WATER RESOURCES DEVELOPMENT PROJECT

PARK RIVER LOCAL PROTECTION

CONNECTICUT RIVER BASIN
HARTFORD, CONNECTICUT

DESIGN MEMORANDUM NO. 5

EMBANKMENTS AND FOUNDATIONS

PART I- BOX CONDUIT

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS.

FEBRUARY 1975

29

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

REPLY TO
ATTENTION OF:

NEDED-F 7 February 1975

SUBJECT: Park River Local Protection, Connecticut River Basin, Hartford, Connecticut, Design Memorandum No. 5 - Embankments and Foundations: Part 1 - Box Conduit

HQDA (DAEN-CWE-B)
WASH DC 20314

In accordance with ER 1110-2-1150, there is submitted herewith for review and approval Design Memorandum No. 5, Embankments and Foundations: Part 1 - Box Conduit, for the Park River Local Protection, Connecticut River Basin, Hartford, Connecticut.

FOR THE DIVISION ENGINEER:

John Wm. Leslie

Incl (10 cys)
as

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Chief, Engineering Division

WATER RESOURCES DEVELOPMENT PROJECT

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DESIGN MEMORANDA INDEX

Number	Title	Anticipated Submission Date	Date Submitted	Date Approved
1	Hydrology		16 Feb 73	12 Apr 73
2	GDM - Phase I - Plan Formulation		30 Mar 73	16 Jul 73
2	GDM - Phase II - Project Design, Site Geology & Interior Drainage Part I - Box Conduit		30 Aug 74	18 Oct 74
2	GDM - Phase II - Project Design Part II - Auxiliary Conduit		24 Jan 75	
3	Hydraulic Analysis	Feb 75		
4	Concrete Materials Part I - Box Conduit	Apr 75		
5	Embankment & Foundations Part I - Box Conduit		7 Feb 75	
6	Pumping Stations		29 Nov 74	
7	Detailed Design of Structures Part I - Box Conduit		25 Oct 74	4 Dec 74
8	Auxiliary Conduit Shafts Site Geology, Foundations & Detailed Design of Structures	Dec 75		
9	Auxiliary Conduit Tunnel Site Geology, Foundations, Concrete Materials & Detailed Design of Structures	Apr 76		

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WALTHAM, MASSACHUSETTS

JANUARY 1975

WATER RESOURCES DEVELOPMENT PROJECT

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DESIGN MEMORANDUM NO. 5
EMBANKMENTS & FOUNDATIONS
PART 1 - BOX CONDUIT

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WATER RESOURCES DEVELOPMENT PROJECT

PARK RIVER LOCAL PROTECTION
CONNECTICUT RIVER BASIN
HARTFORD, CONNECTICUT

A. PERTINENT DATA

PURPOSE	Flood Control
LOCATION	
State	Connecticut
County	Hartford
City	Hartford
River	Park River & North and South Branch Park River
River Basin	Connecticut
PARK RIVER DRAINAGE AREAS	
Park River at the Mouth	78.7 Square Miles
North Branch Park River	27.7 Square Miles
South Branch Park River	47.0 Square Miles

RECORD OF MAJOR FLOODS

Year	Month	Peak Discharge, c.f.s. *
1936	March	5,400
1938	January	5,650
1938	September	5,320
1955	August	14,000
1955	October	6,420

*Gage at Riverside St. on Park River about 600 feet below junction of North and South Branches.

AREAS	
Subject to flooding, Acres	3,000
Inundated 1955 flood of record, Acres	2,300
Properties protected	Industrial, commercial, residential and public

TWIN-RECTANGULAR BOX CONDUIT

Material: Reinforced Concrete

Conduit Section	Length in Feet	Half Section Width	Half Section Height
Existing (12,743 ft):			
Original (1944)	5,600	30'-0"	19'-4"
Section 1	1,213	34'-0"	26'-6"
Section 3	1,710	34'-0"	26'-6"
Section 6	1,460	36'-0"	27'-6"
Section 8	2,760	22'-0"	25'-0"
Proposed (4,036 ft):			
Section 2	1,232	34'-0"	26'-6"
Section 4	1,337	34'-0"	26'-6"
Section 5	103	36'-0"	27'-6"
Section 7	1,044	22'-0"	25'-0"
Section 9	320	22'-0"	25'-0"

AUXILIARY CONDUIT

Length, feet	9,100
Size, Inside Dia.	222'-0"
Material	Reinforced Concrete

CONDUIT CAPACITIES

North Branch (Section 7, 8, & 9)	
Normal Flow Control	10,000 CFS
System Capacity Portion	7,200 CFS
South Branch (Sections 5 & 6)	
Normal Flow Control	22,000 CFS
System Capacity Portion	16,600 CFS
Park River (Sections 1, 2, 3, & 4, plus original 5,600 ft. length)	18,000 CFS
Auxiliary Conduit (22 ft. dia.)	5,800 CFS

SYSTEM DESIGN CAPACITY (Conn. River Stage of 30 ft. MSL)

Park River Conduit	18,000 CFS
Auxiliary Conduit	5,800 CFS
Total	23,800 CFS

HEADWALLS

South Branch (Existing):

Elevation	54.5 MSL
Freeboard	2.5 ft
Ponding Level	52.0 MSL
Material	Reinforced Concrete

North Branch:

Elevation	54.5 MSL
Freeboard	2.5 ft
Ponding level	52.0 MSL
Material	Reinforced Concrete

POPE PARK PUMPING STATION
(Formerly Riverside Pumping Station)

Location	Pope Park by Conduit Section 4
Capacity, cfs	75
Area Controlled, Acres	40
Runoff Controlled, inches per hr	1

ARMORY PUMPING STATION

Location	State Armory by Conduit Section 1
Capacity, cfs	120
Constructed by Others:	
Substructure, Approx. Size	70' x 90'
Sluice Gates, each	4
Flap Gate, each	1
Discharge Conduit	7' wide x 7' high
Gravity Conduit	8' wide x 7' high
Sluice Gates, each	2
Pumps, each	3
Superstructure, Approx. Size (L-shape)	50' x 57'-6"

B. INTRODUCTION

1. PURPOSE. The purpose of this memorandum is to present geotechnical investigations conducted to support the basic design of project features in accordance with ER 1110-2-1150.

2. SCOPE. Part I of this design memorandum incorporates the project phase which includes five sections of box conduit (section 2, 4, 5, 7 and 9), headwall structure, flood walls, and a junction structure. Part II of this design memorandum will incorporate the auxiliary conduit. Plate 5A-1 is a general project plan.

3. DESIGN CRITERIA. The following have been used for design guidance and criteria:

EM 1110-2-2906, Design of Pile Structures and Foundations
Draft EM 1110-2-2906 dated 1 Feb. 1971
EM 1110-2-1902, Stability of Earth and Rockfill Dams.
EM 1110-2-2501, Flood Walls
EM 1110-2-2502, Retaining Walls
EM 1110-2-1901, Seepage Control
EM 1110-2-1903, Bearing Capacity
EM 1110-2-1904, Settlement Analyses
ETL 1110-2-107, Reporting Consolidation Test Results

C. SUBSURFACE INVESTIGATIONS

4. GENERAL. Subsurface investigations were made to supplement work done previously by the Greater Hartford Flood Commission, the State of Connecticut, Department of Transportation, and the City of Hartford, Connecticut. A seismic survey was made concurrently with the boring program.

5. EXPLORATIONS. A total of 19 borings (FD-1 thru FD-19) were made to supplement and confirm previous work. Pressed shelby tube undisturbed samples were obtained at three boring locations (FD-7U, 9U, and 13U). Boring locations are shown on Plates 5A-2 through 5A-11. Typical boring logs are shown in Appendix B. Additional subsurface exploration data and geologic work are presented in "Report on Review of Survey for Flood Control, Park River Basin", Vol. II dated July 1966, and in DM No. 2, Phase II, "Project Design, Site Geology and Interior Drainage", Part I-Box Conduit, dated August 1974.

6. LABORATORY TESTS. All laboratory tests on soil samples obtained under the supplementary boring program were made in accordance with EM 1110-2-1906, "Laboratory Soils Testing." Soil samples were classified visually in conformance with the Unified Soil Classification System.

Grain size and Atterberg tests were made on selected samples to confirm visual classification and to provide precise data where considered necessary. Natural water contents were determined for selected samples of fine-grained soils.

7. PRESENTATION OF TEST DATA. A summary of laboratory soil test results is presented in Appendix A. Selected test data are presented in Plates 5A-17 thru 5A-20 and in Appendix F.

D. CHARACTERISTICS OF FOUNDATION SOILS

8. GENERAL. All box conduit sections, junction structure and headwall structure are located along the present course of Park River and along both branches of the river. Subsurface investigations have disclosed three salient delineations in soil types: fill materials, varved clay and till. The characteristics of varved clay and till are described in Sections E and F of this report. The foundation areas of the project structures which are located along the North Branch Park River will be pile supported because of the presence of compressible soft varved clay; all other structures will be founded either on dense till or on rock.

9. DISTRIBUTION AND DESCRIPTION OF FOUNDATION SOILS.

a. Box Conduit Section 2. The proposed structure is located between two completed conduit sections. The box conduit will be founded on rock along most of the reach and on undisturbed compact till. Plate 5A-15 shows geologic profiles, and Plates 5A-10 and 11 show plans, profiles and soil sections. Construction of the conduit will require excavation and temporary support of river banks. The materials in the river banks consist principally of 15 to 20 feet of man-made fill overlying a thin till mantle over rock. The man-made fill consists principally of loose to moderately compact sandy silt, silty sand, and gravelly sand, all erratically interspersed.

b. Box Conduit Section 4. At its downstream end, the conduit section will join an existing conduit. Upstream it will connect with the junction structure where both branches of Park River and the proposed auxiliary conduit will join. The box conduit will be founded on undisturbed compact till along most of its reach and on rock. Plate 5A-14 shows geologic profiles and Plates 5A-8 and 9 show plans, profiles and soil sections. Construction of the conduit will require excavation and temporary support of the river banks. The river banks contain soft varved clay overlying compact till and rock. About 10 feet of man-made fill overlies the varved clay along the left bank of the river.

c. Junction Structure and Box Conduit Section 5. The foundation and riverbank conditions at these structures are similar to that of box conduit section 4. Both the junction and section 5 structures will be founded on undisturbed compact till. Conduit section 5 will join at its upstream end against the existing section 6 conduit. Geologic profiles are shown on Plates 5A-13 and 14 and plan, profile and soils sections are shown on Plates 5A-6 and 7.

d. Box Conduit Section 7. The conduit section upstream end will join an existing pile-supported section 8 conduit. The downstream end will join the proposed junction structure. The conduit foundation consists of soft compressible, varved clay overlying campact till and the conduit structure will be pile supported. Plate 5A-13 shows geologic profiles and Plates 5A-4 and 5, plan, profiles and soil sections. Construction of the conduit will require excavation and temporary support of the river banks. Overlying the varved clay in the river banks there is a 2 to 10 feet thick deposit of flood plain materials which in turn are overlain by man-made fill. The flood plain material consists of loose silty sand, gravelly sand and soft organic silt and clay. The man-made fill is composed of erratically banded, loose to moderately compact sandy gravel, silty sand, mixed with cinders, roots, bricks and other material. The soft varved clay stratum varies in thickness from about 15 feet at the downstream end to about 55 feet at the upstream end. The till overlies rock.

e. Box Conduit Section 9. The downstream end of the conduit will join an existing pile supported section 8 conduit. The conduit foundation consists of soft compressible, varved clay overlying compact till and the conduit structure will be pile supported. Plate 5A-12 shows geologic profiles and Plates 5A-2 and 3, plans, profiles and soil sections. The material in the riverbanks is basically as described for river bank material along conduit section 7. The soft varved clay stratum varies in thickness from about 90 feet at the conduit downstream end to about 50 feet at the upstream end. The till overlies rock.

f. Flood Walls and Inlet Structure. The foundation consists of soft compressible, varved clay overlain by about 10 to 15 feet of loose to moderately compact man-made fill overlying 0-5 feet of flood plain materials consisting principally of loose silty sand and sandy silt. The varved clay deposit is about 40 to 50 feet thick which overlies compact till. Plate 5A-12 shows geologic profiles and Plate 5A-3 shows soil profiles and sections. The inlet structure and T-Type walls will be pile supported and will be provided with a 10-foot deep sheet pile wall for seepage and erosion control purpose.

g. Armory Pumping Station. The structure for the Armory Pumping Station was built in 1966 by the Greater Hartford Flood Commission. The structure is founded on rock. See DM No. 6, "Pumping Station" dated November 1974.

h. Pope Park Pumping Station. The Pope Park Pumping Station is located adjacent to the downstream end of conduit section 4, see paragraph b above for description of foundation condition. The pumping station structure will be founded on compact till. See DM No. 6, "Pumping Station" dated November 1974.

10. (OMITTED)

E. VARVED CLAY

11. GENERAL. The varved clays of the Connecticut Valley were deposited in a glacial lake during the latest Pleistocene time. The deposition is present along the flood plains and terraces of the Connecticut River. The general character of the material is similar throughout the valley.

Summary and analyses of available data on the engineering properties of the varved clays in the Hartford area were made in conjunction with development and selection of design criteria. Information was obtained from unpublished reports, professional papers, and from project testing program.

The term "varved" as used herein refers to alternating bands of highly plastic clay (CH) and slightly plastic silt (ML); seams of silty sand are present occasionally. The thickness of the bands varies from paper thin to about one inch and occasionally thicker. The bands are nearly horizontal or dip to the north generally not more than 5 degrees.

12. EVALUATION OF ENGINEERING PROPERTIES. The evaluation of soil properties needed for the design is difficult at best, and the distinct layering of the varved clay makes the task considerably more difficult. Some of the obvious difficulties in the development and selection of design values are as follows:

a. Consolidation test data apply only to portions of the varve tested.

b. The permeability in the direction parallel to the varves is many times greater than across the varves.

c. The strength can be highly anisotropic. Undrained strength for a failure plane along a varve may be considerably lower than that when the failure plane intersects the varves.

d. The effective-strength parameter of the silt is quite different from that of the clay.

13. INDEX PROPERTIES. Appendix F contains a photograph of partially dried slices of varved clay undisturbed specimen. The layering is clearly seen in partially dried samples, but often barely evident at its natural water content. Test data are shown in Plates 5A-16 through 20 and in Appendix F.

a. Atterberg Limits. The clay bands plot above the A-line with liquid limits at 65 ± 10 and plasticity index 35 ± 10. The silt bands plot at and below the A-line with liquid limits at 40 ± 10 and plasticity index at 10 ± 10.

b. Natural Water Content. The natural water content of the silt bands is about equal to its liquid limit and that of the clay bands is generally lower than its liquid limit. The natural water content of the silt varies from about 35 percent by weight to 50, and of the clay from about 60 to 80.

c. Specific Gravity. The specific gravity of silt bands varies from about 2.75 to 2.80 and of that of clay bands from about 2.75 to 2.85.

d. Total Unit Weight. Saturated unit weights vary from 100 to 110 pounds percubic foot, based on tests on undisturbed specimens of varved clay.

14. COMPRESSIBILITY. Typical compression curves from one-dimensional consolidation tests are presented in Plate 5A-20 and Appendix F. The test data indicate that the varved clay is normally consolidated under its own weight plus a small pre-consolidation load due possibly to an ancient lake terrace deposit no longer present. Estimates of stress history at the locations of borings FD-7U and FD-9U, shown on Plates 5A-17 and 18, indicate that the pre-consolidation stress is about 1000 pounds per sq. ft. larger than the existing overburden stress, at each boring location.

15. SHEAR STRENGTH. Results of unconsolidated undrained triaxial shear tests (Q-tests) on undisturbed shelby tube vertical specimens are shown on Plates 5A-17, 18 and in Appendix F. The data indicates a Q-strength of about 450 pounds per square foot at the surface of the clay and increasing with depth at a rate of 4 to 5 pounds per foot of depth. The laboratory Q-strength on vertical test specimens is considered to be higher than for specimens with varves oriented at 45 degrees; however, loss of strength due to sample disturbance has been found to be a compensating factor. Therefore, the Q-strength on vertical test specimens are considered acceptable for design purposes. Furthermore, the values presented in this report are in good agreement with design values used locally by others.

F. TILL

16. GENERAL. The till consists of compact, well graded, dense material ranging from unsorted, non-plastic gravelly silty sand to slightly cohesive silty-clayey sand. Test data summary is shown in Plate 5A-16.

17. EVALUATION OF ENGINEERING PROPERTIES. The engineering properties of the till were evaluated by considering soil index properties, penetration resistance (N-values), visual examination of samples, and previous experience. The till is considered an excellent foundation provided it is maintained reasonably undisturbed and protected against the action of water and frost.

18. INDEX PROPERTIES.

a. Atterberg Limits. The plot of test data on the plasticity chart displays a position above and parallel to the A-line within a zone considered typical for tills. The liquid limit is less than 25 and the plasticity index is less than 8.

b. Natural Water Content. The natural water content varies from about 8 to 15, and it is generally lower than the plastic limit.

c. Specific Gravity. The specific gravity varies from about 2.69 to 2.76.

d. Total Unit Weight. Calculated unit weights of saturated soil samples vary from about 140 to 150 pounds per cubic foot.

19. COEFFICIENT OF SUBGRADE REACTION. The coefficient of subgrade reaction was estimated with considerable confidence inasmuch as not more than a reasonable value is necessary. The errors in the evaluation of the stresses in a mat foundation due to an error of plus or minus 50 percent in the evaluation of the coefficient, are negligible. Based on a general visual examination of samples, tactile impressions on sample plugs and experience with till foundations, it is estimated that the coefficient of subgrade reaction of a square plate, one-foot wide, is in the order of 400 pounds per square inch per inch.

20. COMPRESSIBILITY AND BEARING CAPACITY. The values of standard penetration resistance (N-values) obtained from test borings vary generally from about 35 to 70. The compressibility of the till under design loads is considered to be insignificant and its allowable bearing capacity is considered to be well above the maximum design pressure of 3 tons per square foot developed by project structures. The State of Connecticut Building Code limits the maximum allowable bearing pressure to 10 tons per square foot.

21. SHEAR STRENGTH. The selection of the design shear strength was made on the basis of past experience with similar till. For the purpose of designing construction slopes, sheeting and shoring and for selection of ultimate bearing capacity it is estimated that the till has a minimum friction angle of 35 degrees.

G. ROCK

22. GENERAL. The rock is a moderately hard, non-slaking, red shale and sandstone with a compressive strength of 2000 pounds per square inch. For additional information refer to Design Memorandum No. 2, Phase II, Part 1 - Box Conduit, "Project Design, Site Geology and Interior Drainage."

H. BOX CONDUIT AND APPURTENANT STRUCTURES.

23. GENERAL. Detailed design of structures are presented in Design Memorandum No. 7, Part I, dated October 1974.

24. FOUNDATION DESIGN.

a. General. Conduit sections 2, 4 and 5, the junction structure, and pumping station structures will be founded on rock or undisturbed compact till. Conduit section 7, 9, T-walls and inlet structure will be founded on end bearing steel H-piles.

b. Bearing Capacity and Settlement. The maximum bearing pressure of the structures founded on till or rock does not exceed 3 tons per square foot. Based on experience and considering the physical properties of the till and rock, it is considered that the allowable bearing capacity of the foundation is at least 3 tons per square foot, and settlement, if any, will be insignificant.

c. Foundation Piles. Subsurface conditions in the foundation areas of conduit section 7 and 9 necessitate the use of piles which will extend through the soft varved clay and will become end bearing in the underlying compact till. Based on pile driving experience in conduit section 8, which was built in 1965, it is expected that the piles may have to penetrate the till about 10 feet to develop capacity sufficient for the 100 ton maximum design load. Where the till mantle is thin, the piles should become fully end bearing at shallow depths of penetration in bedrock. Pile sections will be selected based on the design load produced by the structure plus the additional load produced by "drag" forces within the zone of soft varved clay. The magnitude of "drag" stresses to be selected will not exceed the shear strength of the varved clay. The bulk of the permanent piling for the project will be for the box conduit for which an HP 14 x 73 pile has been tentatively selected.

(1) Pile Tests. Pile loading and driving tests will be made during construction. Appendix C contains results of pile load tests made by others during construction of conduit section 8 and in the Greater Hartford area. The load test on conduit section 8 was made in 1965, on a 14BP89 steel H-pile which was inserted in a pre-cased hole to eliminate skin friction within the varved clay, and driven about 7 feet in till. The pile was loaded to 200 tons for a total settlement of 1 inch and a net settlement 0.25 inch after load release.

d. Seepage Control. The tops of I-walls and T-walls at conduit section 9 intake area are less than 10 feet above landside finished ground surface and foundation seepage will be controlled by a steel sheet pile cut-off wall. Ground water along the box conduit will be intercepted by lateral continuous perforated drains located along both sides of the box structure. These lateral drains will be connected with the existing lateral drains of conduit section built in mid-1960. Typical wall sections are shown on Plate 5A-21.

I. CONSTRUCTION CONSIDERATIONS

25. RIVER MANAGEMENT, SHORING AND SHEETING. Measures and procedures for river management during construction and for shoring and sheeting of excavation areas are presented in DM No. 2, Phase II, Part 1 (GDM) and DM No. 7, Part 1 (Detailed Design of Structures).

26. FOUNDATION PREPARATION. The bottom of required earth excavations within the box conduit footprint area will be protected by a concrete fill working slab (mud slab) to prevent softening of the surface by workmen, equipment and weather. Gravel and crushed stone base courses were used in some of the conduit sections built in mid-1960; however, these types of base materials performed poorly and quite frequently contractors had to resort to using concrete "mud slabs". Regardless of past performance, the use of pervious materials in work bases is not considered to be desirable because the higher permeability of base materials may cause uncontrolled seepage of ground water into the base course and may create soil segregation and foundation piping beneath the structure.

27. CONSTRUCTION IN POPE PARK AREA.

a. General. The Pope Park area is adjacent to proposed conduit section 4, 5 and the junction structure and is singled out because of the ground subsidence and riverbank erosion that area has experienced since 1969, the year in which the river level dropped about 5 feet after the removal of a downstream dam. The park grounds at present are relatively stable although minute movements and bank erosion are still occurring. Upon completion of the proposed structures and finished grading of the area, the stability of the hillside will improve from its current marginally stable condition to a full conservatively safe condition since the present river channel and adjacent areas will be filled and graded to at least El. 48. See Plates 5A-8 and 21.

b. Geotechnical Aspects. The Pope Park hillside has now an overall slope of 1 vertical on 5 horizontal except the riverbank edge has a 1 on 2 slope. The riverbank is stable under low river stages but it easily erodes by increased river flow during spring melt periods and high river flow after prolonged rainfalls. Loss of bank materials at the toe triggers ground subsidence and downhill movements. There are tension cracks and shallow slide scarps adjacent to the river bank within an area 50 to 100 feet wide and about 1,000 long. Soil cross-sections are shown on Plates 5A-8 and 9. Geotechnical studies were made for the city of Hartford by private consulting firms and the studies have disclosed the marginal stability of the hillside due to the relatively weak soft varved clay and the loss of counterbalance weight at the toe of the hillside due to continued erosion of the riverbank. The box conduit alignment has been located as far away from the toe of the hillside as possible; nevertheless, the required excavations will have to be made with the aid of earth retaining structures. The design and construction of the earth retaining structures will be made a construction contract reponsibility. For design and cost estimate purpose it is considered that whenever internally braced structures are not feasible nor economical, that a system of soldier piles and lagging wall tied back to rock with prestressed tendons is feasible and practical.

28. PILE DRIVING VIBRATIONS. Vibrations from driving of piles may shake nearby structures and foundations enough to cause damage. The prediction of damage potential is a difficult task and the reliance on experience coupled with appropriate construction control features does not provide a quaranteed solution but a prudent safeguard tool. Project areas were studied to seek out potential problem areas and conduit section 9 area is considered to be such an area. Plate 5A-2 shows the locations of two existing buildings close to the proposed conduit and a soil section. The structures are three story light frameapartment buildings without pile foundations and located 20 to 50 feet from conduit section 9. During the construction, in 1965, of conduit section 8, vibrations from driving sheet piles were monitored at a location approximately 300 feet downstream of the above designated potential problem area; test results are shown in Appendix D. The tests showed that the pile driving generated "energy ratios" of less than 0.5 at a distance of 20 feet from similar buildings and similar foundation conditions. "Energy ratios" of 0.6 and under are considered to be quite mild in regards to the structural integrity of the buildings although cracking of plaster walls, ceilings and window panes may occur. For the purpose of construction control for the proposed project it is considered that to insure least damage to the above mentioned apartment buildings that a prudent construction contract requirement will be included to require the monitoring of the emission of pile driving vibrations and selection of pile installation methods by the contractor based on "energy ratios" of less than 0.6 or particle velocities less than 1.5 inches per second.

J. FILL MATERIALS

29. EARTH FILL.

a. General. About two thirds of the total volume of fill materials will be obtained from required excavations for the box conduit and the balance will be furnished by the contractor. See preliminary material useage chart, Appendix E.

b. Materials from required Excavations. The contractor will be directed to stockpile all materials from required excavations on "urban renewal" area located along the west side of conduit section 4 (see Plate 5A-1). It is estimated that shrinkage and waste may amount to about 25 percent of the total in-place excavation volume. About two-thirds of all useable materials will consist of silty sand, gravelly sand and sandy silt from existing man-made fills and flood plain deposition and the balance will be till and varved clay material. The waste material will consist mainly of undried varved clay and it will be stockpiled separately and used towards the end of construction for finished grading in the stockpile area.

c. Materials Furnished by the Contractor. The contractor furnished material will consist of gravelly sand, and silty sand containing less than 40 percent by weight passing the No. 200 mesh screen. The materials are available from sources located 10 to 30 miles from the project site.

d. Moisture Control & Compaction. Moisture control will be required to the extent needed to provide adequate soil trafficability and prevent ruts and dust. The materials will be spread in 12-inch loose layers and compacted by four coverages of the treads of a light crawler-tractor similar to a Cat. D-7. The compaction effort is considered adequate for the purpose of providing a stable fill.

