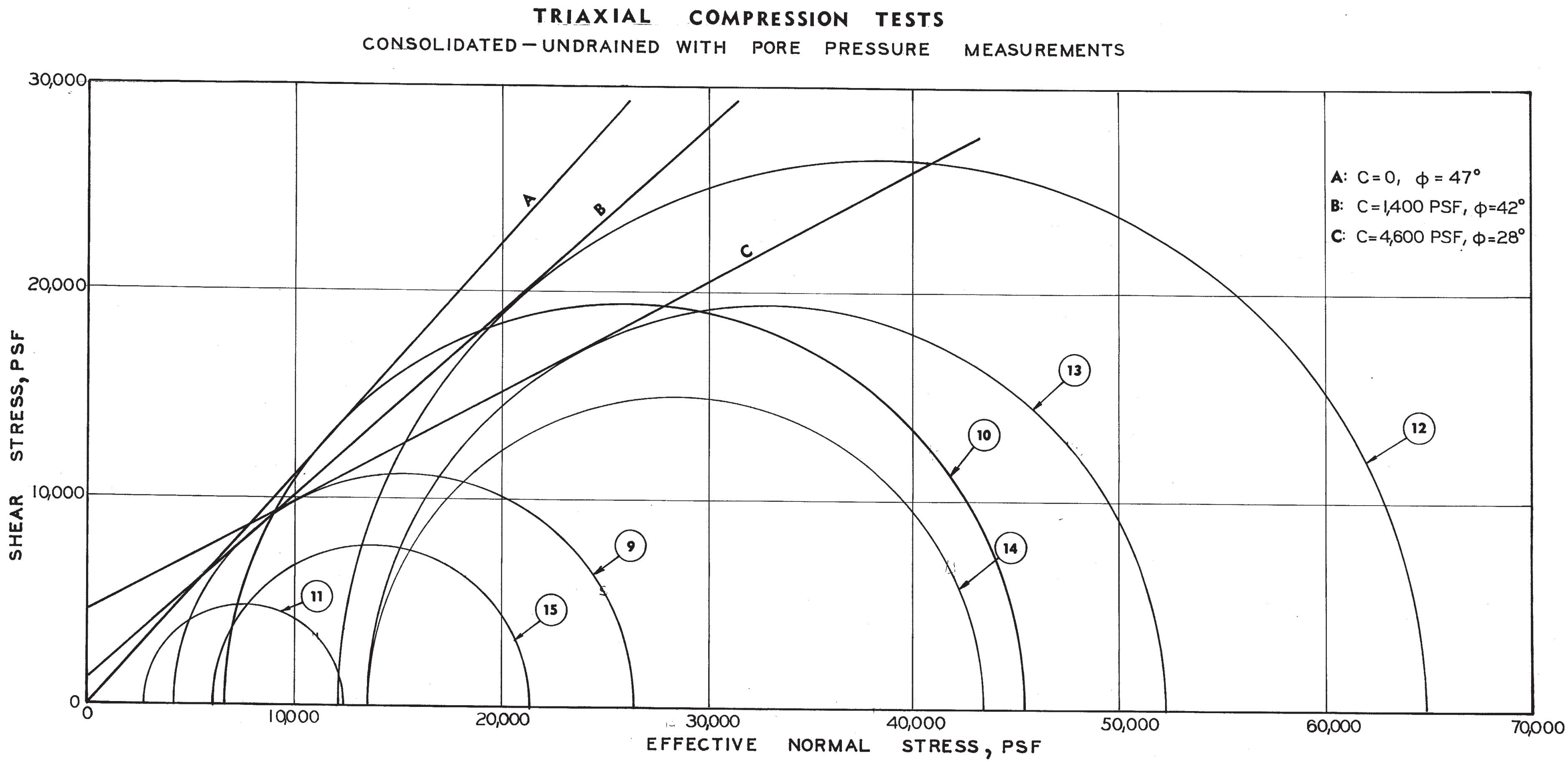
FIGURE 2.5-405

MOHR CIRCLES - INTERGLACIAL TILL



KEY	BORING	ELEVATION	SOIL TYPE	BLOW COUNTS/FT	DRY DENSITY IN PCF
9	H-38	673.4	ML	154/11"	123.5
10	P-38	648.5	ML	100/6"	138
11	H-3	645.1	ML	60	139
12	H-25	633.7	ML	100/4"	146
13	D-8	631.7	ML	94	135.2
14	D-8	591.7	ML	83	132
15	H-6	504.3	ML	31	109

CLINTON POWER STATION
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FIGURE 2.5-406

MOHR CIRCLES - ILLINOIAN GLACIAL TILL

TRIAXIAL COMPRESSION TEST

CONSOLIDATED-UNDRAINED WITH PORE PRESSURE MEASUREMENTS

KEY	BORING	ELEVATION	SOIL TYPE	BLOW COUNTS/FT.	DRY DENSITY IN PCF
16	P-38	572.9	ML	48	125.9

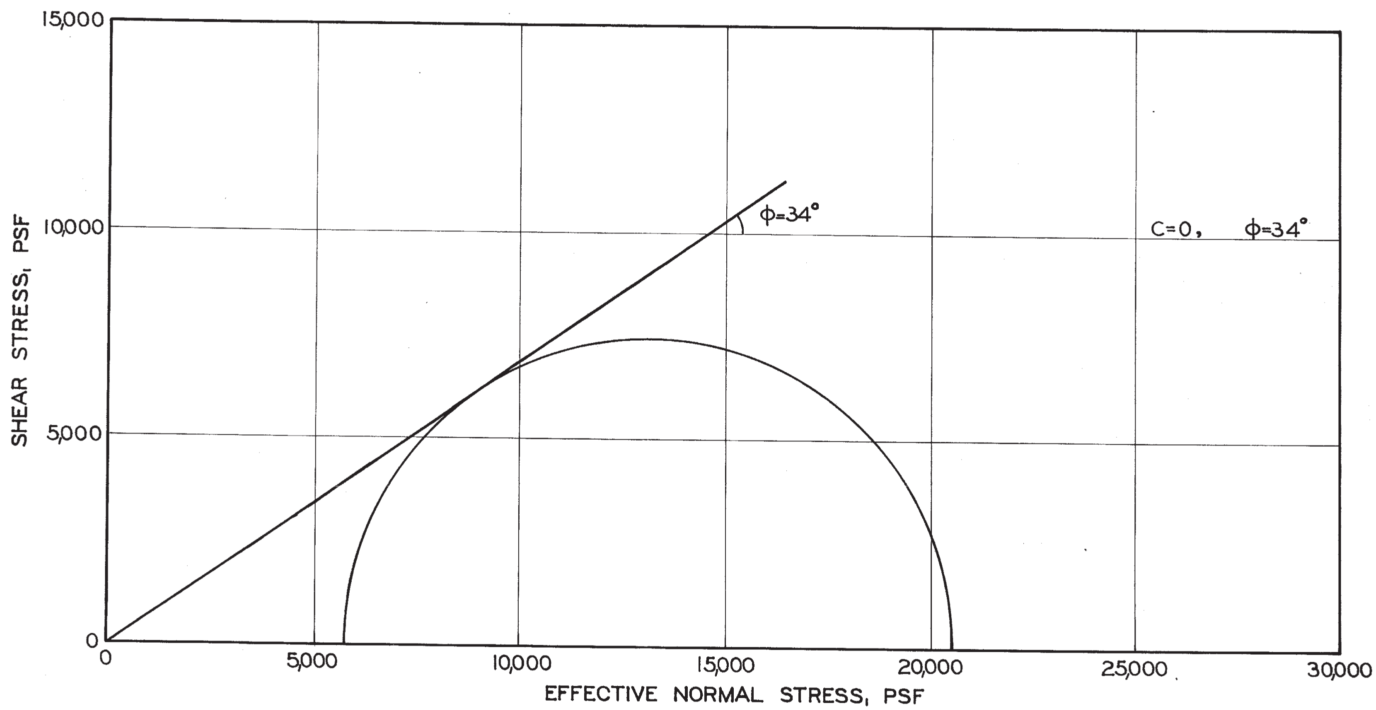

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FIGURE 2.5-407

MOHR CIRCLE - LACUSTRINE DEPOSITS

TRIAXIAL COMPRESSION TESTS

CONSOLIDATED-UNDRAINED WITH PORE PRESSURE MEASUREMENTS

KEY	BORING	ELEVATION	SOIL TYPE	BLOW COUNT/FT.	DRY DENSITY IN PCF
17	H-25	674.7	ML	3	–
18	H-13	673.6	ML	6	102
19	H-24	670.7	SM	2	–

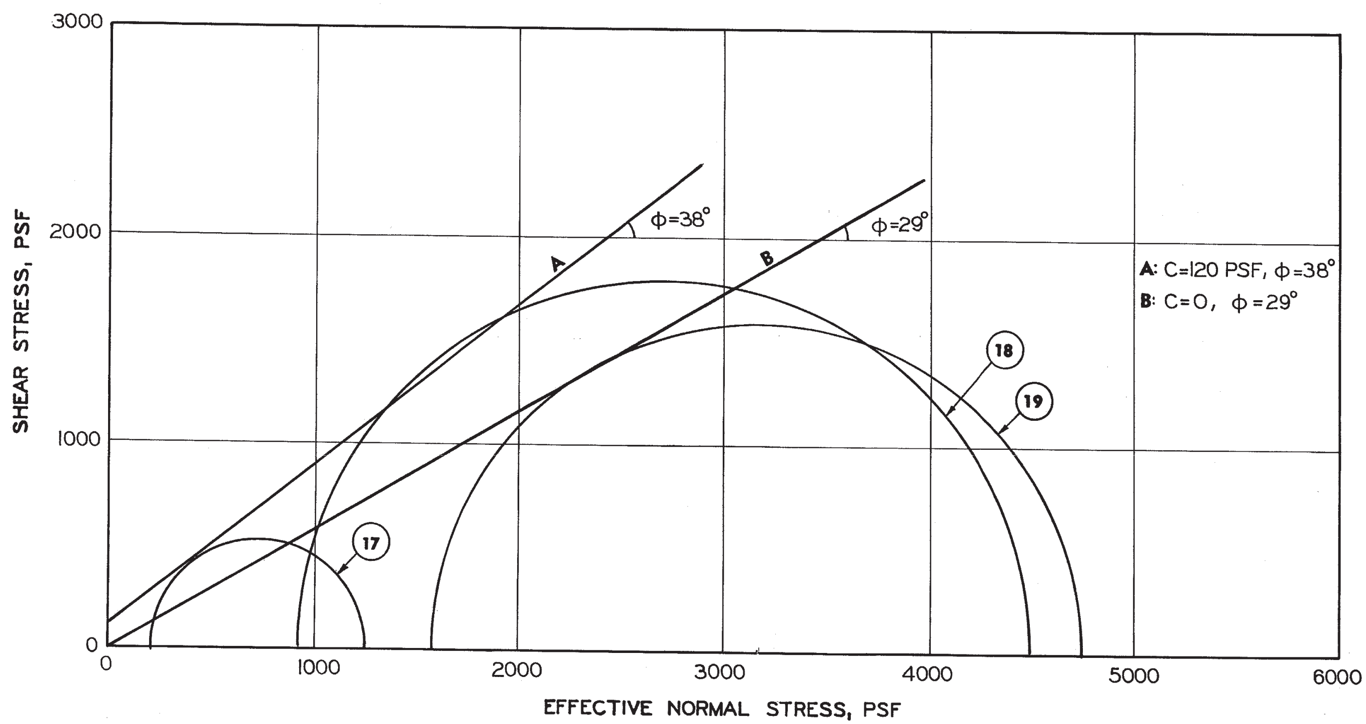

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FIGURE 2.5-408

MOHR CIRCLES - SALT CREEK ALLUVIUM

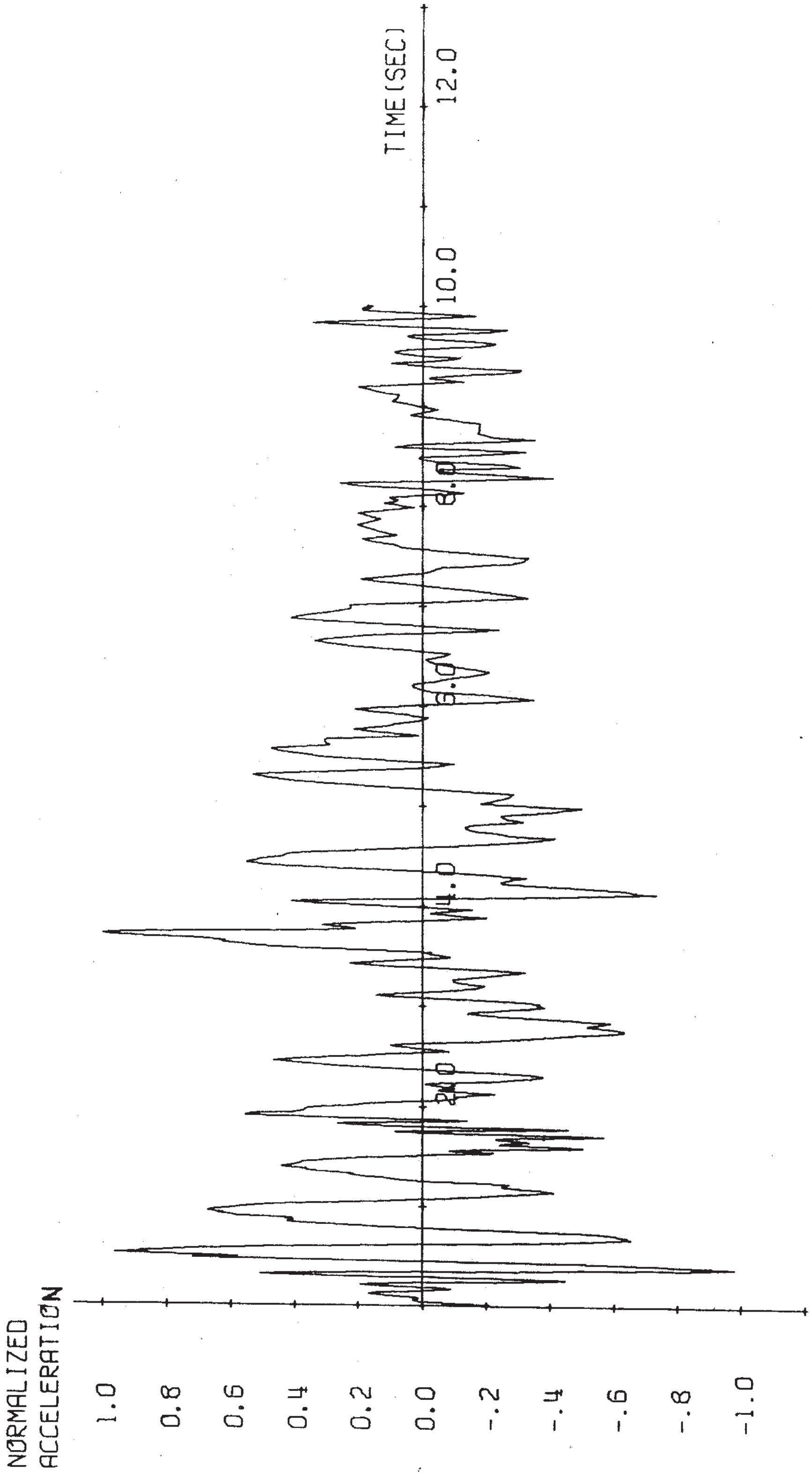

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FIGURE 2.5-409

ARTIFICIAL ACCELEROGRAM FOR
HORIZONTAL GROUND MOTION

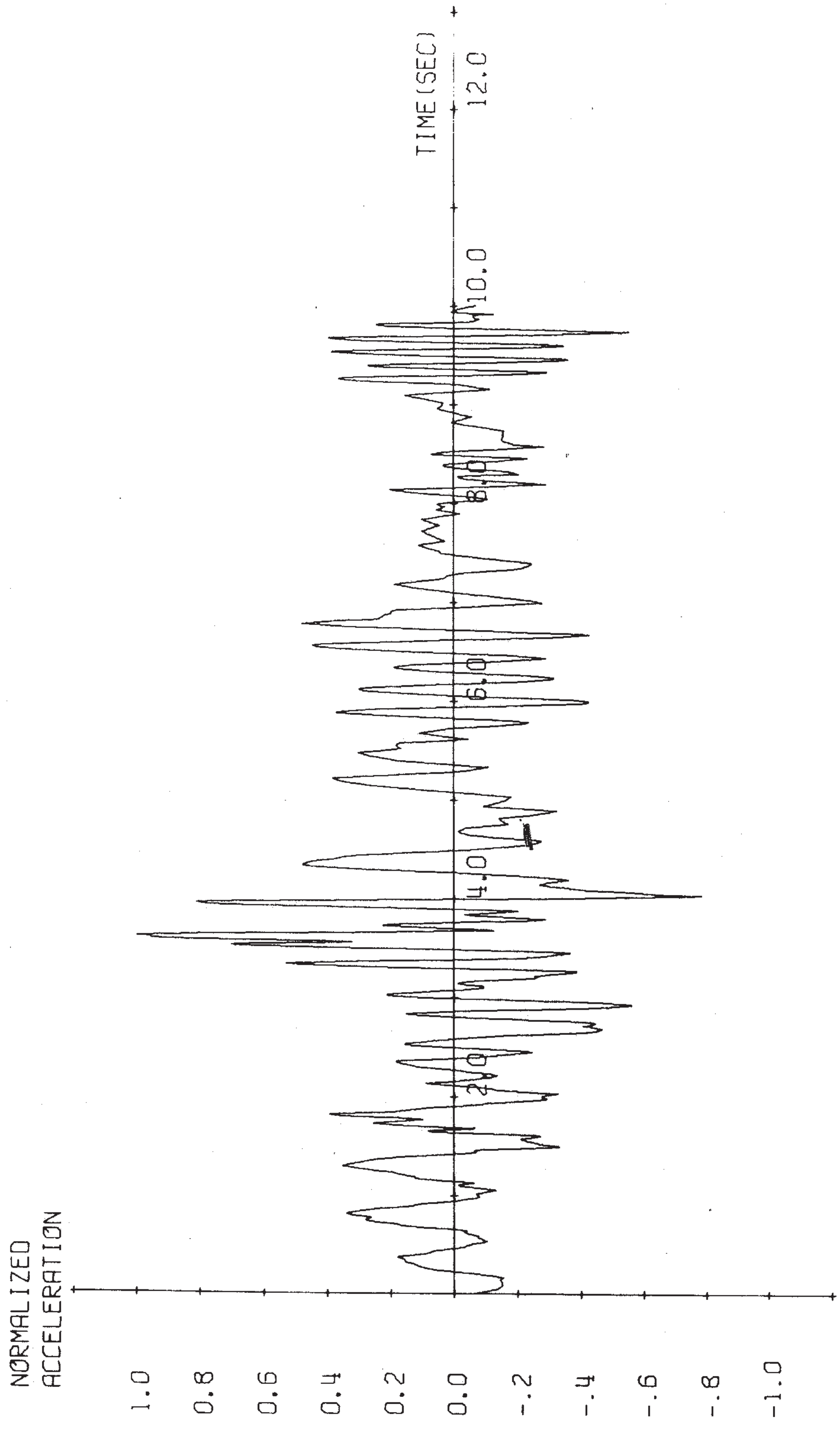

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FIGURE 2.5-410

ARTIFICIAL ACCELEROGRAM FOR
VERTICAL GROUND MOTION

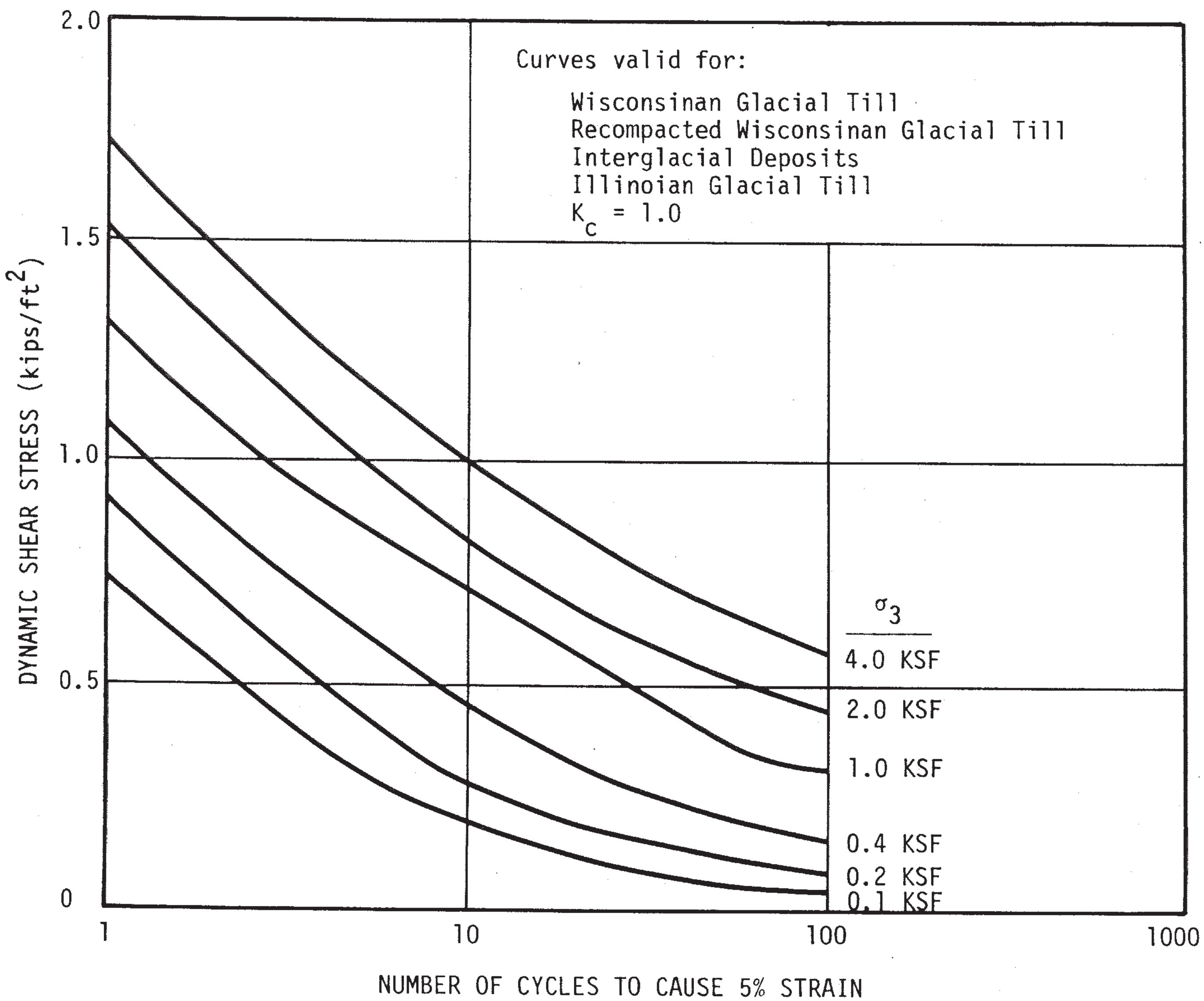

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FIGURE 2.5-411

DYNAMIC SHEAR STRESS VS. NUMBER OF CYCLES TO CAUSE 5% STRAIN - K_c = 1.0

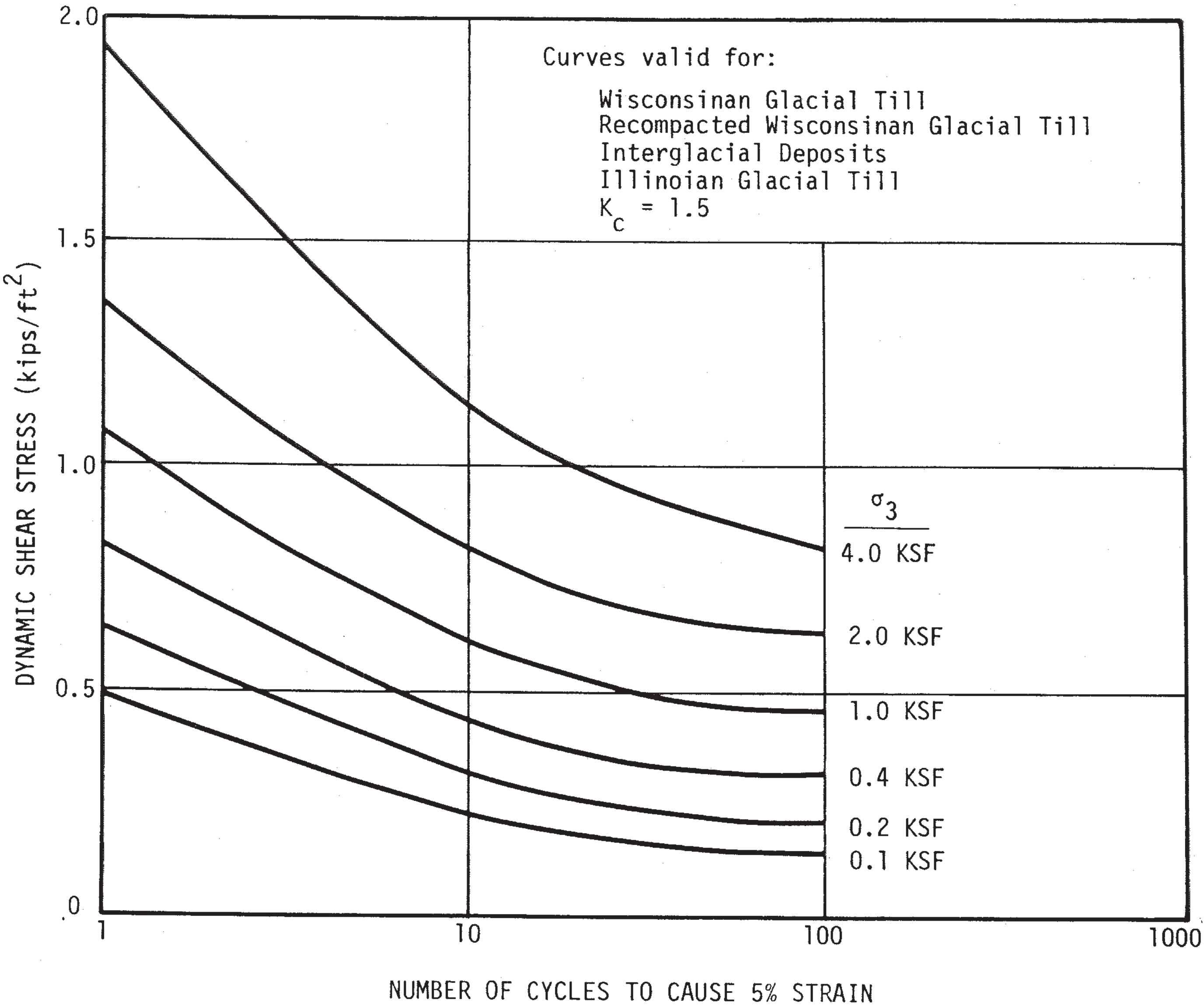

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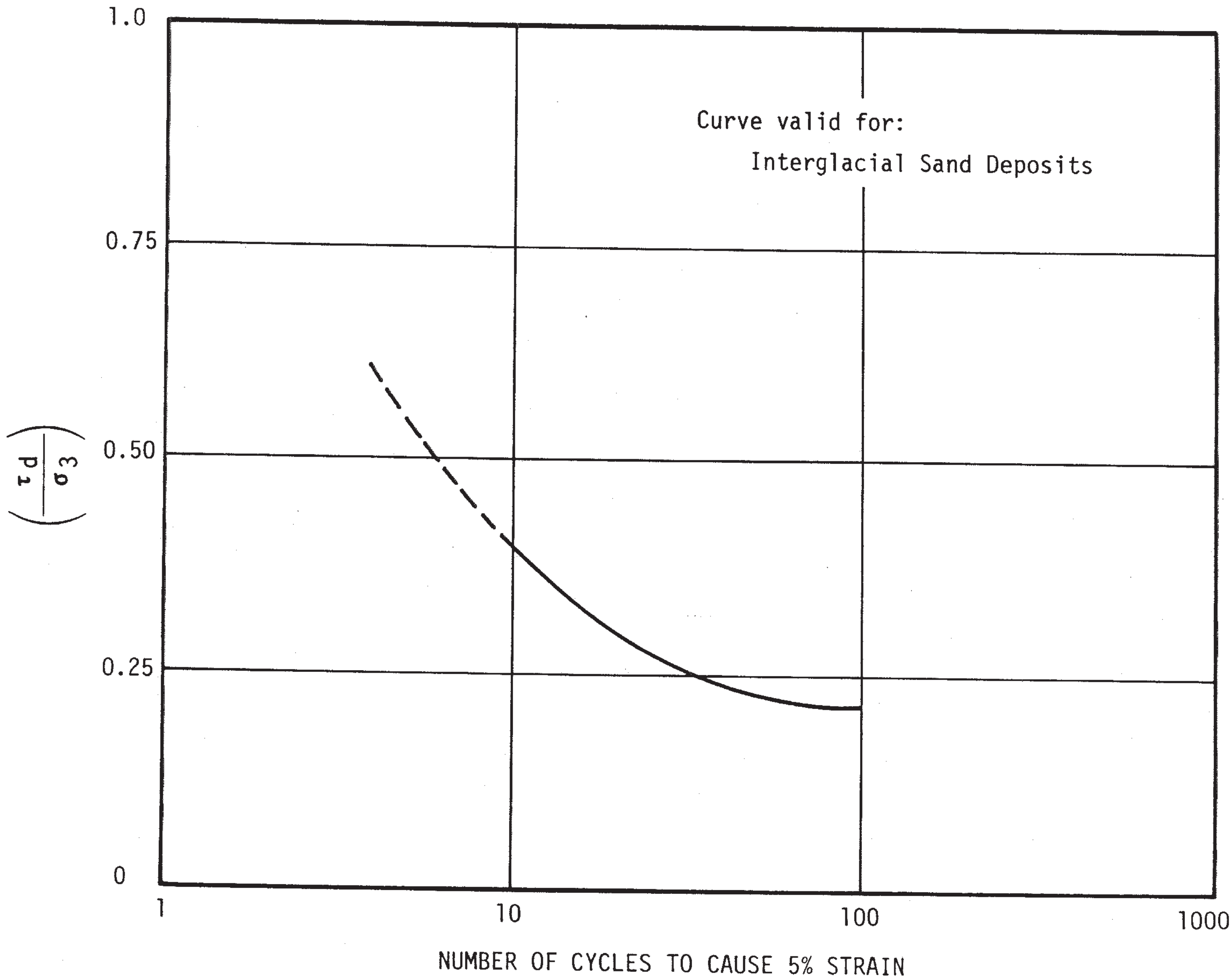
FIGURE 2.5-412

DYNAMIC SHEAR STRESS VS. NUMBER OF CYCLES TO CAUSE 5% STRAIN - K_c = 1.5



CLINTON POWER STATION
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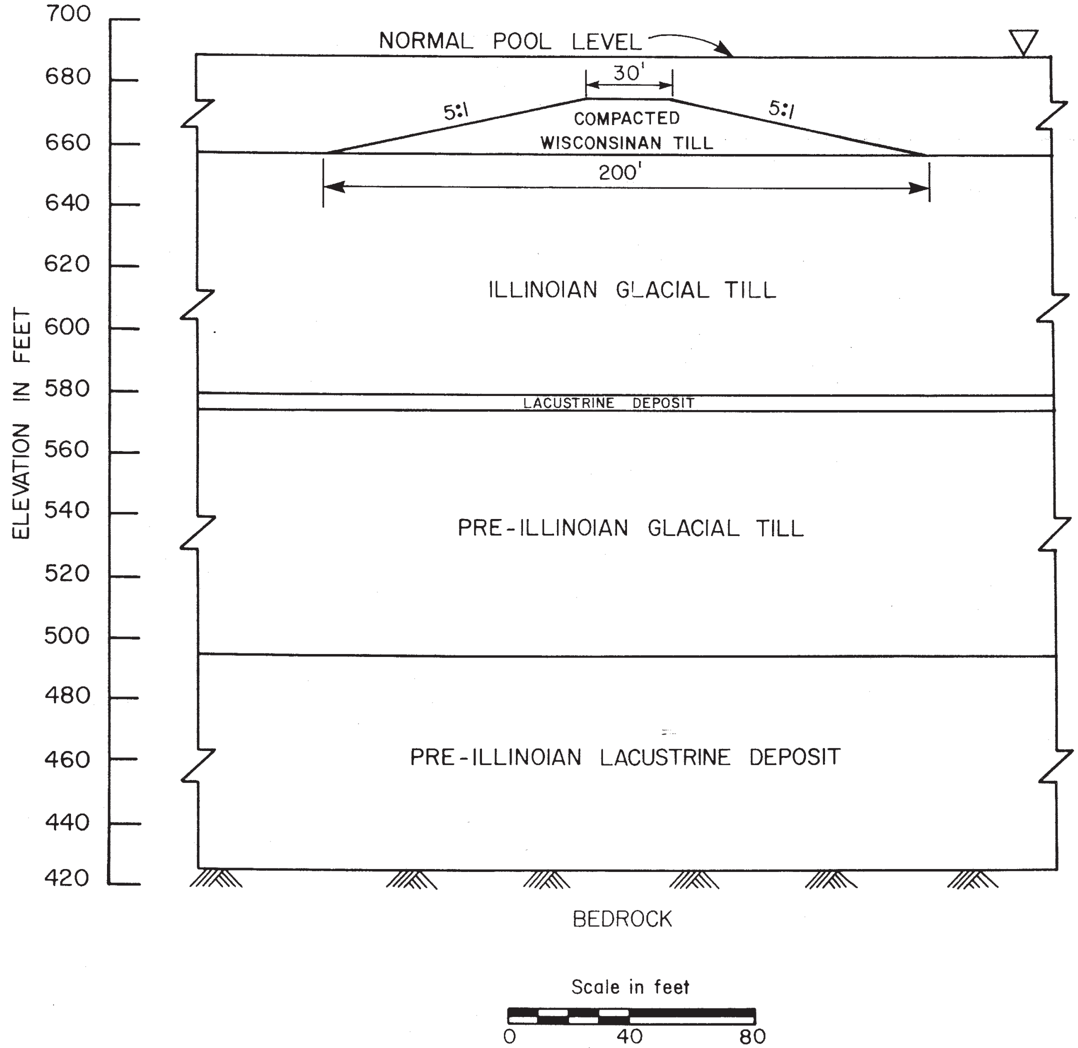
FIGURE 2.5-413

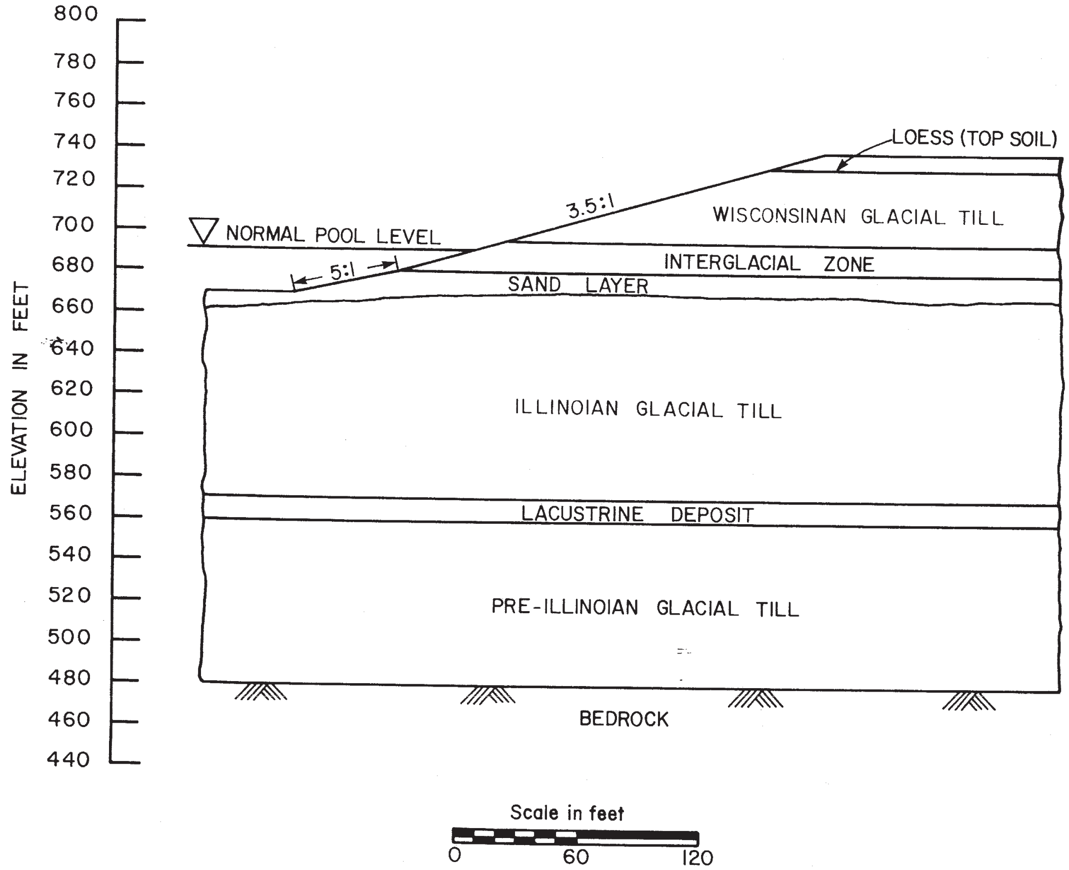
DYNAMIC SHEAR STRESS TO MINOR PRINCIPAL STRESS RATIO VS. NUMBER OF CYCLES TO CAUSE 5% STRAIN



CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-414

SUBMERGED DIKE - CROSS SECTION ANALYZED FOR SEISMIC STABILITY



CLINTON POWER STATION
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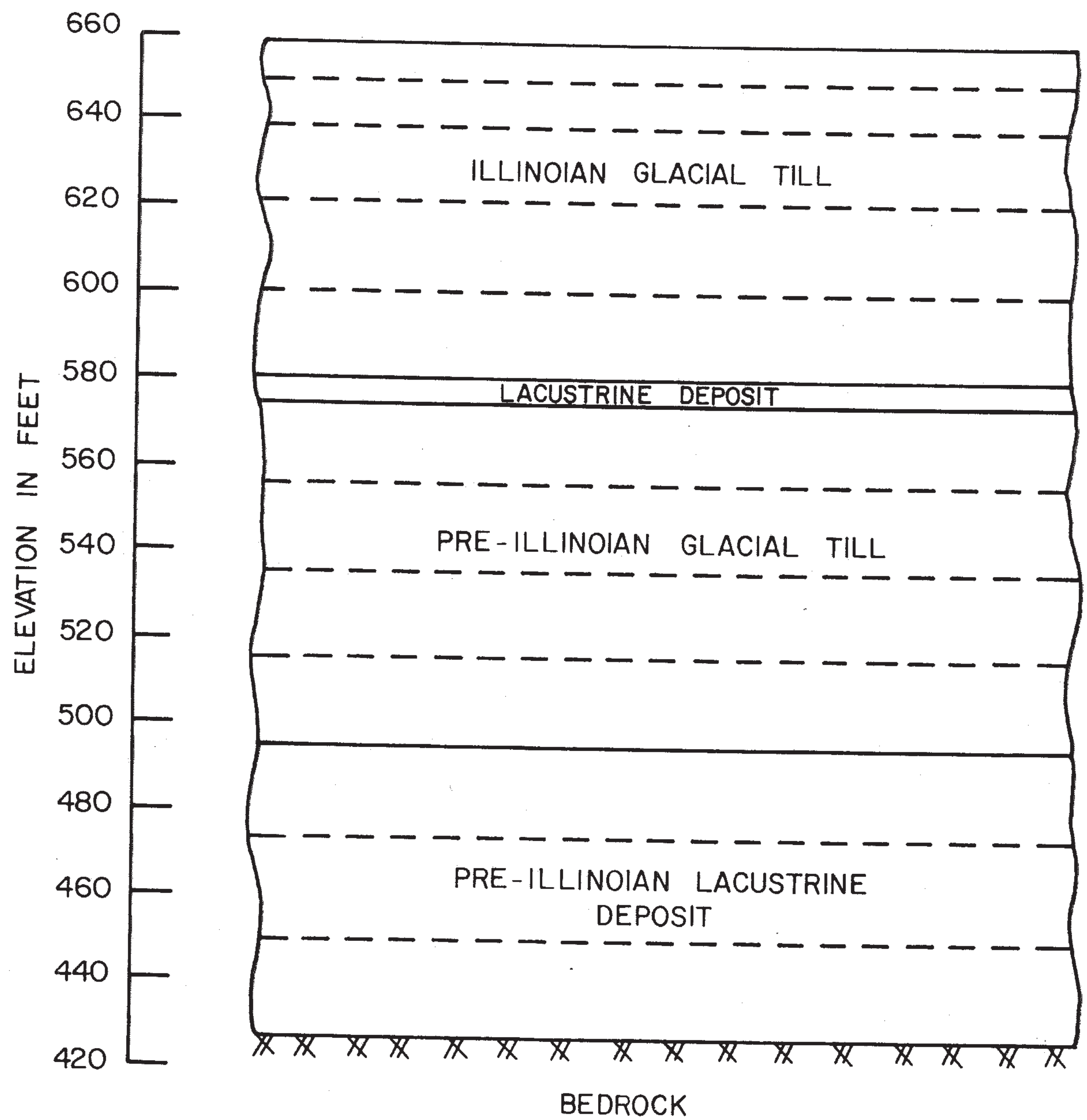
FIGURE 2.5-415

NATURAL SLOPE - CROSS SECTION ANALYZED FOR SEISMIC STABILITY



CLINTON POWER STATION
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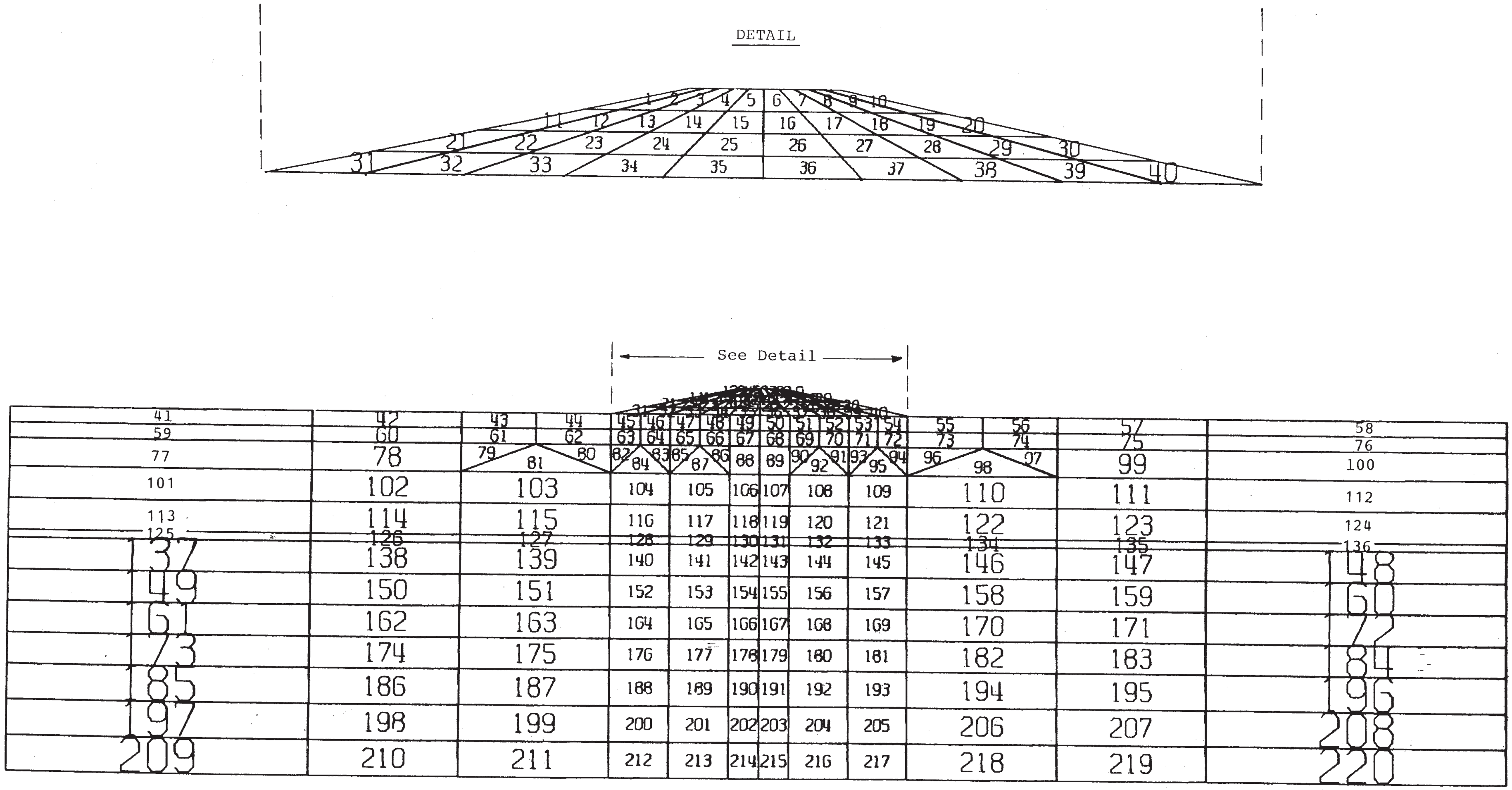
FIGURE 2.5-416

SHEAR LAYER MODEL FOR THE SUBMERGED DIKE FOUNDATION

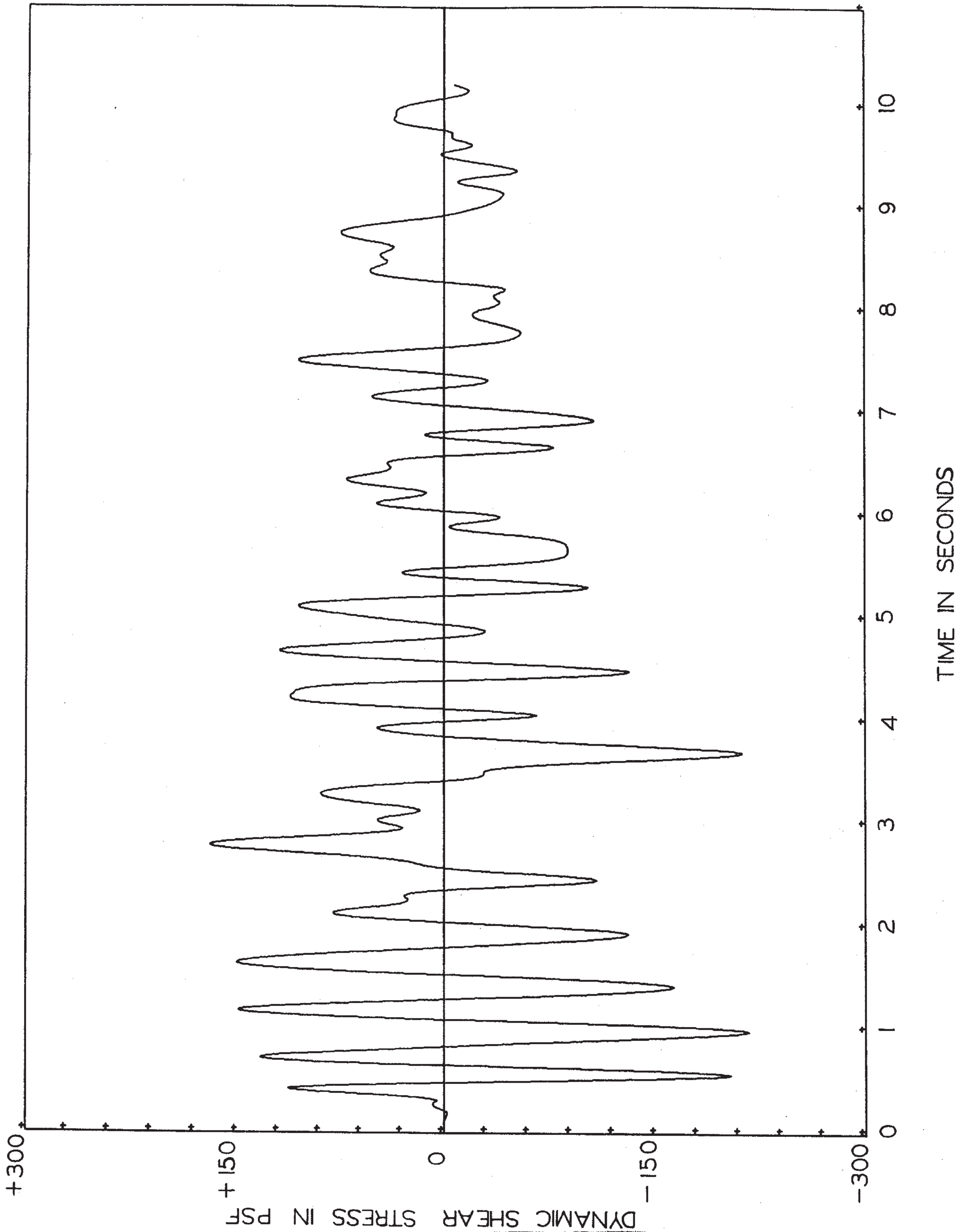


SCALE= 1./ 66.667

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-417

FINITE ELEMENT MODEL FOR THE DIKE



CLINTON POWER STATION
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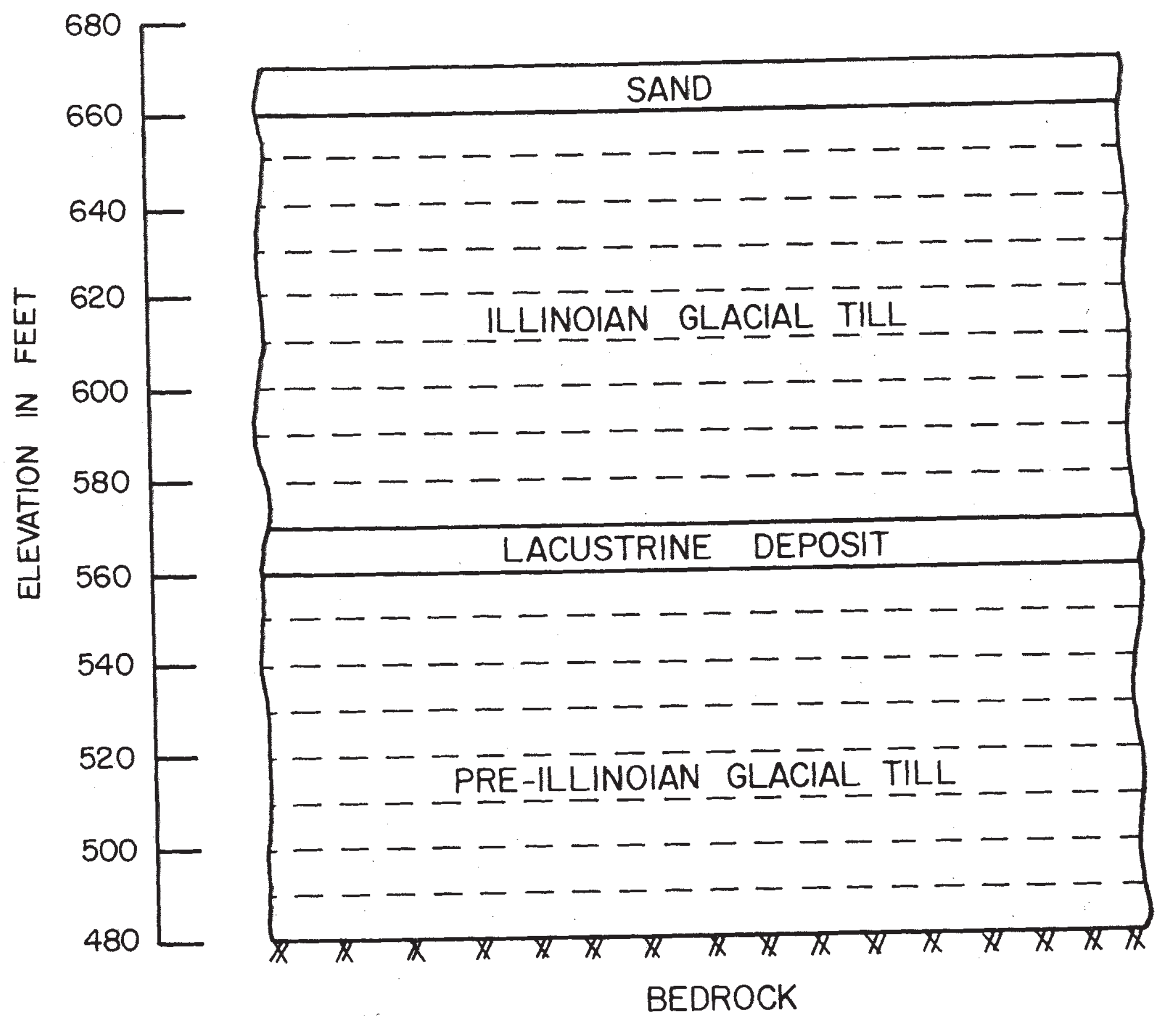
FIGURE 2.5-418

TYPICAL SHEAR STRESS TIME HISTORY



CLINTON POWER STATION
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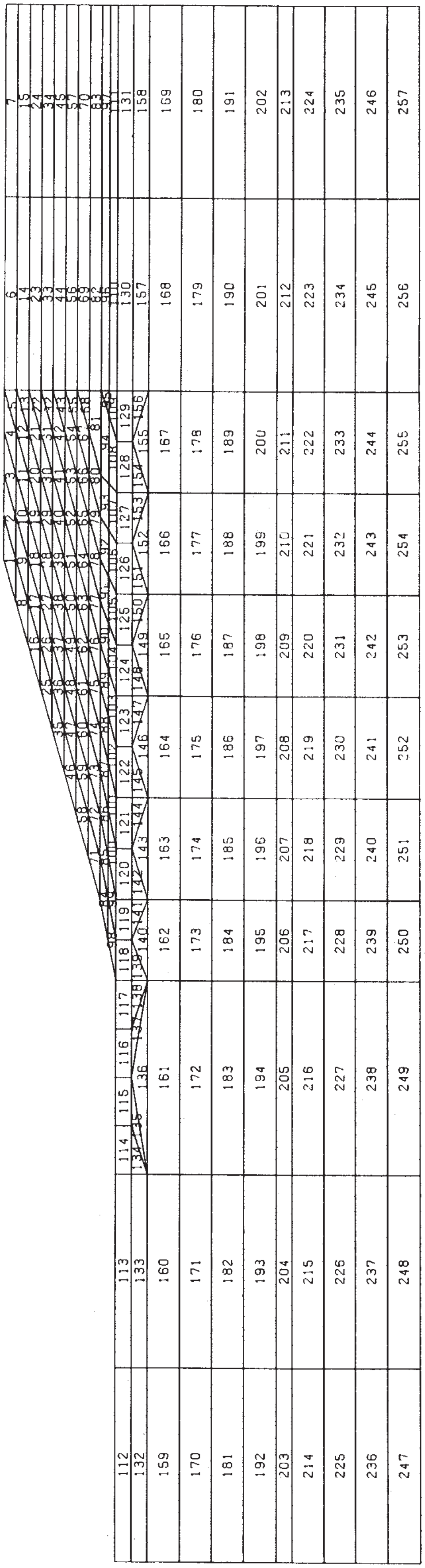
FIGURE 2.5-419

SHEAR LAYER MODEL FOR NATURAL SLOPE FOUNDATION



CLINTON POWER STATION

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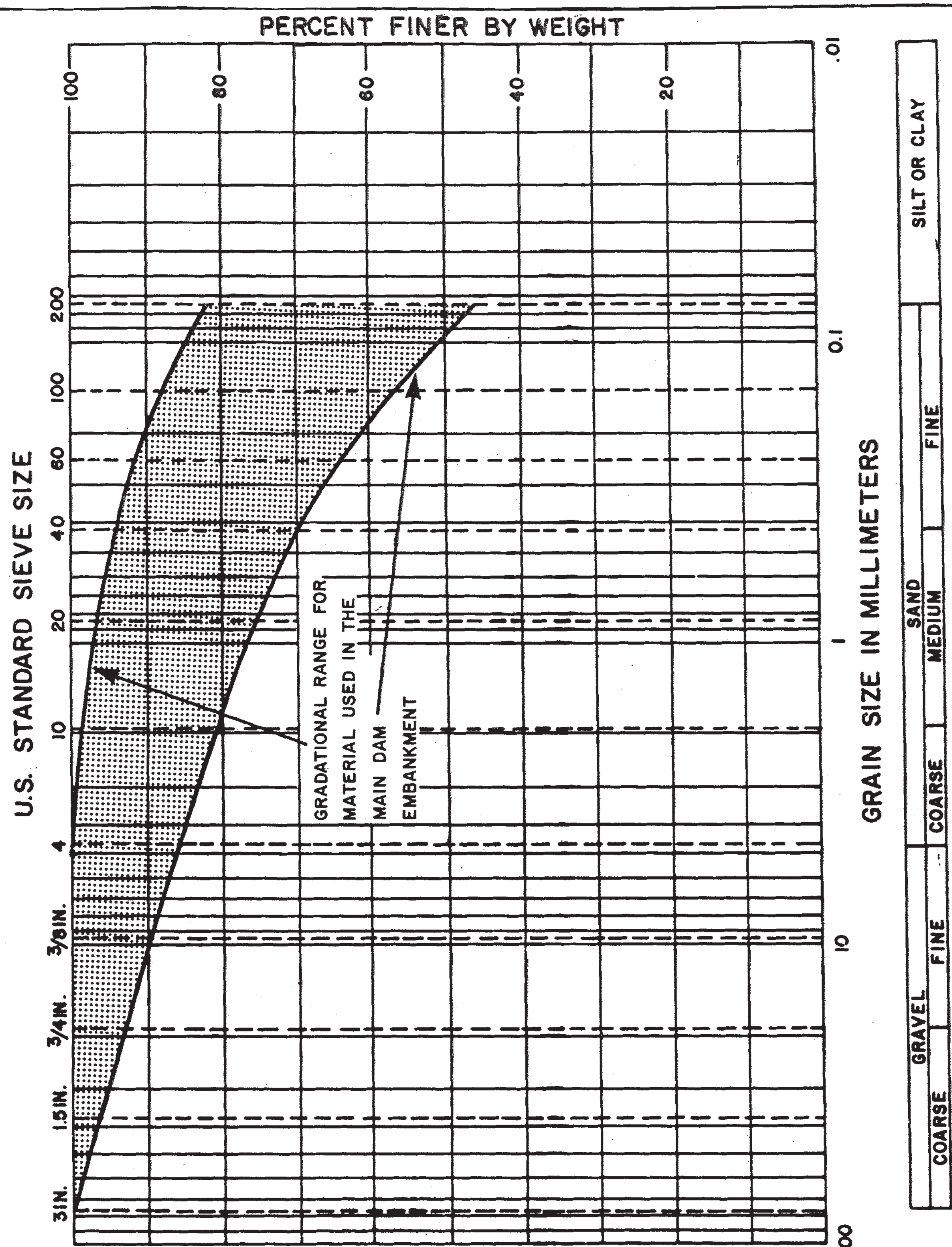
FIGURE 2.5-420

FINITE ELEMENT MODEL USED FOR NATURAL SLOPE STABILITY ANALYSIS



NOTE:

The gradational range for the embankment materials is based on a composite of grain size analyses performed.

CLINTON POWER STATION

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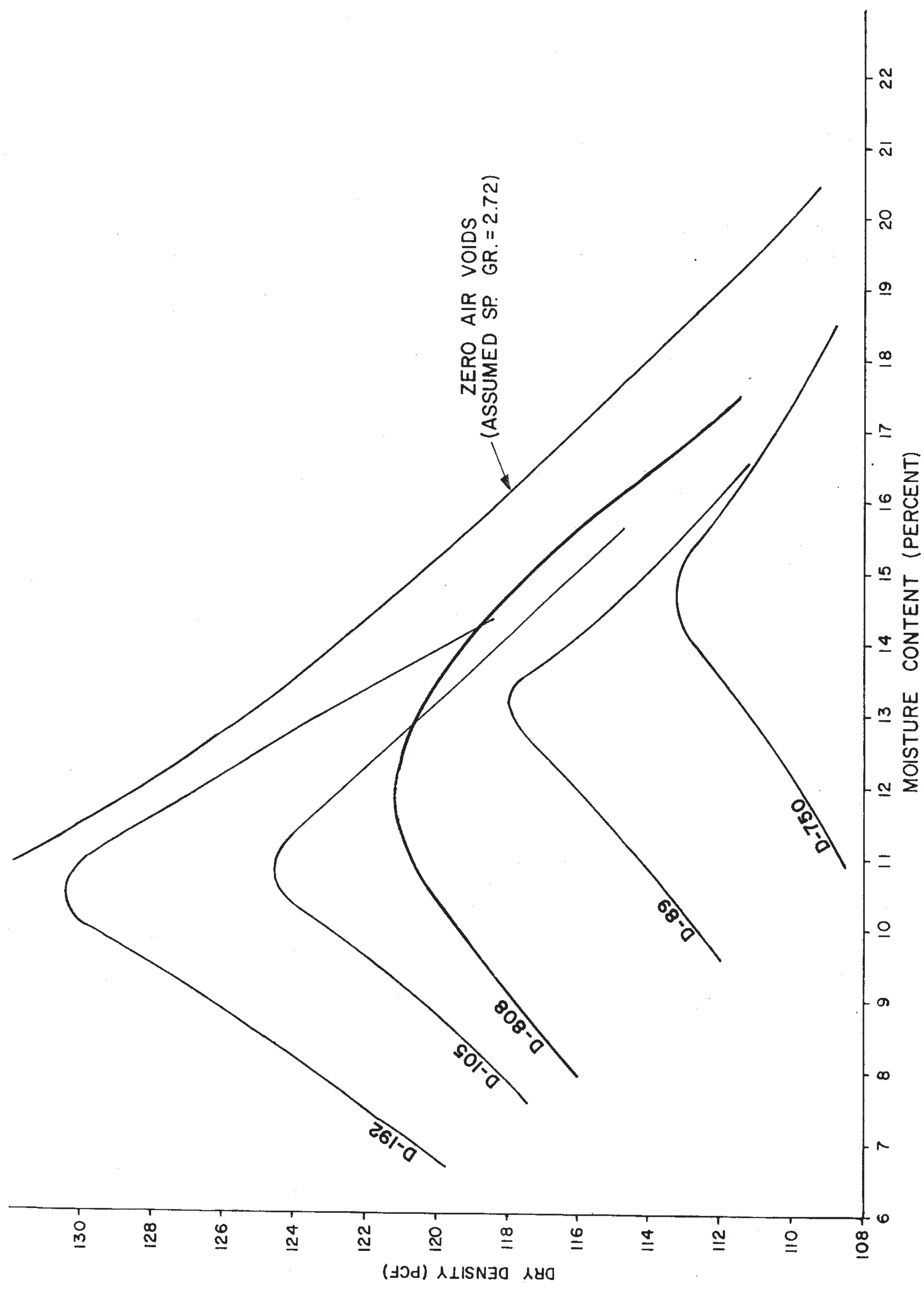
FIGURE 2.5-421

GRADATION OF EMBANKMENT MATERIALS - MAIN DAM



NOTES

1. Moisture density relationships based on standard Proctor test ASTM D698.
2. Data based on field laboratory testing of type A material used as fill for Main Dam.
3. D-192, D-105, D-808, D-89 and D-750 denote field sample numbers.

CLINTON POWER STATION
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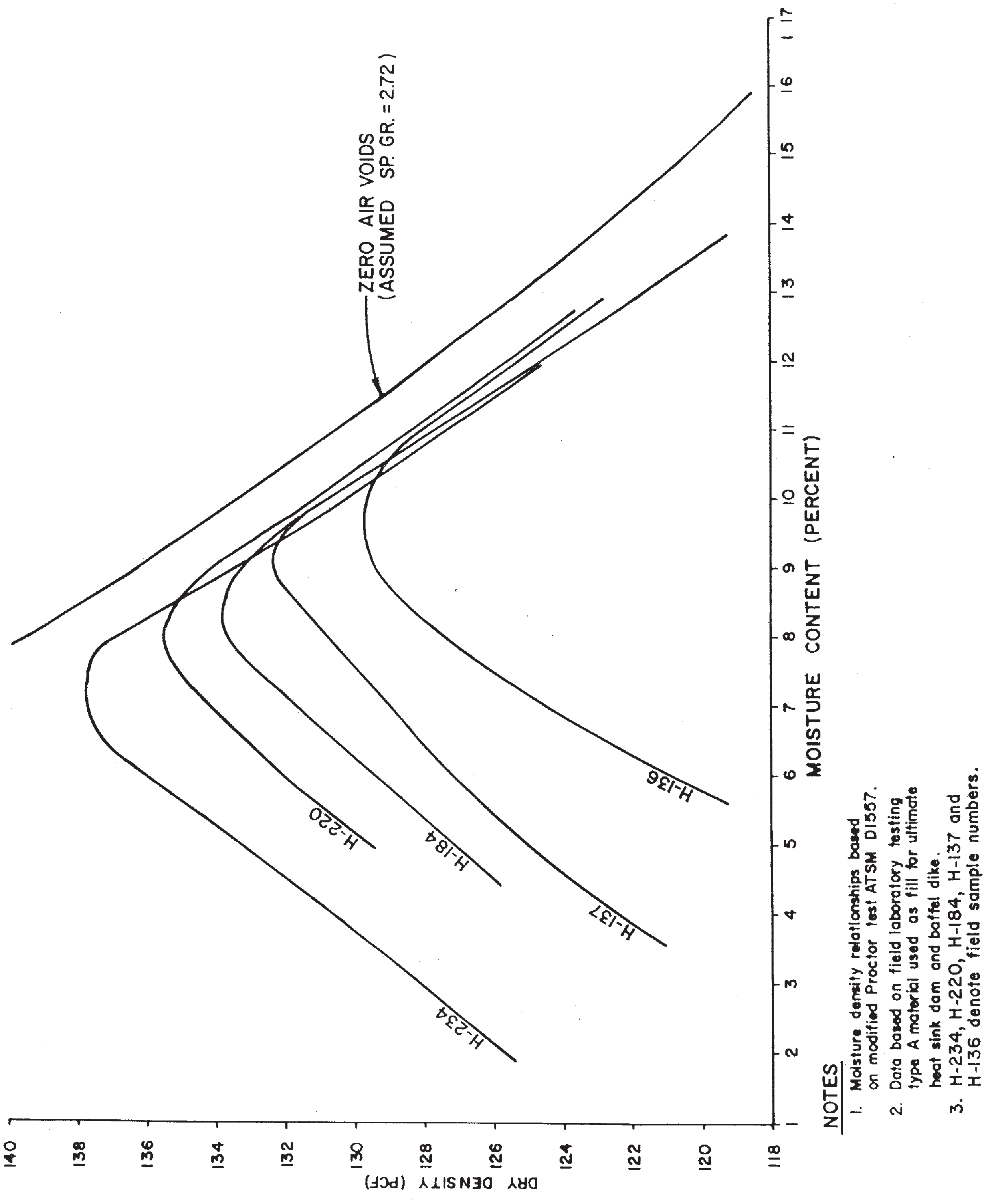
FIGURE 2.5-422

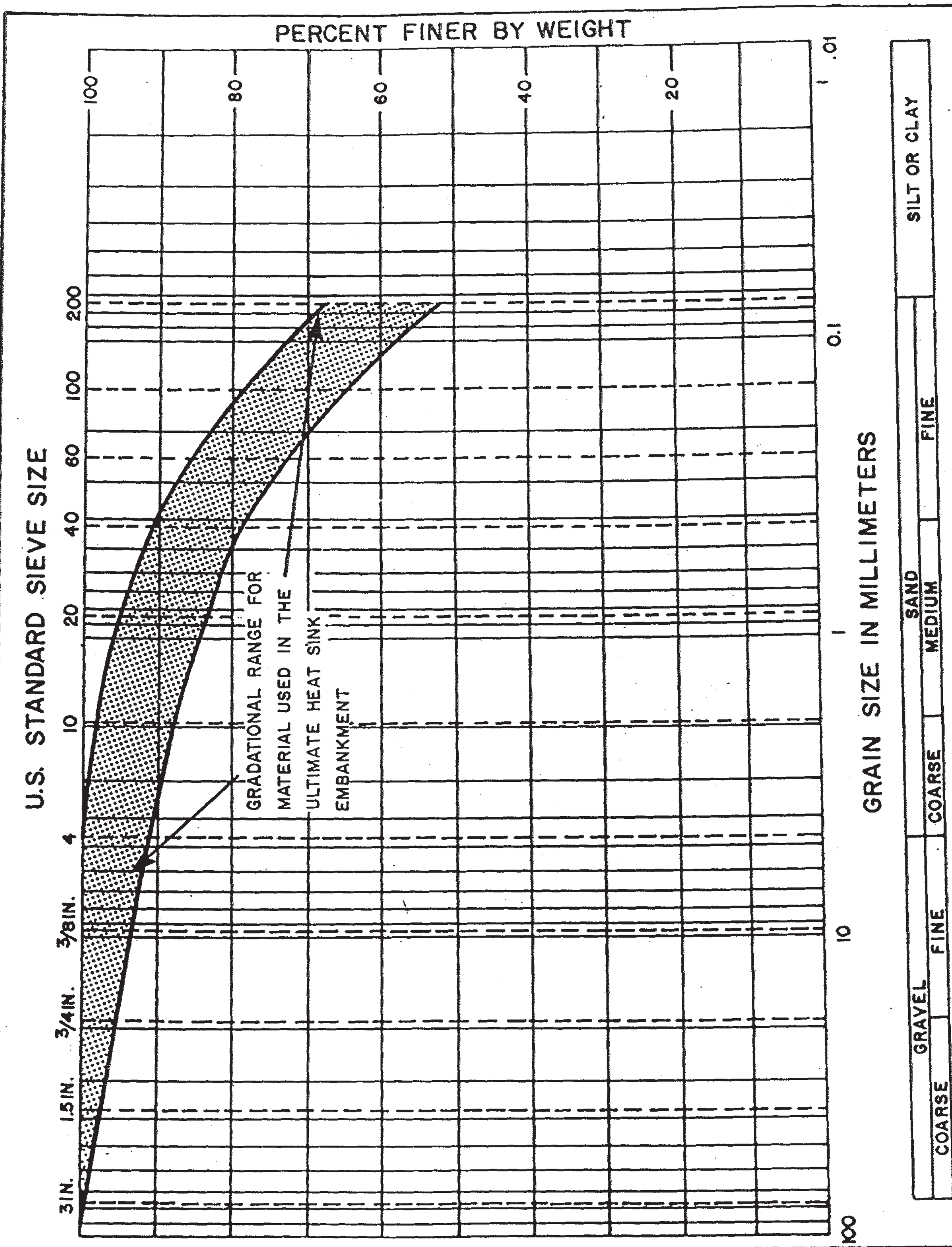
TYPICAL MOISTURE - DENSITY RELATIONSHIP - MAIN DAM



CLINTON POWER STATION
FINAL SAFETY ANALYSIS REPORT

FIGURE 2.5-423

TYPICAL MOISTURE-DENSITY RELATIONSHIPS - ULTIMATE HEAT SINK



CLINTON POWER STATION
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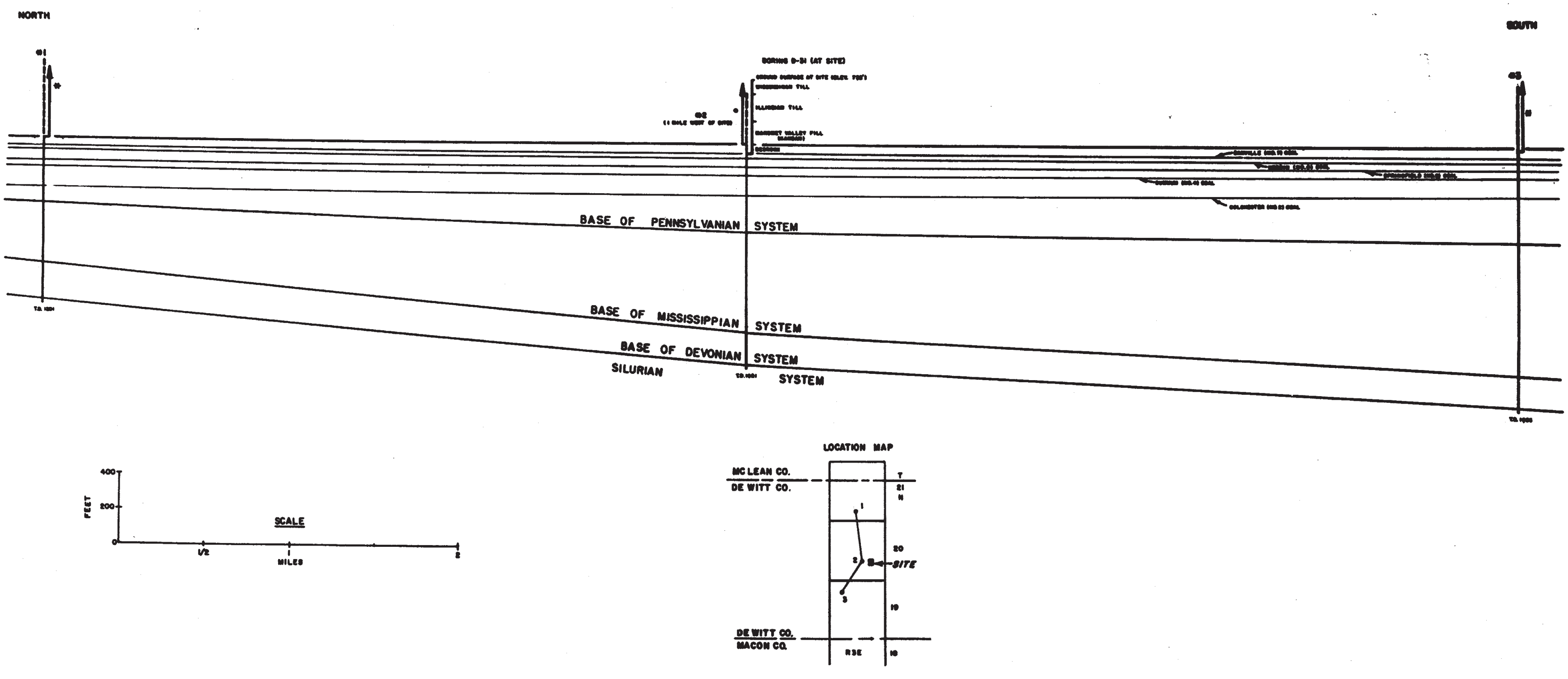
FIGURE 2.5-424

GRADATION OF EMBANKMENT MATERIALS - ULTIMATE HEAT SINK

NOTE:

The gradational range for the embankment materials is based on a composite of grain size analyses performed.



NOTE:

1. * NOT PROVIDED IN AVAILABLE LOG

2. COMPILED FROM DATA TABULATED IN: ILLINOIS GEOLOGICAL SURVEY CIRCULAR 377.

CLINTON POWER STATION
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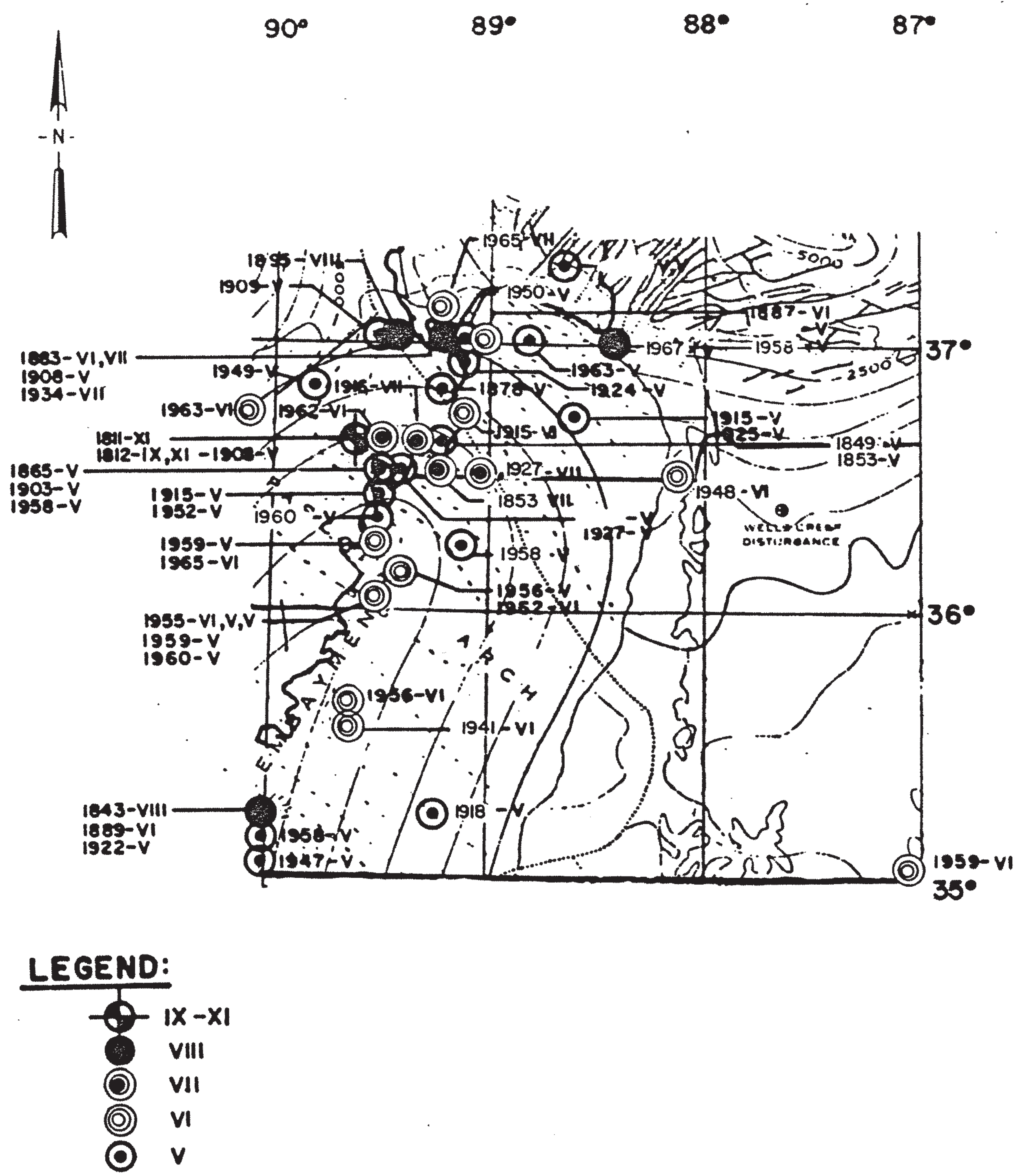
FIGURE 2.5-425

REGIONAL CORRELATION BETWEEN DEEP BORINGS



NOTE:

FROM TECTONIC MAP OF THE UNITED STATES, UNITED STATES GEOLOGICAL SURVEY AND AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, 1962.