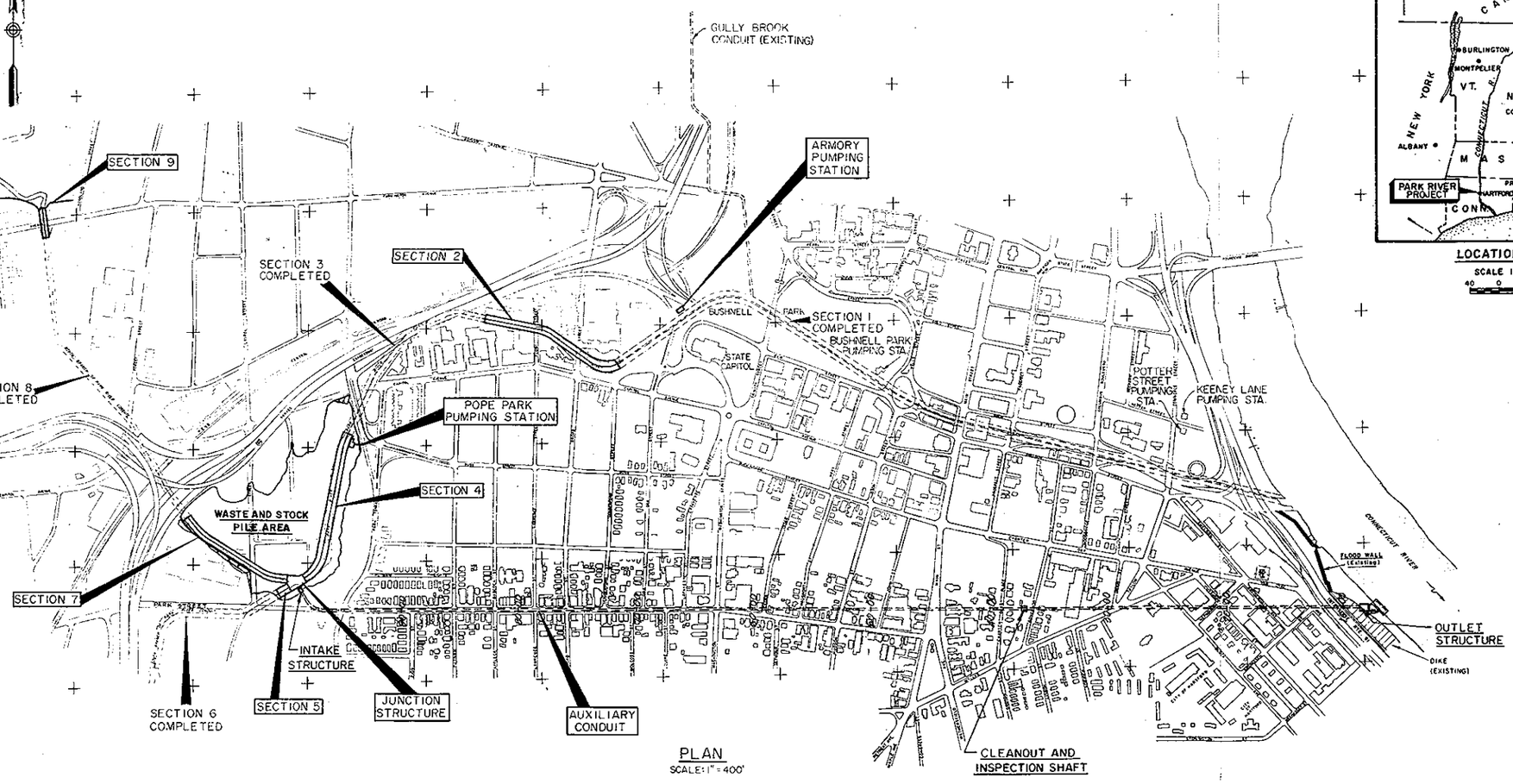
30. PERVIOUS FILL. Pervious fill material will be contractor furnished from existing off-site commercial sources located 10 to 30 miles from the project site. The material will consist of sand and gravelly sand containing not more than 8 percent by weight passing the No. 200 mesh sieve. The material will be placed in 6-inch loose layers and each layer compacted by two coverages of a self-propelled vibratory roller.

31. PROCESSED GRAVEL. Processed gravel material shall meet the quality and gradation requirements for "3/4-inch to No. 4" coarse aggregate for Portland cement concrete.

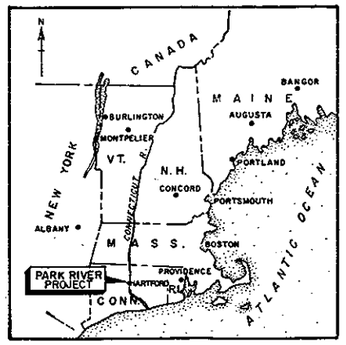
H. COST ESTIMATE

32. GENERAL. The latest estimate is contained in Design Memorandum No. 2, Phase II, Part 1.

CORPS OF ENGINEERS — U. S. ARMY



PLAN
SCALE: 1" = 400'



LOCATION MAP
SCALE IN MILES
40 0 40 80

LEGEND

- ● FD 10 — U.S. ARMY CORPS OF ENGINEERS BORING
- ● 80 — GREATER HARTFORD FLOOD COMMISSION BORING.
- ● FC 7 — GREATER HARTFORD FLOOD COMMISSION BORING.

GENERAL NOTES:

1. Elevations refer to Mean Sea Level Datum.
2. All elevations are plus except as noted otherwise.
3. Plane coordinates refer to Connecticut Lambert Grid System.
4. For Seismic Lines and Profiles see D.M. No. 2 Phase II, Part I, "Project Design, Site Geology and Interior Drainage."

GRAPHIC SCALES
1" = 400' — 400' 0 400' 800'

SAFETY PAYS

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WALTHAM, MASS.

DES. BY | DR. BY | CK. BY

SUBMITTED:
CHIEF, SECTION
APPROVAL RECOMMENDED:
CHIEF, TECH. ENG. BRANCH
REVIEWED:
PROJECT ENGINEER
APPROVAL RECOMMENDED:
CHIEF BRANCH

WATER RESOURCES DEVELOPMENT PROJECT
PARK RIVER LOCAL PROTECTION
GENERAL PLAN

HARTFORD — CONNECTICUT

APPROVED — DATE
CHIEF, ENGINEERING DIVISION

SCALE | SPEC. NO.
DRAWING NUMBER
SHEET

PLATE 5A-1

CORPS OF ENGINEERS U. S ARMY

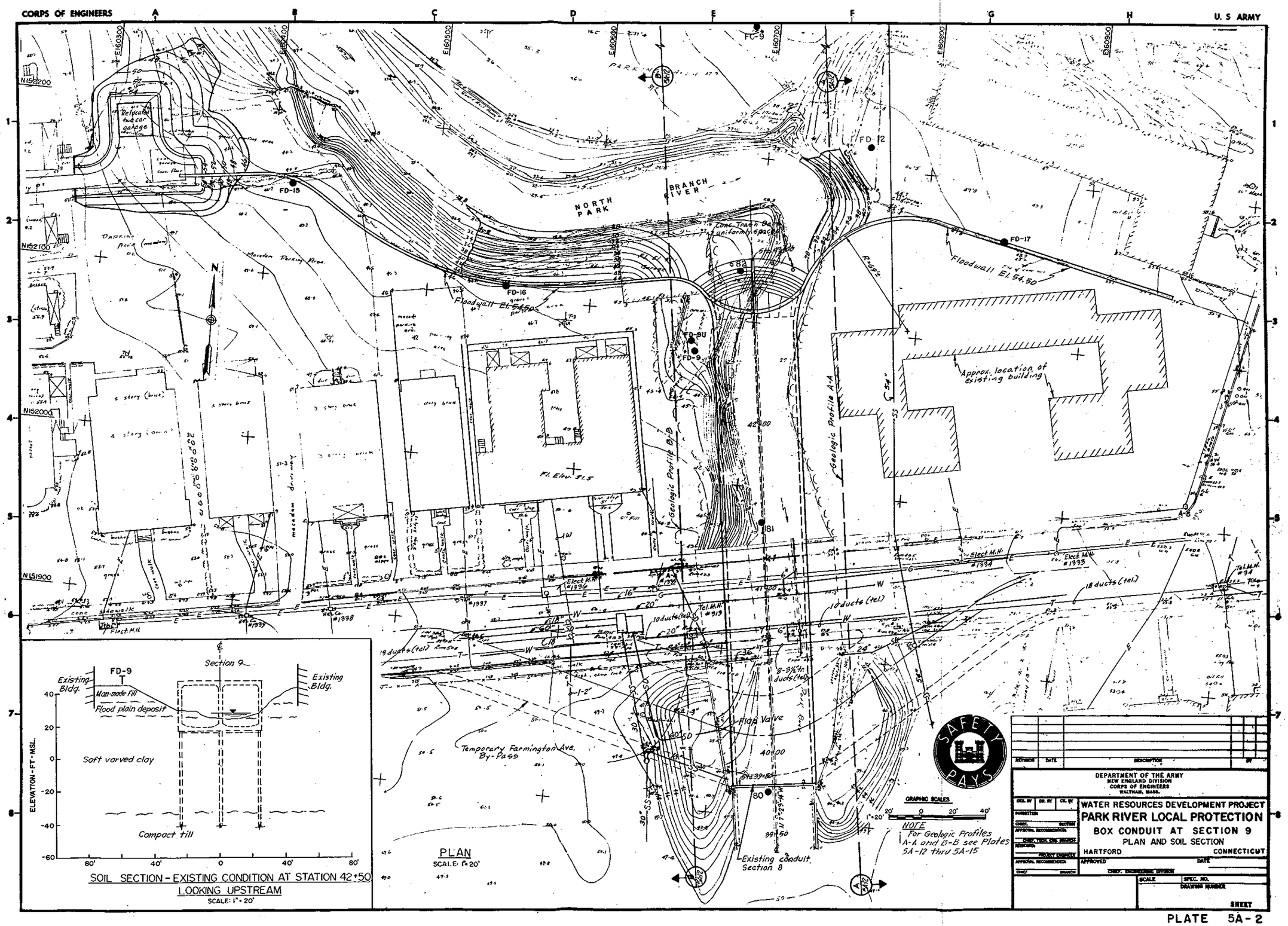
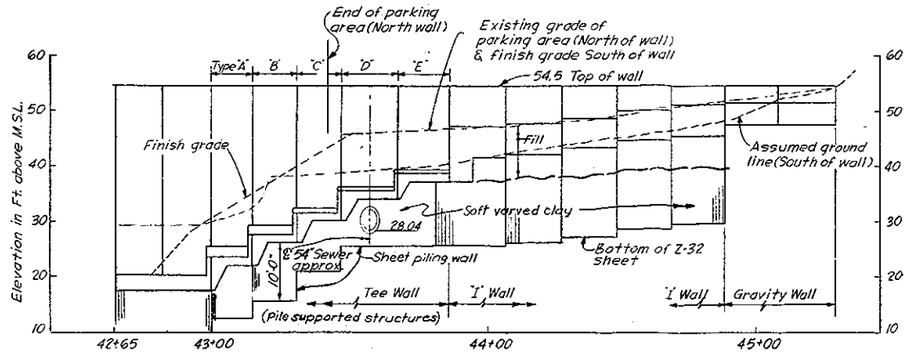
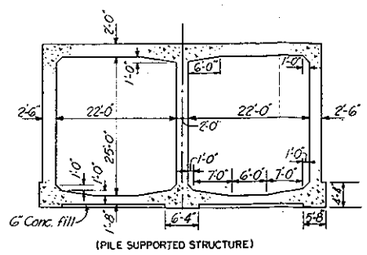


PLATE 5A-2

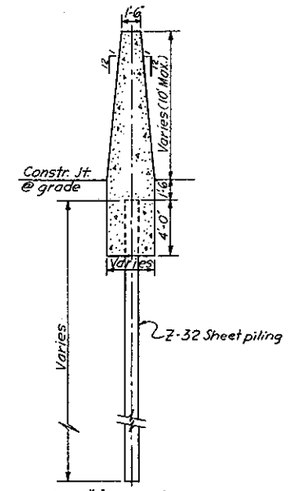
CORPS OF ENGINEERS — U. S. ARMY



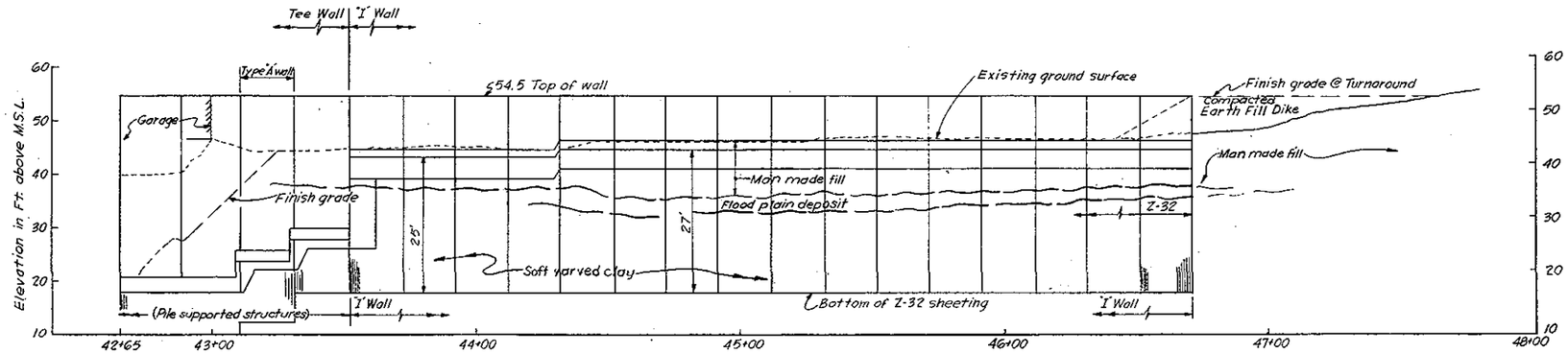
PROFILE EAST FLOOD WALL
SCALE HORZ. 1" = 20' VERT. 1" = 10'



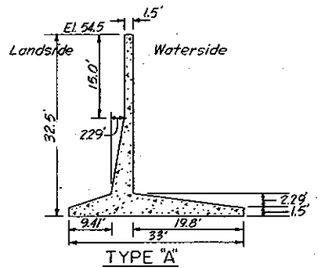
TYPICAL CONDUIT SECTION
SECTION 9
SCALE 1" = 10'



TYPICAL "I" WALL SECTION
SCALE 1/4" = 1'-0"

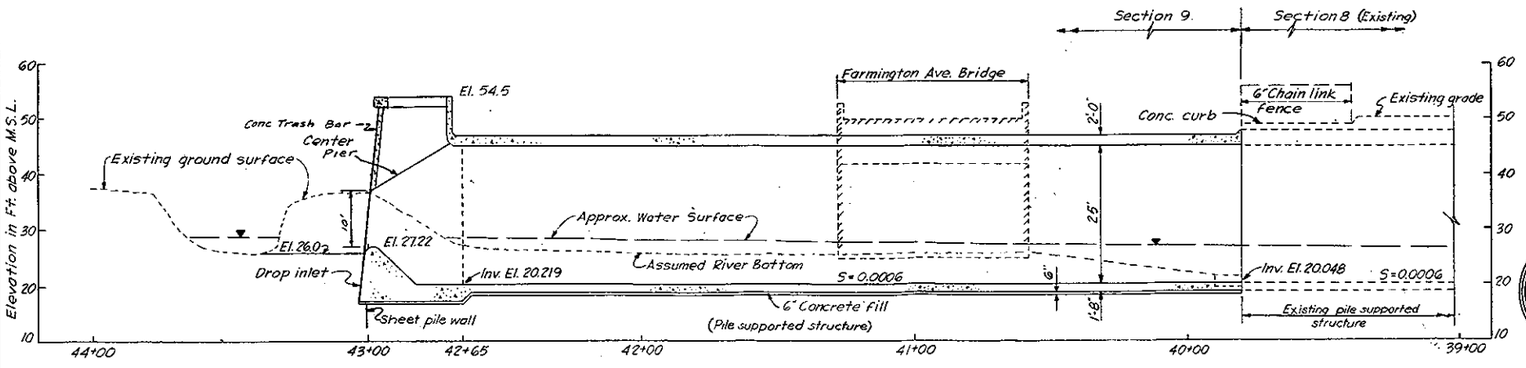


PROFILE WEST FLOOD WALL
SCALE HORZ. 1" = 20' VERT. 1" = 10'



TYPE "A"
TYPICAL "TEE" WALL SECTION
SCALE 1" = 10'
(PILE SUPPORTED STRUCTURE)
WITH SHEET PILE CUTOFF WALL

(See plate 5A-21)



CENTERLINE PROFILE – SECTION 9
SCALE HORZ. 1" = 20' VERT. 1" = 10'

GRAPHIC SCALES
1" = 20' 20' 0 20' 40'
1" = 10' 10' 0 10' 20'
1/4" = 1'-0" 4' 0 4' 8'

SAFETY PAYS

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WALTHAM, MASS.

DES. BY — DR. BY J.A.P. — CK. BY
SUBMITTED:
CHIEF, SECTION
APPROVAL RECOMMENDED:
CHIEF, TECH. ENG. BRANCH
REVIEWED:
PROJECT ENGINEER
APPROVAL RECOMMENDED:
CHIEF BRANCH

WATER RESOURCES DEVELOPMENT PROJECT
PARK RIVER LOCAL PROTECTION
BOX CONDUIT AT SECTION 9
PROFILES AND SECTIONS
HARTFORD CONNECTICUT
APPROVED DATE
CHIEF, ENGINEERING DIVISION
SCALE SPEC. NO.
DRAWING NUMBER
SHEET

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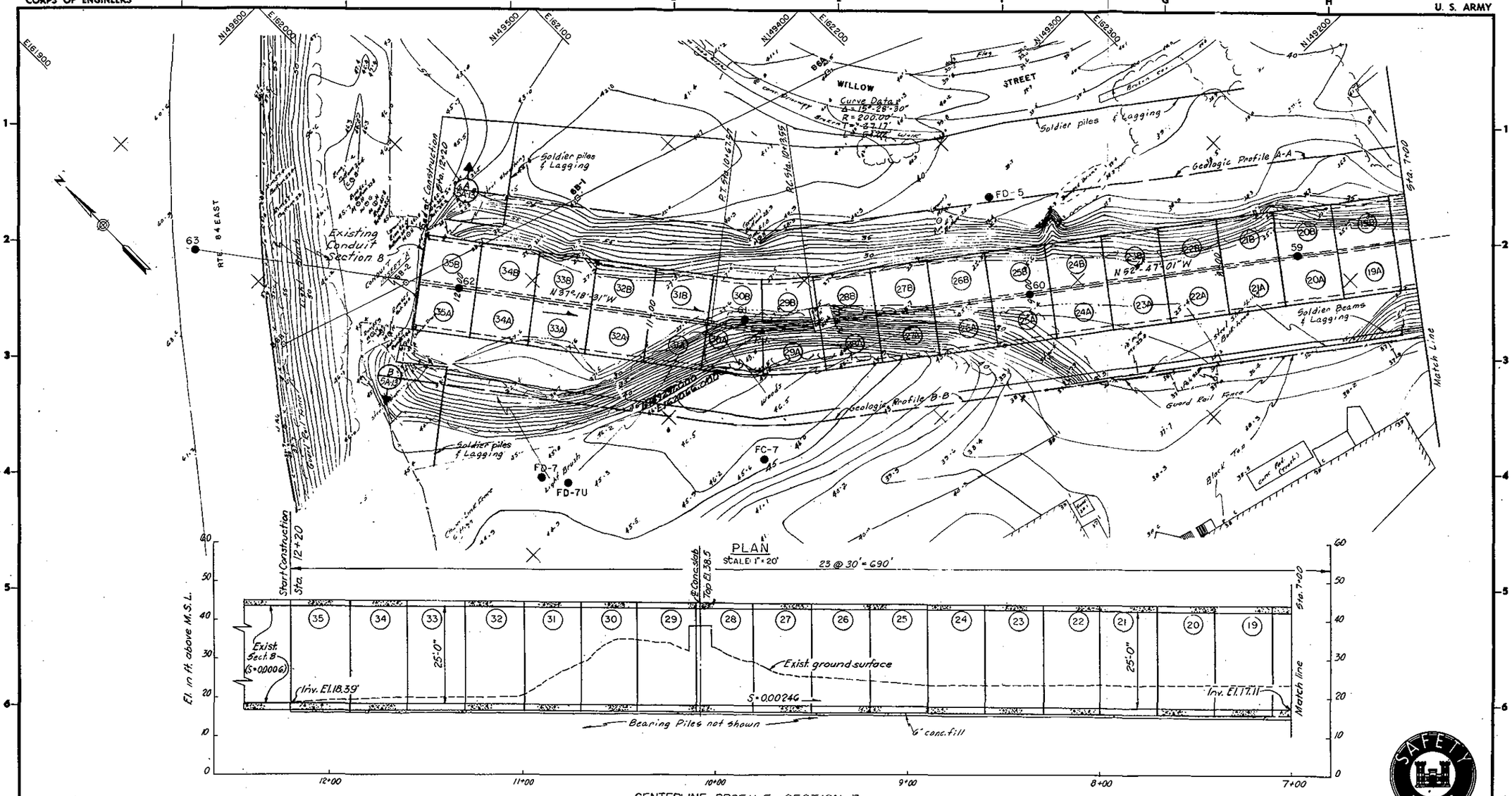

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WALTHAM, MASS.

DES. BY | DR. BY | CK. BY

SUBMITTED:
CHIEF, SECTION
APPROVAL RECOMMENDED:
CHIEF, TECH. ENG. BRANCH
REVIEWED:
APPROVAL RECOMMENDED:

WATER RESOURCES DEVELOPMENT PROJECT
PARK RIVER LOCAL PROTECTION
BOX CONDUIT AT SECTION 7
PLAN, PROFILE AND SOIL SECTION NO. 1
HARTFORD CONNECTICUT
APPROVED DATE
CHIEF, ENGINEERING DIVISION
SCALE | SPEC. NO.
DRAWING NUMBER
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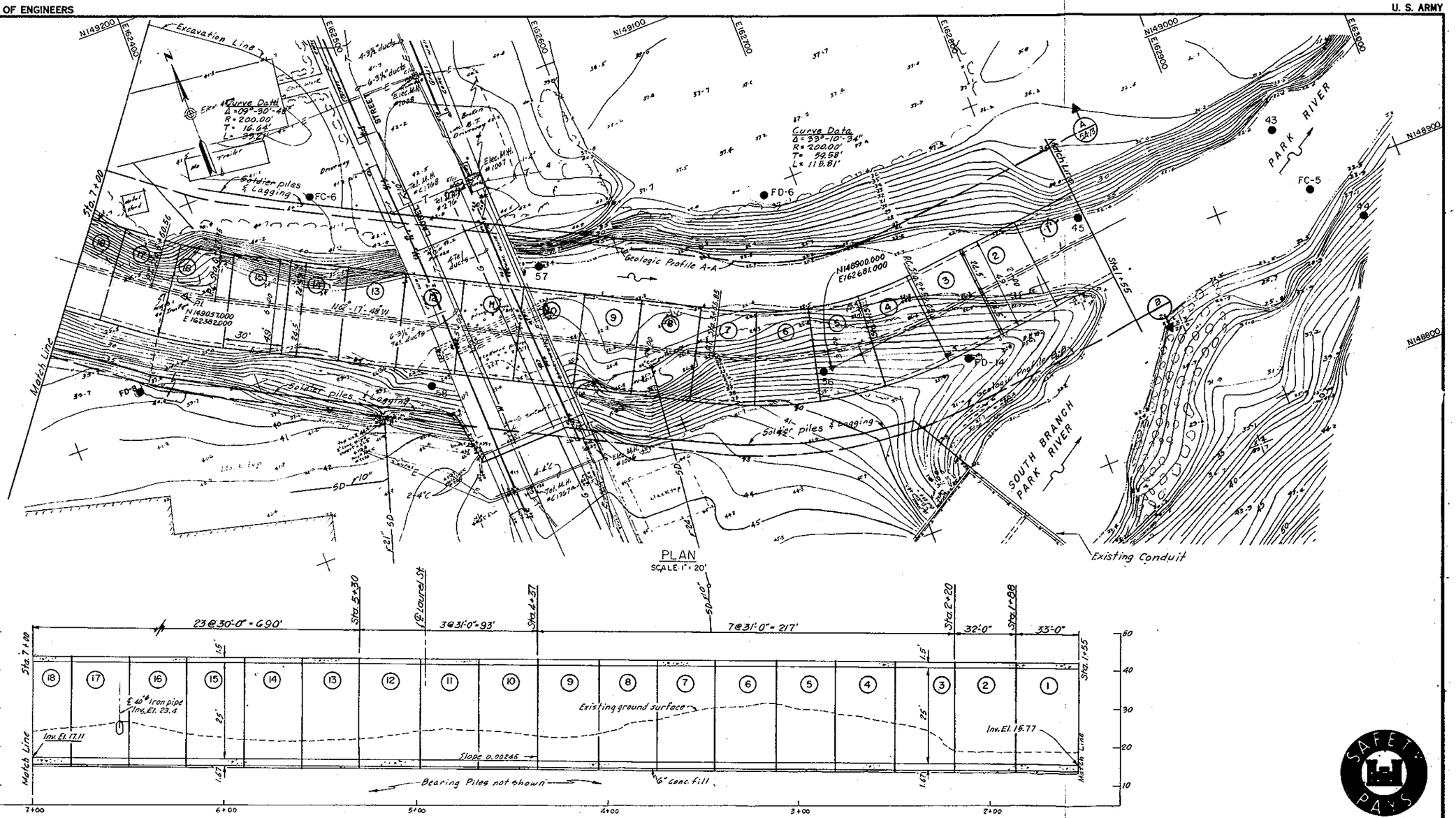
PLATE 5A-4



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NEW ENGLAND DIVISION
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WALTHAM, MASS.

WATER RESOURCES DEVELOPMENT PROJECT

PARK RIVER LOCAL PROTECTION

BOX CONDUIT AT SECTION 7.

PLAN, PROFILE AND SOIL SECTIONS NO.2

HARTFORD CONNECTICUT

SHEET

PLATE 5A-5

CORPS OF ENGINEERS U. S. ARMY

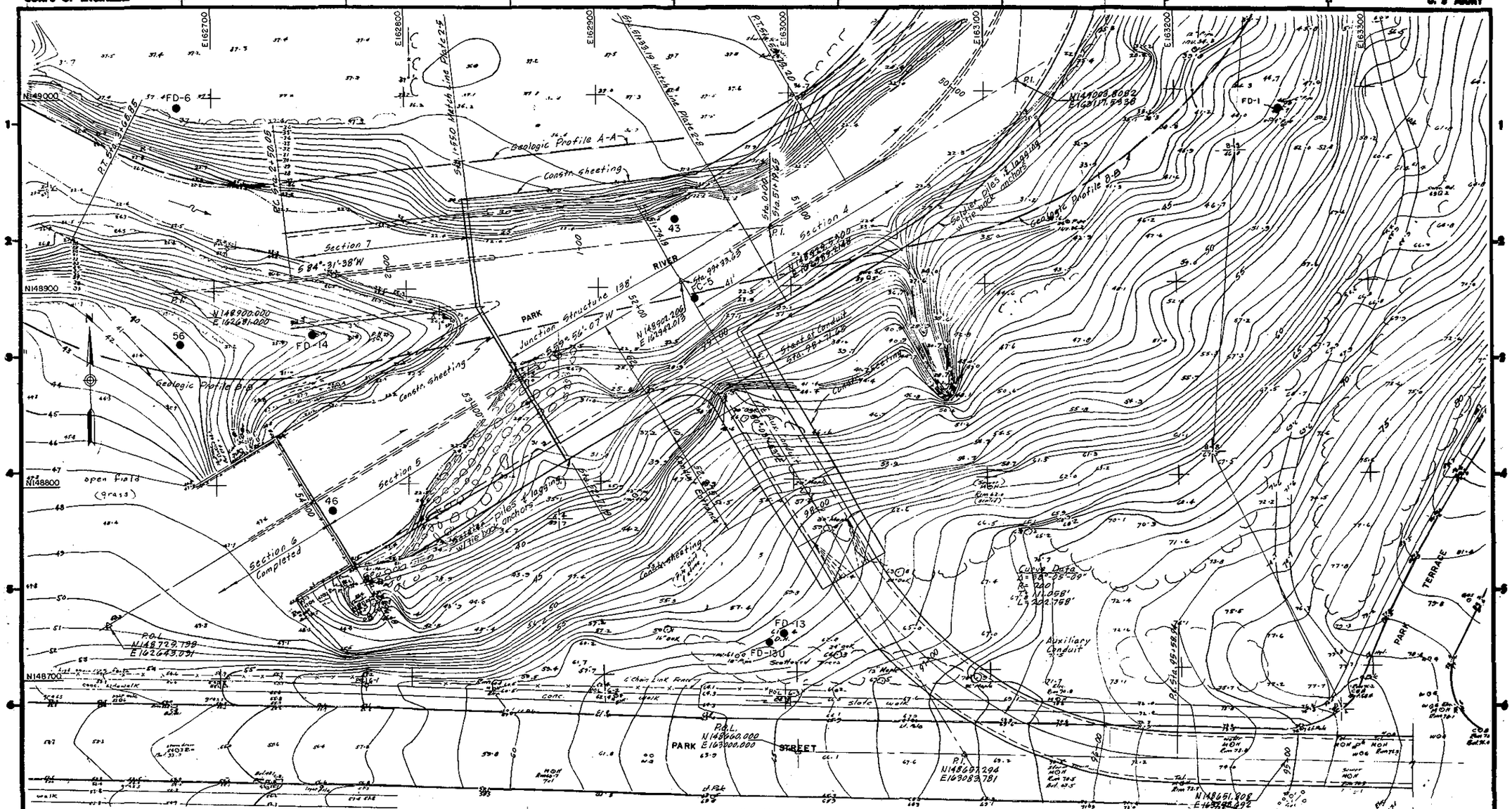
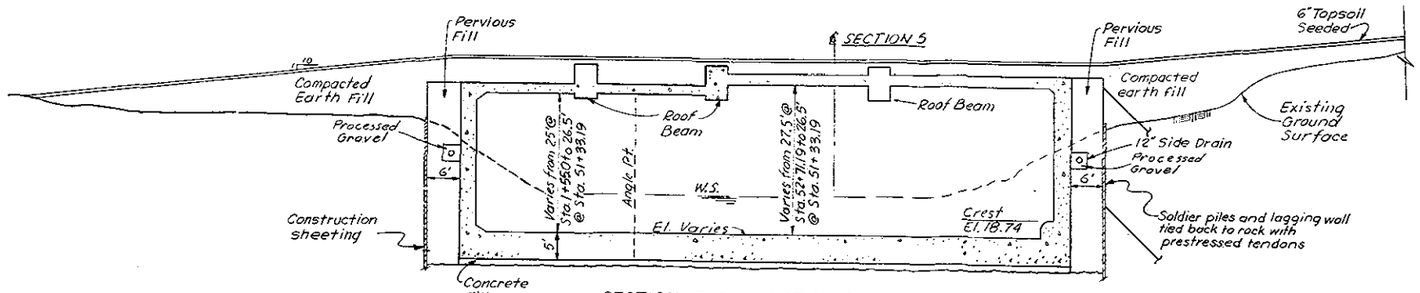


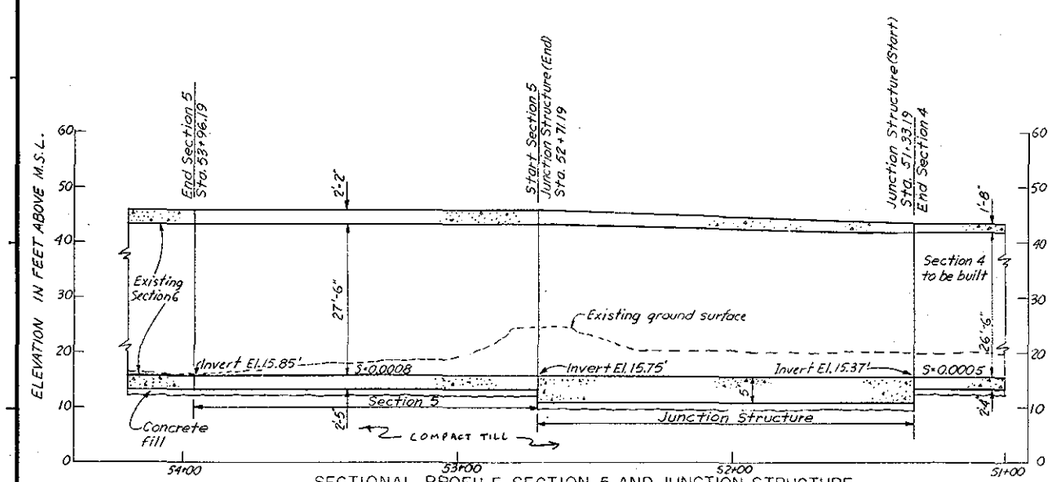
PLATE 5A-6

CORPS OF ENGINEERS A B C D E F G H U. S. ARMY



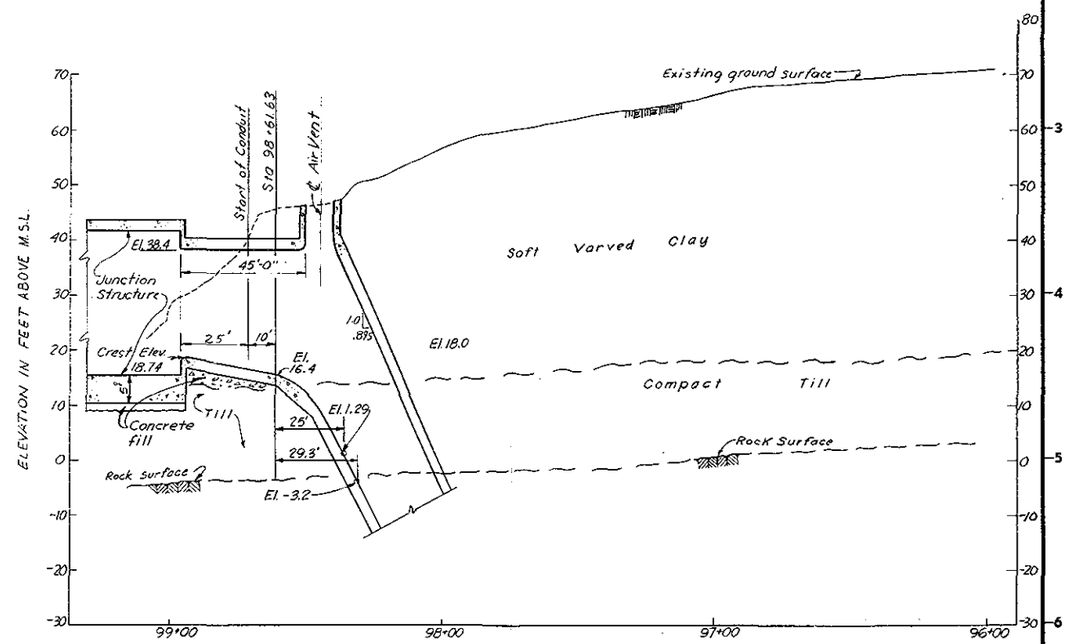
SECTION THRU JUNCTION STRUCTURE

SCALE 1" = 10'



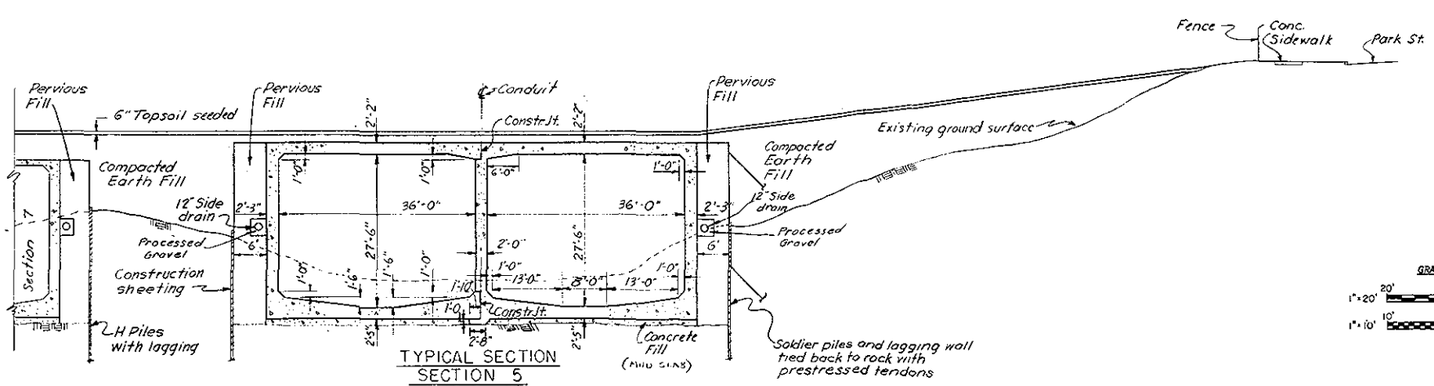
SECTIONAL PROFILE SECTION 5 AND JUNCTION STRUCTURE

SCALE: HORZ. 1" = 20' VERT. 1" = 10'



PROFILE ℄ AUXILIARY CONDUIT

SCALE: HORZ. 1" = 20' VERT. 1" = 10'



TYPICAL SECTION SECTION 5

SCALE 1" = 10'

GRAPHIC SCALES

1" = 20' 20' 0 20' 40'

1" = 10' 10' 0 10' 20'

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WALTHAM, MASS.

DES. BY | DR. BY | CK. BY

SUBMITTED:
CHIEF, SECTION
APPROVAL RECOMMENDED:
CHIEF, TECH. ENG. BRANCH
REVIEWED:
PROJECT ENGINEER
APPROVAL RECOMMENDED:
CHIEF BRANCH

WATER RESOURCES DEVELOPMENT PROJECT

PARK RIVER LOCAL PROTECTION

BOX CONDUIT AT SECTION 5 AND JUNCTION STRUCTURE PROFILE AND SECTIONS

HARTFORD CONNECTICUT

APPROVED DATE
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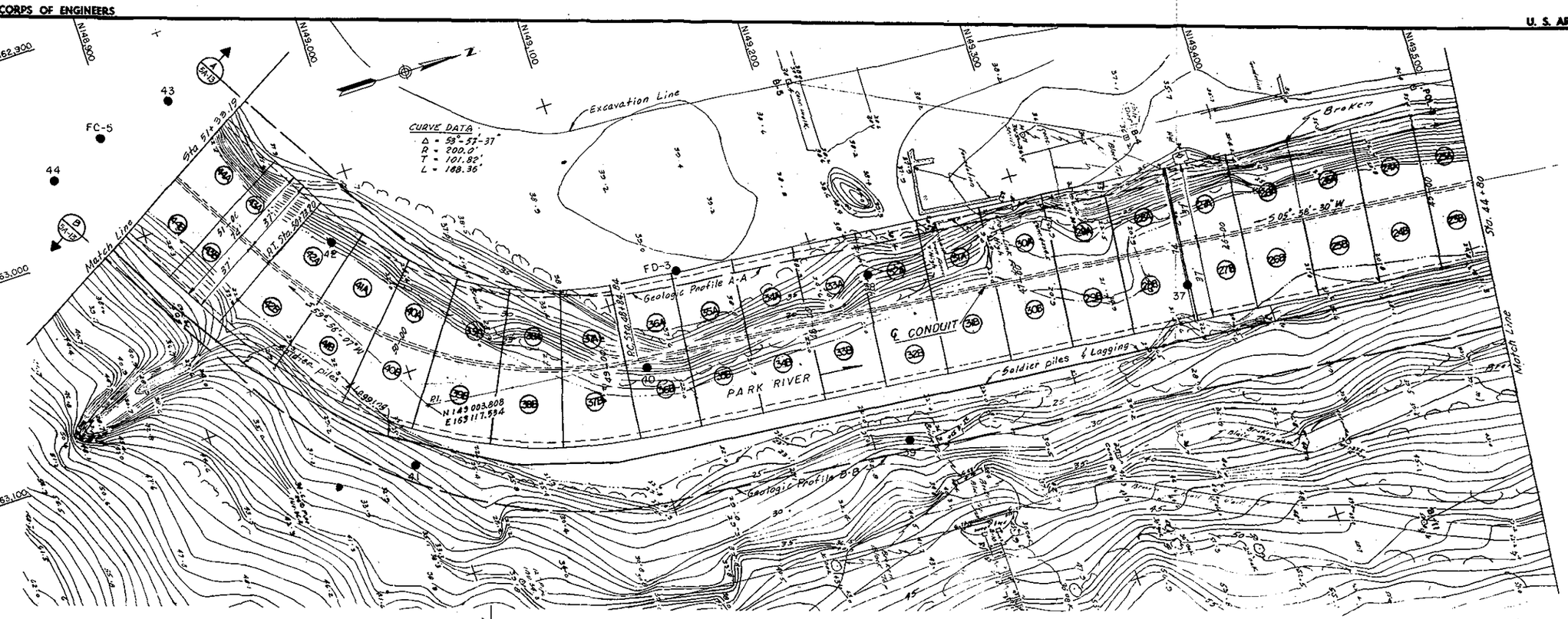
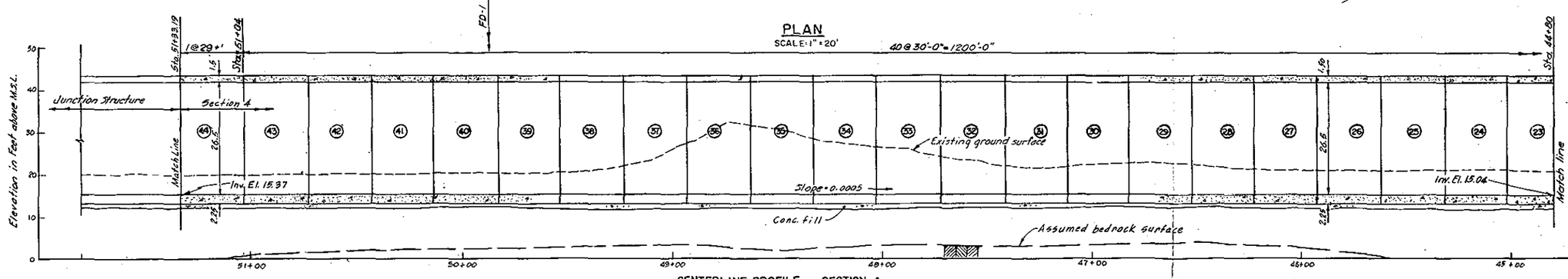
SCALE | SPEC. NO.
DRAWING NUMBER
SHEET

PLATE 5A-7

CORPS OF ENGINEERS

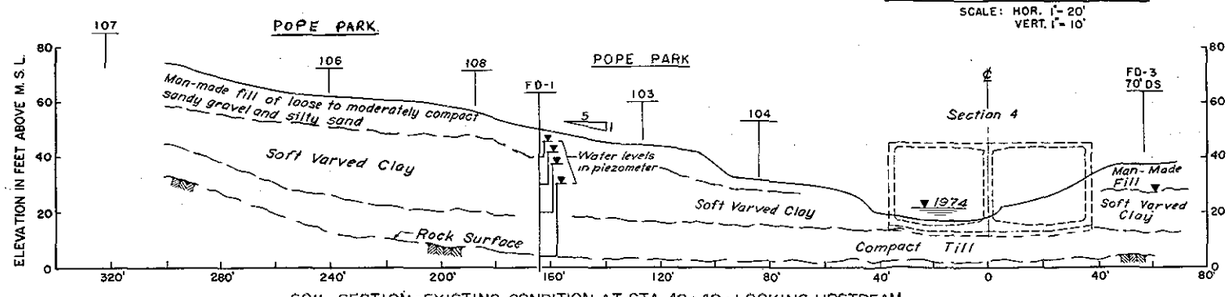
U. S. ARMY





CENTERLINE PROFILE — SECTION 4

SCALE: HOR. 1" = 20'
VERT. 1" = 10'



SOIL SECTION - EXISTING CONDITION AT STA. 49+40 - LOOKING UPSTREAM

SCALE: 1" = 20'

GRAPHIC SCALES

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WALTHAM, MASS.

WATER RESOURCES DEVELOPMENT PROJECT

PARK RIVER LOCAL PROTECTION

BOX CONDUIT AT SECTION 4

PLAN, PROFILE AND SOIL SECTION NO. 1

HARTFORD CONNECTICUT

DES. BY | DR. BY | CK. BY

SUBMITTED:

CHIEF, SECTION

APPROVAL RECOMMENDED:

CHIEF, TECH. ENG. BRANCH

REVIEWED:

PROJECT ENGINEER

APPROVAL RECOMMENDED:

APPROVED: DATE

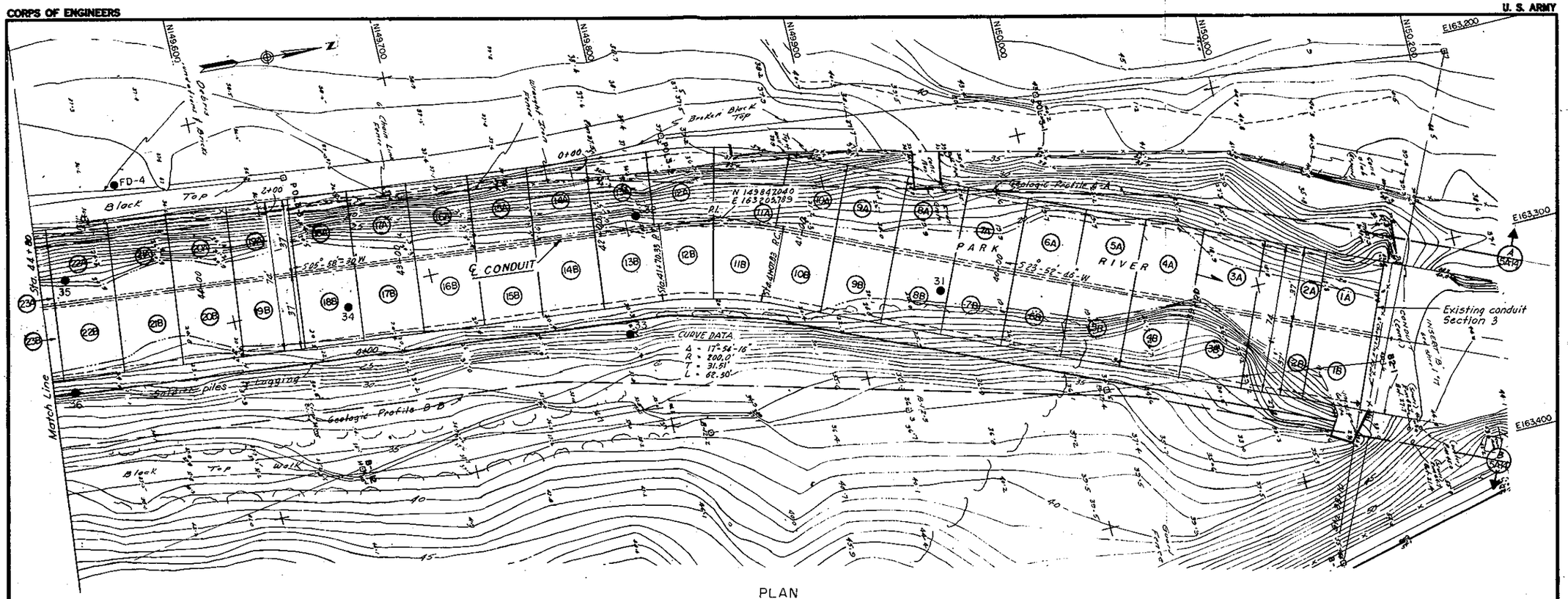
CHIEF, ENGINEERING DIVISION

SCALE | SPEC. NO. | DRAWING NUMBER

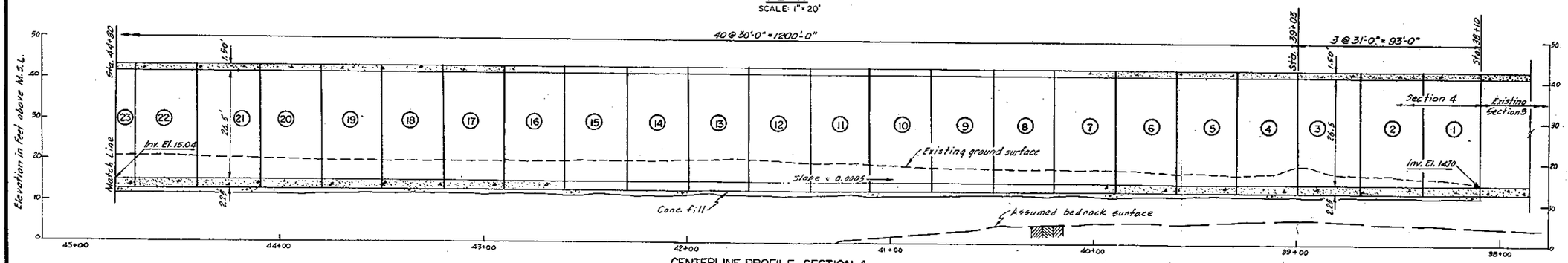
SHEET

CORPS OF ENGINEERS

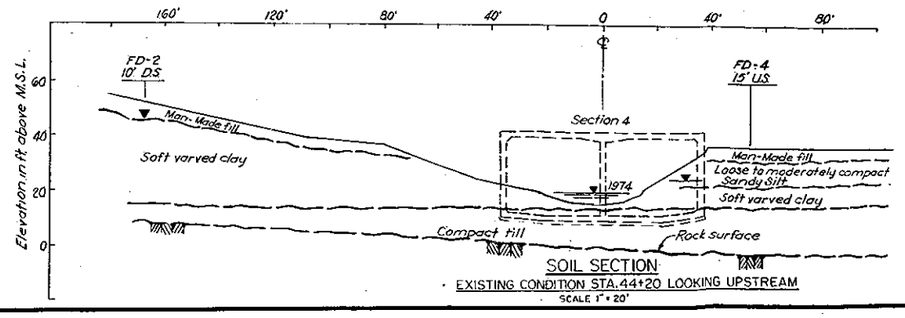
U. S. ARMY



PLAN
SCALE: 1" = 20'



CENTERLINE PROFILE-SECTION 4
SCALE: HOR. 1" = 20'
VERT. 1" = 10'



SOIL SECTION
EXISTING CONDITION STA. 44+20 LOOKING UPSTREAM
SCALE 1" = 20'

GRAPHIC SCALES
1" = 20' 20' 0 20' 40'
1" = 10' 10' 0 10' 20'

REVISION	DATE	DESCRIPTION	BY

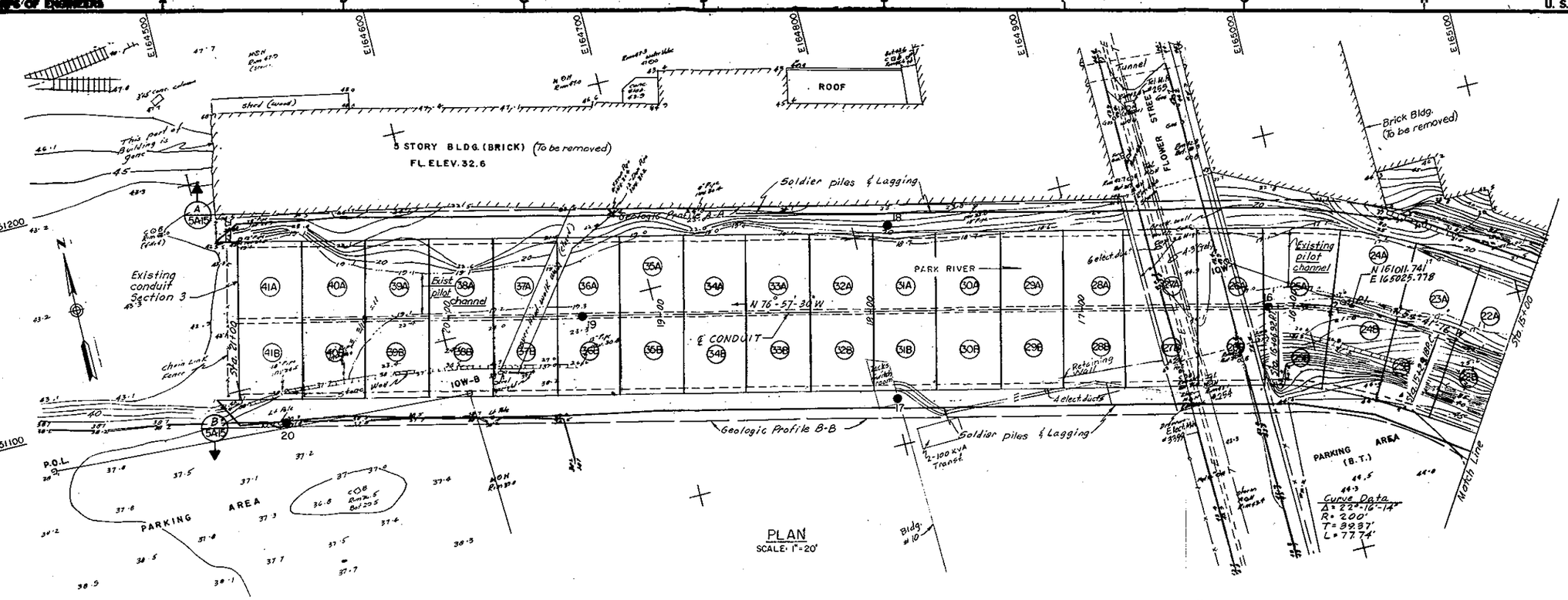
DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WALTHAM, MASS.

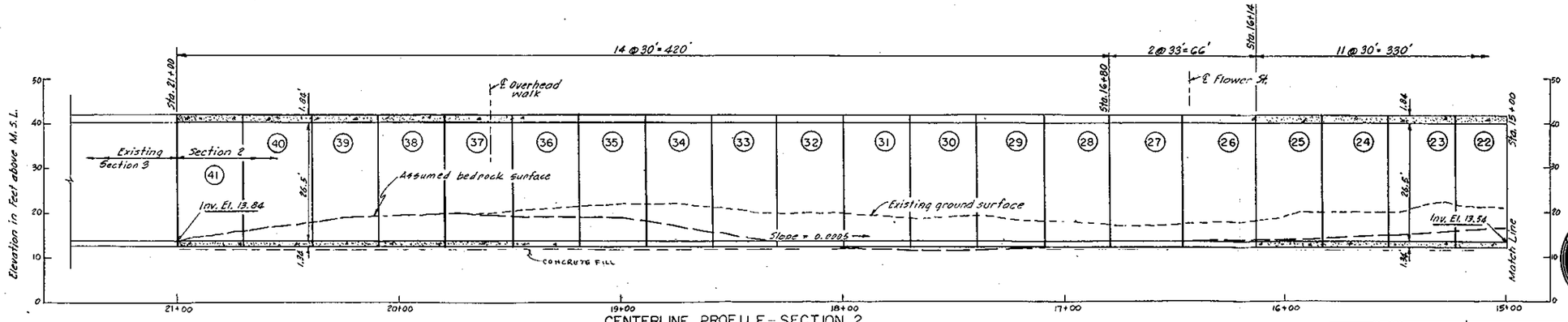
WATER RESOURCES DEVELOPMENT PROJECT
PARK RIVER LOCAL PROTECTION
BOX CONDUIT AT SECTION 4
PLAN, PROFILE AND SOIL SECTION NO. 2
HARTFORD CONNECTICUT

DES. BY | DR. BY | CK. BY
SUBMITTED
CHIEF, SECTION
APPROVAL RECOMMENDED
CHIEF, BRANCH
REVIEWED
PROJECT ENGINEER
APPROVAL RECOMMENDED
CHIEF, PROJECT BRANCH
APPROVED
CHIEF, ENGINEERING DIVISION
DATE
SCALE
SPEC. NO.
DRAWING NUMBER
SHEET

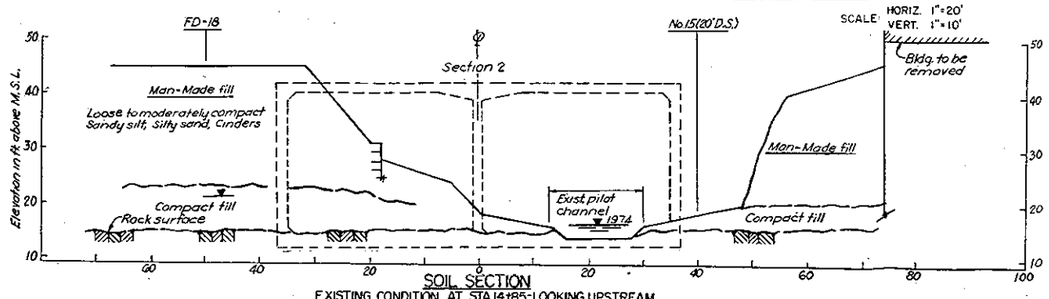
PLATE 5A-9

CORPS OF ENGINEERS — U. S. ARMY





CENTERLINE PROFILE - SECTION 2



SOIL SECTION
EXISTING CONDITION AT STA. 14+85 - LOOKING UPSTREAM
SCALE 1" = 10'

GRAPHIC SCALES
1" = 20' : 20' 0 20' 40'
1" = 10' : 10' 0 10' 20'

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WALTHAM, MASS.