EARTHQUAKE DATA COMPILED FROM. COFFMAN, J.L. AND VONHAKE, C.A. (1973) EARTHQUAKE HISTORY OF THE UNITED STATES, U.S. DEPT. COMMERCE, NOAA, PUBLICATION 41-1 AND FROM OTHER SOURCES

CLINTON POWER STATION
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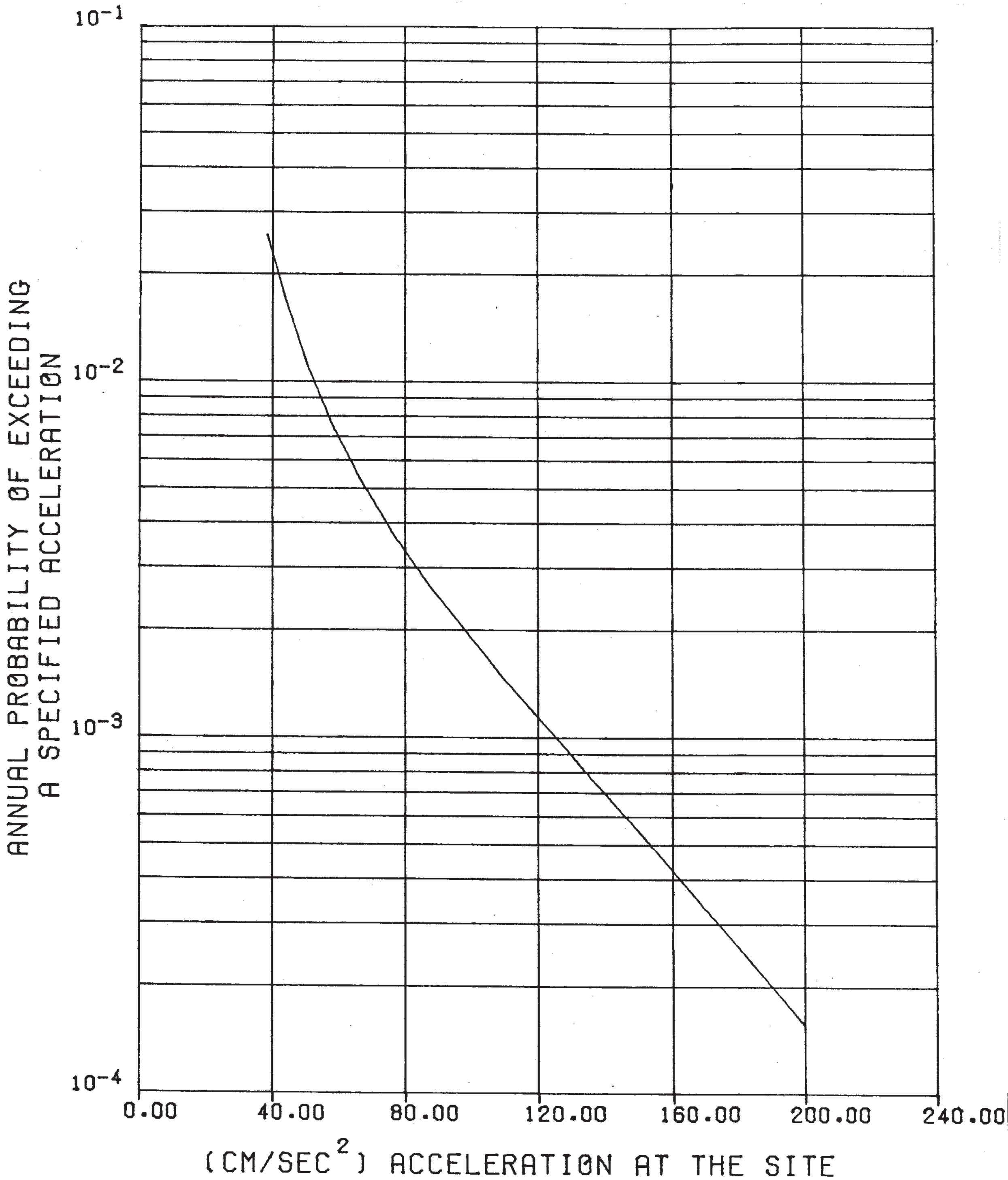
FIGURE 2.5-426

EARTHQUAKE EPICENTER MAP - BELOW 37°



CLINTON SEISMIC RISK ANALYSIS

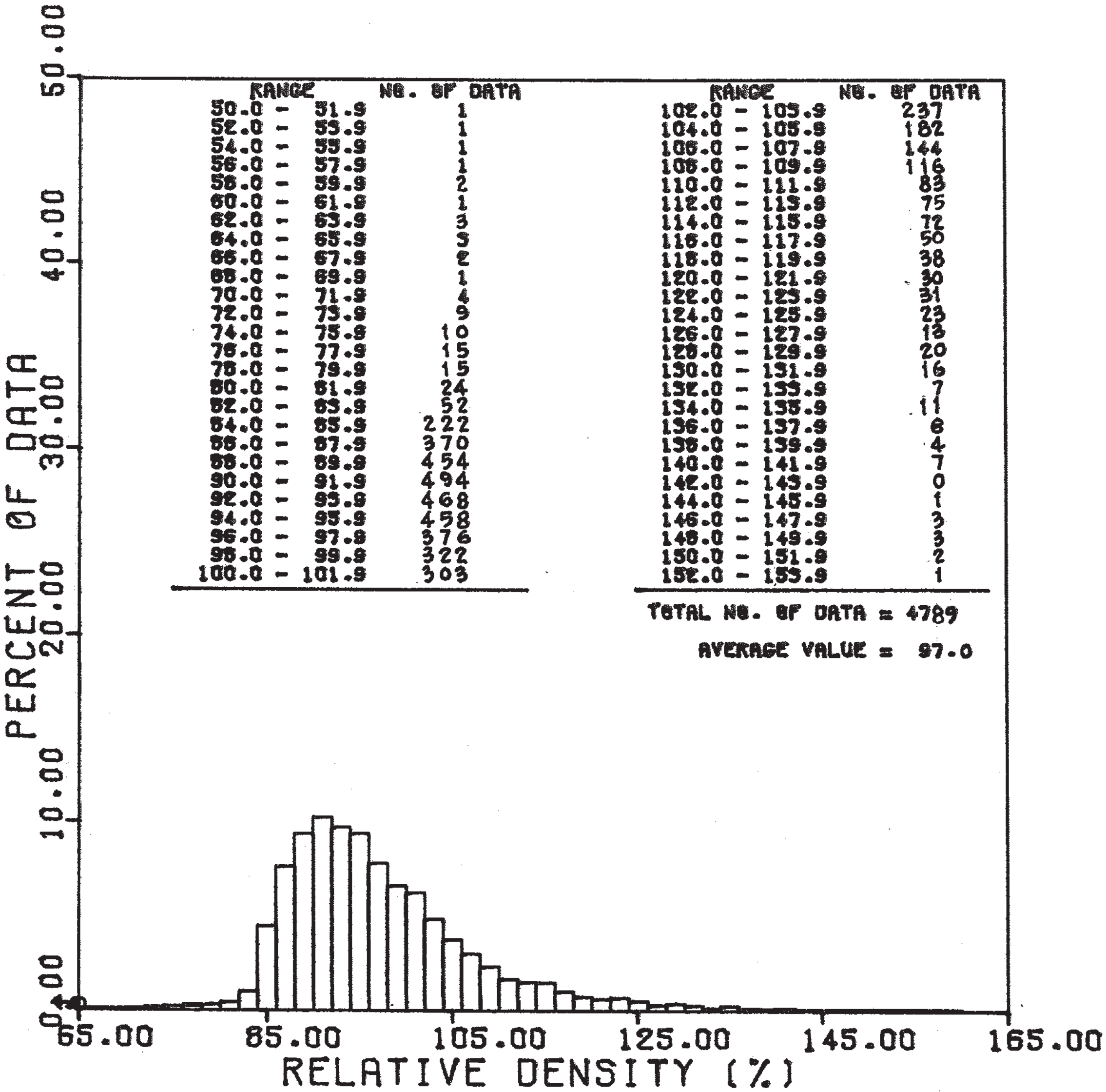
CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-427

SEISMIC RISK CURVE

G-6249

DISTRIBUTION OF RELATIVE DENSITY



RANGE	NO. OF DATA	RANGE	NO. OF DATA
50.0 - 51.9	1	102.0 - 103.9	237
52.0 - 53.9	1	104.0 - 105.9	182
54.0 - 55.9	1	106.0 - 107.9	144
56.0 - 57.9	1	108.0 - 109.9	116
58.0 - 59.9	2	110.0 - 111.9	83
60.0 - 61.9	1	112.0 - 113.9	75
62.0 - 63.9	3	114.0 - 115.9	72
64.0 - 65.9	3	116.0 - 117.9	50
66.0 - 67.9	2	118.0 - 119.9	38
68.0 - 69.9	1	120.0 - 121.9	30
70.0 - 71.9	4	122.0 - 123.9	31
72.0 - 73.9	9	124.0 - 125.9	23
74.0 - 75.9	10	126.0 - 127.9	18
76.0 - 77.9	15	128.0 - 129.9	20
78.0 - 79.9	15	130.0 - 131.9	16
80.0 - 81.9	24	132.0 - 133.9	7
82.0 - 83.9	52	134.0 - 135.9	11
84.0 - 85.9	222	136.0 - 137.9	6
86.0 - 87.9	370	138.0 - 139.9	4
88.0 - 89.9	454	140.0 - 141.9	7
90.0 - 91.9	494	142.0 - 143.9	0
92.0 - 93.9	468	144.0 - 145.9	1
94.0 - 95.9	458	146.0 - 147.9	3
96.0 - 97.9	376	148.0 - 149.9	3
98.0 - 99.9	322	150.0 - 151.9	2
100.0 - 101.9	303	152.0 - 153.9	1

TOTAL NO. OF DATA = 4789

AVERAGE VALUE = 97.0

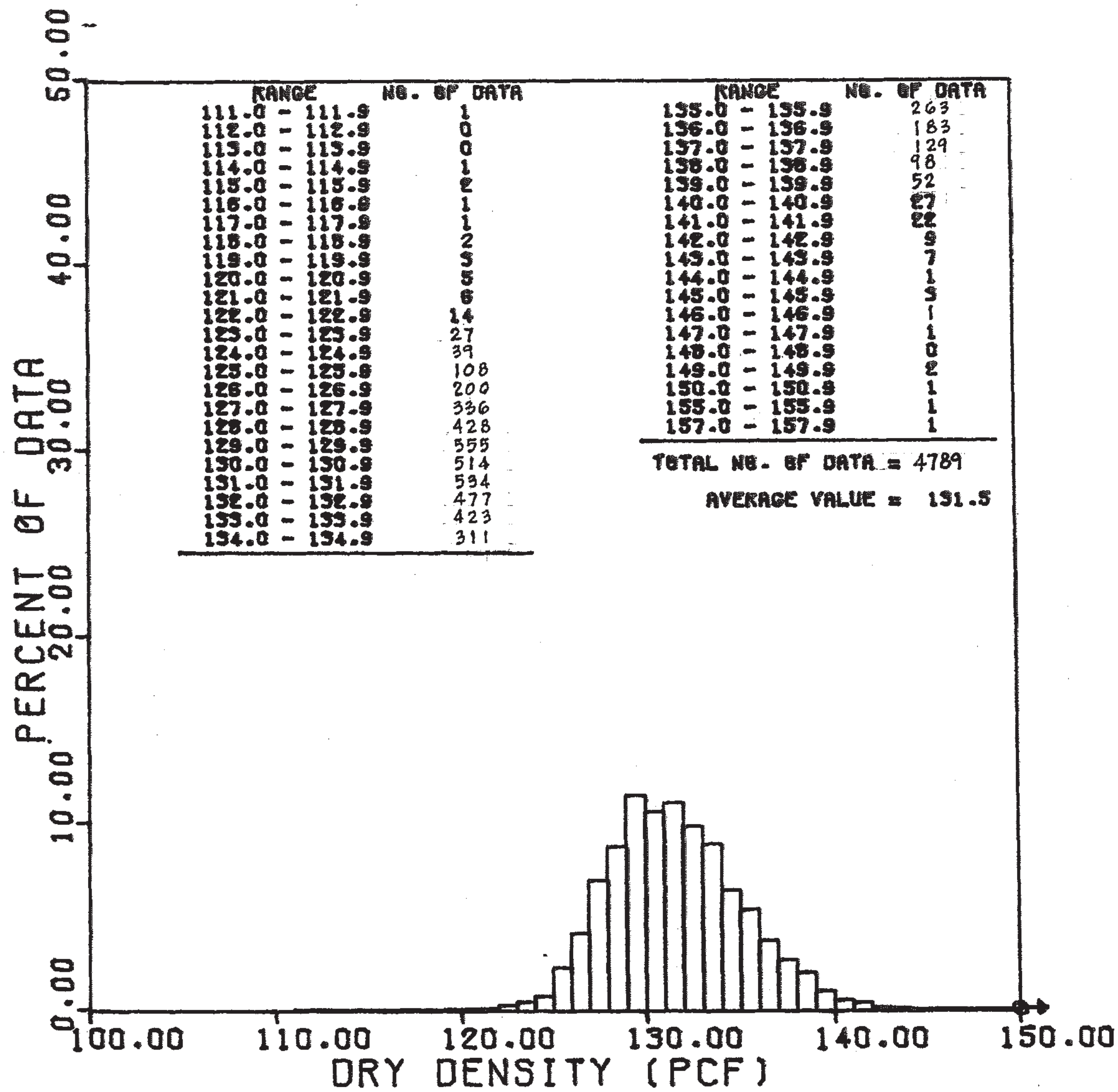
CLINTON STA. COMPACTION TESTS
ALL PASSING DATA
ELEVATIONS 671.00 TO 703.00

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-428

TYPE B GRANULAR FILL DISTRIBUTION
OF RELATIVE DENSITY

DISTRIBUTION OF DRY DENSITY



RANGE	NO. OF DATA
111.0 - 111.9	1
112.0 - 112.9	0
113.0 - 113.9	0
114.0 - 114.9	1
115.0 - 115.9	2
116.0 - 116.9	1
117.0 - 117.9	1
118.0 - 118.9	2
119.0 - 119.9	3
120.0 - 120.9	5
121.0 - 121.9	6
122.0 - 122.9	14
123.0 - 123.9	27
124.0 - 124.9	39
125.0 - 125.9	108
126.0 - 126.9	200
127.0 - 127.9	336
128.0 - 128.9	428
129.0 - 129.9	555
130.0 - 130.9	514
131.0 - 131.9	534
132.0 - 132.9	477
133.0 - 133.9	423
134.0 - 134.9	311

RANGE	NO. OF DATA
135.0 - 135.9	263
136.0 - 136.9	183
137.0 - 137.9	129
138.0 - 138.9	98
139.0 - 139.9	52
140.0 - 140.9	27
141.0 - 141.9	22
142.0 - 142.9	9
143.0 - 143.9	7
144.0 - 144.9	1
145.0 - 145.9	3
146.0 - 146.9	1
147.0 - 147.9	1
148.0 - 148.9	0
149.0 - 149.9	2
150.0 - 150.9	1
155.0 - 155.9	1
157.0 - 157.9	1

TOTAL NO. OF DATA = 4789

AVERAGE VALUE = 131.5

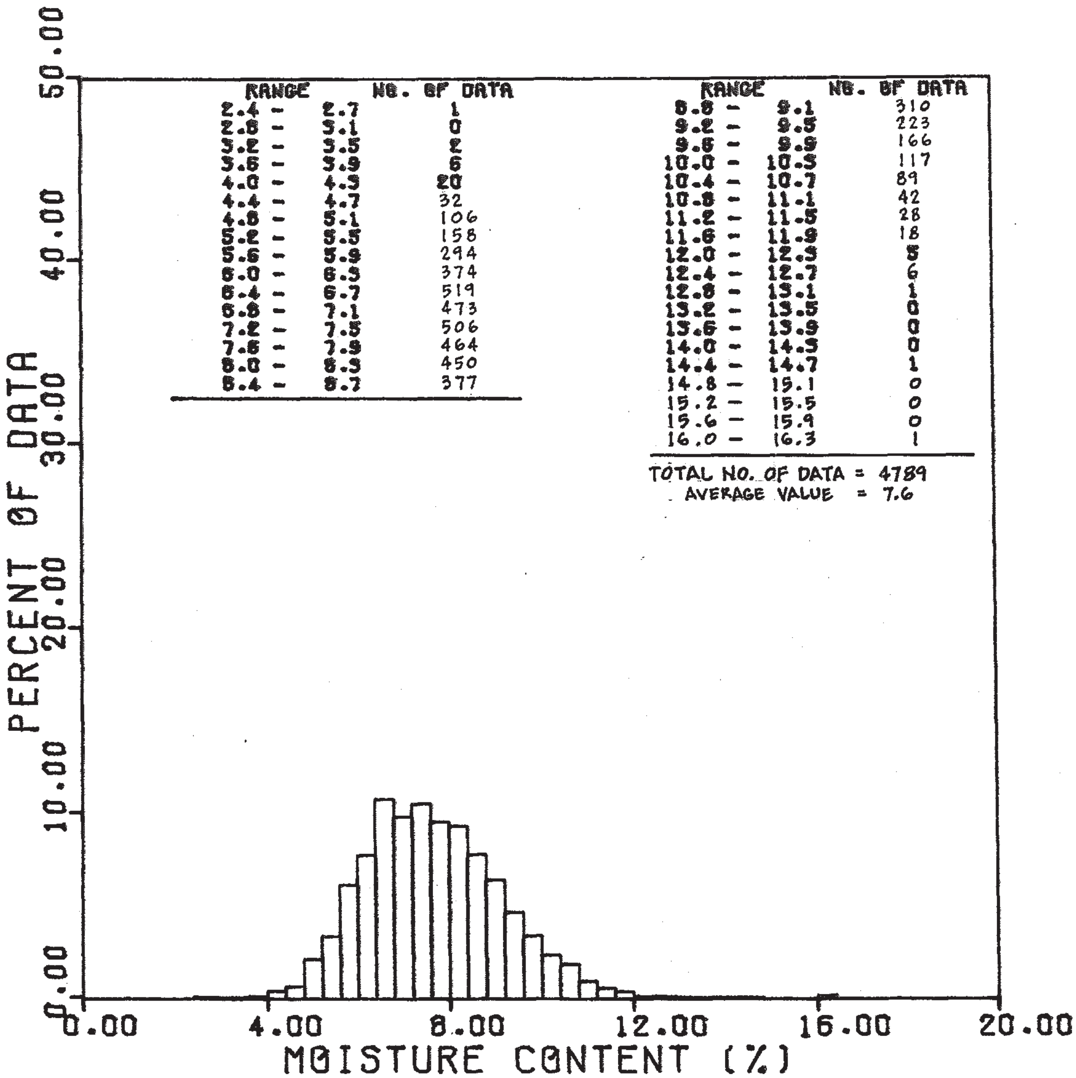
CLINTON STA. COMPACTION TESTS
ALL PASSING DATA
ELEVATIONS 671.00 TO 703.00

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-429

TYPE B GRANULAR FILL DISTRIBUTION
OF DRY DENSITY

DISTRIBUTION OF MOISTURE CONTENT



RANGE	NO. OF DATA
2.4 - 2.7	1
2.8 - 3.1	0
3.2 - 3.5	2
3.6 - 3.9	6
4.0 - 4.3	20
4.4 - 4.7	32
4.8 - 5.1	106
5.2 - 5.5	158
5.6 - 5.9	294
6.0 - 6.3	374
6.4 - 6.7	519
6.8 - 7.1	473
7.2 - 7.5	506
7.6 - 7.9	464
8.0 - 8.3	450
8.4 - 8.7	377

RANGE	NO. OF DATA
8.8 - 9.1	310
9.2 - 9.5	223
9.6 - 9.9	166
10.0 - 10.3	117
10.4 - 10.7	89
10.8 - 11.1	42
11.2 - 11.5	28
11.6 - 11.9	18
12.0 - 12.3	5
12.4 - 12.7	6
12.8 - 13.1	1
13.2 - 13.5	0
13.6 - 13.9	0
14.0 - 14.3	0
14.4 - 14.7	1
14.8 - 15.1	0
15.2 - 15.5	0
15.6 - 15.9	0
16.0 - 16.3	1

TOTAL NO. OF DATA = 4789
AVERAGE VALUE = 7.6

CLINTON STA. COMPACTION TESTS
ALL PASSING DATA
ELEVATIONS 671.00 TO 703.00

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-430

TYPE B GRANULAR FILL DISTRIBUTION
OF MOISTURE CONTENT

LOW DENSITY TESTS BY LIFTS AND GRIDS

GRID

ELEVATION FEET (MSL)	A 1	A 2	A 3	A 4	A 5	A 6	B 1	B 2	B 3	B 4	B 5	B 6	C 1	C 2	C 3	C 4	C 5	C 6	D 1	D 2	D 3	D 4	D 5	D 6	E 1	E 2	E 3	E 4	E 5	E 6	F 1	F 2	F 3	F 4	F 5	F 6	F 7
671																																					
672																																					
673																																					
674																					1																
675																																					
676																																					
677																																					
678																																					
679																																					
680										3																	1										
681				1	2										1				3																		
682					1												1			1																2	
683					2	1		1												1	1				1						4				1		
684				1					1			1				1				2										2	1	1				4	1
685																												1					2				
686								1														1								1	3		1				
687																											1				2					2	
688	3		2											1				1	1						2				1		1						
689				4					2												1				1	1				1						1	
690	3			2		1					1							2		1			1							2	1			2			
691		3				1	1		2		3											2								2						1	
692						2	1						2												2						1				1		
693				2						2																		1							1		
694		1				1					1							5							1			1				1					
695						5		1				3						1																			
696		1				1		1	1															2													
697								1		1														1					2								2
698			3		1	1	1																	1													
699												1												1													
700					2		1																														
701																																					
702																								1													

NOTE: The numbers indicate the quantity of low density tests in a grid at a corresponding elevation.

CLINTON POWER STATION
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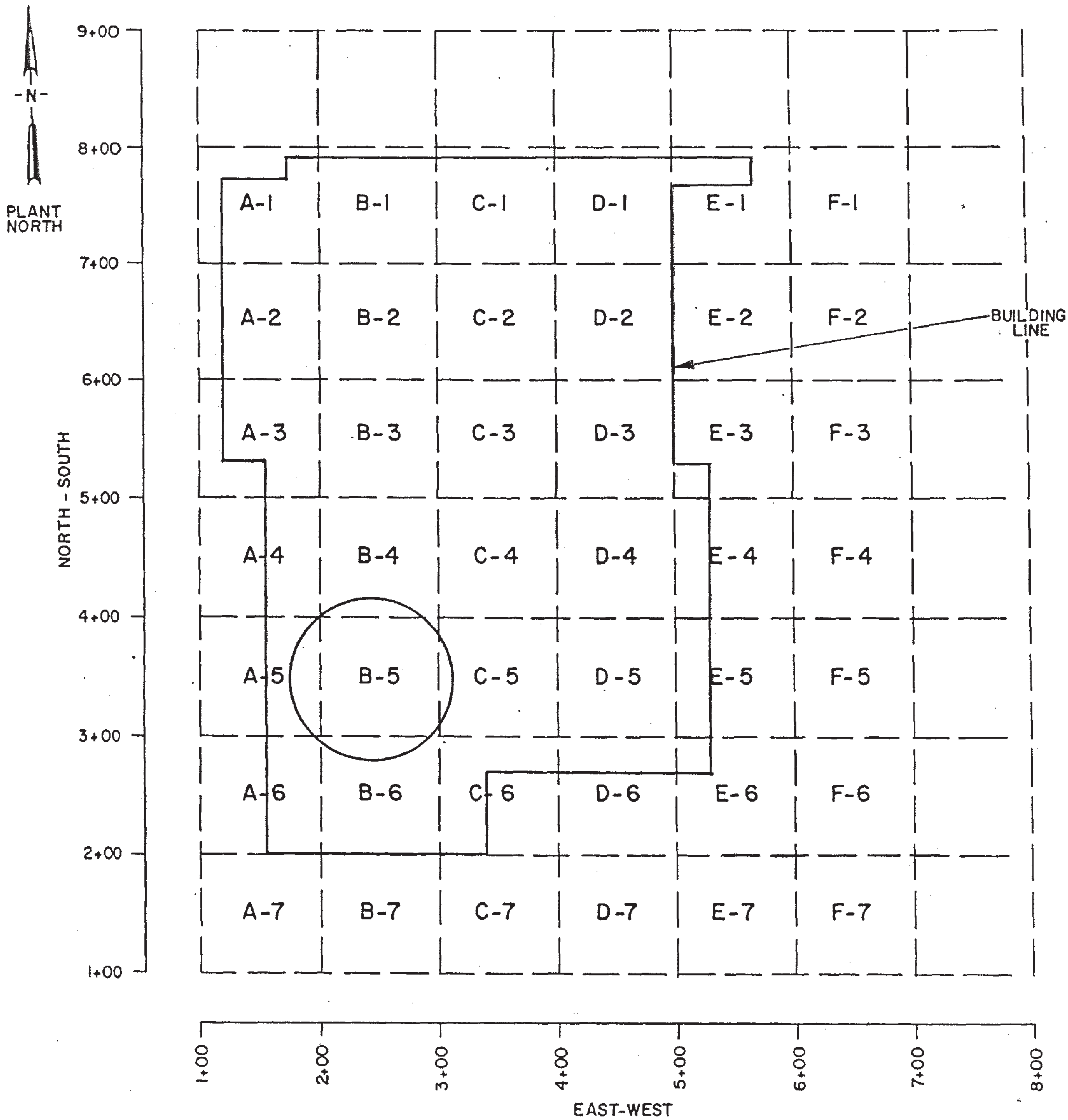
FIGURE 2.5-431

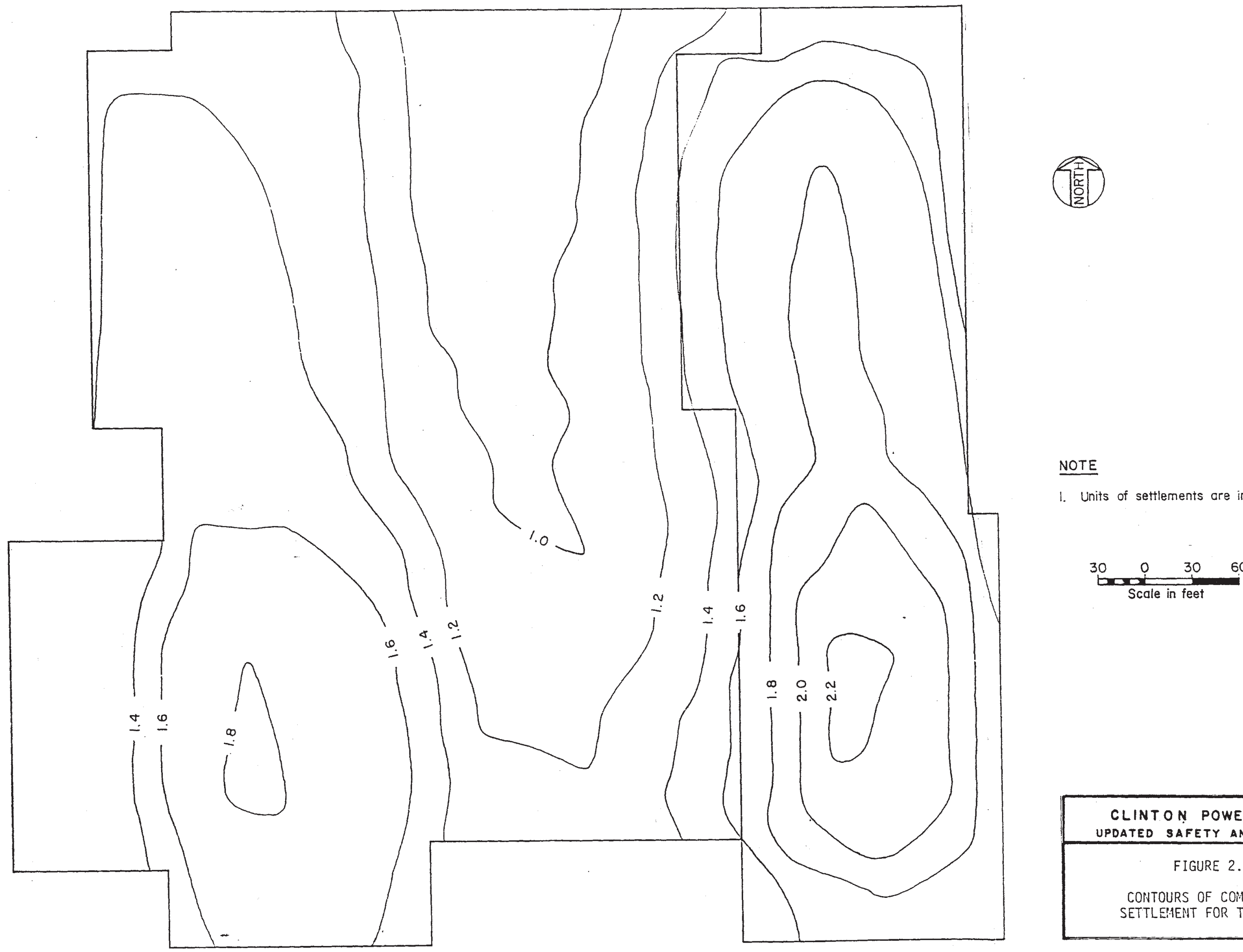
DISTRIBUTION OF IN-PLACE LOW DENSITY TESTS



CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-432

POWER BLOCK GRID SYSTEM



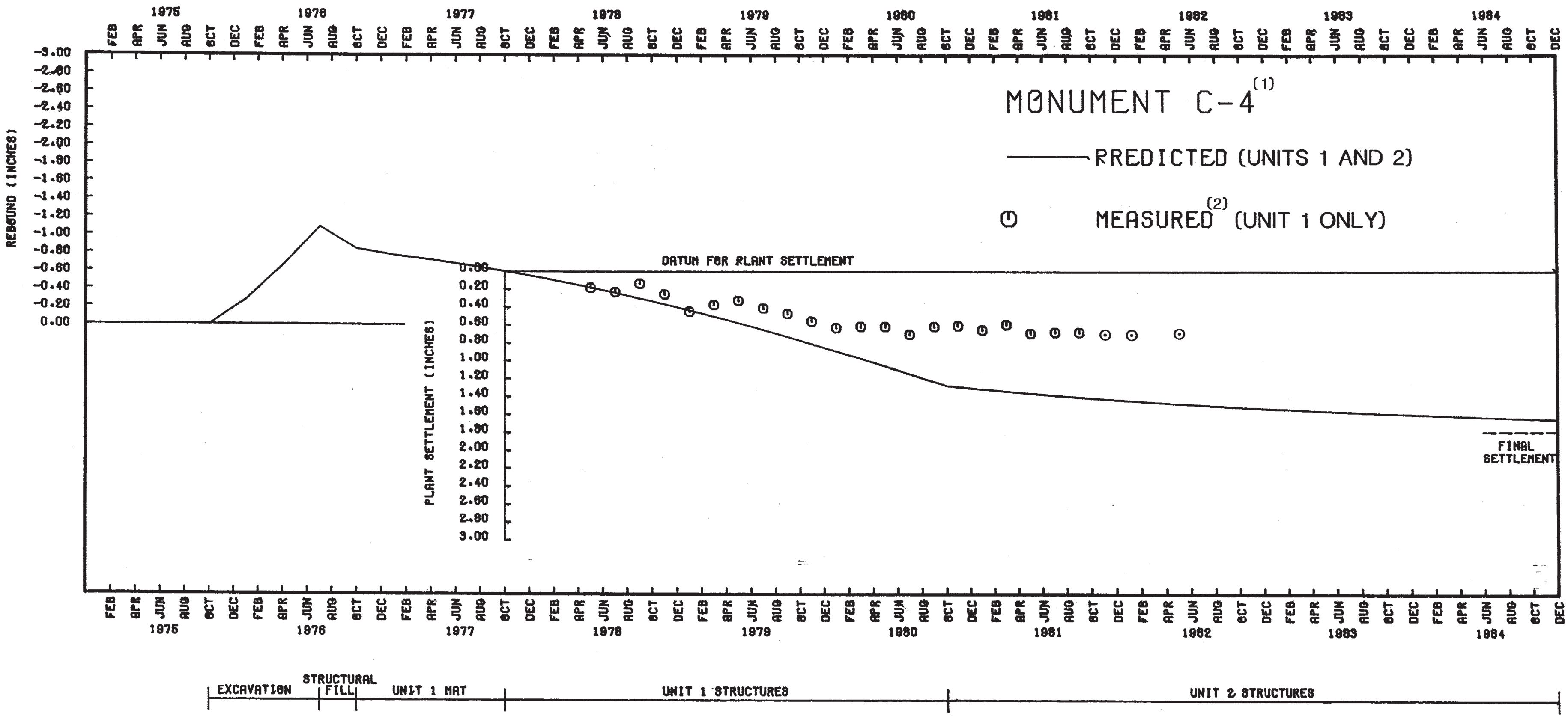
NOTE

1. Units of settlements are inches

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-433

CONTOURS OF COMPUTED FINAL SETTLEMENT FOR THE MAIN PLANT

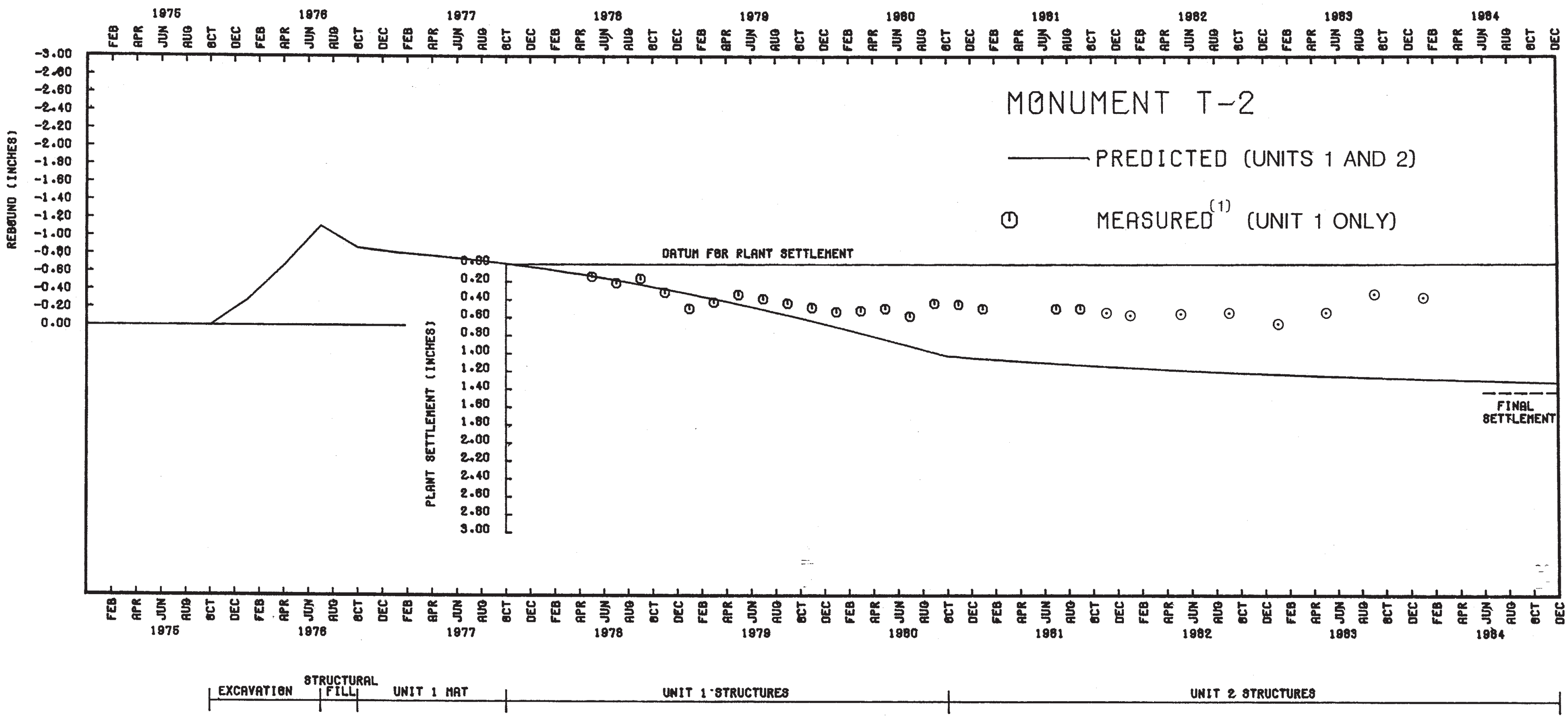


NOTES
1. THIS MONUMENT WAS REPLACED BY C-4A AFTER SEPTEMBER 1982.
2. UNIT 2 HAS BEEN CANCELLED.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-434

COMPARISON OF PREDICTED AND MEASURED SETTLEMENT TIME HISTORIES AT SETTLEMENT MONUMENT C4 (CONTAINMENT BUILDING)

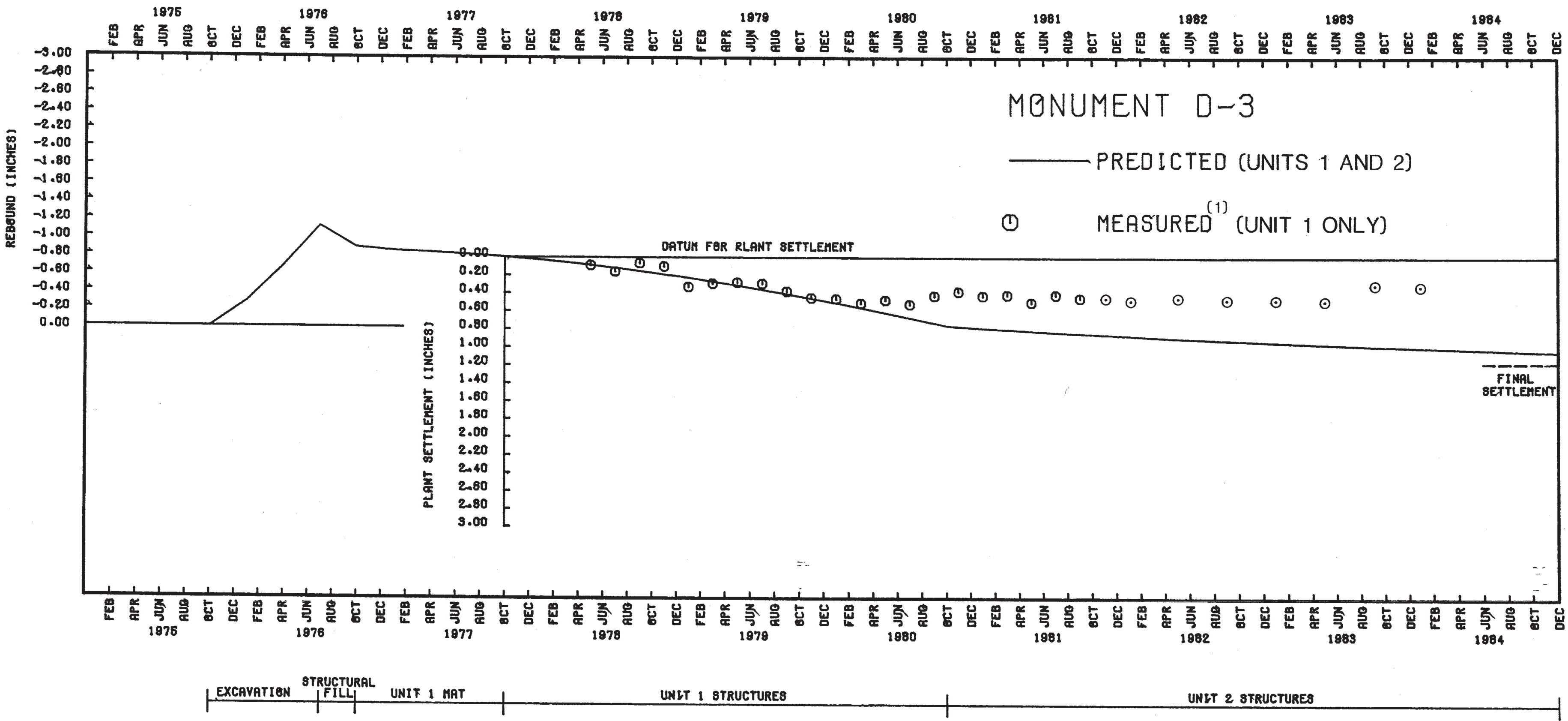


NOTES
1. UNIT 2 HAS BEEN CANCELLED.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-435

COMPARISON OF PREDICTED AND MEASURED SETTLEMENT TIME HISTORIES AT SETTLEMENT MONUMENT T1 (TURBINE BUILDING)

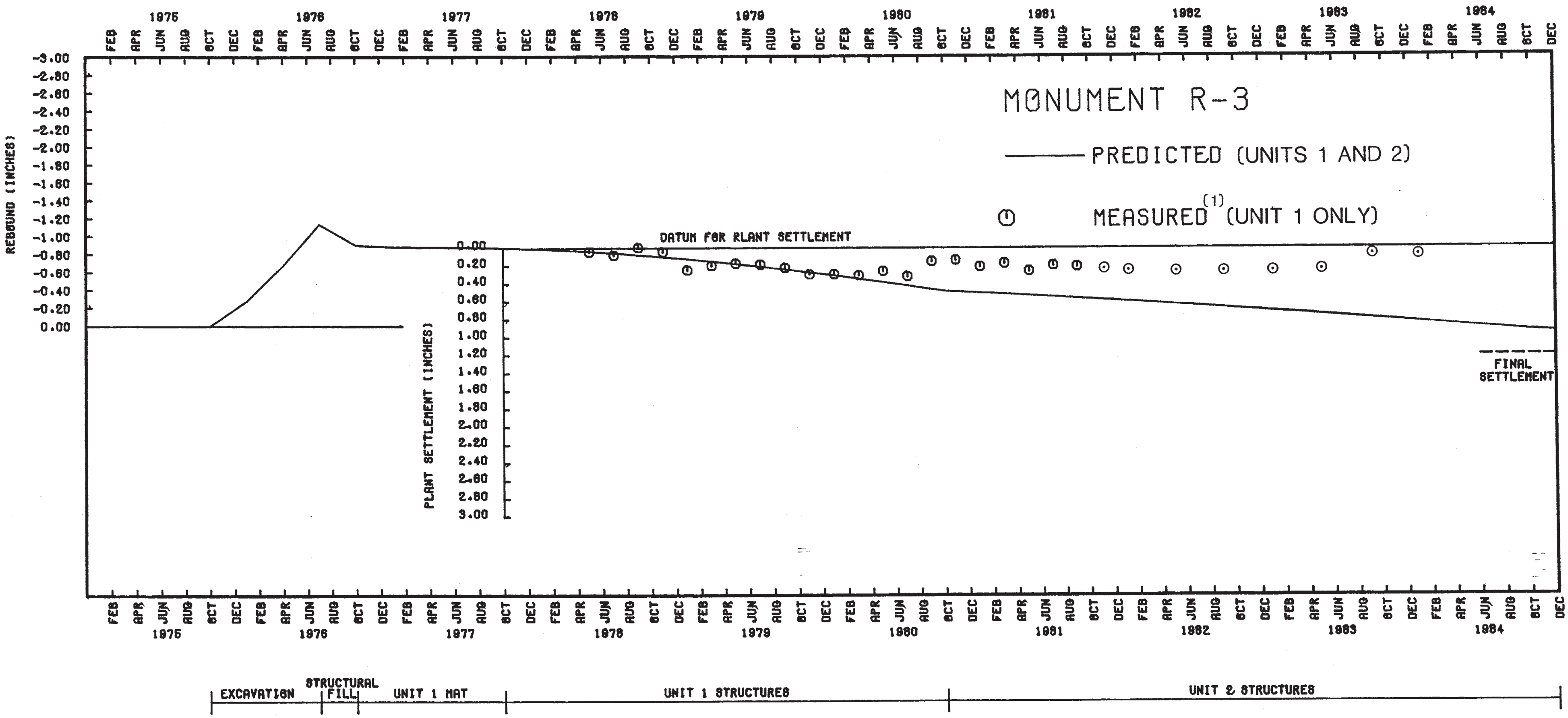


NOTES
1. UNIT 2 HAS BEEN CANCELLED.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-436

COMPARISON OF PREDICTED AND MEASURED SETTLEMENT TIME HISTORIES AT SETTLEMENT MONUMENT D3 (DIESEL GENERATOR BUILDING)

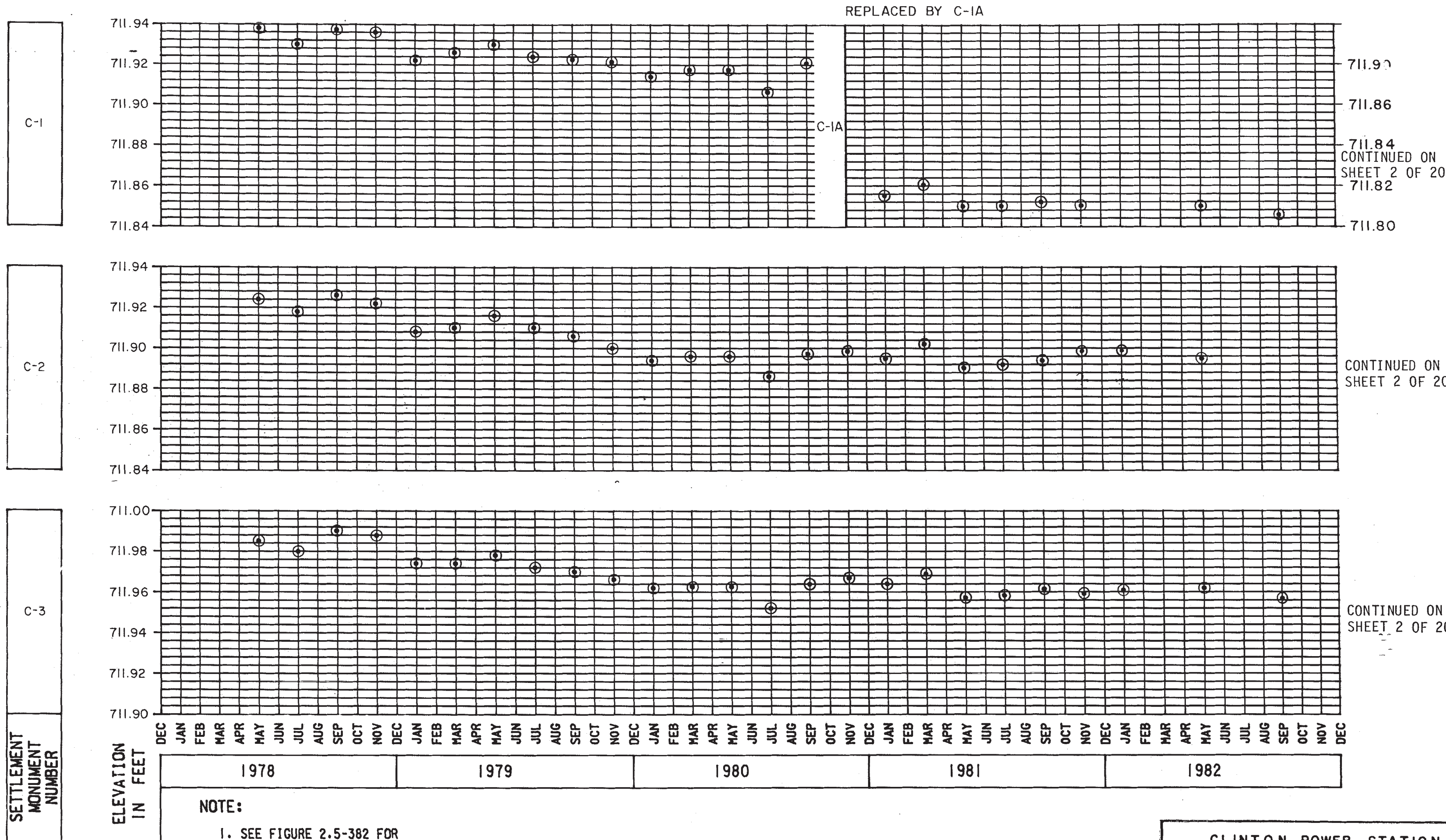


NOTES
1. UNIT 2 HAS BEEN CANCELLED.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-437

COMPARISON OF PREDICTED AND MEASURED SETTLEMENT TIME HISTORIES AT SETTLEMENT MONUMENT R3 (RADWASTE BUILDING)



NOTE:

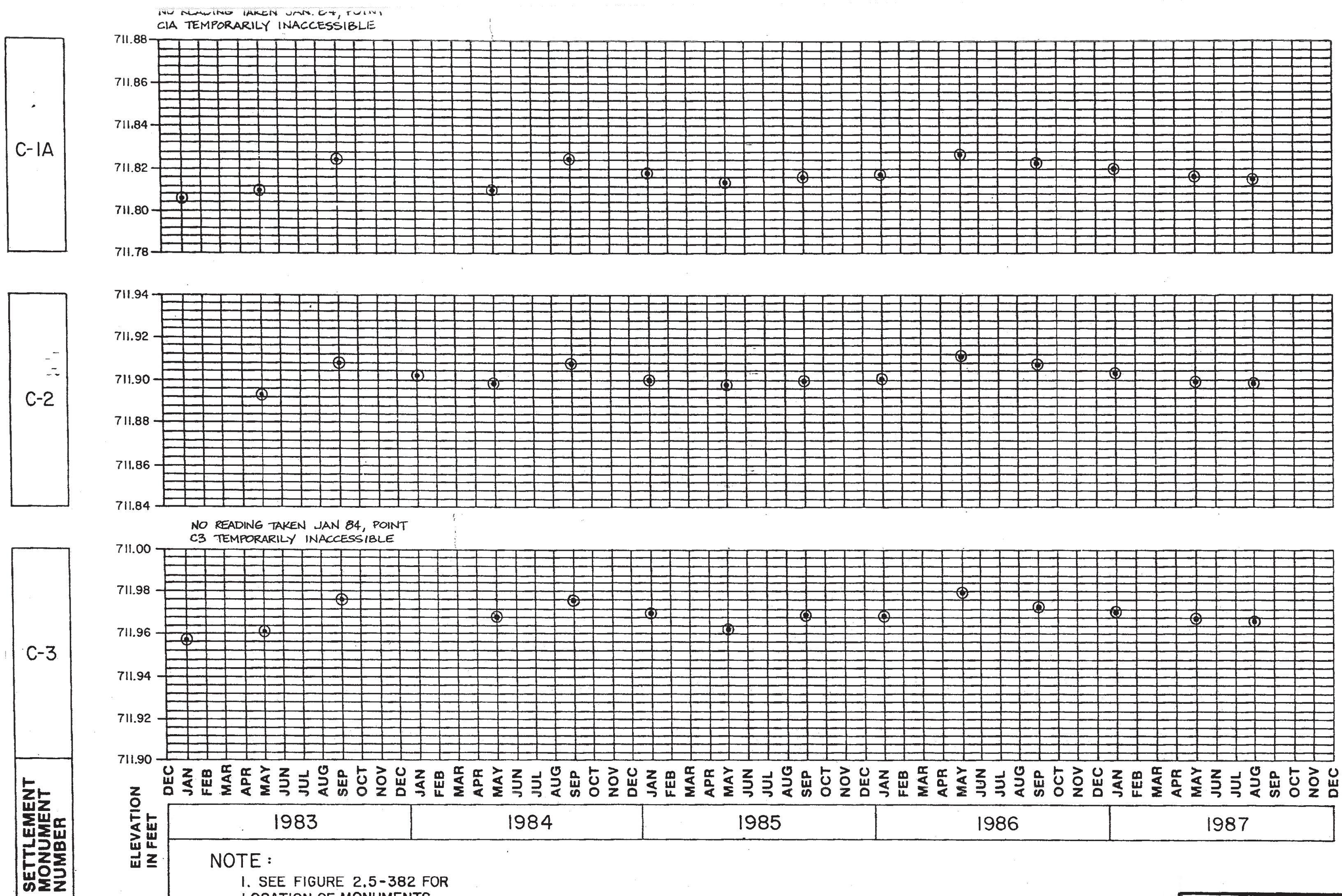
1. SEE FIGURE 2.5-382 FOR LOCATION OF MONUMENTS

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-438

MAIN PLANT SETTLEMENT MEASUREMENTS

(SHEET 1 OF 20)



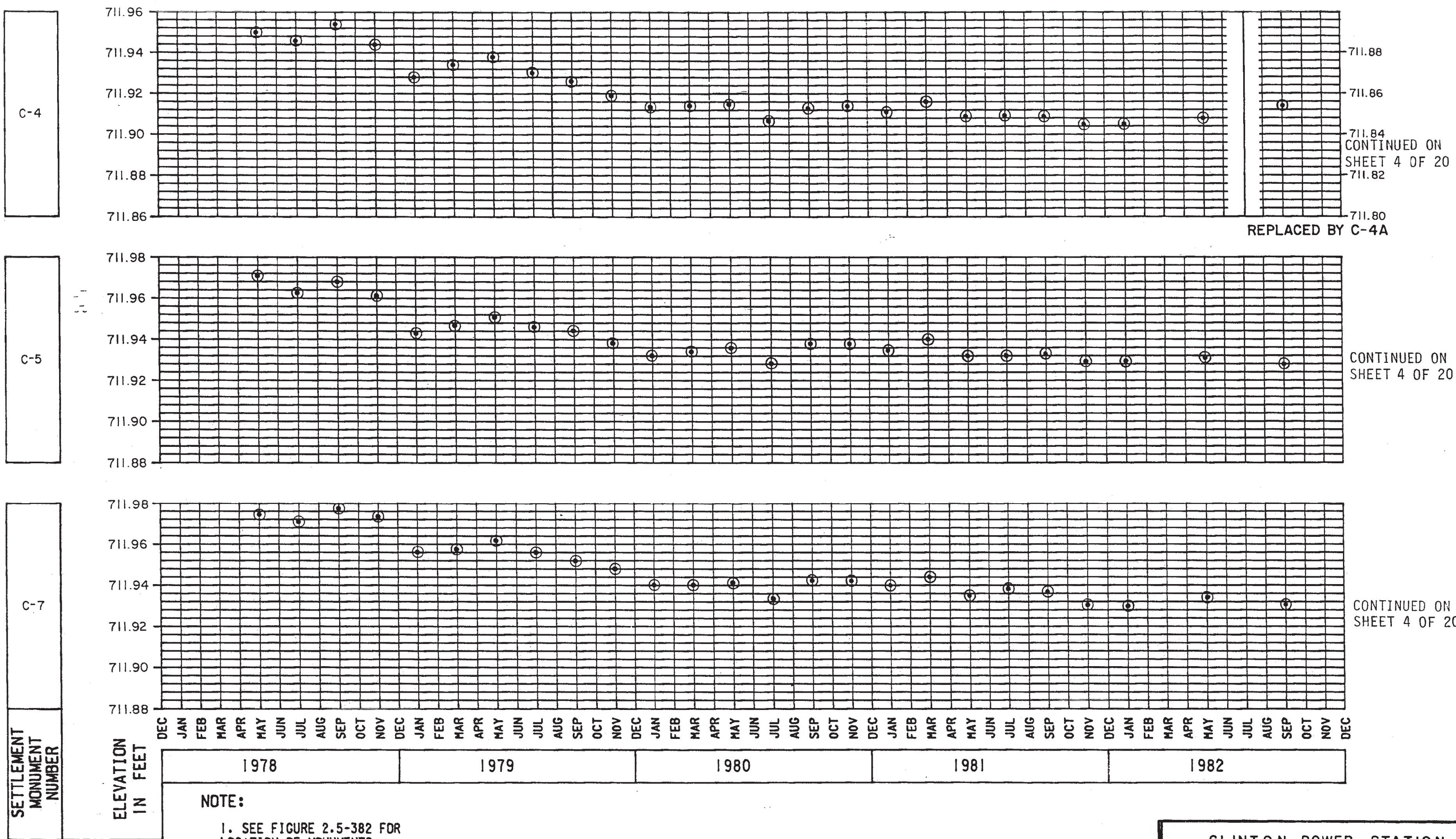
NOTE:
1. SEE FIGURE 2.5-382 FOR LOCATION OF MONUMENTS

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-438

MAIN PLANT
SETTLEMENT MEASUREMENTS

(SHEET 2 OF 20)



NOTE:

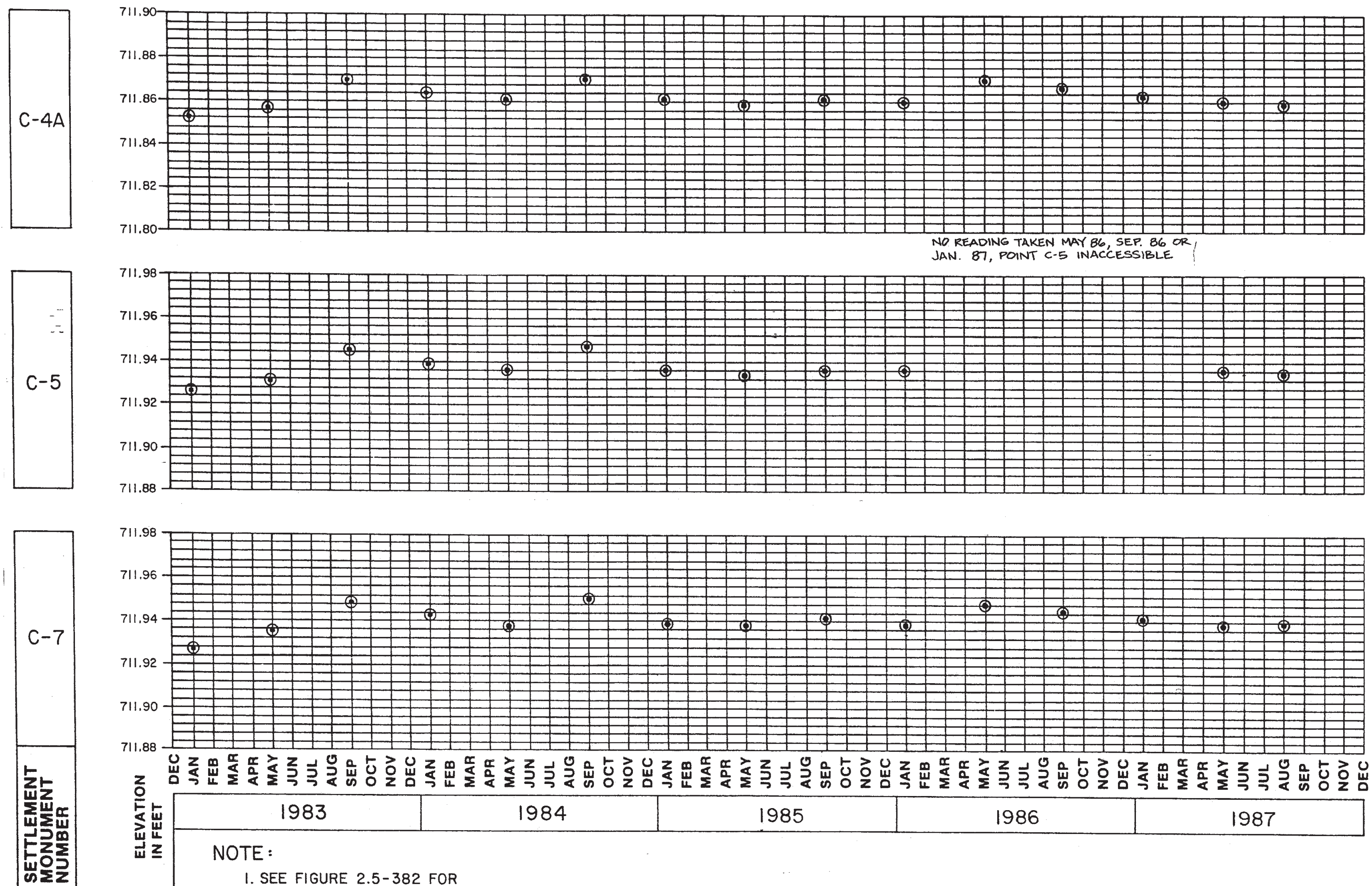
1. SEE FIGURE 2.5-382 FOR LOCATION OF MONUMENTS

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-438

MAIN PLANT SETTLEMENT MEASUREMENTS

(SHEET 3 OF 20)



NOTE:

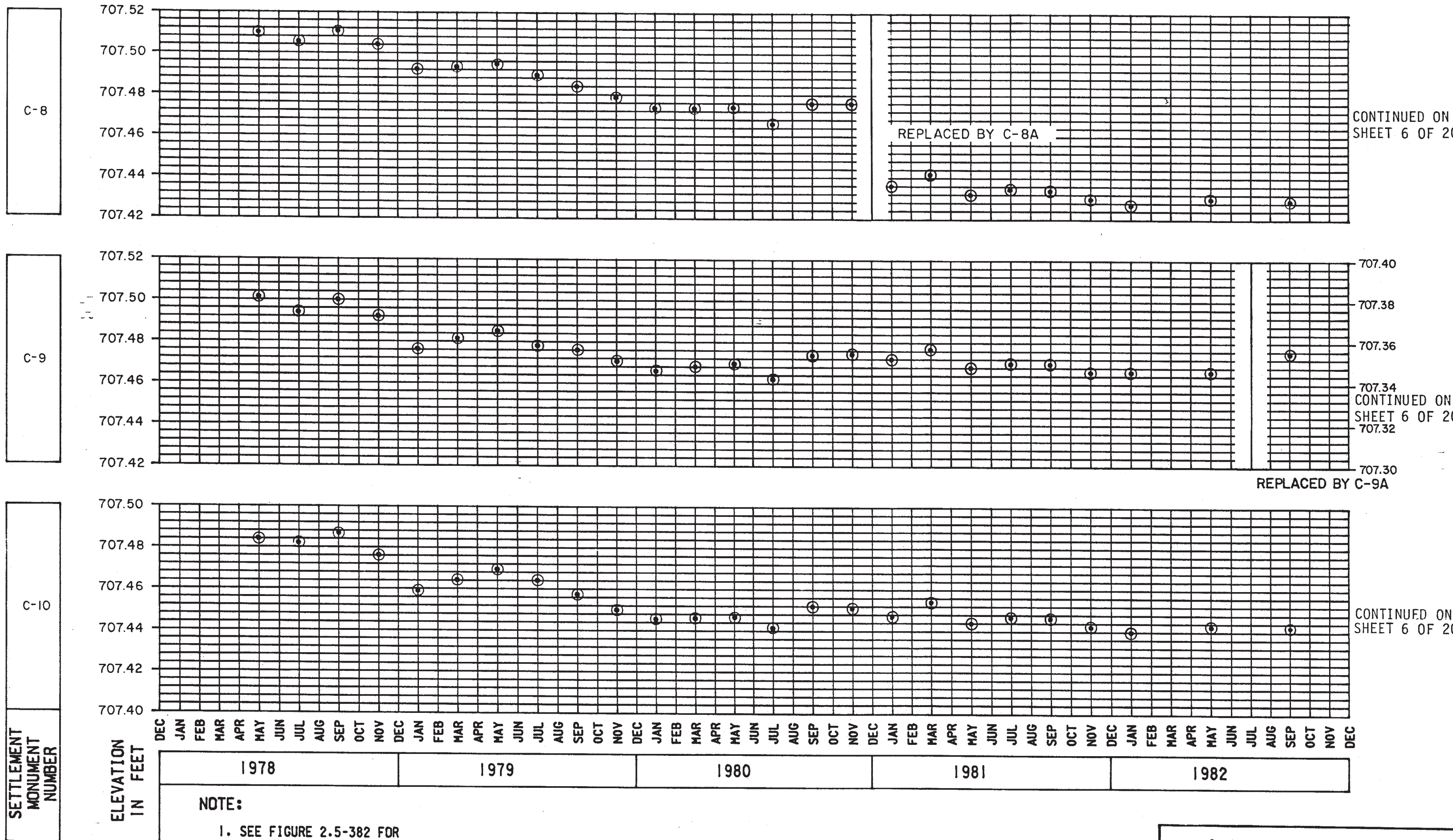
1. SEE FIGURE 2.5-382 FOR LOCATION OF MONUMENTS

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-438

MAIN PLANT
SETTLEMENT MEASUREMENTS

(SHEET 4 OF 20)



NOTE:

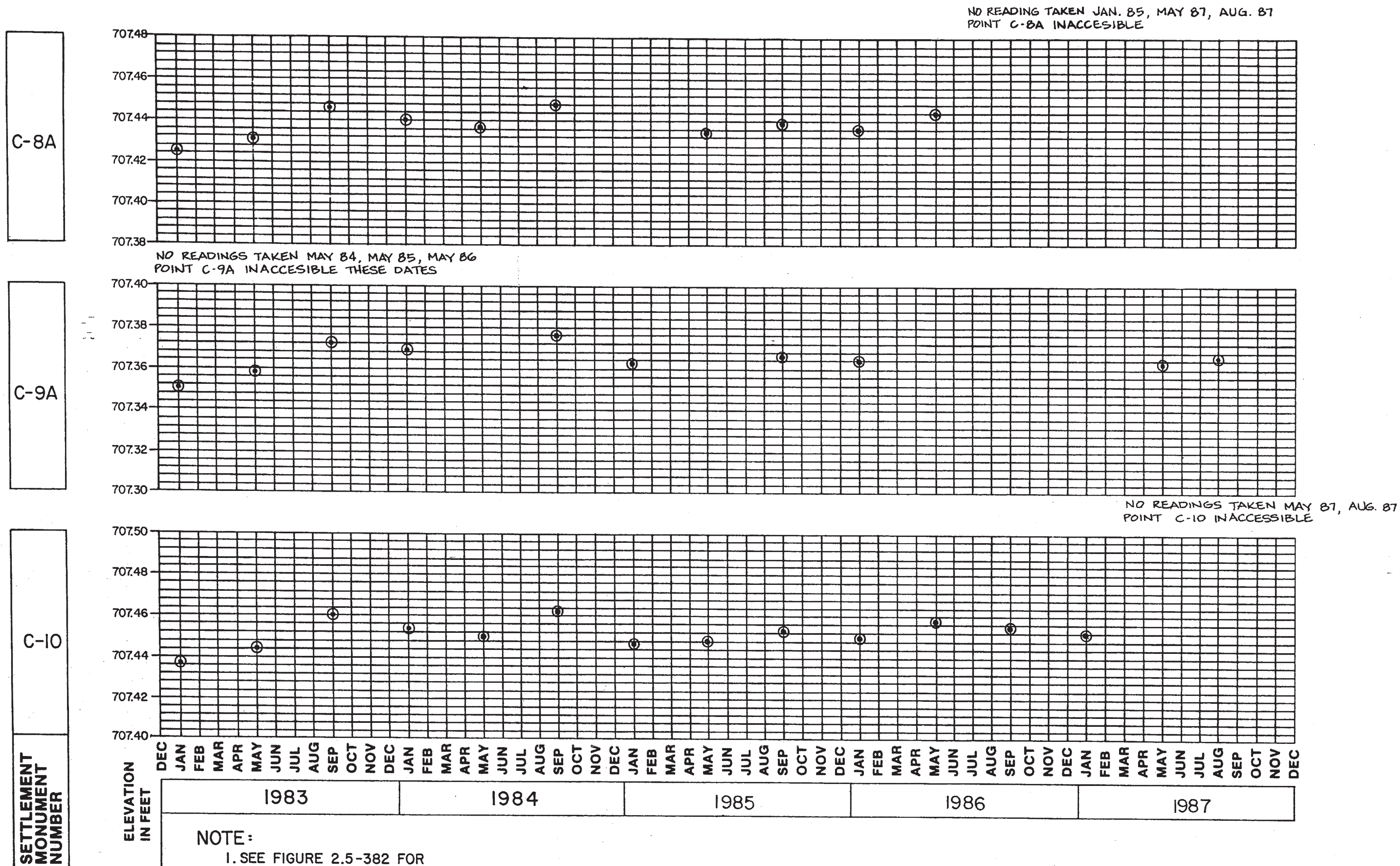
1. SEE FIGURE 2.5-382 FOR LOCATION OF MONUMENTS

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-438

MAIN PLANT
SETTLEMENT MEASUREMENTS

(SHEET 5 OF 20)



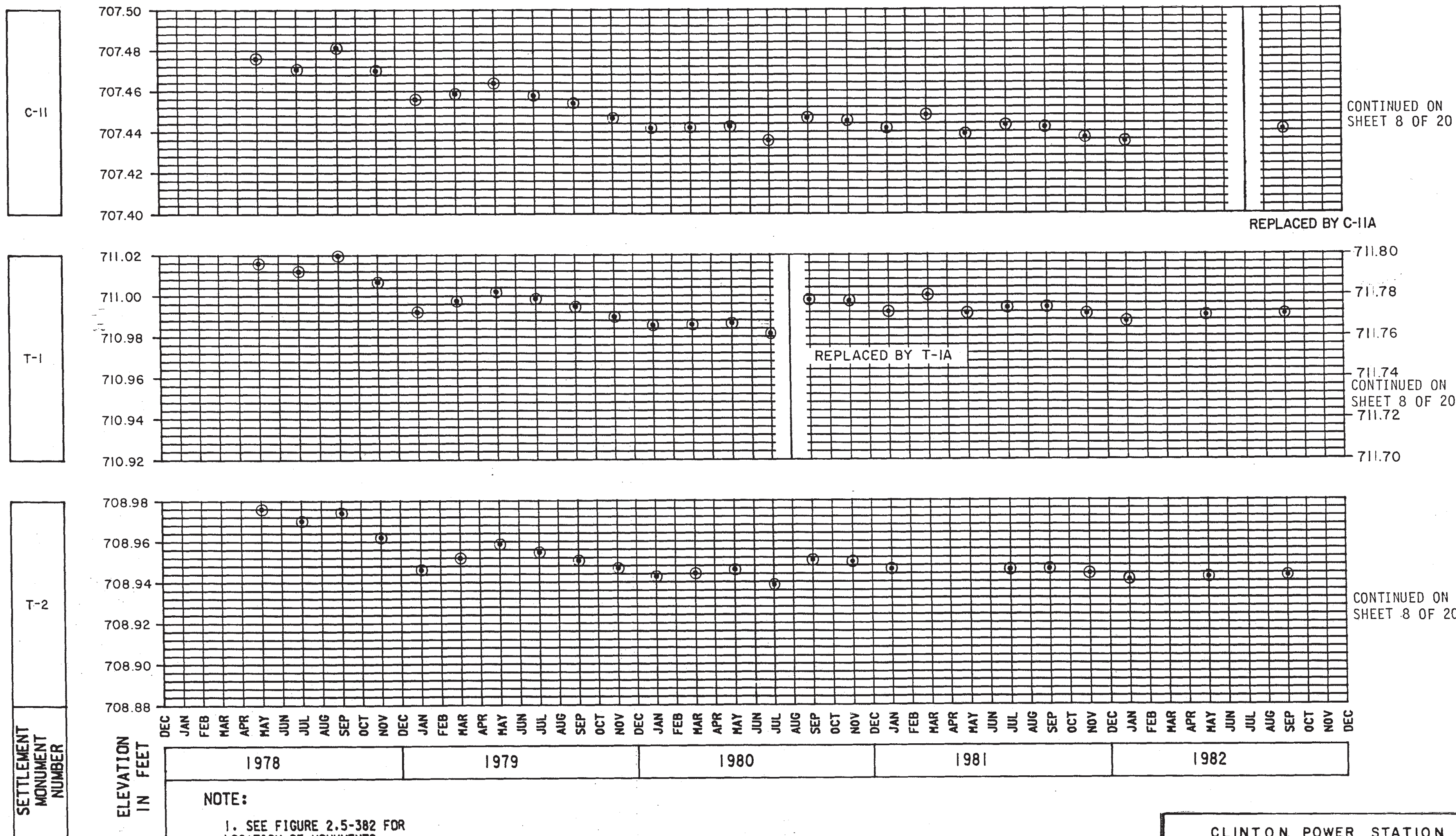
NOTE:
1. SEE FIGURE 2.5-382 FOR LOCATION OF MONUMENTS

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-438

MAIN PLANT
SETTLEMENT MEASUREMENTS

(SHEET 6 OF 20)



NOTE:

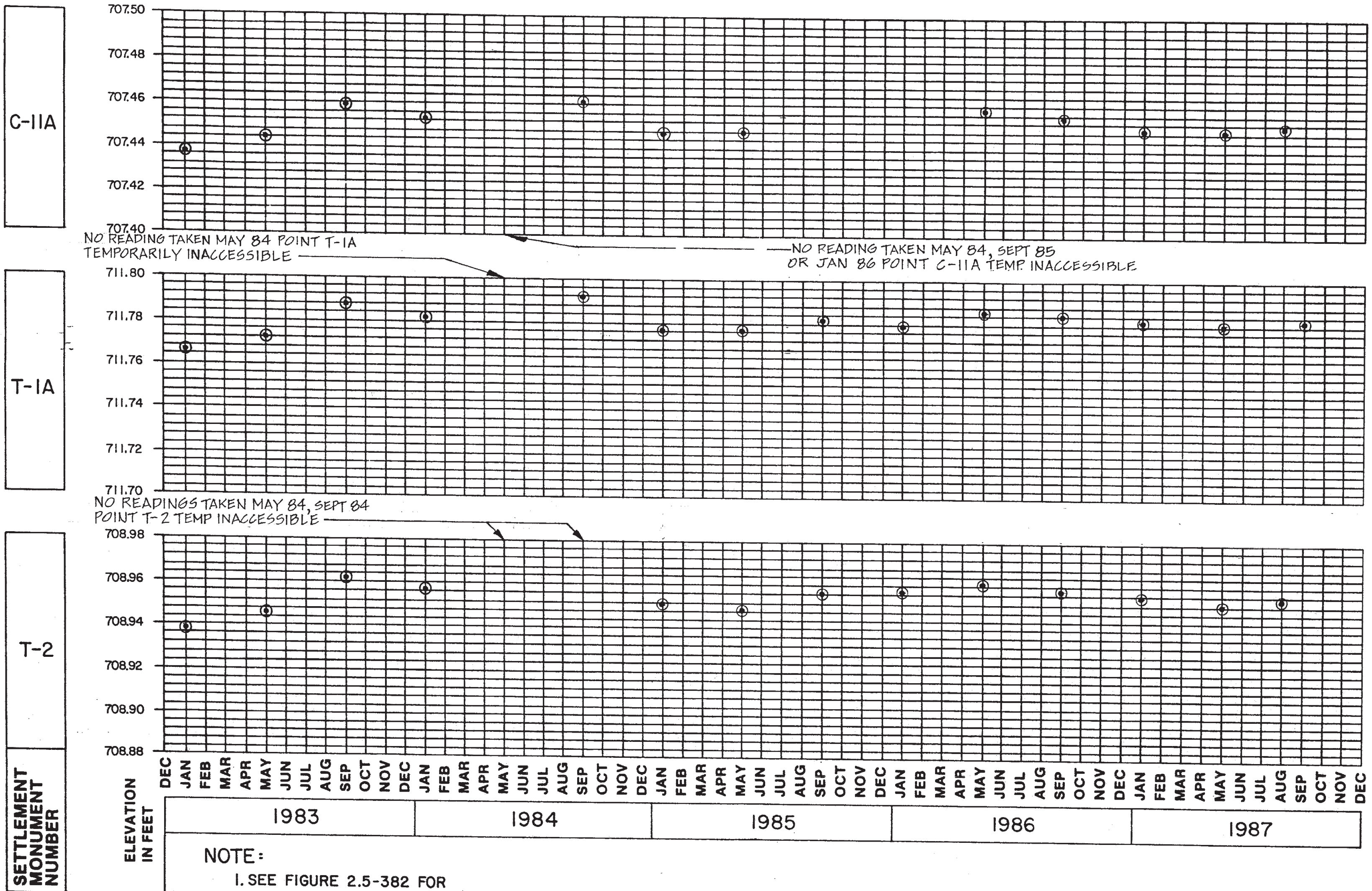
1. SEE FIGURE 2.5-382 FOR LOCATION OF MONUMENTS

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-438

MAIN PLANT SETTLEMENT MEASUREMENTS

(SHEET 7 OF 20)