DES. BY | DR. BY | CK. BY
SUBMITTED:
CHIEF, SECTION
APPROVAL RECOMMENDED:
CHIEF, FOUN. SOIL BRANCH
REVIEWED:
PROJECT ENGINEER
APPROVAL RECOMMENDED:

WATER RESOURCES DEVELOPMENT PROJECT
PARK RIVER LOCAL PROTECTION
BOX CONDUIT AT SECTION 2
PLAN, PROFILE AND SOIL SECTION NO. 1
HARTFORD CONNECTICUT

APPROVED — DATE
CHIEF, ENGINEERING DIVISION
SCALE | SPEC. NO. | DRAWING NUMBER
SHEET

SAFETY PAYS

PLATE 5A-10

CORPS OF ENGINEERS — U. S. ARMY

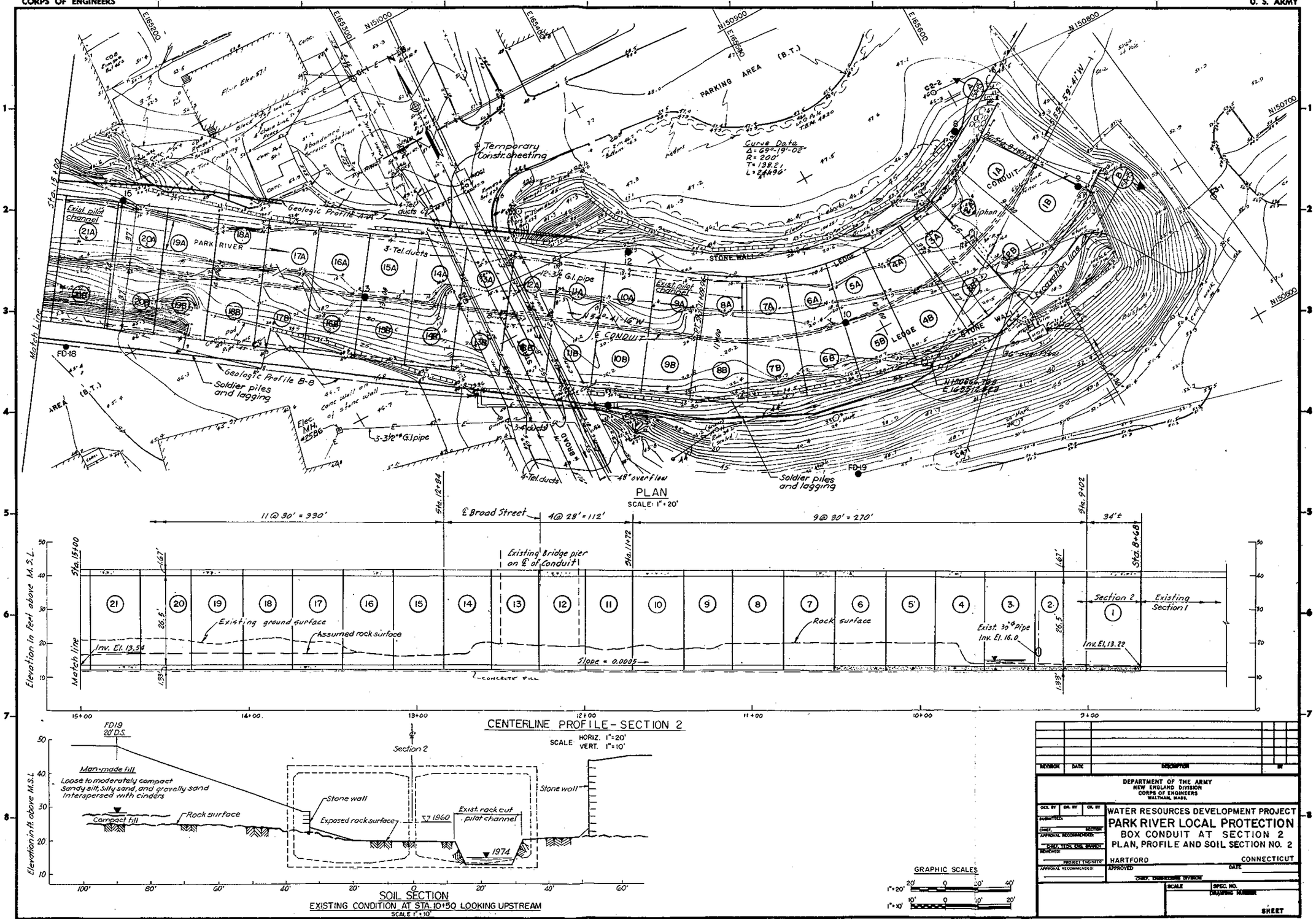
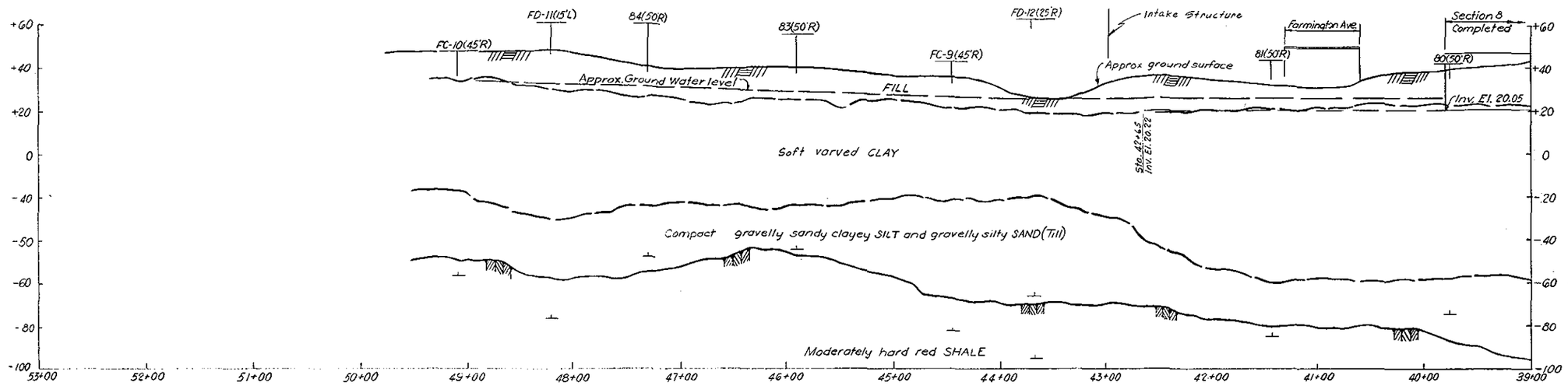


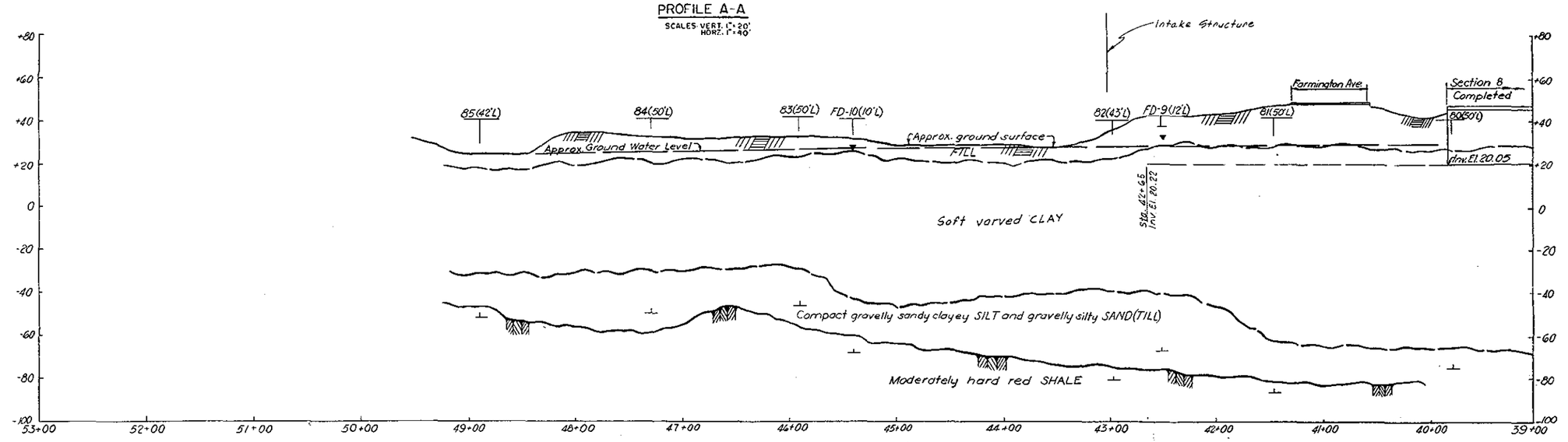
PLATE 5A-11

CORPS OF ENGINEERS U. S. ARMY



PROFILE A-A

SCALES: VERT. 1" = 20' HORZ. 1" = 40'



PROFILE B-B

SCALES: VERT 1" = 20' HOR. 1" = 40'

Notes:
For Plan of Explorations and location of Geologic Sections See Plate SA-2.
For Typical Foundation Explorations see Appendix B.

GRAPHIC SCALES

1" = 40' 40' 0 40' 80'

1" = 20' 20' 0 20' 40'

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WALTHAM, MASS.

DES. BY | DR. BY | CK. BY

SUBMITTED:
CHIEF, SECTION
APPROVAL RECOMMENDED:
CHIEF, TECH. ENG. BRANCH
REVIEWED:
PROJECT ENGINEER
APPROVAL RECOMMENDED:
CHIEF BRANCH

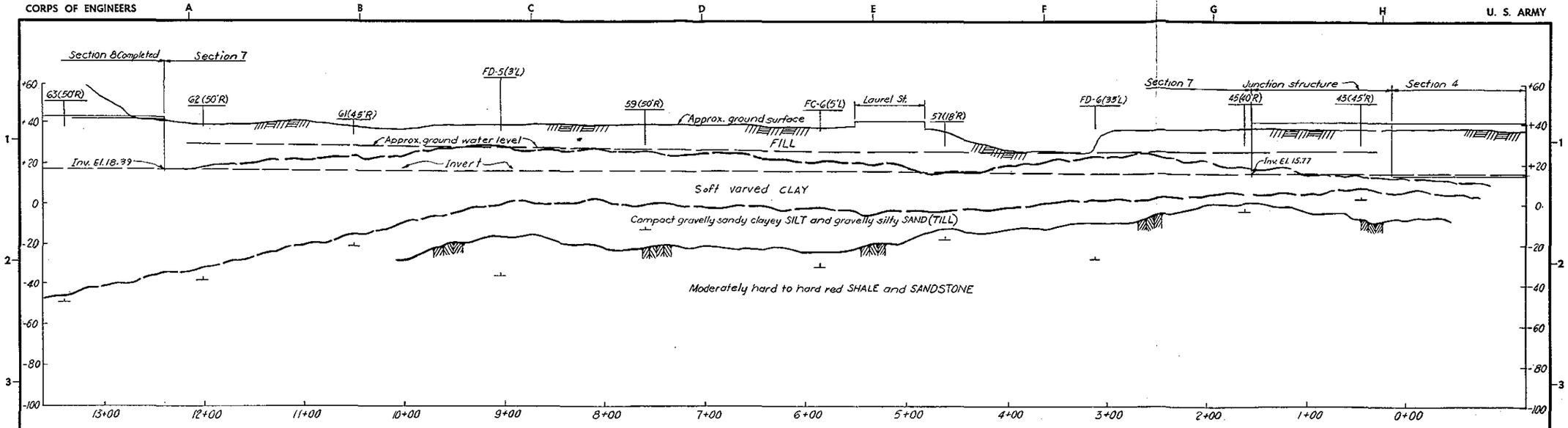
WATER RESOURCES DEVELOPMENT PROJECT
PARK RIVER LOCAL PROTECTION
BOX CONDUIT AT SECTION 9
GEOLOGIC PROFILES A-A AND B-B
HARTFORD CONNECTICUT

APPROVED DATE
CHIEF, ENGINEERING DIVISION

SCALE | SPEC. NO.
DRAWING NUMBER
SHEET

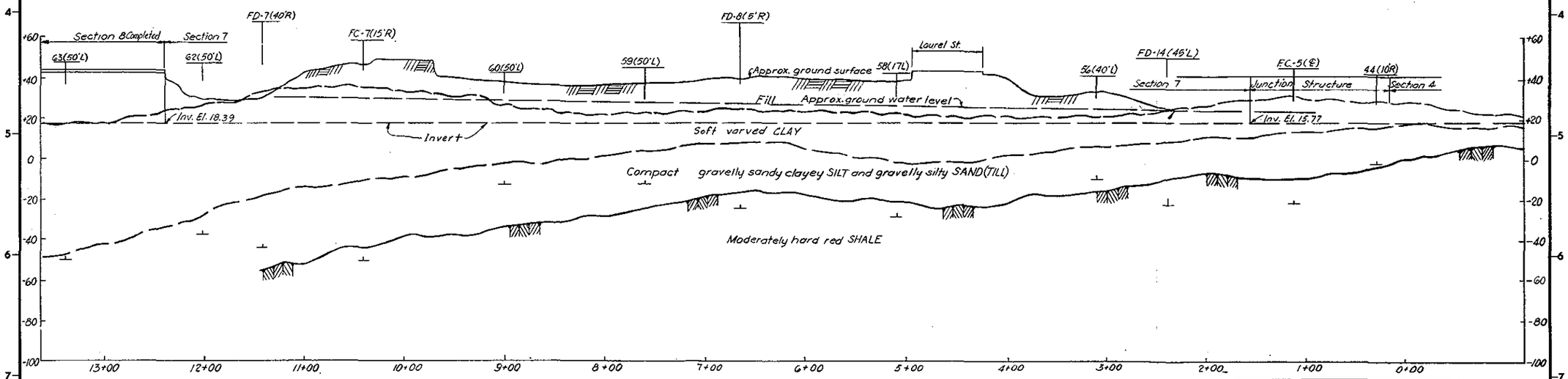
PLATE 5A-12

CORPS OF ENGINEERS — U. S. ARMY



PROFILE A-A

SCALES: VERT 1" = 20' HORZ. 1" = 40'



PROFILE B-B

SCALES: VERT 1" = 20' HORZ. 1" = 40'

Notes:
For Plan of Explorations and location of Geologic Sections see Plates 5A-4 & 5A-5
For Typical Foundation Explorations see Appendix B.

GRAPHIC SCALES

1" = 20' — 20' 0 20' 40'

1" = 40' — 40' 0 40' 80'

SAFETY PAYS

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WALTHAM, MASS.

DES. BY | DR. BY | CK. BY

SUBMITTED: CHIEF, SECTION

APPROVAL RECOMMENDED: CHIEF, TECH. ENG. BRANCH

REVIEWED: PROJECT ENGINEER

APPROVAL RECOMMENDED: CHIEF BRANCH

APPROVED CHIEF, ENGINEERING DIVISION

DATE

WATER RESOURCES DEVELOPMENT PROJECT

PARK RIVER LOCAL PROTECTION

BOX CONDUIT AT SECTION 7

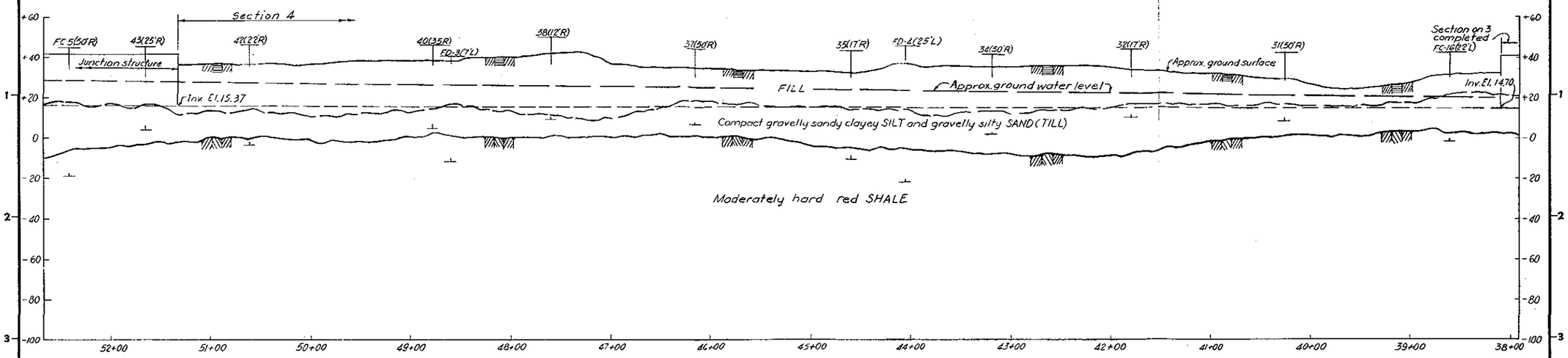
GEOLOGIC PROFILES A-A AND B-B

HARTFORD CONNECTICUT

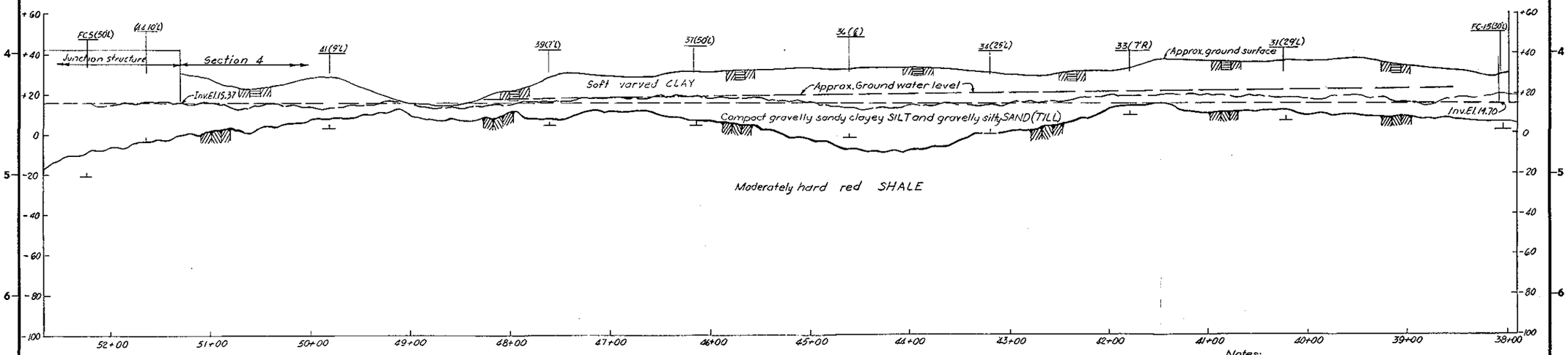
SCALE | SPEC. NO. | DRAWING NUMBER | SHEET

PLATE 5A-13

CORPS OF ENGINEERS — U. S. ARMY



PROFILE A-A
SCALE: VERT. 1" = 20' HORZ. 1" = 40'



PROFILE B-B
SCALE: VERT. 1" = 20' HORZ. 1" = 40'

Notes:
For Plan of Explorations and location of Geologic Sections see Plates 5A-8 & 5A-9.
For Typical Foundation Explorations see Appendix B.

GRAPHIC SCALES
1" = 20' 20' 0 20' 40'
1" = 40' 40' 0 40' 80'

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WALTHAM, MASS.

DES. BY | DR. BY | CK. BY

SUBMITTED:
CHIEF, SECTION
APPROVAL RECOMMENDED:
CHIEF, TECH. ENG. BRANCH
REVIEWED:
PROJECT ENGINEER
APPROVAL RECOMMENDED:
CHIEF BRANCH

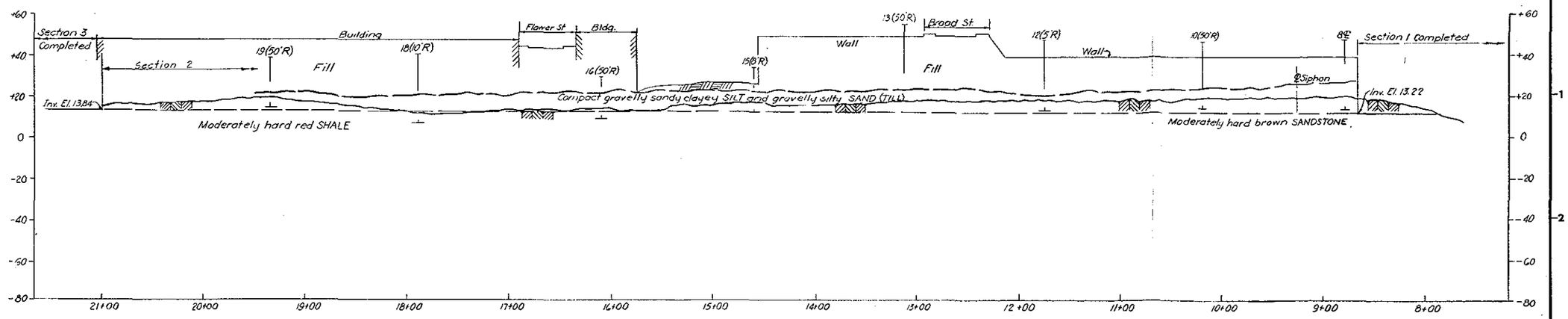
WATER RESOURCES DEVELOPMENT PROJECT
PARK RIVER LOCAL PROTECTION
BOX CONDUIT AT SECTION 4
GEOLOGIC PROFILES A-A AND B-B
HARTFORD CONNECTICUT

APPROVED DATE
CHIEF, ENGINEERING DIVISION

SCALE | SPEC. NO.
DRAWING NUMBER
SHEET

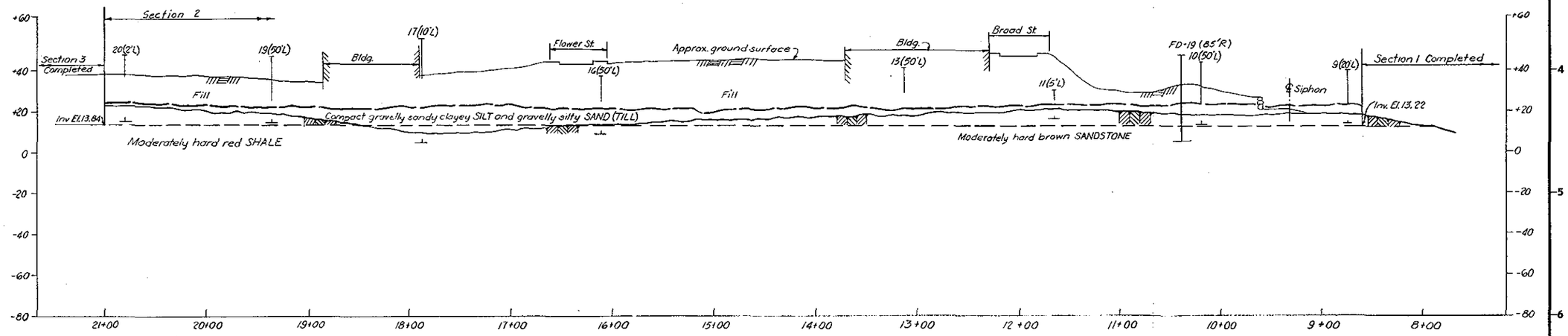
PLATE 5A-14

CORPS OF ENGINEERS U. S. ARMY



PROFILE A-A

SCALE: VERT. 1" = 20' HORZ. 1" = 40'



PROFILE B-B

SCALE: VERT. 1" = 20' HORZ 1" = 40'

Notes:
For Plan of Explorations and locations of Geologic Sections see Plates 5A-10 & 5A-11.
For Typical Foundation Explorations see Appendix B.

GRAPHIC SCALES

1" = 20' 20' 0 20' 40'

1" = 40' 40' 0 40' 80'

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WALTHAM, MASS.