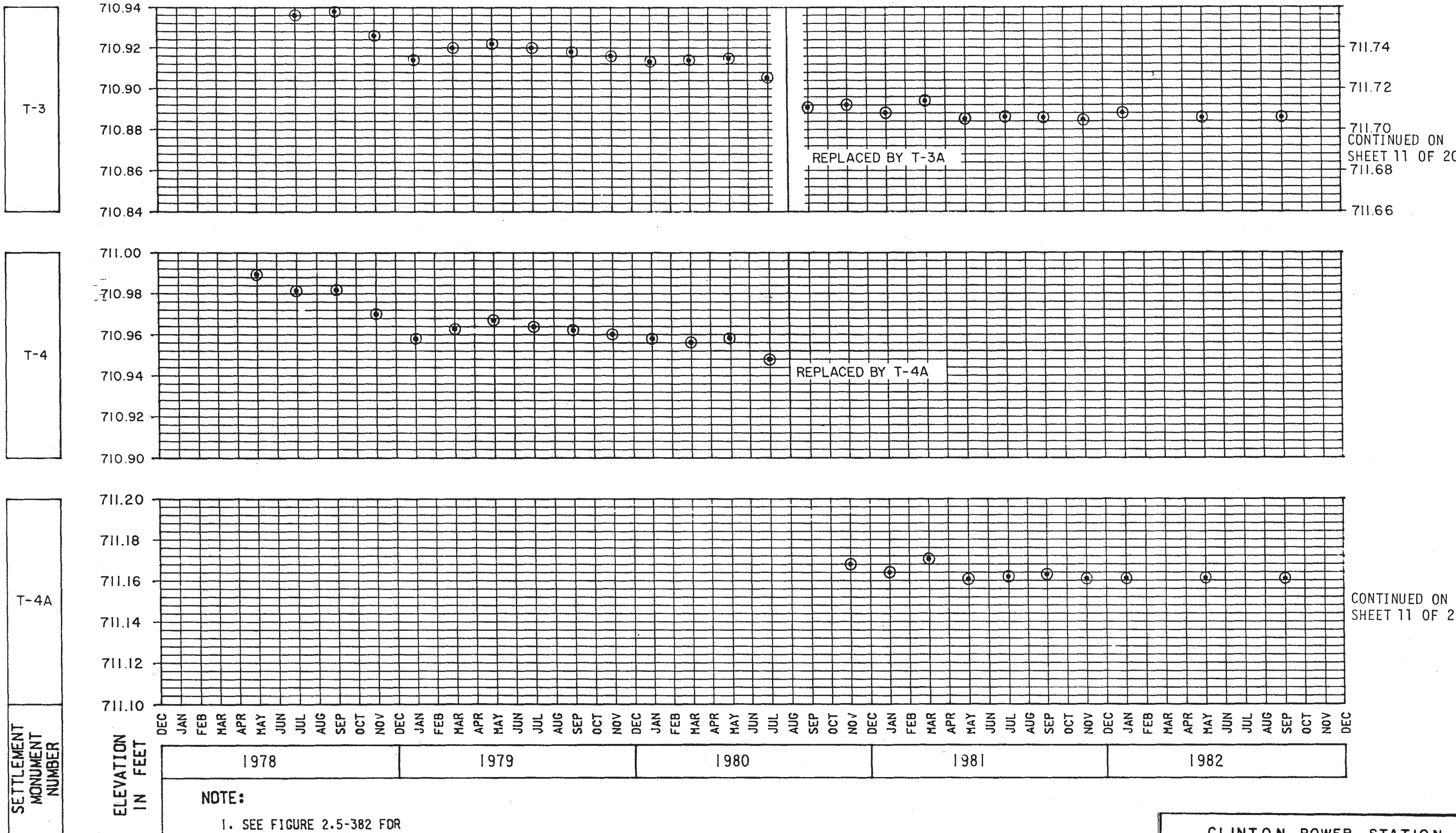
NOTE:
1. SEE FIGURE 2.5-382 FOR LOCATION OF MONUMENTS

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-438

MAIN PLANT
SETTLEMENT MEASUREMENTS

(SHEET 8 OF 20)



NOTE:

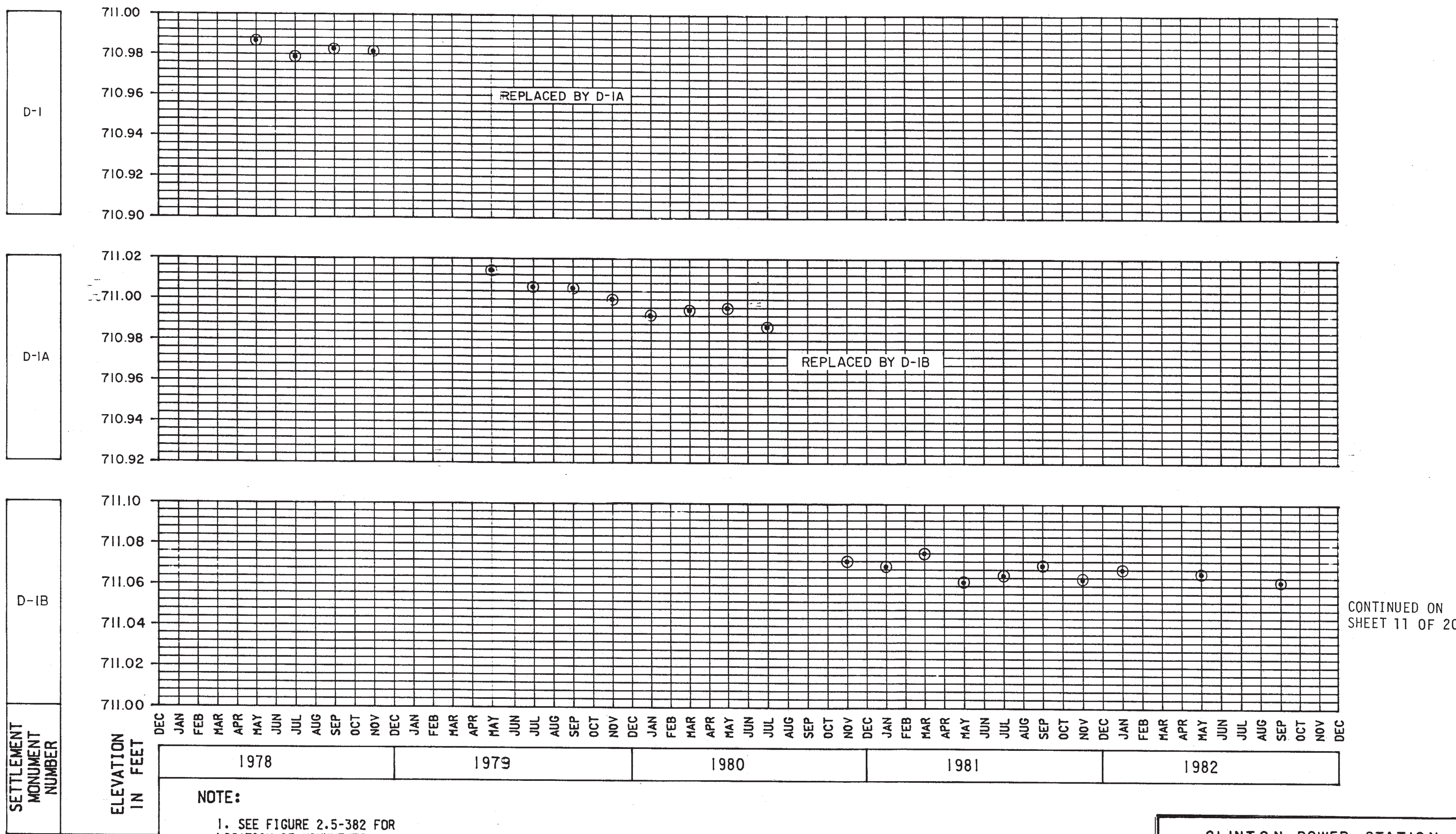
1. SEE FIGURE 2.5-382 FOR LOCATION OF MONUMENTS

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-438

MAIN PLANT SETTLEMENT MEASUREMENTS

(SHEET 9 OF 20)



CONTINUED ON SHEET 11 OF 20

NOTE:

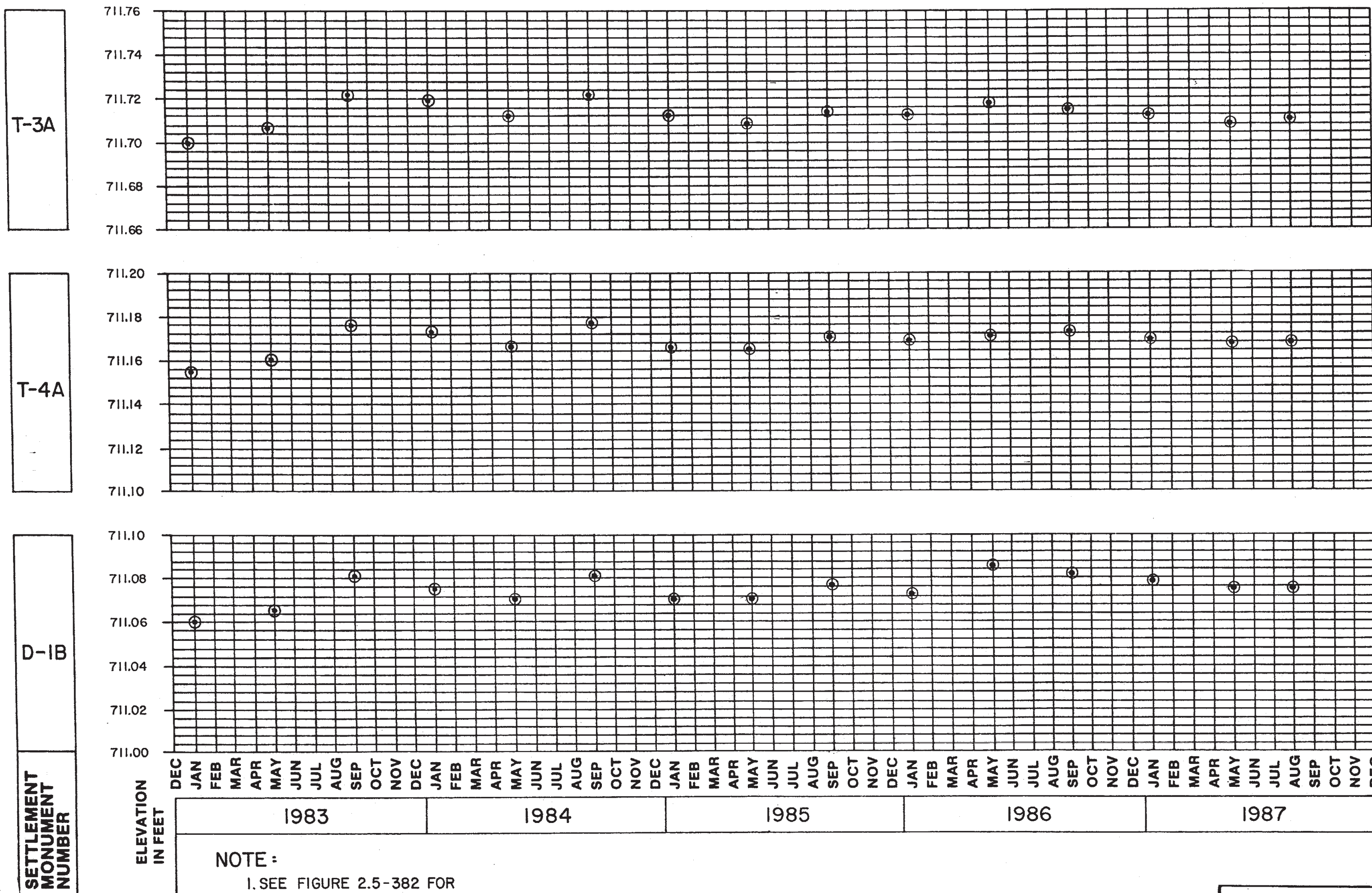
1. SEE FIGURE 2.5-382 FOR LOCATION OF MONUMENTS

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-438

MAIN PLANT
SETTLEMENT MEASUREMENTS

(SHEET 10 OF 20)



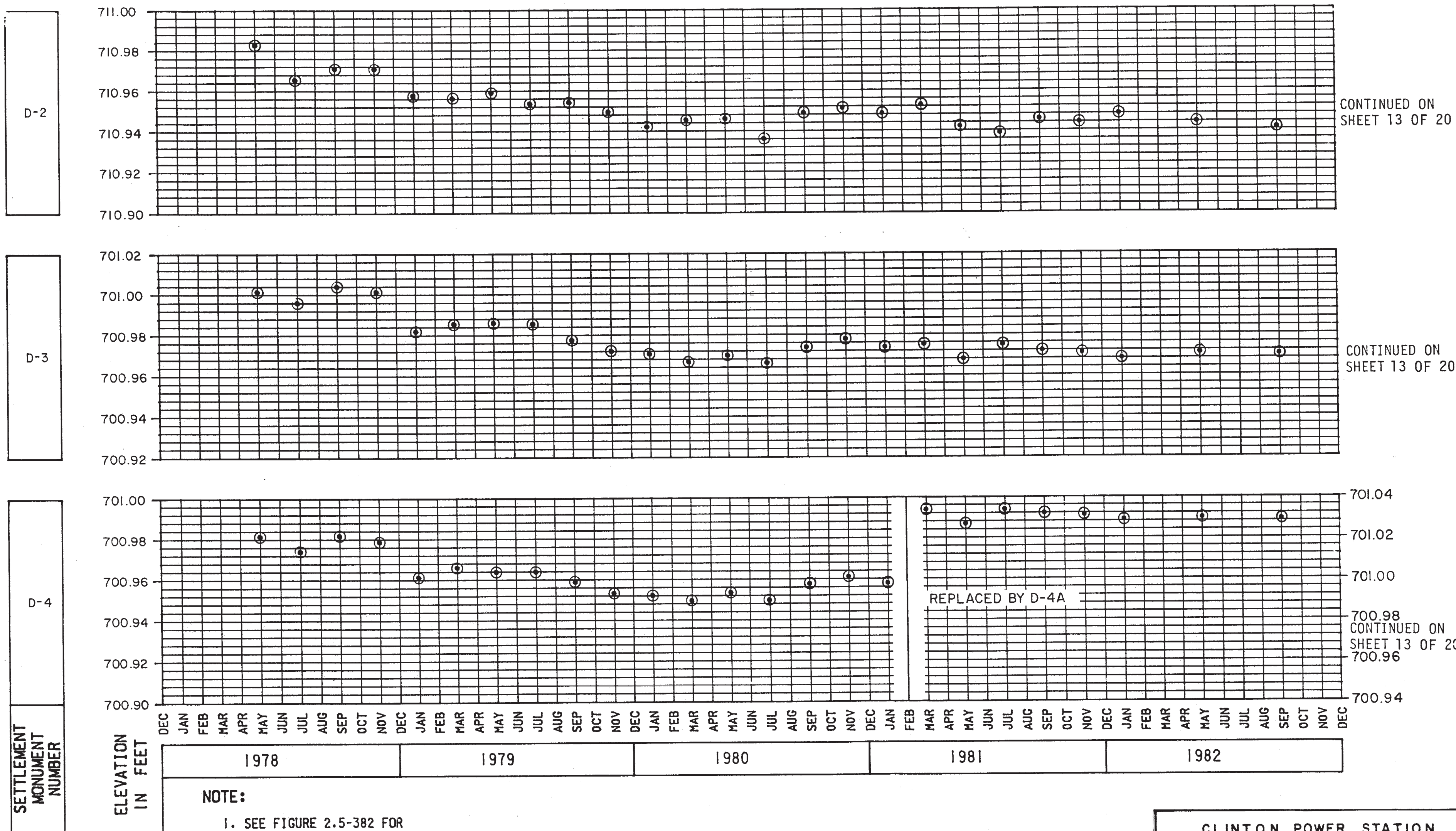
NOTE:
1. SEE FIGURE 2.5-382 FOR LOCATION OF MONUMENTS

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-438

MAIN PLANT
SETTLEMENT MEASUREMENTS

(SHEET 11 OF 20)



NOTE:

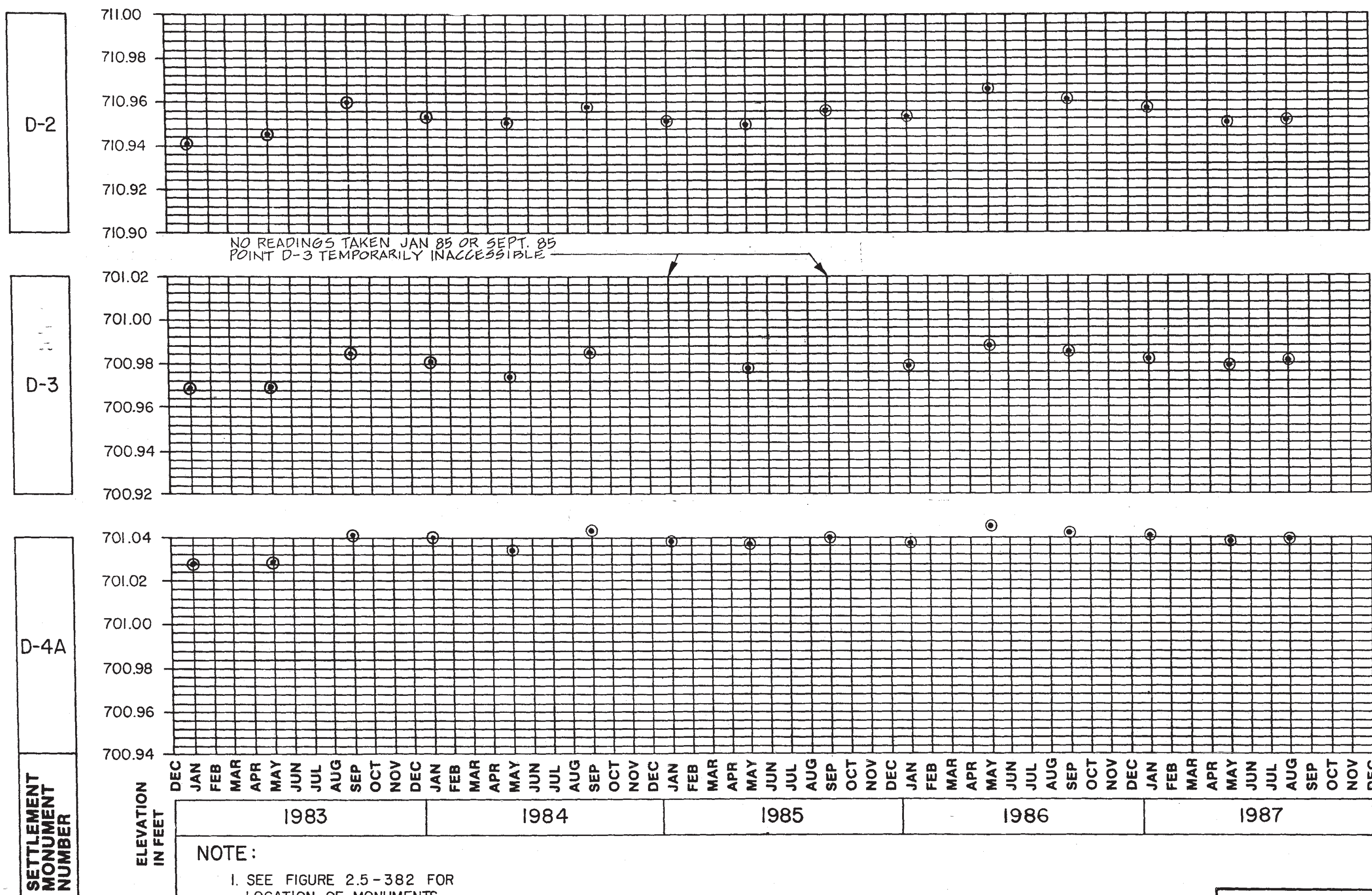
1. SEE FIGURE 2.5-382 FOR LOCATION OF MONUMENTS

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-438

MAIN PLANT SETTLEMENT MEASUREMENTS

(SHEET 12 OF 20)



NOTE:

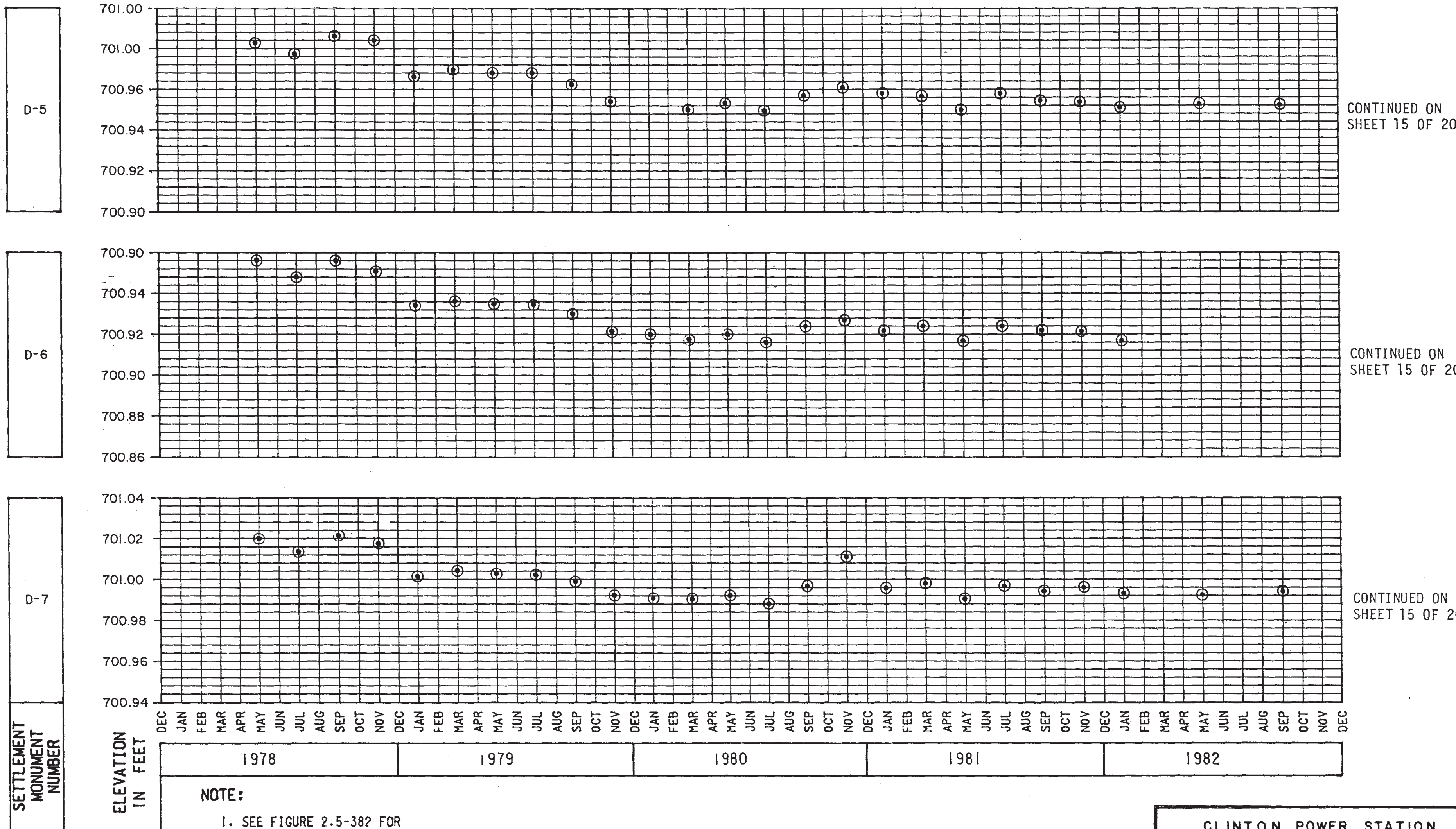
1. SEE FIGURE 2.5-382 FOR LOCATION OF MONUMENTS

CLINTON POWER STATION

UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-438

MAIN PLANT SETTLEMENT MEASUREMENTS (SHEET 13 OF 20)



NOTE:

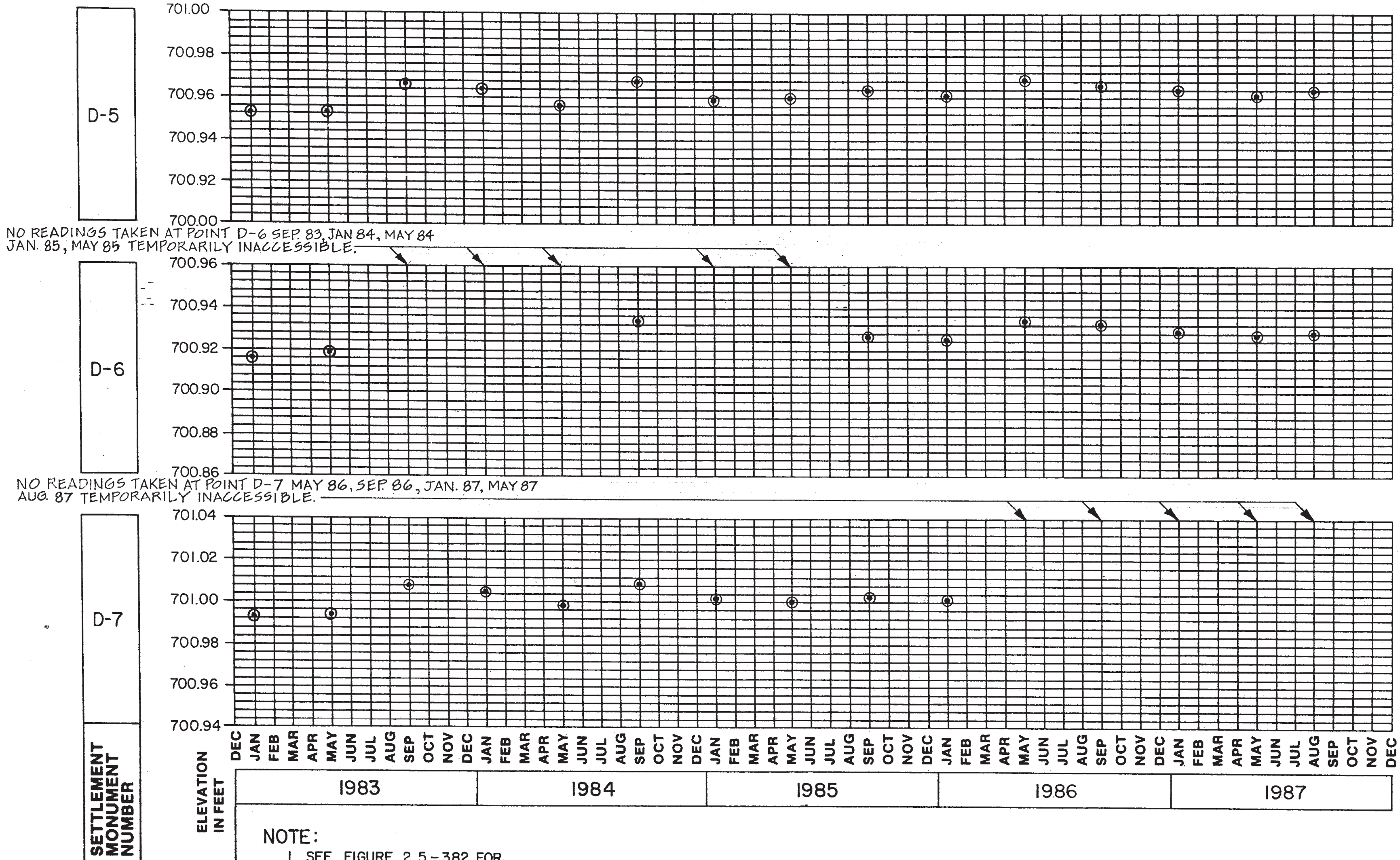
1. SEE FIGURE 2.5-382 FOR LOCATION OF MONUMENTS

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-438

MAIN PLANT SETTLEMENT MEASUREMENTS

(SHEET 14 OF 20)



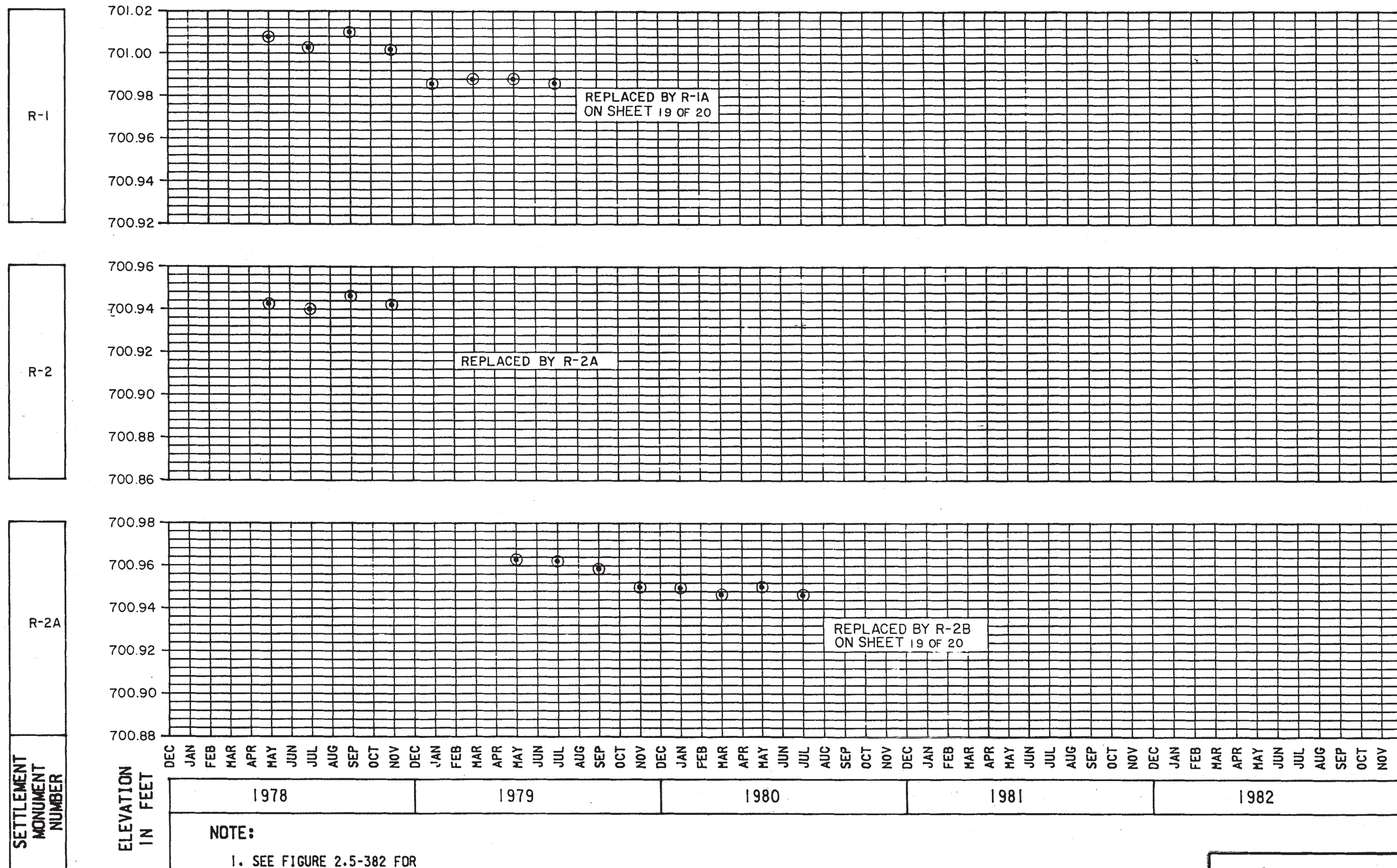
NOTE:
1. SEE FIGURE 2.5-382 FOR LOCATION OF MONUMENTS

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-438

MAIN PLANT
SETTLEMENT MEASUREMENTS

(SHEET 15 OF 20)



NOTE:

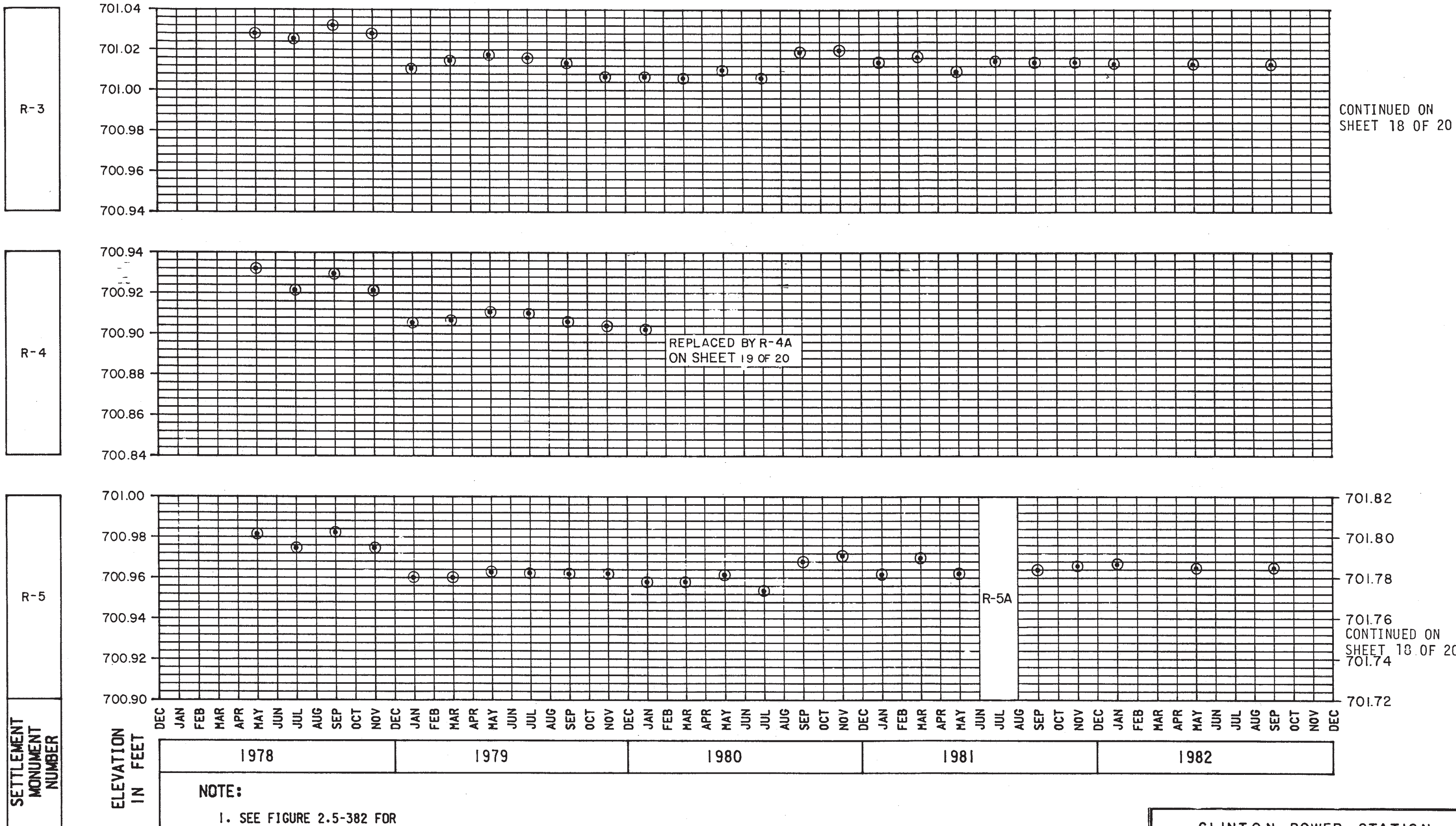
1. SEE FIGURE 2.5-382 FOR LOCATION OF MONUMENTS

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-438

MAIN PLANT SETTLEMENT MEASUREMENTS

(SHEET 16 OF 20)



NOTE:

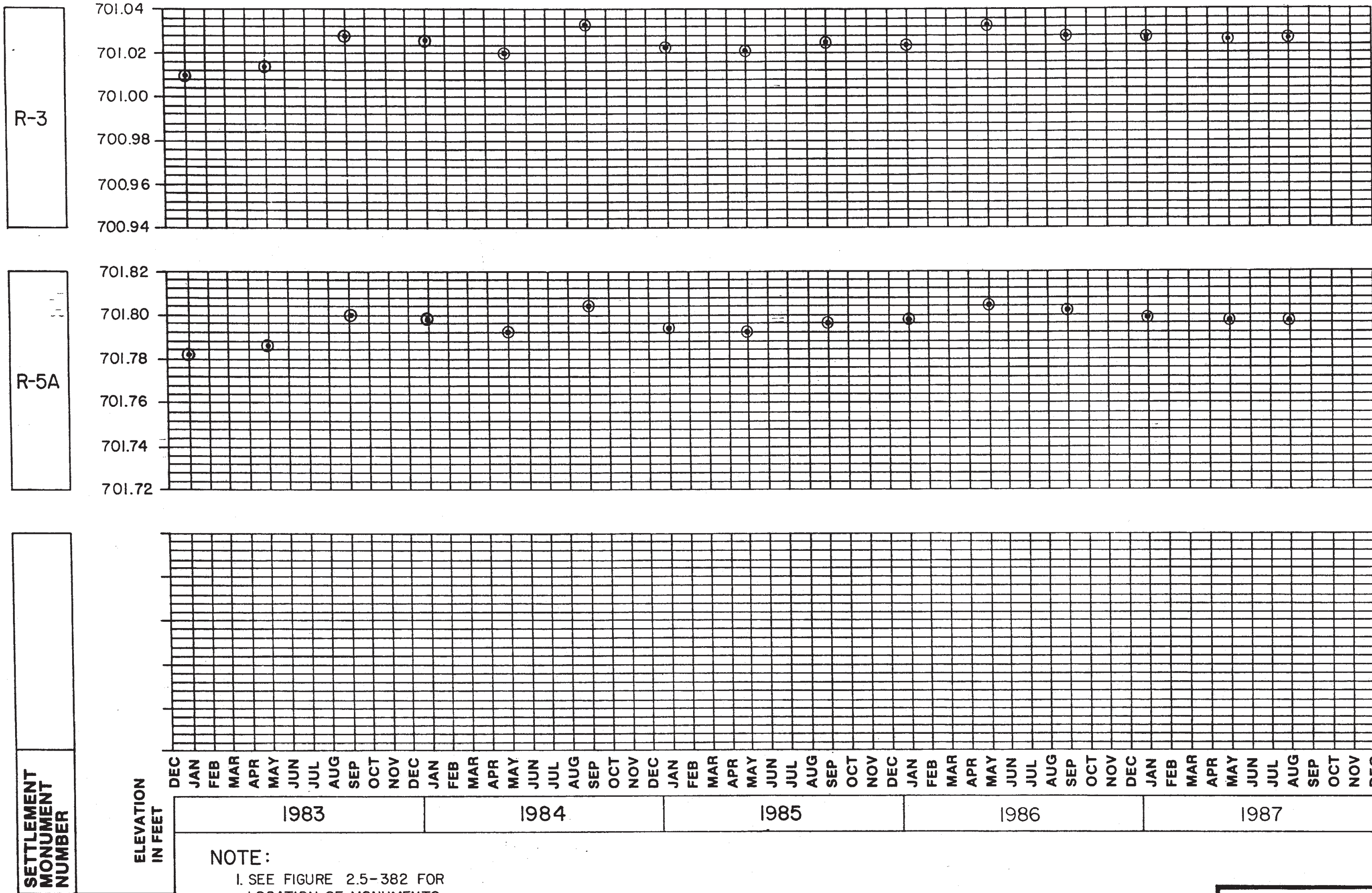
1. SEE FIGURE 2.5-382 FOR LOCATION OF MONUMENTS

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-438

MAIN PLANT SETTLEMENT MEASUREMENTS

(SHEET 17 OF 20)



NOTE:

1. SEE FIGURE 2.5-382 FOR LOCATION OF MONUMENTS

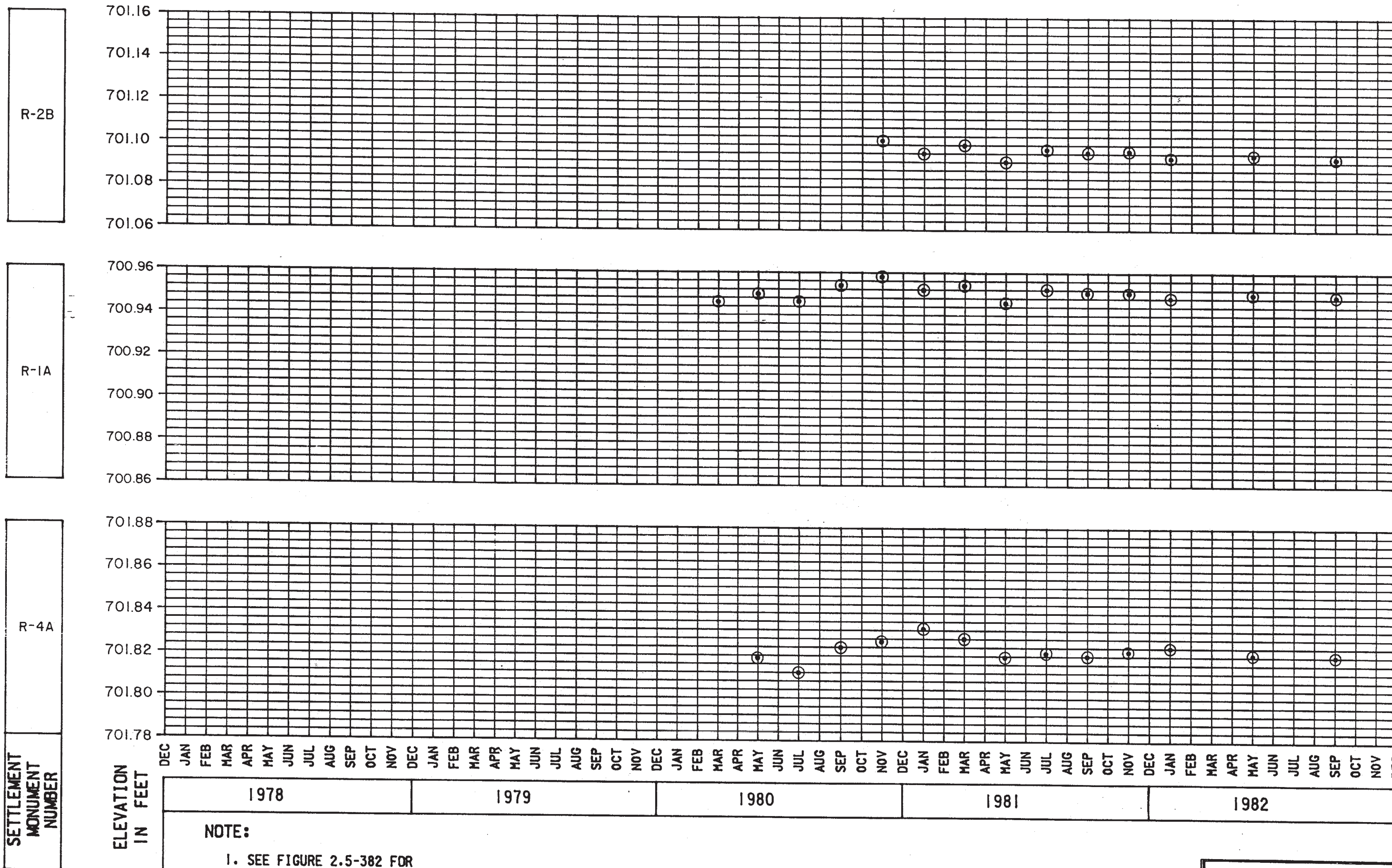
CLINTON POWER STATION

UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-438

MAIN PLANT SETTLEMENT MEASUREMENTS

(SHEET 18 OF 20)



CONTINUED ON SHEET 20 OF 20

CONTINUED ON SHEET 20 OF 20

CONTINUED ON SHEET 20 OF 20

NOTE:

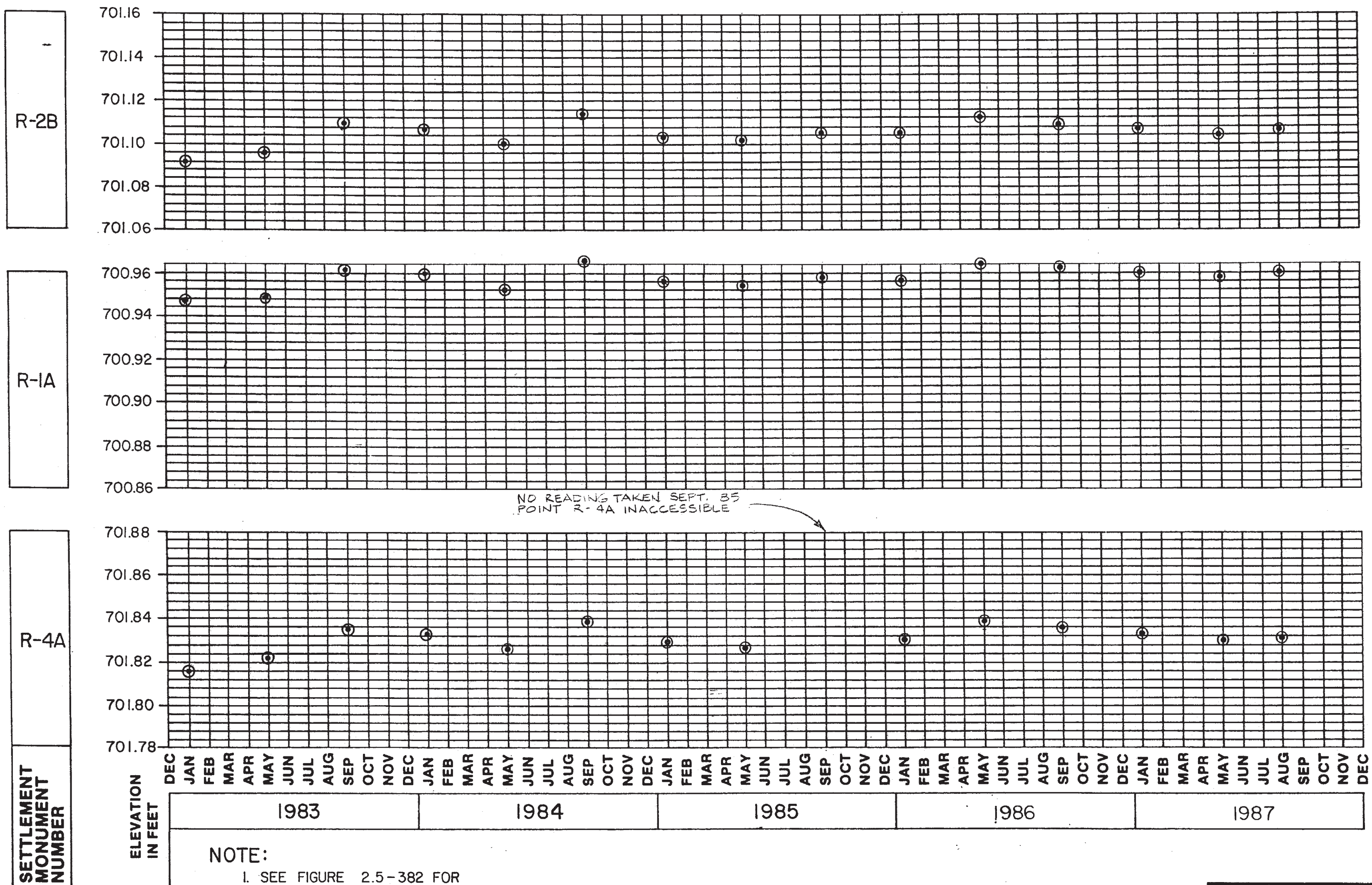
1. SEE FIGURE 2.5-382 FOR LOCATION OF MONUMENTS

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-438

MAIN PLANT
SETTLEMENT MEASUREMENTS

(SHEET 19 OF 20)



NOTE:

1. SEE FIGURE 2.5-382 FOR LOCATION OF MONUMENTS

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-438

MAIN PLANT SETTLEMENT MEASUREMENTS

(SHEET 20 OF 20)

BORING OW-18

SURFACE ELEVATION 656.5

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH: TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	SHEAR STRENGTH: TRIAXIAL COMPRESSION σ_3 psf	SHEAR STRENGTH: UNCONFINED COMPRESSION $\frac{q_u}{2}$ psf	ATTERBERG LIMITS: PLASTIC LIMIT %	ATTERBERG LIMITS: PLASTICITY INDEX %	FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE	BLOW COUNTS	SAMPLES	SYMBOLS	DESCRIPTIONS	ELEVATION (FEET)
0												SM	SLOPEWASH. Brown, fine sand and silt.	
5										10	SS	CL	FILL. Brown, silty clay, some fine to coarse sand, trace silt.	
10										6	SS	SW SM	SALT CREEK ALLUVIUM. Gray, fine to medium sand, trace silt.	
15										37	SS	ML	ILLINOIAN TILL. Gray, clayey silt and fine to medium sand, trace coarse sand and fine gravel.	
20														
25													BORING COMPLETED AT 15.0 FT. ON 7/16/79. WATER LEVEL AT 9.5 FT. ON 7/16/79.	
30													PIEZOMETER INSTALLED 7/16/79. PRESLOTTED SECTION 10.5 TO 14.5 FT. BENTONITE SEAL AT 5.0 TO 7.0 FT.	
35														
40														
45														
50														
55														
60														
65														
70														
75														

LOGGED BY: SARGENT & LUNDY

DRILLED BY: RAYMOND INTERNATIONAL

CLINTON POWER STATION

UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-439

LOG OF BORING OW-18

BORING OW-19

SURFACE ELEVATION 654.4

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH: TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	σ_3 psf	UNCONFINED COMPRESSION $\frac{q_u}{2}$ psf	ATTERBERG LIMITS: PLASTIC LIMIT %	PLASTICITY INDEX %	FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE	BLOW COUNTS	SAMPLES
0											
5										5	SS
10										6	SS
15										15	SS
20											
25											
30											
35											
40											
45											
50											
55											
60											
65											
70											
75											

SYMBOLS	DESCRIPTIONS
ML	SLOPEWASH. Brown, clay silt and fine to medium sand.
ML / CL	SALT CREEK ALLUVIUM. Black, clayey silt, trace fine sand.
SP / SM	6.0 ft., gray, fine to medium sand, trace silt.
SW / SM	9.5 ft., gray, fine to coarse sand, little fine gravel, trace silt.
ML	ILLINOIAN TILL. Gray, clayey silt, some fine to coarse sand, trace fine gravel.

BORING COMPLETED AT 18.5 FT. ON 7/16/79.
WATER LEVEL AT 6.0 FT. ON 7/16/79.

PIEZOMETER INSTALLED 7/16/79.
PRESLOTTED SECTION 8.0 TO 12.0 FT.
BENTONITE SEAL FROM 4.0 TO 6.0 FT.

ELEVATION (FEET)

LOGGED BY: SARGENT & LUNDY

DRILLED BY: RAYMOND INTERNATIONAL

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-440

LOG OF BORING OW-19

BORING OW-20

SURFACE ELEVATION 658.4

Tests reported elsewhere	Shear strength: Triaxial compression $\frac{\sigma_1+\sigma_3}{2}$ psf	σ_3 psf	Unconfined compression $\frac{Q_u}{2}$ psf	Atterberg limits: Plastic limit %	Plasticity index %	Moisture content %	Dry density PCF	Percent passing 200 sieve	Blow counts / Samples
									16 SS
									12 SS
									17 SS
									19 SS
GSD						14.1		0.39	44 SS
									116 SS
									100/5"

Depth (feet): 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75

ELEVATION (FEET)

SYMBOLS | DESCRIPTIONS

SM — SLOPEWASH.
Light brown, fine sand and silt.

CL — FILL.
Brown, silty clay, some fine to coarse sand, trace fine gravel.
3.5 ft., grades to gray.

ML — ILLINOIAN TILL.
Gray, clayey silt and fine to medium sand, trace coarse sand and fine gravel.

SP — 24.0 ft., gray, fine to medium sand, trace silt.

SW — 24.5 ft., gray, fine to coarse sand, little fine gravel, trace silt.

ML — 26.0 ft., gray, clayey silt and fine to medium sand, trace coarse sand and fine gravel.

BORING COMPLETED AT 34.4 FT. ON 7/17/79.
WATER TABLE ENCOUNTERED AT 24.0 FT. ON 7/17/79. ONE HOUR LATER WATER LEVEL AT 2.3 FT.

PIEZOMETER INSTALLED 7/17/79.
PRE-SLOTTED SECTION 22.5 TO 26.5 FT.
BENTONITE SEAL FROM 5.0 TO 10.0 FT.

LOGGED BY: SARGENT & LUNDY
DRILLED BY: RAYMOND INTERNATIONAL
TESTED BY: SOIL TESTING SERVICES

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-441

LOG OF BORING OW-20

BORING OW-21

SURFACE ELEVATION 670.0

Tests reported elsewhere	Shear strength: Triaxial compression $\frac{\sigma_1-\sigma_3}{2}$ psf	σ_3 psf	Unconfined compression $\frac{Q_u}{2}$ psf	Atterberg limits: Plastic limit %	Plasticity index %	Field moisture content %	Dry density pcf	Percent passing 200 sieve	Blow counts	Samples
			4500+*						15	SS
			4500+*						14	SS
			3000*						15	SS
			4500*						13	SS
			4500+*						11	SS
			4500+*						28	SS
			4500+*							
									101	SS
									144	SS
									104/4"	SS
			4500+*						118	SS
									100/6"	SS
									100/8"	SS
									124	SS

Depth (feet): 0–75

Symbols	Descriptions	Elevation (feet)
CL	FILL (TYPE A) Gray, silty clay, little fine to medium sand, trace coarse sand and fine gravel.	
ML	ILLINOIAN TILL Gray, clayey silt, some fine to medium sand, trace coarse sand and fine gravel. 35.0 feet, grades to clayey silt and fine to medium sand. 35.7 to 36.3 feet, gray, fine to medium sand, trace silt. 36.3 to 36.5 feet, gray, fine sand and silt. 36.5 to 37.2 feet, gray, fine to medium sand, little coarse sand, trace fine gravel and silt. 37.2 to 38.3 feet, gray, fine to coarse sand, trace silt and fine gravel. 38.3 to 38.5 feet, driller notes hard drilling. 38.5 to 38.7 feet, gray fine to medium sand, little silt. 38.7 to 39.0 feet, gray, fine sand and silt. 39.0 feet, dark gray, clayey silt and fine to medium sand, trace coarse sand and fine gravel. 43.5 feet, light gray, clayey silt, some fine to medium sand, trace coarse sand and fine gravel. 52.5 to 54.0 feet, gray, fine to coarse sand, trace silt and fine gravel. 54.0 feet, gray, clayey silt, some fine to medium sand, trace coarse sand and fine gravel.	641.5

BORING COMPLETED AT 56.5 FEET ON 10/8/79.

WATER LEVEL ENCOUNTERED AT 35.7 FEET ON 10/8/79.

WATER LEVEL AT 6.2 FEET ON 10/11/79.

PIEZOMETER INSTALLED ON 10/8/79. A 2 INCH PVC PIPE WITH A 2 FOOT PRE-SLOTTED SCREEN ATTACHED TO A 7 FOOT PERFORATED LOWER SECTION WITH THE END PLUGGED WAS PLACED AT ELEVATION 615; GRANULAR FILL WAS PLACED FROM ELEVATION 615 TO 665; BENTONITE SEAL FROM ELEVATION 665 TO 657; AND GROUT FROM ELEVATION 667 TO 670.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-442

LOG OF BORING OW-21

BORING OW-22

SURFACE ELEVATION 665.9

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH: TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	σ_3 psf	UNCONFINED COMPRESSION $\frac{q_u}{2}$ psf	ATTERBERG LIMITS: PLASTIC LIMIT %	PLASTICITY INDEX %	FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE	BLOW COUNTS SAMPLES
0										
5										10 SS
10										11 SS
15										28 SS
20										28 SS
25										59 SS 68 SS
30										48 SS
35										100/7"SS
40										160 SS
45				4500*						100/5"SS
50										
55										
60										
65										
70										
75										

SYMBOLS		DESCRIPTIONS	ELEVATION (FEET)
	SW SM	WISCONSINAN TILL (OUTWASH DEPOSIT) Brown, fine to medium sand, trace silt. Brown, fine to coarse sand, trace silt, little fine gravel. 14.5 feet, some fine to coarse gravel.	
	ML	ILLINOIAN TILL Brown, clayey silt to silty clay, some fine to coarse sand, trace silt 24.5 to 34.0 feet, driller noted hard (till) and soft (sand) seams.	645.9
	SM	24.5 to 25.0 feet, gray, fine to coarse sand, trace fine gravel and silt. 25.0 to 25.8 feet, gray, clayey silt, some fine to coarse sand, trace fine gravel. 25.8 to 27.0 feet, gray, fine to coarse sand, trace silt.	
	ML	27.0 feet, gray, clayey silt, some fine to medium sand, trace fine gravel, 1 inch fine to coarse sand seams noted. 28.3 feet, 8 inch cobble noted. 29.0 to 30.0 feet, gray, fine to medium sand, trace silt, clayey silt layers noted. 30.0 feet, gray, clayey silt, some fine to coarse sand, trace fine gravel. 33.0 to 34.0 feet, driller noted sand seam. 34.5 feet, 1 inch fine to coarse sand and silt seam noted.	

BORING COMPLETED AT 45.5 FEET ON 10/9/79.

WATER LEVELS ENCOUNTERED AT 13.5 FEET AND 24.5 FEET ON 10/9/79.

WATER LEVEL AT 11.0 AND 6.2 FEET ON 10/11/79.

TWO PIEZOMETERS (OW-22A AND 22B) WERE INSTALLED IN BORE HOLE ON 10/9/79. OW-22A CONSISTED OF A 2 INCH PVC PIPE WITH A 2 FOOT PRE-SLOTTED SECTION ATTACHED TO A 7 FOOT PERFORATED LOWER SECTION WITH THE END OF THE LOWER SECTION PLUGGED WAS PLACED AT ELEVATION 621.4; GRANULAR FILL WAS PLACED FROM ELEVATION 621.4 TO 642.9; AND A BENTONITE SEAL FROM ELEVATION 642.9 TO 645.9. OW-22B CONSISTED OF A 2 INCH PVC PIPE WITH THE LOWER 7 FEET PERFORATED AND THE LOWER END PLUGGED WAS PLACED AT ELEVATION 645.9; GRANULAR FILL WAS PLACED FROM ELEVATION 645.9 TO 660.4; BENTONITE SEAL FROM ELEVATION 660.4 TO 663.9; AND GROUT FROM ELEVATION 663.9 TO 665.9.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-443

LOG OF BORING OW-22

BORING OW-23

SURFACE ELEVATION 654.5

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH: TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	σ_3 psf	UNCONFINED COMPRESSION $\frac{Q_u}{2}$ psf	ATTERBERG LIMITS: PLASTIC LIMIT %	PLASTICITY INDEX %	FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE	BLOW COUNTS	SAMPLES
5				2750*						9	SS
10				2500*						14	SS
15				4000*						10	SS
20										—	SS
25										92	SS
30				4500+*						100/3"	SS
35				4500+*						120/6"	SS
40											
45											
50											
55											
60											
65											
70											
75											

SYMBOLS	DESCRIPTIONS	ELEVATION (FEET)
CL	FILL (TYPE A) Brown, silty clay, little fine to medium sand, trace fine gravel and coarse sand. 8.5 feet, grades to brown and gray. 13.5 feet, grades to gray.	
SW SM	ILLINOIAN TILL Gray, fine to coarse sand and fine gravel, coarse gravel noted, trace silt. 19.5 feet, rock wedged in split spoon. 19.5 to 22.5 feet, driller notes 2 to 6 inch sand seams.	637.5
ML	Dark gray, clayey silt, some fine to medium sand, trace coarse sand and fine gravel. 30.2 feet, coarse gravel in split spoon tip.	

BORING COMPLETED AT 35.0 FEET ON 10/10/79.

WATER LEVEL ENCOUNTERED AT 17.0 FEET ON 10/10/79.

WATER LEVEL AT 3.9 FEET AFTER APPROXIMATELY 10 MINUTES

WATER LEVEL AT 1.0 FOOT ON 10/11/79.

PIEZOMETER INSTALLED ON 10/10/79. A 2 INCH PVC PIPE WITH A 2-FOOT PRE-SLOTTED SECTION ATTACHED TO A 7 FOOT PERFORATED LOWER SECTION WITH THE END PLUGGED WAS PLACED AT ELEVATION 620.0; GRANULAR FILL WAS PLACED FROM ELEVATION 620.0 TO 649.5; BENTONITE SEAL FROM ELEVATION 649.5 TO 651.5; AND GROUT FROM ELEVATION 651.5 TO 654.5.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-444

LOG OF BORING OW-23

BORING OW-24

SURFACE ELEVATION 654.9

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH: TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	σ_3 psf	UNCONFINED COMPRESSION $\frac{q_u}{2}$ psf	ATTERBERG LIMITS: PLASTIC LIMIT %	PLASTICITY INDEX %	FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE	BLOW COUNT	SAMPLES
5				1500*						4	SS
10				2750*						8	SS
15				1000*						5	SS
				4500*						19	SS
20										72	SS
										66	SS
25										100/5"	SS
30										85/6"	SS
35										100/6"	SS

SYMBOLS	DESCRIPTIONS	ELEVATION (FEET)
CL	FILL (TYPE A)	
	Gray, silty clay, little fine to medium sand, trace coarse sand and fine gravel.	
	8.5 feet, grades to brown.	
	13.5 feet, pockets of organics noted in tip of spoon.	
ML	ILLINOIAN TILL	643.4
	Gray, clayey silt, some fine to medium sand, trace coarse sand and fine gravel.	
	19.5 feet, gravel noted in spoon.	
	20.5 to 22.0 feet, gray, fine to medium sand, coarse sand seams noted, trace silt.	
	22.0 to 22.3 feet, gray, silt.	
	22.3 to 22.9 feet, gray, clayey silt, some fine to medium sand, trace coarse sand and fine gravel.	
SW SM	22.9 to 23.1 feet, driller noted sand lense.	
	24.0 to 24.3 feet, gray, fine to coarse sand, trace silt.	
ML	29.0 to 29.3 feet, gray, fine to coarse sand, some fine gravel, trace coarse gravel and silt.	
	29.3 to 29.4 feet, gray, clayey silt, some fine to coarse sand, trace fine gravel.	
	29.4 to 29.6 feet, gray, silt.	
	29.6 to 30.0 feet, gray, clayey silt, some fine to medium sand.	
	30.0 to 30.1 feet, gray, fine to coarse sand, trace silt and fine gravel.	
	30.1 feet, gray, clayey silt, some fine to coarse sand, trace fine gravel.	

BORING COMPLETED AT 34.5 FEET ON 10/11/79.

WATER LEVEL ENCOUNTERED AT 20.5 FEET. WATER LEVEL AT 2.4 FEET AFTER APPROXIMATELY 30 MINUTES AND AT 3.2 FEET ABOVE GROUND SURFACE AFTER APPROXIMATELY 4.5 HOURS.

PIEZOMETER INSTALLED ON 10/11/79. A 2 INCH PVC PIPE WITH THE LOWER 13.5 FEET PERFORATED AND THE LOWER END PLUGGED WAS PLACED AT ELEVATION 620.9; GRANULAR FILL WAS PLACED FROM ELEVATION 620.9 TO 649.9; BENTONITE SEAL FROM ELEVATION 649.9 TO 651.9; AND GROUT FROM ELEVATION 651.9 TO 654.9.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-445

LOG OF BORING OW-24

BORING RW-1

SURFACE ELEVATION 658.2

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH: TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	σ_3 psf	UNCONFINED COMPRESSION $\frac{q_u}{2}$ psf	ATTERBERG LIMITS: PLASTIC LIMIT %	PLASTICITY INDEX %	FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE	BLOW COUNTS SAMPLES
5				4500+*						20 SS
10										10 SS
15										17 SS
20				4000*						15 SS
										53 SS
25										80 SS
				4250*						100/9"SS
30				4500+*						167/11"SS
35				4500+*						75/½"SS
40				4500+*						100/7"SS
45				4500+*						100/6"SS

SYMBOLS	DESCRIPTIONS	ELEVATION (FEET)
SM	SLOPEWASH Brown, fine sand and silt, very loose, dry.	
CL	FILL (TYPE A) Gray, silty clay, some fine to coarse sand, trace fine gravel. 12.5 feet, 4 inch cobble noted. 13.5 feet, grades to brown. 18.5 feet, grades to gray.	656.7
ML	ILLINOIAN TILL Gray, clayey silt and fine to medium sand, trace coarse sand and fine gravel.	636.7
SW SM	Gray, fine to medium sand, little coarse sand, trace silt. 25.0 to 25.4 feet, gray fine to coarse sand, trace silt.	
ML	25.4 feet, 4 inch, silt and fine sand seam. 25.7 feet, 4 inch seam of gray clayey silt and fine to medium sand, trace fine gravel. 26.0 feet, 2 inch seam of gray, fine sand, some silt. 26.2 feet, cobble noted. Gray, clayey silt, some fine to medium sand, trace fine gravel and coarse sand. 34.0 feet, cobble noted.	

BORING COMPLETED AT 44.0 FEET ON 10/1/79.

WATER LEVEL ENCOUNTERED AT 24.0 FEET ON 10/1/79.

WATER LEVEL AT 1.3 FEET ABOVE GROUND SURFACE ON 10/11/79.

PIEZOMETER INSTALLED ON 10/2/79. A 2 INCH PVC PIPE WITH A 4 FOOT WIRE-WOUND SCREENED SECTION ATTACHED 10 FEET ABOVE THE BOTTOM AND THE LOWER END OF THE PIPE PLUGGED WAS PLACED AT ELEVATION 614.7; GRANULAR BACK-FILL WAS PLACED FROM ELEVATION 614.7 TO 655.2; BENTONITE SEAL FROM ELEVATION 655.2 TO 657.2; AND GROUT FROM ELEVATION 657.2 TO 658.2.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-446

LOG OF BORING RW-1

BORING RW-2

SURFACE ELEVATION 656.9

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH: TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	σ_3 psf	UNCONFINED COMPRESSION $\frac{q_u}{2}$ psf	ATTERBERG LIMITS: PLASTIC LIMIT %	PLASTICITY INDEX %	FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE	BLOW COUNTS	SAMPLES
0											
				1500*							
5				3500*						9	SS
10				3500*						12	SS
15				4500+*						14	SS
20				4500+*						18	SS
										14	SS
25										156	SS
30				4500+*						100	SS
35										150/10"	SS
40				4500+*						100/10"	SS
45										100/9"	SS
50											
55											
60											
65											
70											
75											

SYMBOLS	DESCRIPTIONS	ELEVATION (FEET)
	FILL (TYPE A)	
CL	Gray, silty clay, some fine to coarse sand, trace fine gravel.	
ML	Brown, clayey silt and fine to medium sand, trace coarse sand and fine gravel. 18.0 feet, 2 inches of coarse gravel noted. 18.5 feet, grades to gray. 20.0 feet, driller notes easy drilling.	
	ILLINOIAN TILL	635.4
ML	Light gray, clayey silt and fine to coarse sand, trace fine gravel. 22.3 feet, 3 inch gravel layer noted.	
SW	22.5 feet, gray fine to medium sand, trace silt.	
SM to SM	23.3 feet, gray fine sand and silt. 23.7 feet, 1 inch seam, gray, fine to medium sand. 23.8 feet, gray fine sand and silt.	
ML	24.0 feet, gray clayey silt and fine to medium sand, trace coarse sand and fine gravel 28.5 feet, dark gray, clayey silt, some fine to medium sand, trace coarse sand and fine gravel.	

BORING COMPLETED AT 44.8 FEET. ON 10/2/79.
WATER LEVEL ENCOUNTERED AT 22.3 FEET ON 10/2/79.
WATER LEVEL AT 2.4 FEET ABOVE GROUND SURFACE ON 10/11/79.

PIEZOMETER INSTALLED ON 10/2/79. A 2 INCH PVC PIPE WITH A 4 FOOT WIRE-WOUND SCREENED SECTION ATTACHED 1o FEET ABOVE THE BOTTOM AND THE LOWER END OF THE PIPE PLUGGED AT ELEVATION 613.4; GRANULAR BACKFILL WAS PLACED FROM ELEVATION 613.4 TO 653.9; BENTONITE SEAL FROM ELEVATION 653.9 TO 655.9; AND GROUT FROM ELEVATION 655.9 TO 656.9.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-447

LOG OF BORING RW-2

BORING RW-3

SURFACE ELEVATION 655.8

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH: TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	SHEAR STRENGTH: TRIAXIAL COMPRESSION σ_3 psf	SHEAR STRENGTH: UNCONFINED COMPRESSION $\frac{q_u}{2}$ psf	ATTERBERG LIMITS: PLASTIC LIMIT %	ATTERBERG LIMITS: PLASTICITY INDEX %	FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE	BLOW COUNTS	SAMPLES
5				2500*						7	SS
10										12	SS
15				2750* 2000*						9	SS
20				4500*+						15	SS
										101	SS
25				4500*+						172	SS
30				4500*+						125	SS
35				4500*+						100/6"	SS
40				4500*+						100/7"	SS
45				4500*+						141	SS

Depth scale: 0 to 75 feet.

SYMBOLS	DESCRIPTIONS	ELEVATION (FEET)
ML CL	Dark gray, clayey silt to silt.	
	8.5 feet, brown, silty clay mixed with dark gray, clayey silt.	
CL	Gray, silty clay, some fine to medium sand, trace coarse sand and fine gravel.	
SC	Brown, clayey fine to medium sand, trace coarse sand.	
ML SM	ILLINOIAN TILL Gray, fine to medium sand and clayey silt.	637.0
ML	19.8 feet, gray, clayey silt, some fine to medium sand, trace coarse sand and fine gravel. 21.0 to 21.3 feet, fine to coarse gravel noted by driller.	
SM to SW - SM	21.3 feet, gray, fine sand and silt. 22.0 feet, gray, fine to medium sand, little silt. 22.5 feet, gray, fine sand and silt. 22.7 feet, gray, fine to medium sand and silt, little coarse sand, trace fine gravel. 23.9 feet, gray, fine to medium sand, little coarse sand, trace fine gravel and silt. 24.5 feet, gray, fine sand and silt.	
ML	24.8 feet, gray, clayey silt, some fine to medium sand, trace fine gravel and coarse sand. 32.0 feet, driller noted 6 inch sand seam.	

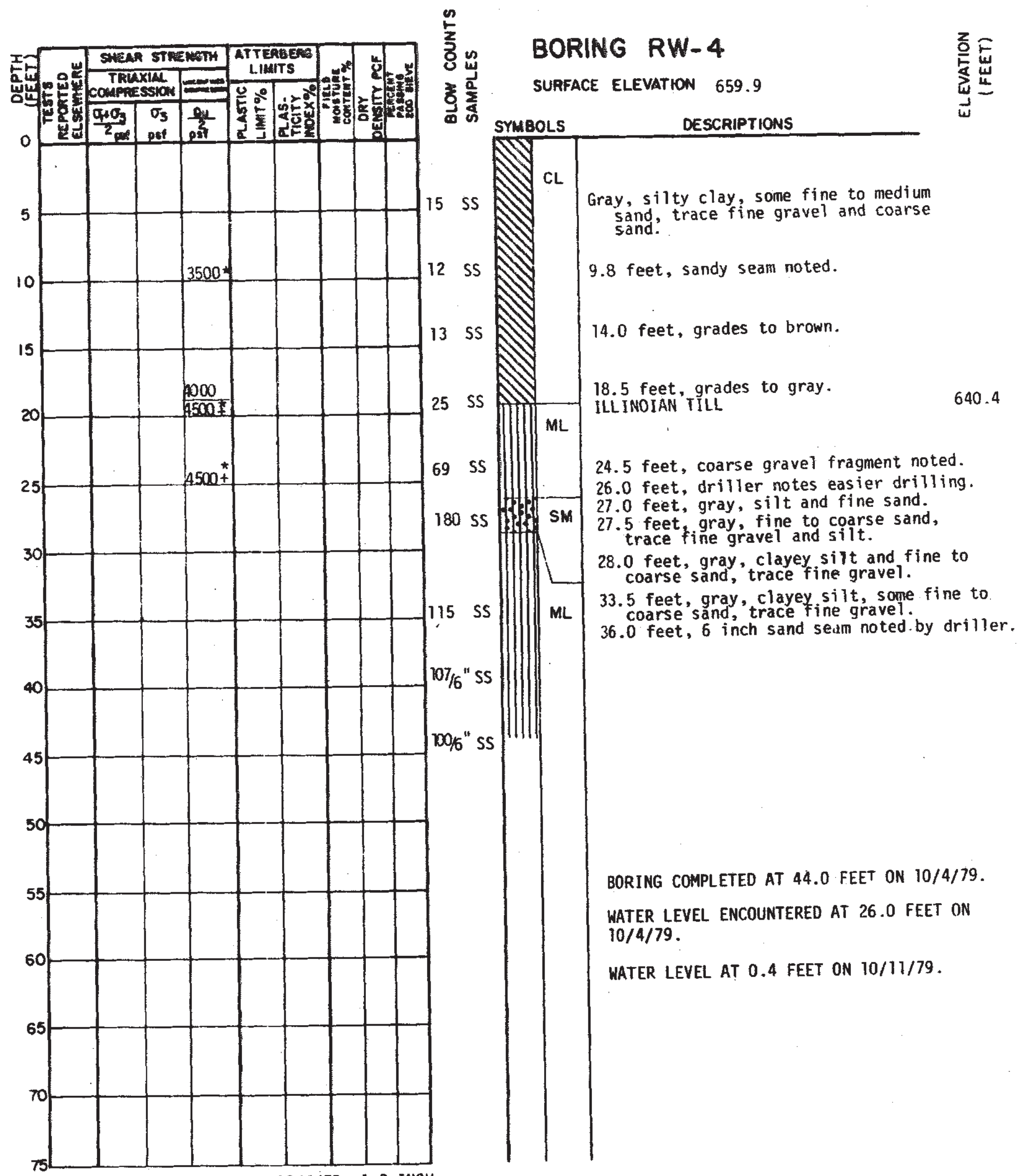
BORING COMPLETED AT 45.0 FEET ON 10/3/79.
WATER LEVEL ENCOUNTERED AT 21.0 FEET ON 10/3/79.
WATER LEVEL AT 2.8 FEET ABOVE SURFACE ON 10/11/79.

PIEZOMETER INSTALLED ON 10/3/79. A 2 INCH PVC PIPE WITH A 4 FOOT WIRE-WOUND SCREENED SECTION ATTACHED 10 FEET ABOVE THE BOTTOM AND THE LOWER END OF THE PIPE PLUGGED WAS PLACED AT ELEVATION 612.3.; GRANULAR BACKFILL WAS PLACED FROM ELEVATION 612.3 TO 652.8; BENTONITE SEAL FROM ELEVATION 652.8 TO 654.8; AND GROUT FROM ELEVATION 654.8 TO 655.8.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-448

LOG OF BORING RW-3



PIEZOMETER INSTALLED ON 10/4/79. A 2 INCH PVC PIPE WITH A 4 FOOT WIRE-WOUND SCREENED SECTION ATTACHED 10 FEET ABOVE THE BOTTOM AND THE LOWER END OF THE PIPE PLUGGED WAS PLACED AT ELEVATION 616.4; GRANULAR BACKFILL WAS PLACED FROM ELEVATION 616.4 TO 656.9; BENTONITE SEAL FROM ELEVATION 658.9 TO 658.9; AND GROUT FROM ELEVATION 658.9 TO 659.9.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-449

LOG OF BORING RW-4

BORING RW-5

SURFACE ELEVATION 662.8

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH – TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	SHEAR STRENGTH – TRIAXIAL COMPRESSION σ_3 psf	SHEAR STRENGTH – UNCONFINED COMPRESSION $\frac{q_u}{2}$ psf	ATTERBERG LIMITS – PLASTIC LIMIT %	ATTERBERG LIMITS – PLASTICITY INDEX %	FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE	BLOW COUNTS	SAMPLES
										17	SS
				3000*						11	SS
										12	SS
				1500*						9	SS
				4500+*						28	SS
										108	SS
				4500+*						110/6"	SS
				4500+*						152	
				4500+*						100/8"	SS
				4500+*						100/7"	SS

SYMBOLS	DESCRIPTIONS	ELEVATION (FEET)
CL	FILL (TYPE A) Gray and brown, silty clay, some fine to medium sand, trace coarse sand and fine gravel. 17.0 feet, driller noted easy drilling.	
ML	ILLINOIAN TILL Light gray, clayey silt to silty clay, some fine to coarse sand, trace fine gravel.	641.3
SM	28.0 feet, gray, fine to medium sand, trace silt, driller noted gravel just above sample. 29.0 to 29.2 feet, gray, silt and fine sand. 29.2 to 30.3 feet, gray, fine to medium sand, trace silt. 30.3 to 30.8 feet, gray, fine to coarse sand trace silt.	
ML	30.8 feet, gray, clayey silt, some fine to coarse sand, trace fine gravel. 33.5 feet, grades to trace coarse sand and fine gravel.	

BORING COMPLETED AT 44.1 FEET ON 10/5/79.

WATER LEVEL ENCOUNTERED AT 28.0 FEET ON 10/5/79.

WATER LEVEL AT 3.2 FEET ON 10/11/79.

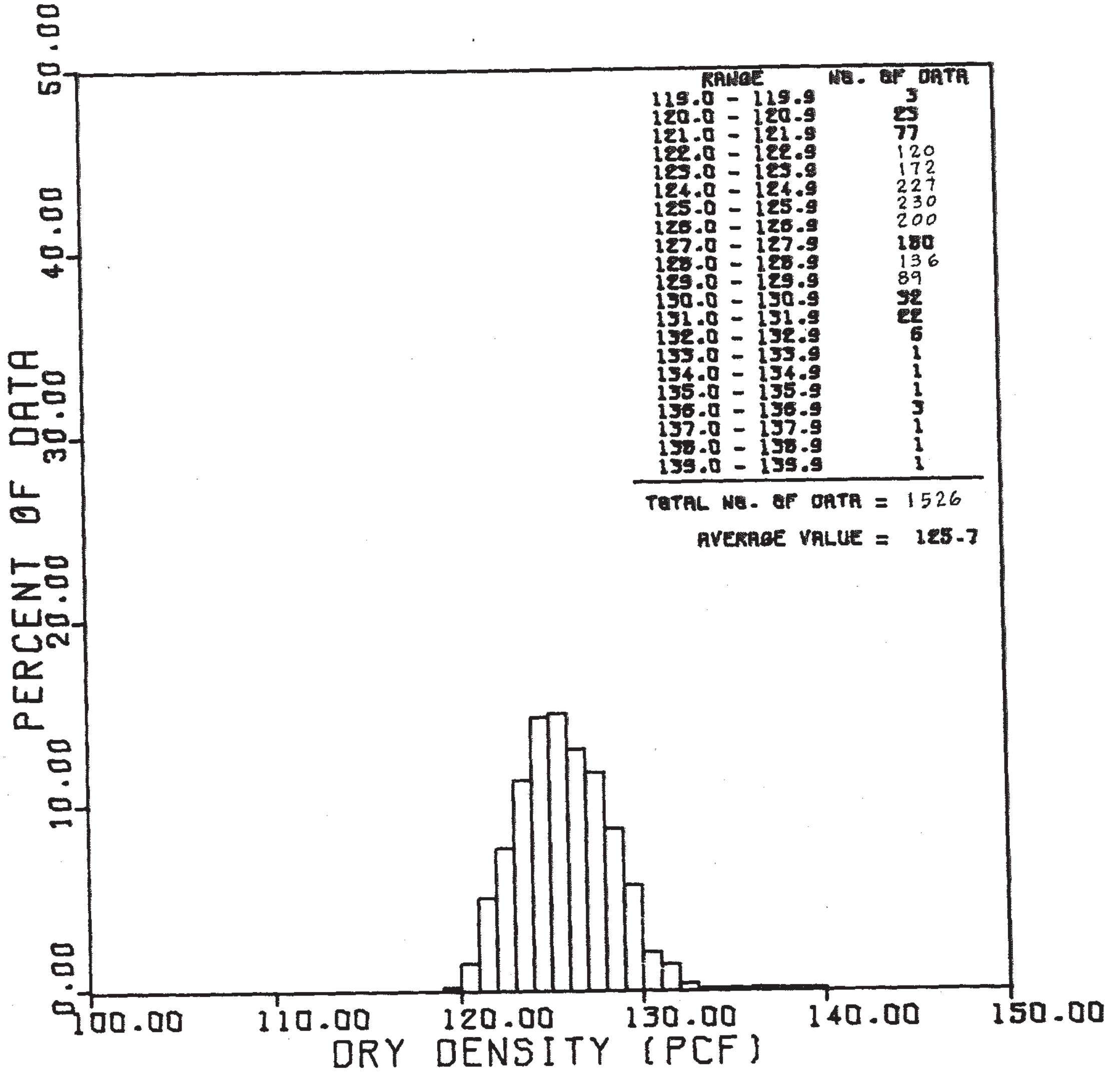
PIEZOMETER INSTALLED ON 10/5/79. A 2 INCH PVC PIPE WITH A 4 FOOT WIRE-WOUND SCREENED SECTION ATTACHED 10 FEET ABOVE THE BOTTOM AND THE LOWER END OF THE PIPE PLUGGED WAS PLACED AT ELEVATION 619.3; GRANULAR BACKFILL WAS PLACED FROM ELEVATION 619.3 TO 659.8; BENTONITE SEAL FROM ELEVATION 659.8 TO 661.8; AND GROUT FROM ELEVATION 661.8 TO 662.8.

CLINTON POWER STATION

UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-450

LOG OF BORING RW-5

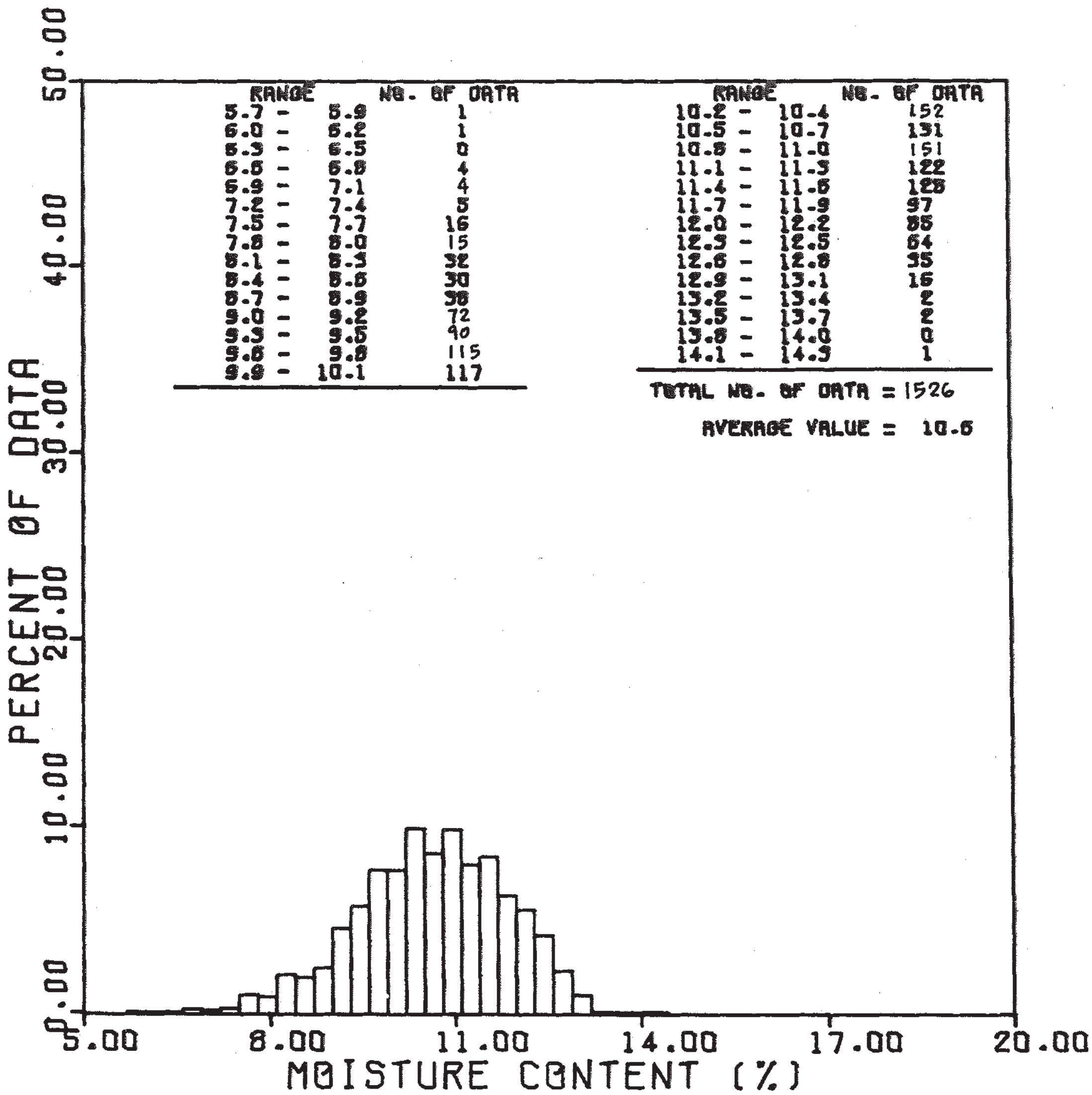


CLINTON STATION IN-PLACE TEST
SUBMERGED DAM
ELEVATION FROM 645.0 TO 673.99

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-451

UHS DAM TYPE A COHESIVE FILL
DISTRIBUTION OF DRY DENSITY

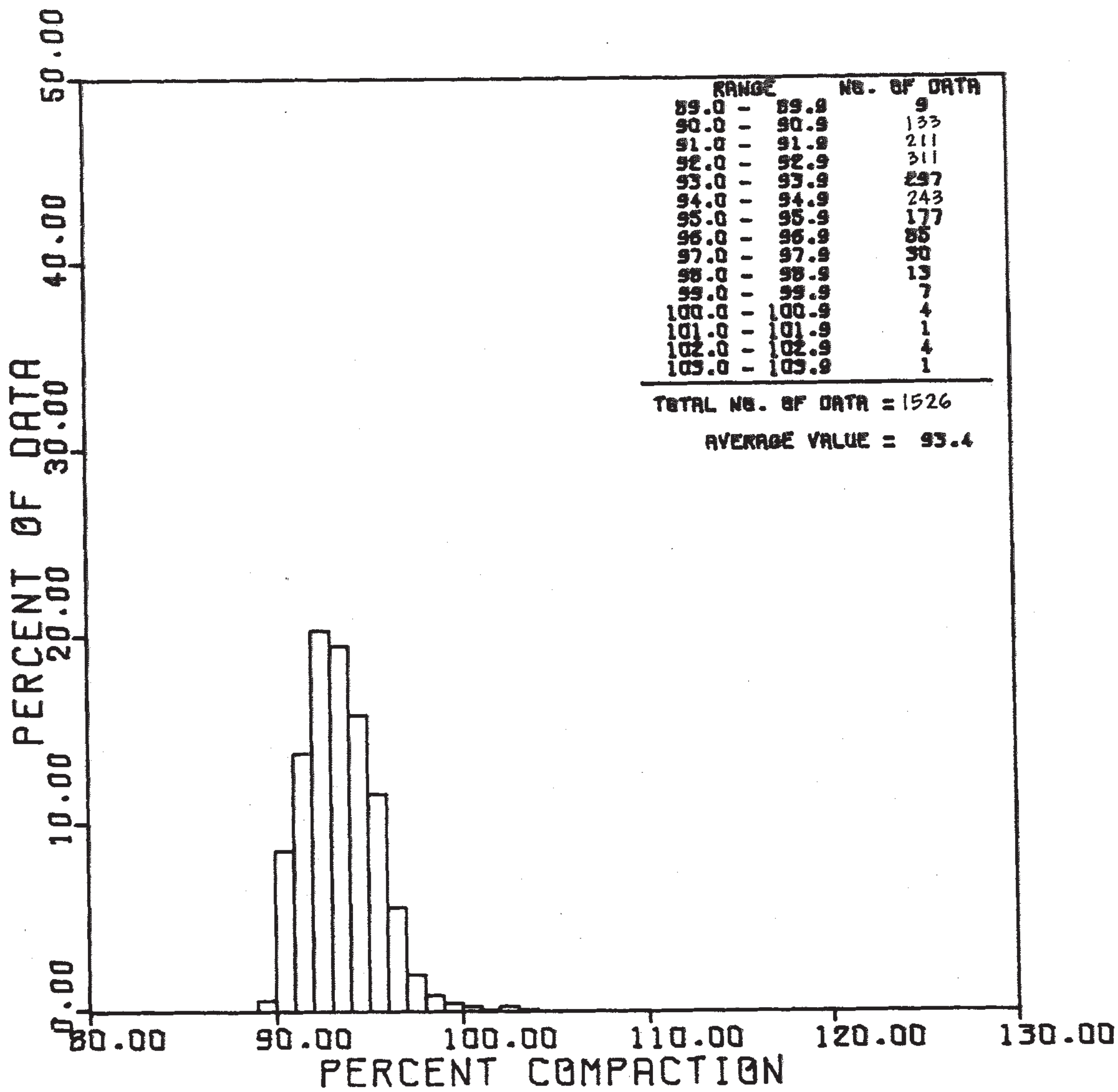


CLINTON STATION IN-PLACE TEST
SUBMERGED DAM
ELEVATION FROM 645.0 TO 673.99

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-452

UHS DAM TYPE A COHESIVE FILL
DISTRIBUTION OF MOISTURE CONTENT

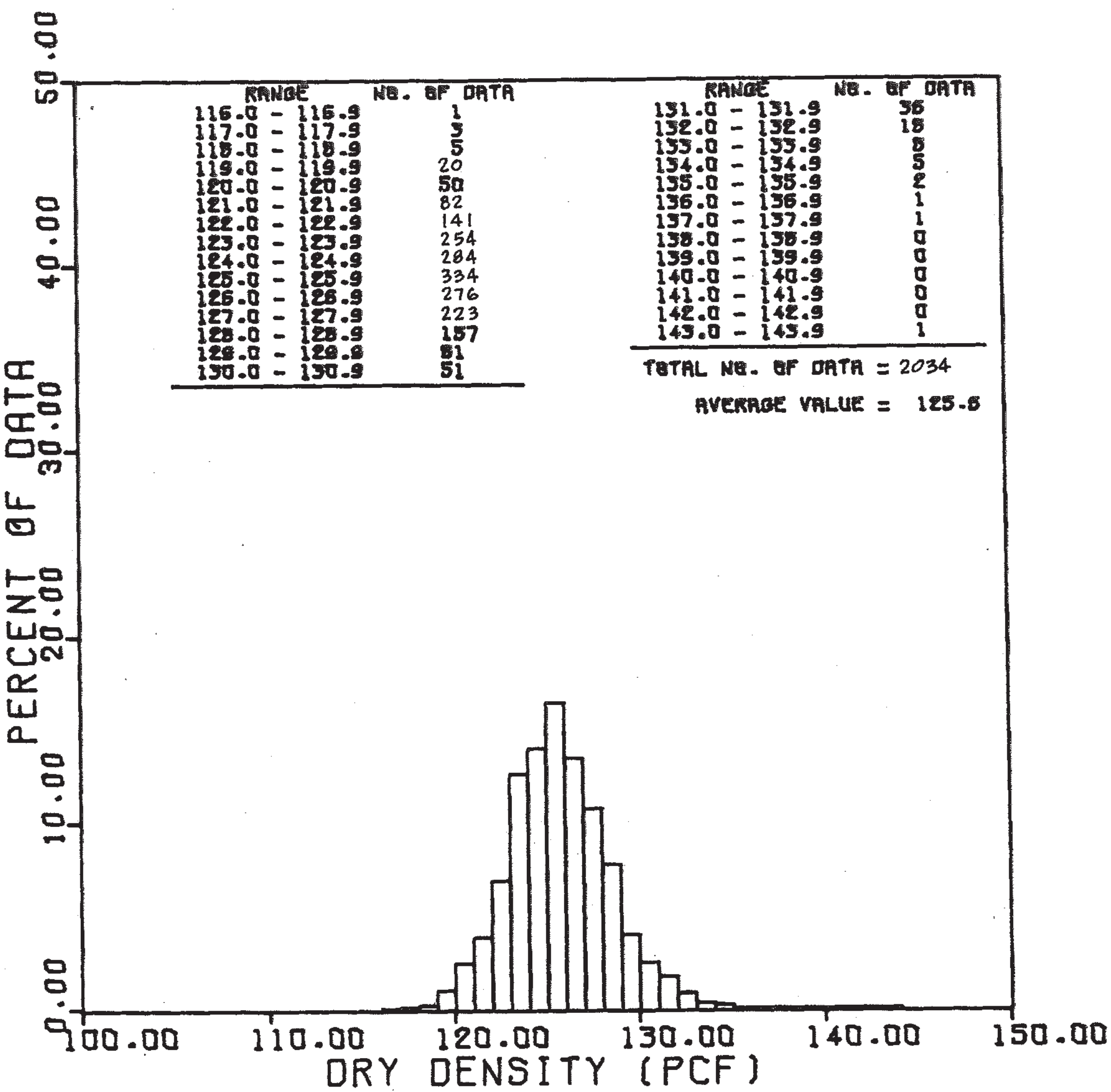


CLINTØN STATIØN IN-PLACE TEST
SUBMERGED DAM
ELEVATIØN FRØM 645.0 TØ 673.99

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-453

UHS DAM TYPE A COHESIVE FILL
DISTRIBUTION OF PERCENT COMPACTION

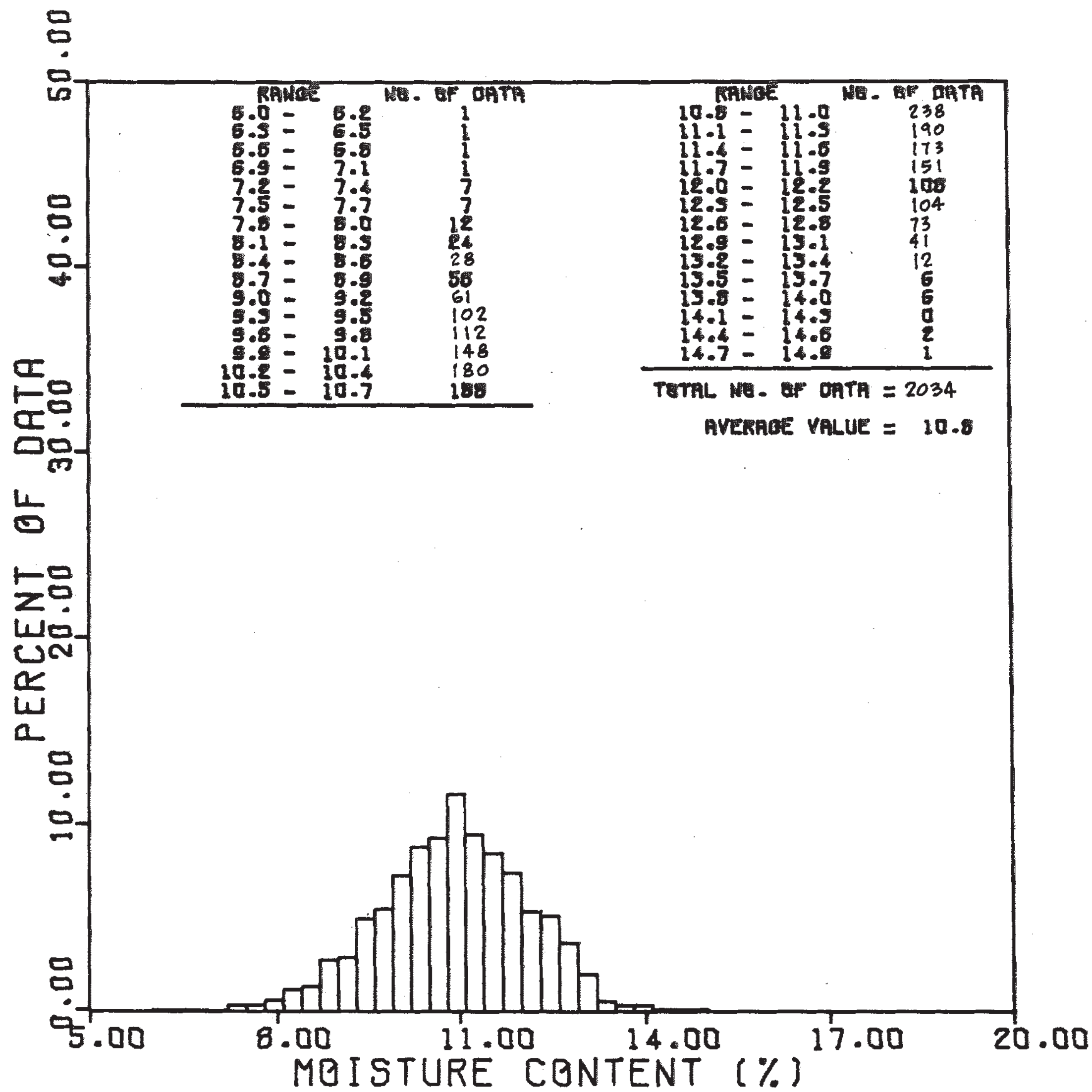


CLINTON STATION IN-PLACE TEST
BAFFLE DIKE
ELEVATION FROM 649.0 TO 699.99

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

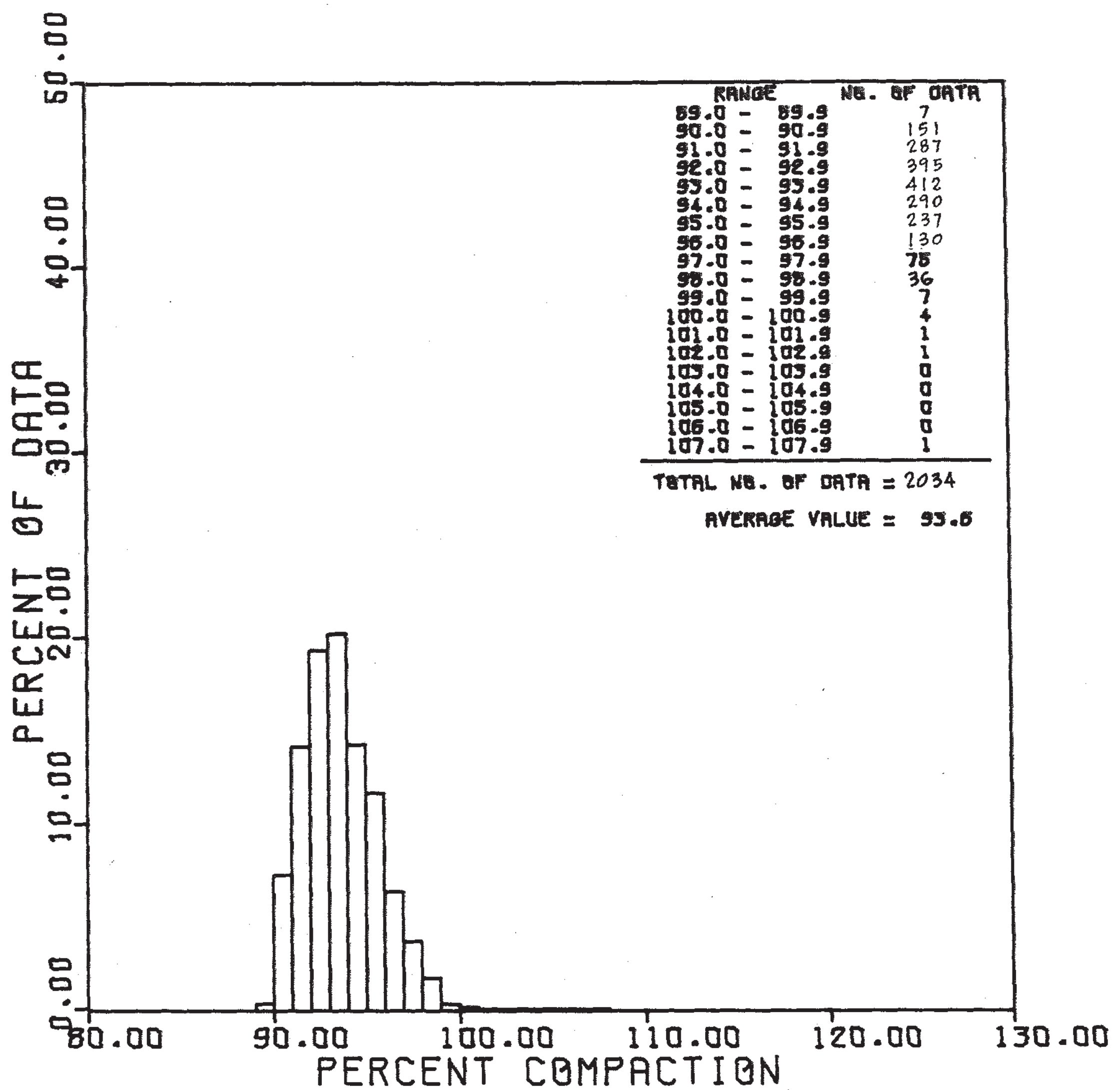
FIGURE 2.5-454

UHS BAFFLE DIKE TYPE A COHESIVE
FILL DISTRIBUTION OF DRY DENSITY



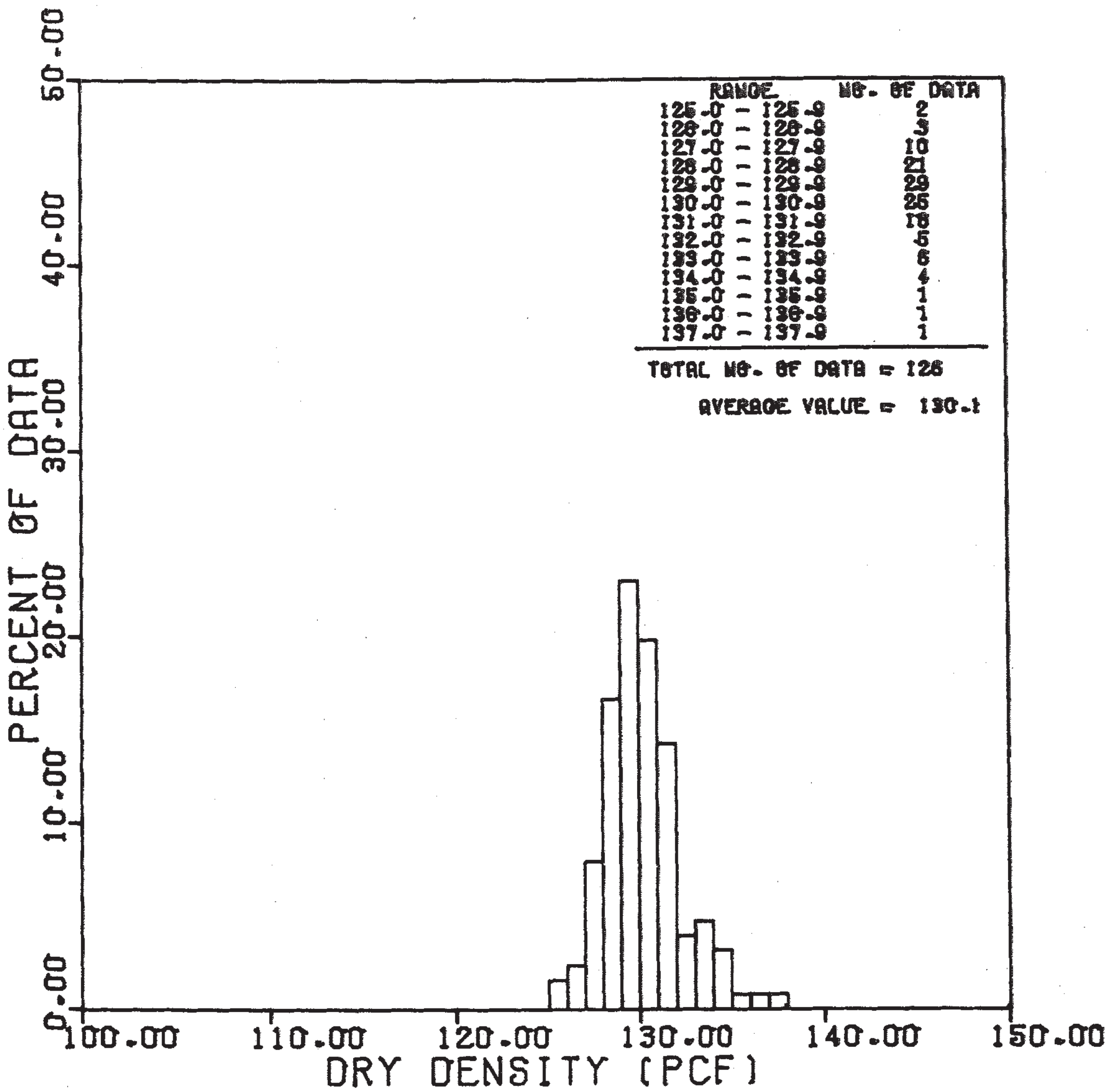
CLINTON STATION IN-PLACE TEST
BAFFLE DIKE
ELEVATION FROM 649.0 TO 699.99

CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT
FIGURE 2.5-455 UHS BAFFLE DIKE TYPE A COHESIVE FILL DISTRIBUTION OF MOISTURE CONTENT



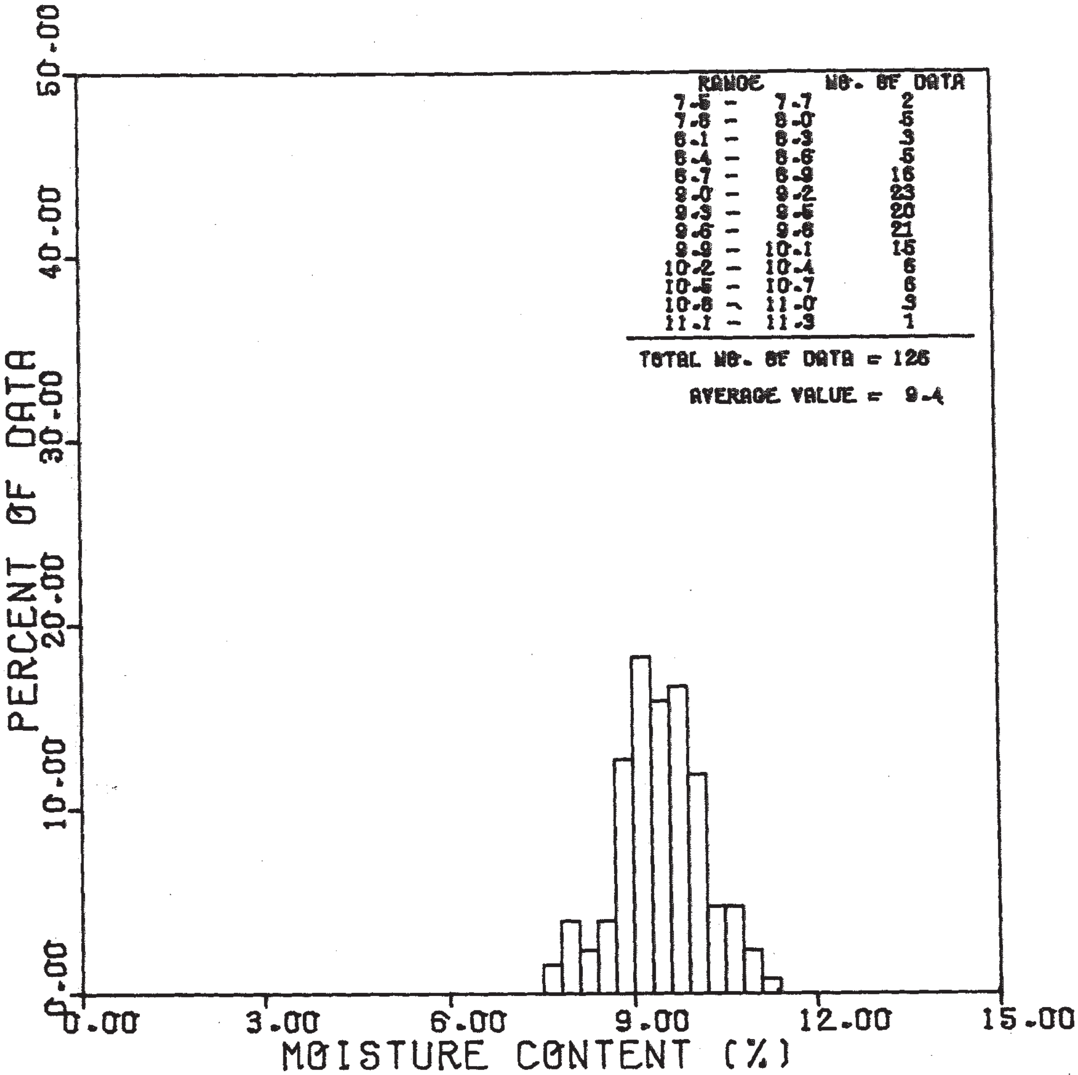
CLINTON STATION IN-PLACE TEST
BAFFLE DIKE
ELEVATION FROM 649.0 TO 699.99

CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT
FIGURE 2.5-456 UHS BAFFLE DIKE TYPE A COHESIVE FILL DISTRIBUTION OF PERCENT COMPACTION



CLINTON STATION IN-PLACE TEST
BAFFLE DIKE - SOIL CEMENT
ELEVATION FROM 673.0 TO 676.99

CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT
FIGURE 2.5-457 UHS BAFFLE DIKE SOIL CEMENT SLOPE PROTECTION DISTRIBUTION OF DRY DENSITY

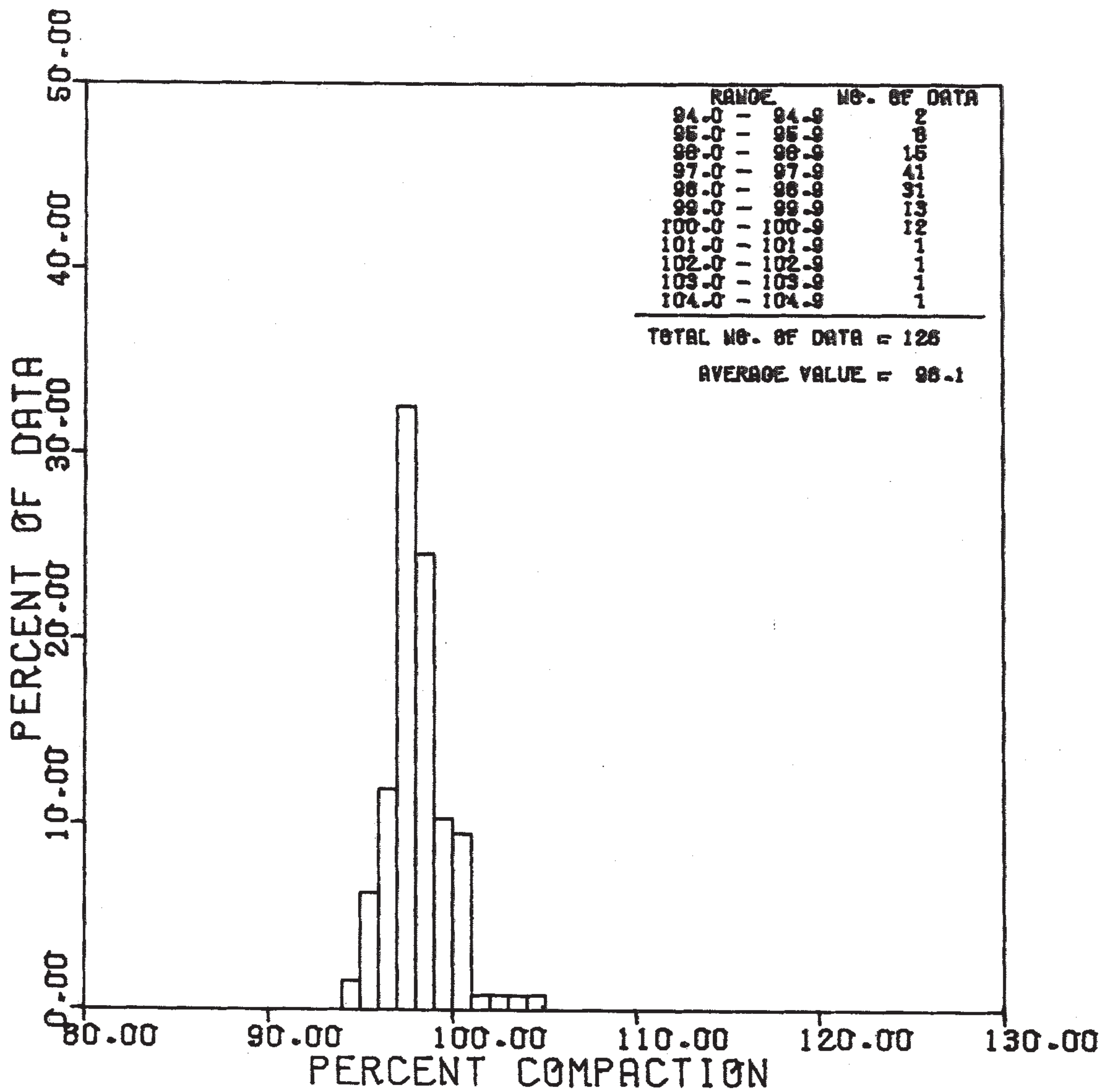


CLINTON STATION IN-PLACE TEST
BAFFLE DIKE - SOIL CEMENT
ELEVATION FROM 673.0 TO 676.99

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-458

UHS BAFFLE DIKE SOIL CEMENT
SLOPE PROTECTION DISTRIBUTION
OF MOISTURE CONTENT

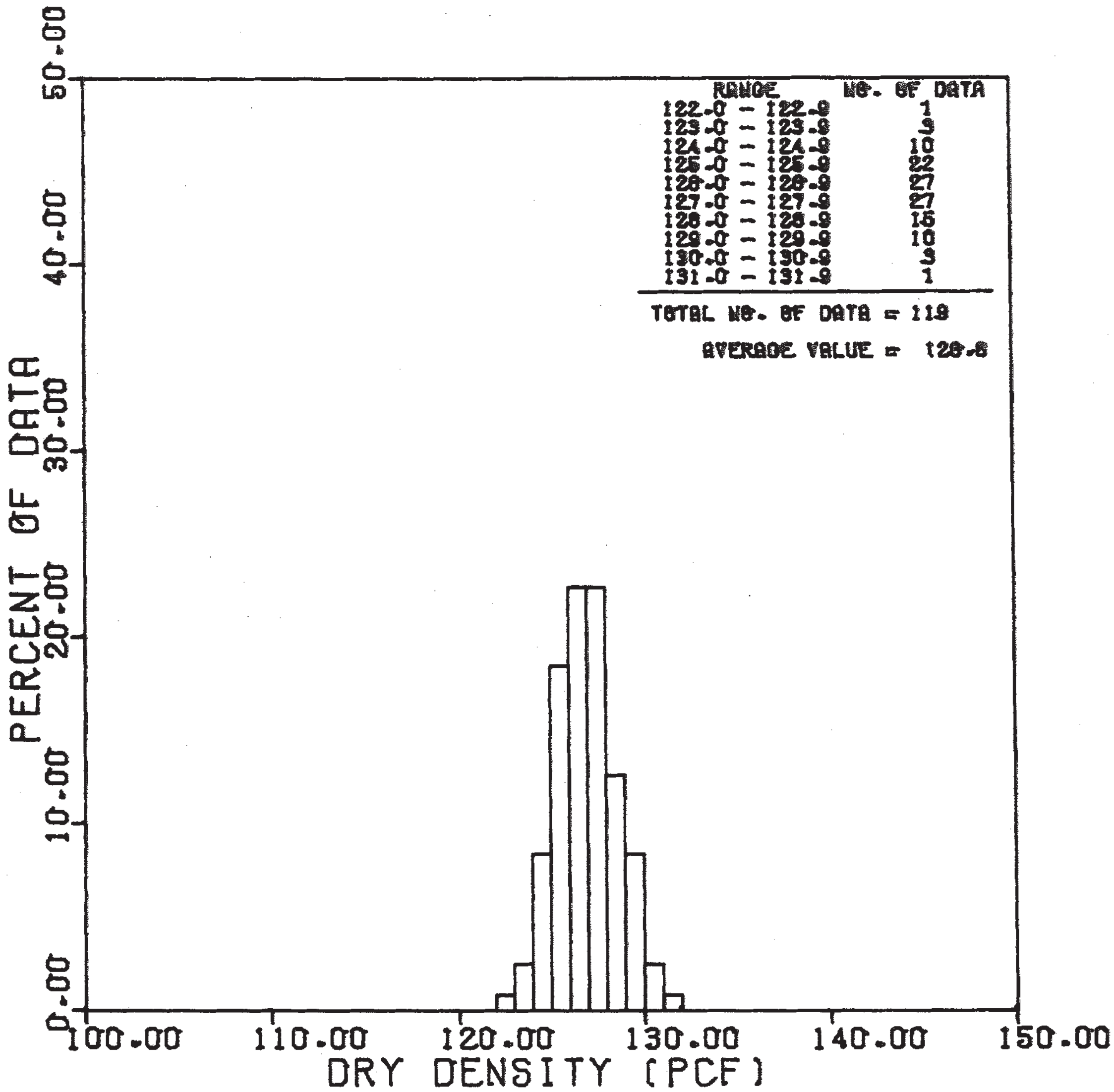


CLINTON STATION IN-PLACE TEST
BAFFLE DIKE - SOIL CEMENT
ELEVATION FROM 673.0 TO 676.99

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-459

UHS BAFFLE DIKE SOIL CEMENT
SLOPE PROTECTION DISTRIBUTION
OF PERCENT COMPACTION



CLINTON STATION IN-PLACE TEST
SOUTH DAM USDSCR-SOIL CEMENT
ELEVATION FROM 649.0 TO 697.99

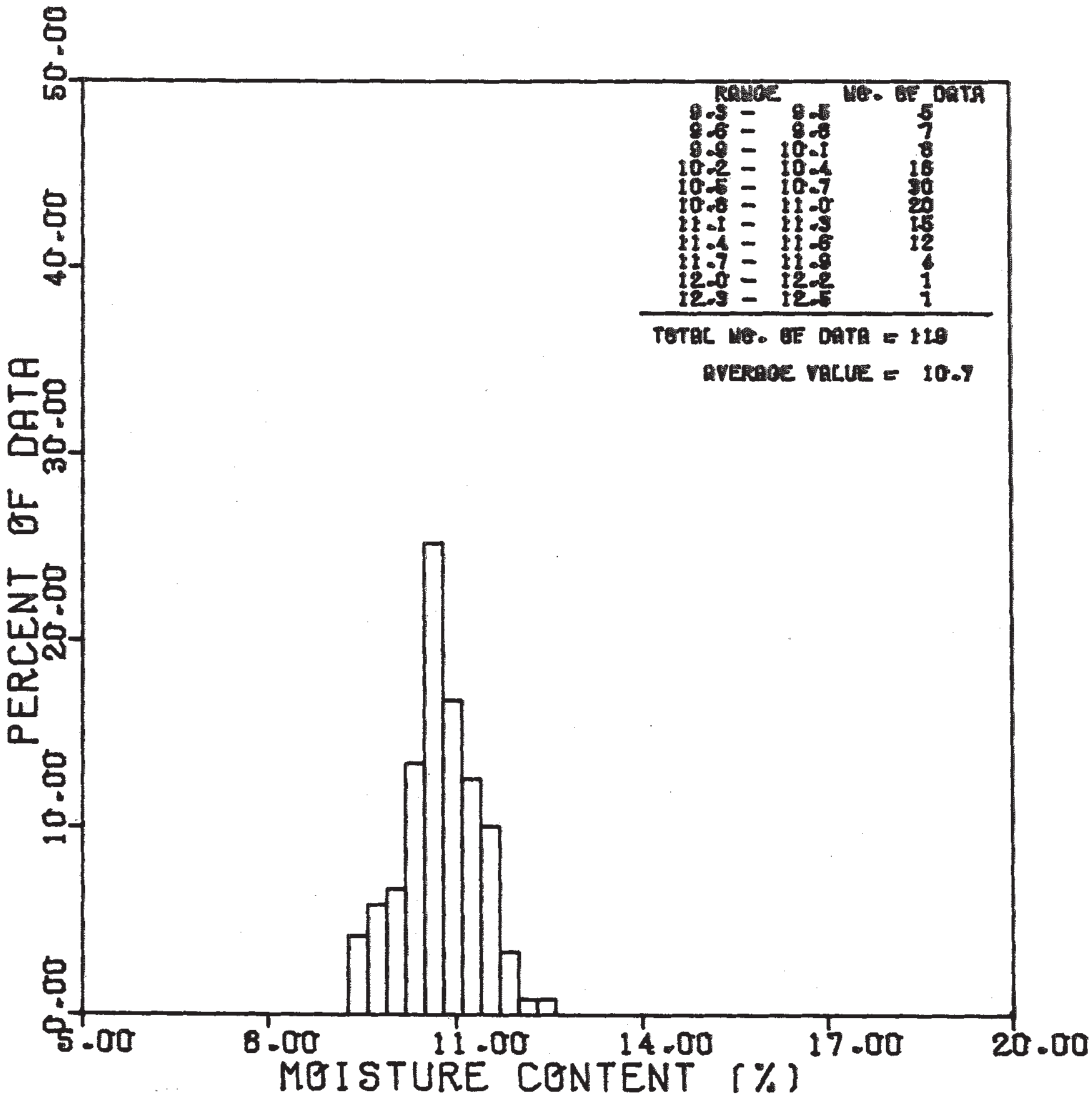
NOTE:

ONLY TESTS FOR THE UPSTREAM FACE, CREST AND DOWNSTREAM SLOPE ARE INCLUDED IN THIS ANALYSIS.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-460

UHS DAM SOIL CEMENT SLOPE PROTECTION DISTRIBUTION OF DRY DENSITY



CLINTON STATION IN-PLACE TEST
SOUTH DAM USDSCR-SOIL CEMENT
ELEVATION FROM 649.0 TO 697.99

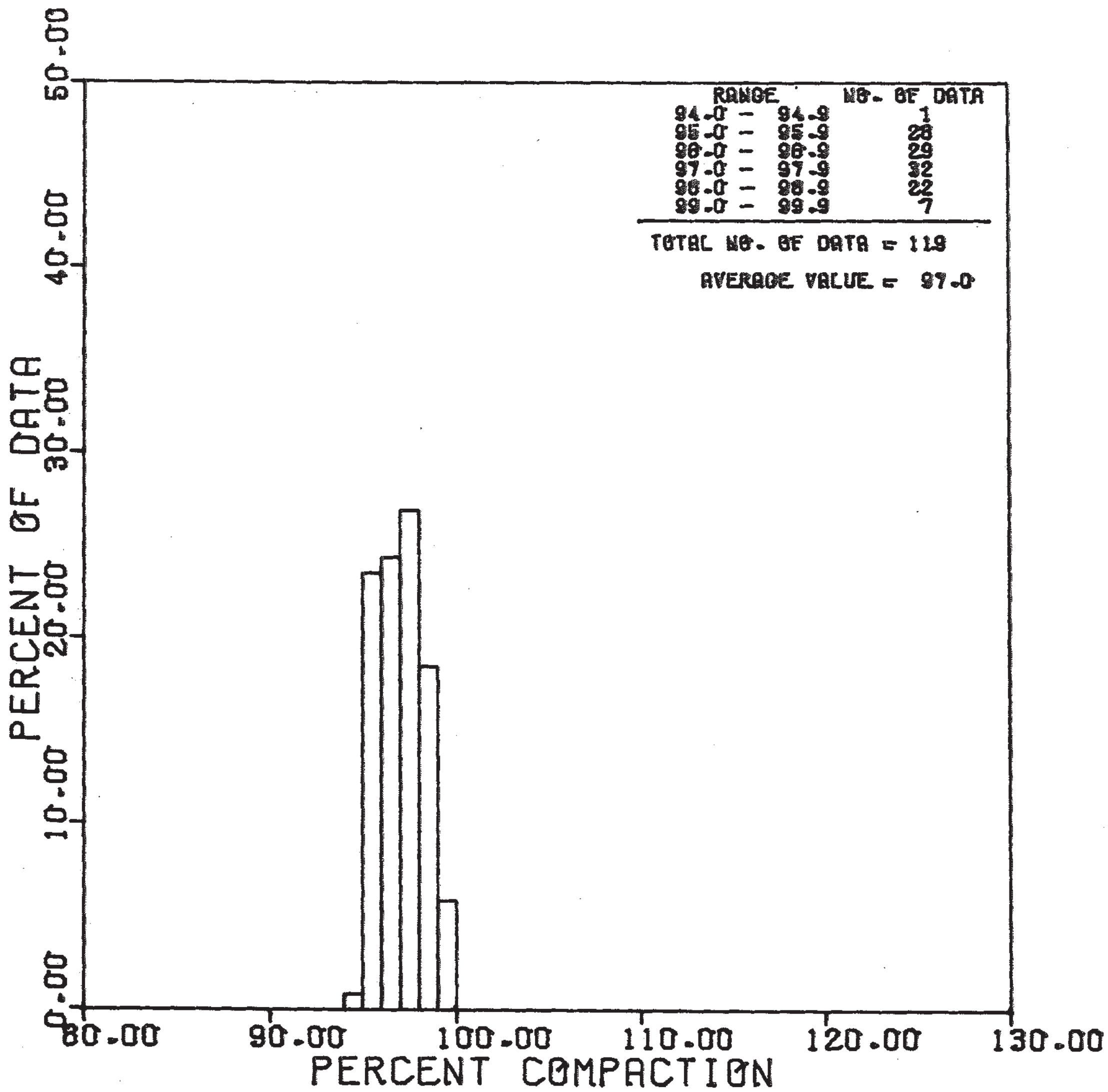
NOTE:

ONLY TESTS FOR THE UPSTREAM FACE, CREST AND DOWNSTREAM SLOPE ARE INCLUDED IN THIS ANALYSIS.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-461

UHS DAM SOIL CEMENT SLOPE
PROTECTION DISTRIBUTION
OF MOISTURE CONTENT



CLINTON STATION IN-PLACE TEST
SOUTH DAM USDSCR-SOIL CEMENT
ELEVATION FROM 649.0 TO 697.99

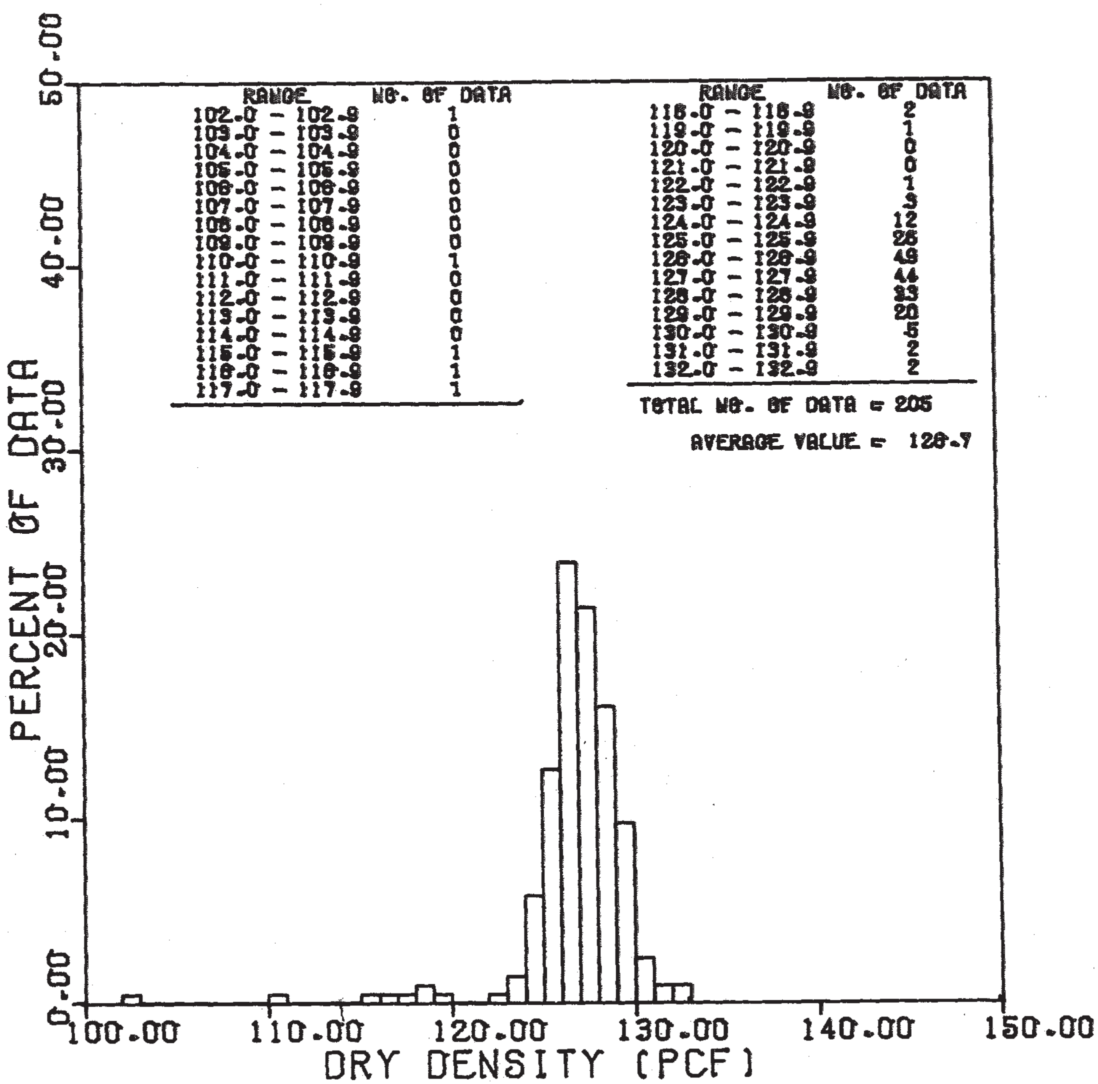
NOTE:

ONLY TESTS FOR THE UPSTREAM FACE, CREST AND DOWNSTREAM SLOPE ARE INCLUDED IN THIS ANALYSIS.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-462

UHS DAM SOIL CEMENT SLOPE PROTECTION DISTRIBUTION OF PERCENT COMPACTION

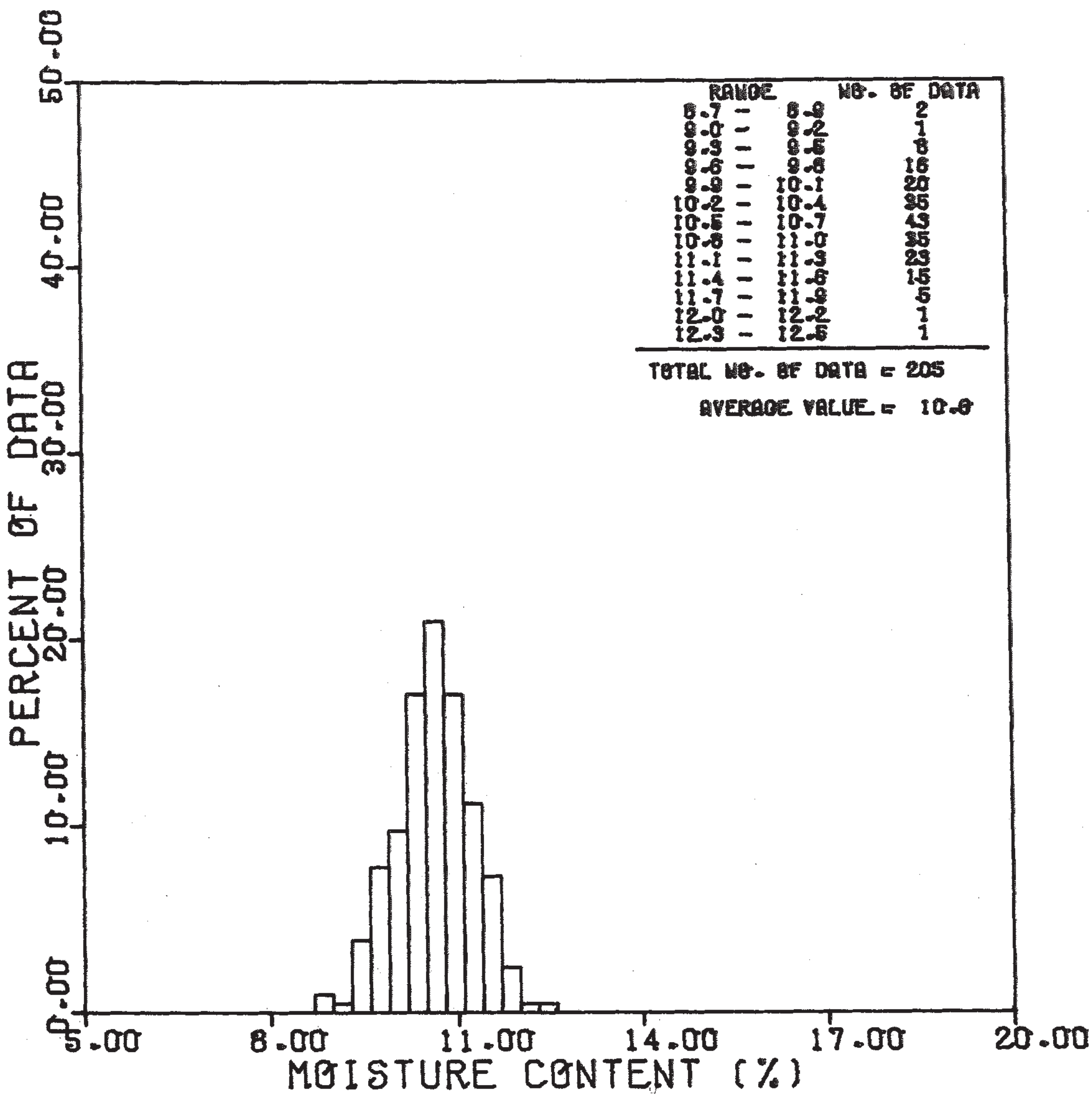


CLINTON STATION IN-PLACE TEST
SOUTH DAM - SOIL CEMENT
ELEVATION FROM 649.0 TO 697.99

NOTE:

TESTS FOR ALL AREAS, INCLUDING THE ABUTMENTS AND DOWNSTREAM FLAT AREA, ARE INCLUDED IN THIS ANALYSIS.

CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT
FIGURE 2.5-463 UHS DAM SOIL CEMENT SLOPE PROTECTION DISTRIBUTION OF DRY DENSITY



CLINTON STATION IN-PLACE TEST
SOUTH DAM - SOIL CEMENT
ELEVATION FROM 649.0 TO 697.99

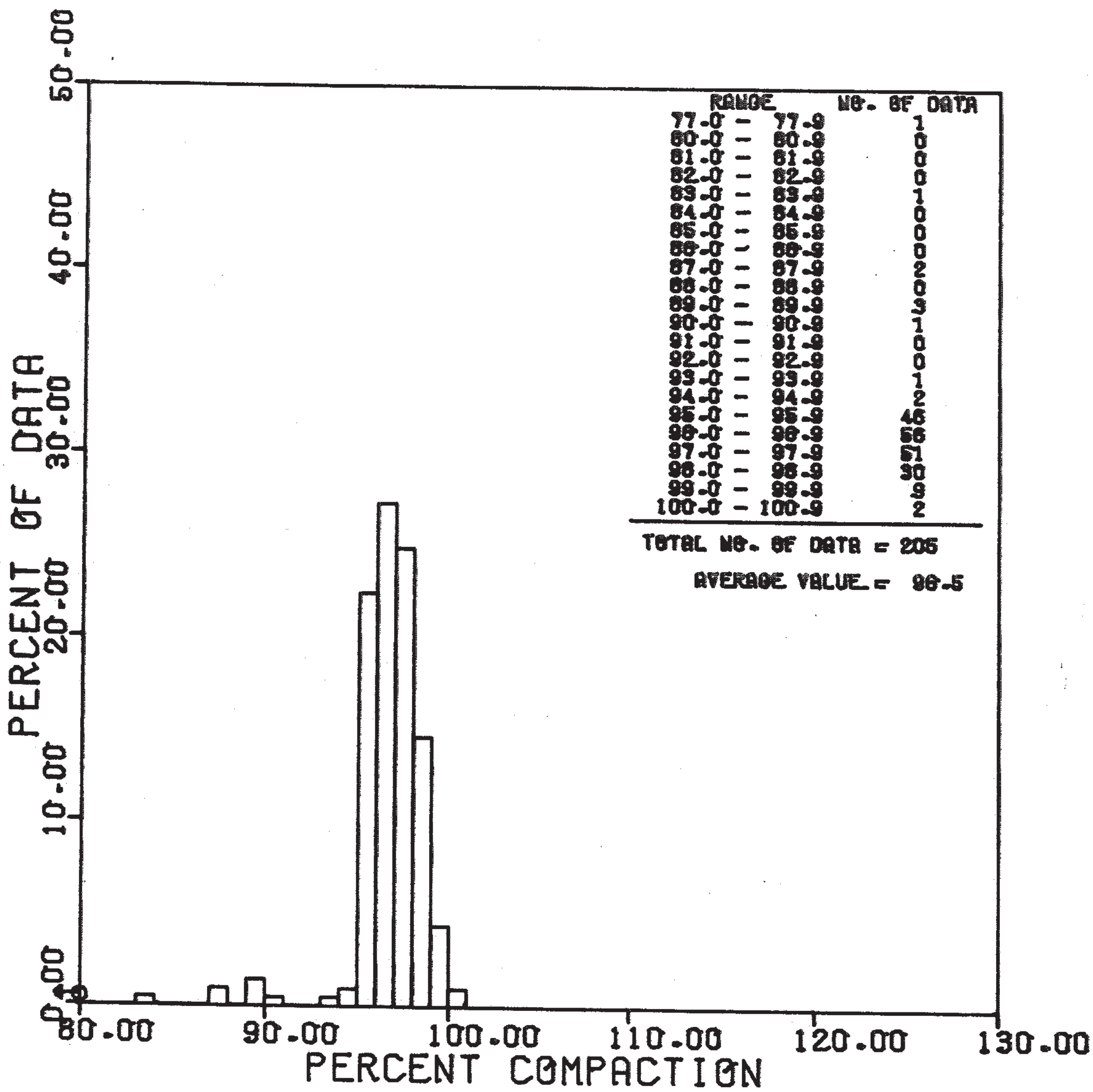
NOTE:

TESTS FOR ALL AREAS, INCLUDING THE ABUTMENTS AND DOWNSTREAM FLAT AREA, ARE INCLUDED IN THIS ANALYSIS.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-464

UHS DAM SOIL CEMENT SLOPE PROTECTION DISTRIBUTION OF MOISTURE CONTENT



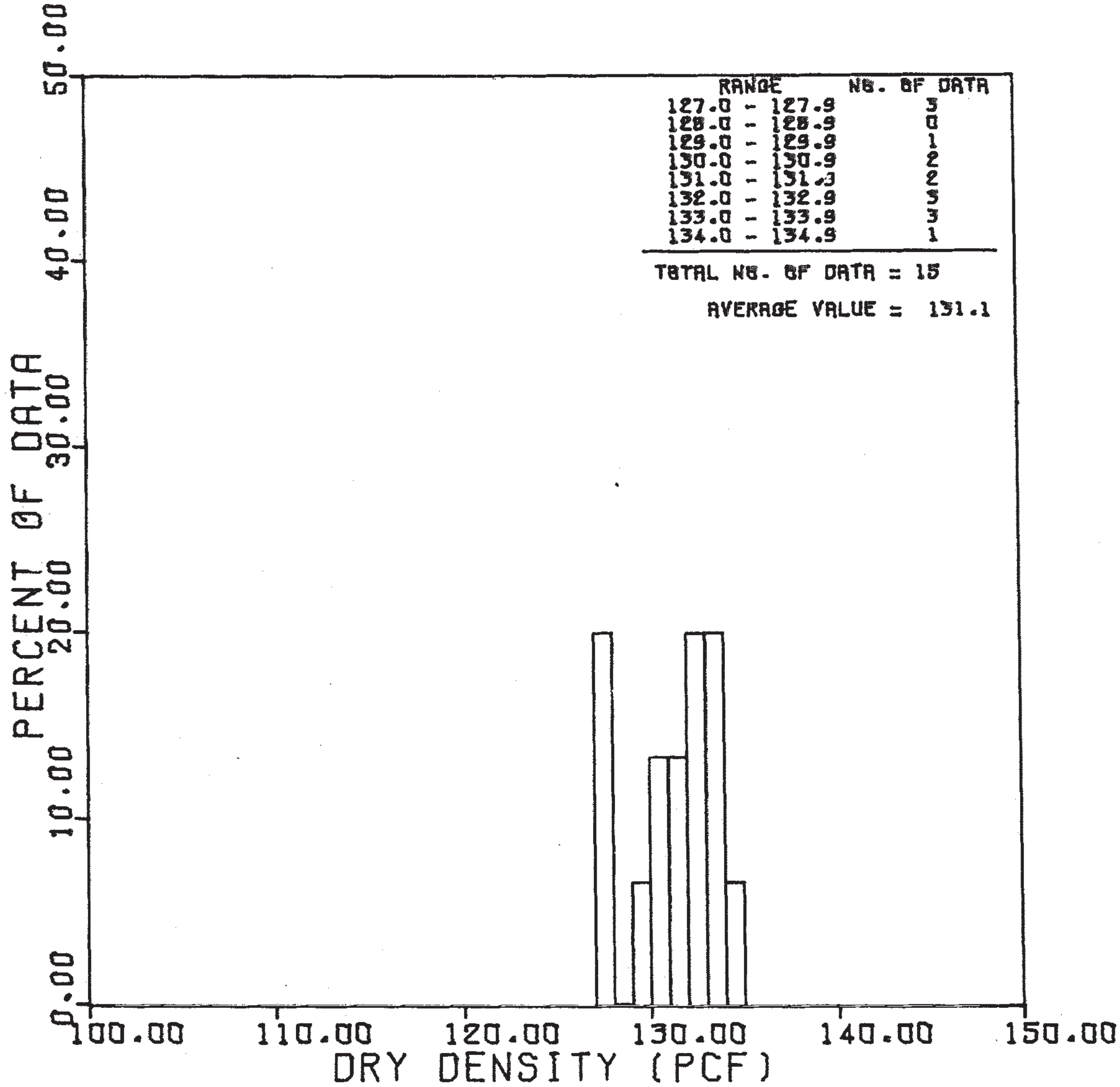
CLINTON STATION IN-PLACE TEST
SOUTH DAM - SOIL CEMENT
ELEVATION FROM 649.0 TO 697.99

NOTE:
Tests for all areas, including the abutments and the downstream flat area are included in this analysis.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-465

UHS DAM SOIL CEMENT SLOPE PROTECTION DISTRIBUTION OF PERCENT COMPACTION

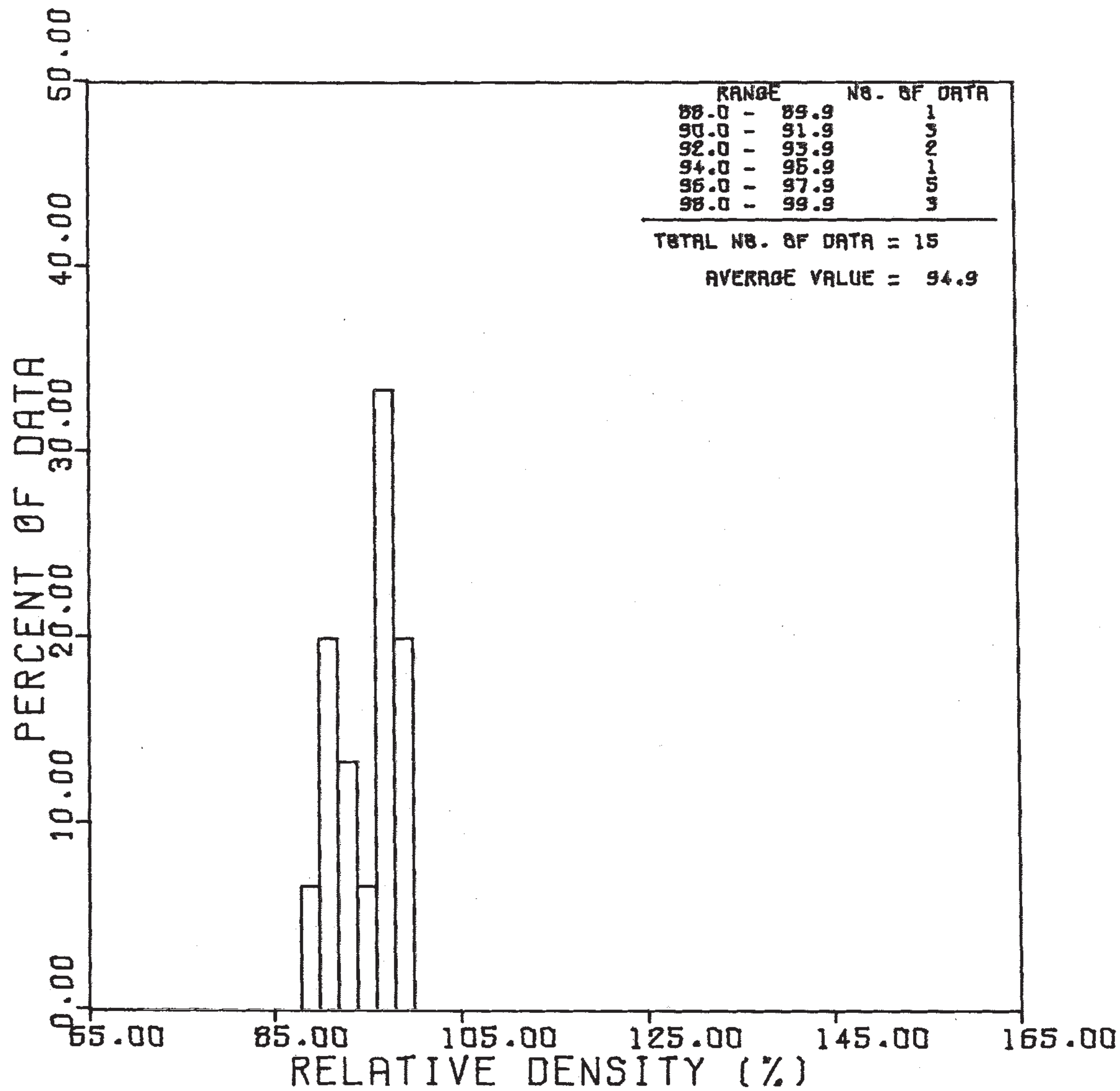


CLINTON POWER STATION
ALL DATA
OUTLET - P & R SERIES

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-466

SSWS OUTLET STRUCTURE
GRANULAR FILL - DISTRIBUTION OF
DRY DENSITY

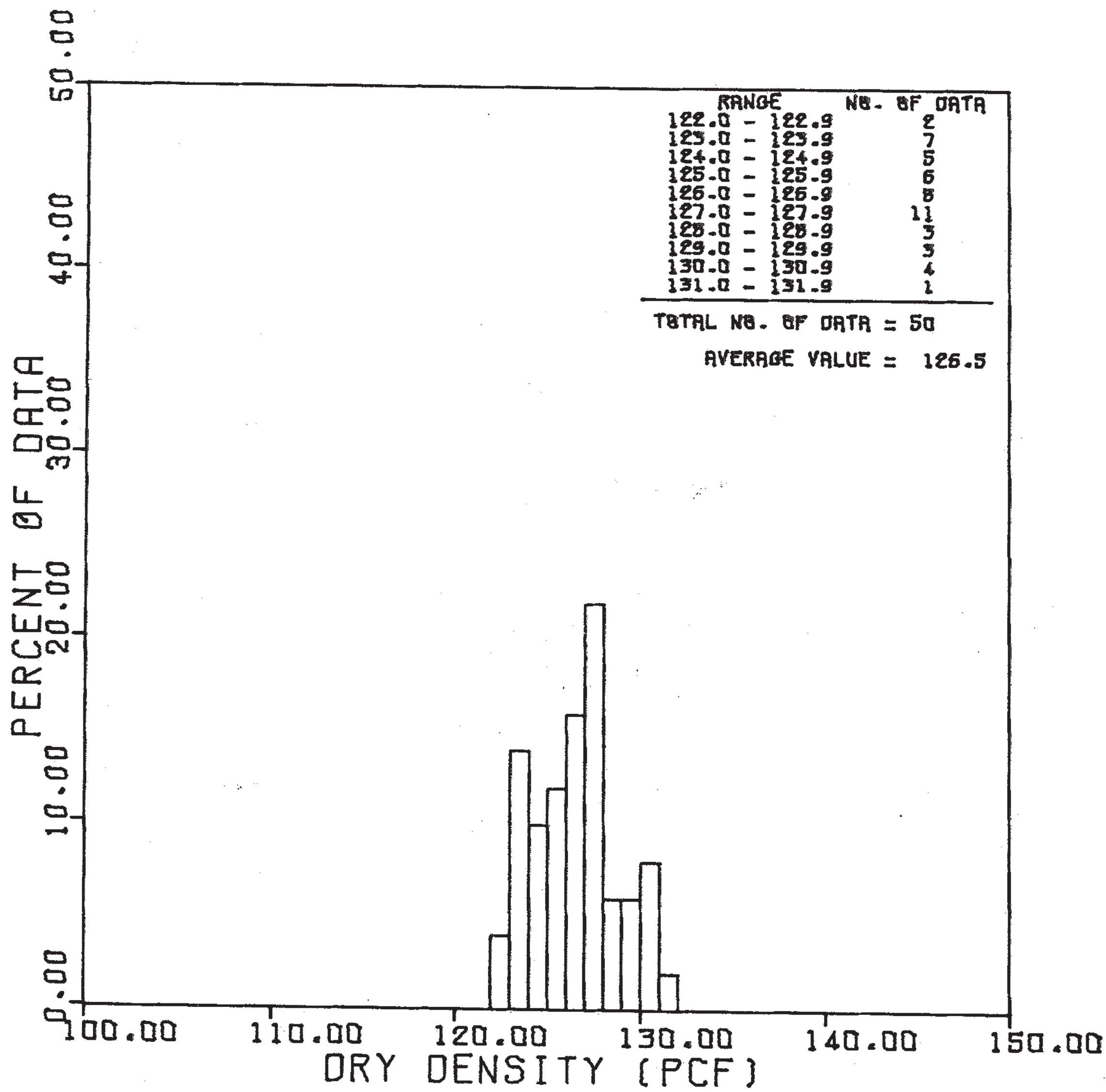


CLINTON POWER STATION
ALL DATA
OUTLET - P & R SERIES

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-467

SSWS OUTLET STRUCTURE
GRANULAR FILL - DISTRIBUTION OF
RELATIVE DENSITY

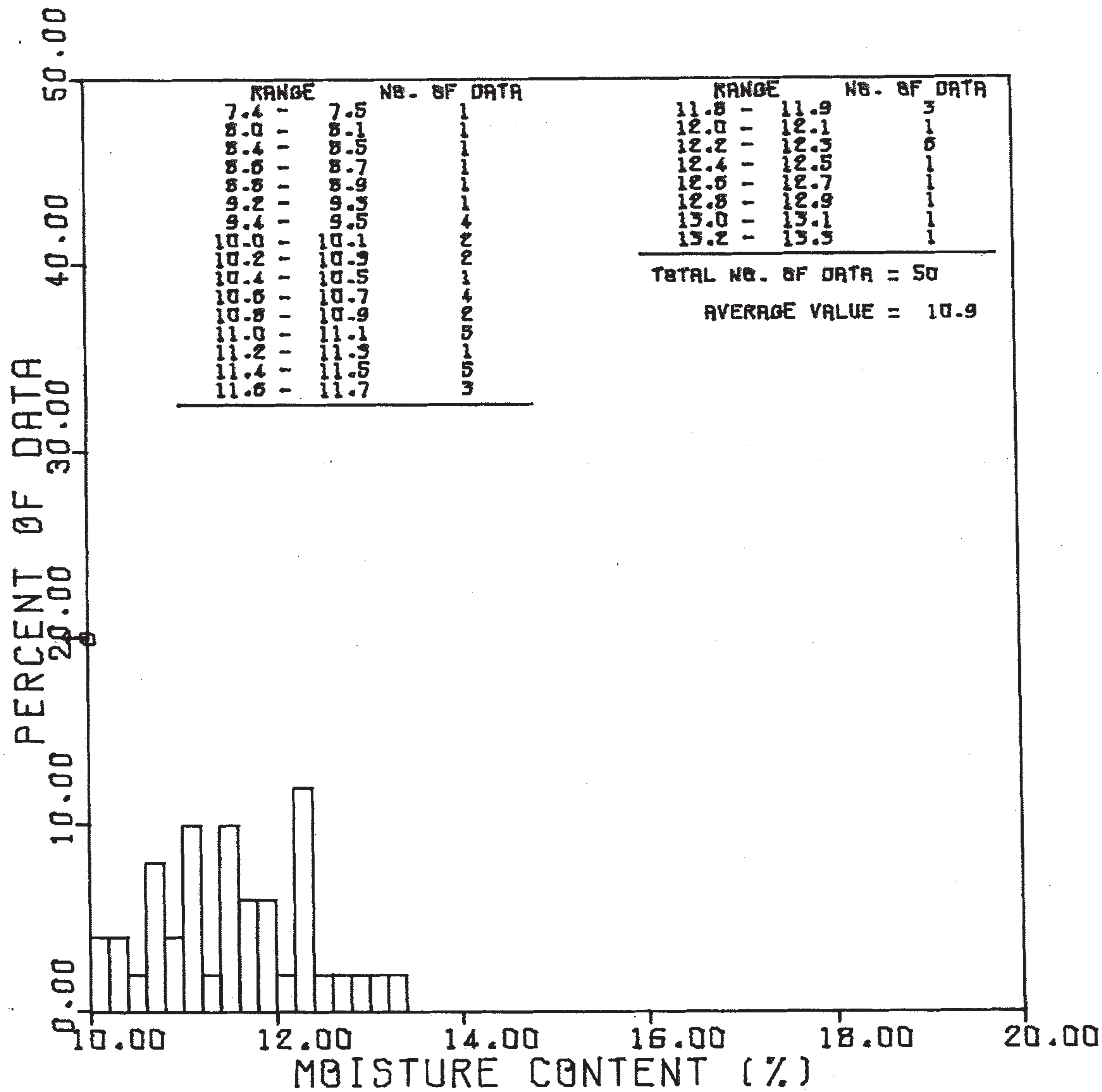


CLINTON POWER STATION
ALL DATA
PIPELINE - PB SERIES

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

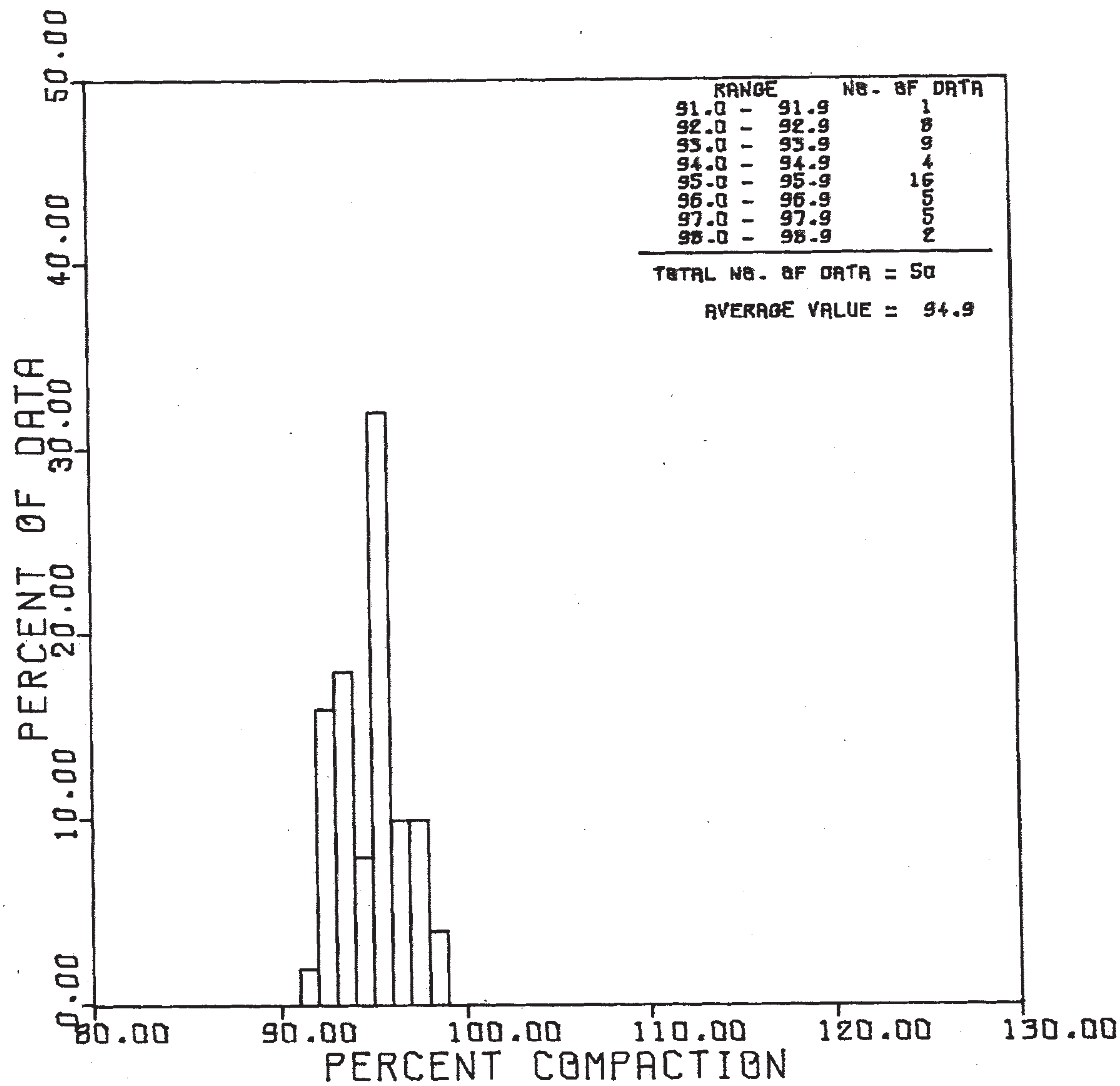
FIGURE 2.5-468

SSWS OUTLET STRUCTURE
COHESIVE BACKFILL - DISTRIBUTION OF
DRY DENSITY



CLINTON POWER STATION
ALL DATA
PIPELINE - PB SERIES

CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT
FIGURE 2.5-469 SSWS OUTLET STRUCTURE COHESIVE BACKFILL - DISTRIBUTION OF MOISTURE CONTENT