DES. BY | DR. BY | CK. BY

SUBMITTED:
CHIEF, SECTION
APPROVAL RECOMMENDED:
CHIEF, TECH. ENG. BRANCH
REVIEWED:
PROJECT ENGINEER
APPROVAL RECOMMENDED:
CHIEF BRANCH

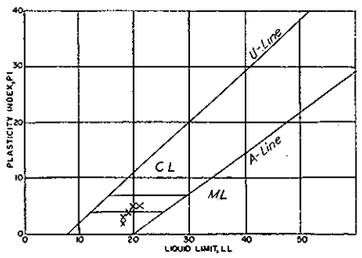
WATER RESOURCES DEVELOPMENT PROJECT
PARK RIVER LOCAL PROTECTION
BOX CONDUIT AT SECTION 2
GEOLOGIC PROFILES A-A AND B-B
HARTFORD CONNECTICUT

APPROVED DATE
CHIEF, ENGINEERING DIVISION

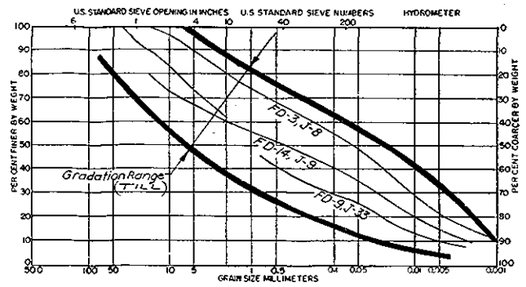
SCALE | SPEC. NO.
DRAWING NUMBER
SHEET

PLATE 5A-15

CORPS OF ENGINEERS — U. S. ARMY



PLASTICITY CHART - TILL



GRADATION CURVES - TILL

EXP. NO.	TOP ELEV. FT.	SAMPLE NO.	DEPTH FT.	SOIL SYMBOL	MECHANICAL ANALYSIS GRAVEL %	SAND %	FINES %	D10 mm.	ATT. LIMITS LL	PL	SPECIFIC GRAVITY	NAT. WATER CONTENT % DRY WT. TOTAL	-NO.4
FD-1	45.8	J-16	35.0-38.4	SM	55	25	20	.01	21	16	—	—	—
FD-2	53.1	J-15	36.7-40.0	CL-ML	22	34	44	.002	—	—	—	—	—
		J-16	40.0-43.0	CL-ML	—	—	—	—	19	15	2.69	—	—
FD-3	39.1	J-8	25.0-30.0	CL	14	34	52	.001	—	—	—	—	10.1
FD-4	36.6	J-8	21.5-25.0	SC	15	34	51	.0019	—	—	—	—	—
		J-9	25.0-30.0	SC	—	—	—	—	20	15	2.73	—	11.7
		J-10	30.0-35.0	SM	—	—	—	—	—	—	—	—	8.9
FD-5	39.5	J-14	37.9-40.0	SC	18	32	50	.002	—	—	—	—	—
		J-15	40.0-45.0	SC	—	—	—	—	—	—	—	—	9.3
		J-16	45.0-48.0	SM	14	39	47	.0055	—	—	—	—	—
		J-18	50.0-52.2	SM	—	—	—	—	—	—	—	—	10.3
FD-7	45.4	J-28	70.0-72.7	CL	16	26	58	—	—	—	2.73	—	—
		J-30	75.0-78.2	SM	12	42	46	.0032	—	—	2.71	—	—
FD-8	40.1	J-13	35.0-40.0	SM	—	—	—	—	—	—	—	—	12.0
		J-15	45.0-50.0	SM	—	—	—	—	—	—	—	—	13.8
FD-9	45.7	J-33	80.0-85.0	SC	30	42	28	.0075	18	13	2.76	—	10.3
		J-35	85.0-90.0	SM	23	62	15	.03	—	—	—	—	10.0
FD-10	43.0	J-32	77.8-80.0	SM	13	49	38	.013	—	—	2.67	—	13.0
		J-33	80.0-85.0	SM	8	75	17	.04	—	—	2.70	—	10.4
		J-34	90.0-94.0	SM	35	30	35	.018	—	—	—	—	14.0
FD-11	50.6	J-34	86.4-90.0	SM	10	65	25	.024	—	—	—	—	13.6
		J-37R	90.0-95.0	SM	24	51	25	.00850	—	—	—	—	7.7
		J-40R	100.5-102.6	SM	29	43	28	.0055	—	—	—	—	8.0
FD-12	46.5	J-30R	80.0-85.0	SP-SM	—	—	—	—	—	—	—	—	—
FD-13	60.5	J-23R	50.0-55.0	SM	40	42	18	.011	18	16	2.70	—	—
		J-25R	55.0-57.0	ML	18	24	58	.001	—	—	—	—	—
FD-14	33.3	J-9	20.5-25.0	SC	35	27	38	.003	—	—	—	—	10.4
		J-11	25.0-30.0	SC	17	35	48	.0015	—	—	—	—	12.8
		J-13	30.0-35.0	CL	12	34	52	.001	—	—	—	—	12.4
		J-15	35.0-38.0	SC	38	37	25	.007	—	—	—	—	11.5

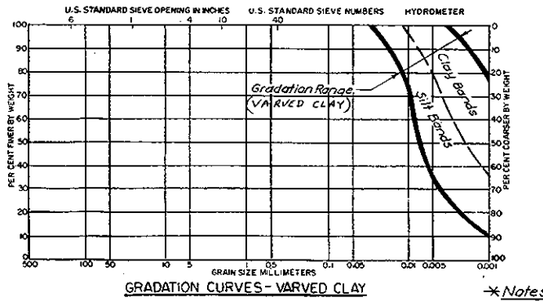
SELECTED TEST DATA SUMMARY - TILL

TILL

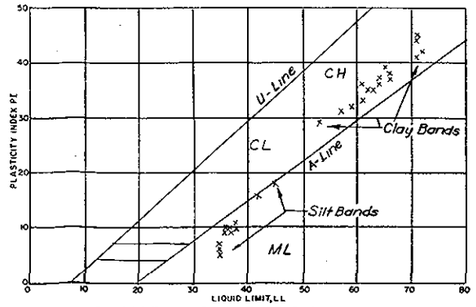
VARVED CLAY

EXP. NO.	TOP ELEV. FT.	SAMPLE NO.*	DEPTH FT.	SOIL SYMBOL	MECHANICAL ANALYSIS GRAVEL %	SAND %	FINES %	D10 mm.	ATT. LIMITS LL	PL	SPECIFIC GRAVITY	NAT. WATER CONTENT % DRY WT. TOTAL	-NO.4	ACTIVITY*
FD-2	53.1	LB-2	10.0-34.7	ML	0	0	100	<.001	35	28	2.76	—	—	0.4
FD-4	36.6	LB-2	15.0-20.0	ML	—	—	—	—	—	—	—	50	—	—
		LB-4	20.0-21.5	ML	—	—	—	—	—	—	—	46	—	—
FD-5	39.5	LB-2	18.0-20.0	ML	—	—	—	—	—	—	—	54	—	—
FD-7	45.4	LB-2	40.0-55.0	ML	—	—	—	—	45	27	—	—	—	—
		LB-4	40.0-45.0	ML	—	—	—	—	—	—	—	43	—	—
		LB-6	45.0-50.0	ML	—	—	100	<.001			2.79			1.0
FD-8	40.1	LB-2	15.9-20.0	ML	—	—	—	—	—	—	—	47	—	—
		LB-4	25.0-30.0	ML	—	—	—	—	—	—	—	40	—	—
FD-9	45.7	LB-5	50.0-75.0	ML	0	0	100	<.001	35	29	2.81	35	—	0.4
FD-10	43.0	LB-1	25.0-50.0	ML	0	0	100	<.001	36	25	2.76	—	—	0.4
		LB-3	50.0-60.0	ML	0	0	100	<.001	35	29	2.73	—	—	0.4
		LB-5	60.0-70.0	ML	0	0	100	<.001	38	27	2.72	—	—	—
FD-11	50.6	LB-1	45.0-60.0	ML	0	0	100	<.001	37	27	2.74	—	—	0.4
		LB-3	60.0-75.0	ML	0	0	100	<.001	37	28	2.73	—	—	0.3
FD-12	46.5	LB-2	25.0-55.0	ML	0	0	100	<.001	42	26	2.78	42	—	0.5
		LB-4	55.0-65.0	ML	0	0	100	<.001	36	26	2.79	35	—	0.5
FD-13		LB-1	20.0-30.0	ML	0	0	100	<.001	38	27	2.76	—	—	0.5
		LB-3	30.0-35.0	ML	0	0	100	<.001	38	28	2.74	—	—	0.5

SILT BANDS
SELECTED TEST DATA SUMMARY
(* SEE NOTES)



GRADATION CURVES - VARVED CLAY



PLASTICITY CHART - VARVED CLAY

* Notes
1. Laboratory tests samples (LB SAMPLES) were prepared by physically separating the CLAY BANDS from the SILT BANDS.
2. Activity values = PLASTICITY INDEX / % CLAY SIZE

EXPL. NO.	TOP ELEV. FT.	SAMPLE NO.*	DEPTH FT.	SOIL SYMBOL	MECHANICAL ANALYSIS GRAVEL %	SAND %	FINES %	D10 mm.	ATT. LIMITS LL	PL	SPECIFIC GRAVITY	NAT. WATER CONTENT % DRY WT. TOTAL	-NO.4	ACTIVITY*
FD-2	53.1	LB-1	10.0-36.7	CH	0	0	100	<.001	71	30	2.78	—	—	1.7
FD-4	36.6	LB-1	15.0-20.0	CH	—	—	—	—	—	—	—	62	—	—
		LB-3	20.0-21.5	CH	—	—	—	—	—	—	—	63	—	—
FD-5	39.5	LB-1	18.0-20.0	CH	—	—	—	—	—	—	—	60	—	—
FD-7	45.4	LB-1	40.0-55.0	CH	—	—	—	—	72	30	—	—	—	—
		LB-3	40.0-45.0	CH	—	—	—	—	—	—	—	61	—	—
		LB-5	45.0-50.0	CH	0	0	100	<.001	—	—	2.85	—	—	1.8
FD-8	40.1	LB-1	15.9-20.0	CH	—	—	—	—	—	—	—	67	—	—
		LB-3	25.0-30.0	CH	—	—	—	—	—	—	—	73	—	—
FD-9	45.7	LB-1	15.0-30.0	CH	0	0	100	<.001	61	28	2.77	—	—	2.2
		LB-2	15.0-30.0	CH	0	0	100	<.001	61	25	2.73	—	—	1.9
		LB-3	30.0-50.0	CH	0	0	100	<.001	66	28	2.78	—	—	1.2
		LB-4	30.0-50.0	CH	0	0	100	<.001	63	28	2.79	—	—	2.1
		LB-6	50.0-75.0	CH	0	0	100	<.001	71	26	2.78	—	—	1.8
FD-10	43.0	LB-2	25.0-50.0	CH	0	0	100	<.001	59	27	2.72	—	—	2.2
		LB-4	50.0-60.0	CH	0	0	100	<.001	64	28	2.75	—	—	1.7
		LB-6	60.0-70.0	CH	0	0	100	<.001	64	27	2.72	—	—	1.9
FD-11	50.6	LB-2	45.0-60.0	CH	0	0	100	<.001	66	29	2.74	—	—	2.1
		LB-4	60.0-75.0	CH	0	0	100	<.001	62	27	2.77	—	—	2.3
FD-12	46.5	LB-1	25.0-55.0	CH	0	0	100	<.001	71	26	2.78	65	—	2.0
		LB-3	55.0-65.0	CH	0	0	100	<.001	65	26	2.74	61	—	2.2
FD-13	60.5	LB-2	20.0-30.0	CH	0	0	100	<.001	53	24	2.73	—	—	2.3
		LB-4	30.0-35.0	CH	0	0	100	<.001	57	26	2.76	—	—	1.8

CLAY BANDS
SELECTED TEST DATA SUMMARY (* SEE NOTES)

GRAPHIC SCALES

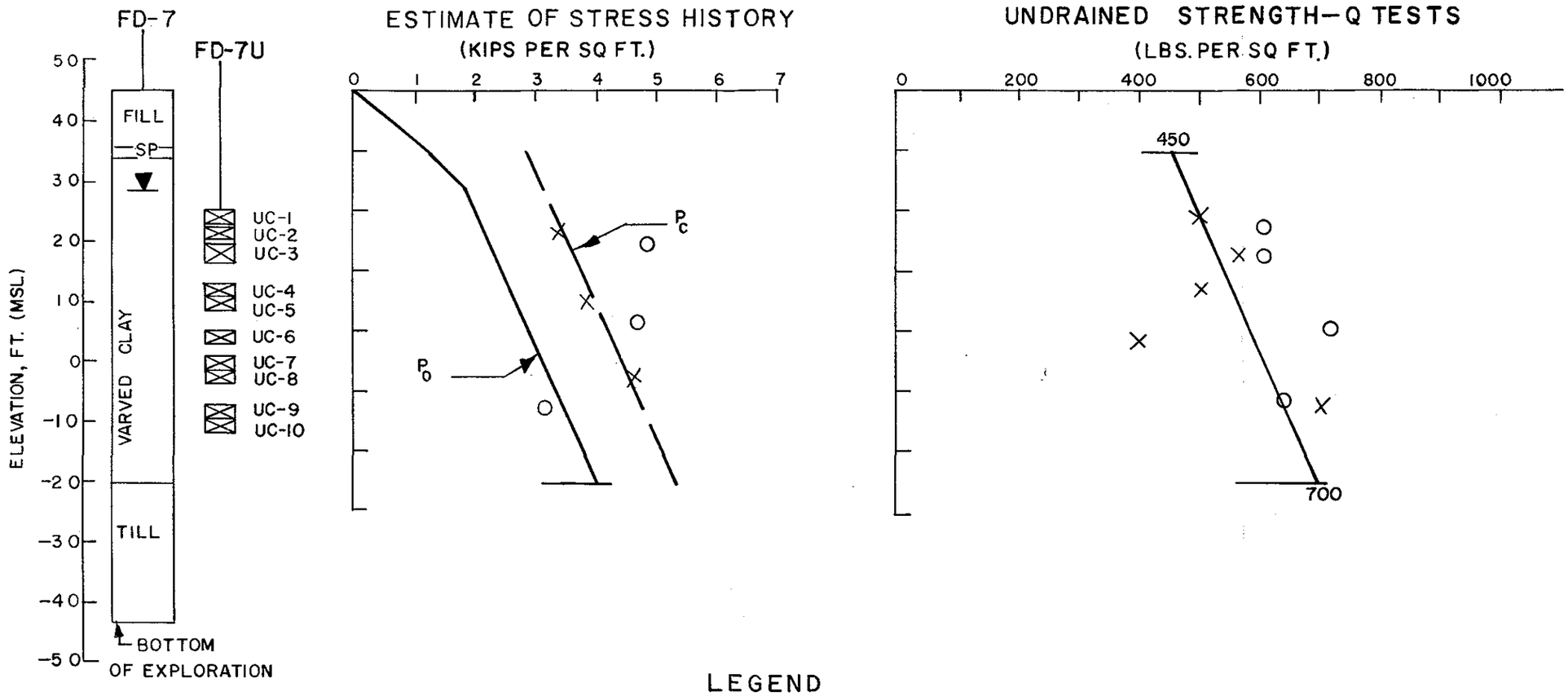
REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WALTHAM, MASS.

DES. BY | DR. BY | CK. BY
SUBMITTED:
CHIEF, SECTION
APPROVAL RECOMMENDED:
CHIEF, TECH. ENG. BRANCH
REVIEWED:
PROJECT ENGINEER
APPROVAL RECOMMENDED:
CHIEF BRANCH

WATER RESOURCES DEVELOPMENT PROJECT
PARK RIVER LOCAL PROTECTION
SELECTED TEST DATA
TILL AND VARVED CLAY
HARTFORD CONNECTICUT
APPROVED DATE
CHIEF, ENGINEERING DIVISION
SCALE | SPEC. NO.
DRAWING NUMBER
SHEET

PLATE 5A-16



LEGEND

FD-7	PILOT TEST BORING
FD-7U	UNDISTURBED TEST BORING
UC-1	PRESSED SHELBY TUBE SAMPLE
P_c	ESTIMATE OF PRE-CONSOLIDATION STRESS
P_o	ESTIMATE OF PRESENT EFFECTIVE OVERBURDEN STRESS
Q	UNCONSOLIDATED UNDRAINED TRIAXIAL SHEAR TEST
X	TEST PLOT POINT-FD-7U
O	TEST PLOT POINT—FD-9U

WATER RESOURCES DEVELOPMENT PROJECT

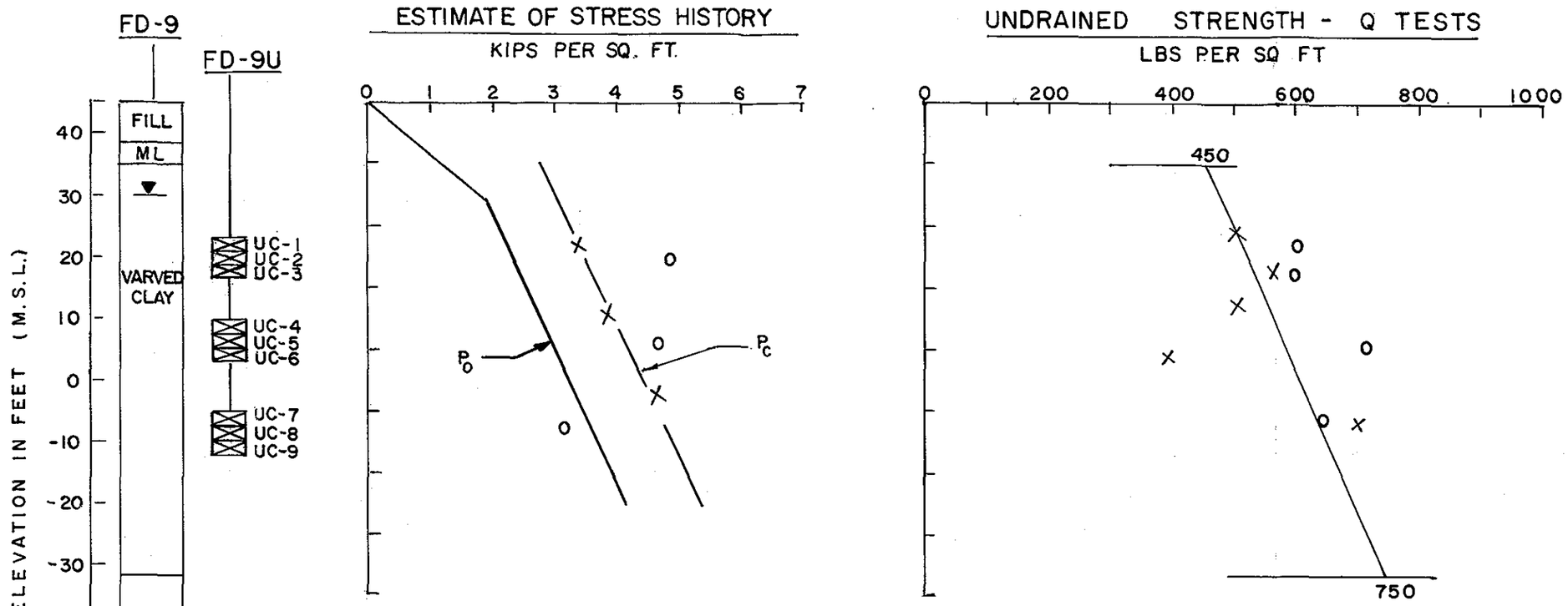
PARK RIVER LOCAL PROTECTION

STRESS-STRENGTH PLOTS

TEST BORING FD-7

BOX CONDUIT - SECTION 7

PLATE 5A-17



LEGEND

FD-9	PILOT TEST BORING
FD-9U	UNDISTURBED TEST BORING
UC-1	PRESSED SHELBY TUBE SAMPLE
P_c	ESTIMATE OF PRE-CONSOLIDATION STRESS
P_o	ESTIMATE OF PRESENT EFFECTIVE OVERBURDEN STRESS
Q	UNCONSOLIDATED UNDRAINED TRIAXIAL SHEAR TEST (Q-TEST)
X	TEST PLOT POINT FD-7U
O	TEST PLOT POINT FD-9U

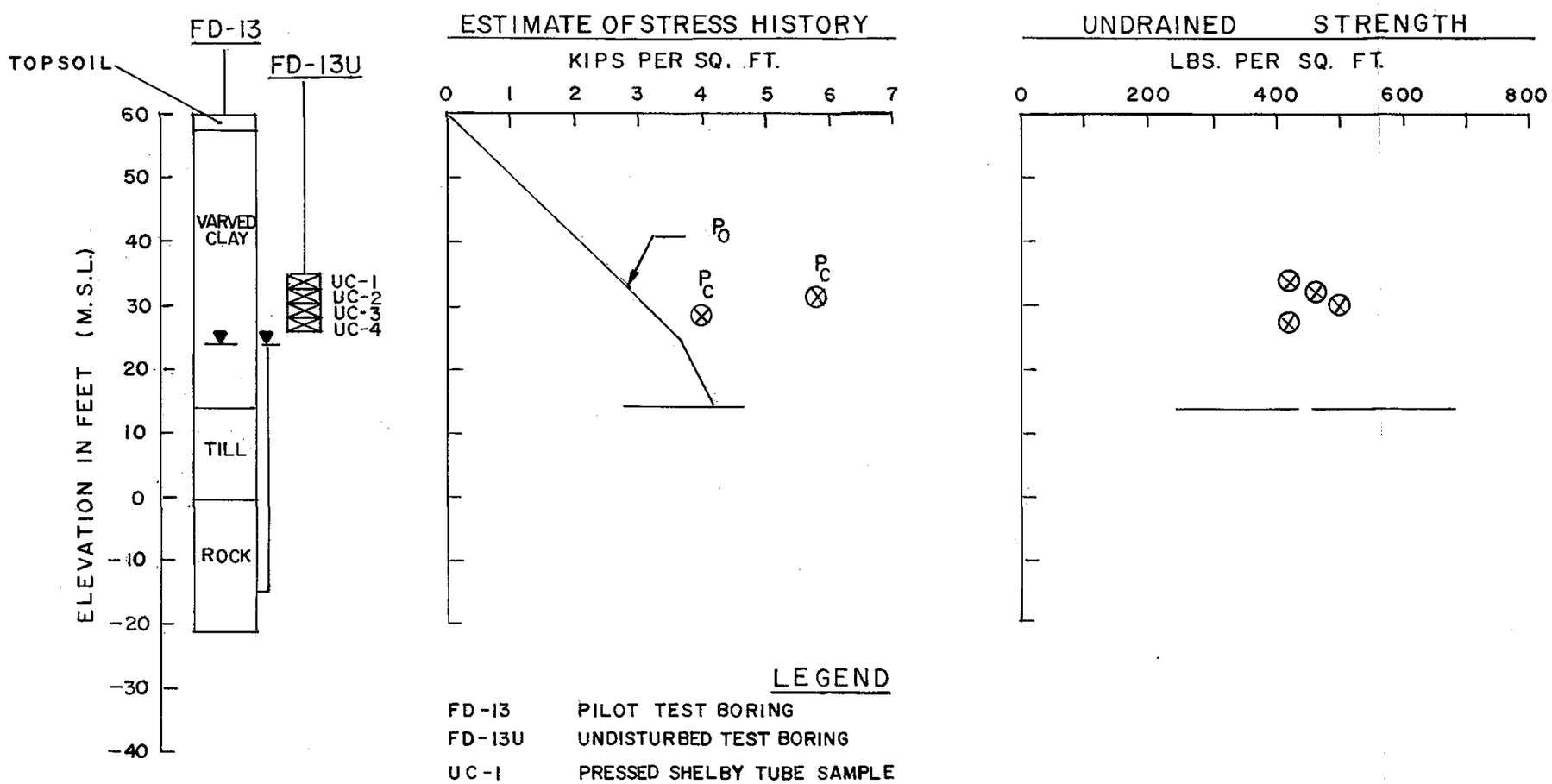
WATER RESOURCES DEVELOPMENT PROJECT

PARK RIVER LOCAL PROTECTION

STRESS-STRENGTH PLOTS

TEST BORING FD-9

BOX CONDUIT SECTION 9



LEGEND

FD-13	PILOT TEST BORING
FD-13U	UNDISTURBED TEST BORING
UC-1	PRESSED SHELBY TUBE SAMPLE
P_C	ESTIMATE OF PRE-CONSOLIDATION STRESS
P_O	ESTIMATE OF PRESENT EFFECTIVE OVERBURDEN STRESS
Q	UNCONSOLIDATED UNDRAINED TRIAXIAL SHEAR TEST (Q-TEST)
⊗	TEST PLOT POINT - FD-13 U

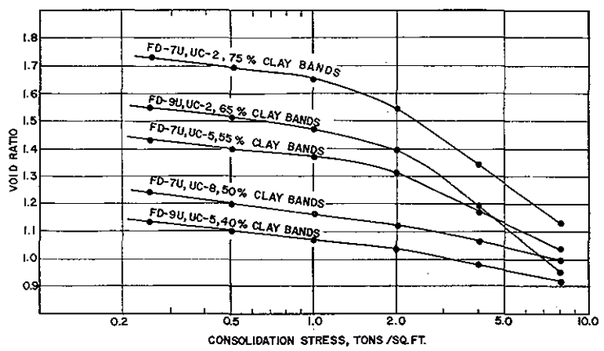
WATER RESOURCES DEVELOPMENT PROJECT

PARK RIVER LOCAL PROTECTION

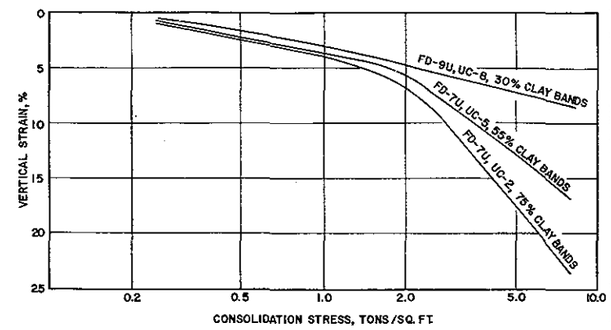
STRESS-STRENGTH PLOTS

TEST BORING FD-13

POPE PARK AREA

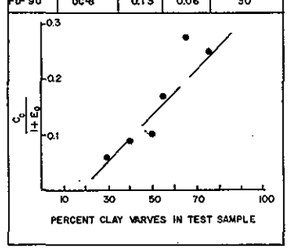


CONSOLIDATION STRESS V_S VOID RATIO

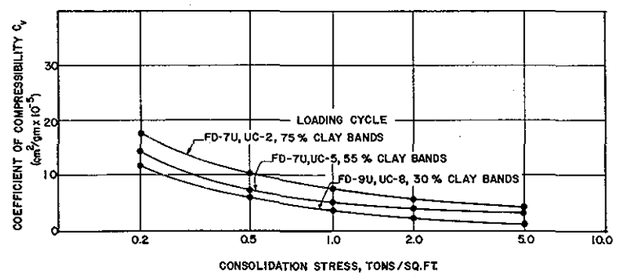


CONSOLIDATION STRESS V_S VERTICAL STRAIN

BORING	SAMPLE	C_c	$\frac{C_c}{1+E_0}$	% CLAY BANDS
FD-7U	UC-2	0.70	0.25	75
FD-7U	UC-5	0.47	0.17	55
FD-7U	UC-8	0.22	0.1	50
FD-9U	UC-2	0.75	0.28	65
FD-9U	UC-5	0.20	0.09	40
FD-9U	UC-8	0.13	0.06	30



COMPRESSION RATIO V_S % CLAY BANDS



CONSOLIDATION STRESS V_S COEFFICIENT OF COMPRESSIBILITY

GRAPHIC SCALES

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WALTHAM, MASS.

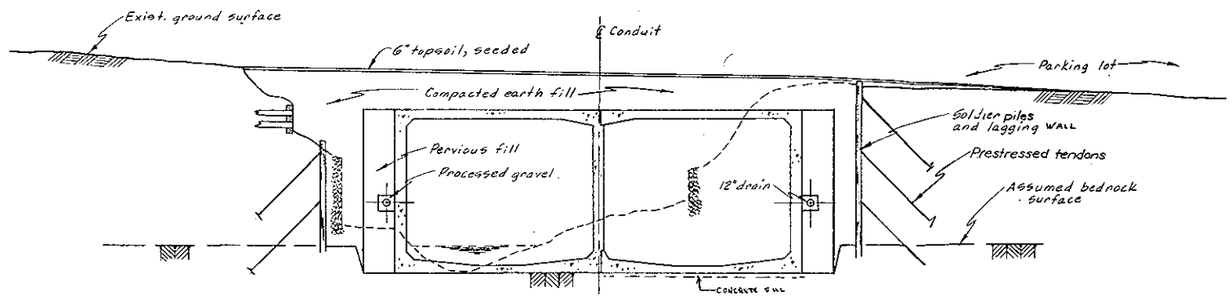
DES. BY | DR. BY | CK. BY
SUBMITTED:
CHIEF, SECTION
APPROVAL RECOMMENDED:
CHIEF, TECH. ENG. BRANCH
REVIEWED:
PROJECT ENGINEER
APPROVAL RECOMMENDED:
CHIEF, BRANCH

WATER RESOURCES DEVELOPMENT PROJECT
PARK RIVER LOCAL PROTECTION
SELECTED TEST DATA
VARVED CLAY CONSOLIDATION TESTS
HARTFORD CONNECTICUT

APPROVED DATE
CHIEF, ENGINEERING DIVISION

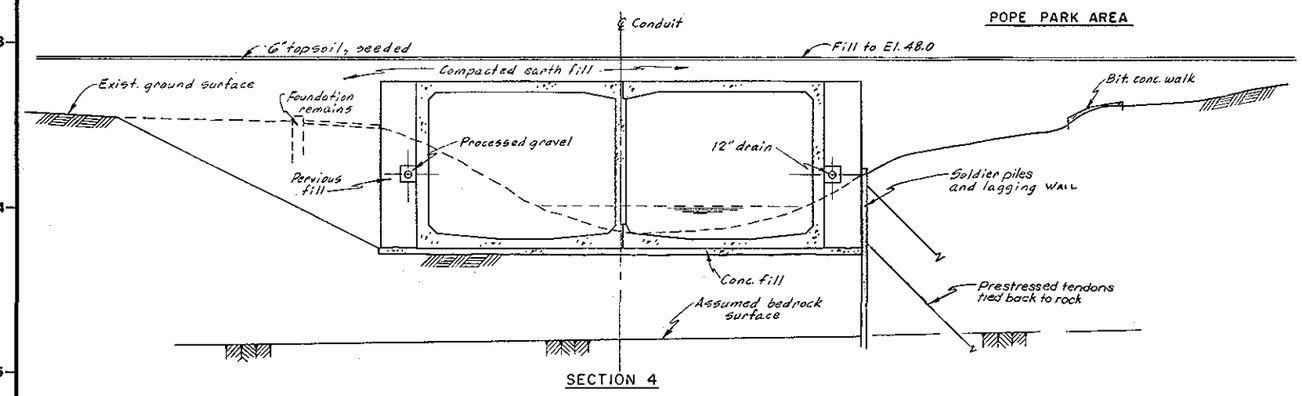
SCALE | SPEC. NO.
DRAWING NUMBER
SHEET

CORPS OF ENGINEERS U. S. ARMY

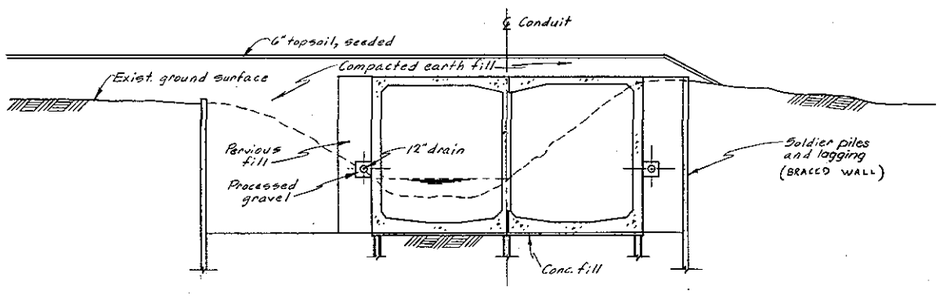


SECTION 2

POPE PARK AREA

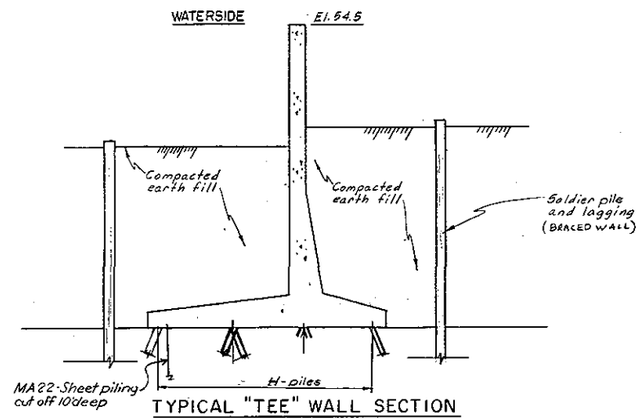


SECTION 4

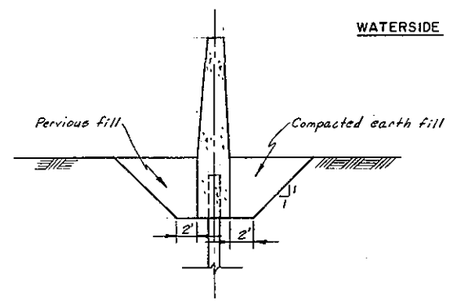


SECTION 7

TYPICAL SECTIONS (LOOKING DOWNSTREAM)
SCALE: 1"=10'



TYPICAL "TEE" WALL SECTION
SCALE: 1"=5'



TYPICAL "I" WALL SECTION
SCALE: 1"=5'

GRAPHIC SCALES
1"=10' 10' 0 10' 20'
1"=5' 5' 0 5' 10'

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WALTHAM, MASS.