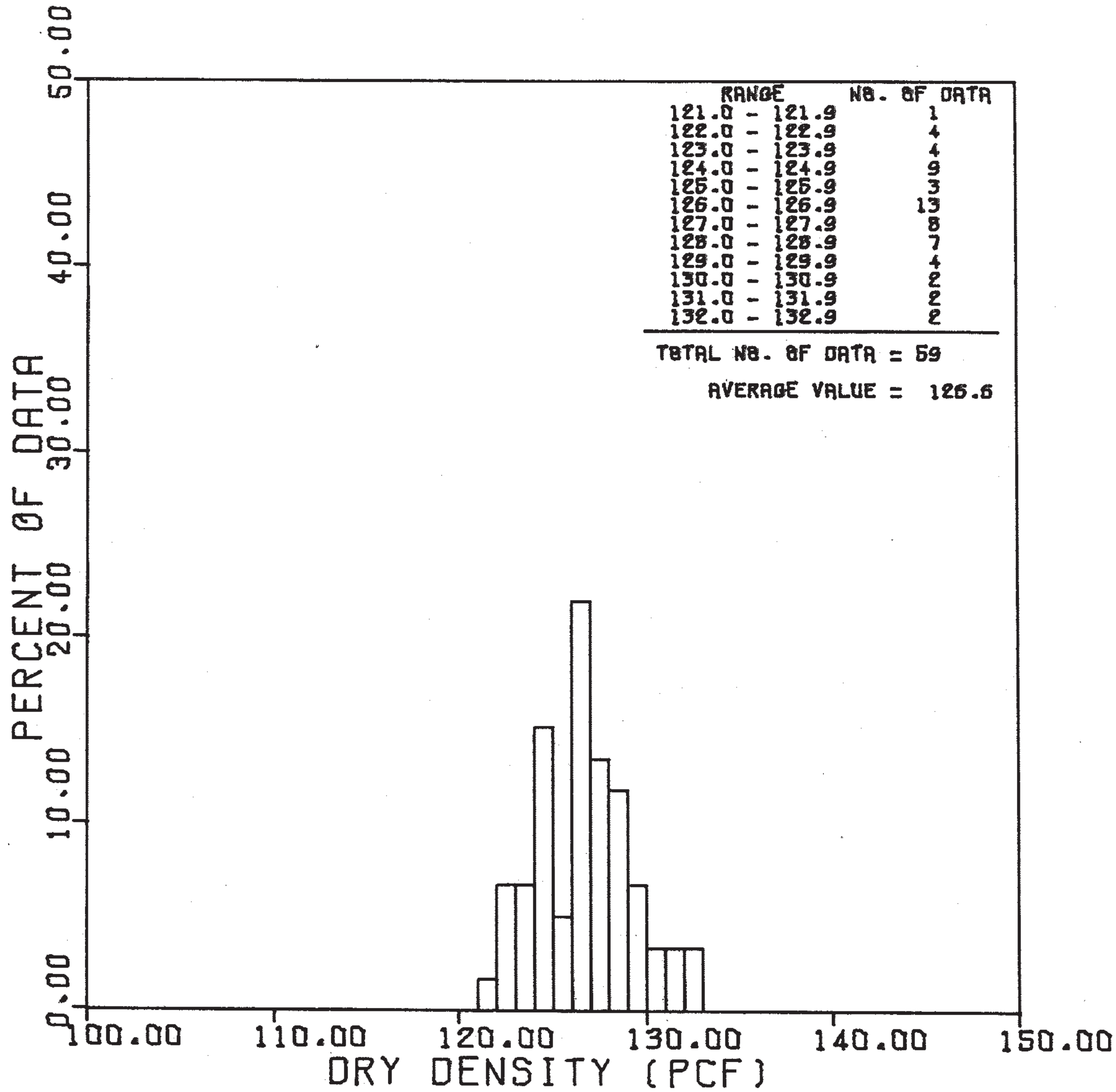


CLINTON POWER STATION
ALL DATA
PIPELINE - PB SERIES

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

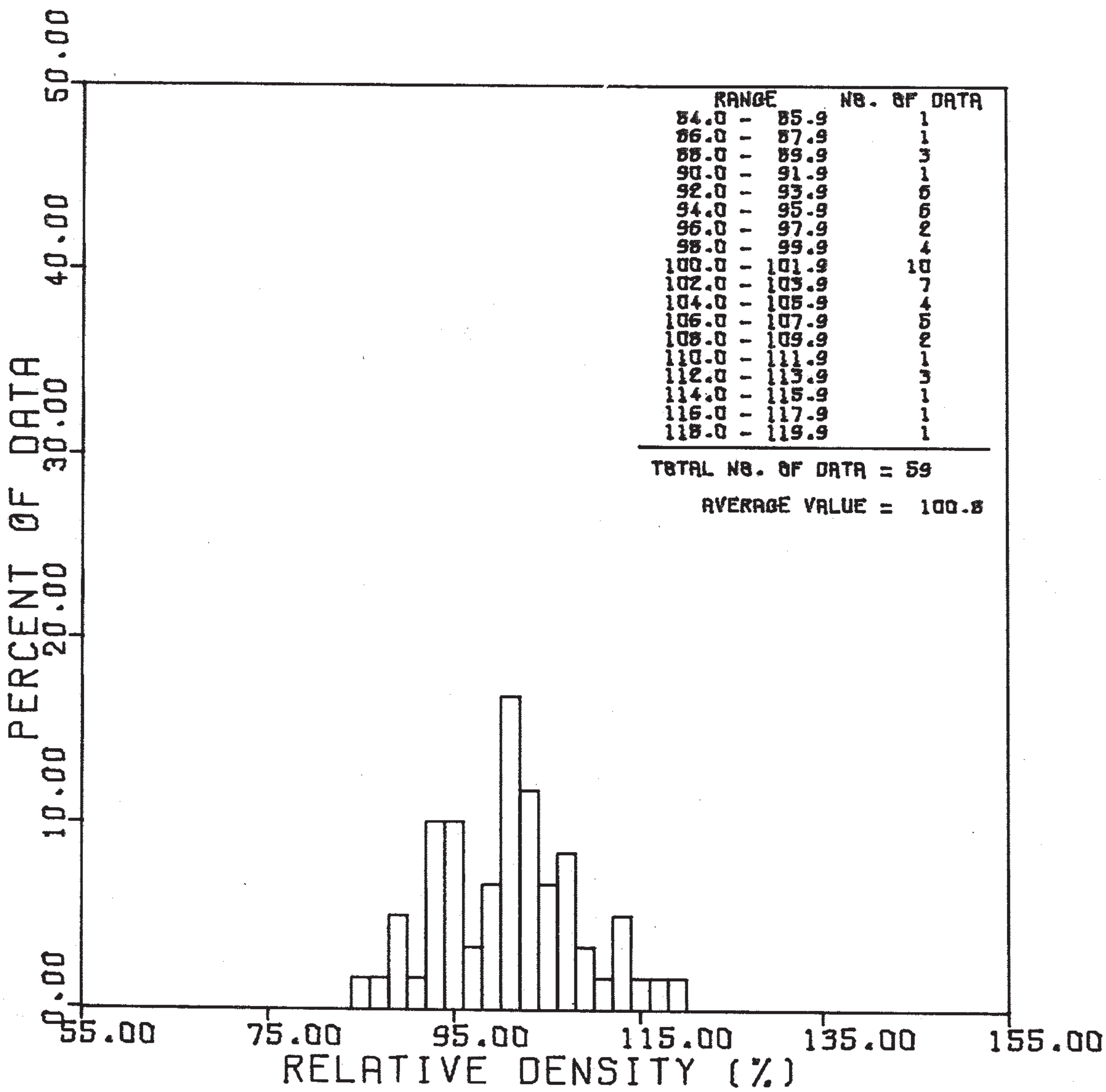
FIGURE 2.5-470

SSWS OUTLET STRUCTURE
COHESIVE BACKFILL - DISTRIBUTION OF
PERCENT COMPACTION



CLINTON POWER STATION
ALL DATA
PIPELINE - P SERIES

CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT
FIGURE 2.5-471 SSWS PIPELINE GRANULAR FILL DISTRIBUTION OF DRY DENSITY

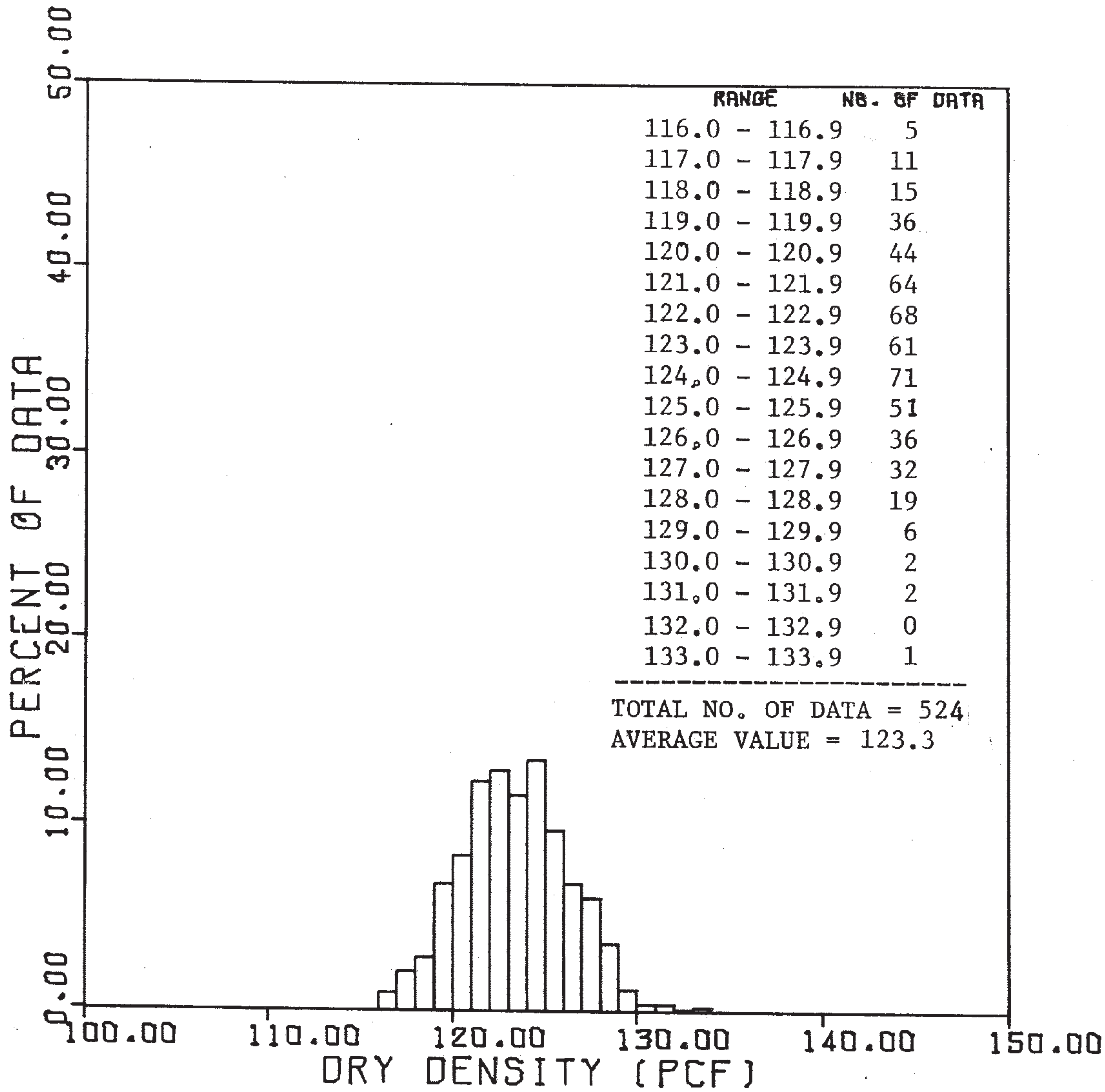


CLINTON POWER STATION
ALL DATA
PIPELINE - P SERIES

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-472

SSWS PIPELINE GRANULAR FILL -
DISTRIBUTION OF RELATIVE DENSITY

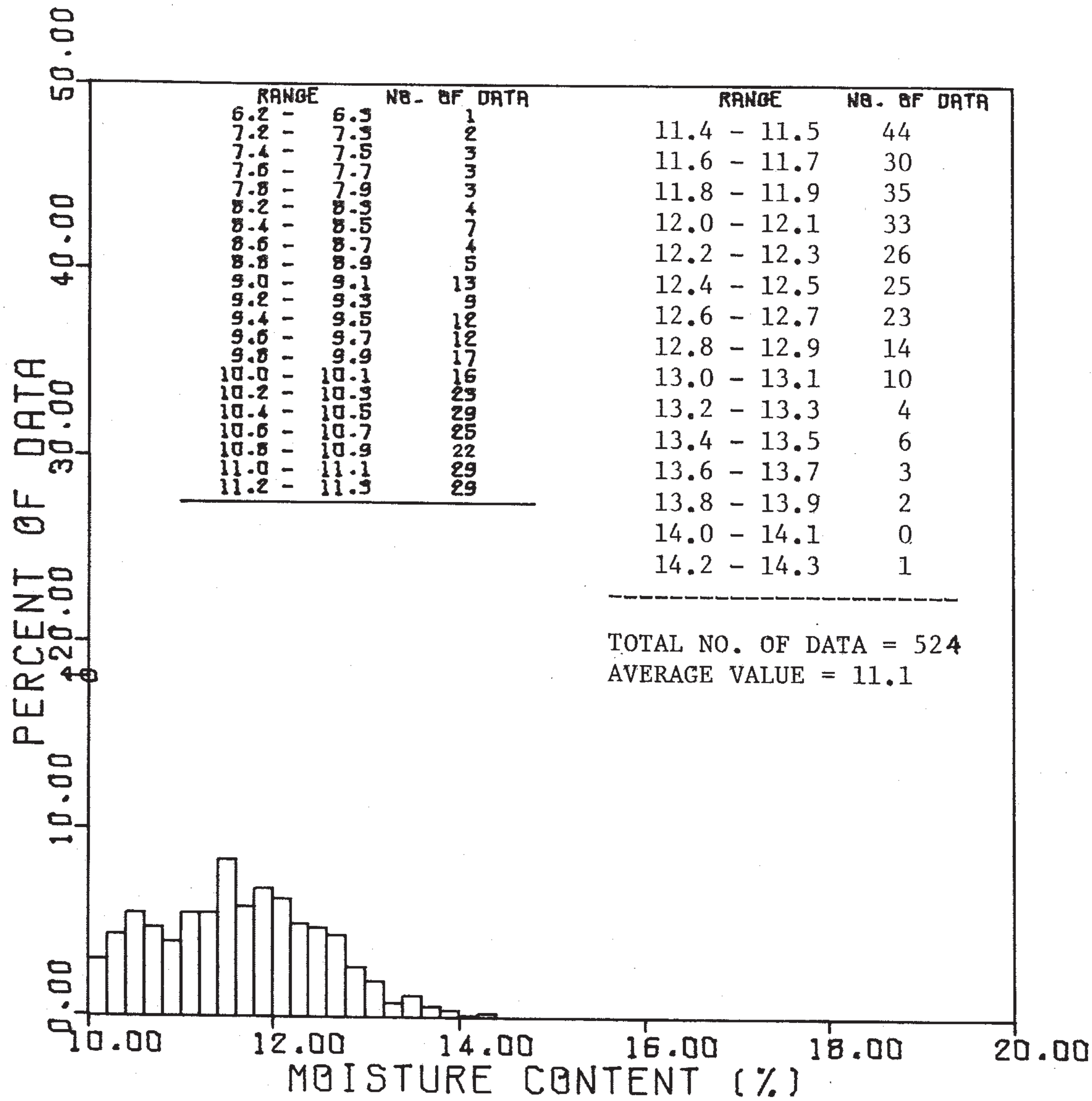


CLINTON POWER STATION
ALL DATA
PIPELINE - PB SERIES

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-473

SSWS PIPELINE COHESIVE FILL -
DISTRIBUTION OF DRY DENSITY



RANGE	NO. OF DATA
6.2 - 6.3	1
7.2 - 7.3	2
7.4 - 7.5	3
7.6 - 7.7	3
7.8 - 7.9	3
8.2 - 8.3	4
8.4 - 8.5	7
8.6 - 8.7	4
8.8 - 8.9	5
9.0 - 9.1	13
9.2 - 9.3	9
9.4 - 9.5	12
9.6 - 9.7	12
9.8 - 9.9	17
10.0 - 10.1	16
10.2 - 10.3	23
10.4 - 10.5	29
10.6 - 10.7	25
10.8 - 10.9	22
11.0 - 11.1	29
11.2 - 11.3	29

RANGE	NO. OF DATA
11.4 - 11.5	44
11.6 - 11.7	30
11.8 - 11.9	35
12.0 - 12.1	33
12.2 - 12.3	26
12.4 - 12.5	25
12.6 - 12.7	23
12.8 - 12.9	14
13.0 - 13.1	10
13.2 - 13.3	4
13.4 - 13.5	6
13.6 - 13.7	3
13.8 - 13.9	2
14.0 - 14.1	0
14.2 - 14.3	1

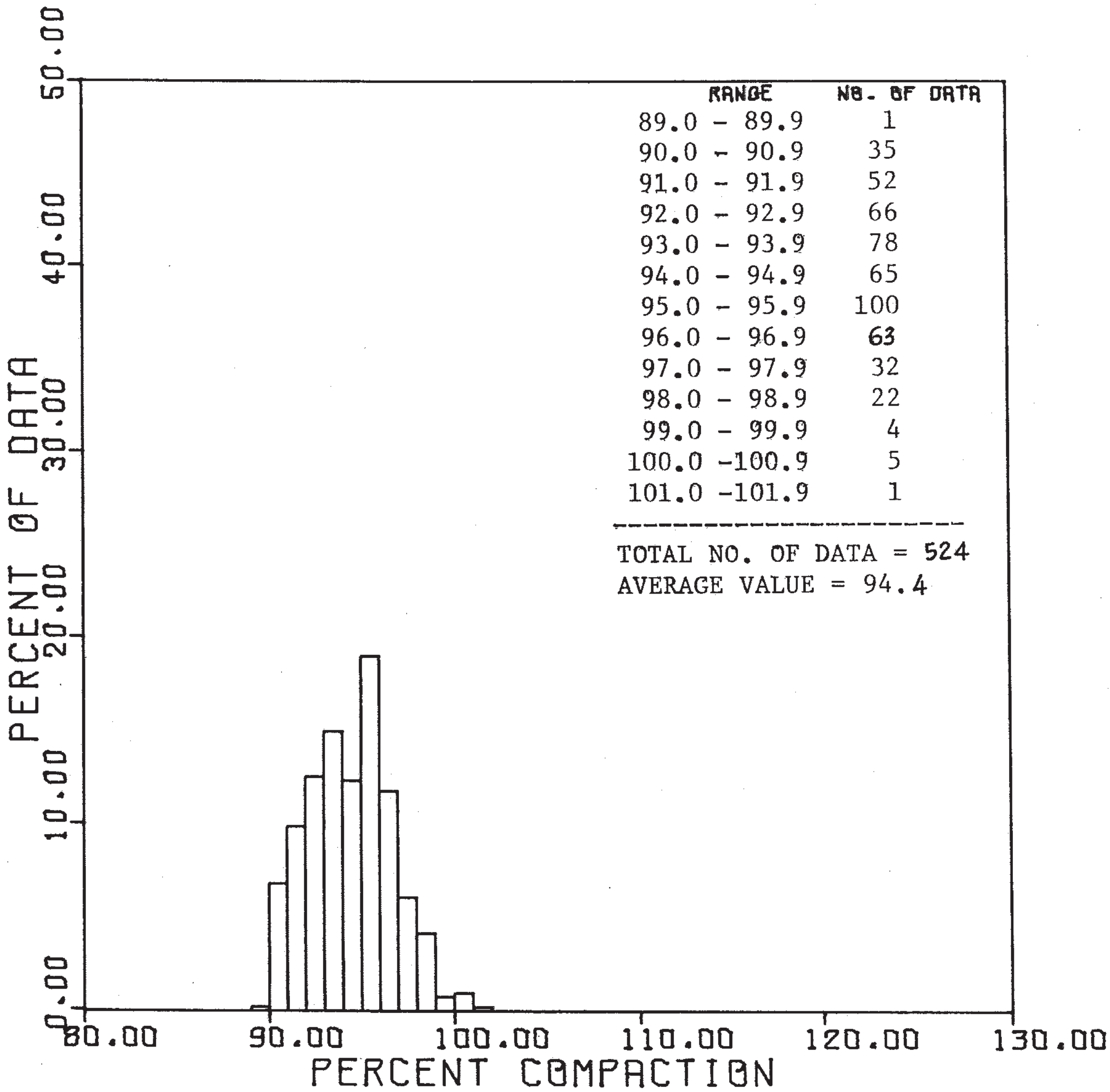
TOTAL NO. OF DATA = 524
AVERAGE VALUE = 11.1

CLINTON POWER STATION
ALL DATA
PIPELINE - PB SERIES

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-474

SSWS PIPELINE COHESIVE FILL -
DISTRIBUTION OF MOISTURE CONTENT

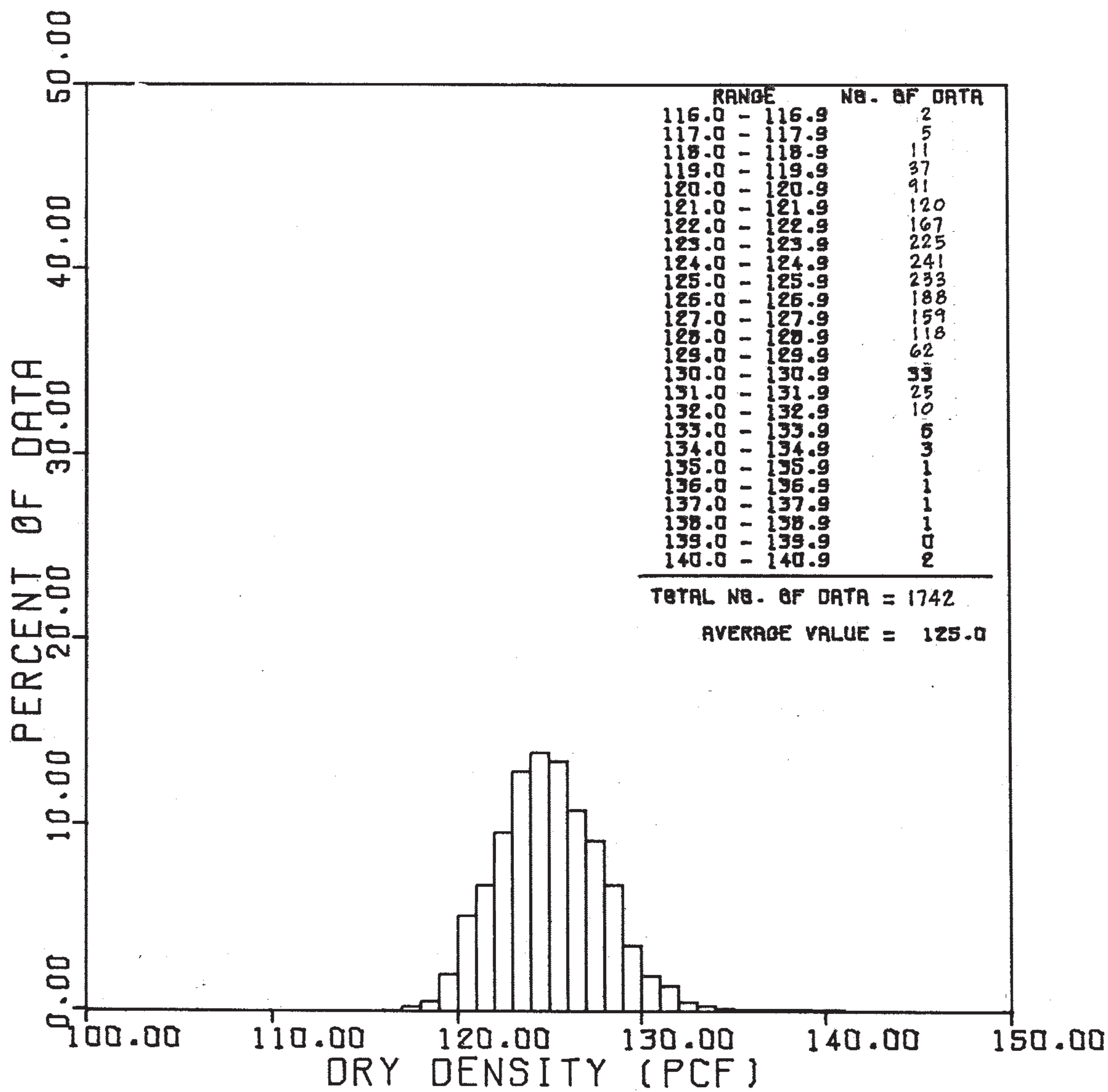


CLINTON POWER STATION
ALL DATA
PIPELINE - PB SERIES

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-475

SSWS PIPELINE COHESIVE FILL -
DISTRIBUTION OF PERCENT COMPACTION

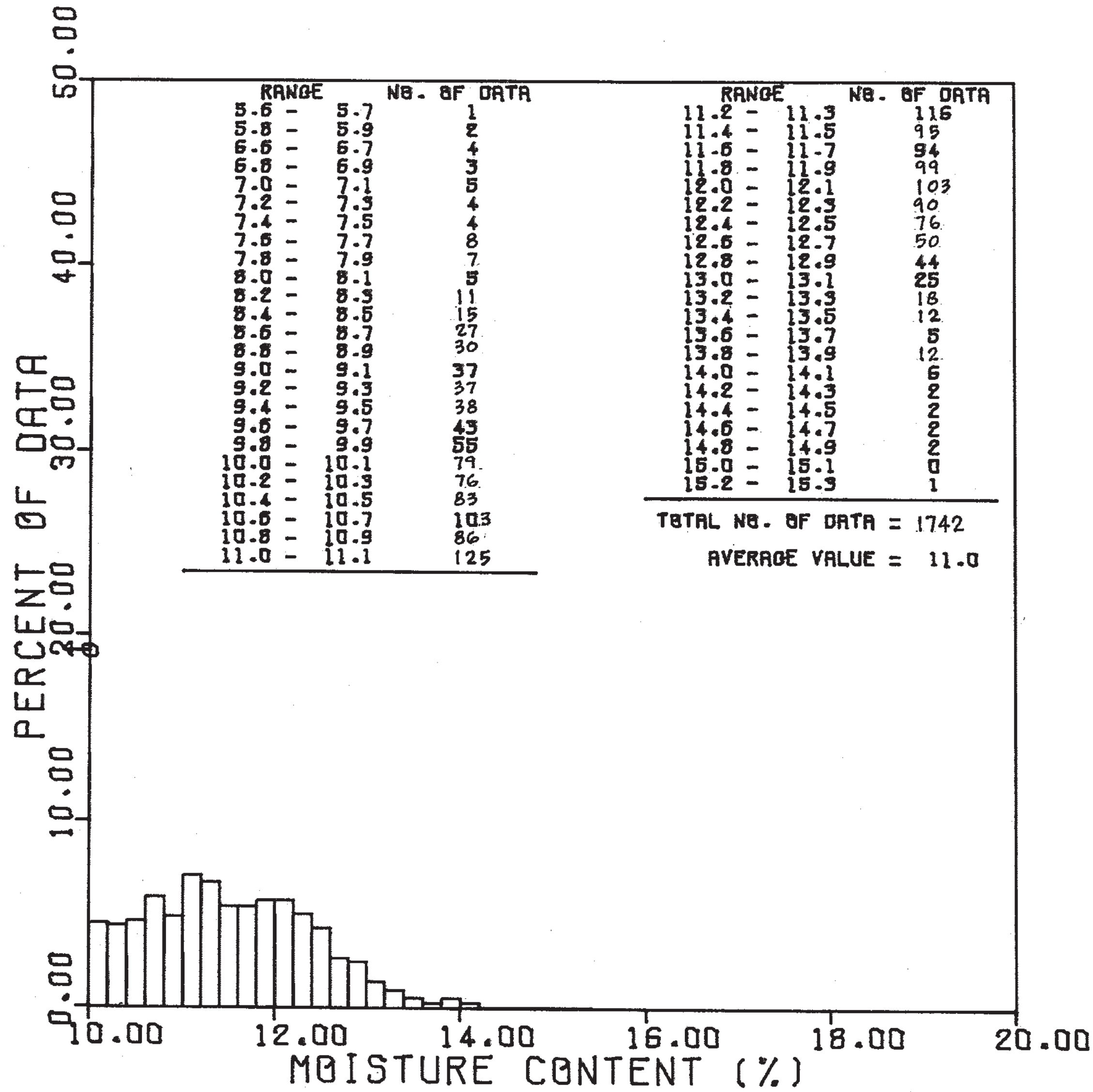


CLINTON POWER STATION
ALL DATA
SCREEN HOUSE

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-476

SCREEN HOUSE COHESIVE BACKFILL -
DISTRIBUTION OF DRY DENSITY



RANGE	NO. OF DATA	RANGE	NO. OF DATA
5.6 - 5.7	1	11.2 - 11.3	116
5.8 - 5.9	2	11.4 - 11.5	95
6.6 - 6.7	4	11.6 - 11.7	94
6.8 - 6.9	3	11.8 - 11.9	99
7.0 - 7.1	5	12.0 - 12.1	103
7.2 - 7.3	4	12.2 - 12.3	90
7.4 - 7.5	4	12.4 - 12.5	76
7.6 - 7.7	8	12.6 - 12.7	50
7.8 - 7.9	7	12.8 - 12.9	44
8.0 - 8.1	5	13.0 - 13.1	25
8.2 - 8.3	11	13.2 - 13.3	18
8.4 - 8.5	15	13.4 - 13.5	12
8.6 - 8.7	27	13.6 - 13.7	5
8.8 - 8.9	30	13.8 - 13.9	12
9.0 - 9.1	37	14.0 - 14.1	6
9.2 - 9.3	37	14.2 - 14.3	2
9.4 - 9.5	38	14.4 - 14.5	2
9.6 - 9.7	43	14.6 - 14.7	2
9.8 - 9.9	55	14.8 - 14.9	2
10.0 - 10.1	79	15.0 - 15.1	0
10.2 - 10.3	76	15.2 - 15.3	1
10.4 - 10.5	83		
10.6 - 10.7	103		
10.8 - 10.9	86		
11.0 - 11.1	125		

TOTAL NO. OF DATA = 1742

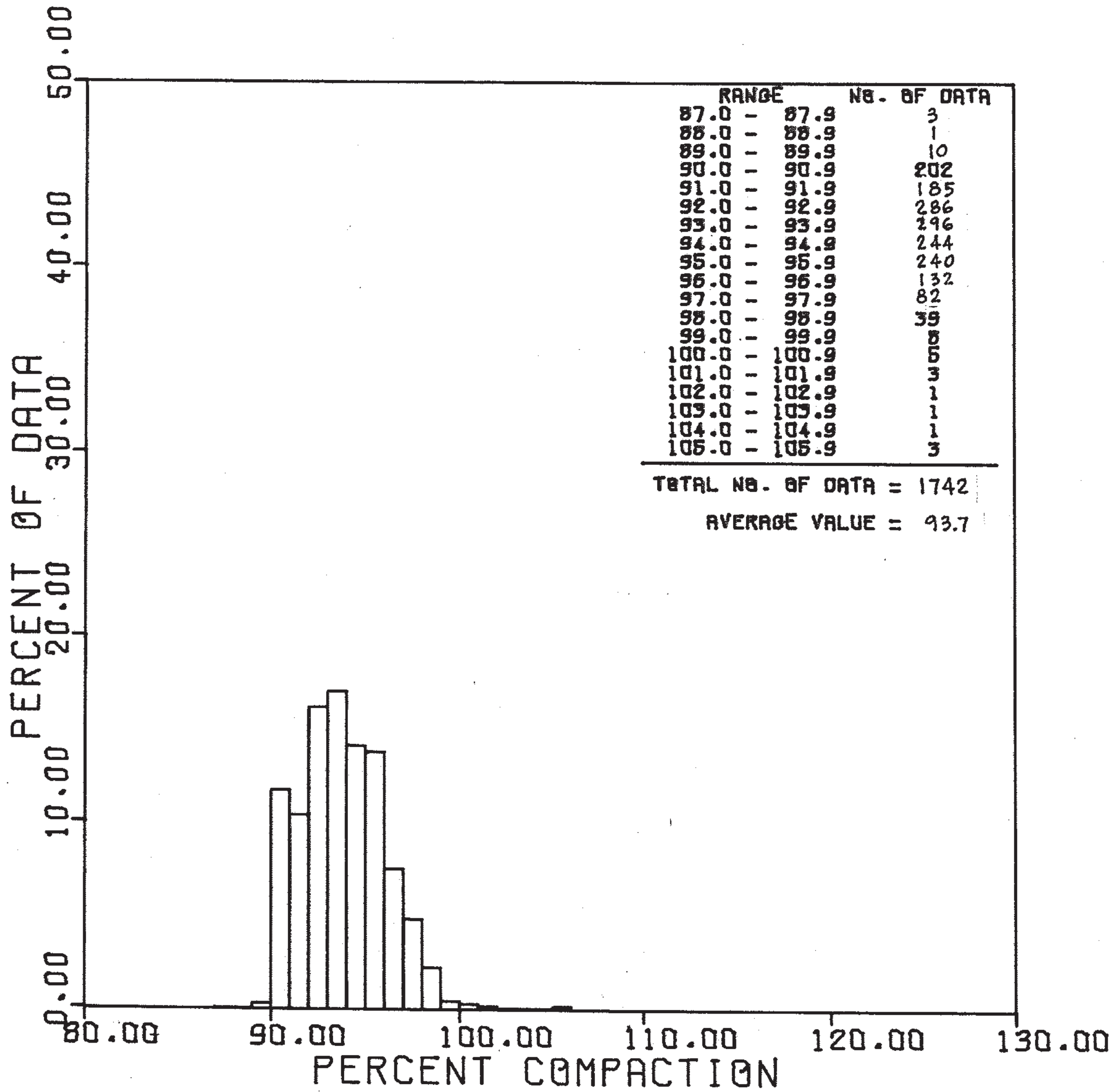
AVERAGE VALUE = 11.0

CLINTON POWER STATION
ALL DATA
SCREEN HOUSE

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-477

SCREEN HOUSE COHESIVE BACKFILL - DISTRIBUTION OF MOISTURE CONTENT

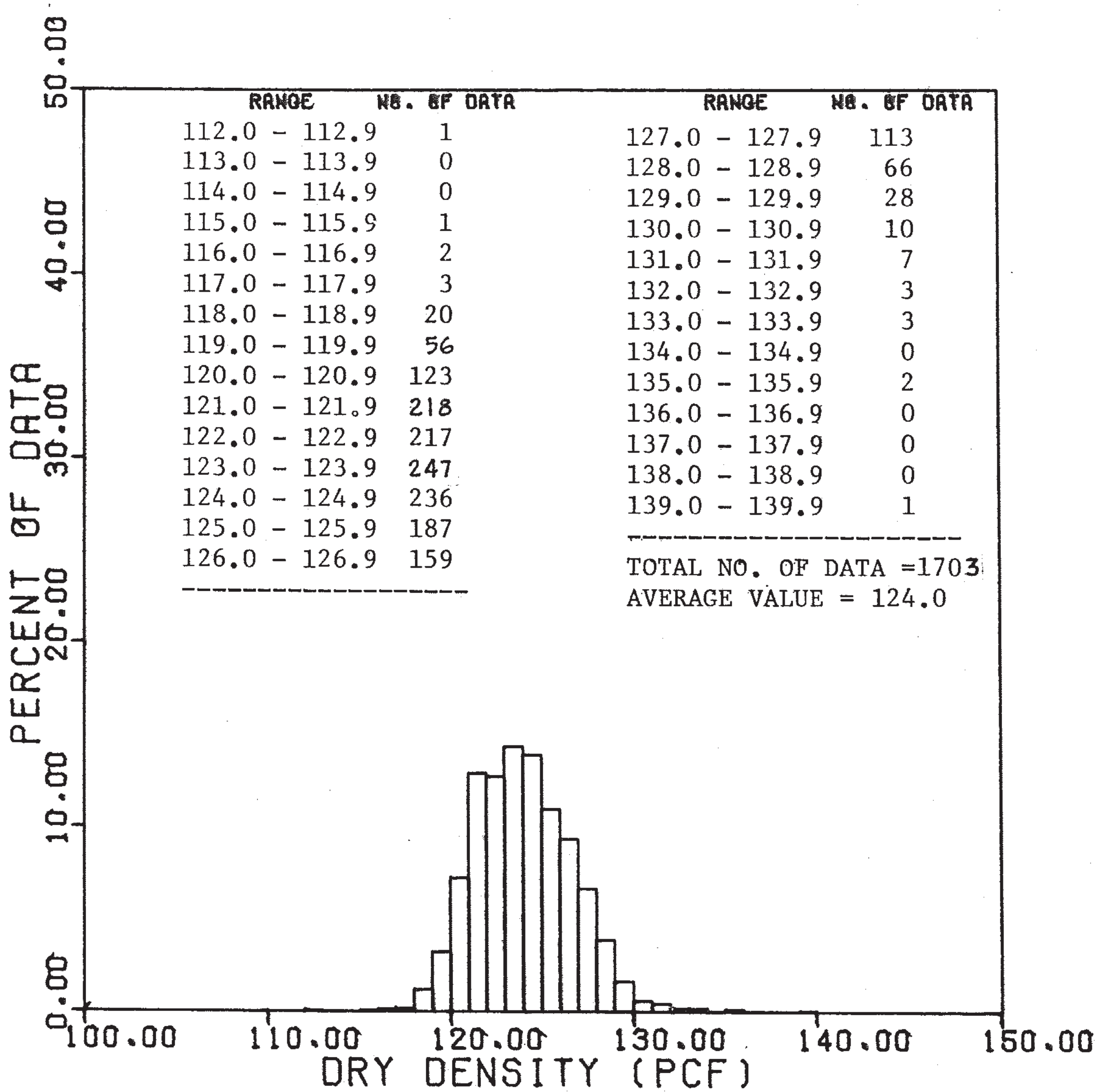


CLINTON POWER STATION
ALL DATA
SCREEN HOUSE

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

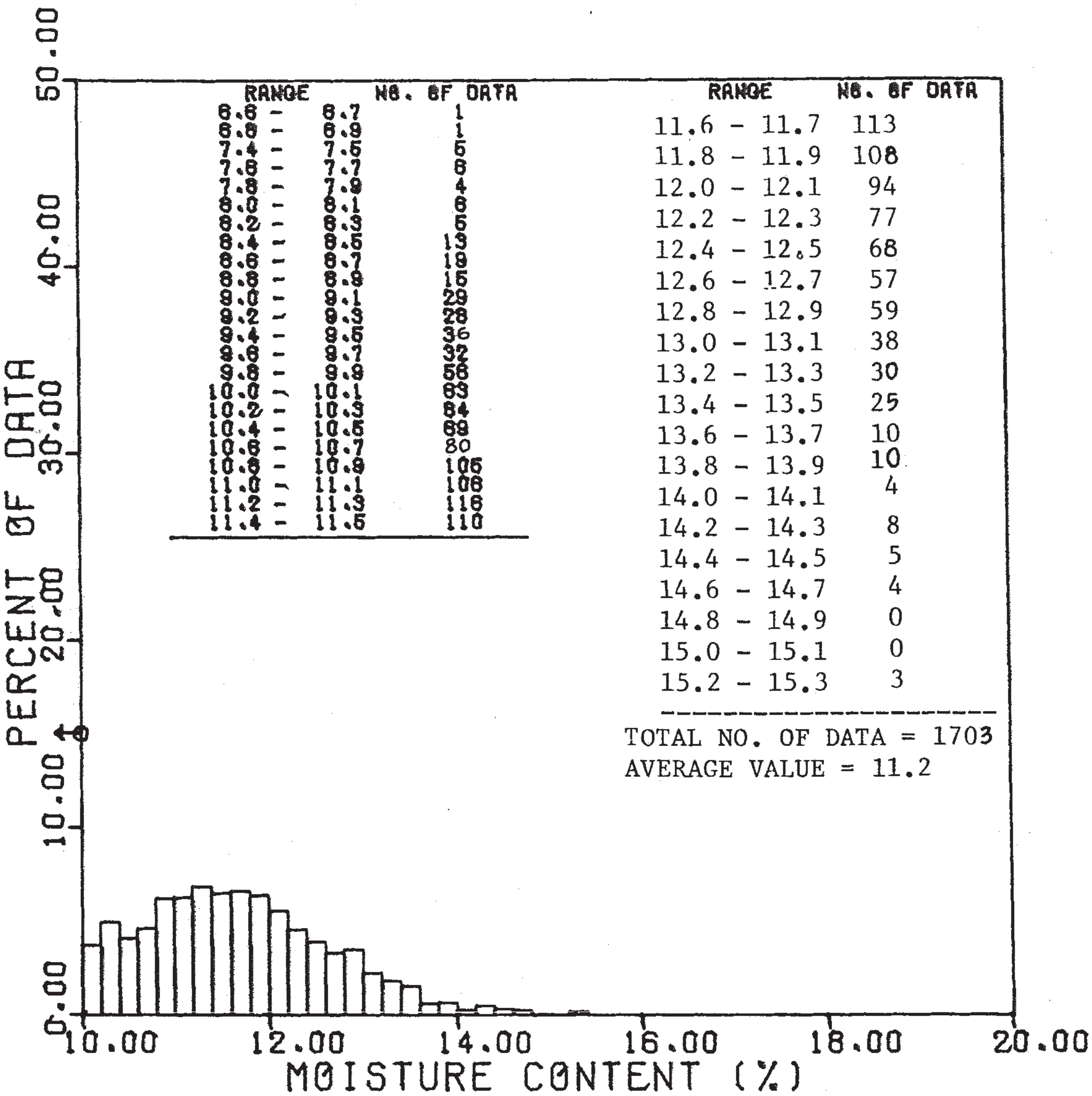
FIGURE 2.5-478

SCREEN HOUSE COHESIVE BACKFILL -
DISTRIBUTION OF PERCENT COMPACTION



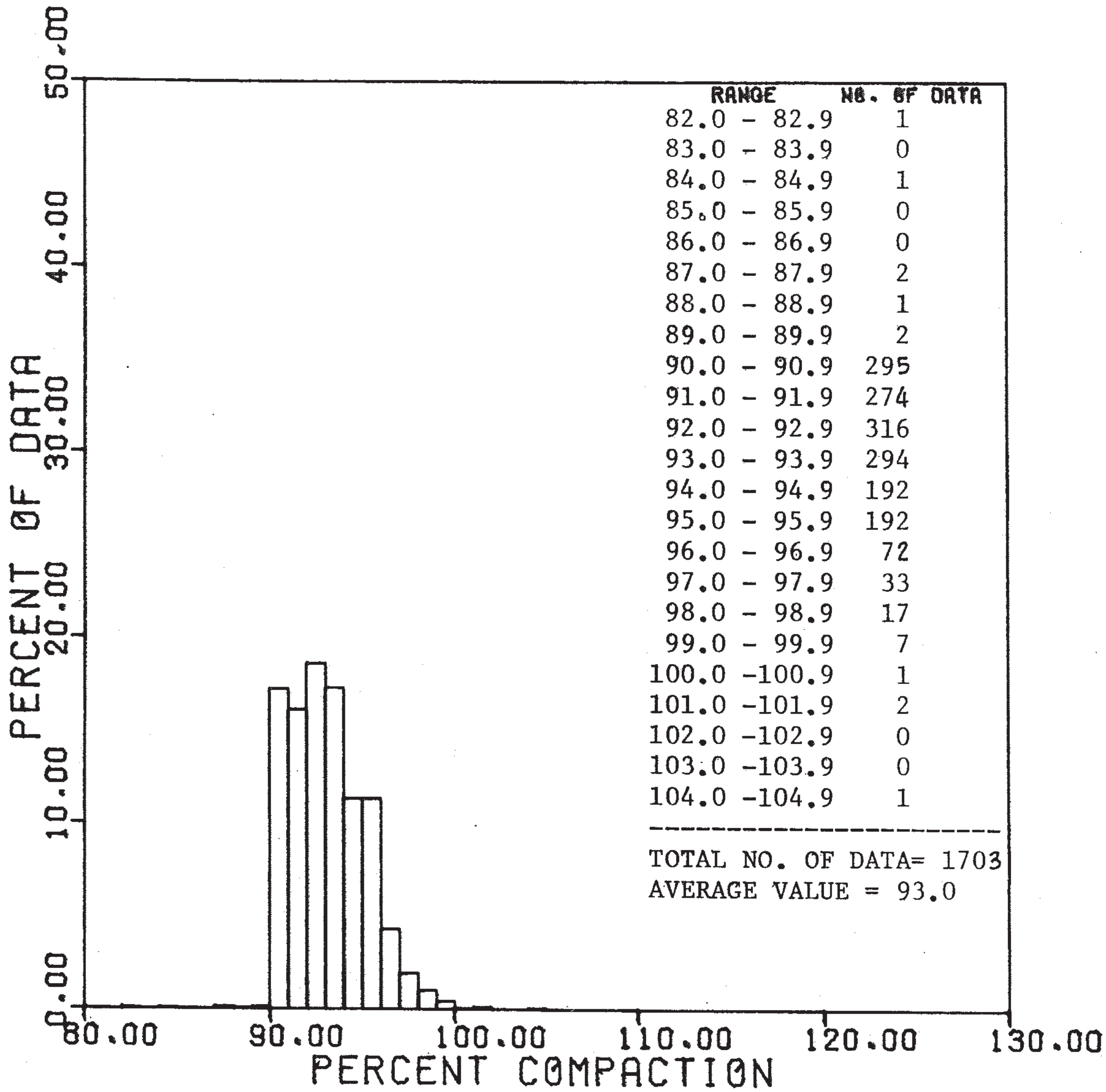
CLINTON POWER STATION
ALL DATA
POWER - PBT SERIES

CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT
FIGURE 2.5-479 MAIN PLANT COHESIVE BACKFILL - DISTRIBUTION OF DRY DENSITY



CLINTON POWER STATION
ALL DATA
POWER - PBT SERIES

CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT
FIGURE 2.5-480 MAIN PLANT COHESIVE BACKFILL - DISTRIBUTION OF MOISTURE CONTENT

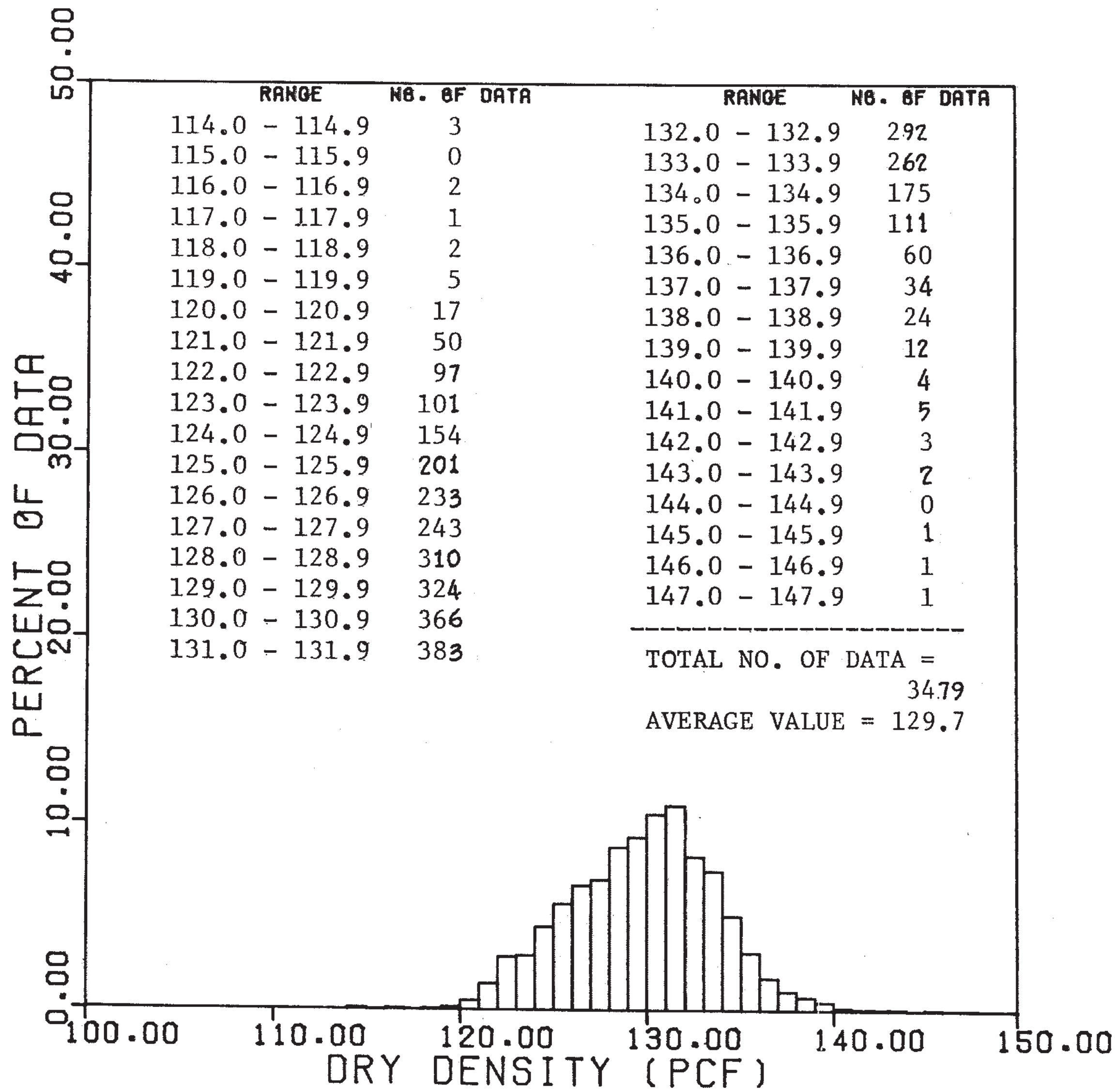


CLINTON POWER STATION
ALL DATA
POWER - PBT SERIES

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-481

MAIN PLANT COHESIVE BACKFILL -
DISTRIBUTION OF PERCENT COMPACTION



RANGE	NO. OF DATA
114.0 - 114.9	3
115.0 - 115.9	0
116.0 - 116.9	2
117.0 - 117.9	1
118.0 - 118.9	2
119.0 - 119.9	5
120.0 - 120.9	17
121.0 - 121.9	50
122.0 - 122.9	97
123.0 - 123.9	101
124.0 - 124.9	154
125.0 - 125.9	201
126.0 - 126.9	233
127.0 - 127.9	243
128.0 - 128.9	310
129.0 - 129.9	324
130.0 - 130.9	366
131.0 - 131.9	383

RANGE	NO. OF DATA
132.0 - 132.9	292
133.0 - 133.9	262
134.0 - 134.9	175
135.0 - 135.9	111
136.0 - 136.9	60
137.0 - 137.9	34
138.0 - 138.9	24
139.0 - 139.9	12
140.0 - 140.9	4
141.0 - 141.9	5
142.0 - 142.9	3
143.0 - 143.9	2
144.0 - 144.9	0
145.0 - 145.9	1
146.0 - 146.9	1
147.0 - 147.9	1

TOTAL NO. OF DATA = 3479

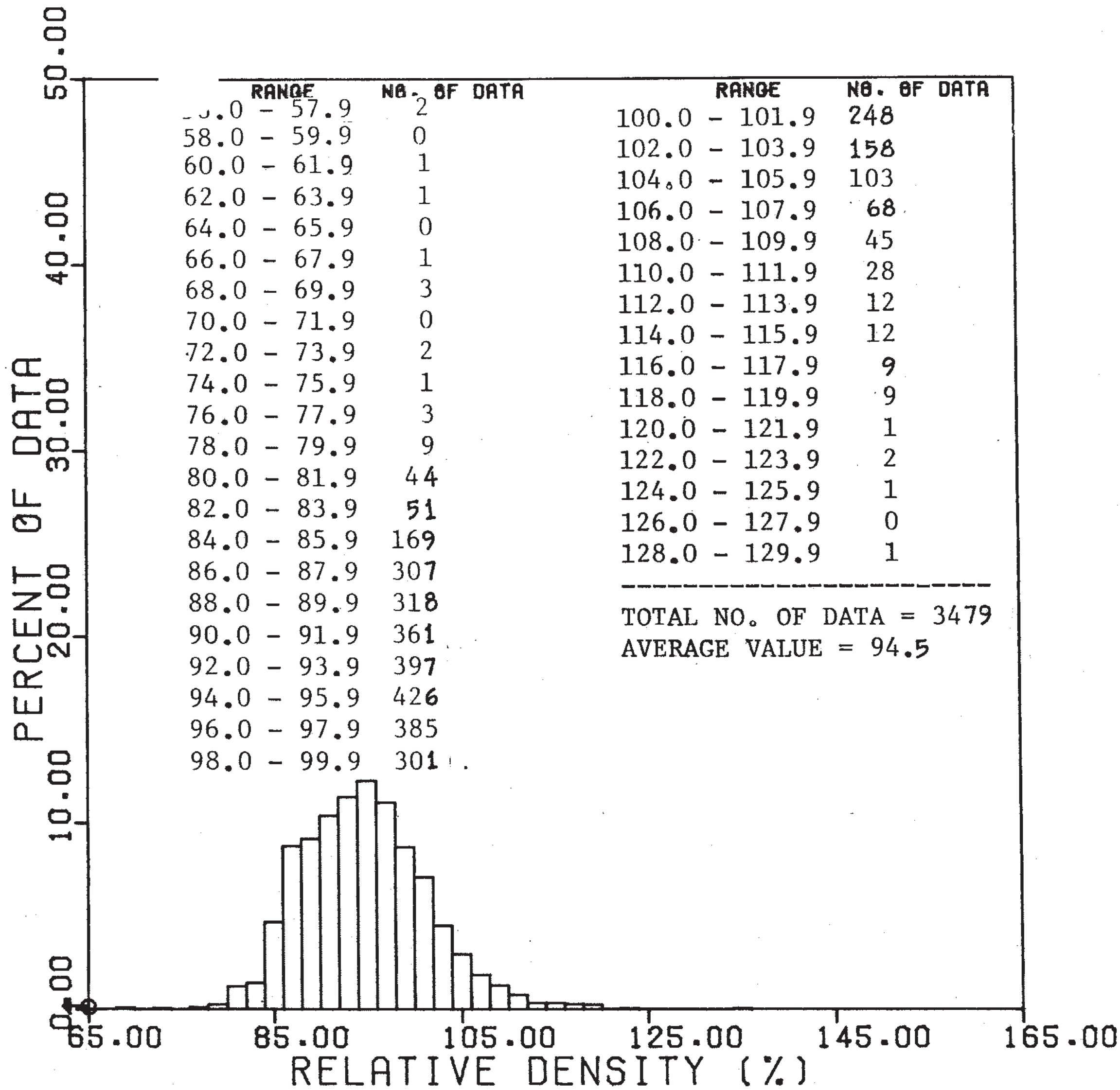
AVERAGE VALUE = 129.7

CLINTON POWER STATION
ALL DATA
POWER-P SERIES

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-482

MAIN PLANT GRANULAR BACKFILL - DISTRIBUTION OF DRY DENSITY



RANGE	NO. OF DATA
[illegible] - 57.9	2
58.0 - 59.9	0
60.0 - 61.9	1
62.0 - 63.9	1
64.0 - 65.9	0
66.0 - 67.9	1
68.0 - 69.9	3
70.0 - 71.9	0
72.0 - 73.9	2
74.0 - 75.9	1
76.0 - 77.9	3
78.0 - 79.9	9
80.0 - 81.9	44
82.0 - 83.9	51
84.0 - 85.9	169
86.0 - 87.9	307
88.0 - 89.9	318
90.0 - 91.9	361
92.0 - 93.9	397
94.0 - 95.9	426
96.0 - 97.9	385
98.0 - 99.9	301

RANGE	NO. OF DATA
100.0 - 101.9	248
102.0 - 103.9	158
104.0 - 105.9	103
106.0 - 107.9	68
108.0 - 109.9	45
110.0 - 111.9	28
112.0 - 113.9	12
114.0 - 115.9	12
116.0 - 117.9	9
118.0 - 119.9	9
120.0 - 121.9	1
122.0 - 123.9	2
124.0 - 125.9	1
126.0 - 127.9	0
128.0 - 129.9	1

TOTAL NO. OF DATA = 3479
AVERAGE VALUE = 94.5

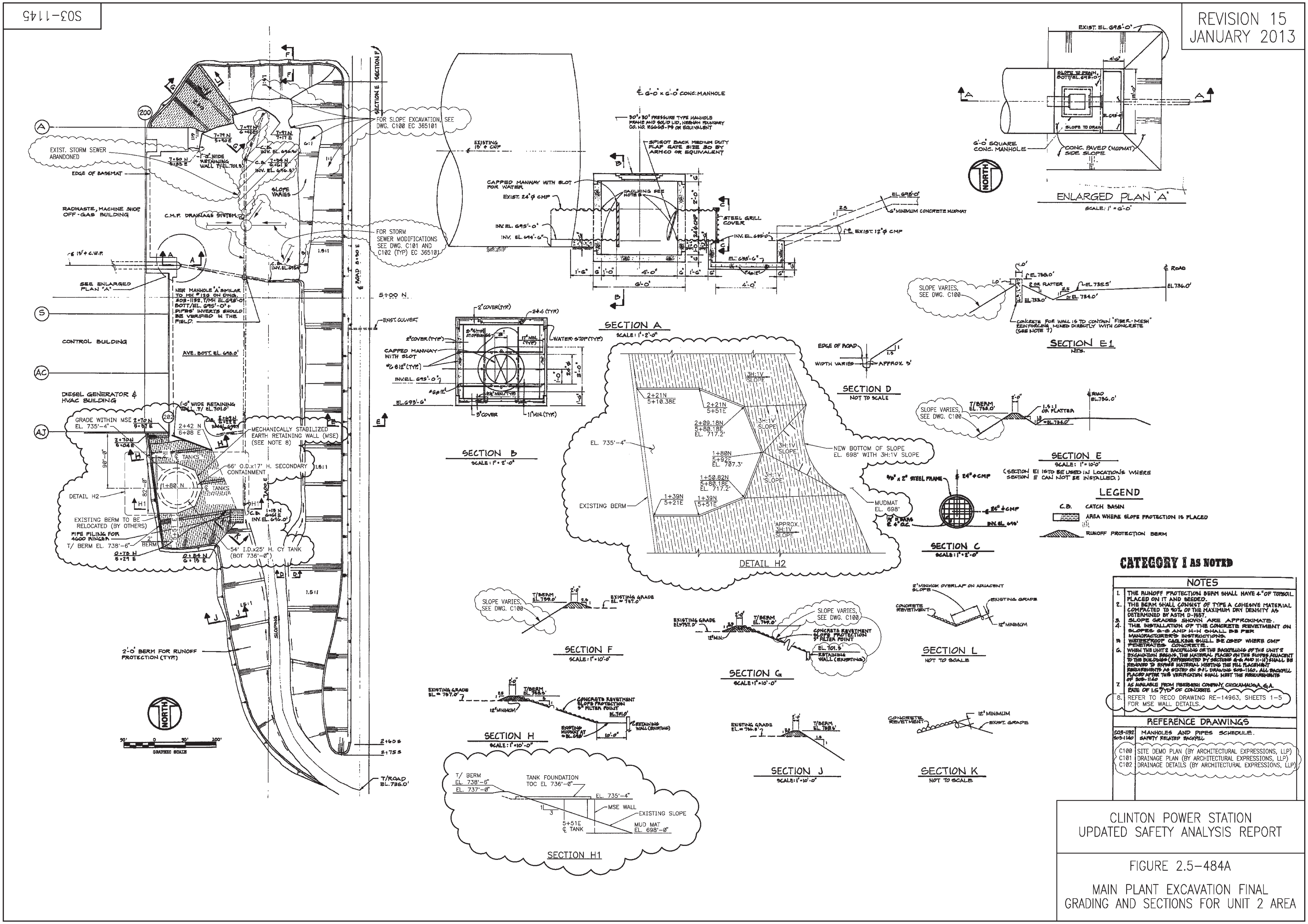
CLINTON POWER STATION
ALL DATA
POWER-P SERIES

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-483

MAIN PLANT GRANULAR BACKFILL -
DISTRIBUTION OF RELATIVE DENSITY

FIGURE 2.5-484
HAS BEEN DELETED



CATEGORY I AS NOTED

NOTES

1. THE RUNOFF PROTECTION BERM SHALL HAVE 4" OF TOPSOIL PLACED ON IT AND SEEDED.
2. THE BERM SHALL CONSIST OF TYPE A COHESIVE MATERIAL COMPACTED TO 90% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-1557.
3. SLOPE GRADES SHOWN ARE APPROXIMATE.
4. THE INSTALLATION OF THE CONCRETE REVETMENT ON SLOPES G-G AND H-H SHALL BE PER MANUFACTURER'S INSTRUCTIONS.
5. WATERPROOF CAULKING SHALL BE USED WHERE CMP PENETRATES CONCRETE.
6. WHEN THE UNIT 2 BACKFILLING OR THE BACKFILLING OF THE UNIT 2 EXCAVATION BEGINS, THE MATERIAL PLACED ON THE SLOPES ADJACENT TO THE BUILDINGS (REPRESENTED BY SECTIONS G-G AND H-H) SHALL BE REMOVED TO EXPOSE MATERIAL MEETING THE FILL PLACEMENT REQUIREMENTS AS STATED ON S&L DRAWING S03-1140. ALL BACKFILL PLACED AFTER THIS VERIFICATION SHALL MEET THE REQUIREMENTS OF S03-1140
7. AS AVAILABLE FROM FIBERMESH COMPANY, CHICKAMAUGA, GA. RATE OF 1.5#/YD³ OF CONCRETE
8. REFER TO RECO DRAWING RE-14963, SHEETS 1-5 FOR MSE WALL DETAILS.

REFERENCE DRAWINGS

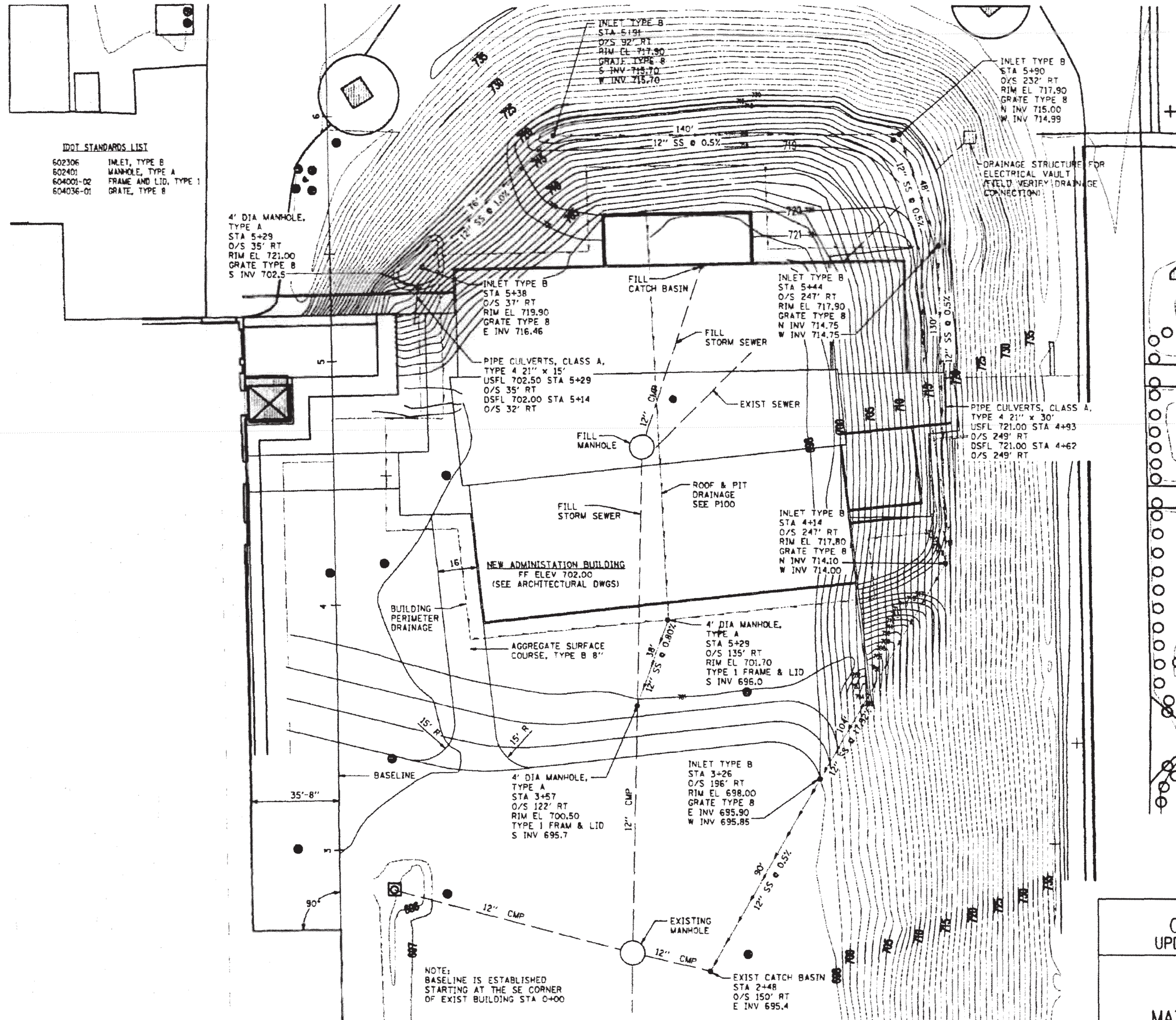
S03-1192	MANHOLES AND PIPES SCHEDULE.
S03-1140	SAFETY RELATED BACKFILL
C100	SITE DEMO PLAN (BY ARCHITECTURAL EXPRESSIONS, LLP)
C101	DRAINAGE PLAN (BY ARCHITECTURAL EXPRESSIONS, LLP)
C102	DRAINAGE DETAILS (BY ARCHITECTURAL EXPRESSIONS, LLP)

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-484A

MAIN PLANT EXCAVATION FINAL GRADING AND SECTIONS FOR UNIT 2 AREA

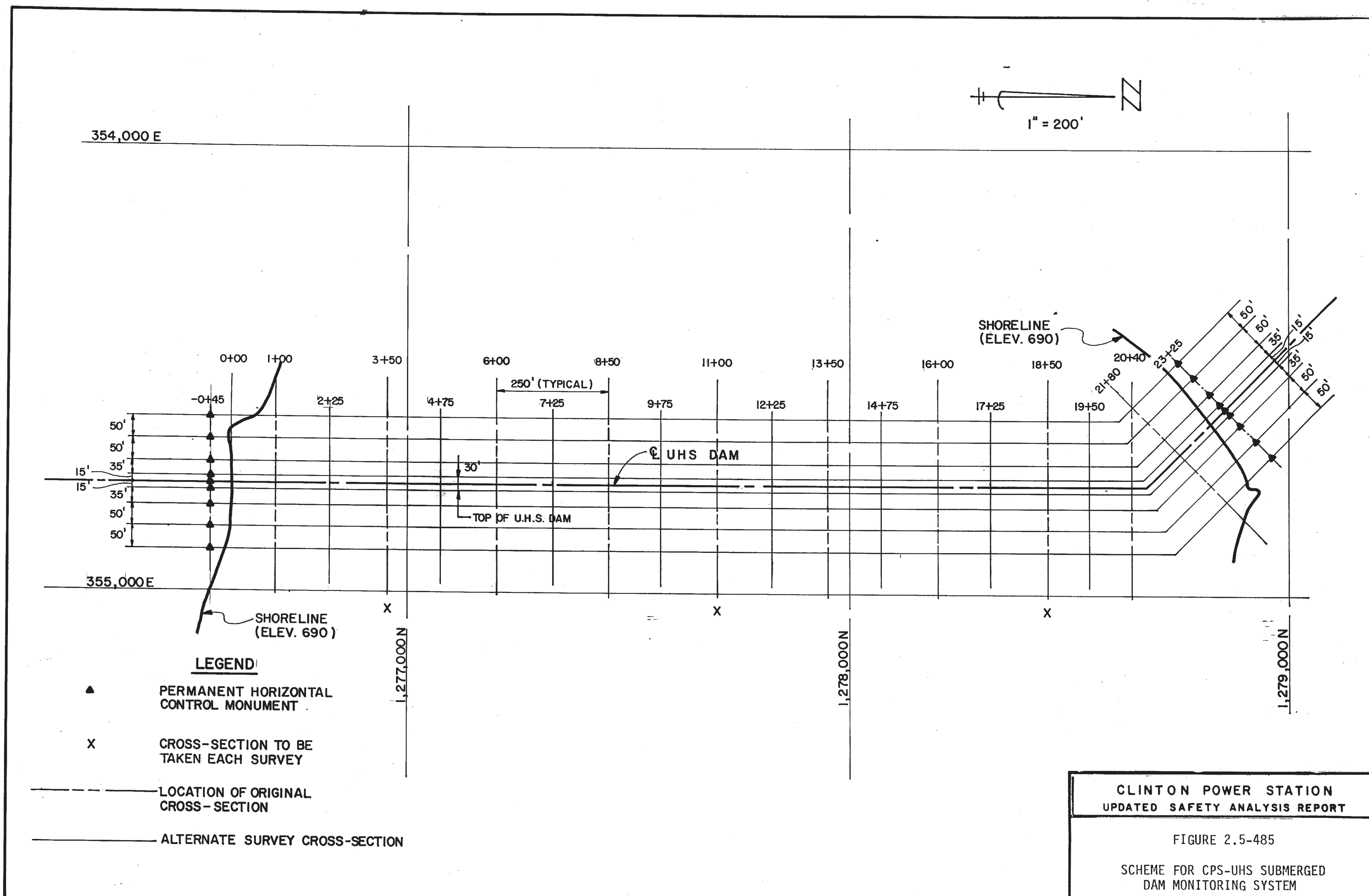
REVISION 13
JANUARY 2009



CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-484B

MAIN PLANT EXCAVATION FINAL GRADING AND SECTIONS FOR UNIT 2 AREA



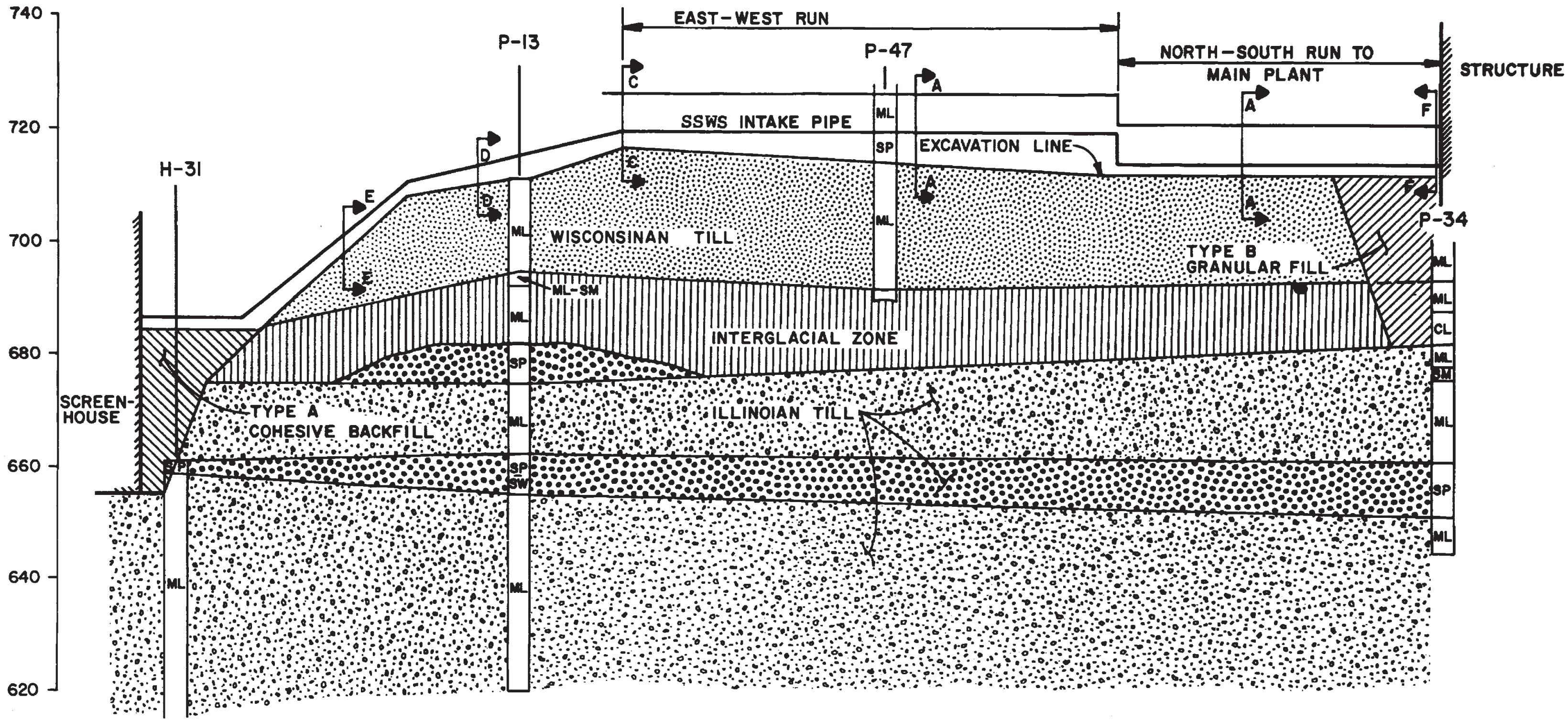
CLINTON POWER STATION

UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-485

SCHEME FOR CPS-UHS SUBMERGED DAM MONITORING SYSTEM

REVISION 9
JANUARY 2001



NOTES

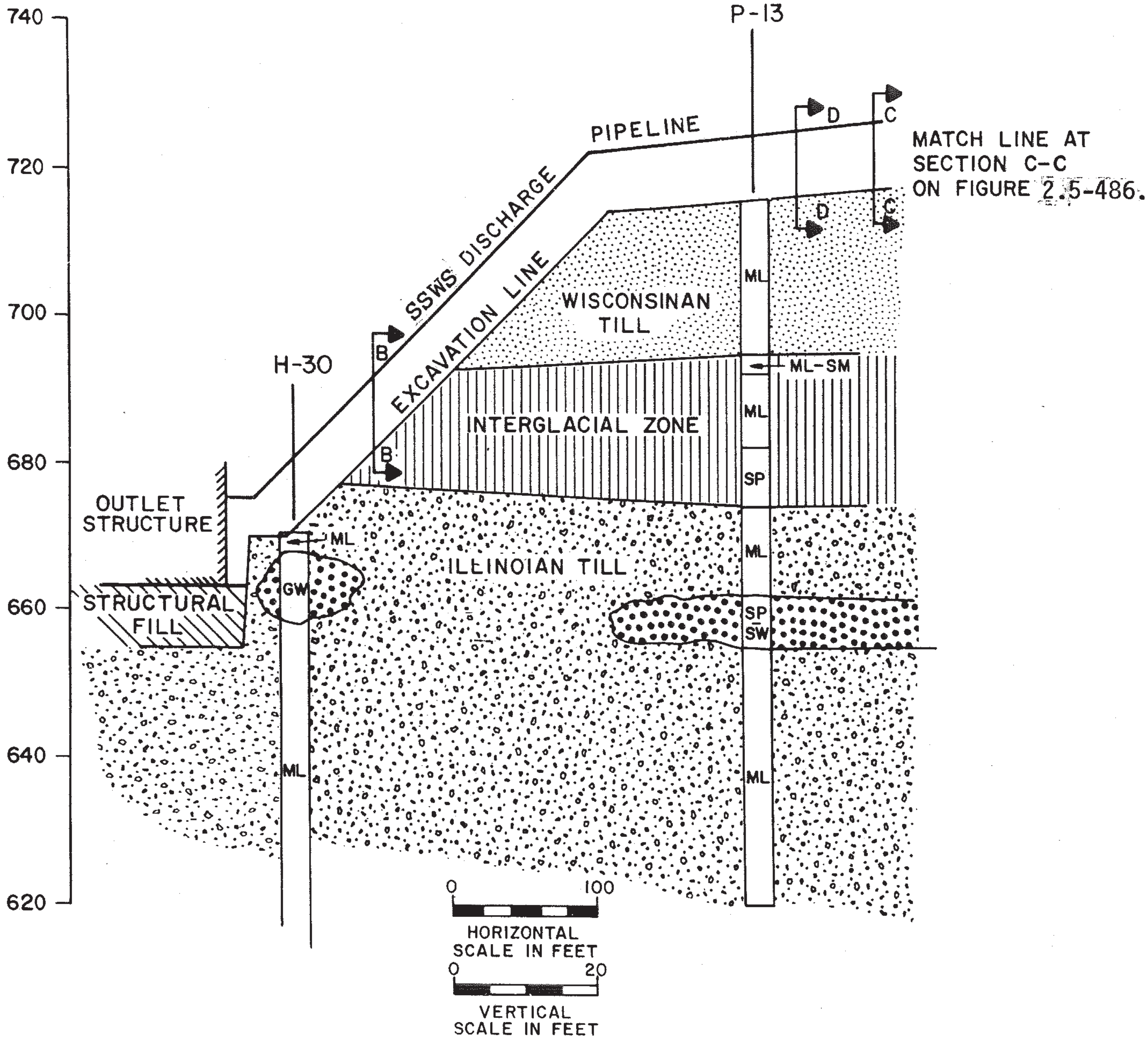
1. REFER TO FSAR FIGURE 2.5-372 FOR GEOLOGIC SECTION BELOW ELEVATION 620 FEET.
2. SEE FIGURE C2.5-23 FOR PLAN VIEW OF ECCS PIPELINE EXCAVATION.
3. SECTIONS SHOWN ON FIGURE 2.5-488.

0 100
HORIZONTAL SCALE IN FEET
0 20
VERTICAL SCALE IN FEET

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

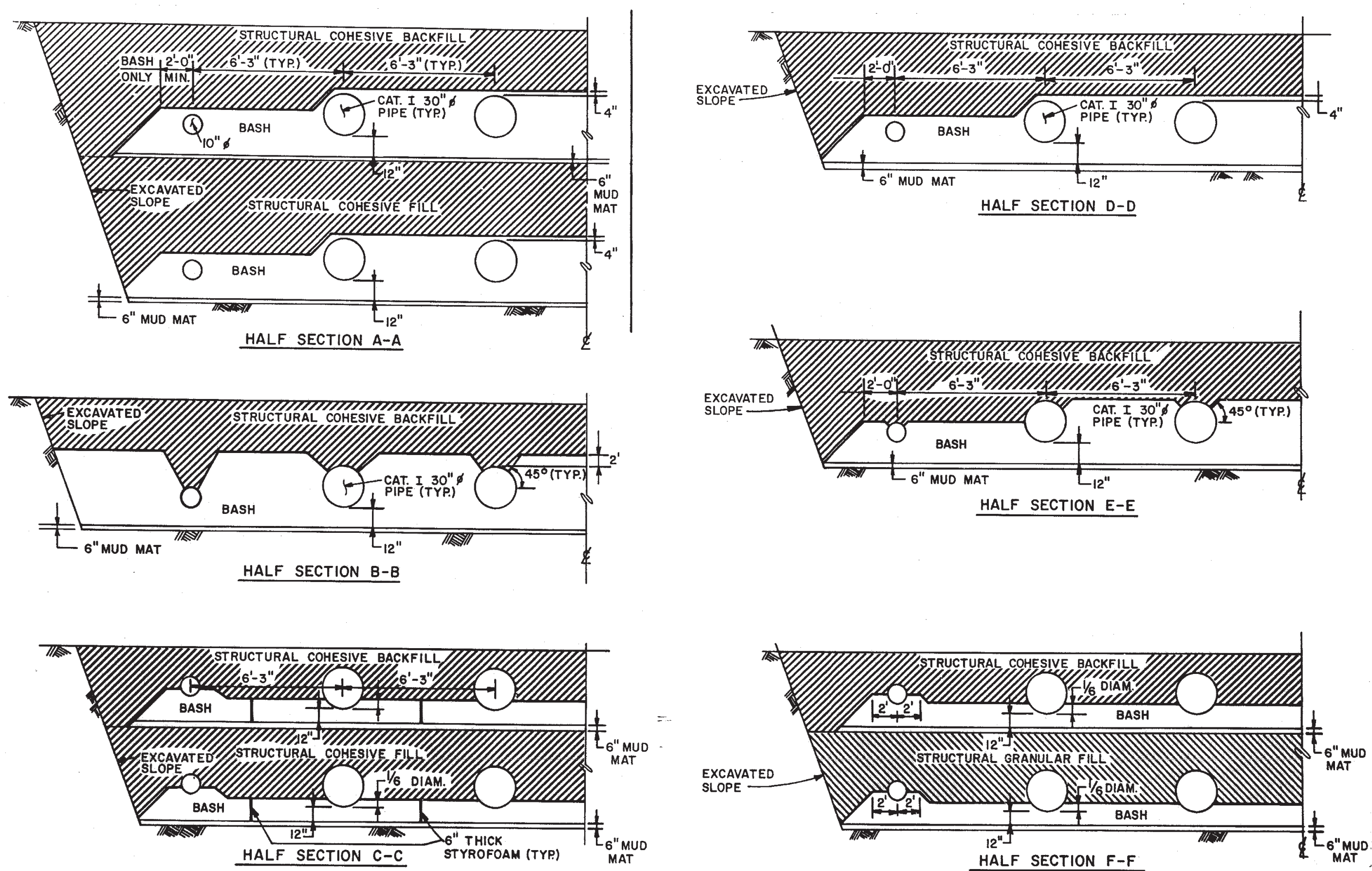
FIGURE 2.5-486

GEOLOGIC PROFILE ALONG SSWS PIPELINE - SCREENHOUSE TO MAIN PLANT



SEE NOTES ON FIGURE 2.5-486
FOR REFERENCE FIGURES.

CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT
FIGURE 2.5-487 GEOLOGIC PROFILE ALONG SSWS PIPELINE - OUTLET STRUCTURE TO MAIN PLANT



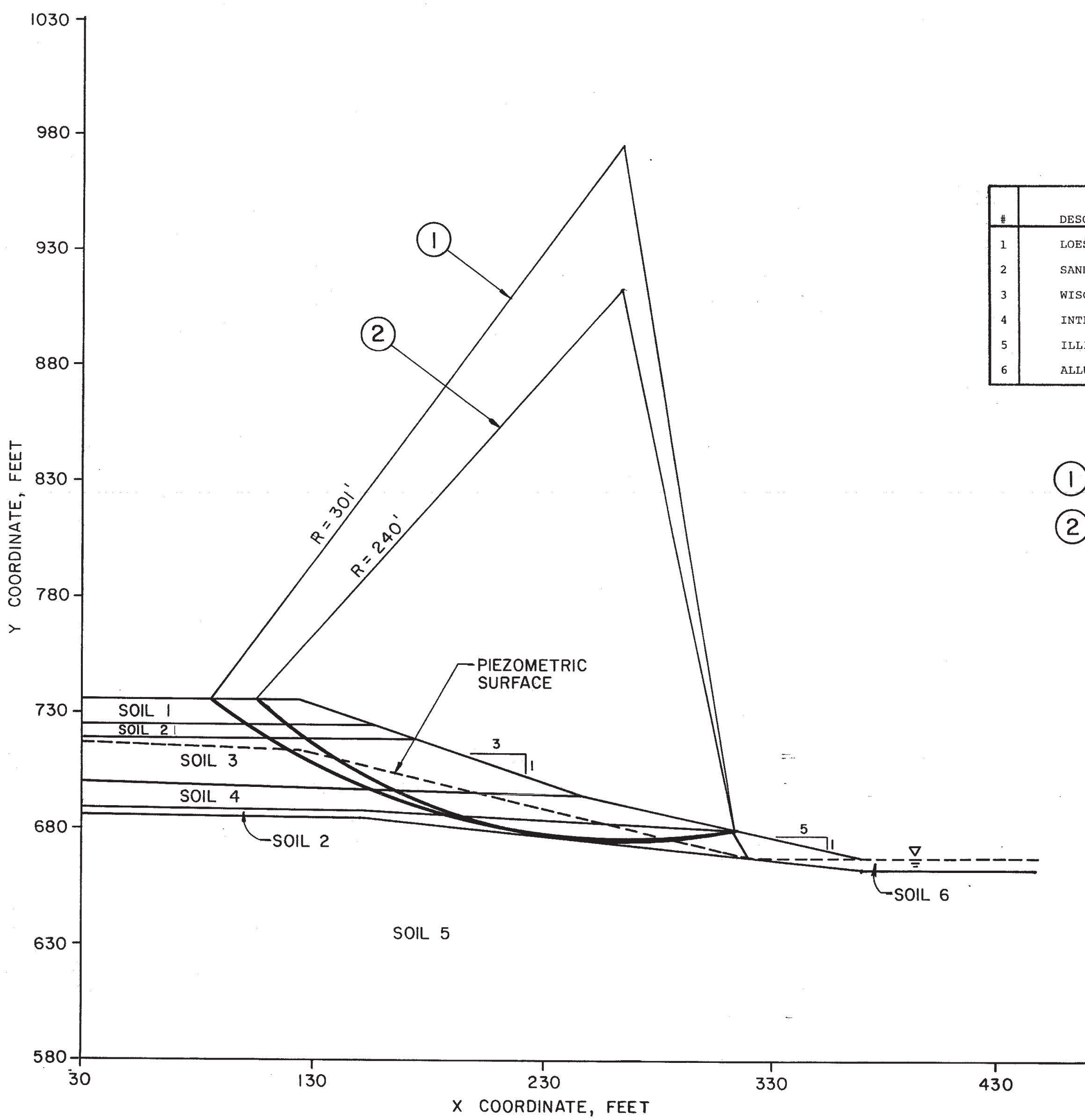
NOTES:

1. SECTIONS GIVEN ARE HALF SECTIONS AND ARE SYMMETRICAL ABOUT THE CENTERLINE.
2. SECTION C-C IS TYPICAL FOR ALL BEND LOCATIONS ALONG PIPELINE.
3. SECTION F-F IS FOR AREA IMMEDIATELY ADJACENT TO MAIN PLANT STRUCTURE ONLY.
4. LOCATION OF SECTIONS SHOWN ON FIGURES 2.5-486 AND 2.5-487.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-488

TYPICAL CROSS SECTIONS
SSWS PIPELINE



#	DESCRIPTION	SOIL DATA γ'(PCF)	C'(PSF)	Ø
1	LOESS	120.0	0	20
2	SAND	125.0	0	38
3	WISCONSIN TILL	137.0	600	30
4	INTERGLACIAL	131.0	600	30
5	ILLINOIAN TILL	150.0	0	47
6	ALLUVIUM	120.0	120	38

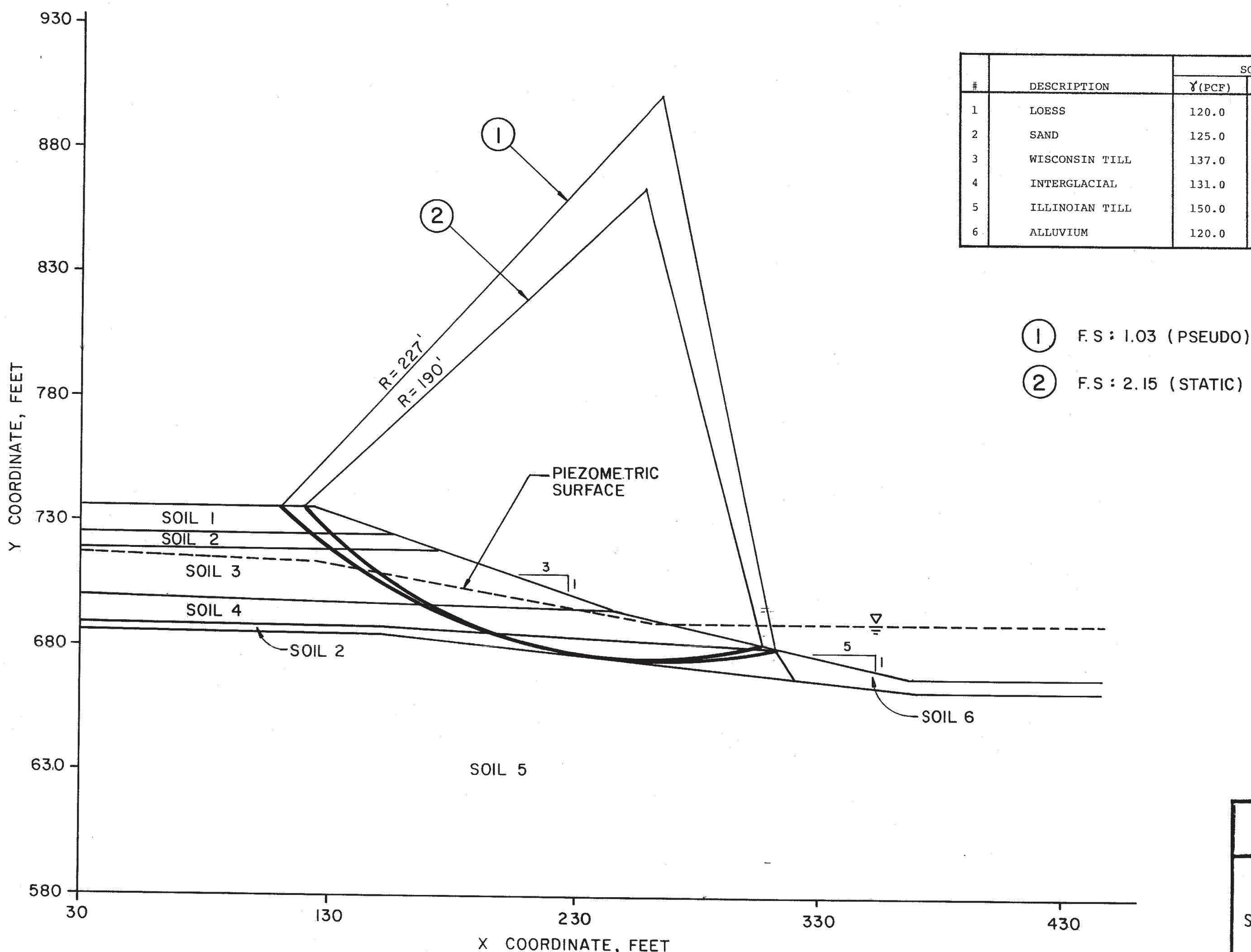
1 F.S : 1.21 (PSEUDO)

2 F.S : 2.42 (STATIC)

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-489

STABILITY ANALYSIS - END OF CONSTRUCTION CONDITION - SECTION Y-Y, ULTIMATE HEAT SINK

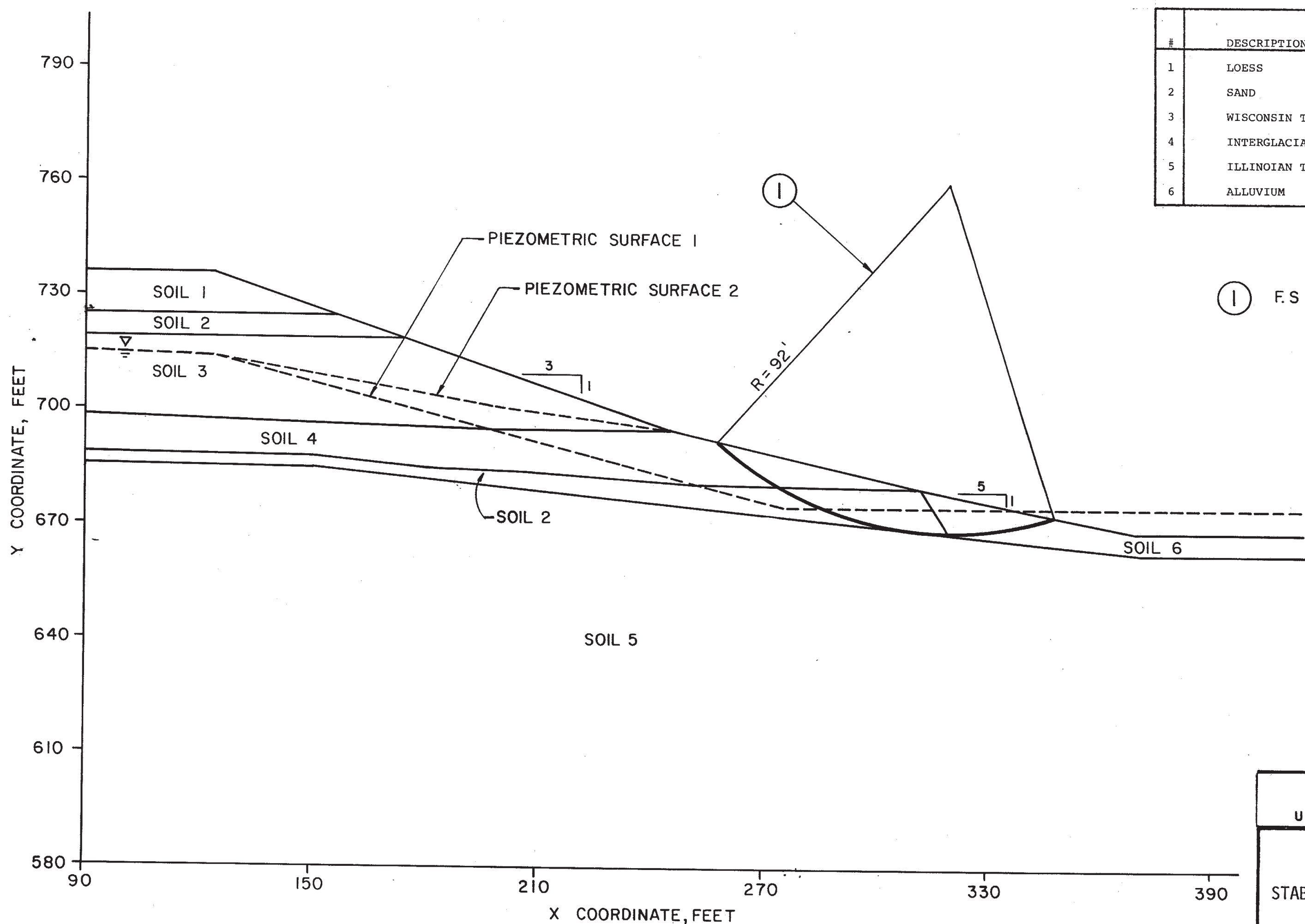


#	DESCRIPTION	SOIL DATA γ(PCF)	C' (PSF)	Ø
1	LOESS	120.0	0	20
2	SAND	125.0	0	38
3	WISCONSIN TILL	137.0	600	30
4	INTERGLACIAL	131.0	600	30
5	ILLINOIAN TILL	150.0	0	47
6	ALLUVIUM	120.0	120	38

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-490

STABILITY ANALYSIS - FULL COOLING LAKE CONDITION - SECTION Y-Y, ULTIMATE HEAT SINK

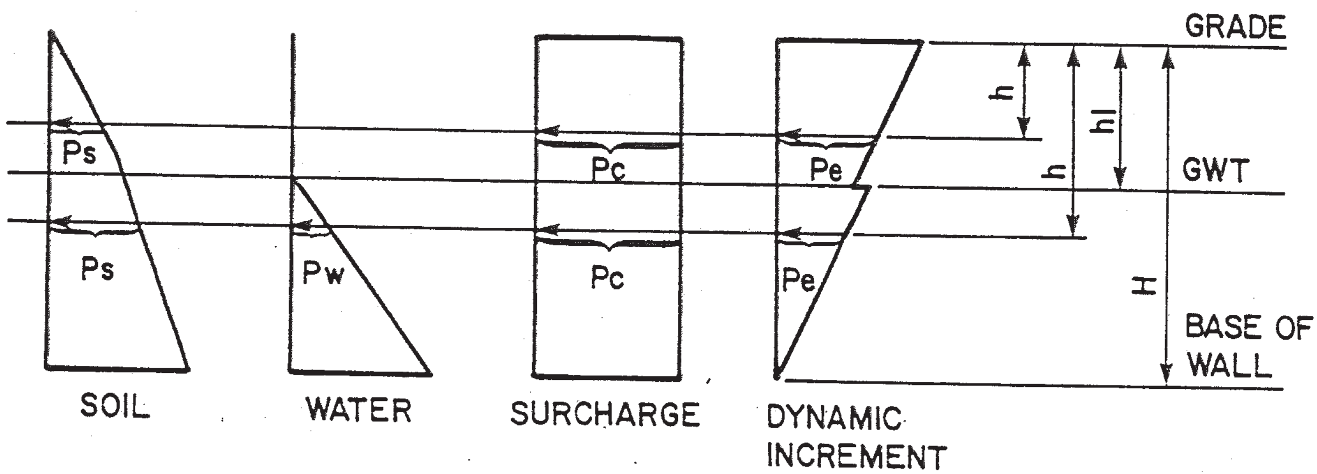


#	DESCRIPTION	SOIL DATA γ (PCF)	C' (PSF)	Ø
1	LOESS	120.0	0	20
2	SAND	125.0	0	38
3	WISCONSIN TILL	137.0	600	30
4	INTERGLACIAL	131.0	600	30
5	ILLINOIAN TILL	150.0	0	47
6	ALLUVIUM	120.0	120	38

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE 2.5-491

STABILITY ANALYSIS - EMPTY COOLING LAKE CONDITION - SECTION Y-Y, ULTIMATE HEAT SINK

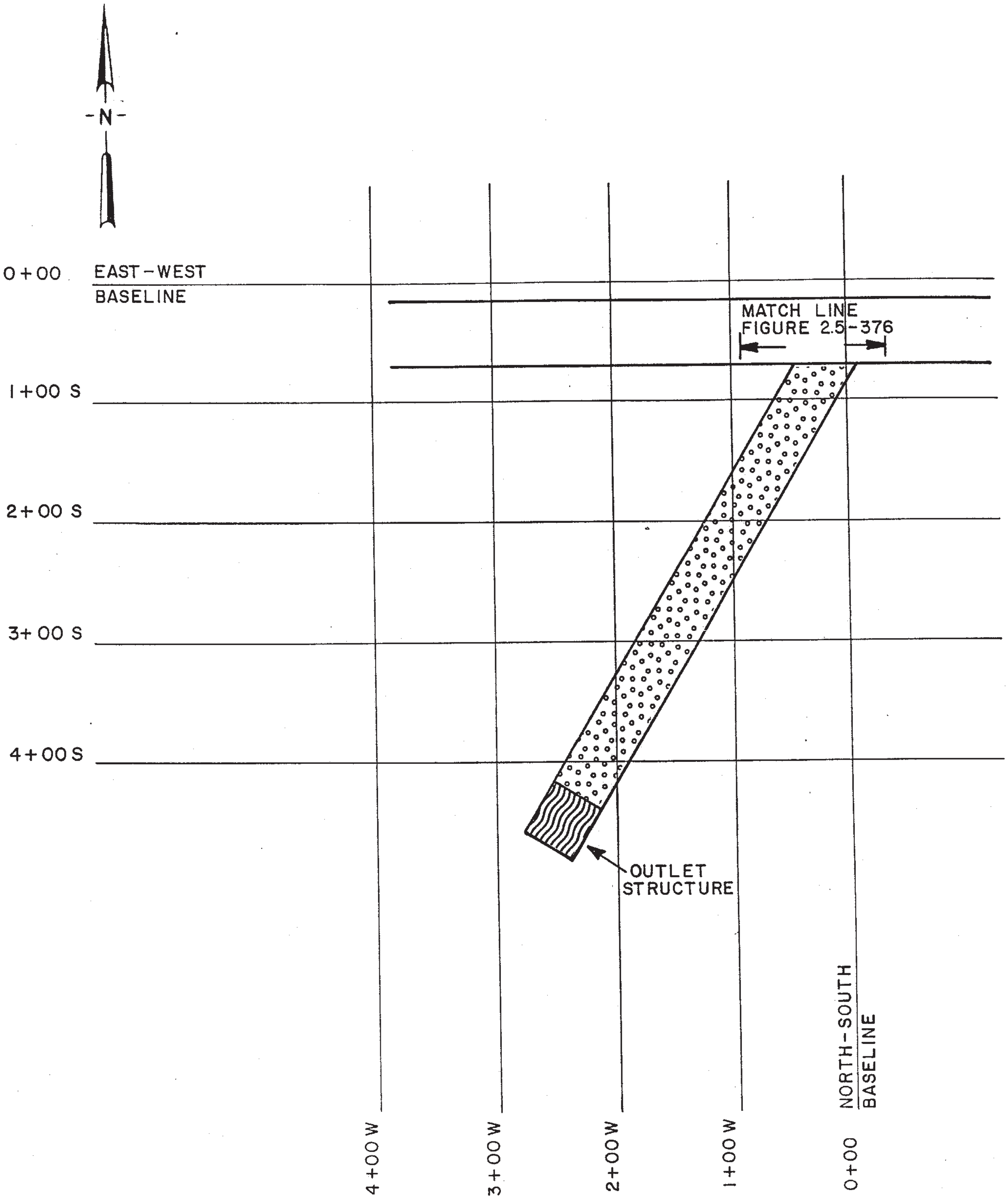


CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

Figure 2.5-492
(Q & R 241.7)

LATERAL SOIL PRESSURES

Figures 2.5-493 through 2.5-495
Deleted



NOTE

SEE FIGURE 2.5-376 FOR KEY.

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UPDATED SAFETY ANALYSIS REPORT

Figure 2.5-496
(Q & R 241.8)
FLY ASH MIXTURE AS FILL
AND BACKFILL FOR THE
SSWS DISCHARGE PIPELINE

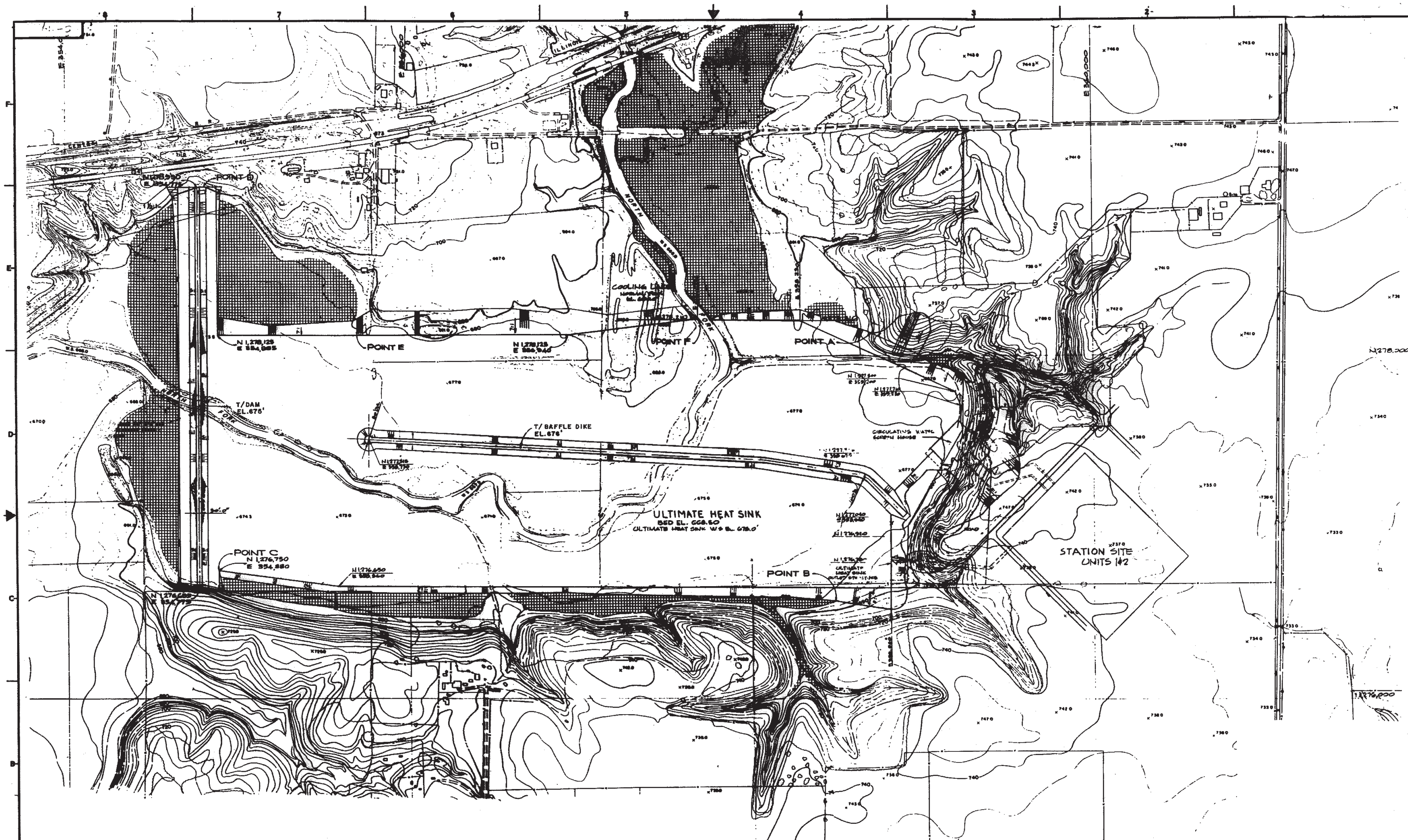

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FIGURE A2.5-1

ULTIMATE HEAT SINK SALT CREEK ALLUVIUM

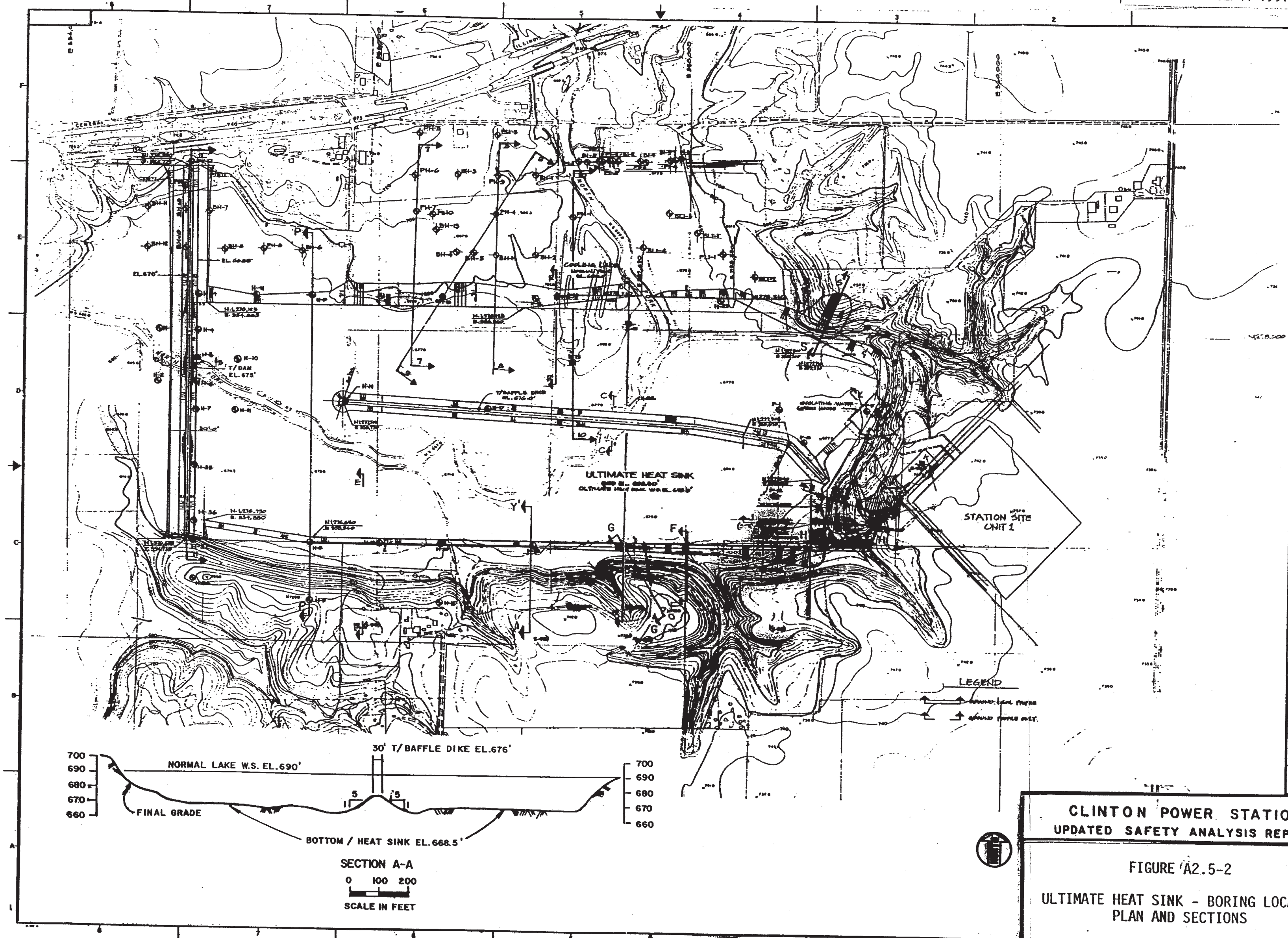

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FIGURE A2.5-2

ULTIMATE HEAT SINK - BORING LOCATION PLAN AND SECTIONS

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	σ_3 psf	UNCONFINED COMPRESSION $\frac{Q_u}{2}$ psf	ATTERBERG LIMITS PLASTIC LIMIT %	PLASTICITY INDEX %	FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE	BLOW COUNTS	SAMPLES
0										6	SS
				1500*			19.4				
							20.5				
5										44	SS
	MA						13.0		29.8	17	SS
10										30	SS
										27	SS
							10.0	127			
15	MA						7.3	137	56.5	100/5"	SS
							8.0	131		52	SS
										94	SS
20											
25											
30											
35											
40											
45											
50											
55											
60											
65											
70											
75											

BORING BH-1

SURFACE ELEVATION 690.3 ft.

SYMBOLS	DESCRIPTIONS	ELEVATION (FEET)
SM	TOP OF OUTWASH Brown, sandy silt, some fine gravel -large boulder noticed at 4.0' -some thin sand seams -mottled	
ML	TOP OF ILLINOIAN TILL Gray, silt, some fine sand, trace fine gravel Gray, silt, trace fine to coarse sand, trace fine gravel	676.3

Boring completed at 20. feet on 4-1-75

Water level not recorded.

CLINTON POWER STATION

UPDATED SAFETY ANALYSIS REPORT

FIGURE A2.5-3

LOG OF BORING BH-1

BORING BH-2

SURFACE ELEVATION 689.9 Ft.

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH: TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	SHEAR STRENGTH: TRIAXIAL COMPRESSION σ_3 psf	SHEAR STRENGTH: UNCONFINED COMPRESSION $\frac{Q_u}{2}$ psf	ATTERBERG LIMITS: PLASTIC LIMIT %	ATTERBERG LIMITS: PLASTICITY INDEX %	FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE
0									
5									
10									
15									
20									
25									
30									
35									
40									
45									
50									
55									
60									
65									
70									
75									

BLOW COUNTS / SAMPLES	SYMBOLS	DESCRIPTIONS	ELEVATION (FEET)
11 SS 11 SS	CL	Orange-brown to light brown, silty clay, some organics, trace fine sand.	
4 SS	SM	Medium brown, silty fine to medium sand, some coarse sand, trace fine gravel	
20 SS 35 SS 27 SS 23 SS 24 SS	SW-SM	TOP OF OUTWASH Medium brown, silty, fine to coarse sand, trace fine gravel.	679.9
25 SS	CL-ML	TOP OF ILLINOIAN TILL Mottled orange-brown, fine sandy clayey silt, trace medium to coarse sand, trace fine gravel.	668.9
37 SS	ML	Medium gray, fine sandy silt, trace organics.	
38 SS	CL-ML	Medium gray, fine sandy clayey silt, trace medium to coarse sand, trace gravel seams .1 feet thick of silty fine sand.	
	ML	Medium gray, fine sandy clayey silt, trace medium to coarse sand, trace fine gravel.	

Boring completed at 27.5 feet
on 3-26-75.
Water level at 17. feet.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE A2.5-4

LOG OF BORING BH-2

BORING BH-3

SURFACE ELEVATION 700.6 Ft.

Blow Counts	Samples	Tests Reported Elsewhere	Triaxial Compression $\frac{\sigma_1+\sigma_3}{2}$ psf	Triaxial Compression σ_3 psf	Unconfined Compression $\frac{Q_u}{2}$ psf	Plastic Limit %	Plasticity Index %	Field Moisture Content %	Dry Density PCF	Percent Passing 200 Sieve
8	SS				2000*	19.2	28.7	24.2		
11	SS				1100*			28.4	94	
11	SS	MA			3000*			17.0		37.3
4	SS									
4	SS	MA						30.5		15.6
19	SS				2200*	13.3	10.7	14.5	123	
100	SS	MA			6370			11.6	127	61.3
163	SS							14.5		
37	SS				1700*			14.1	128	
129	SS							10.2		
117	SS									
192	SS	MA						17.6		25.3
96	SS							22.9		
98	SS									
67	SS									
41	SS									
54	SS							19.3		
68	SS	SA								9.7
91	SS							20.6		
162	SS									
206	SS									
173	SS				11930			7.8	139	

Depth (feet): 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75

Symbols	Descriptions	Elevation (Feet)
CL	Mottled brown to light brown, fine sandy clay, some silt.	
	TOP OF OUTWASH	693.1
SM	Reddish brown, silty fine sand, some medium sand.	
SM	-some medium to coarse sand, trace fine gravel.	
SM-GP	-some fine to coarse gravel.	
CL	Medium dark brown, fine sandy clay, some silt, trace medium to coarse sand, trace gravel.	
SW-SM	Medium dark brown, silty fine to coarse sand, trace fine gravel.	
SP-SM	Medium dark brown, silty fine to medium sand.	
ML	Medium dark brown, fine sandy silt, some clay, trace medium to coarse sand, trace fine gravel.	
SM	Medium dark brown silty fine to coarse sand, trace fine gravel.	
ML	Medium dark brown, fine sandy silt, some clay, trace medium to coarse sand.	
SM	Medium dark brown, silty fine to coarse sand, trace fine gravel.	
SP	Medium dark brown, fine sand, some silt, trace medium to coarse sand.	
SP	Medium brown, fine to medium sand.	
	Medium brown, fine to medium sand, trace coarse sand.	
	Reddish brown, fine to medium sand, some silt, trace coarse sand.	
	TOP OF ILLINOIAN TILL	652.1
ML	Medium gray, fine sandy silt, some clay, trace fine gravel.	

Boring completed at 55.0 feet on 4-2-75.

Water level at 11. feet.

CLINTON POWER STATION

UPDATED SAFETY ANALYSIS REPORT

FIGURE A2.5-5

LOG OF BORING BH-3

BORING BH-4

SURFACE ELEVATION 694.0 Ft.

Depth (feet)	Tests reported elsewhere	Shear strength: triaxial compression $\frac{\sigma_1+\sigma_3}{2}$ psf	Shear strength: triaxial compression σ_3 psf	Shear strength: unconfined compression $\frac{q_u}{2}$ psf	Atterberg limits: plastic limit %	Atterberg limits: plasticity index %	Field moisture content %	Dry density pcf	Percent passing 200 sieve	Blow counts / samples	Symbols	Descriptions	Elevation (feet)
0–5				1600*			22.0	105		11 SS	CL	Medium brown, silty clay, some fine sand.	
				1300*	18.8	26.1	25.1	102		10 SS		Mottled light brown to medium dark brown, clayey silt, some fine to medium sand.	
5–10	MA						16.3		16.0	4 SS		TOP OF OUTWASH	
	SA						19.3		12.8	2 SS	SW-SM	Reddish brown, silty, fine to medium sand, some coarse sand, trace fine gravel.	686.5
10–15										1/18"SS			
	SA						27.8		14.9	1/18"SS		TOP OF ILLINOIAN TILL	677.0
15–20										19 SS	ML-CL	Medium brown, silt, some clay, trace medium to coarse sand, trace fine gravel.	
				4690	13.3	6.1	14.5 12.1	128		56 SS			
20–25										137 SS			
				9360			11.5 9.8	143		94 SS			
25–30										70 SS	ML	Medium gray, silt, some clay, some medium to coarse sand, trace fine gravel.	

Boring completed at 27.5 feet on 3-3-75.
Water level not recorded.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE A2.5-6

LOG OF BORING BH-4

BORING BH-5

SURFACE ELEVATION 691.8

Depth (feet)	Tests reported elsewhere	Shear strength: Triaxial compression $\frac{\sigma_1+\sigma_3}{2}$ psf	Shear strength: Triaxial compression σ_3 psf	Shear strength: Unconfined compression $\frac{q_u}{2}$ psf	Atterberg limits: Plastic limit %	Atterberg limits: Plasticity index %	Field moisture content %	Dry density pcf	Percent passing 200 sieve	Blow counts / Samples
				2330	19.6	27.9	24.1	102		14 SS
5	MA						17.6		17.8	9 SS
	SA						20.7		11.9	4 SS
										3 SS
10	MA						27.4	103	26.0	2 SS
15	MA						23.4	107	48.3	4 SS
										4 SS
20	SA						14.6		7.6	21 SS
										14 SS
25	SA						16.5		5.9	21 SS
										38 SS
30	SA						14.2		5.6	51 SS
										60 SS
35	SA						15.6		6.9	48 SS
										47 SS
40										34 SS
				4500+*	10.6	10.0	9.5			162 SS
45				4500+*			10.2	136		153/6" SS
50										
55										
60										
65										
70										
75										

Symbols	Descriptions	Elevation (feet)
CL	Medium to light brown, silty clay, some fine sand.	
	TOP OF OUTWASH	687.8
SW-SM	Reddish-brown, fine to coarse sand, little fine gravel, trace silt.	
ML-SM	Reddish-brown, silt and fine to coarse sand.	
SW	Reddish-brown, fine to coarse sand, trace silt, trace fine to medium gravel.	
	-grades gray	
	-grades light brown	
	-grades medium brown	
	TOP OF ILLINOIAN TILL	651.8
ML	Medium gray, silt, some fine to coarse sand, some clay, trace fine gravel.	

Boring completed at 44.0 feet on 4-1-75.
Water level not recorded.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE A2.5-7

LOG OF BORING BH-5

BORING BH-6

SURFACE ELEVATION 685.0 Ft.

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH: TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	σ_3 psf	UNCONFINED COMPRESSION $\frac{q_u}{2}$ psf	ATTERBERG LIMITS: PLASTIC LIMIT%	PLASTICITY INDEX%	FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE	BLOW COUNTS	SAMPLES
0											
										5	SS
5				1000*	20.5	15.1	28.7	100		4	SS
				660			23.5	105		9	SS
10				1410	15.7	30.7	31.6	98		7	SS
				300*			35.7			3	SS
15	SA						23.8		296	8	SS
										28	SS
20				4790			9.0	139		41	SS
							8.8			53	SS
25							9.3	137		116	SS
30											
35											
40											
45											
50											
55											
60											
65											
70											
75											

SYMBOLS	DESCRIPTIONS	ELEVATION (FEET)
CL	TOP OF SALT CREEK ALLUVIUM Grayish brown to brown mottled, silty clay, trace fine sand.	
	Light grayish brown mottled, silty clay.	
GC • GM	TOP OF OUTWASH Gray, clayey gravel, some silt.	671.0
ML	TOP OF ILLINOIAN TILL Gray, silt, trace fine to coarse sand, trace fine gravel.	669.0

Boring completed at 25. feet on 4-1-75.
Water level at 6.5 feet.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE A2.5-8

LOG OF BORING BH-6

BORING BH-7

SURFACE ELEVATION 681.8 Ft.

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	σ_3 psf	UNCONFINED COMPRESSION $\frac{q_u}{2}$ psf	ATTERBERG LIMITS PLASTIC LIMIT %	PLASTICITY INDEX %	FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE	BLOW COUNTS SAMPLES	SYMBOLS	DESCRIPTIONS	ELEVATION (FEET)
0												TOP OF SALT CREEK ALLUVIUM	
										13 SS	CL	Black, silty clay - topsoil.	
5				1800*			23.3	104		15 SS	CL	Mottled dark to light brown, silty clay, trace fine sand.	
					15.7	30.7				6 SS			
10				700*			31.3			3 SS			
												TOP OF OUTWASH	669.8
										17 SS	GW • GM	Mottled brownish orange to medium gray, silty, fine to coarse gravel and fine to coarse sand.	
15	SA						12.9		8.3	15 SS		Medium brown, fine to coarse gravel, trace fine to coarse sand, some silt.	
										43 SS			
												TOP OF ILLINOIAN TILL	663.3
20							8.7			105 SS	ML	Medium gray, silt, some fine to coarse sand, trace fine gravel.	
										129 SS			
25													
30													
35													
40													
45													
50													
55													
60													
65													
70													
75													

Boring completed at 22.5 feet on 4-2-75.
Water level at 7. feet.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE A2.5-9

LOG OF BORING BH-7

BORING BH-8

SURFACE ELEVATION 681.7 Ft.

Depth (Feet)	Tests Reported Elsewhere	Shear Strength: Triaxial Compression $\frac{\sigma_1+\sigma_3}{2}$ psf	Shear Strength: Triaxial Compression σ_3 psf	Shear Strength: Unconfined Compression $\frac{Q_u}{2}$ psf	Atterberg Limits: Plastic Limit %	Atterberg Limits: Plasticity Index %	Field Moisture Content %	Dry Density PCF	Percent Passing 200 Sieve	Blow Counts Samples
0										
										8 SS
5				500*	17.6	22.8	27.4	106		3 SS
					15.2	9.5	28.1			2 SS
10										4 SS
	MA						12.6		9.7	19 SS
15										30 SS
										23 SS
20				4000*			11.4	141		33 SS
							10.6	136		123 SS
25							11.8	137		100 SS / 2"
30										
35										
40										
45										
50										
55										
60										
65										
70										
75										

SYMBOLS

Symbols	Descriptions	Elevation (Feet)
CL	TOP OF SALT CREEK ALLUVIUM Mottled grayish black to brown, silty clay, trace fine sand.	
ML	Brown, silt, trace fine sand.	
	TOP OF OUTWASH	673.7
SP	Brown, fine sand, some silt.	
SM	Brown, fine to coarse sand, some gravel, trace silt.	
GP	Brown, fine to medium gravel.	
	TOP OF ILLINOIAN TILL	663.7
ML	Gray silt, trace fine to coarse sand, trace fine gravel.	

Boring completed at 25. feet
on 3-31-75.
Water level at 3. feet.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE A2.5-10

LOG OF BORING BH-8

BORING BH-9

SURFACE ELEVATION 682.1 Ft.

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH: TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	σ_3 psf	UNCONFINED COMPRESSION $\frac{Qu}{2}$ psf	ATTERBERG LIMITS: PLASTIC LIMIT %	PLASTICITY INDEX %	FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE	BLOW COUNTS	SAMPLES	SYMBOLS	DESCRIPTIONS	ELEVATION (FEET)
0										5	SS	CL ML	TOP OF SALT CREEK ALLUVIUM Blackish-to-brownish gray, silty clay, trace organics.	
5				1000*			235			5	SS			
										2	SS			
10	MA						239		644	2	SS	ML	Brown, silt, some fine sand, trace clay.	
										2	SS			
15	SA						104		96	21	SS	GP	TOP OF OUTWASH Brownish gray, fine to coarse gravel, some fine to coarse sand.	668.1
										49	SS	ML	TOP OF ILLINOIAN TILL Gray, clayey silt, trace fine to coarse sand, trace fine gravel.	665.6
20					105	9.3	110	142		52	SS			
							100			154	SS			
25							133	132		133	SS			
30														
35														
40														
45														
50														
55														
60														
65														
70														
75														

Boring completed at 25. feet
on 3-31-75.
Water level at 4. feet.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE A2.5-11

LOG OF BORING BH-9

BORING BH-10

SURFACE ELEVATION 680.9 Ft.

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	SHEAR STRENGTH TRIAXIAL COMPRESSION σ_3 psf	SHEAR STRENGTH UNCONFINED COMPRESSION $\frac{Qu}{2}$ psf	ATTERBERG LIMITS PLASTIC LIMIT %	ATTERBERG LIMITS PLASTICITY INDEX %	FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE	BLOW COUNTS SAMPLES
0										9 SS
					16.5	23.3	25.4	106		
5										3 SS
										2 SS
							24.7			2 SS
10										
	SA						22.6		34.9	4 SS
15										16 SS
							10.6	134		32 SS
20										34 SS
							11.3	138		70 SS
25										
30										
35										
40										
45										
50										
55										
60										
65										
70										
75										

SYMBOLS	DESCRIPTIONS	ELEVATION (FEET)
	TOP OF SALT CREEK ALLUVIUM	
CL	Blackish-to-brownish gray, silty clay, trace fine sand.	
ML	Gray, silt, some fine sand.	
SM	Gray, silty fine sand.	
	TOP OF ILLINOIAN TILL	666.9
ML	Gray, sandy silt, some fine gravel.	

Boring completed at 22.5 feet on 3-31-75.

Water level at 3.5 feet.

CLINTON POWER STATION

UPDATED SAFETY ANALYSIS REPORT

FIGURE A2.5-12

LOG OF BORING BH-10

BORING BH-11

SURFACE ELEVATION 685.5 Ft.

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH: TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	TRIAXIAL COMPRESSION σ_3 psf	UNCONFINED COMPRESSION $\frac{Qu}{2}$ psf	ATTERBERG LIMITS: PLASTIC LIMIT %	ATTERBERG LIMITS: PLASTICITY INDEX %	FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE	BLOW COUNTS SAMPLES
0										7 SS
5					14.4	19.2	19.2	115		6 SS
							22.5			4 SS
10										4 SS
					15.2	17.6	26.6			4 SS
15				500*			22.6	114		4 SS
							14.3			22 SS
20										43 SS
										99 SS
25										57 SS
										119 SS
30										
35										
40										
45										
50										
55										
60										
65										
70										
75										

SYMBOLS	DESCRIPTIONS	ELEVATION (FEET)
CL	TOP OF SALT CREEK ALLUVIUM Grayish brown to brown, silty clay, trace fine sand, trace organics.	
CL-ML	Brown, silty clay, some fine to medium sand, trace fine to medium gravel.	
SP SM	TOP OF OUTWASH Gray, fine to coarse sand, little silt, trace fine to medium gravel.	670.5
ML	TOP OF ILLINOIAN TILL Gray, clayey silt, trace fine to coarse sand, trace fine gravel.	668.5

Boring completed at 27.5 feet on 3-26-75.

Water level not recorded.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE A2.5-13

LOG OF BORING BH-11

BORING BH-12

SURFACE ELEVATION 681.0 Ft.

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH: TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	σ_3 psf	UNCONFINED COMPRESSION $\frac{Q_u}{2}$ psf	ATTERBERG LIMITS: PLASTIC LIMIT %	PLASTICITY INDEX %	FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE
0									
5									
10									
15									
20									
25									
30									
35									
40									
45									
50									
55									
60									
65									
70									
75									

BLOW COUNTS SAMPLES	SYMBOLS	DESCRIPTIONS	ELEVATION (FEET)
7 SS	CL ML	TOP OF SALT CREEK ALLUVIUM Grayish black to brownish gray, silty clay, trace fine sand.	
9 SS			
2 SS	SM	TOP OF OUTWASH Reddish brown, silty fine sand, trace clay.	675.0
2 SS			
21 SS	GP	Reddish brown to dark brown, silty fine gravel, trace fine to coarse sand.	
23 SS			
41 SS	ML	TOP OF ILLINOIAN TILL Gray, clayey silt, some fine to coarse sand, trace fine gravel.	664.0
37 SS			
237 SS			
150/2"SS			

Boring completed at 24. feet on 3-26-75.

Water level at 6.5 feet.

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FINAL SAFETY ANALYSIS REPORT

FIGURE A2.5-14

LOG OF BORING BH-12

BORING BH-13

SURFACE ELEVATION 695.3 Ft.

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH: TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	σ_3 psf	UNCONFINED COMPRESSION $\frac{q_u}{2}$ psf	ATTERBERG LIMITS: PLASTIC LIMIT %	PLASTICITY INDEX %	FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE	BLOW COUNTS	SAMPLES
0											
				2000*						10	SS
5					185	254	259	101		13	SS
										9	SS
10	MA						162		134	7	SS
										39	SS
15	SA						46		104	53	SS
										34	SS
20				4500*			120			63	SS
				4500*			116	133		116	SS
25							186			31	SS
	SA						144		92	80	SS
30							309			142	SS
										127	SS
35							179			91	SS
				8250			100	141		115	SS
40										133	SS
45											
50											
55											
60											
65											
70											
75											

SYMBOLS	DESCRIPTIONS	ELEVATION (FEET)
CL ML	Mottled medium brown to dark brown, silty clay, trace fine sand.	
	TOP OF OUTWASH	689.3
SP	Reddish-brown, medium sand, trace silt, some medium to coarse sand.	
SW	Medium brown, fine to coarse sand, some fine gravel, trace silt.	
ML	Medium brown, silt, some clay, little fine to coarse sand, trace fine gravel.	
SW	Medium brown, fine to coarse sand, trace fine gravel, trace silt.	
ML	Laminated brown to gray, silt, trace fine sand.	
SM	Medium brown, silty fine to coarse sand.	
ML	Laminated black to gray, silt, trace fine sand.	
	TOP OF ILLINOIAN TILL	659.3
ML	Medium gray, silt, some clay, some fine to coarse sand, trace gravel.	

Boring completed at 40. feet on 4-3-75.

Water level not recorded.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE A2.5-15

LOG OF BORING BH-13

BORING BH-14

SURFACE ELEVATION 694.1 Ft.

Blow Counts	Samples	Tests Reported Elsewhere	Triaxial Compression $\frac{\sigma_1+\sigma_3}{2}$ psf	σ_3 psf	Unconfined Compression $\frac{q_u}{2}$ psf	Plastic Limit %	Plasticity Index %	Field Moisture Content %	Dry Density PCF	Percent Passing 200 Sieve
10	SS				2300*			26.0	101	
8	SS					17.1	20.2	24.2		
7	SS	MA						18.0		18.9
14	SS									
64	SS	SA						5.6		10.4
77	SS							4.5		
47	SS									
48	SS									
25	SS	SA						8.2		10.8
18	SS									
57	SS							17.4		
23	SS							28.6		
28	SS							13.8		
75	SS				6480			10.3	135	
168	SS							8.3		

Symbols	Descriptions	Elevation (Feet)
CL	Mottled medium to dark brown, silty clay, trace fine sand, trace organics.	
	TOP OF OUTWASH	688.1
SM	Reddish-brown, silty, fine to coarse sand, trace fine to medium gravel.	
SW	Medium brown, fine to coarse sand, some fine to medium gravel, trace silt.	
GP	Medium brown, fine to medium gravel, some fine to coarse sand, trace silt.	
SP	Medium gray, fine to coarse sand, some fine gravel.	
ML	Mottled medium to dark gray, silt.	
	TOP OF ILLINOIAN TILL	665.1
ML	Medium gray, silt, some fine to coarse sand, trace fine gravel.	

Depth scale: 0 to 75 feet.

Boring completed at 37.5 feet on 4-4-75.
Water level at 22.0 feet.

CLINTON POWER STATION
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FIGURE A2.5-16

LOG OF BORING BH-14

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH: TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	SHEAR STRENGTH: TRIAXIAL COMPRESSION σ_3 psf	SHEAR STRENGTH: UNCONFINED COMPRESSION $\frac{Qu}{2}$ psf	ATTERBERG LIMITS: PLASTIC LIMIT %	ATTERBERG LIMITS: PLASTICITY INDEX %	FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE
0									
5									
10									
15									
20									
25									
30									
35									
40									
45									
50									
55									
60									
65									
70									
75									

BORING PH-1

SURFACE ELEVATION 689.2 Ft.

BLOW COUNTS SAMPLES	SYMBOLS	DESCRIPTIONS	ELEVATION (FEET)
AG	CL-ML	Brown mottled, silty clay.	
		Brown, silty clay, trace fine gravel.	
		TOP OF OUTWASH	680.2
BG	SP-SM	Brown, silty fine to coarse sand, trace fine gravel.	
	CL-ML	Gray, silty clay, trace fine gravel.	
	ML	Grayish brown, silt, trace organics.	
		TOP OF ILLINOIAN TILL	666.7
	ML	Gray, silt, some fine to coarse sand, some fine gravel.	

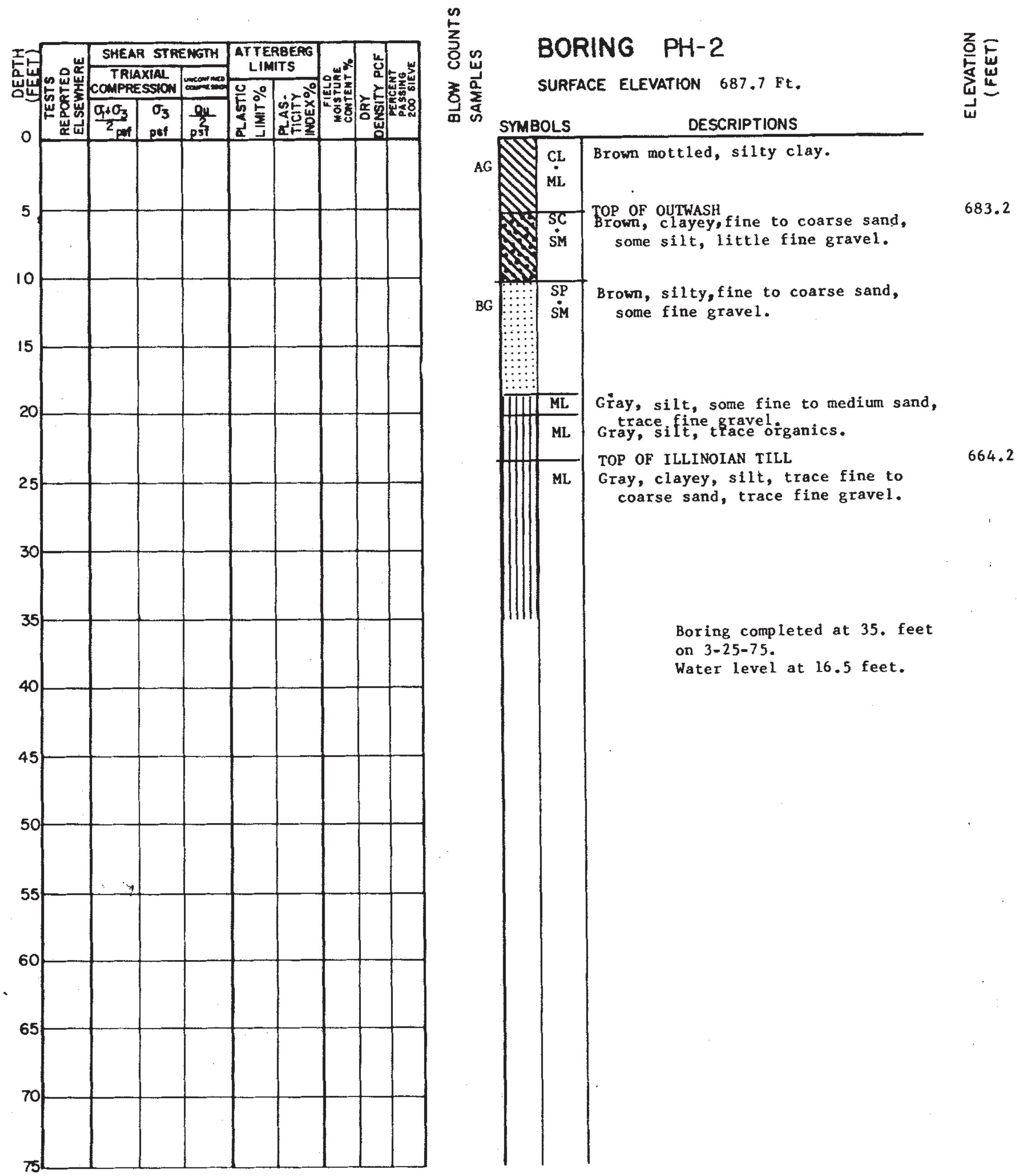
Boring completed at 25. feet on 3-25-75.

Water level not recorded.

CLINTON POWER STATION
FINAL SAFETY ANALYSIS REPORT

FIGURE A2.5-17

LOG OF BORING PH-1



CLINTON POWER STATION

UPDATED SAFETY ANALYSIS REPORT

FIGURE A2.5-18

LOG OF BORING PH-2

BORING PH-3

SURFACE ELEVATION 697.3 Ft.

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH: TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	SHEAR STRENGTH: TRIAXIAL COMPRESSION σ_3 psf	SHEAR STRENGTH: UNCONFINED COMPRESSION $\frac{q_u}{2}$ psf	ATTERBERG LIMITS: PLASTIC LIMIT%	ATTERBERG LIMITS: PLASTICITY INDEX%	FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE	BLOW COUNTS	SAMPLES
0											AG
5											
10											
15											
20											
25											
30											
35											
40											
45											
50											
55											
60											
65											
70											
75											

SYMBOLS	DESCRIPTIONS	ELEVATION (FEET)
CL-ML	Grayish black, silty clay, some fine to coarse sand.	
SC	Brown, clayey, fine to medium sand, some silt, trace fine gravel.	
CL-ML	Brownish gray, silty clay, trace fine to coarse sand, trace fine gravel.	
	TOP OF OUTWASH	
SP	Brown, medium sand, trace gravel, trace silt.	682.3
ML	Gray, silt, some fine sand.	
SP	Reddish brown, silty coarse sand.	
	-grades with silt.	
	TOP OF ILLINOIAN TILL	655.8
ML	Gray, silty, clay, trace fine to coarse sand, trace fine gravel.	

Boring completed at 42.5 feet
on 3-24-75.
Water level 16.0 feet.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE A2.5-19

LOG OF BORING PH-3

BORING PH-4

SURFACE ELEVATION 694.5 Ft.

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	σ_3 psf	UNCONFINED COMPRESSION $\frac{q_u}{2}$ psf	ATTERBERG LIMITS PLASTIC LIMIT%	PLASTICITY INDEX%	FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE
0									
5									
10									
15									
20									
25									
30									
35									
40									
45									
50									
55									
60									
65									
70									
75									

BLOW COUNTS SAMPLES	SYMBOLS	DESCRIPTIONS	ELEVATION (FEET)
AG	CL • ML	Orange-brown, mottled, silty, clay.	
	SP • SM	TOP OF OUTWASH Brown, silty fine to coarse sand, trace fine gravel.	689.5
	SW	-silt and gravel grade out.	
	ML	TOP OF ILLINOIAN TILL Gray,silt, trace clay, trace fine to coarse sand, trace gravel.	677.5

Boring completed at 25. feet on 3-24-75.
Water level not recorded.

CLINTON POWER STATION
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FIGURE A2.5-20

LOG OF BORING PH-4

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH: TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	SHEAR STRENGTH: TRIAXIAL COMPRESSION σ_3 psf	SHEAR STRENGTH: UNCONFINED COMPRESSION $\frac{Qu}{2}$ psf	ATTERBERG LIMITS: PLASTIC LIMIT %	ATTERBERG LIMITS: PLASTICITY INDEX %	FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE
0									
5									
10									
15									
20									
25									
30									
35									
40									
45									
50									
55									
60									
65									
70									
75									

BLOW COUNTS / SAMPLES

BORING PH-5

SURFACE ELEVATION 722.6 Ft.

BLOW COUNTS / SAMPLES	SYMBOLS	DESCRIPTIONS	ELEVATION (FEET)
AG	CL-ML	TOP OF WISCONSINAN TILL Medium brown, silty clay, some fine sand.	
	ML-CL	Mottled brown to orange brown, clayey silt, some fine sand, trace fine gravel. -grades dark brown.	
	ML	TOP OF INTERGLACIAL ZONE Mottled green-to-blueish gray, clayey silt, some fine sand.	695.6
	ML	TOP OF ILLINOIAN TILL Medium gray, clayey silt, some fine sand, trace fine gravel.	691.6

Boring completed at 37. feet on 3-25-75.

Water level at 35.5 feet.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE A2.5-21

LOG OF BORING PH-5

BORING PH-6

SURFACE ELEVATION 713.0 Ft.

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH: TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	SHEAR STRENGTH: TRIAXIAL COMPRESSION σ_3 psf	SHEAR STRENGTH: UNCONFINED COMPRESSION $\frac{q_u}{2}$ psf	ATTERBERG LIMITS: PLASTIC LIMIT %	ATTERBERG LIMITS: PLASTICITY INDEX %	FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE	BLOW COUNTS	SAMPLES
0											AG
5											
10											
15											
20											
25											
30											
35											
40											
45											
50											
55											
60											
65											
70											
75											

SYMBOLS	DESCRIPTIONS	ELEVATION (FEET)
CL	Dark brown to brown, silty clay, trace organics.	
	TOP OF OUTWASH	
SM	Medium brown, silty fine sand.	707.0
SW-SM	Medium brown, silty, fine to coarse sand, some fine gravel.	
ML-CL	Mottled orange brown to gray, clayey silt, some fine sand.	
	-trace fine gravel.	
	TOP OF ILLINOIAN TILL	688.0
ML	Medium gray, clayey silt, some fine sand, trace fine gravel.	

Boring completed at 42. feet on 3-25-75.

Water level at 26. feet.

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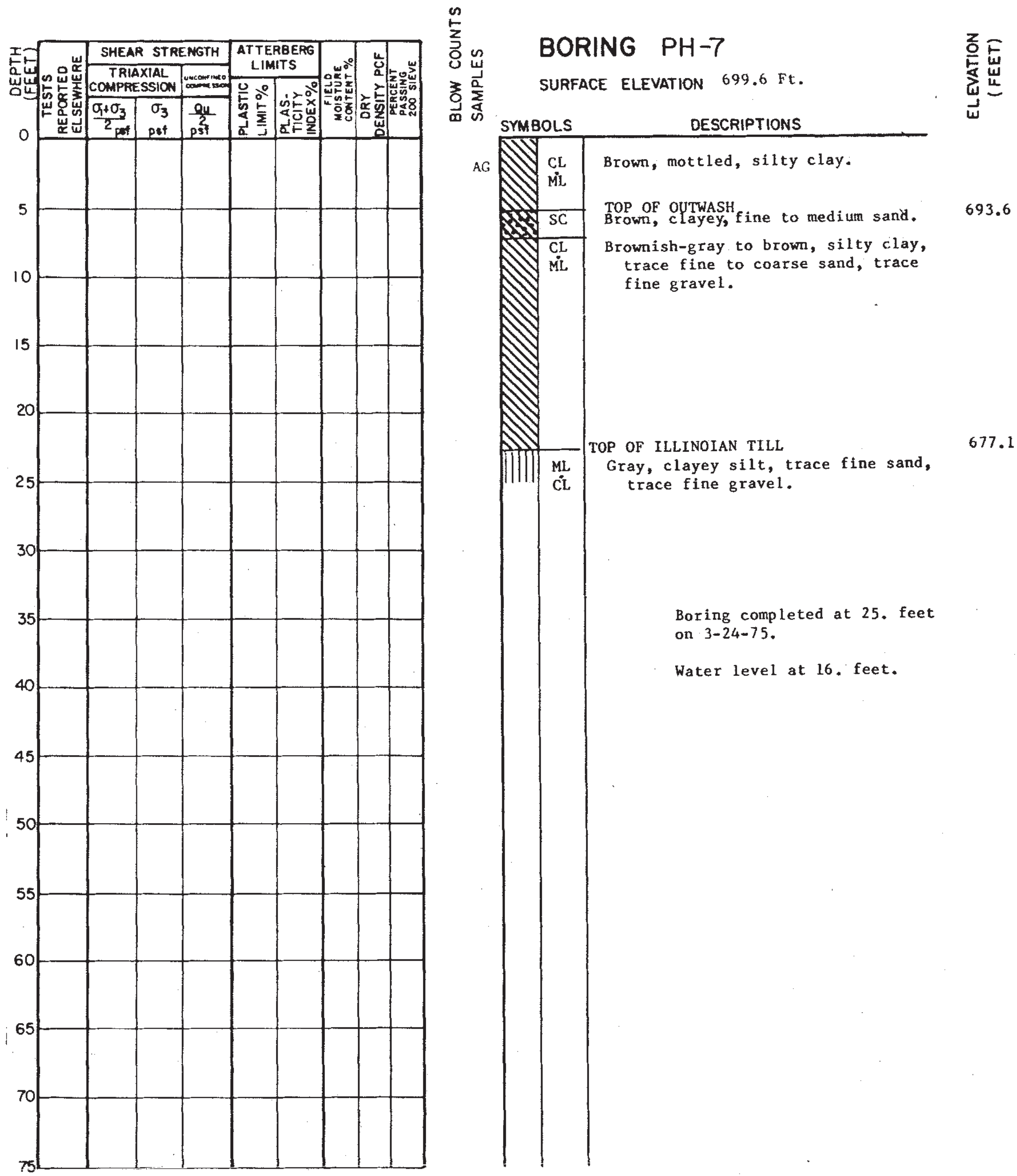
UPDATED SAFETY ANALYSIS REPORT

FIGURE A2.5-22

LOG OF BORING PH-6



CLINTON POWER STATION

UPDATED SAFETY ANALYSIS REPORT

FIGURE A2.5-23

LOG OF BORING PH-7

BORING PH-8

SURFACE ELEVATION 682.3 Ft.

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH: TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	σ_3 psf	UNCONFINED COMPRESSION $\frac{Qu}{2}$ psf	ATTERBERG LIMITS: PLASTIC LIMIT %	PLASTICITY INDEX %	FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE
0									
5									
10									
15									
20									
25									
30									
35									
40									
45									
50									
55									
60									
65									
70									
75									

BLOW COUNTS / SAMPLES	SYMBOLS	DESCRIPTIONS	ELEVATION (FEET)
AG	ML-CL	TOP OF SALT CREEK ALLUVIUM Blackish gray, clayey silt, trace fine sand.	
	SC-SM	TOP OF OUTWASH Brown, silty fine sand, some clay. -sand grades more coarse.	675.3
	ML-CL	Gray, clayey silt, trace fine to coarse sand, trace fine gravel.	
	ML	Gray silt, trace organics.	
	ML	TOP OF ILLINOIAN TILL Gray, clayey silt, trace fine to coarse sand, trace fine gravel.	666.3

Boring completed at 20. feet on 3-25-75.
Water level at 8. feet.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE A2.5-24

LOG OF BORING PH-8

BORING PH-9

SURFACE ELEVATION 691.0 Ft.

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH: TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	SHEAR STRENGTH: TRIAXIAL COMPRESSION σ_3 psf	SHEAR STRENGTH: UNCONFINED COMPRESSION $\frac{Qu}{2}$ psf	ATTERBERG LIMITS: PLASTIC LIMIT %	ATTERBERG LIMITS: PLASTICITY INDEX %	FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE
0									
5									
10									
15									
20									
25									
30									
35									
40									
45									
50									
55									
60									
65									
70									
75									

BLOW COUNTS / SAMPLES	SYMBOLS	DESCRIPTIONS	ELEVATION (FEET)
AG	ML	Dark brownish-black, clayey silt.	
		TOP OF OUTWASH	
	ML	Medium dark brown, silt, some fine to coarse sand.	687.0
	GM SM	-grades with fine to medium gravel silt grades out.	
BG	SM	-gravel grades out.	
		TOP OF ILLINOIAN TILL	677.0
	ML	Medium gray, silt, some fine to coarse sand, trace fine to medium gravel.	

Boring completed at 18.5 feet on 4-2-75.

Water level 8. feet.

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FIGURE A2.5-25

LOG OF BORING PH-9

BORING PH-10

SURFACE ELEVATION 697.5

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH: TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	σ_3 psf	UNCONFINED COMPRESSION $\frac{q_u}{2}$ psf	ATTERBERG LIMITS: PLASTIC LIMIT%	PLASTICITY INDEX%	FIELD MOISTURE CONTENT%	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE
0									
5									
10									
15									
20									
25									
30									
35									
40									
45									
50									
55									
60									
65									
70									
75									

BLOW COUNTS / SAMPLES	SYMBOLS	DESCRIPTIONS	ELEVATION (FEET)
AG	ML • CL	TOP OF SALT CREEK ALLUVIUM Light to medium brown, silty clay, trace medium to coarse sand, trace fine gravel.	
	ML	TOP OF OUTWASH Light, orangish-brown, silt, some clay, trace fine to medium gravel, some fine to medium sand.	885.5
BG	SW	Medium brown, fine to coarse sand, some fine gravel, trace silt.	
	SP • SM	Medium brown, silty, fine to medium sand.	
	ML	TOP OF ILLINOIAN TILL Medium gray, silt, trace medium to coarse sand, trace fine to medium gravel.	651.5

Boring completed at 50.0 feet on 4-8-75.
Water level at 15.0 feet.

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FIGURE A2.5-26

LOG OF BORING PH-10

BORING PH-11

SURFACE ELEVATION 679.2

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH: TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	TRIAXIAL COMPRESSION σ_3 psf	UNCONFINED COMPRESSION $\frac{q_u}{2}$ psf	ATTERBERG LIMITS: PLASTIC LIMIT%	ATTERBERG LIMITS: PLASTICITY INDEX%	FIELD MOISTURE CONTENT%	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE	BLOW COUNTS	SAMPLES	SYMBOLS	DESCRIPTIONS	ELEVATION (FEET)
0													TOP OF SALT CREEK ALLUVIUM	
											AG	CL • ML	Dark brown, silty clay, trace fine to medium sand, trace fine gravel.	
5														
10														
15													TOP OF OUTWASH	664.2
												SP • SM	Grayish brown, silty, fine sand. -grades to gray.	
20														
													TOP OF ILLINOIAN TILL	657.2
												ML	Gray, silt, trace fine gravel, some fine to medium sand.	
25														
30													Boring completed at 24.5 feet on 4-11-75. Water level at 18.0 feet.	
35														
40														
45														
50														
55														
60														
65														
70														
75														

CLINTON POWER STATION
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FIGURE A2.5-27

LOG OF BORING PH-11

DEPTH (FEET)	TESTS REPORTED ELSEWHERE	SHEAR STRENGTH: TRIAXIAL COMPRESSION $\frac{\sigma_1+\sigma_3}{2}$ psf	SHEAR STRENGTH: TRIAXIAL COMPRESSION σ_3 psf	SHEAR STRENGTH: UNCONFINED COMPRESSION $\frac{Qu}{2}$ psf	ATTERBERG LIMITS: PLASTIC LIMIT%	ATTERBERG LIMITS: PLASTICITY INDEX%	FIELD MOISTURE CONTENT %	DRY DENSITY PCF	PERCENT PASSING 200 SIEVE
0									
5									
10									
15									
20									
25									
30									
35									
40									
45									
50									
55									
60									
65									
70									
75									

BORING PH-12

SURFACE ELEVATION 690.3

BLOW COUNTS / SAMPLES	SYMBOLS	DESCRIPTIONS	ELEVATION (FEET)
		TOP OF SALT CREEK ALLUVIUM	
AG	CL • ML	Dark brown silty clay, trace fine to coarse sand, trace fine gravel.	
		TOP OF OUTWASH	680.3
	GM	Brown, silty, fine to medium gravel, some fine to medium sand.	
		TOP OF ILLINOIAN TILL	678.3
	ML • CL	Gray, clayey silt, trace fine to medium gravel, some fine to medium sand.	