DES. BY | DR. BY | CK. BY
SUBMITTED:
CHIEF, SECTION
APPROVAL RECOMMENDED:
CHIEF, TECH. ENG. BRANCH
RECOMMEND:
PROJECT ENGINEER
APPROVAL RECOMMENDED:
CHIEF BRANCH

WATER RESOURCES DEVELOPMENT PROJECT
PARK RIVER LOCAL PROTECTION
CONDUIT AND WALLS
TYPICAL SECTIONS
HARTFORD CONNECTICUT
APPROVED DATE
CHIEF, ENGINEERING DIVISION
SCALE | SPEC. NO.
DRAWING NUMBER
SHEET

PLATE 5A-21

APPENDIX A

SUMMARY OF LABORATORY TEST RESULTS

Borings FD-1 Thru FD-19

SOIL TESTS RESULTS

PARK RIVER L.P.

EXPL. NO.	TOP ELEV. FT.	SAMPLE NO.	DEPTH FT.	SOIL SYMBOL	MECHANICAL ANALYSIS				ATT. LIMITS		SPECIFIC GRAVITY	NAT. WATER CONTENT % DRY WT		COMPACTION DATA STND. AASHO			NAT. DRY DENSITY LBS/CU FT		OTHER TESTS			
					GRAVEL %	SAND %	FINES %	D_{10} mm.	LL	PL		TOTAL	-NO4	OPT. WATER % DRY WT	MAX. DRY DENS. LBS/CU FT	* PVD LBS/CU FT	TOTAL	-NO4	SHEAR	CONSOL.	PERM.	
FD-1		J-3	5.0-6.8	SM	28	47	25	0.01														
		J-16	35.0-38.4	SM	55	25	20	0.01	21	16												
FD-2		J-15	36.7-40.0	CL-ML	22	34	44	0.002														
		J-16	40.0-43.0	CL-ML					19	15	2.69											
		LB-1	10.0-36.7	CH			100		71	30	2.78	(Lab. composite sample of clay layers)										
		LB-2	10.0-36.7	ML			100		35	28	2.76	(Lab. composite sample of silt layers)										
FD-3		J-8	25.0-30.0	CL	14	34	52	0.001				10.1										

NED FORM JUL 63 510

* PROVIDENCE VIBRATED DENSITY TEST

SOIL TESTS RESULTS

PARK RIVER L.P.

EXPL. NO.	TOP ELEV. FT.	SAMPLE NO.	DEPTH FT.	SOIL SYMBOL	MECHANICAL ANALYSIS GRAVEL %	SAND %	FINES %	D_{10} mm.	ATT. LIMITS LL	PL	SPECIFIC GRAVITY	NAT. WATER CONTENT % DRY WT TOTAL	- NO4	COMPACTION DATA STND. AASHO OPT. WATER % DRY WT	MAX. DRY DENS. LBS/CU FT	* PVD LBS/CU FT	NAT. DRY DENSITY LBS/CU FT TOTAL	- NO4	OTHER TESTS SHEAR	CONSOL.	PERM.	
FD-4		J-8(2)	21.5-25.0	SC	15	34	51	0.0019														
		J-9(2)	25.0-30.0	SC					20	15	2.73	11.7										
		J-10(2)	30.0-35.0	SM								8.9										
		LB-1	15.0-20.0	CH								62	(Lab. composite sample of clay layers)									
		LB-2	15.0-20.0	ML								50	(Lab. composite sample of silt layers)									
		LB-3	20.0-21.5	CH								63	(Lab. composite sample of clay layers)									
		LB-4	20.0-21.5	ML								46	(Lab. composite sample of silt layers)									
FD-5		J-14(2)	37.9-40.0	SC	18	32	50	0.002														
		J-15(2)	40.0-45.0	SC								9.3										
		J-16(2)	45.0-48.0	SM	14	39	47	0.0055														
		J-18	50.0-52.2	SM								10.3										
		LB-1	18.0-20.0	CH								60	(Lab. composite sample of clay layers)									
		LB-2	18.0-20.0	ML								54	(Lab. composite sample of silt layers)									

NED FORM JUL 63 510

* PROVIDENCE VIBRATED DENSITY TEST

SOIL TESTS RESULTS

PARK RIVER L. P.

EXPL. NO.	TOP ELEV. FT.	SAMPLE NO.	DEPTH FT.	SOIL SYMBOL	MECHANICAL ANALYSIS GRAVEL %	SAND %	FINES %	D_{10} mm.	ATT. LIMITS LL	PL	SPECIFIC GRAVITY	NAT. WATER CONTENT % DRY WT TOTAL	- NO4	COMPACTION DATA STND. AASHO OPT. WATER % DRY WT	MAX. DRY DENS. LBS/CU FT	* PVD LBS/CU FT	NAT. DRY DENSITY LBS/CUFT TOTAL	- NO4	OTHER TESTS SHEAR	CONSOL.	PERM.	
FD-7		J-11(2)	25.0-30.0	CH/ML								68.9										
		J-28(2)	70.0-72.7	CL	16	26	58				2.73											
		J-30(2)	75.0-78.2	SM	12	42	46	0.0032			2.71											
		LB-1	40.0-55.0	CH					72	30			(Lab. composite sample of clay layers)									
		LB-2	40.0-55.0	ML					45	27			(Lab. composite sample of silt layers)									
		LB-3	40.0-45.0	CH								61	(Lab. composite sample of clay layers)									
		LB-4	40.0-45.0	ML								43	(Lab. composite sample of silt layers)									
		LB-5	45.0-50.0	CH	0	0	100				2.85		(Lab. composite sample of clay layers)									
		LB-6	45.0-50.0	ML	0	0	100	0.0016			2.79		(Lab. composite sample of silt layers)									
FD-8		J-13(2)	35.0-40.0	SM								12.0										
		J-15(2)	45.0-50.0	SM								13.8										
		LB-1	15.9-20.0	CH								67	(Lab. composite sample of clay layers)									
		LB-2	15.9-20.0	ML								47	(Lab. composite sample of silt layers)									
		LB-3	25.0-30.0	CH								73	(Lab. composite sample of clay layers)									
		LB-4	25.0-30.0	ML								40	(Lab. composite sample of silt layers)									

NED FORM JUL 63 510

* PROVIDENCE VIBRATED DENSITY TEST

EXPL. NO.	TOP ELEV. FT.	SAMPLE NO.	DEPTH FT.	SOIL SYMBOL	MECHANICAL ANALYSIS GRAVEL %	SAND %	FINES %	D_{10} mm.	ATT. LIMITS LL	PL	SPECIFIC GRAVITY	NAT. WATER CONTENT % DRY WT TOTAL	- NO4	COMPACTION DATA STND. AASHO OPT. WATER % DRY WT	MAX. DRY DENS. LBS/CU FT	* PVD LBS/CU FT	NAT. DRY DENSITY LBS/CU FT TOTAL	- NO4	OTHER TESTS SHEAR	CONSOL.	PERM.
FD-9		J-6 (2) J-7R	15.0-20.0	CH/ML								62									
		J-8 (2) J-9R	20.0-25.0	CH/ML								65									
		J-10(2) J-11R	25.0-30.0	CH/ML								62									
		J-12 (2) J-13R	30.0-35.0	CH/ML								62									
		J-14(2) J-15R	35.0-40.0	CH/ML								54									
		J-16(2) J-17R	40.0-45.0	CH/ML								44									
		J-18(2) J-19R	45.0-50.0	CH/ML								44									
		J-20(2) J-21R	50.0-55.0	CH/ML								46									
		J-22(2) J-23R	55.0-60.0	CH/ML								40									
		J-24(2) J-25R	60.0-65.0	CH/ML								42									
		J-26(2) J-27R	65.0-70.0	CH/ML								50									
		J-28(2) J-29R	70.0-75.0	CH/ML								50									
		J-30	75.0-76.8	CH/ML								25									
		J-31 J-32R	76.8-80.0	ML	2	28	70	0.005			2.67	21									
		J-33(2) J-34R	80.0-85.0	SC	30	42	28	0.0075	18	15	2.76		10.3								
		J-35(2) J-36R	85.0-90.0	SM	23	62	15	0.03	NP	NP			10.0								
		J-37	90.0-95.0										11.4								

NED FORM JUL 63 510

* PROVIDENCE VIBRATED DENSITY TEST

SOIL TESTS RESULTS

PARK RIVER L. P.

EXPL. NO.	TOP ELEV. FT.	SAMPLE NO.	DEPTH FT.	SOIL SYMBOL	MECHANICAL ANALYSIS GRAVEL %	SAND %	FINES %	D_{10} mm.	ATT. LIMITS LL	PL	SPECIFIC GRAVITY	NAT. WATER CONTENT % DRY WT TOTAL	-NO4	COMPACTION DATA STND.AASHO OPT. WATER % DRY WT	MAX. DRY DENS. LBS/CU FT	* PVD LBS/CU FT	NAT. DRY DENSITY LBS/CU FT TOTAL	-NO4	OTHER TESTS SHEAR	CONSOL.	PERM.	
FD-9 (cont.d		LB-1	15.0-30.0	CH	0	0	100		61	28	2.77											
		LB-2	15.0-30.0	CH	0	0	100		61	25	2.73											
		LB-3	30.0-50.0	CH	0	0	100		66	28	2.78											
		LB-4	30.0-50.0	CH	0	0	100		63	28	2.79											
		LB-5	50.0-75.0	ML	0	0	100		35	29	2.81											
		LB-6	50.0-75.0	CH	0	0	100		71	26	2.78											

NED FORM JUL 63 510

* PROVIDENCE VIBRATED DENSITY TEST

EXPL. NO.	TOP ELEV. FT.	SAMPLE NO.	DEPTH FT.	SOIL SYMBOL	MECHANICAL ANALYSIS GRAVEL %	SAND %	FINES %	D_{10} mm.	ATT. LIMITS LL	PL	SPECIFIC GRAVITY	NAT. WATER CONTENT % DRY WT TOTAL	-NO4	COMPACTION DATA STND. AASHO OPT. WATER % DRY WT	MAX. DRY DENS. LBS/CU FT	* PVD LBS/CU FT	NAT. DRY DENSITY LBS/CU FT TOTAL	-NO4	OTHER TESTS SHEAR	CONSOL.	PERM.	
FD-10		J-2(2) J-3R	5.0-10.0	CL								22										
		J-4(2) J-5R	10.0-15.0	CH/ML								65										
		J-6(2) J-7R	15.0-20.0	CH/ML								60										
		J-8(2) J-9R	20.0-25.0	CH/ML								63										
		J-10(2) J-11R	25.0-30.0	CH/ML								62										
		J-12(2) J-13R	30.0-35.0	CH/ML								42										
		J-14(2) J-15R	35.0-40.0	CH/ML								49										
		J-16(2) J-17R	40.0-45.0	CH/ML								52										
		J-18(2) J-19R	45.0-50.0	CH/ML								48										
		J-20(2) J-21R	50.0-55.0	CH/ML								50										
		J-22(2) J-23R	55.0-60.0	CH/ML								45										
		J-24(2) J-25R	60.0-65.0	CH/ML								45										
		J-26(2) J-27R	65.0-70.0	CH/ML								43										
		J-28(2) J-29R	70.0-75.0	CH/ML								44										
		J-30 J-31R	75.0-77.8	ML	0	12	88	0.002			2.67	22										
		J-32	77.8-80.0	SM	12	50	38	0.004					13.0									
		J-33	80.0-85.0	SM	8	75	17	0.04	NP	NP	2.70		10.4									
		J-34(2) J-35R	90.0-94.4	GM	35	30	35	0.018					14.0									

NED FORM JUL 63 510

* PROVIDENCE VIBRATED DENSITY TEST

SOIL TESTS RESULTS

PARK RIVER L. P.

EXPL. NO.	TOP ELEV. FT.	SAMPLE NO.	DEPTH FT.	SOIL SYMBOL	MECHANICAL ANALYSIS GRAVEL %	SAND %	FINES %	D_{10} mm.	ATT. LIMITS LL	PL	SPECIFIC GRAVITY	NAT. WATER CONTENT % DRY WT TOTAL	-NO4	COMPACTION DATA STND. AASHO OPT. WATER % DRY WT	MAX. DRY DENS. LBS/CU FT	* PVD LBS/CU FT	NAT. DRY DENSITY LBS/CU FT TOTAL	-NO4	OTHER TESTS SHEAR	CONSOL.	PERM.	
FD-10 (cont'd)		LB-1	25.0-50.0	ML	0	0	100		36	25	2.76											
		LB-2	25.0-50.0	CH	0	0	100		59	27	2.72											
		LB-3	50.0-60.0	ML	0	0	100		35	29	2.73											
		LB-4	50.0-60.0	CH	0	0	100		64	28	2.75											
		LB-5	60.0-70.0	ML	0	0	100		38	27	2.75											
		LB-6	60.0-70.0	CH	0	0	100		64	27	2.72											
FD-11		J-31(2) J-32R	80.0-85.0	CH/ML	4	82	13	0.0013	27	20		25										
		J-34 J-35R	86.4-90.0	SM	10	65	25	0.024	--	NP			13.6									
		J-36 J-37R	90.0-95.0	SM	24	51	25	0.060					7.7									
		J-39 J-40R	100.5-102.6	SM	29	43	28	0.0055					8.0									
		LB-1	45.0-60.0	ML	0	0	100		37	27	2.74											
		LB-2	45.0-60.0	CH	0	0	100		66	29	2.71											
		LB-3	60.0-75.0	ML	0	0	100		37	28	2.73											
		LB-4	60.0-75.0	CH	0	0	100		62	27	2.77											

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* PROVIDENCE VIBRATED DENSITY TEST

EXPL. NO.	TOP ELEV. FT.	SAMPLE NO.	DEPTH FT.	SOIL SYMBOL	MECHANICAL ANALYSIS GRAVEL %	SAND %	FINES %	D_{10} mm.	ATT. LIMITS LL	PL	SPECIFIC GRAVITY	NAT. WATER CONTENT % DRY WT TOTAL	- NO4	COMPACTION DATA STND. AASHO OPT. WATER % DRY WT	MAX. DRY DENS. LBS/CU FT	* PVD LBS/CU FT	NAT. DRY DENSITY LBS/CU FT TOTAL	- NO4	OTHER TESTS SHEAR	CONSOL.	PERM.	
FD-12		J-7(2) J-8R	25.0-30.0	CH≠ML								60 47	clay silt									
		J-11(2) J-12R	35.0-40.0	CH≠ML								66 48	clay silt									
		J-13(2) J-14R	40.0-45.0	CH≠ML								65 36	clay silt									
		J-15(2) J-16R	45.0-50.0	CH≠ML								57 37	clay silt									
		J-17(2) J-18R	50.0-55.0	CH≠ML								72 42	clay silt									
		J-19(2) J-20R	55.0-60.0	CH≠ML								64 32	clay silt									
		J-21(2) J-22R	60.0-65.0	CH≠ML								57 39	clay silt									
		J-23(2) J-24R	65.0-70.0	CH≠ML								57 35	clay silt									
		J-25(2) J-26R	70.0-75.0	CH≠ML								58 38	clay silt									
		J-27	75.0-76.6	ML	0	22	78	0.006				23										
		J-28	76.6-80.0	SM								16										
		J-29 J-30R	80.0-85.0	SP-SM									7.1									
		J-31	85.0-90.0	SM									8.2									
		J-32	90.0-95.0	SM									8.8									
		J-33	95.0-100.0	GM									8.1									
		J-34 J-35R	100.0-105.0	GM	50	32	18	0.25			2.73											
		J-37 J-38R	110.0-115.0	GP-GM	55	37	8	0.16														
		J-40(2) J-41R	116.2-120.0	ML	0	8	92	0.006			2.68	23										

NED FORM JUL 63 510

* PROVIDENCE VIBRATED DENSITY TEST

SOIL TESTS RESULTS

PARK RIVER L. P.

EXPL. NO.	TOP ELEV. FT.	SAMPLE NO.	DEPTH FT.	SOIL SYMBOL	MECHANICAL ANALYSIS GRAVEL %	SAND %	FINES %	D_{10} mm.	ATT. LIMITS LL	PL	SPECIFIC GRAVITY	NAT. WATER CONTENT % DRY WT TOTAL	- NO4	COMPACTION DATA STND. AASHO OPT. WATER % DRY WT	MAX. DRY DENS. LBS/CU FT	* PVD LBS/CU FT	NAT. DRY DENSITY LBS/CU FT TOTAL	- NO4	OTHER TESTS SHEAR	CONSOL.	PERM.	
FD-12 (cont'd)		J-42(2) J-43R	120.0-122.7	SM	28	48	24	0.01				11										
		LB-1	25.0-55.0	CH	0	0	100		71	26	2.78	65										
		LB-2	25.0-55.0	ML	0	0	100		42	26	2.78	42										
		LB-3	55.0-65.0	CH	0	0	100		65	26	2.74	61										
		LB-4	55.0-65.0	ML	0	0	100		36	26	2.79	35										
FD-13		J-22(2) J-23R	50.0-55.0	SM	40	42	18	0.011	18	16	2.70											
		J-24(2) J-25R	55.0-57.0	ML	18	24	58	0.001														
		LB-1	20.0-30.0	ML	0	0	100		38	27	2.76											
		LB-2	20.0-30.0	CH	0	0	100		53	24	2.73											
		LB-3	30.0-35.0	ML	0	0	100		38	28	2.74											
		LB-4	30.0-35.0	CH	0	0	100		57	26	2.76											
FD-14		J-9 J-10R	20.5-25.0	SC									10.4									
		J-11(2) J-12R	25.0-30.0	SC									12.8									
		J-13(2) J-14R	30.0-35.0	CL									12.4									
		J-15(2) J-16R	35.0-38.0	SC									11.5									

NED FORM JUL 63 510

* PROVIDENCE VIBRATED DENSITY TEST

PARK RIVER L.P.

EXPL. NO.	TOP ELEV. FT.	SAMPLE NO.	DEPTH FT.	SOIL SYMBOL	MECHANICAL ANALYSIS GRAVEL %	SAND %	FINES %	D_{10} mm.	ATT. LIMITS LL	PL	SPECIFIC GRAVITY	NAT. WATER CONTENT % DRY WT TOTAL	-NO4	COMPACTION DATA STND. AASHO OPT. WATER % DRY WT	MAX. DRY DENS. LBS/CU FT	* PVD LBS/CU FT	NAT. DRY DENSITY LBS/CU FT TOTAL	-NO4	OTHER TESTS SHEAR	CONSOL.	PERM.
FD-15		J-9	20.0-25.0	ML	0	13	87		37	22			36.1								
		J-10	25.0-30.0	CL	0	9	91		52	26			37.9								
FD-16		J-6	15.5-19.5	CL	0	19	81		28	20			30.1								
FD-17		J-3	5.0-9.5	ML	0	20	80	.0028	28	27			29.6								
		J-5	10.0-15.0	CL	0	0	100		60	28			50.0								
FD-19		J-5	5.0-10.0	ML	14	33	53	0.0028													
		J-8	15.0-19.0	ML	1	29	70														

NED FORM JUL 63 510

* PROVIDENCE VIBRATED DENSITY TEST

APPENDIX B

CORPS OF ENGINEERS TEST BORINGS

FIELD LOGS

Borings FD-1 Thru FD-19

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site PARK RIVER CONDUIT EXT. ~~HARTFORD, CONN.~~ Page 1 of 6 Pages

Hole No. FD-1 Desig. ~~B4~~-1 Diam. (Casing) NXFC.

Co-ordinates: N 148,989 E 163,255

Elevation Top of Boring	45.8 M.S.L.	Hammer Wt.	350
Total Overburden Drilled	47.1 Feet	Hammer Drop	18
Elevation Top of Rock	-1.3 M.S.L.	Casing Left	10'
Total Rock Drilled	20.0 Feet	Avg. Subsurface Water Depth	
Elevation Bottom of Boring	-21.3 M.S.L.	Obs. Well	47.7 (FINNERTY)
Total Depth of Boring	67.1' ± Feet	Drilled By	U.S. ARMY CORP OF ENGINEERS
Core Recovered	76.5 % No. Boxes 3	Mfg. Des. Drill	CP-3
Core Recovered	15.3 Ft: NX Diam. 2 1/8 In.	Inspected By	W. SWIFT
Soil Samples	2 1/2 In. Diam. 2 No.	Classification By:	[redacted]
Soil Samples	2 In. Diam. 15 No.	Classification By:	AMPLIFICATIONS BY LABORATORY CLASSIFIER [redacted] M.B

DEPTH	1" = 2	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
0.8'		No Sample	2 1/2"	0.0 0.8	2	DROVE 2 1/2" ID X 5' SOLID SPOON FROM 0.0' TO 5.0'	TOPSOIL
1.4'		J1 (2 JARS)	2 1/2"	0.8 1.4'		& TOOK SAMPLE. 40% REC.	Loose, brown, fine sandy, SILT, (ML), with roots, occ. c sand.
		J2	2 1/2"	1.4' 5.0'	3	JETTED NX FLUSH CASING FROM 0.0' TO 5.0'	Loose to medium compact, reddish-brown, silty, sandy, GRAVEL, (GM)
					5		
					16		Note:- Gravel is angular to subangular, and much of it is possibly freshly fractured
5.0'					21	DROVE 2" ID X 5' SOLID SPOON FROM 5.0' TO 10.0' & TOOK SAMPLE.	
		J3 (2 JARS)	2"	5.0' 6.8'	5	60% REC. JETTED NX FLUSH CASING FROM 5.0' TO 10.0'	Loose to medium compact, reddish, gravelly, silty, M-F SAND (SM)
6.8'					9		
		J4 (2 JARS)	2"	6.8' 10.0'	10		Medium compact, reddish-brown, silty, medium to fine SAND, (SM), w/occ. c-sand.
					10		
10.0'					13		

GENERAL REMARKS: BORING LOCATED ON GRASS SLOPE WITH SCATTERED TREES IN VICINITY. (CITY PARK).

NED FORM 58 (Test) MAR 71

Boring No. FD-1

Site: PK RIVER CONDUIT EXT. HARTFORD, CONN.	Boring No. FD-1	Page 2 of 6

DEPTH	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
12, 14, 15.0'	J5 (2 JARS) B6	2"	10.0' 15.0'	11, 10, 9, 7, 7	DROVE 2" ID X 5' SOLID SPOON FROM 10.0' TO 15.0' & TOOK SAMPLE. SAMPLE RECOVERED ON SECOND ATTEMPT BY OVERDRIVING TO 16.0' 40% REC. JETTED NX FLUSH CASING FROM 10.0' TO 15.0'	Soft and med. st. ft. reddish-brown & gray, sandy, CLAY (CL), w/traces of vegetation. Note:- much of sand in "pockets"; sample too disturbed to identify presence of varved structure.
15.0' 16.0'	NO SAMPLE	2"	15.0' 16.0'	5	DROVE 2" ID X 5' SOLID SPOON FROM 16.0' TO 20.0' & TOOK SAMPLE.	
18, 20.0'	J7 (2 JARS) B8	2"	16.0' 20.0'	3, 3, 3, 3	80% REC. JETTED NX FLUSH CASING FROM 15.0' TO 20.0' DROVE 2" ID X 5' SOLID SPOON FROM 20.0' TO	VERY Soft, reddish-brown & gray, CLAY (CL), laminated, w/occ. very thin lenses of fine sand, occ. grains of c-sand.
22, 24, 25.0'	J9 (2 JARS) B10	2"	20.0' 25.0'	WEIGHT OF TOOLS PLUS HAMMER, 3, 5	25.0' & TOOK SAMPLE. 100% REC. JETTED NX FLUSH CASING FROM 20.0' TO 25.0' DROVE 2" ID X 5' SOLID SPOON FROM 25.0' TO 30.0' & TOOK SAMPLE.	
	J11 (2 JARS) B12 (2 BAGS)	2"	25.0' 29.0'	WT. OF TOOLS PLUS HAMMER, 3	100% REC.	