Boring completed at 19.5 feet
on 4-11-75.
Water level not recorded.

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FIGURE A2.5-28

LOG OF BORING PH-12

Key to Boring Logs

Samples

23	Indicates Standard Penetration Test Value
SS	Indicates Sample Obtained Using a Standard Split Spoon
ST	Indicates Shelby Tube Sample Obtained Using a 3.0 inch diameter Shelby Tube
PR	Indicates Sample Obtained Using a Pitcher Sampler (3.0 inch outer diameter)
CR	Indicates Sample Obtained with 4.0 inch outer diameter Core Sampler
OB	Indicates Sample Obtained Using an Osterberg Sampler (3.0 inch sample diameter)
AG	Indicates Auger Boring; No Standard Penetration Values or Samples Obtained Unless Specially Noted
BG	Indicates Bag Sample Obtained
HR	Indicates Sample Obtained with High Recovery Barrel

Test Data

Qu/2	Indicates ½ Unconfined Compressive Strength (Equal to Shear Strength) in P.S.F.
0.50	Value with no Asterisk is Obtained From RIMAC Test
0.50*	Value with Asterisk is Obtained from Pocket Penetrometer

Test Reported Elsewhere

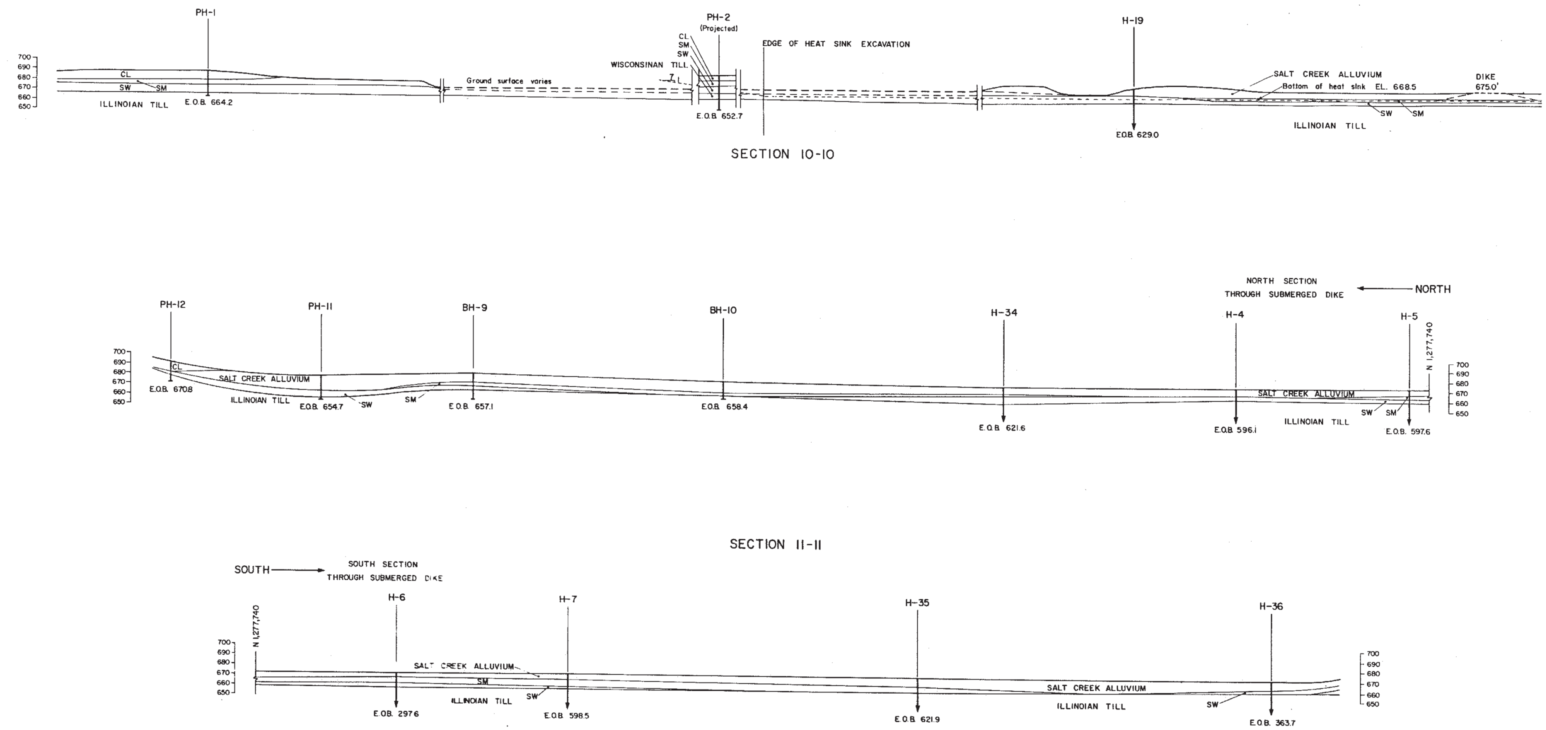
C	Consolidation Test
COMP	Bulk Compaction Test
MA	Mechanical Particle Size Analysis (Sieve and Hydrometer)
PERM	Laboratory Permeability Test
SA	Sieve Analysis
TX/CU/PP	Consolidate-Undrained Triaxial Compression Test with Pore Pressure Measurement
TX/UU/R	Unconsolidated-Undrained Triaxial Compression Test on Remolded Samples
DR	Relative Density Test
UC/R	Remolded Samples

All Elevations Refer to Feet Above Mean Sea Level (MSL)

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

Figure A2.5-29

KEY TO BORING LOGS



NOTES

1. Section 10-10: no slide postulated due to quarry beyond the excavated slope.
2. Section 11-11: Salt Creek alluvium excavated due to construction of submerged dike.

All elevations refer to feet above MSL.

CLINTON POWER STATION
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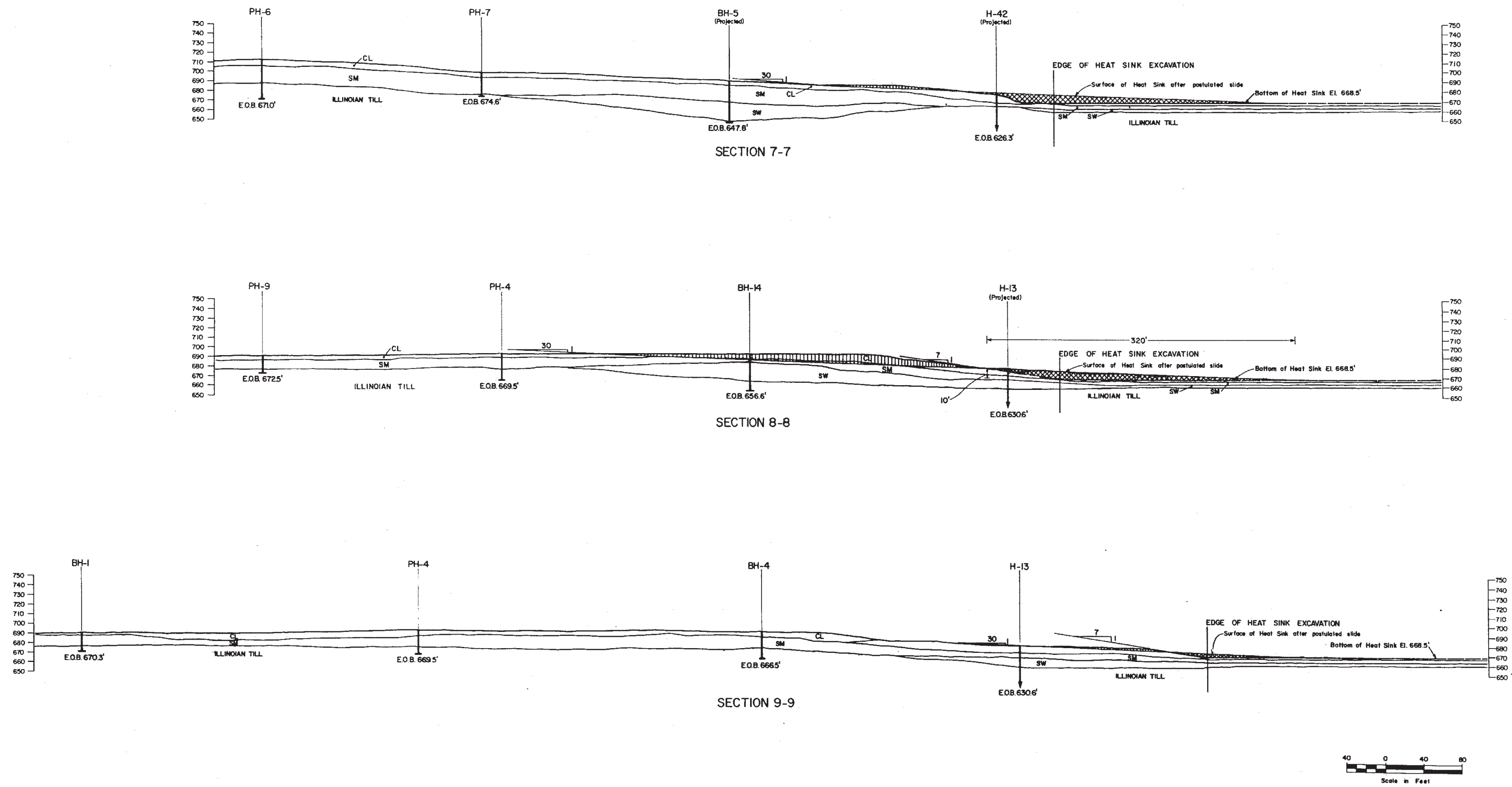
FIGURE A2.5-30

SECTIONS 10-10 AND 11-11



All elevations refer to feet above MSL.

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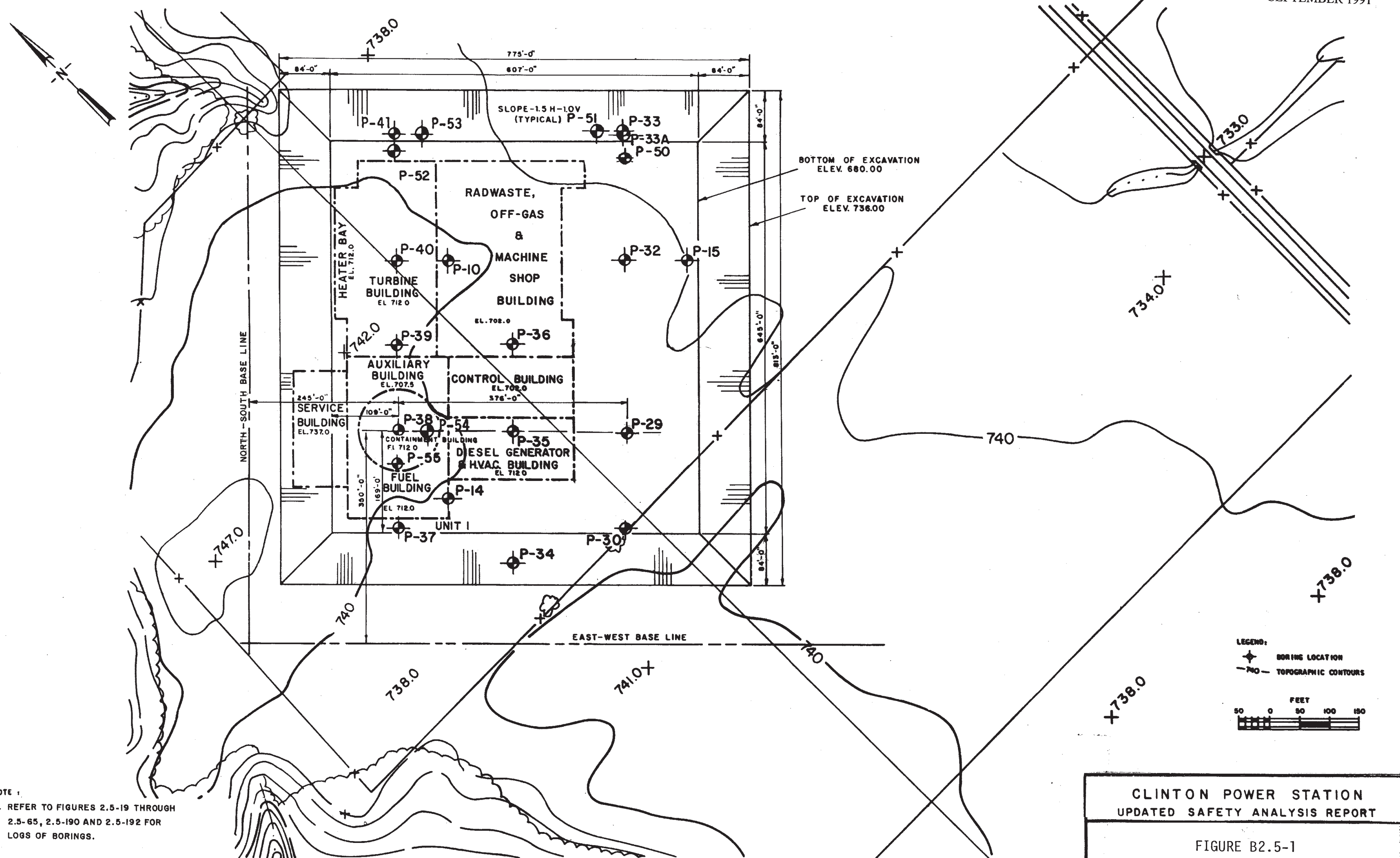
FIGURE A2.5-31

SECTIONS 7-7, 8-8 AND 9-9

REVISION 3
SEPTEMBER 1991



NOTE :

1. REFER TO FIGURES 2.5-19 THROUGH 2.5-65, 2.5-190 AND 2.5-192 FOR LOGS OF BORINGS.

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FIGURE B2.5-1

FOUNDATION EXCAVATION PLAN

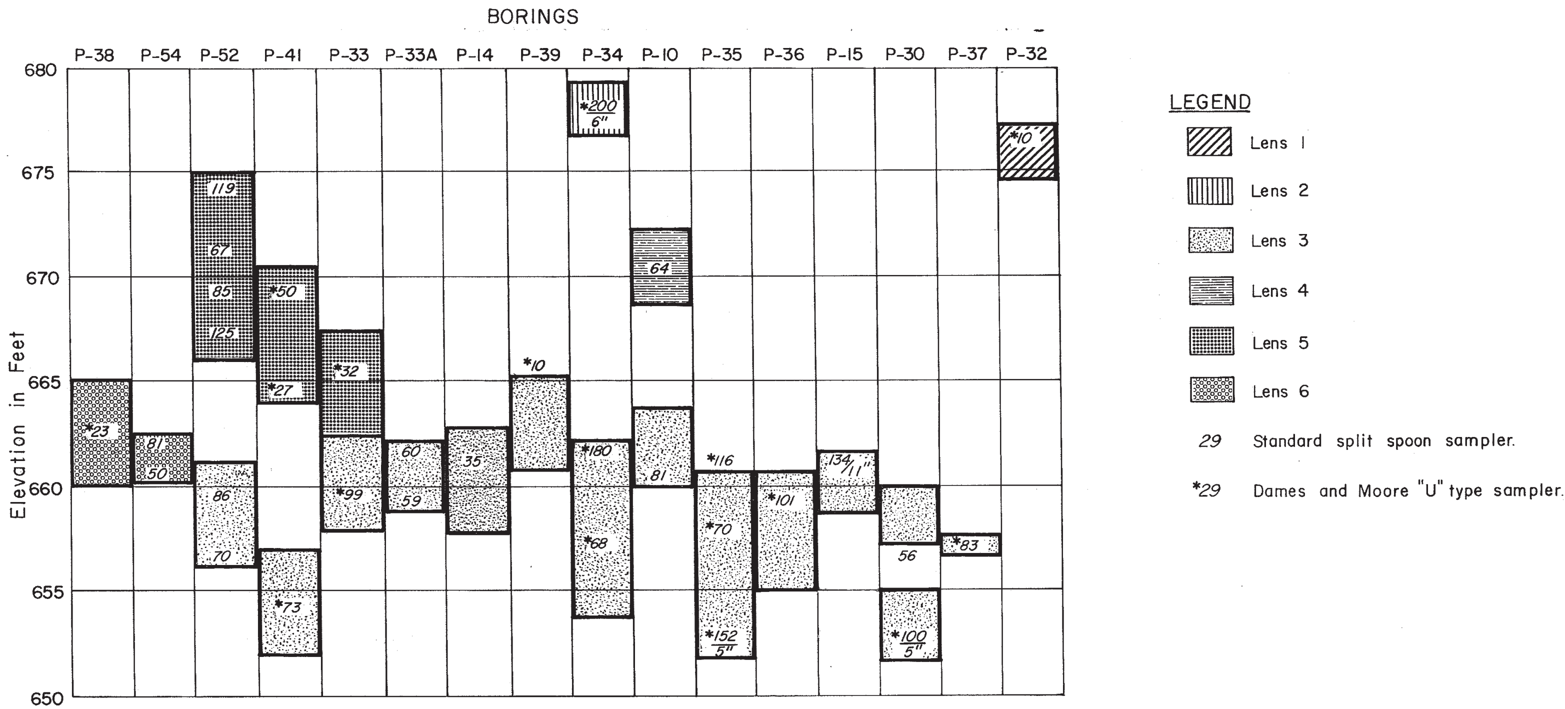

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FIGURE B2.5-2

SUMMARY OF BORING LOGS

LABORATORY TEST DATA

ELEVATION IN FEET: 740, 730, 720, 710, 700, 690, 680, 670, 660, 650

TESTS REPORTED ELSEWHERE	ATTERBERG LIMITS: PLASTIC LIMIT %	ATTERBERG LIMITS: PLASTICITY INDEX %	SHEAR STRENGTH: TRIAXIAL COMPRESSION a $\frac{\sigma_1 - \sigma_3}{2}$ psf	SHEAR STRENGTH: TRIAXIAL COMPRESSION b σ_3 psf	SHEAR STRENGTH: UNCONFINED COMPRESSION c $\frac{Qu}{2}$ psf	SHEAR STRENGTH: POCKET PENETROMETER d $\frac{Qu}{2}$ psf	MOISTURE CONTENT %	DRY DENSITY pcf
MA							12.3	
MA							10.8	
MA							11.5	

BORING P-33 A

SURFACE ELEVATION 734.7

BLOW COUNTS / SAMPLES — SYMBOLS — DESCRIPTIONS

NO SAMPLES TAKEN ABOVE ELEVATION 680 FEET

BLOW COUNTS	SYMBOLS	DESCRIPTIONS
129	ML	GRAY CLAYEY SILT WITH SOME SAND AND TRACE OF FINE GRAVEL (HARD)
151/11"	SM	GRAY SILTY FINE TO COARSE SAND, WITH TRACE FINE GRAVEL (VERY DENSE)
56, 47, 27	ML	GRAY CLAYEY SILT WITH SOME SAND AND TRACE FINE GRAVEL (HARD) GRADES WITH MORE SAND
60	SM	GRAY SILTY FINE TO COARSE SAND WITH SOME FINE GRAVEL (DENSE)
59	ML	GRAY SILTY FINE TO COARSE SAND TO SANDY SILT (DENSE)
101, 121	SM	
100/6"	ML	GRAY CLAYEY SILT WITH SOME SAND AND TRACE OF FINE GRAVEL (HARD) GRAY CLAYEY SILT WITH SOME SAND (HARD)

BORING COMPLETED AT 82.5 FEET ON 8-6-75.
CASING USED TO A DEPTH OF 5.0 FEET.
GROUNDWATER LEVEL MEASURED AT 4.3 FEET ON 8-7-75.

NOTE:
SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

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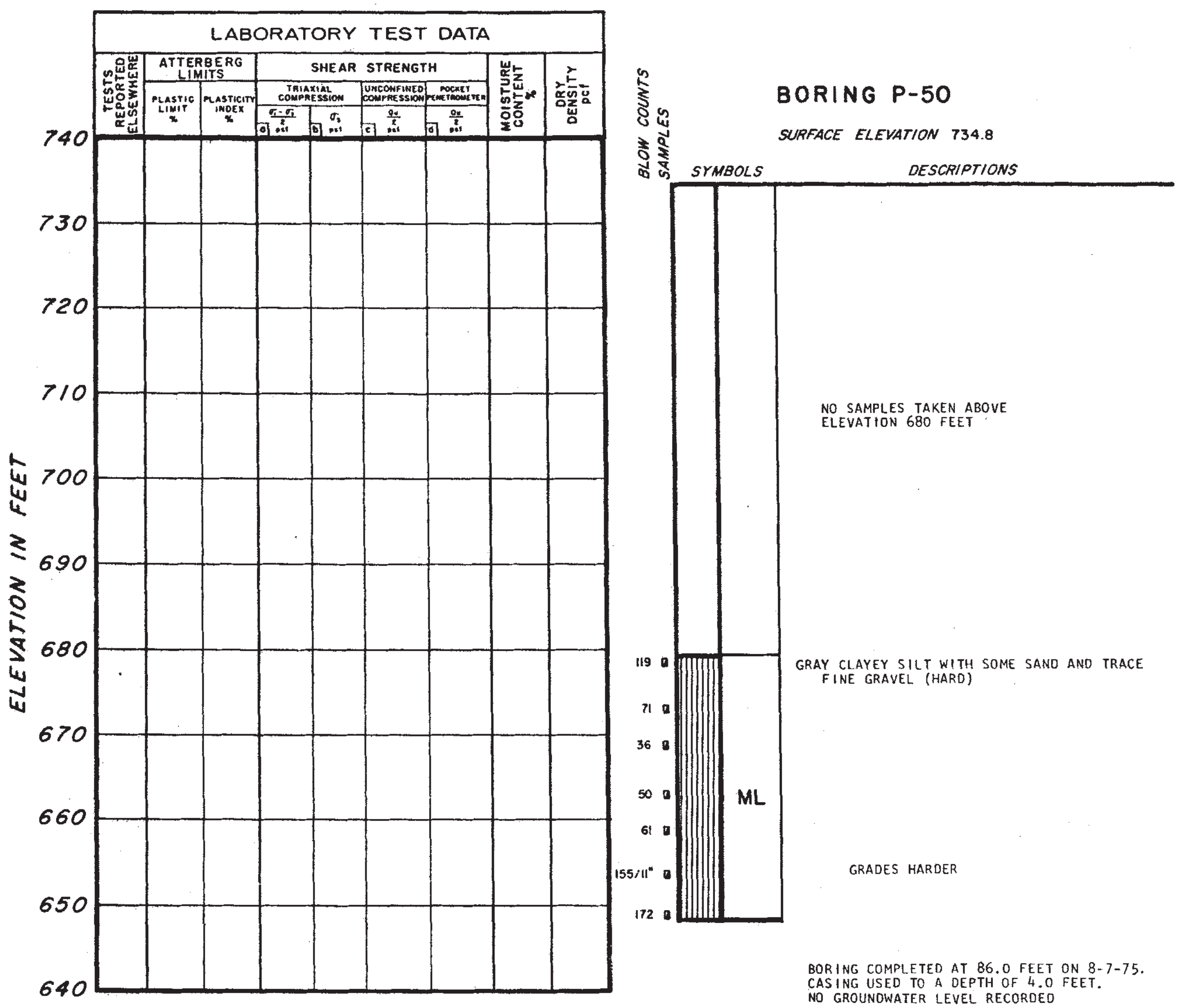
FIGURE B2.5-3

LOG OF BORING P-33A



NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

CLINTON POWER STATION

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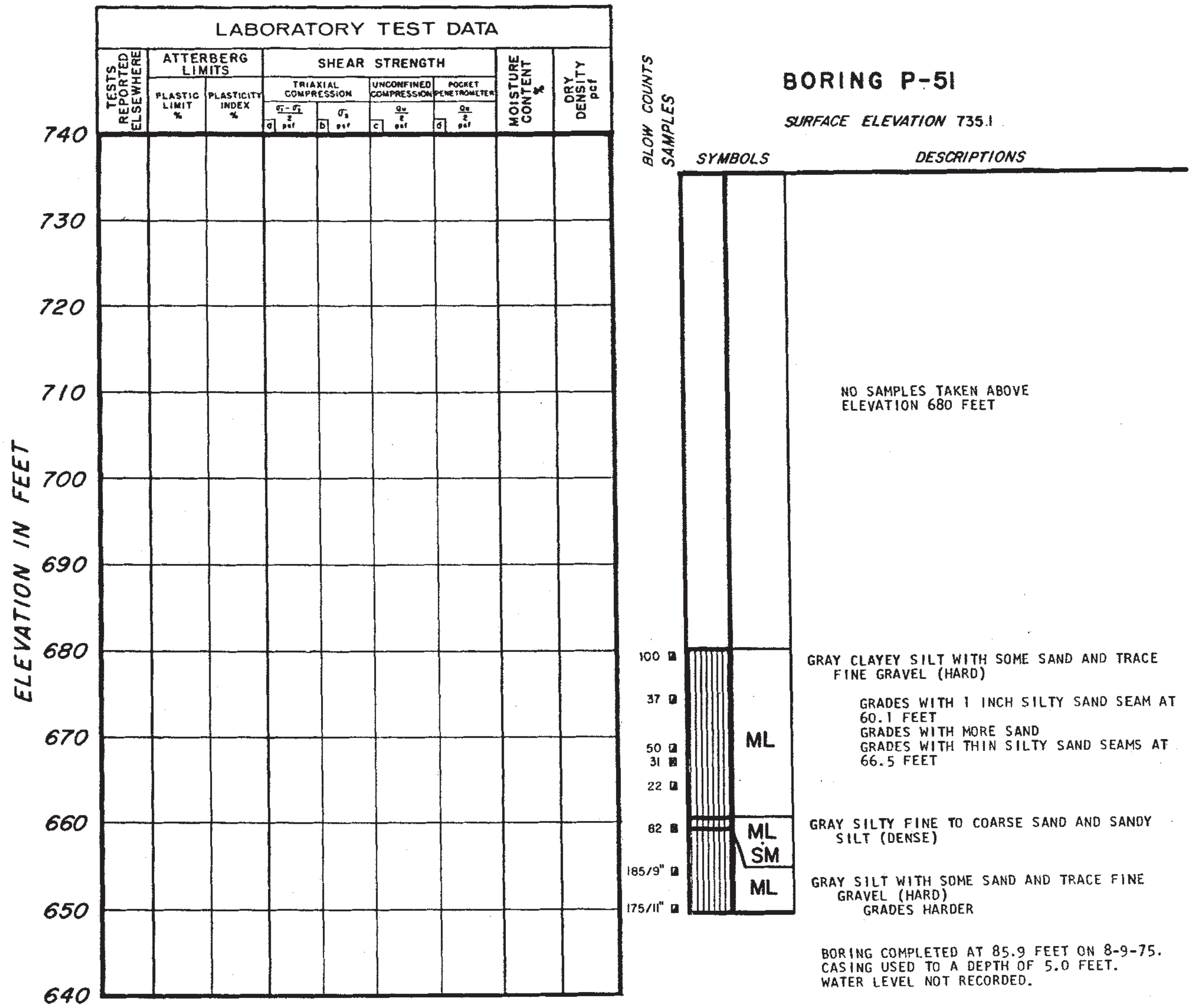
FIGURE B2.5-4

LOG OF BORING P-50



NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

CLINTON POWER STATION

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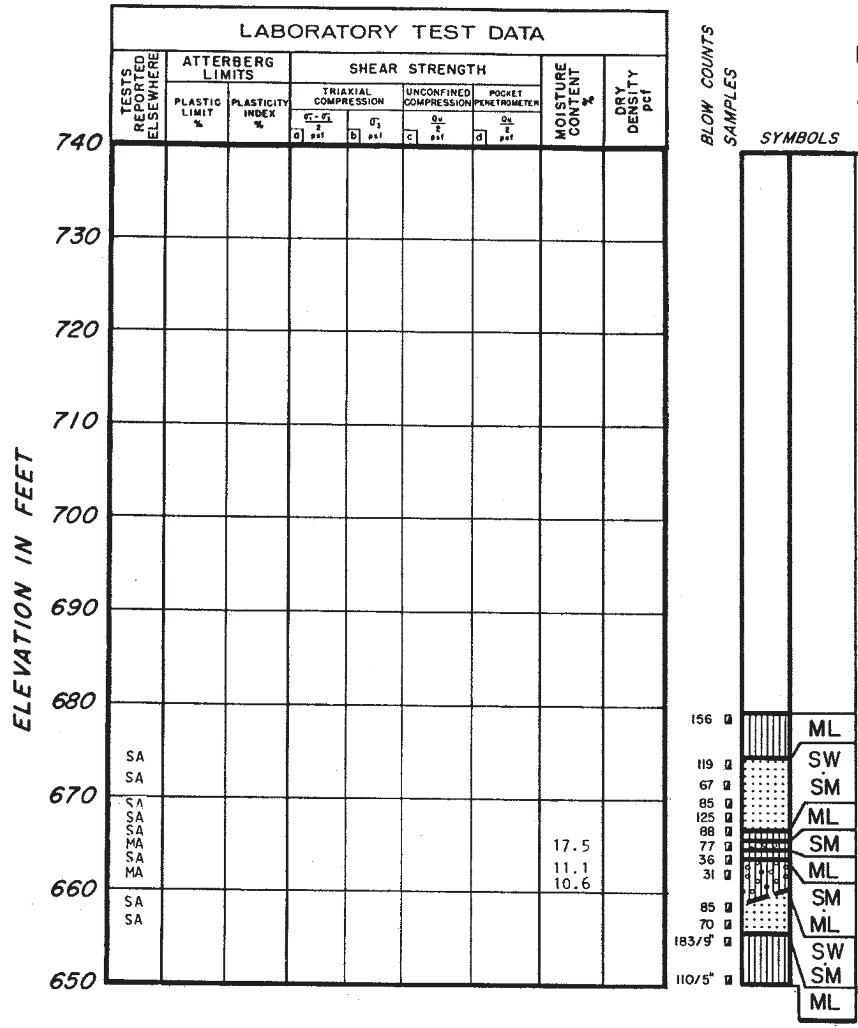
FIGURE B2.5-5

LOG OF BORING P-51



BORING P-52

SURFACE ELEVATION 739.8

NO SAMPLES TAKEN ABOVE ELEVATION 680 FEET

GRAY CLAYEY SILT WITH SOME SAND AND TRACE OF FINE GRAVEL (HARD)
GRAY SILTY FINE TO COARSE SAND WITH TRACE FINE GRAVEL (DENSE)
GRADES WITH 2 INCH SILT SEAM AT 65.3 FEET
GRADES WITH LESS SILT
GRADES WITH MORE SILT
GRADES WITH LESS SILT
1 INCH SILT SEAM AT 70.9 FEET
GRADES WITH MORE FINE TO MEDIUM SAND AND LESS SILT
GRAY FINE TO COARSE SANDY SILT WITH TRACE FINE GRAVEL (DENSE)
GRAY SILTY FINE TO COARSE SAND WITH FINE GRAVEL (DENSE)
GRAY CLAYEY SILT, WITH SOME SAND AND TRACE FINE GRAVEL (HARD)
GRAY SILTY FINE TO COARSE SAND WITH TRACE FINE GRAVEL (DENSE)
GRAY SILTY FINE TO COARSE SAND WITH TRACE FINE GRAVEL (DENSE)
GRAY CLAYEY SILT WITH SOME SAND AND TRACE FINE GRAVEL (HARD)

BORING COMPLETED AT 88.9 FEET ON 8-7-75.
CASING USED TO A DEPTH OF 5.0 FEET.
GROUNDWATER LEVEL NOT RECORDED.

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

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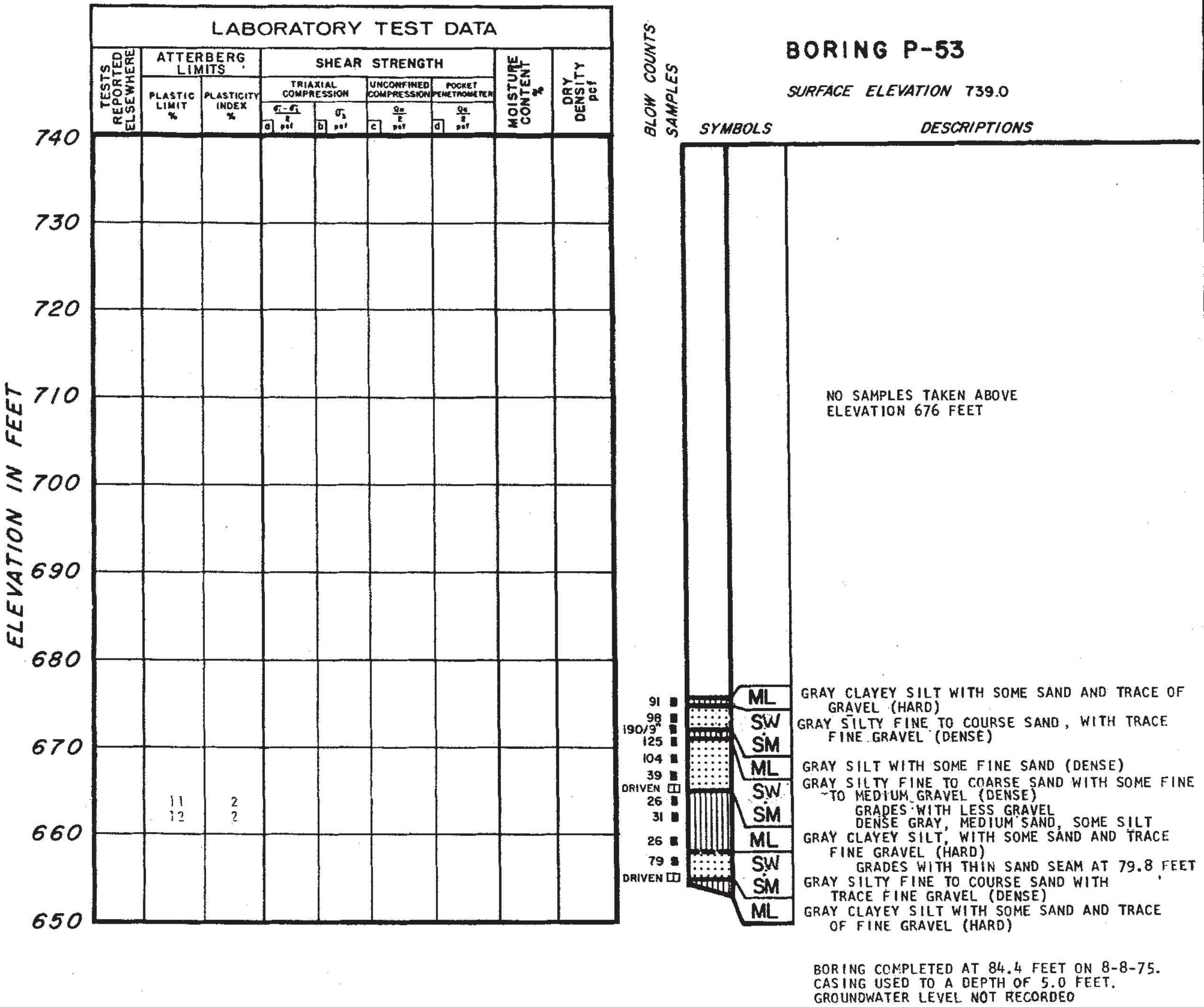
FIGURE B2.5-6

LOG OF BORING P-52



NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

CLINTON POWER STATION

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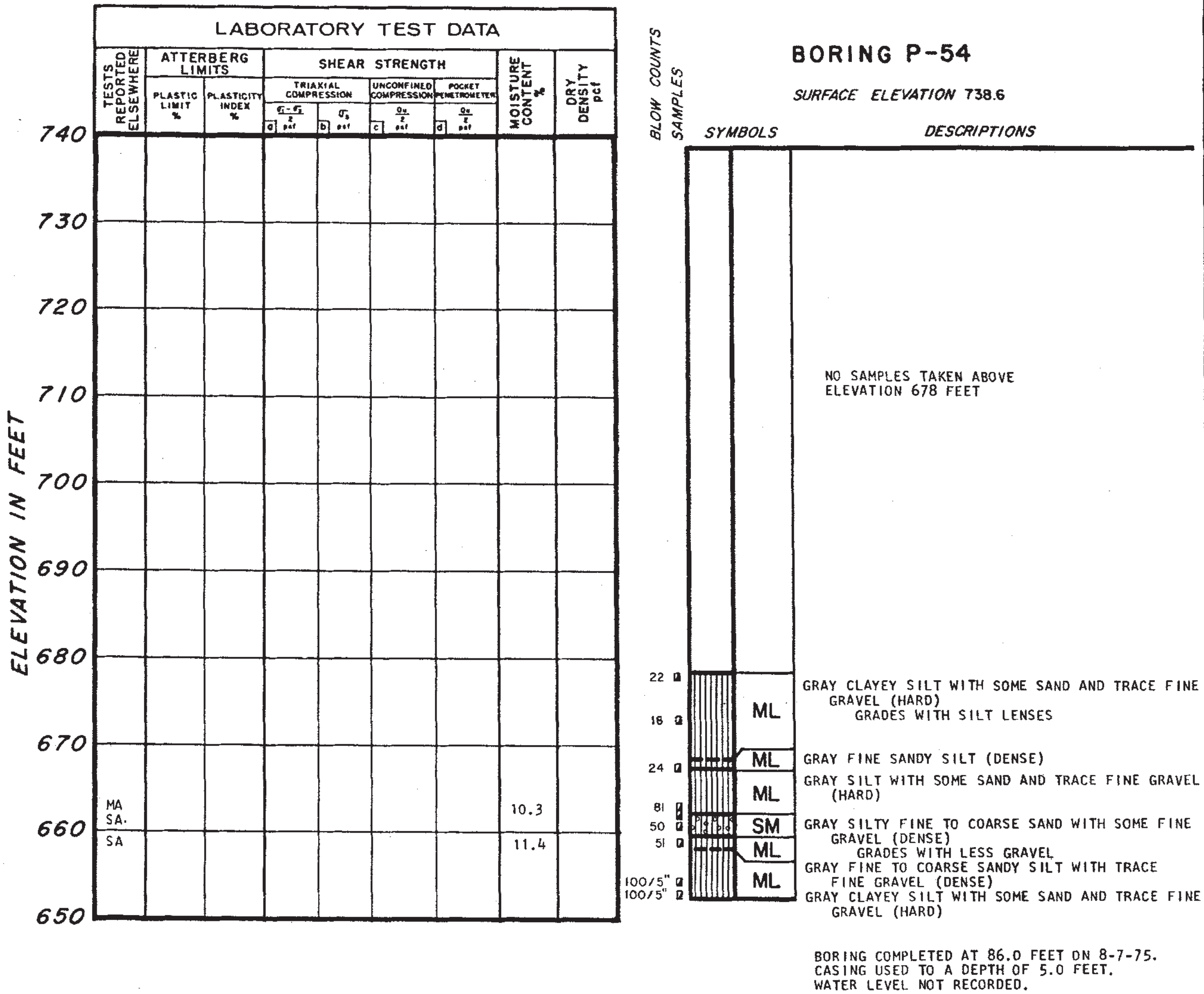
FIGURE B2.5-7

LOG OF BORING P-53



NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

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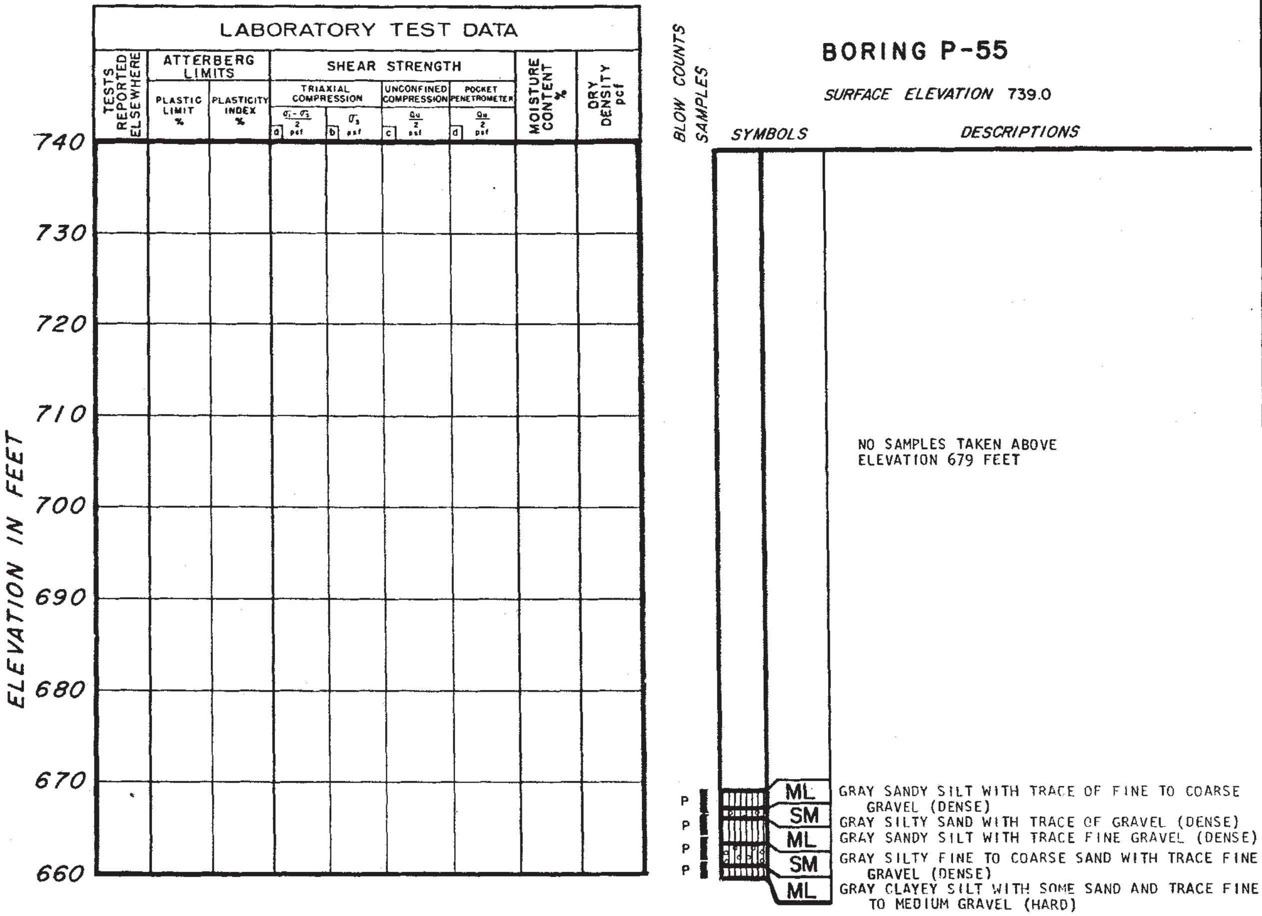
FIGURE B2.5-8

LOG OF BORING P-54



BORING COMPLETED AT 79.0 FEET ON 8-8-75.
CASING USED TO A DEPTH OF 5.0 FEET.
GROUNDWATER LEVEL NOT RECORDED.

NOTE:

SEE FIGURE 2.5-298 AND FIGURE 2.5-355 FOR EXPLANATION OF SYMBOLS USED ON BORING LOGS.

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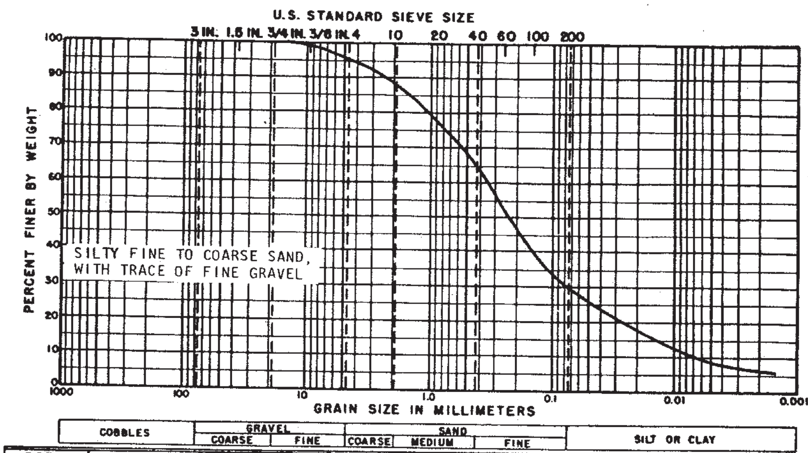
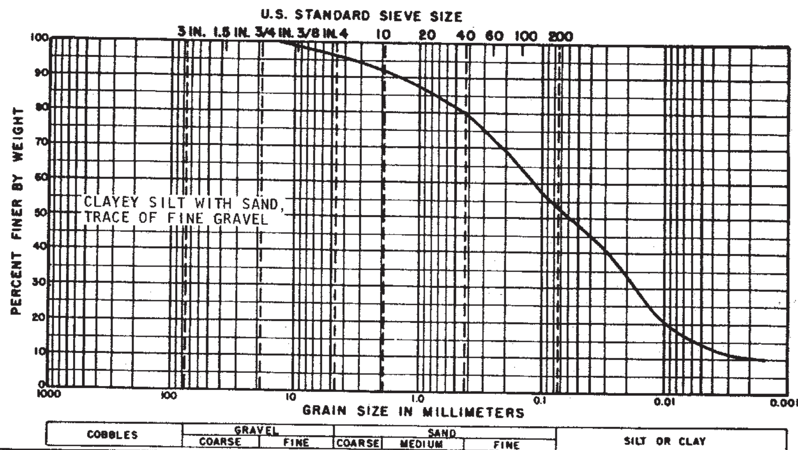
FIGURE B2.5-9

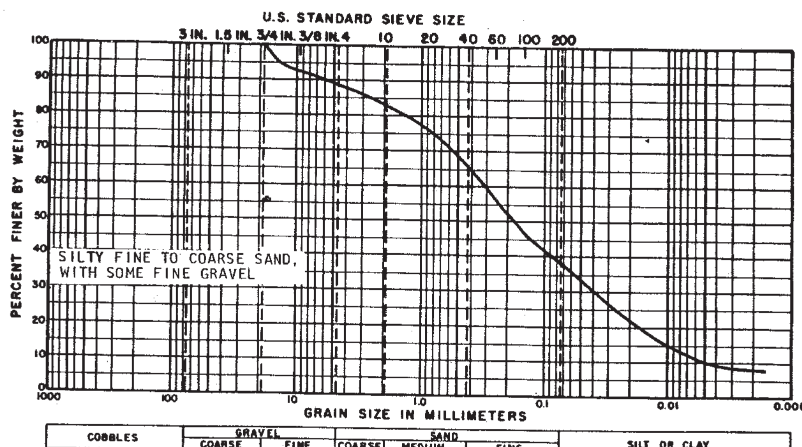
LOG OF BORING P-55



BORING	DEPTH	CLASSIFICATION	NAT. WC	LL	PL	PI	
P-33A	60.0'-60.9'	SM	12.3				



BORING	DEPTH	CLASSIFICATION	NAT. WC	LL	PL	PI	
P-33A	67.5'-69.0'	ML	10.8				



BORING	DEPTH	CLASSIFICATION	NAT. WC	LL	PL	PI	
P-33A	72.5'-74.0'	SM	11.5				

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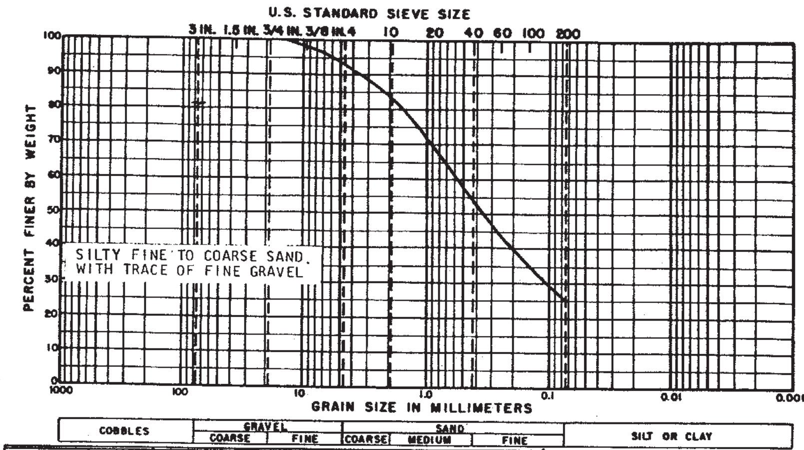
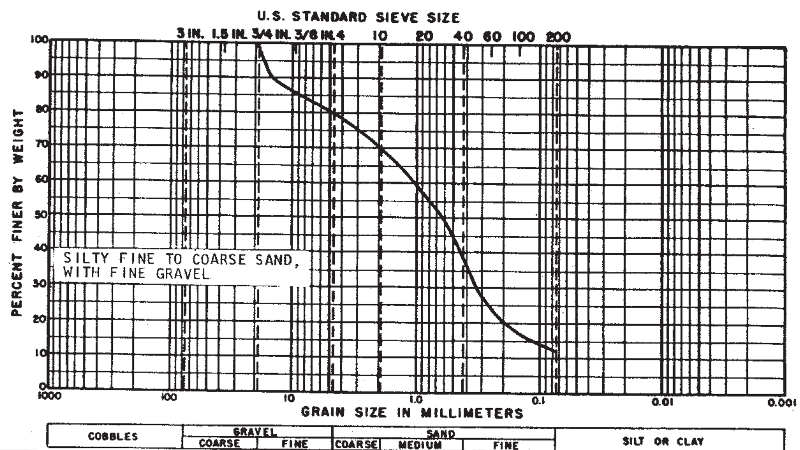
FIGURE B2.5-10

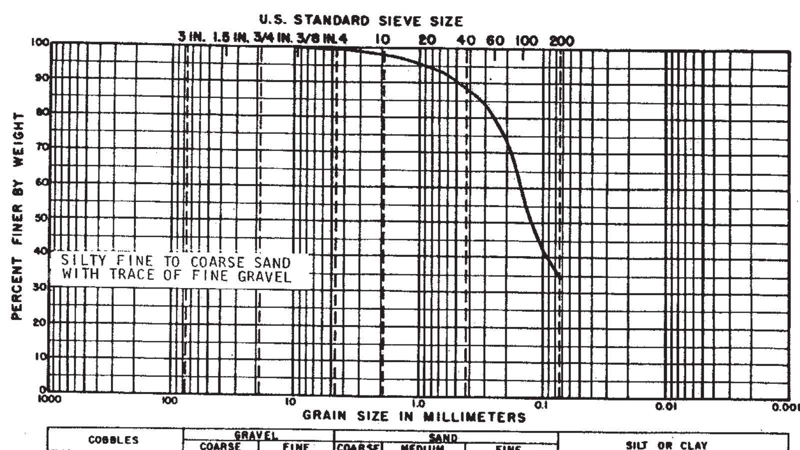
PARTICLE SIZE ANALYSES (BORING P-33A)



BORING	DEPTH	CLASSIFICATION		NAT. WC	LL	PL	PI	
P-52	65.0'-66.5'		SM					



BORING	DEPTH	CLASSIFICATION		NAT. WC	LL	PL	PI	
P-52	66.5'-68.0'		SM					

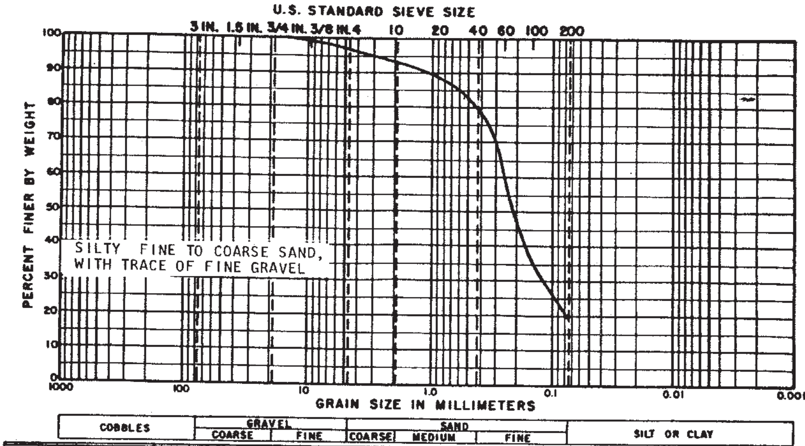


BORING	DEPTH	CLASSIFICATION		NAT. WC	LL	PL	PI	
P-52	68.0'-69.5'		SM					

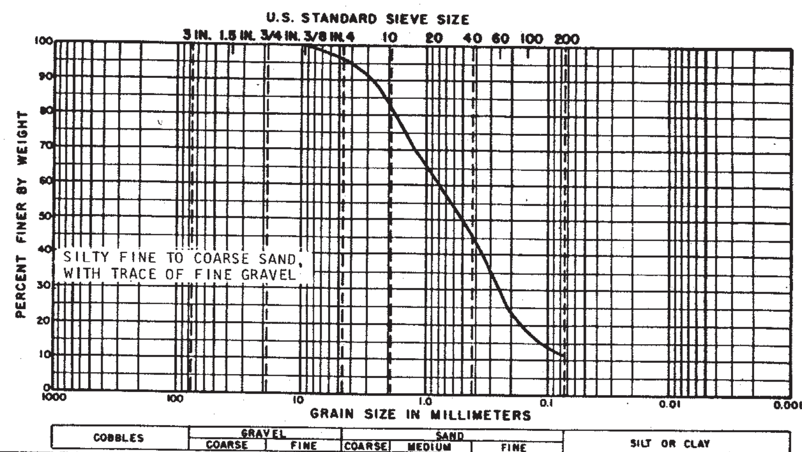
CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE B2.5-11

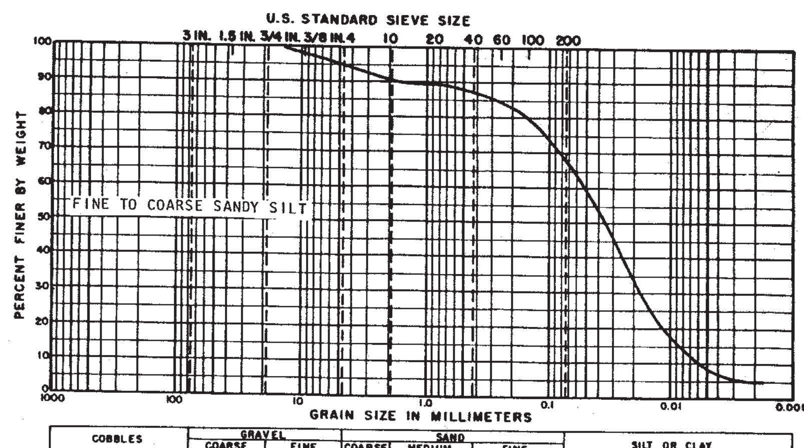
PARTICLE SIZE ANALYSES (BORING P-52)



BORING	DEPTH	CLASSIFICATION	NAT. WC	LL	PL	PI	
P-52	69.5'-71.0'	SM					



BORING	DEPTH	CLASSIFICATION	NAT. WC	LL	PL	PI	
P-52	71.0'-72.5'	SW-SM					

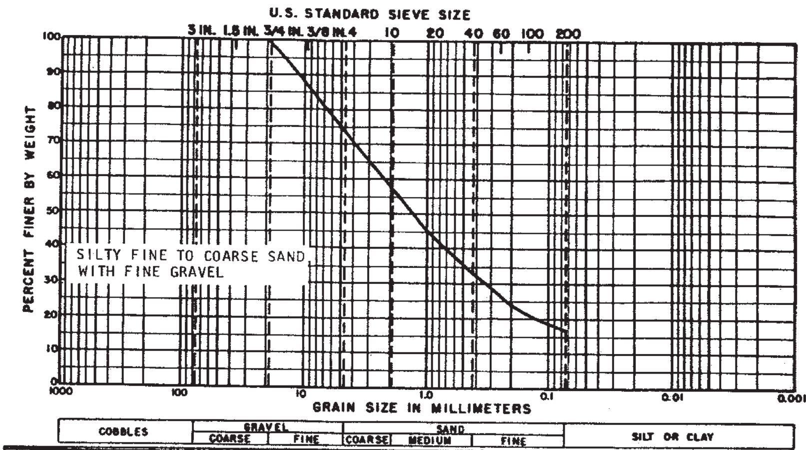


BORING	DEPTH	CLASSIFICATION	NAT. WC	LL	PL	PI	
P-52	72.5'-74.0'	ML	17.6				

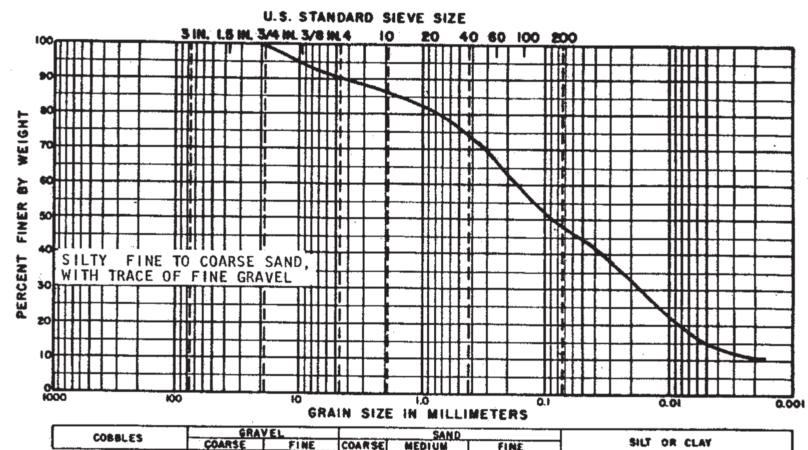
CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE B2.5-12

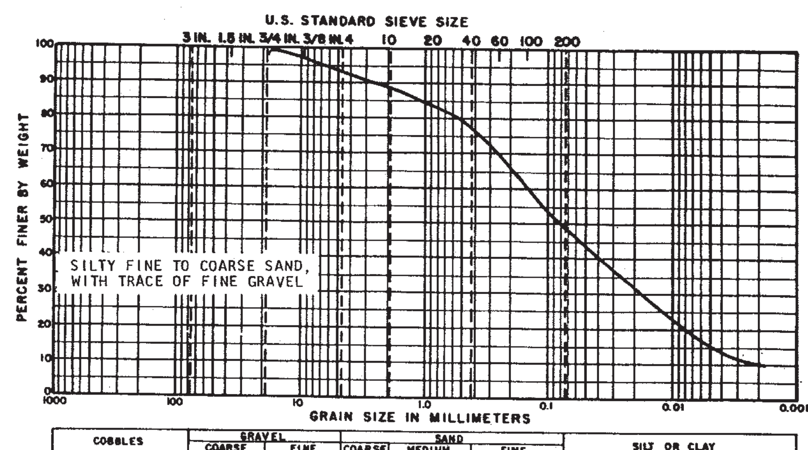
PARTICLE SIZE ANALYSES (BORING P-52)



BORING	DEPTH	CLASSIFICATION	NAT. WC	LL	PL	PI	
P-52	72.5'-74.0'	SM					



BORING	DEPTH	CLASSIFICATION	NAT. WC	LL	PL	PI	
P-52	75.5'-77.0'	SM	11.1				

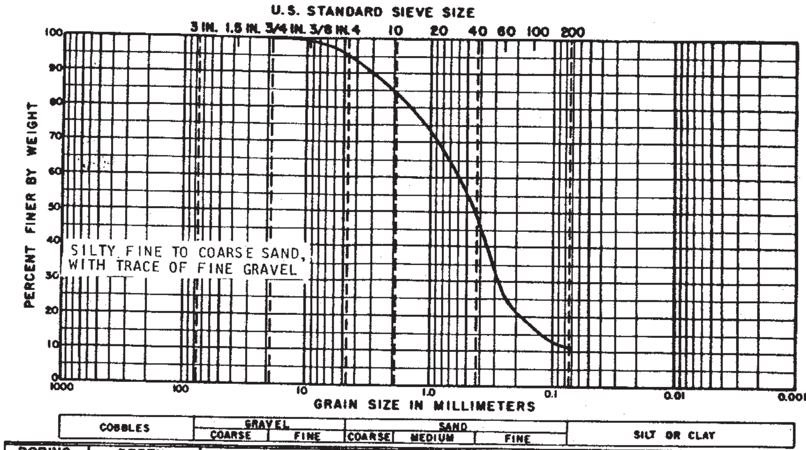


BORING	DEPTH	CLASSIFICATION	NAT. WC	LL	PL	PI	
P-52	75.5'-77.0'	SM	10.6				

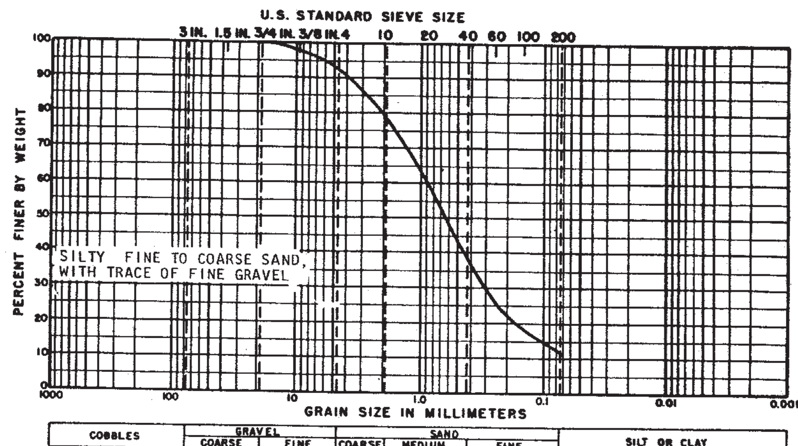
CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE B2.5-13

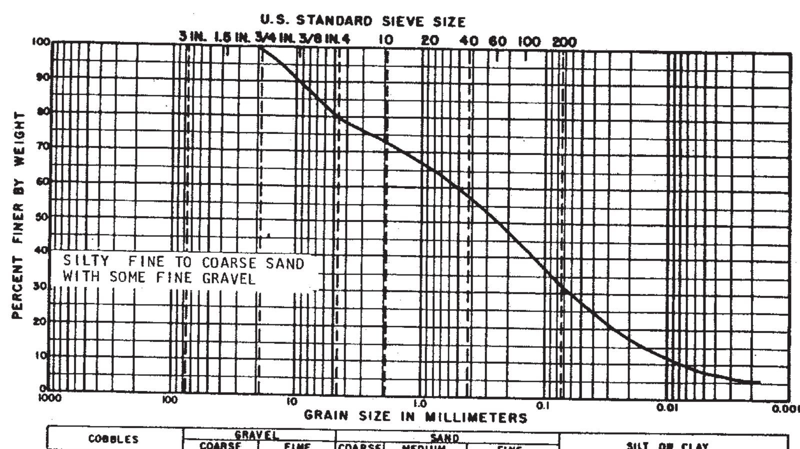
PARTICLE SIZE ANALYSES (BORING P-52)



BORING	DEPTH	CLASSIFICATION		NAT. WC	LL	PL	PI	
P-52	80.0'-81.5		SM-SW					



BORING	DEPTH	CLASSIFICATION		NAT. WC	LL	PL	PI	
P-52	81.5'-83.0'		SM-SW					

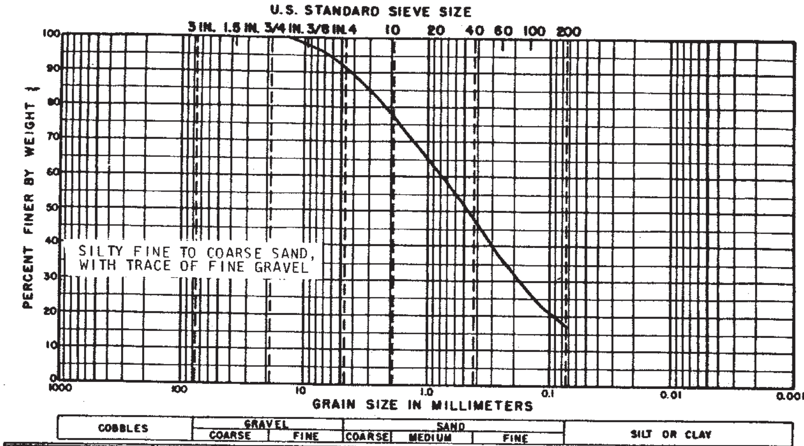


BORING	DEPTH	CLASSIFICATION		NAT. WC	LL	PL	PI	
P-54	76.0'		SM	10.3				

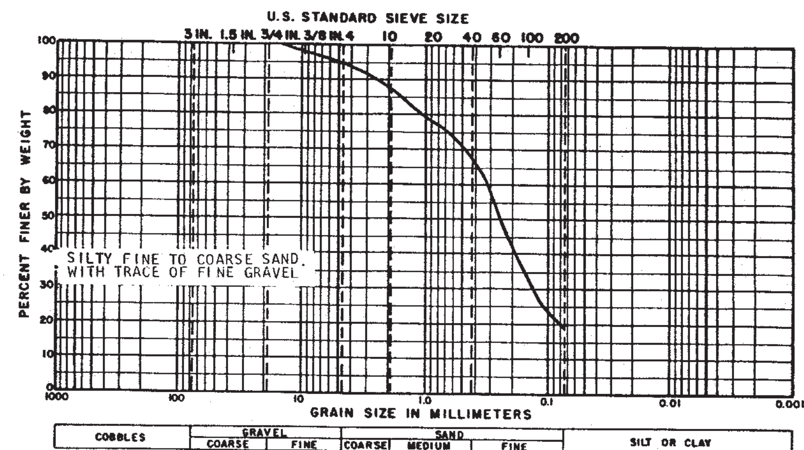
CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE B2.5-14

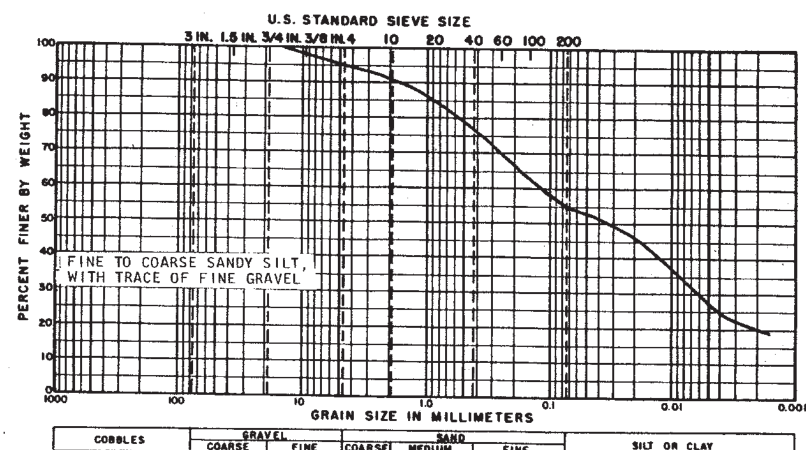
PARTICLE SIZE ANALYSES
(BORINGS P-52 AND P-54)



BORING	DEPTH	CLASSIFICATION		NAT. WC	LL	PL	PI	
P-54	76.5		SM					



BORING	DEPTH	CLASSIFICATION		NAT. WC	LL	PL	PI	
P-54	76.5'-78.0'		SM					

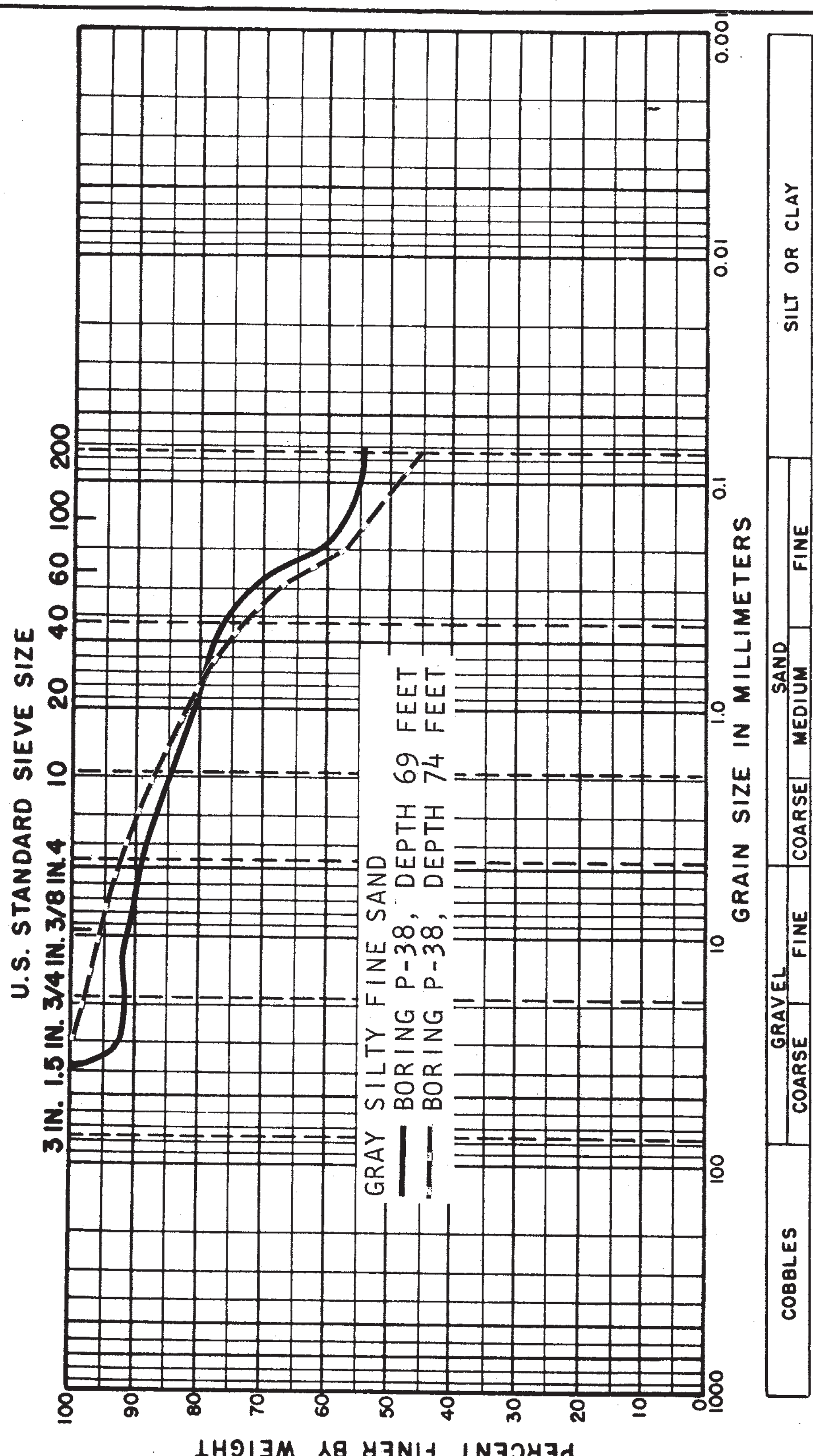


BORING	DEPTH	CLASSIFICATION		NAT. WC	LL	PL	PI	
P-54	78.0'-79.5'		ML	11.4				

CLINTON POWER STATION
FINAL SAFETY ANALYSIS REPORT

FIGURE B2.5-15

PARTICLE SIZE ANALYSES (BORING P-54)



CLINTON POWER STATION

UPDATED SAFETY ANALYSIS REPORT

FIGURE B2.5-16

PARTICLE SIZE ANALYSES (BORING P-38)

Site Stratigraphic Column

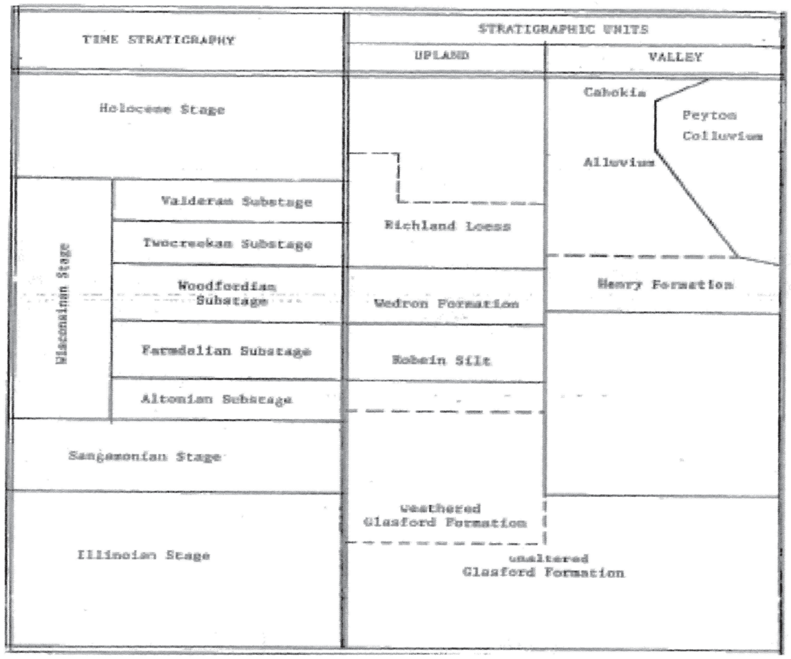


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Figure C2.5-1
Page 1 of 2

SITE STRATIGRAGHIC COLUMN

Site Stratigraphic Column

Stratigraphic Description		
Stratigraphic Unit	Approximate Thickness	General Description
Cahokia Alluvium	0-35 feet	Alluvium: Poorly sorted silt, clay, and silty sand with lenses of sand and gravel. (CL to SM)
Peyton Colluvium	0-10 feet	Colluvium: Brown clayey silt with minor amounts of gravel. (ML to CL)
Richland Loess	0-10 feet	Loess: Brown clayey silt, trace fine sand. (ML to CL)
Henry Formation	0-33 feet	Glacial outwash: Yellow-brown fine to coarse sand and gravel, with pockets of gray-brown silt, sandy silt, and silty clay. A lag gravel is often present at the base. (SM, SW, SP, SM-SW, SP-SW)
Wedron Formation	20-55 feet	Till: Brown silty clay to clayey silt, some interspersed fine to coarse sand, trace fine to coarse gravel, with pockets of brown fine sand, sometimes silty, trace fine gravel. Grades to gray clayey silt, some fine to coarse sand, trace fine gravel with pockets of fine to coarse gray sand, trace fine gravel. (ML to CL)
Robein Silt	0-2 feet	Loess (deposited in water): Dark brown organic silt, trace clay, trace fine sand. Locally consists of peat. (ML to CL)
Weathered Glasford Formation	10-15 feet	Till: Gray silt grading to clayey silt, trace fine sand. Grades to gray-green silty clay or clayey silt, some fine to coarse sand, trace fine to coarse gravel. More sand and gravel with depth. Slightly to highly calcareous. (ML to CL)
Unaltered Glasford Formation	90-140+ feet	Till: Dark gray clayey silt, some interspersed fine to coarse sand, highly calcareous, trace fine to coarse gravel with pockets of gray sand, fine to coarse. (ML-CL to SM)

Notes

1. Vertical scale does not represent either relative thickness or stratigraphic units or relative duration of time interval.
2. Excavations for the Clinton Power Station did not extend below the unaltered Glasford Formation.
3. Illinoian-age till of the Glasford Formation was subjected to a significant period of weathering during the Sangamonian Stage and Altonian Substage.
4. Deposits of Cahokia Alluvium and Henry Formation were not differentiated; reported approximate thicknesses of each unit represents a combined thickness for both deposits.
5. The Holocene Stage is represented by a significant period of weathering and development of agricultural soil profiles.
6. The Cahokia Alluvium and Henry Formation were mapped as a single unit. The Cahokia Alluvium is Holocene and, quite possibly, in part Valderan/Twocreekan in age; the Henry Formation is Woodfordian (probably early) in age. The Wedron Formation is probably early Woodfordian.
7. Locally, the Peyton Colluvium rests directly on the Glasford Formation.

CLINTON POWER STATION
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Figure C2.5-1
Page 2 of 2

SITE STRATIGRAGHIC COLUMN

<u>Comparison of Terminology Used For The FSAR and PSAR</u>

<table>
<tr><td colspan="2" rowspan="2">Time Stratigraphy</td><td colspan="3">Stratigraphic Units</td></tr>
<tr><td colspan="2">FSAR</td><td>PSAR</td></tr>
<tr><td colspan="2">Holocene Stage</td><td>Cahokia Alluvium</td><td>Peyton Colluvium</td><td>Salt Creek Alluvium or Flood Plain Alluvium and Recent Channel Deposits</td></tr>
<tr><td rowspan="5">Wisconsinan Stage</td><td>Valderan Substage</td><td rowspan="2">Richland Loess</td><td></td><td rowspan="2">Loess</td></tr>
<tr><td>Twocreekan Substage</td><td rowspan="2">Henry Formation</td></tr>
<tr><td>Woodfordian Substage</td><td>Wedron Formation</td><td rowspan="2">Wisconsinan Till or Wisconsinan Glacial Till</td></tr>
<tr><td>Farmdalian Substage</td><td colspan="2">Robein Silt</td></tr>
<tr><td>Altonian Substage</td><td colspan="2" rowspan="3">Weathered Glasford Formation</td><td rowspan="3">Interglacial Zone or Sangamon Interglacial Zone or Sangamon Soil Interval</td></tr>
<tr><td colspan="2">Sangamonian Stage</td></tr>
<tr><td colspan="2" rowspan="2">Illinoian Stage</td></tr>
<tr><td colspan="2">Unaltered Glasford Formation</td><td>Illinoian Till or Illinoian Glacial Till</td></tr>
</table>

<u>Notes</u>

1. The Cahokia Alluvium, Peyton Colluvium, and Henry Formation consist of alluvial and outwash deposits and are confined to the valley of the North Fork of Salt Creek.
2. Vertical scale does not represent either relative thickness of stratigraphic units or relative duration of time interval.