Site: PA RIVER CONDUIT EXT. HARTFORD, CONN.	Boring No. FD-1	Page 3 of 6

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	1" = 2'						
	28		2"	25.0' 29.0'	4	JETTED NX FLUSH CASING FROM 25.0' TO 30.0'	↓
					4	DROVE 2" ID X 5' SOLID	
29.0'		J13 (2 JARS)	2"	29.0' 30.0'	6	SPOON FROM 30.0' TO 35.0' & TOOK SAMPLE. 100% REC'Y.	Soft, reddish-brown, gravelly, sandy, CLAY (CL), apparently massive bedded.
30.0'					3	JETTED NX FLUSH CASING FROM 30.0' TO 35.0'	
					7		
	32	J14 (2 JARS)	2"	30.0' 34.4'	9	DROVE 2" ID X 5' SOLID SPOON FROM 35.0' TO 38.4' & TOOK SAMPLE. 50% REC'Y. REFUSAL @ 38.4' 100 BLOWS NO PENETRATION	
					62		
	34						
34.4'		J15 (2 JARS)	2"	34.4' 35.0'	165	CHOPPED & WASHED FROM 38.4' TO 38.6' WASH	compact, dark reddish-brown, gravelly, silty, C-F SAND, (SM)
35.0'						SPOON BOUNCING & RINGING.	
					30	JETTED NX FLUSH CASING FROM 35.0' TO 38.6'	
	36	J16 (2 JARS)	2"	35.0' 38.4'	181	ROTARY DIAMOND DRILLED BX "M" SERIES BIT FROM 38.6' TO 43.5' BIT # 51A63. BIT STILL CORING.	Appears to be similar to above, except w/cobbles and occ. boulder fragments.
					283		
	38				755	DROVE 2" ID X 5' SOLID	
38.4' 38.6'						SPOON FROM 38.6' TO 43.5' AND INSTALLED BX FLUSH CASING TO 43.5'	
	40					ROTARY DIAMOND DRILLED BX "M" SERIES 5.0' CORE BARREL FROM 43.5' TO 46.1' USING BX "M" SERIES BIT # 51A63.	
		BOX #1	BX "M"	38.6' 43.5'			
	42					UNABLE TO ADVANCE CASING. PULLED NX & BX FLUSH CASING AND DRILLED W/DIAMOND	
43.5'						CASING SHOE TO 46.1'	

Site: RK RIVER CONDUIT EXT; HARTFORD, CONN.	Boring No. FD-1	Page 4 of 6

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT; CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
		Box #1	BX "M"	43.5 46.1		DROVE 2" ID x 5' SOLID SPOON FROM 46.1' TO 47.1' & TOOK SAMPLE. 100% REC. REFUSAL @ 47.1' 100 BLOWS NO PENETRATION. DRILLED NX FLUSH CASING	
46.1'	46						
		J17	2"	46.1 47.1	251	TO 47.1'	
47.1'							
	48	Box #2	NX "M"	47.1 48.7	RUN 1.6 REC'Y 1.2 74%	ROTARY DIAMOND DRILLED NX "M" 5.0' CORE BARREL FROM 47.1' TO 48.7' BIT # 91R1047 FEED 300 P.S.I. TIME 25 MIN. WATER REDISH BROWN HOLDING BLOCKED	
48.7'							
		Box #2	NX "M"	48.7 49.8	RUN 1.1 REC. 1.1 100%	DRILLED NX "M" SERIES BIT FROM 48.7' TO 49.8' FEED 300 P.S.I. TIME 10 MIN., WATER REDISH BROWN HOLDING, BLOCKED BIT # 91R1047	SHALE, red-brown moderately hard fine grained, un-weathered. Bedding generally obscure to dip of 45°+ Scattered Joints dip 45° to 70° with calcite coatings
49.8'							
	50	Box #2	NX	49.8 50.9	RUN 1.1 REC. 1.1 100%	DRILLED NX "M" SERIES BIT FROM 49.8' TO 50.9' FEED 300 P.S.I. 10 MIN., WATER REDISH BROWN HOLDING, BLOCKED, BIT # 43B303	
50.9'							
	52	Box #2	NX	50.9 52.6	RUN 1.7 REC. 1.6 93%	DRILLED NX BIT FROM 50.9' TO 52.6' FEED 300 P.S.I. TIME 45 MIN., WATER REDISH BROWN HOLDING. BLOCKED. BIT # 43B303	
52.6'							
	54	Box #2	NX	52.6 56.1	RUN 3.5 REC. 2.6 74%	DRILLED NX 5.0' CORE BARREL FROM 52.6' TO 56.1' FEED 300 P.S.I. TIME 60 MIN. WATER REDISH BROWN, HOLDING. BLOCKED @ 56.1' BIT # 43B303	
56.1'	56						
	58	Box #2	NX	56.1 60.3	RUN 4.2 REC. 2.7 64%	DRILLED NX 5.0' CORE BARREL FROM 56.1' TO 60.3' FEED 300 P.S.I. TIME 75 MIN. WATER, REDISH BROWN HOLDING. BIT # 43B303	
60.3'	60					DRILLED NX 5.0' CORE BARREL FROM 60.3' TO 63.7'	
		Box #3	NX	60.3 63.7			

Site: PA RIVER CONDUIT EXT. HARTFORD, CONN.	Boring No. FD-1	Page 5 of 6

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	1" = 2'						
	62	Box #3	NX	60.3 63.7	RUN 3.4 REC. 2.3 68%	FEED 300 P.S.I. TIME 90 MIN. WATER REDISH BROWN HOLDING BLOCKED BIT # 43B 303 DRILLED NX 5.0' CORE	
63.7	64	Box #3	NX	63.7 67.1	RUN 3.4 REC. 2.7 79%	BARREL FROM 63.7' TO 67.1' FEED 300 P.S.I. TIME 85 MIN. RUN COMP. BIT # 43B 303	Calcite cemented fracture zone at 63.0'. Core in fragments to 4" lengths.
	66						
67.1						BOTTOM OF EXPLORATION BOTTOM ELEVATION PREDETERMINED	

NED FORM 58A(Test) MAR 71

Boring No. FD-1

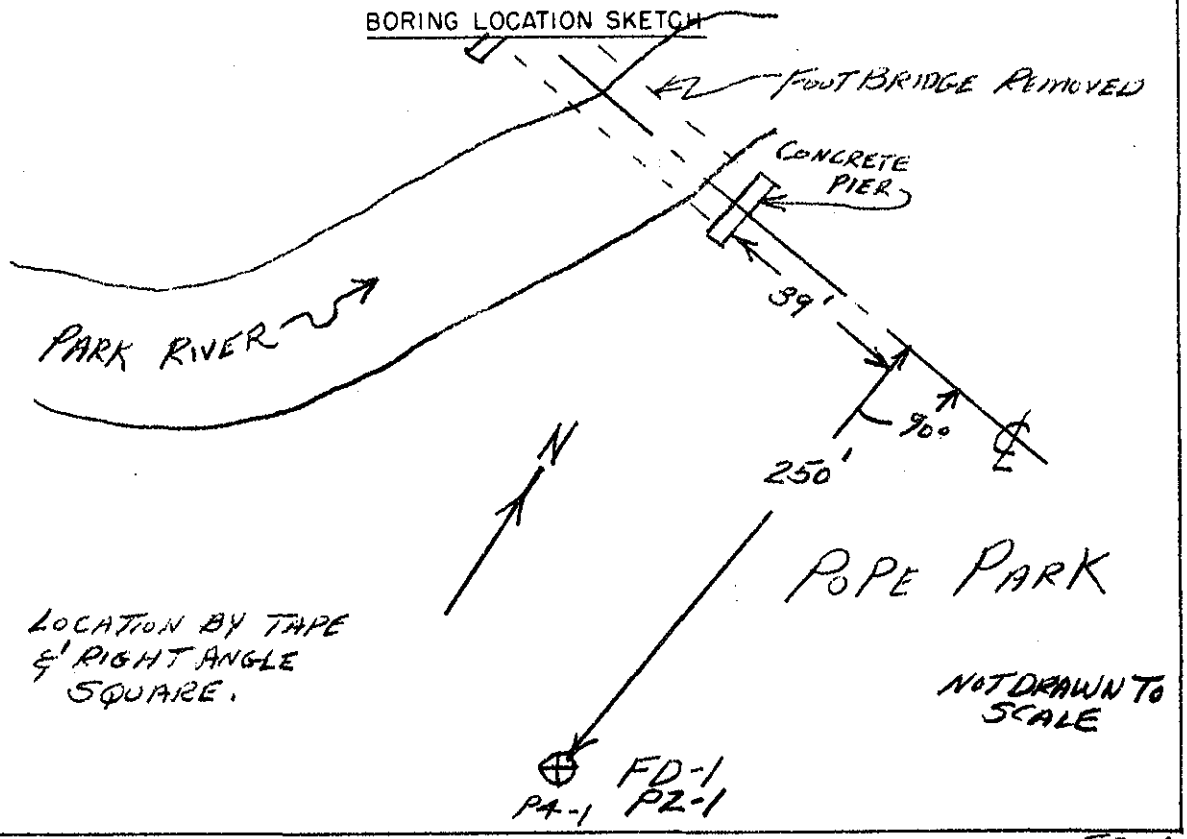
Site: PARK RIVER
Boring No: FD-1

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
1/6	1500	10.0'	10.0'	2.9'		READING 15 MIN AFTER JETTING CASING
1/7	0900	10.0'	10.0'	3.7'		READING BEFORE DRILLING
1/7	1500		TOOLS	IN HOLE		
1/10	0910		TOOLS	IN HOLE		
1/10	1530	38.6'	38.6'	12.7'		READING 15 MIN. AFTER DRILLING
1/11	0900	38.6'	38.6'	16.9'		READING BEFORE DRILLING
1/11	1230	38.6'	43.5'	15.2'		READING 30 MIN. AFTER DRILLING.
1/11	1530		TOOLS	IN HOLE		
1/12			TOOLS	IN HOLE		
1/13	1230	45.0'	46.1'	12.1'		READING 30 MIN AFTER DRILLING.
1/14	1500		TOOLS	IN HOLE		
1/17	1530	46.1	47.1'	15.2'		READING 15 MIN. AFTER DRILLING.
1/18	0900	46.1	47.1'	20.4'		READING BEFORE DRILLING
1/19	1200	47.1	56.1'	18.2'		READING 30 MIN. AFTER DRILLING.
1/20	1300	47.1	67.1'	17.6'		READING 30 MIN. AFTER DRILLING.

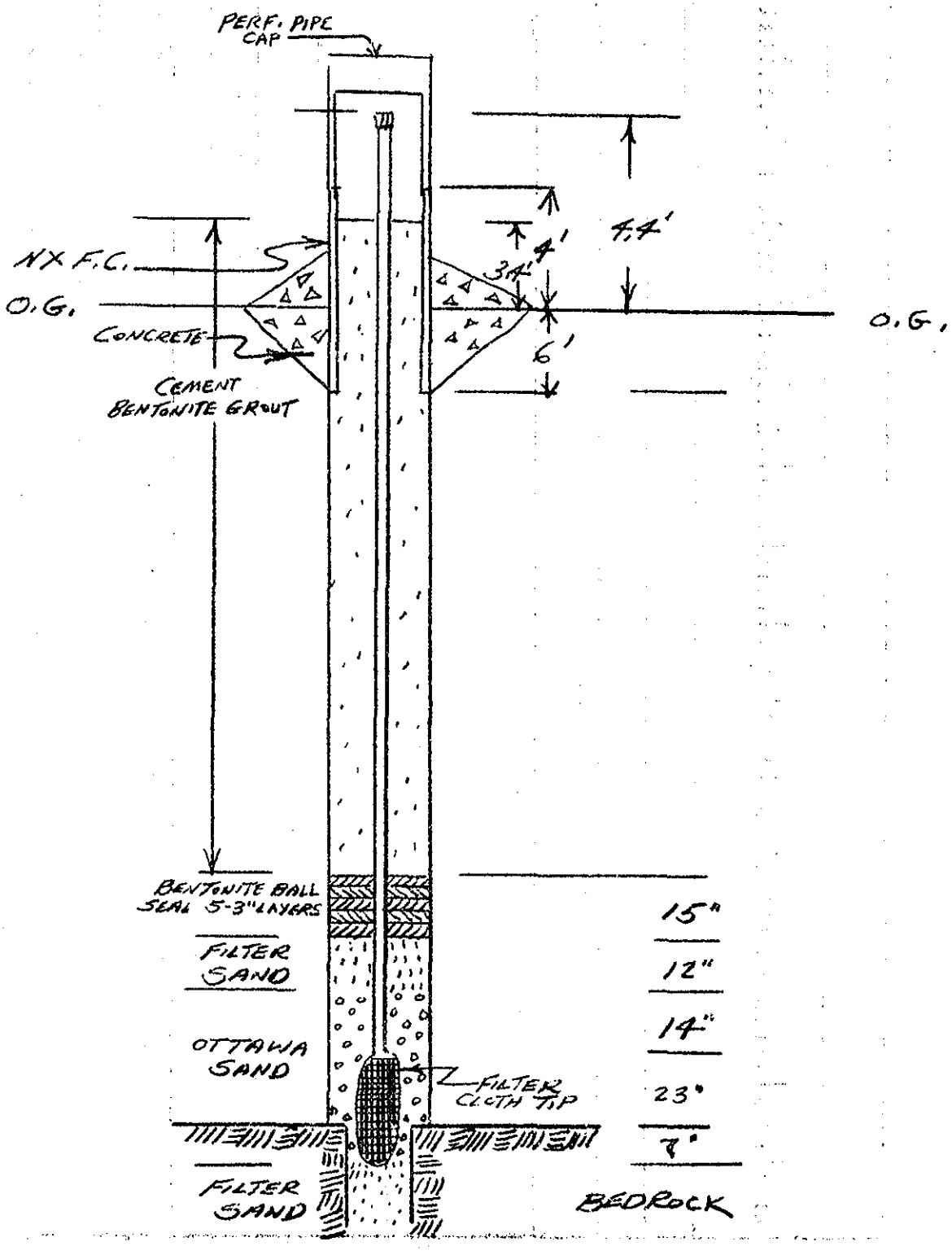
Note: Depths are in feet below original ground

BORING LOCATION SKETCH



PARK RIVER CONDUIT EXT., HARTFORD, CONN.

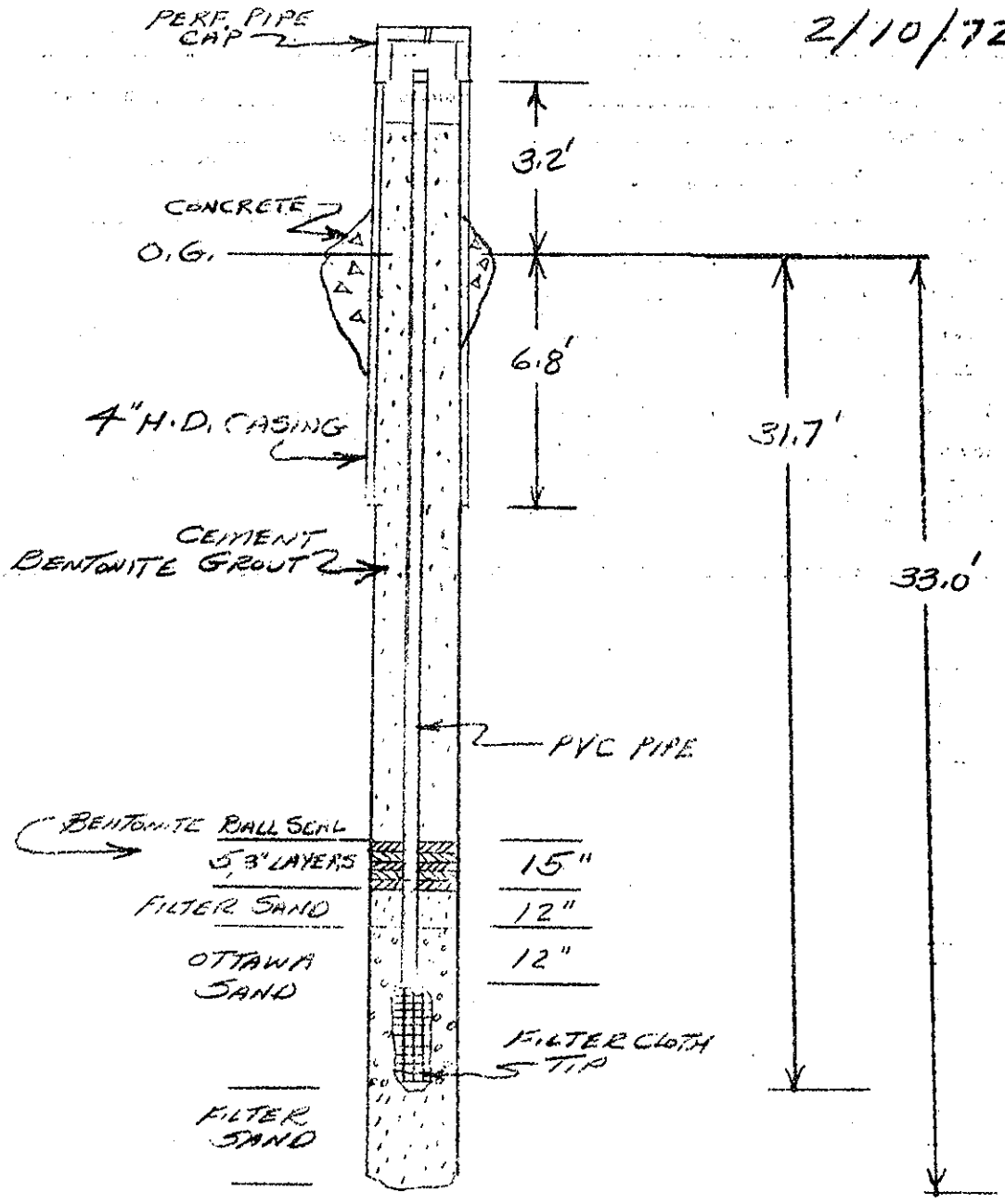
PZ-1 1/24/72

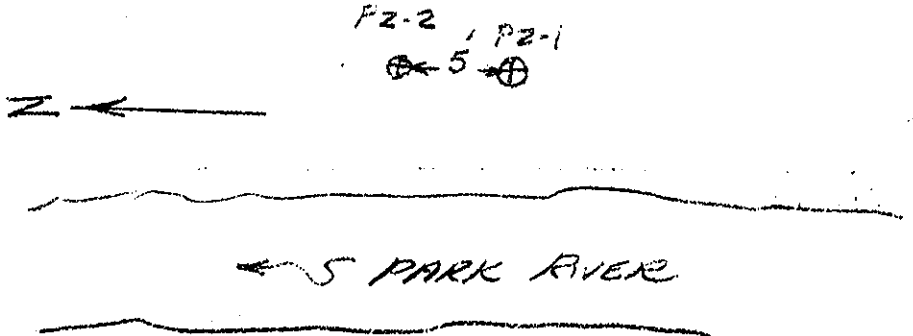


NOT TO SCALE

PIEZOMETER # PZ-2
PARK RIVER CONDUIT EXT. HARTFORD, CONN.

2/10/72





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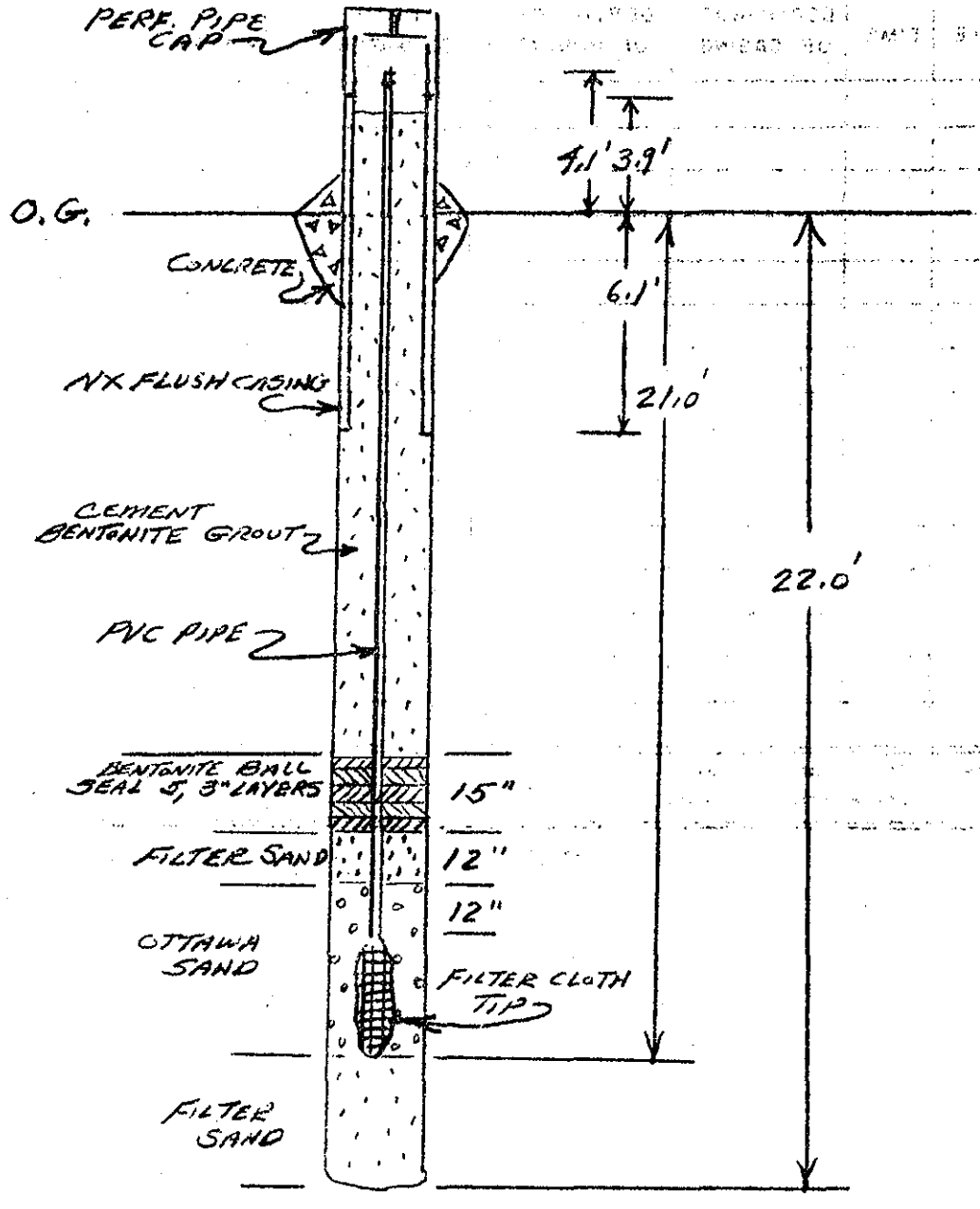
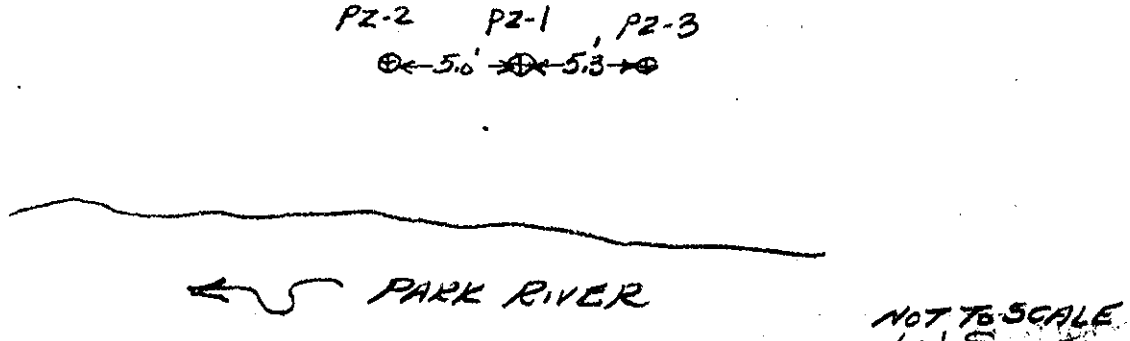
PARK RIVER CONDUIT EXT. HARTFORD CONN.
2/15/72





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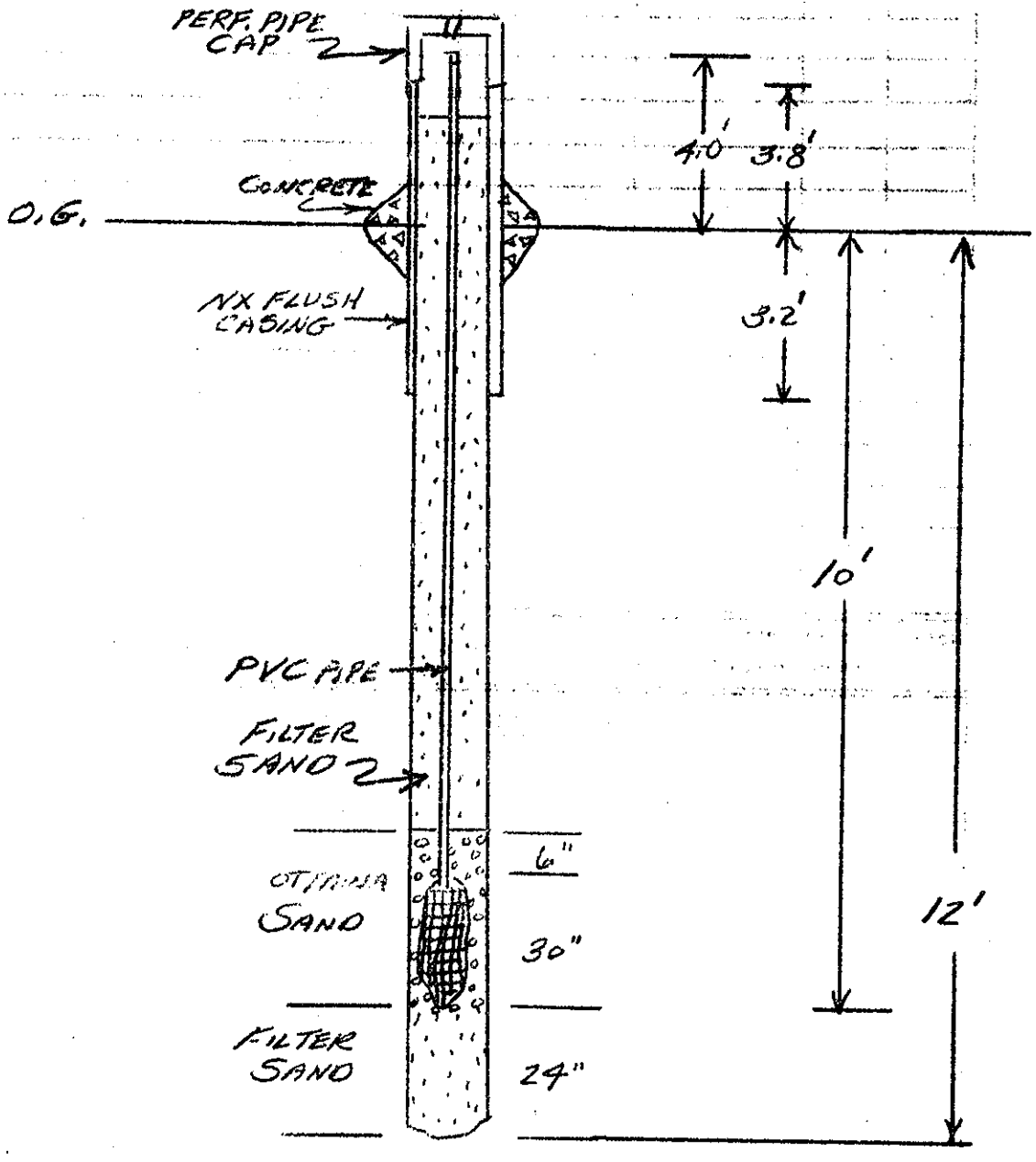
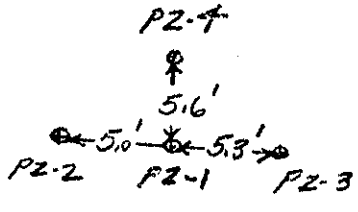
, FZON TER. #PZ-4
PARK RIVER CONDUIT EXT. HARTFORD, CONN.
2/16/72



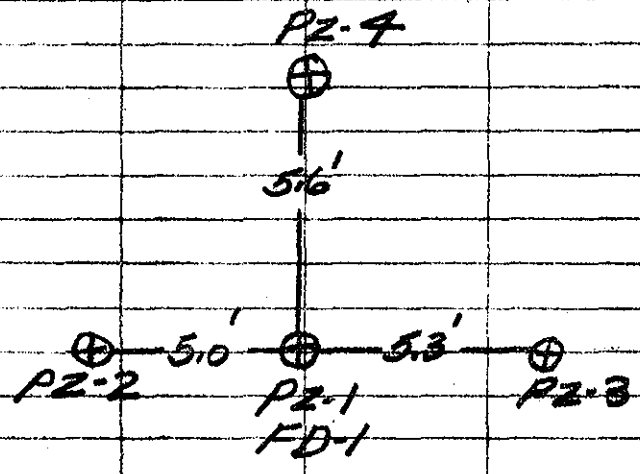


NOT TO SCALE

PIEZOMETER INSTALLATION AT PROPOSED PARK RIVER CONDUIT EXT.

2/16/92

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS



PARK RIVER

NOT TO SCALE

W. SWIFT

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site PARK RIVER CONDUIT EXT. HARTFORD, CONN. — Page 1 of 6 Pages

Hole No. FD-2 Desig. P4-2 Diam. (Casing) NX F.C.