CLINTON POWER STATION
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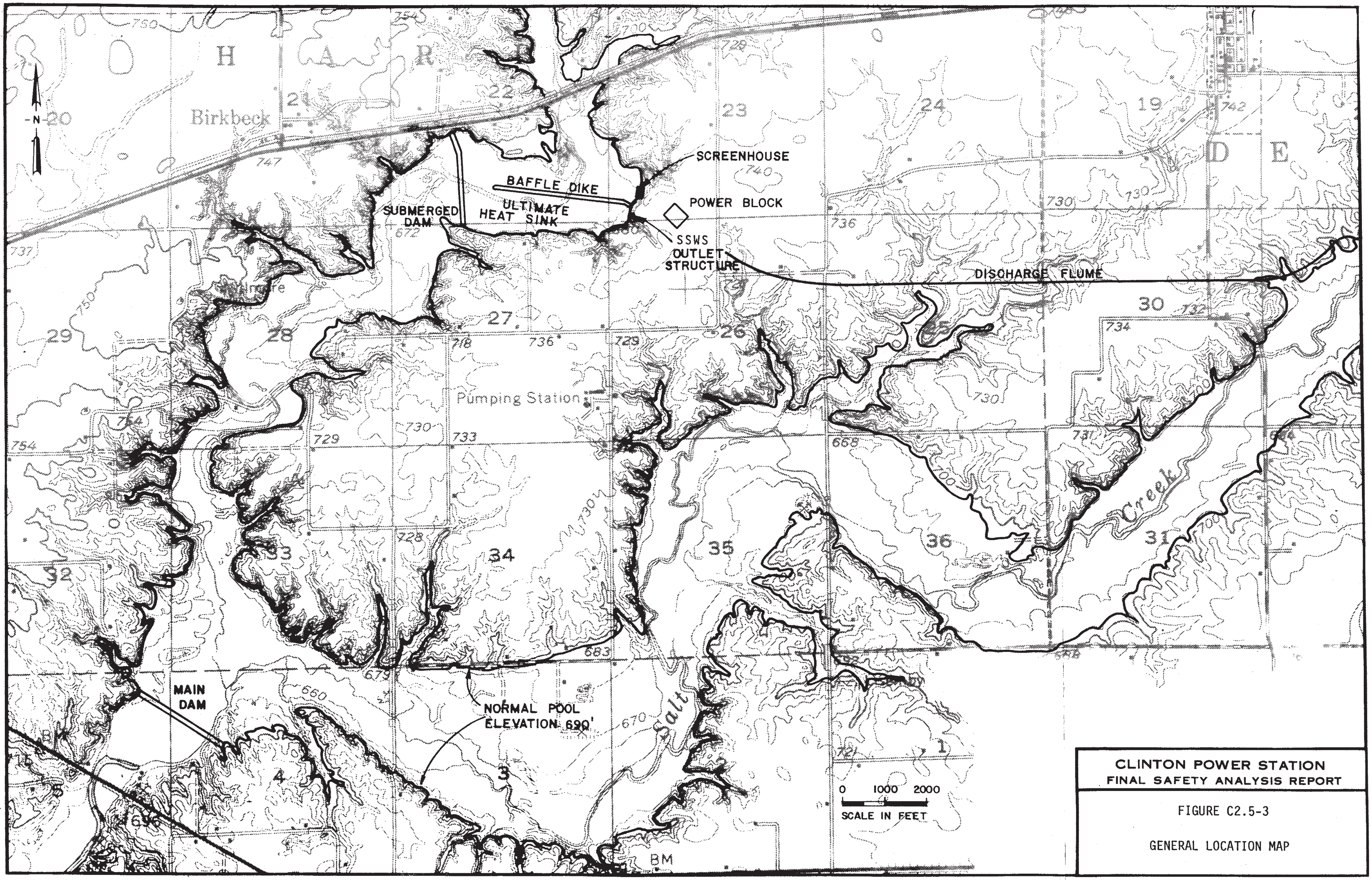
Figure C2.5-2

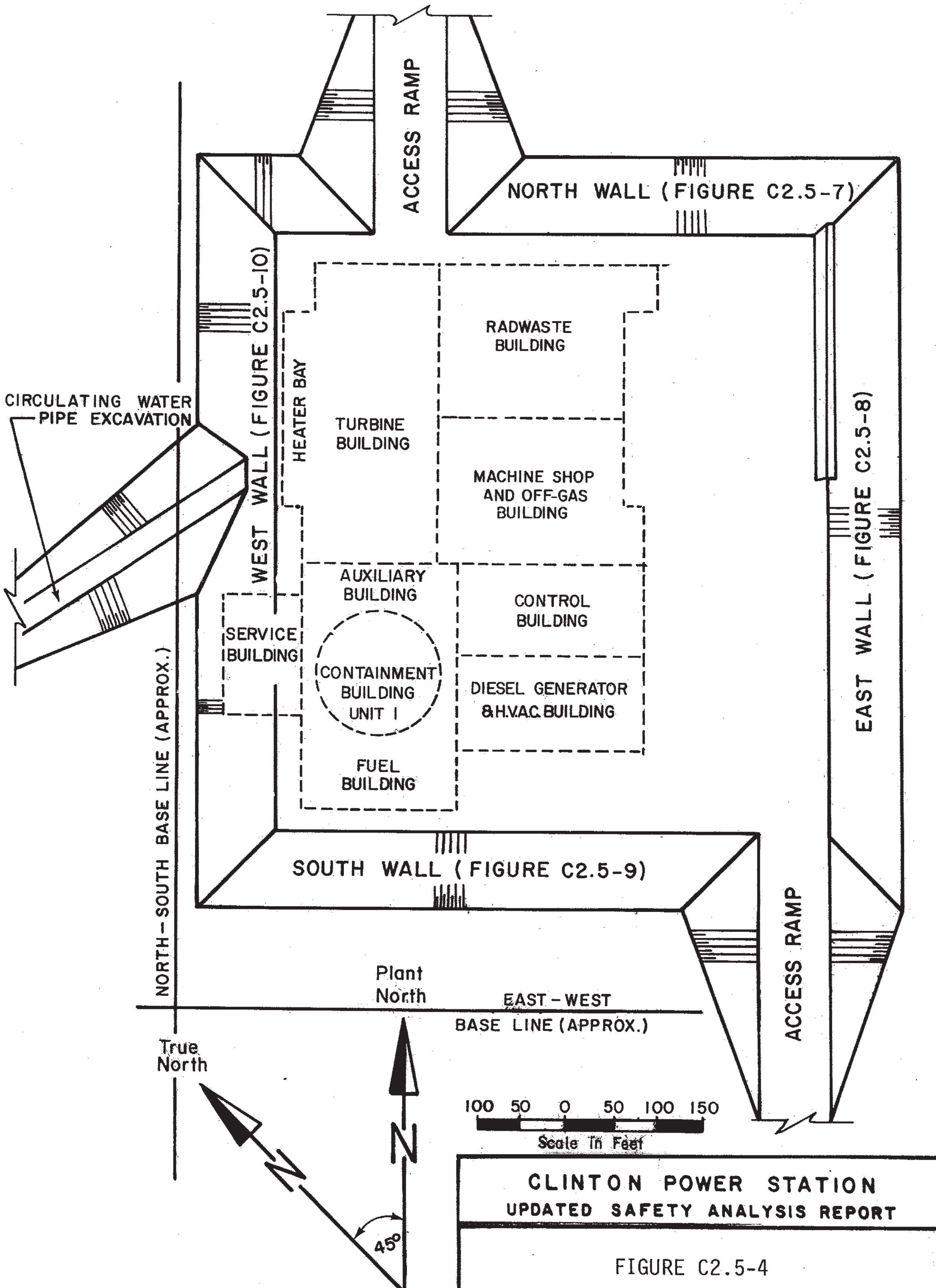
COMPARISON OF TERMINOLOGY USED FOR THE FSAR AND PSAR



CLINTON POWER STATION
FINAL SAFETY ANALYSIS REPORT

FIGURE C2.5-3

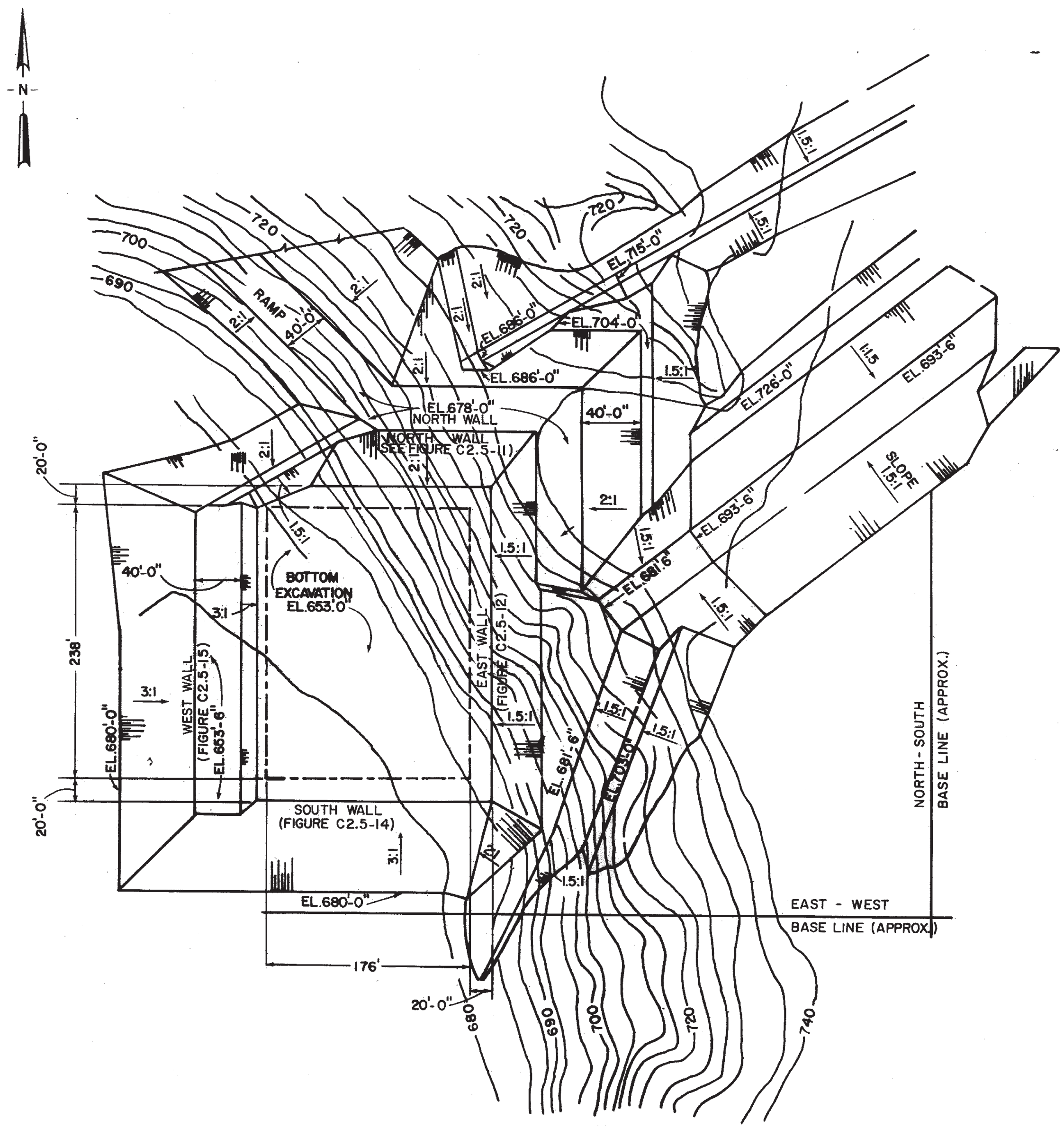
GENERAL LOCATION MAP



CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE C2.5-4

EXCAVATION PLAN OF THE POWER BLOCK AND LOCATIONS OF GEOLOGIC SECTIONS



NOTE

See Figures C2.5-11, C2.5-12, C2.5-14 and C2.5-15 for geologic sections.

0 100 200

Scale in Feet

CLINTON POWER STATION

UPDATED SAFETY ANALYSIS REPORT

FIGURE C2.5-5

EXCAVATION PLAN FOR THE CIRCULATING WATER SCREEN HOUSE

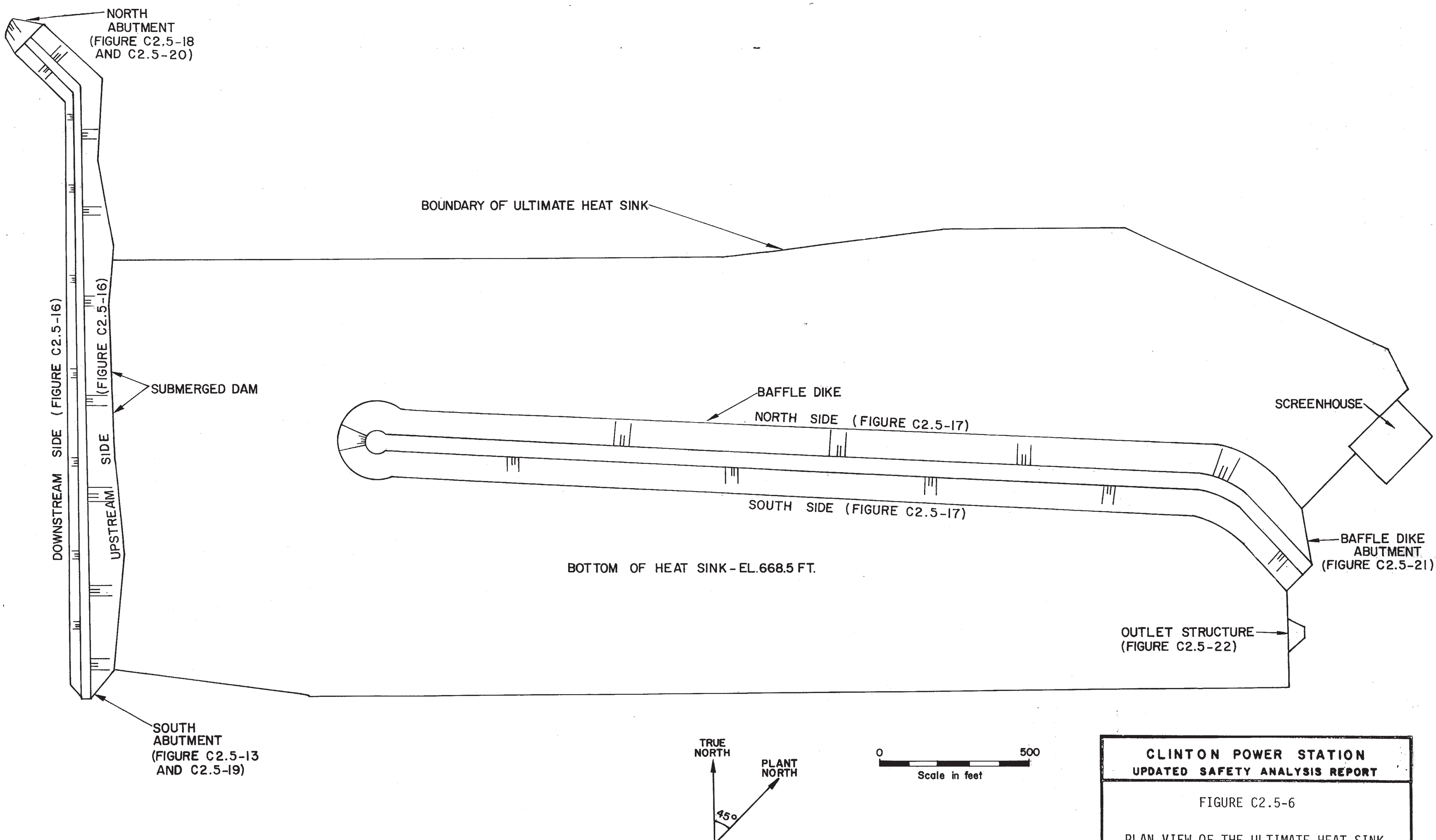


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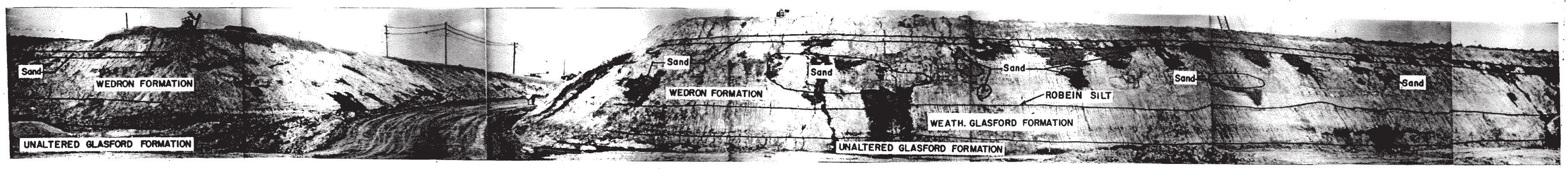
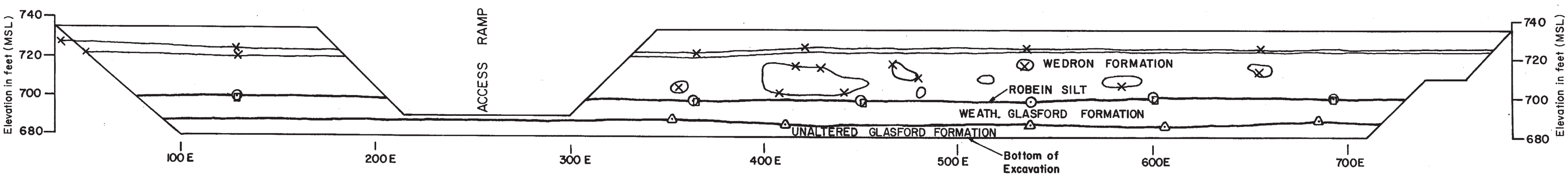
FIGURE C2.5-6

PLAN VIEW OF THE ULTIMATE HEAT SINK



NORTH WALL



East and West Plant Coordinates (Feet)
See Figure No. C2.5-4

LEGEND

STRATIGRAPHIC CONTACTS

——— Contacts between formations

——— Outline of sand deposit

REFERENCE POINTS

⊙ Wedron Fm./Robein Silt contact

⊡ Robein Silt/Weath. Glasford Fm. contact

△ Weath. Glasford Fm./Unalt. Glasford Fm. contact

× Sand location

NOTES

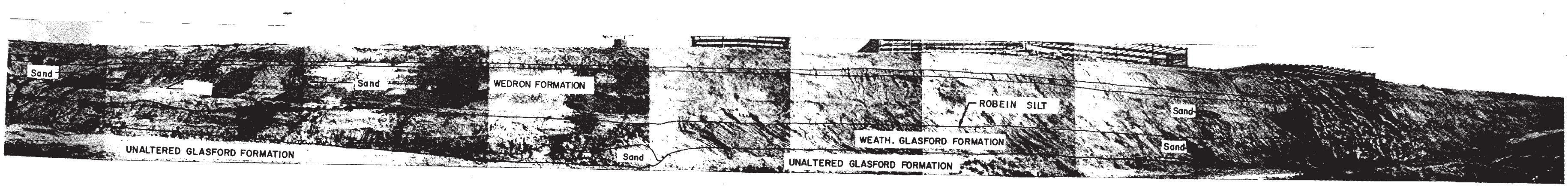
1. Location of this figure is shown in Figure C2.5-4, see also Figure No. C2.5-3.
2. Descriptions and ages of stratigraphic units are presented in Figure C2.5-1.
3. Limits of excavation and slopes shown in geologic section are approximations.
4. Due to radial photography from center of excavation, photo mosaic is not to scale.
5. Contacts between stratigraphic units and limits of sand deposits are approximated between control points.
6. The Robein Silt is a generally 2 to 4 foot thick layer of organic silt between the tills of the Wedron and Glasford Formations.

20 0 20 40 60
Scale in Feet
(See Note 4)

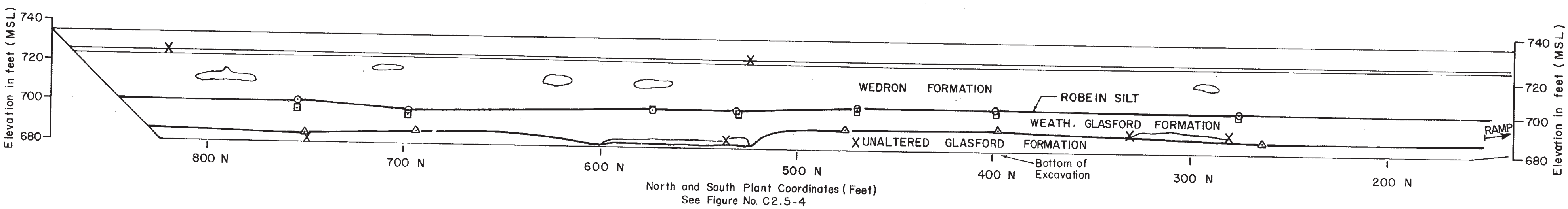
CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE C2.5-7

GEOLOGIC SECTION AND PHOTO MOSAIC OF THE NORTH WALL OF THE POWER BLOCK EXCAVATION



EAST WALL



LEGEND

STRATIGRAPHIC CONTACTS

Contacts between formations

Outline of sand deposit

REFERENCE POINTS

⊙ Wedron Fm./Robein Silt. contact

⊡ Robein Silt/ Weath. Glasford Fm contact.

△ Weath. Glasford Fm./Unalt. Glasford Fm. contact.

X Sand location

NOTES

1. Location of this figure is shown in Figure C2.5-4, see also Figure No. C2.5-3.
2. Descriptions and ages of stratigraphic units are presented in Figure C2.5-1.
3. Limits of excavation and slopes shown in geologic section are approximations.
4. Due to radial photography from center of excavation, photo mosaic is not to scale.
5. Contacts between stratigraphic units and limits of sand deposits are approximated between control points.
6. The Robein Silt is a generally 2 to 4 foot thick layer of organic silt between the tills of the Wedron and Glasford Formations.

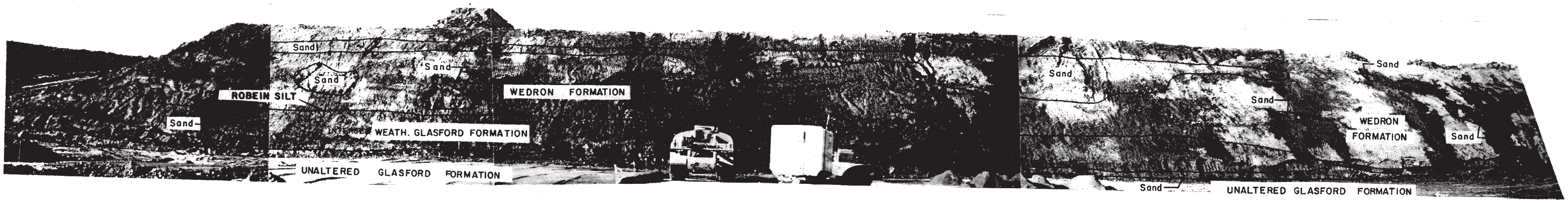
20 0 20 40 60

Scale in Feet
(See Note 4)

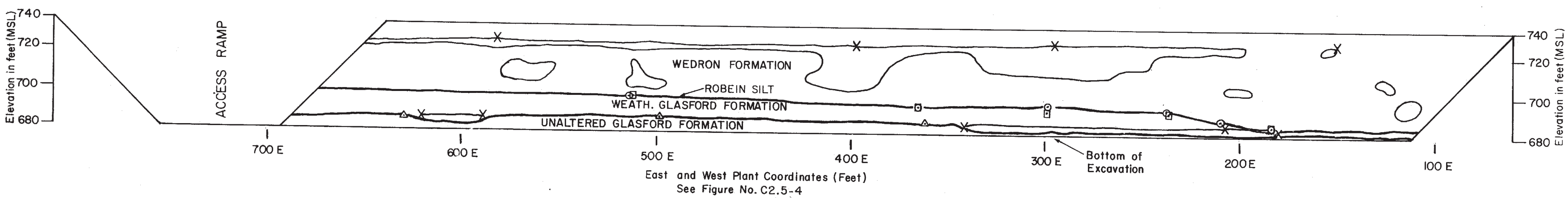
CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE C2.5-8

GEOLOGIC SECTION AND PHOTO MOSAIC OF THE EAST WALL OF THE POWER BLOCK EXCAVATION



SOUTH WALL



LEGEND

STRATIGRAPHIC CONTACTS

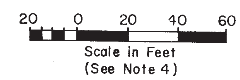
- Contacts between formations
- Outline of sand deposit

REFERENCE POINTS

- ⊙ Wedron Fm./Robein Silt contact
- ⊡ Robein Silt/Weath. Glasford Fm. contact.
- △ Weath. Glasford Fm./Unalt. Glasford Fm. contact
- × Sand location

NOTES

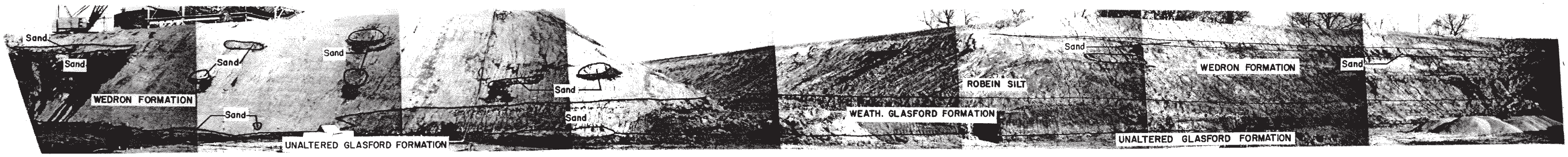
1. Location of excavation shown in Figure C2.5-4, see also Figure No. C2.5-3.
2. Descriptions and ages of stratigraphic units are presented in Figure C2.5-1.
3. Limits of excavation and slopes shown in geologic section are approximations.
4. Due to radial photography from center of excavation, photo mosaic is not to scale.
5. Contacts between stratigraphic units and outlines of sand deposits are approximated between control points.
6. The Robein Silt is a generally 2 to 4 foot thick layer of organic silt between the tills of the Wedron and Glasford Formations.



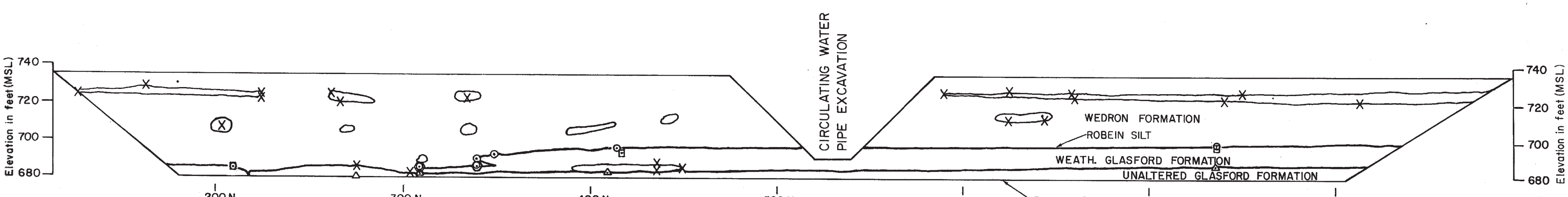
CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE C2.5-9

GEOLOGIC SECTION AND PHOTO MOSAIC OF THE SOUTH WALL OF THE POWER BLOCK EXCAVATION



WEST WALL



LEGEND

STRATIGRAPHIC CONTACTS

- Contacts between formations
- Outline of sand deposit

REFERENCE POINTS

- ⊚ Wedron Fm./Robein Silt contact
- ⊡ Robein Silt/Weath. Glasford Fm. contact,
- ⊙ Wedron Fm./Weath. Glasford Fm. contact.
- ⚠ Weath. Glasford Fm./Unalt. Glasford Fm. contact.

NOTES

1. Location of excavation shown in Figure C2.5-4, see also Figure No. C2.5-3.
2. Descriptions and ages of stratigraphic units are presented in Figure C2.5-1.
3. Limits of excavation and slopes shown in geologic section are approximations.
4. Due to radial photography from center of excavation, photo mosaic is not to scale.
5. Contacts between stratigraphic units and outlines of sand deposits are approximated between control points.
6. The Robein Silt is a generally 2 to 4 foot thick layer of organic silt between tills of the Wedron and Glasford Formations.
7. The Robein Silt has been locally removed by erosion between approximately 220N to 300N.

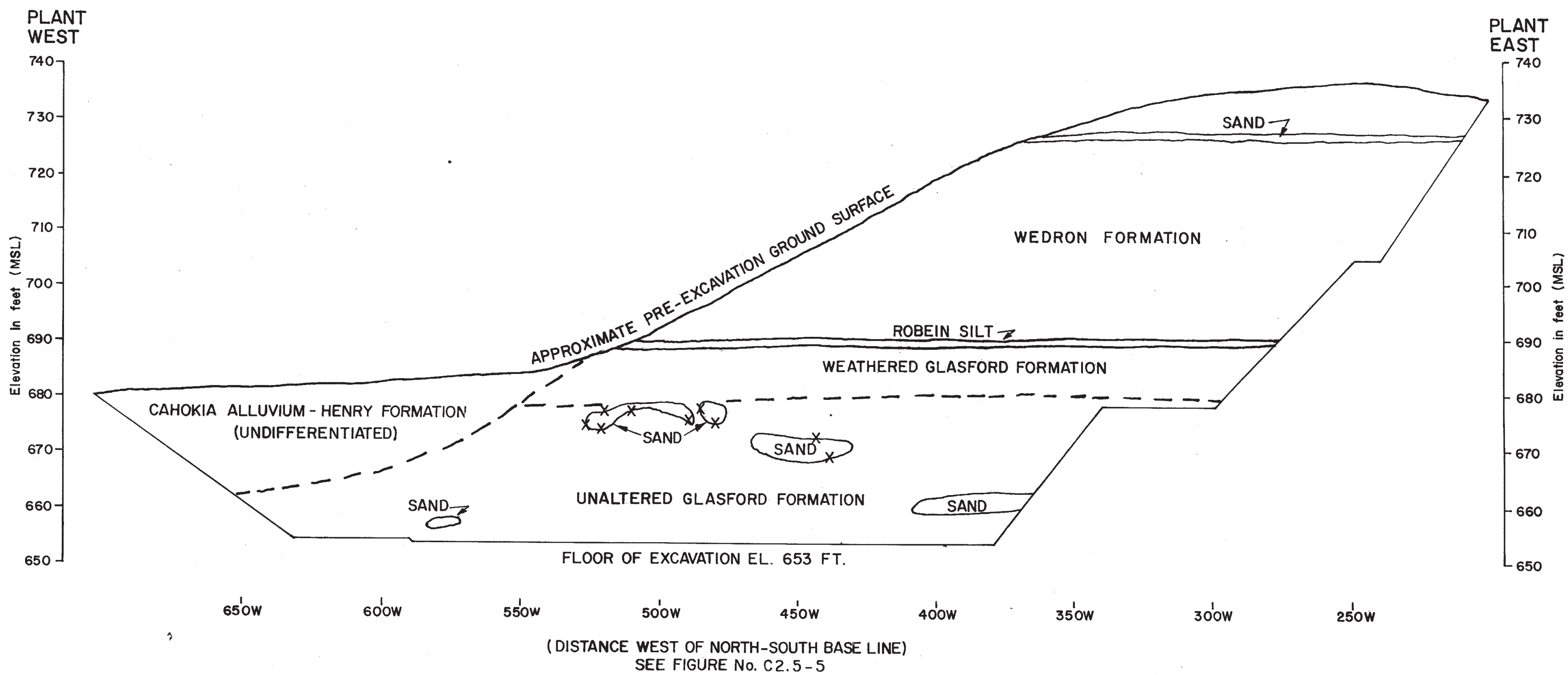
20 0 20 40 60

Scale In Feet
(See Note 4)

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE C2.5-10

GEOLOGIC SECTION AND PHOTO MOSAIC OF THE WEST WALL OF THE POWER BLOCK EXCAVATION



LEGEND

- Contact between stratigraphic units.
- Inferred contact between stratigraphic units.
- Contact between sand or silt deposits.
- X Survey point

NOTES

1. Location of this geologic section is shown in Figure C2.5-5, see also Figure No. C2.5-3.
2. Description and ages of stratigraphic units are presented in Figure C2.5-1.
3. Limits of excavation and slopes shown in geologic section are approximations.
4. Some ramps and cuts in the excavation have been omitted for clarity
5. View is to plant north.

0 50
Scale in Feet
Vertical Exaggeration=2X

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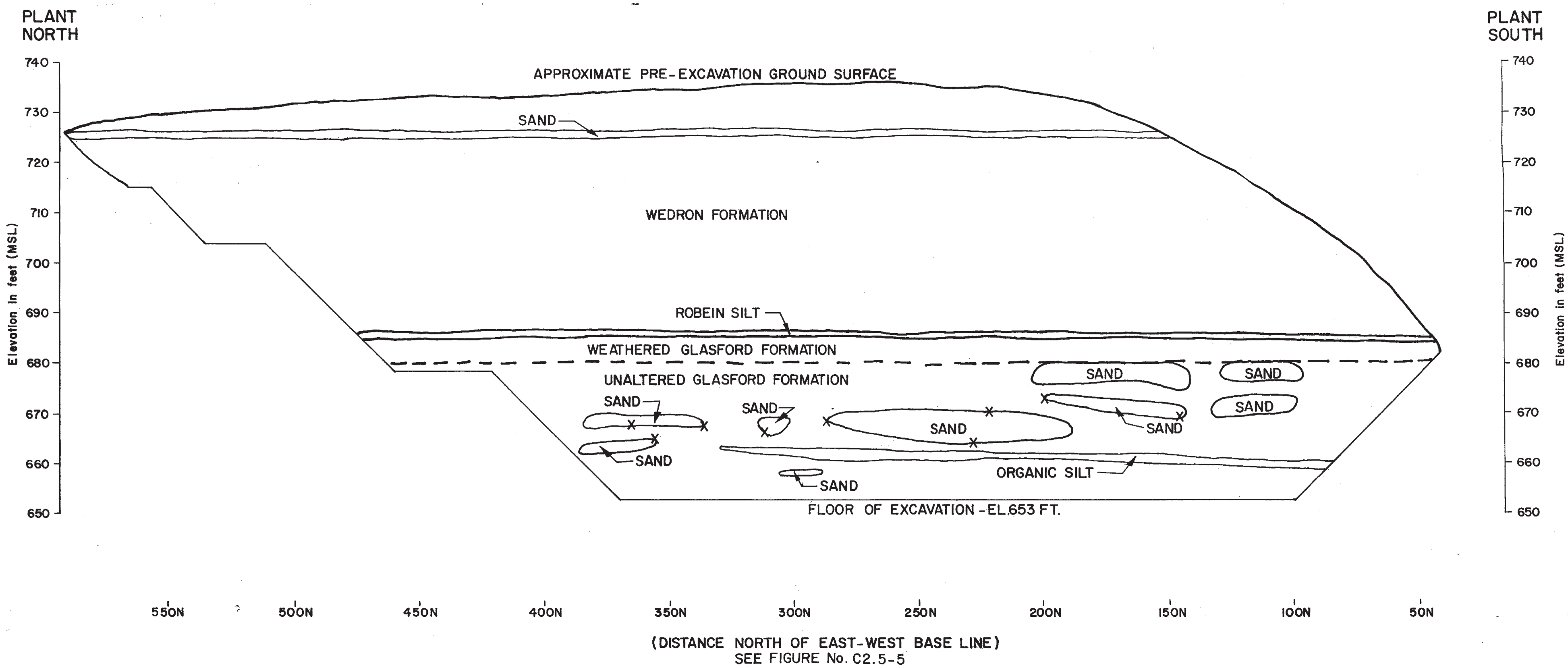
FIGURE C2.5-11

GEOLOGIC SECTION OF THE NORTH WALL OF THE SCREEN HOUSE EXCAVATION



LEGEND

- Contact between stratigraphic units
- Inferred contact between stratigraphic unit.
- Contact between sand or silt deposits.
- X Survey point

NOTES

1. Location of this geologic section is shown in Figure C2.5-5, see also Figure No. C2.5-3.
2. Description and ages of stratigraphic units are presented in Figure C2.5-1.
3. Limits of excavation and slopes shown in geologic section are approximations.
4. Some ramps and cuts in the excavation have been omitted for clarity.
5. View is to plant east.

0 50
Scale in feet
Vertical Exaggeration=2X

CLINTON POWER STATION
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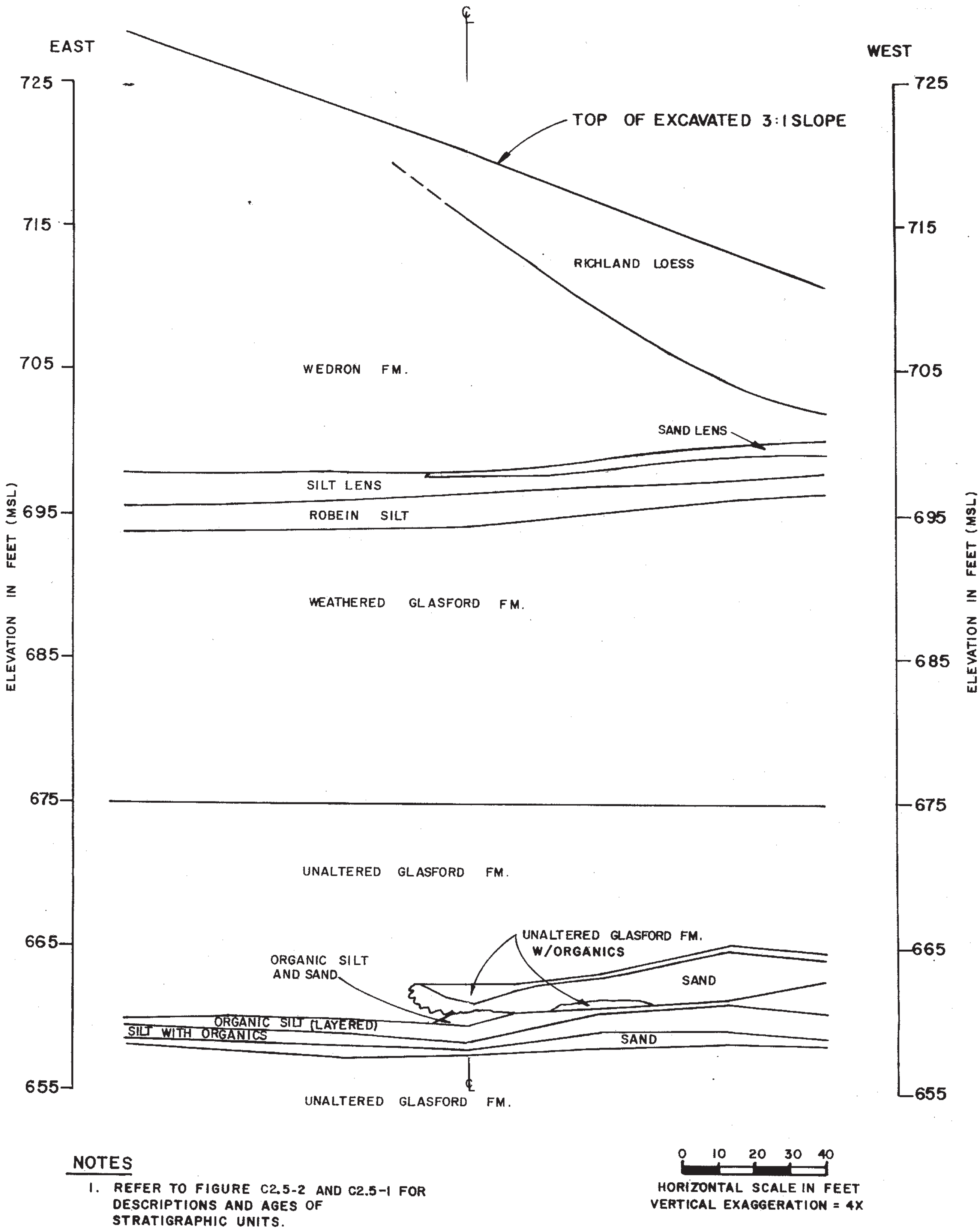
FIGURE C2.5-12

GEOLOGIC SECTION OF THE EAST WALL OF THE SCREEN HOUSE EXCAVATION



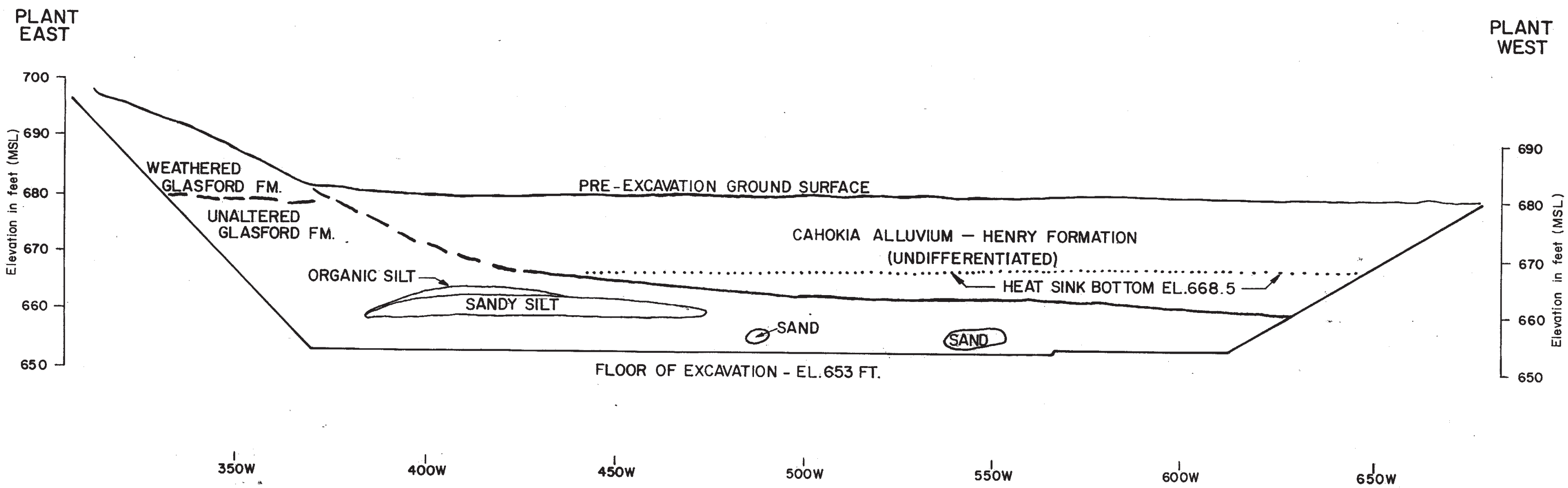
NOTES

1. REFER TO FIGURE C2.5-2 AND C2.5-1 FOR DESCRIPTIONS AND AGES OF STRATIGRAPHIC UNITS.
2. REFER TO FIGURES C2.5-3, C2.5-6 AND C2.5-19 FOR LOCATION OF GEOLOGIC SECTION.

CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT

FIGURE C2.5-13

GEOLOGIC SECTION OF THE SOUTH ABUTMENT OF THE ULTIMATE HEAT SINK DAM EXCAVATION



(DISTANCE WEST OF NORTH-SOUTH BASE LINE)
SEE FIGURE No C2.5-5

LEGEND

- Contact between stratigraphic units.
- Inferred contact between stratigraphic units.
- Contact between sand or silt deposits.

NOTES

1. Location of this geologic section is shown in Figure C2.5-5, see also Figure No. C2.5-3.
2. Desription and ages of stratigraphic units are presented in Figure C2.5-1.
3. Limits of excavation and slopes shown in geologic section are approximations.
4. View is to plant south.

0 50
Scale in feet
Vertical Exaggeration = 1.5X

CLINTON POWER STATION
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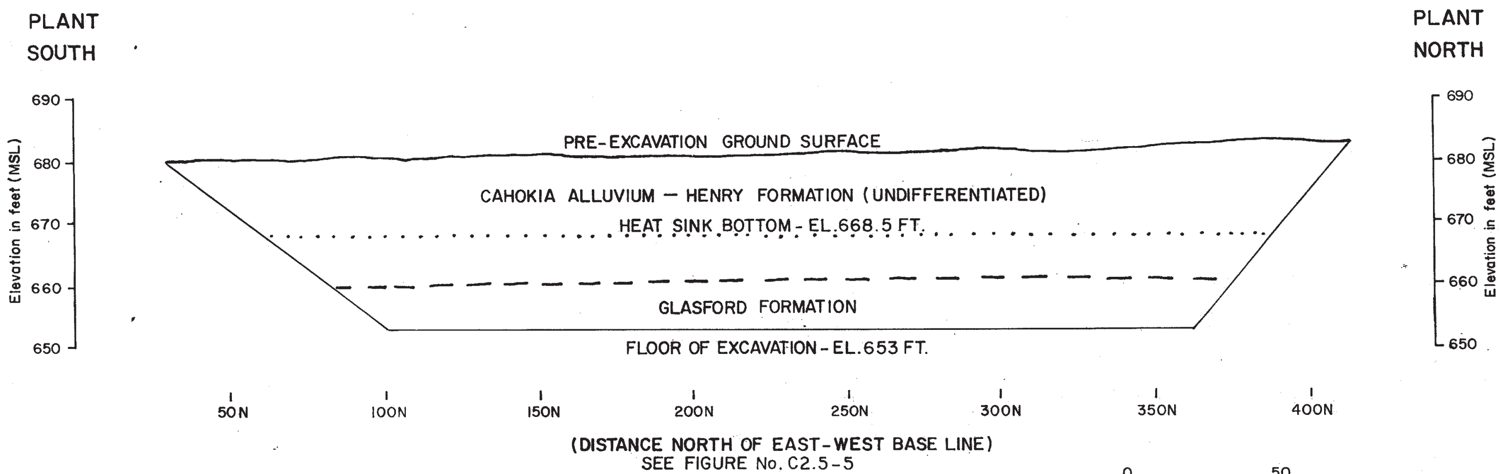
FIGURE C2.5-14

GEOLOGIC SECTION OF THE SOUTH WALL OF THE SCREEN HOUSE EXCAVATION



LEGEND

— — Inferred contact between stratigraphic units.

NOTES

1. Location of this geologic section is shown in Figure C2.5-5, see also Figure No. C2.5-3.
2. Descrption and ages of stratigraphic units are presented in Figure C2.5-1.
3. Limits of excavation and slopes shown in geologic section are approximations.
4. View is to plant west

CLINTON POWER STATION
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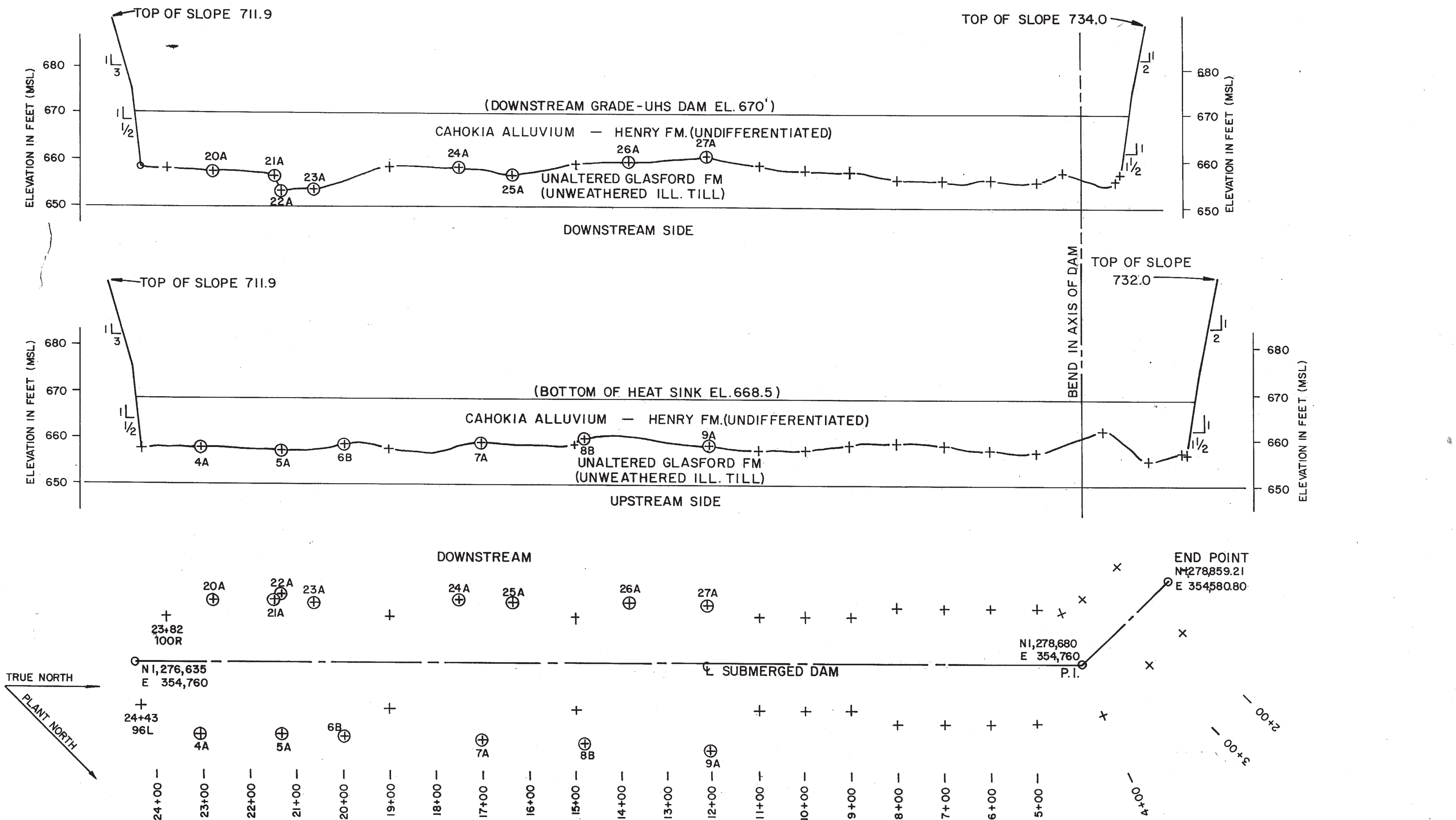
FIGURE C2.5-15

GEOLOGIC SECTION OF THE WEST WALL OF THE SCREEN HOUSE EXCAVATION



200 0 200

HORIZONTAL SCALE IN FEET
VERTICAL EXAGGERATION = 10X

LEGEND

- \+ POINTS TAKEN FROM SUBGRADE PROFILES
- ⊕ POINTS FROM GEOLOGIC MAPPING
- —+—⊕— SUBGRADE EXCAVATION LINE
- 2+00 STATIONING ALONG CENTER LINE OF DAM

NOTES

1. Descriptions and ages of stratigraphic units are presented in Figure C2.5-1.
2. See Figure Nos. C2.5-3 and C2.5-6 for location.

CLINTON POWER STATION
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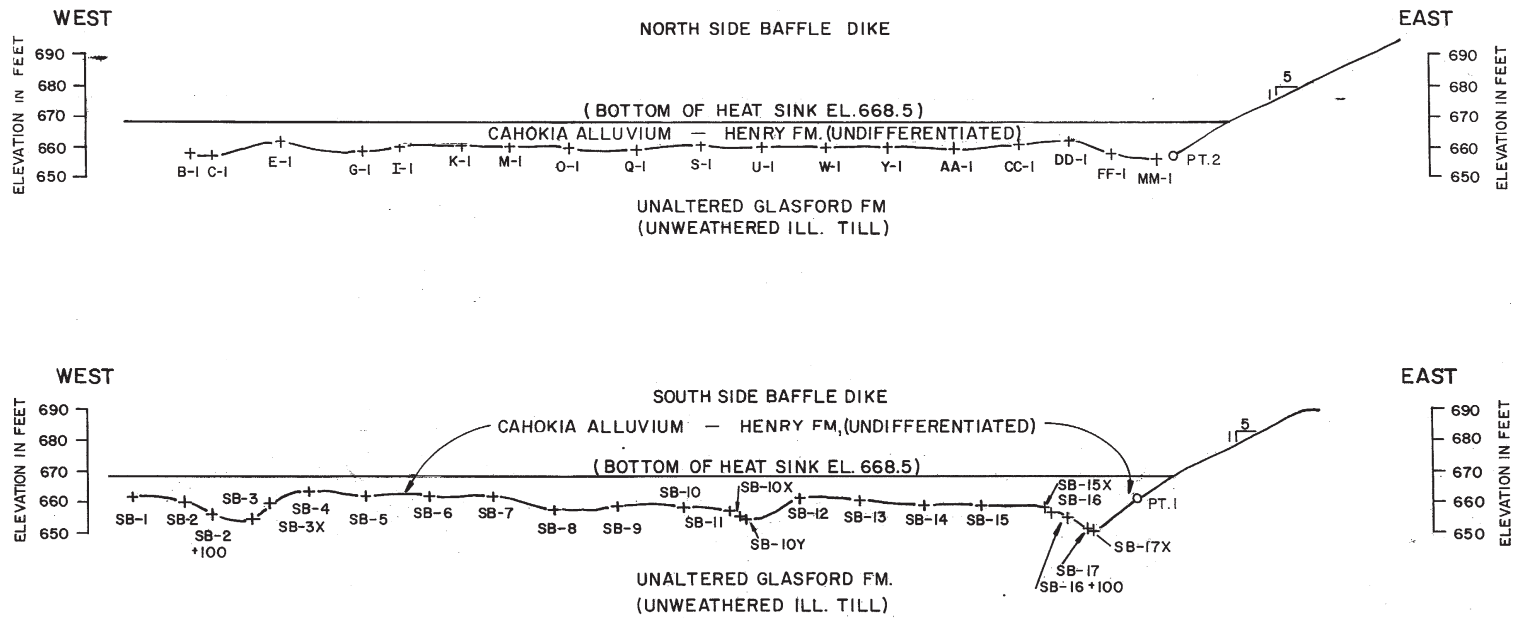
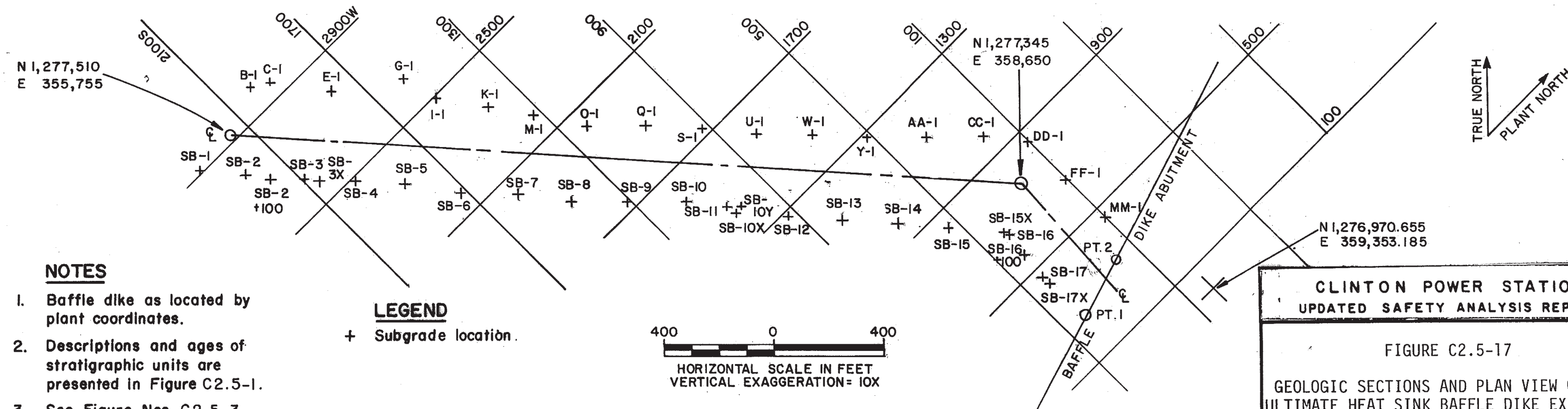
FIGURE C2.5-16

GEOLOGIC SECTIONS AND PLAN VIEW OF THE ULTIMATE HEAT SINK DAM EXCAVATION





NOTES

1. Baffle dike as located by plant coordinates.
2. Descriptions and ages of stratigraphic units are presented in Figure C2.5-1.
3. See Figure Nos. C2.5-3 and C2.5-6 for locations.
4. 2900W Plant coordinates (feet).

LEGEND

\+ Subgrade location.

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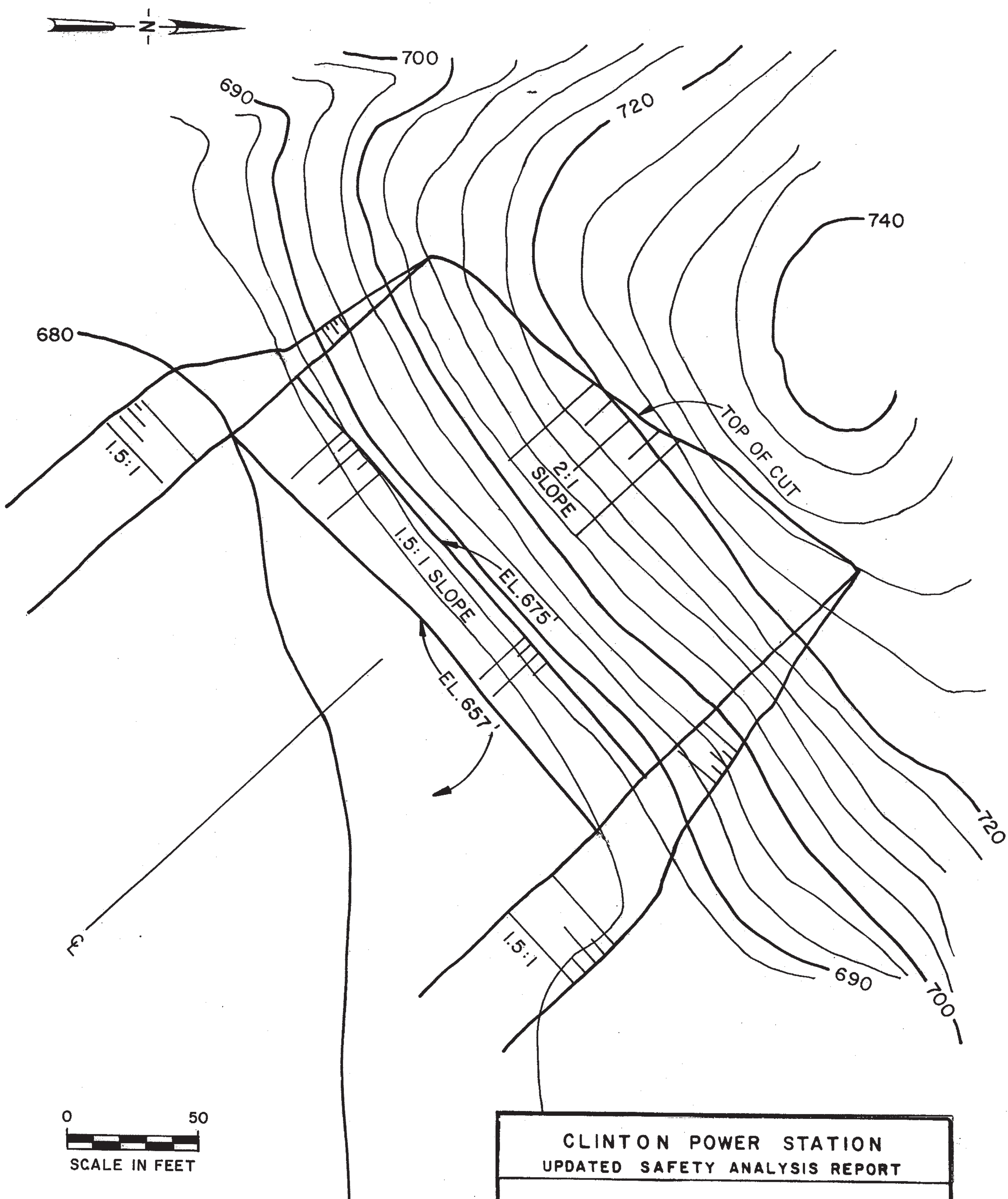
FIGURE C2.5-17

GEOLOGIC SECTIONS AND PLAN VIEW OF THE ULTIMATE HEAT SINK BAFFLE DIKE EXCAVATION



NOTE

See figure numbers C2.5-3 and C2.5-6 for location.

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FIGURE C2.5-18

EXCAVATION PLAN OF THE NORTH ABUTMENT OF THE ULTIMATE HEAT SINK DAM

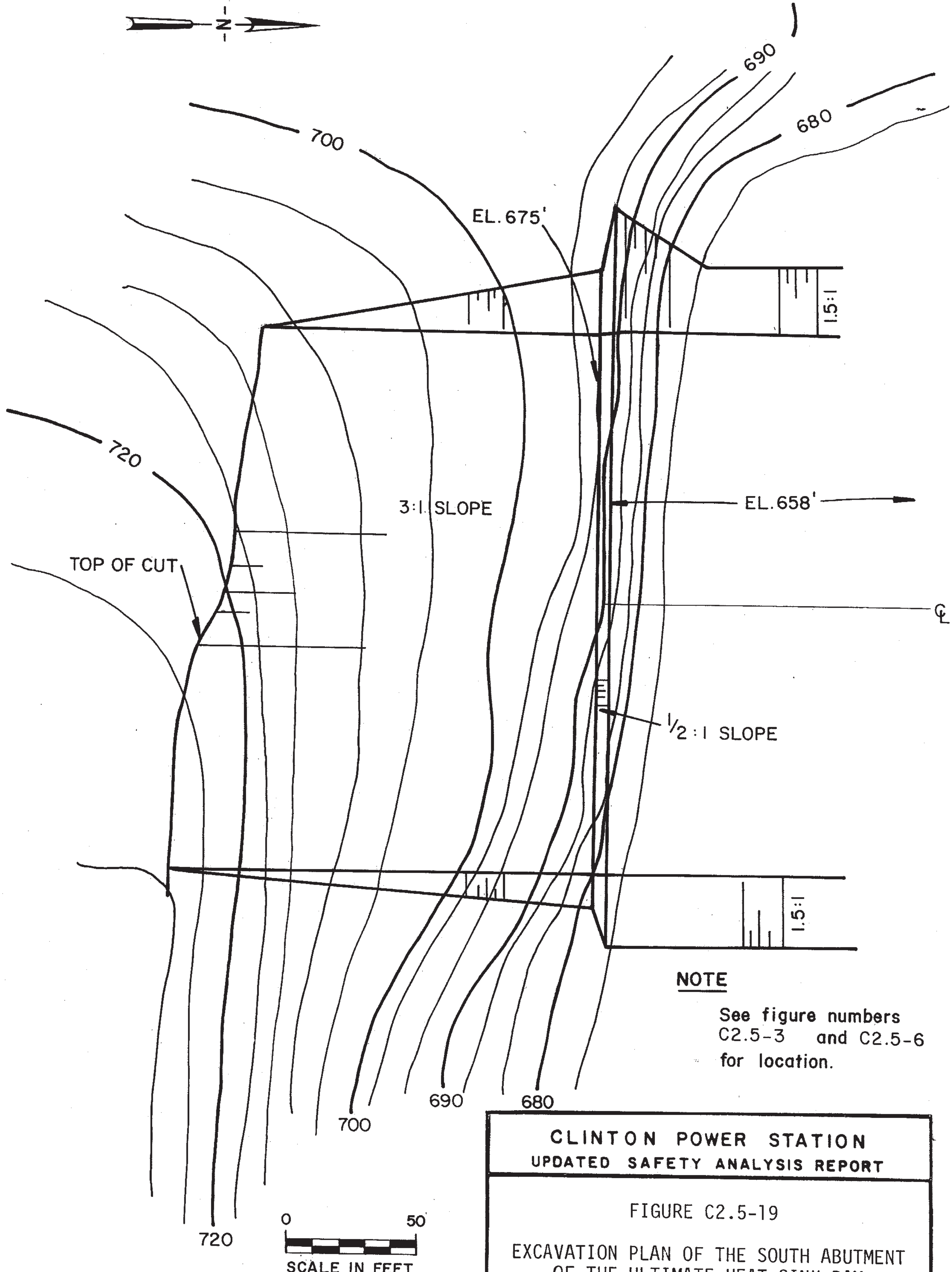

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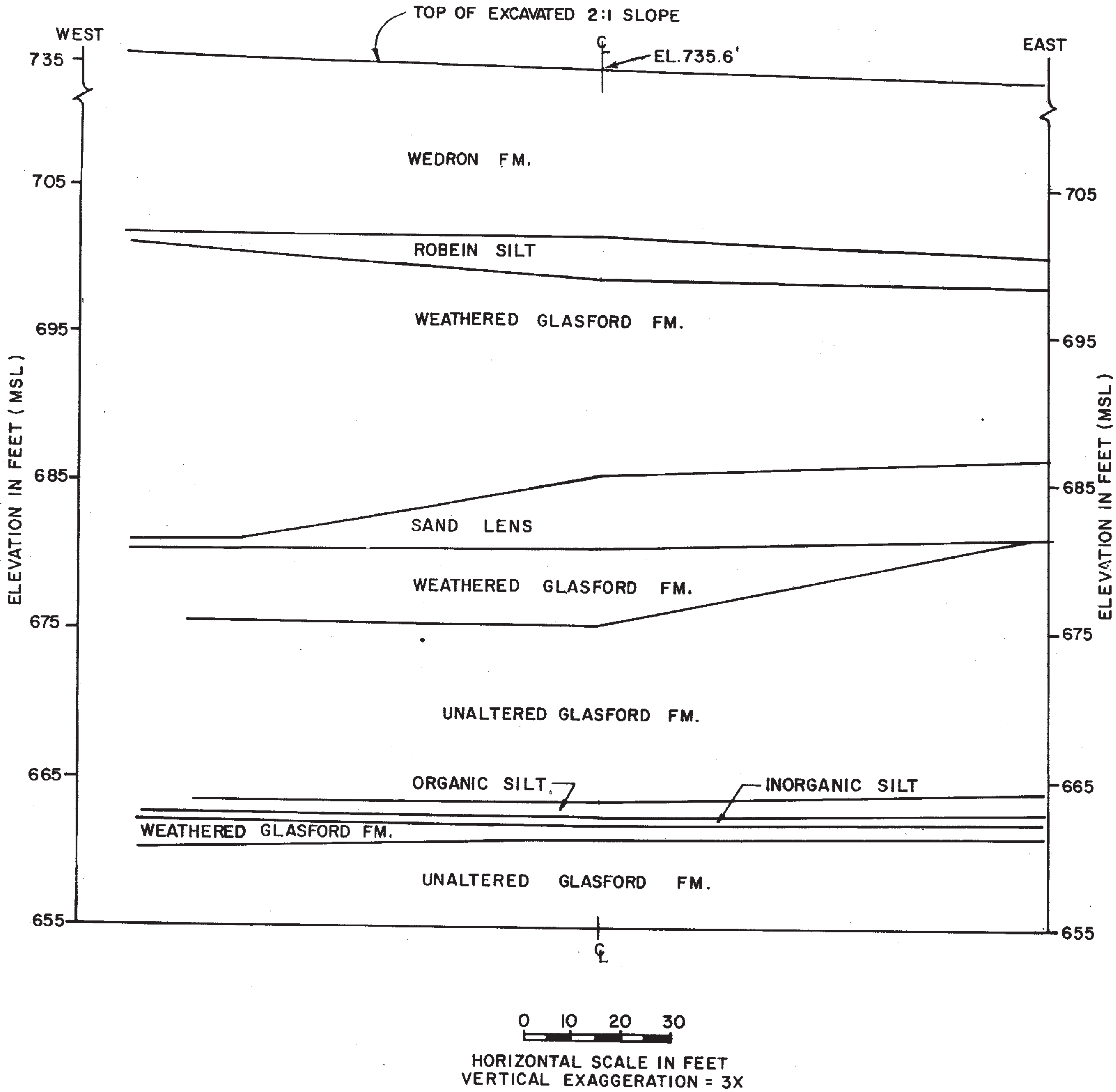
FIGURE C2.5-19

EXCAVATION PLAN OF THE SOUTH ABUTMENT OF THE ULTIMATE HEAT SINK DAM



NOTES

1. REFER TO FIGURE C2.5-1 FOR DESCRIPTIONS AND AGES OF STRATIGRAPHIC UNITS.
2. REFER TO FIGURES C2.5-3, C2.5-6 AND C2.5-18 FOR LOCATION OF GEOLOGIC SECTION.

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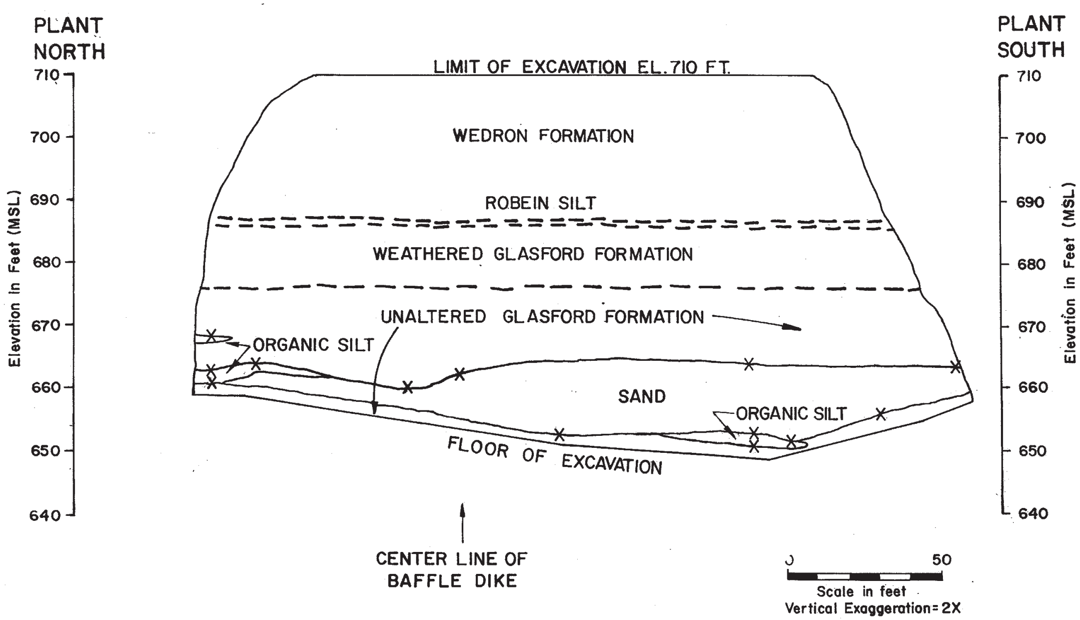
FIGURE C2.5-20

GEOLOGIC SECTION OF THE NORTH ABUTMENT OF THE ULTIMATE HEAT SINK DAM EXCAVATION



LEGEND

- – – – Inferred contact between stratigraphic units.
- ——— Contact between sand or silt units.
- X Survey point

NOTES

1. Location of this geologic section is shown in Figure C2.5-6, see also Figure No. C2.5-3.
2. Description and ages of stratigraphic units are presented in Figure C2.5-1.
3. Limits of excavation and slopes shown in this geologic section are approximations.
4. View is to plant west.

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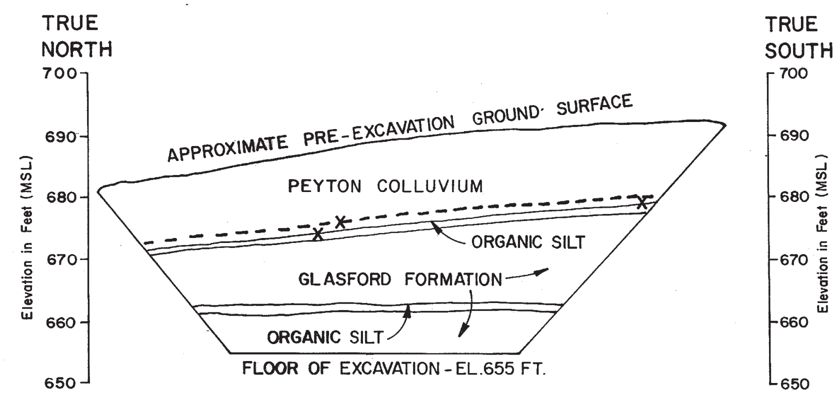
FIGURE C2.5-21

GEOLOGIC SECTION OF THE BAFFLE DIKE ABUTMENT EXCAVATION



NOTES

1. Location of this geologic section is shown in Figure C2.5-6, see also Figure No. C2.5-7
2. Description and ages of stratigraphic units are presented in Figure C2.5-1.
3. Limits of excavation and slopes shown in this geologic section are approximations.
4. View is to true east.

LEGEND

- – – – Inferred contact between stratigraphic units
- ——— Contact between silt units
- X Survey point

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FIGURE C2.5-22

GEOLOGIC SECTION OF THE SSWS OUTLET STRUCTURE EXCAVATION

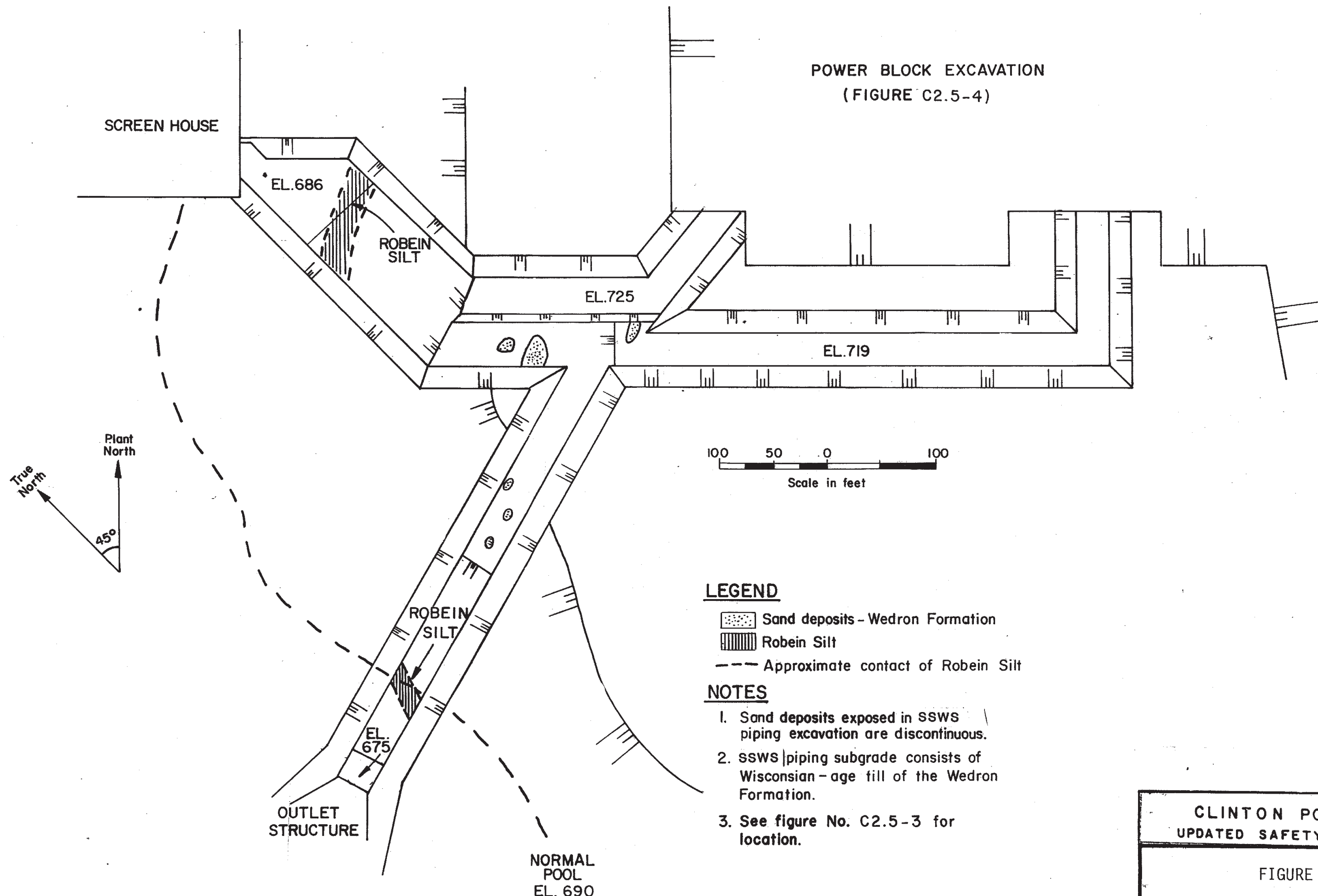

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FIGURE C2.5-23

EXCAVATION PLAN FOR THE SSWS BUILDING