Co-ordinates: N 149,557 E 143,344

Elevation Top of Boring 53.1 M.S.L.
Total Overburden Drilled 43.8 Feet
Elevation Top of Rock 9.3 M.S.L.
Total Rock Drilled 20.2 Feet
Elevation Bottom of Boring -10.9 M.S.L.
Total Depth of Boring 64.0' Feet
Core Recovered 78.2 % No. Boxes 2
Core Recovered 15.8 Ft. NX Diam. 2 1/8 in.
Soil Samples 2 1/2 in. Diam. 1 No.
Soil Samples 2 in. Diam. 16 No.

Hammer Wt. 350# Boring Started 1/25/72
Hammer Drop 18" Boring Completed 2/3/72
Casing Left NONE
Avg. Subsurface Water Depth ____ Elev. ____
Obs. Well NONE (FINNERTY)
Drilled By U.S. ARMY CORP OF ENGS.
Mfg. Des. Drill CP-3
Inspected By: W. SWIFT
Classification By: [redacted]
Classification By: AMPLIFICATIONS BY LABORATORY CLASSIFIER [redacted] KLB

DEPTH (1" = 2')	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
0.8'	NO SAMPLE	2 1/2"	0.0 0.8	3	DROVE 2 1/2" ID X 5' SOLID SPOON FROM	No Sample
2	J1 (2 JARS)	2 1/2"	0.8 5.0	10, 23, 27	0.0' TO 5.0' & TOOK SAMPLE. 40% REC, HOLE OPEN TO 5.0'	Varved, reddish-brown, CLAY (CL), and light brown to tan, SILT (ML), layers ranging from paper thickness to approx. 1/8" thickness, with occasional pieces of gravel, and vegetation
4				35	DROVE 2" ID X 5' SOLID SPOON FROM 5.0' TO	
5.0'				8	10.0' & TOOK SAMPLE 100% REC'Y.	Medium compact and medium stiff, reddish-brown, varved CLAY (CH), and lt. tan to brown & reddish-brown SILT (ML); layers vary in thickness from paper thickness to 1", occ. very thin (too thin for megascopic measurement) sandy strata.
6				13	JETTED NX FLUSH CASING FROM 0.0' TO 10.0'	
8	J2 (2 JARS) B3	2"	5.0 10.0	19, 22, 30		
10.0'						

GENERAL REMARKS: BORING LOCATED ON GRASSY AREA, ON SLOPE, WITH SCATTERED HARDWOODS IN AREA.

NED FORM 58 (Test) MAR. 71

Boring No. FD-2

Site: PARK RIVER CONDUIT EXT. HARTFORD, CONN.	Boring No. FD-2	Page 2 of 6

DEPTH 1" = 2	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
12, 14	J4 (2JARS) B5	2"	10.0' 15.0'	4, 6, 7, 9, 11	DROVE 2" ID X 5' SOLID SPOON FROM 10.0' TO 15.0' & TOOK SAMPLE. 100% REC. JETTED NX FLUSH CASING FROM 10.0' TO 15.0'	Medium compact and medium stiff, reddish-brown, varved CLAY (CH), and lt. tan to brown reddish-brown SILT (ML); layers vary in thickness from paper thickness to approx. 1"; occ. very thin (too thin for megascopic measurement) sandy strata.
15.0', 16, 18	J6 (2JARS) B7	2"	15.0' 20.0'	WT. OF TOOLS, 1, 2, 3, 4, 5	DROVE 2" ID X 5' SOLID SPOON FROM 15.0' TO 20.0' & TOOK SAMPLE. 100% REC. JETTED NX FLUSH CASING FROM 15.0' TO 20.0'	
20, 22, 24	J8 (2JARS) B9	2"	20.0 - 25.0	WT. OF TOOLS, WEIGHT OF TOOLS PLUS HAMMER, 2, 5, 6	DROVE 2" ID X 5' SOLID SPOON FROM 20.0' TO 25.0' & TOOK SAMPLE. 100% REC. JETTED NX FLUSH CASING TO 25.0' DROVE 2" ID X 5' SOLID SPOON FROM 25.0' TO 30.0' & TOOK SAMPLE. 100% REC.	
25, 26	J10 (2JARS) B11	2"	25.0' 30.0'	3, 3	JETTED NX FLUSH CASING FROM 25.0' TO 30.0'	

Site: FOX RIVER CONDUIT EXT. HARTFORD, CONN.	Boring No. FD-2	Page 3 of 5

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. OR CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	1 • 2'						
			2"	25.0' 30.0'	3		
					4		
					6	DROVE 2" I.D X 5' SOLID SPOON FROM 30.0' TO 35.0' & TOOK SAMPLE.	
30.0'						100% REC'Y.	
					WEIGHT OF TOOLS	JETTED NX FLUSH CASING FROM 30.0' TO 35.0'	
		J12 (2 JARS) B13	2"	30.0' 35.0'	3		
					3	DROVE 2" I.D X 5' SOLID SPOON FROM 35.0' TO 40.0' & TOOK SAMPLE.	
					4	80% REC'Y.	
35.0'							
		J14 (2 JARS)	2"	35.0' 36.7'	WT. OF TOOLS PLUS HAMM.	JETTED NX FLUSH CASING FROM 35.0' TO 40.0'	
					1		
					9		
36.7'							
					9		Stiff to very hard, reddish-brown, gravelly, sandy, silty CLAY (CL-ML)
					39		
		J15	2"	36.7' 40.0'	82		
					94		
40.0'							
						CONTINUED ON PAGE 4 →	

Site: PARK RIVER CONDUIT EXT. HARTFORD, CONN.	Boring No. FD-2	Page 4 of 6

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	1"=2'						
						CONTINUED FROM Pg. 3 →	
40.0'		J16	2"	40.0' 43.0'	36 / 71 / 77	DROVE 2" ID X 5' SOLID SPOON FROM 40.0' TO 43.8' & TOOK SAMPLE. 100% REC. REFUSAL @ 43.8' 100 BLOWS NO PENETRATION. DRILLED NX FLUSH CASING FROM 40.0' TO 43.8' W/NX DIAMOND SHOE.	Stiff to very hard, reddish-brown, gravelly (10-20), sandy (30-40), silty CLAY, (CL-ML)
43.0'		J17	2"	43.0' 43.8'	210	ROTARY DIAMOND DRILLED NX 5.0' "M" SERIES CORE	Weathered Rock TOP OF ROCK
43.8'		Box #1	NX "M"	43.8 45.7	RUN 1.9 REC. 1.3 68%	BARREL FROM 43.8' TO 45.7' FEED 300 P.S.I. TIME 33 MIN. WATER RED BROWN HOLDING BLOCKED. NX "M" BIT #91R1047	SHALE, red moderately hard fine grained, unweathered to slightly weathered along numerous clay filled and calcite coated joints which dip at 60° to 70°. Very thin, fine grained Cross-bedded Sandstone zones 50.0' to 57.0'. Major bedding is obscure but essentially horizontal, Calcareous 70° dip Joints at 53.0', 54.0', 54.9' and 55.4'. Voids along Joints 1/8" to 1/4" wide.
45.7'					RUN 9.9 REC. 8.4 43%	FEED 300 P.S.I. TIME 20 MIN. BLOCKED WATER RED BROWN HOLDING NX "M" SERIES #91R1047	
46.6		Box #1	NX	46.6 49.9	RUN 3.3 REC. 2.1 63%	ROTARY DIAMOND DRILLED NX 5.0' CORE BARREL FROM 46.6' TO 49.9' FEED 300 P.S.I. TIME 40 MIN. BLOCKED WATER REDISH BROWN HOLDING. NX BIT # 03B65 ROTARY DIAMOND DRILLED	
49.9'		Box #1	NX	49.9 54.9	RUN 5.0' REC. 4.1 82%	NX 5.0' CORE BARREL FROM 49.9' TO 54.9'. 100% LOSS OF WATER @ 53' FEED 300 P.S.I. TIME 45 MIN. WATER REDISH BROWN HOLDING TO 100% LOSS @ 53' NX BIT # 03B65 ROTARY DIAMOND DRILLED NX 5.0' CORE BARREL	
54.9'		Box #1	NX	54.9 59.1		FROM 54.9' TO 59.1'	

Site: RK RIVER CONDUIT EXT. HARTFORD, CONN.

Boring No. FD-2

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	1" = 2'						
						FEED 300 P.S.I.	
						TIME 50 MIN.	
					RUN	WATER LOSING 100%	
					4.2	BLOCKED.	
		BOX #1	NX	54.9' 59.1'	REC.	NX BIT # 03865	
					4.0	ROTARY DIAMOND DRILLED FROM 59.1' TO 60.0' BLOCKED.	
					95%	FEED 300 P.S.I.	Thick, soft weathered clay Zones 59.1 to 60.0' Irregular vertical Joint 63.0' to 64.0'.
						TIME 20 MIN.	
						WATER LOSING 100%	
59.1'							
		BOX #2	NX	59.1' 60.0'	RUN 0.9 REC. 0.5	NX BIT # 03865	
60.0'					56%	ROTARY DIAMOND DRILLED	
						NX 5.0' CORE BARREL FROM 60.0' TO 64.0' END OF RUN.	
					RUN	FEED 300 P.S.I.	
					4.0	TIME 55 MIN.	
						WATER-LOSING 100% TO	
		BOX #2	NX	60.0' 64.0'	REC.	RETURN @ 60.3' & IMMEDIATE	Water Loss 100% 53.0' to 63.5'
					3.4	LOSS AGAIN @ 60.3'	
						RETURNING @ 63.5' REDISH	
					85%	BROWN & HOLDING.	
64.0'							
						BOTTOM OF EXPLORATION @ 64.0'	
						BOTTOM ELEVATION PREDETERMINED	

NED FORM 58A (Test) MAR 71

Boring No. FD-2

PARK RIVER CONDUIT EXT.

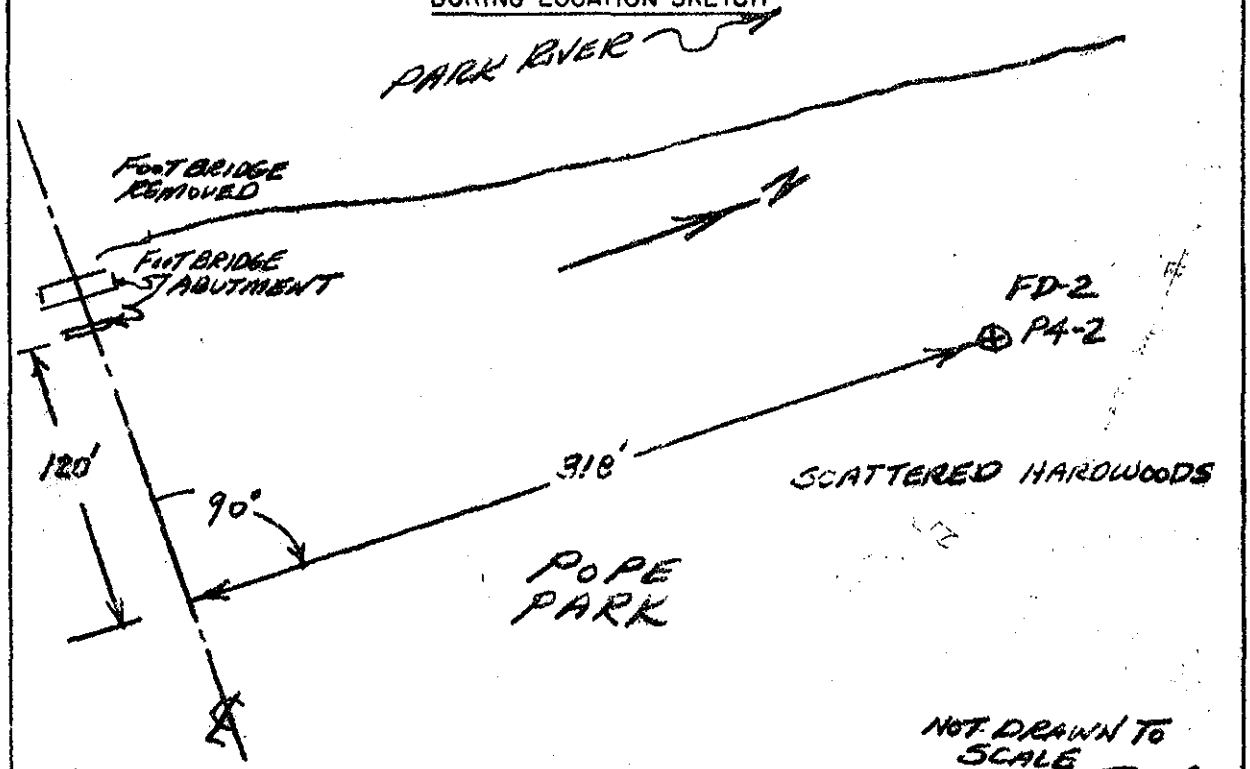
Site: HARTFORD, CONN.
Boring No: FD-2

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
1/25	1600	10.0'	10.0'	DRY		READING AFTER DRIVING CASING
1/26	0800	10.0'	10.0'	DRY		READING BEFORE CLEANING CASING.
1/26	1600	25.0'	25.0'	0.4'		READING 15 MIN. AFTER DRILLING.
1/27	0800	25.0'	25.0'	5.1'		READING BEFORE DRILLING
1/27	1600	40.0'	43.8'	1.4'		READING 15 MIN. AFTER DRILLING.
2/2	1200	43.8'	49.9'	27.7'		READING 30 MIN. AFTER DRILLING.
2/3	0800	43.8'	60.0'	31.5'		READING BEFORE DRILLING

Note: Depths are in feet below original ground

BORING LOCATION SKETCH



B-6

Test)

Boring No. FD-2

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site PARK RIVER CONDUIT E.T. HARTFORD, CONN. Page 1 of 5 Pages
Hole No. FD3 Desig. CP-3 Diam. (Casing) NX F.C.
Co-ordinates: N 149,138 E 163,092

Elevation Top of Boring 39.1 M.S.L.
Total Overburden Drilled 33.2 Feet
Elevation Top of Rock 5.9 M.S.L.
Total Rock Drilled 16.8 Feet
Elevation Bottom of Boring -10.9 M.S.L.
Total Depth of Boring 50.0' Feet
Core Recovered 84.5 % No. Boxes 2
Core Recovered 14.2' Ft. NX Diam. 2 1/8 In.
Soil Samples 2" In. Diam. 8 No.
Soil Samples 2 1/2" In. Diam. 1 No.

Hammer Wt. 350# Boring Started 2/17/72
Hammer Drop 18"
Casing Left NONE Boring Completed 2/23/72
Avg. Subsurface Water Depth ____ Elev. ____
Obs. Well NONE (FINNERTY)
Drilled By U.S. ARMY CORP OF ENGS. N.E.D.
Mfg. Des. Drill CP-3
Inspected By: W. SWIFT
Classification By: [redacted]
Classification By: AMPLIFICATIONS BY LABORATORY
CLASSIFIER [redacted]
CLASSIFICATION OF MATERIALS

DEPTH	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
1" = 2'						
2	J1	2 1/2"	0.0' 5.0'	40, 18, 17, 20, 24	DROVE 2 1/2" IDX5' SOLID SPOON FROM 0.0' TO 5.0' & TOOK SAMPLE. 25% REC'Y. HOLE OPEN TO 5.0'	Loose, reddish-brown, silty, sandy, GRAVEL, pieces of brick and glass, moist, (Fill)
4						
5.0'						
6	J2	2"	5.0' 10.0'	6, 7, 8, 10, 11	DROVE 2" IDX5' SOLID SPOON FROM 5.0' TO 10.0' & TOOK SAMPLE. 25% REC'Y. JETTED NX FLUSH CASING FROM 0.0' TO 10.0'	Soft, reddish-brown, gravelly, sandy, clayey SILT, layer of silty CLAY, with layer of Ashes, moist, (Fill)
8						
10.0'						

GENERAL REMARKS: BORING LOCATED ON FILL AREA AT TOP OF EMBANKMENT.

NED FORM 58 MAR 71 (Test)

Boring No. FD-3

Site: PA RIVER CONDUIT EXT. HARTFORD, CONN.	Boring No. FD-3	Page 2 of 5

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	1"=2'						
		J3	2"	10.0' 10.8'	3	DROVE 2" ID X 5' SOLID SPOON FROM 10.0' TO	Soft, reddish-brown, clayey SILT (ML), and gray silty CLAY (CL) stratified or varved, with roots and pieces of wood, moist, (Probable Fill mixed)
10.8'						15.0' & TOOK SAMPLE. 40% REC'Y.	
					4	JETTED NX FLUSH CASING FROM 10.0' TO 15.0'	
		J4 (2 JARS)	2"	10.8' 15.0'	3		Soft, reddish-brown sandy, clayey, SILT (ML), and gray brown, silty, CLAY (CL), stratified layers, moist, roots
					5		
					7		
15.0'					WEIGHT OF TOOLS PLUS HAMMER	DROVE 2" ID X 5' SOLID SPOON FROM 15.0' TO 20.0' & TOOK SAMPLE. 65% REC'Y.	Soft, stratified layers of brown sandy SILT, (ML), and layers of (roots, leaves) organics, moist to wet.
					2	JETTED NX FLUSH CASING FROM 15.0' TO 20.0'	
		J5 (2 JARS)	2"	15.0' 20.0'	5		
					7		
					7	DROVE 2" ID X 5' SOLID SPOON FROM 20.0' TO	
20.0'		J6 (2 JARS)	2"	20.0' 21.0'	1	25.0' & TOOK SAMPLE. 60% REC'Y.	same as above.
21.0'					2	JETTED NX FLUSH CASING FROM 20.0' TO 21.0'	Soft, reddish-brown gravelly, sandy, CLAY (CL), moist.
		J7 (2 JARS)	2"	21.0' 25.0'	3		
					5		
					6	DROVE 2" ID X 5' SOLID SPOON FROM 25.0' TO 30.0' & TOOK SAMPLE.	
25.0'					24	20% REC'Y. JETTED NX FLUSH CASING FROM 25.0' TO 30.0'	same as above
		J8	2"	25.0' 30.0'	39		

Test)

Boring No. FD-3

Site: PA RIVER CONDUIT EXT. HARTFORD, CONN.

Boring No. FD-3

DEPTH	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
28		2"	25.0' 30.0'	31 52 95	DROVE 2" ID X 5' SOLID SPOON FROM 30.0' TO 33.0' REFUSAL @ 33.0	same as above.
30.0' 32	J9	2"	30.0' 33.0'	25 87 141	100 BLOWS NO PENETRATION. TOOK SAMPLE, 30% REC'Y. CHOPPED & WASHED FROM 33.0' TO 33.2', WASH SPOON BOUNCING @ 33.2' JETTED NX FLUSH CASING FROM 30.0' TO 33.2'	Compact, reddish-brown, sandy, clayey, GRAVEL (GC), Till, moist.
33.0' 33.2'	None		28.0 33.2			Top of Rock
34 36 38	Box #1	NX	33.2' 38.2'	RUN 5.0' REC. 4.3' 86%	ROTARY DIAMOND DRILLED NX 5.0' CORE BARREL, FROM 33.2' TO 38.2' END OF RUN @ 38.2' FEED 300 P.S.I. TIME 90 MIN. WATER REDISH BROWN HOLDING. NX BIT # 03B65 ROTARY DIAMOND DRILLED NX 5.0' CORE BARREL	SHALE, red-brown moderately hard fine grained, fresh. Scattered, slightly weathered joints dip 45°± throughout. Zones of thin-cross-bedded sandstone. Locally calcareous. Bedding generally obscure but where apparent dip 22°±.
38.2' 40	Box #1	NX	38.2 41.6	RUN 3.4 REC. 2.2 65%	FROM 38.2' TO 41.6' BLOCKED @ 41.6' FEED 300 P.S.I. TIME 70 MIN. WATER REDISH BROWN HOLDING. NX BIT # 03B65 ROTARY DIAMOND DRILLED	
41.6'	Box #1	NX	41.6 46.1	RUN 4.5 REC 3.9 89%	NX 5.0' CORE BARREL FROM 41.6' TO 46.1' BLOCK @ 46.1 FEED 300 P.S.I. TIME 75 MIN. WATER REDISH BROWN HOLDING. NX BIT # 03B65	

NED FORM 55BA (Test) MAR 71

Boring No. FD-3

Site: PA X RIVER CONDUIT EXT. HARTFORD, CONN.	Boring No. FD-3	Page 4 of 5

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	1"=2'	Box #1	NX	41.6 46.1		ROTARY DIAMOND DRILLED NX 5.0' CORE BARREL	Soft clay in fracture zones 49.4' to 49.8'
46.1'					RUN 3.9	FROM 46.1' TO 50.0' BLOCKED @ 50.0' FEED 300 P.S.I. TIME 90 MIN. WATER-REDISH BROWN HOLDING. NX BIT # 08365	
		Box #2	NX	46.1' 50.0	REC. 3.8		
					97%		
50.0'						BOTTOM OF EXPLORATION — BOTTOM ELEVATION PREDETERMINED.	

PARK RIVER CONDUIT EXT.

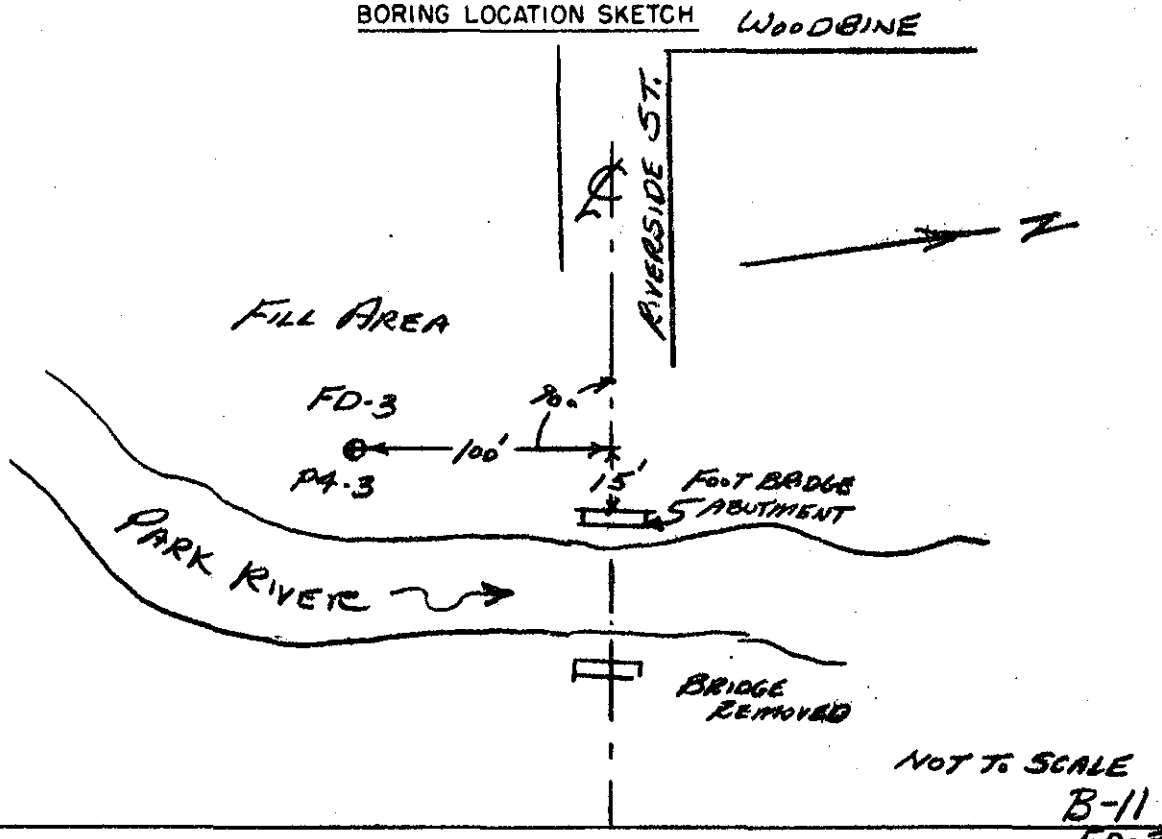
Site: HARTFORD, CONN.
Boring No: FD-3

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
2/18	1600	33.2'	38.2'	12.6'		READING 30 MIN. AFTER DRILLING.
2/22	0800	33.2'	38.2'	13.2'		READING BEFORE DRILLING
2/23	0800	33.2'	38.2'	12.8'		READING BEFORE DRILLING
2/23	1600	33.2'	50.0'	9.9'		READING 15 MIN. AFTER DRILLING.
2/24	0800	33.2'	50.0'	11.8'		READING BEFORE PULLING CASING.

Note: Depths are in feet below original ground

BORING LOCATION SKETCH



B-11

NED FORM 59 (Test)

Boring No. FD-3

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site PARK RIVER CONDUIT EXT. HARTFORD, CONN Page 1 of 5 Pages
Hole No. FD-4 Desig. P4-4 Diam. (Casing) NX E.C.
Co-ordinates: N 149,542 E 163,116

Elevation Top of Boring 36.6 M.S.L.
Total Overburden Drilled 39.0 Feet
Elevation Top of Rock -2.4 M.S.L.
Total Rock Drilled 21.0 Feet
Elevation Bottom of Boring -23.4 M.S.L.
Total Depth of Boring 60.0' Feet
Core Recovered 79.5% No. Boxes 2
Core Recovered 16.7 Ft. NX Diam. 2 1/8 in.
Soil Samples 2 1/2 in. Diam. 1 No.
Soil Samples 2 in. Diam. 10 No.

Hammer Wt. 350# Boring Started 2/28/72
Hammer Drop 18" Boring Completed 3/6/72
Casing Left NONE
Avg. Subsurface Water Depth _____ Elev. _____
Obs. Well NONE (FINNERTY)
Drilled By U.S. ARMY CORP OF ENGS.
Mfg. Des. Drill S&H 40C
Inspected By: SWIFT
Classification By: [redacted]
Classification By: AMPLIFICATIONS BY LABORATORY CLASSIFIER [redacted]

DEPTH	1"=2'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
0.4	NO SAMPLE	NO SAMPLE	2 1/2"	0.0 0.4		DROVE 2 1/2" IDX5' SOLID	Bituminous Concrete
					111	SPOON FROM 0.0' TO 5.0' & TOOK SAMPLE. 50% REC. HOLE OPEN TO 5.0'	Compact, brown & dark brown, sandy SILT, Gray-brown layer of Clay, brick, ashes, coal, moist, (Fill)
					47		
		J1	2 1/2"	0.4', 5.0'	28		
					28		
					51		
5.0', 5.3		J2	2"	[illegible]		DROVE 2" IDX5' SOLID	concrete frgs and metal (Fill)
					10	SPOON FROM 5.0' TO 10.0' & TOOK SAMPLE. 20% REC'Y. JETTED NX FLUSH CASING FROM 0.0' TO 10.0'	Loose to med. compact reddish-brown, sandy SILT (ML) moist.
					10		
		J3 (8 JARS)	2"	5.3', 10.0'	15		
					20		
					27		

GENERAL REMARKS: BORING LOCATED ON FLAT FILL AREA ADJACENT TO PARK RIVER.

NED FORM 58 (Test) MAR 71

Boring No. FD-4

Site: PARK RIVER CONDUIT EXT. HARTFORD, CONN.

Boring No. FD-4

DEPTH (Ft. 2')	CORE/SAMPLE No.	SIZE	DEPTH RANGE	BLOWS PER FT. OR CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
				13	DROVE 2" ID X 5' SOLID SPOON FROM 10.0' TO 15.0' & TOOK SAMPLE. 40% REC'Y. JETTED NX FLUSH CASING FROM 10.0' TO 15.0'	Medium compact, reddish-brown, sandy, clayey, SILT, (ML), moist.
				17		
12	J4 (2 JARS)	2"	10.0' 15.0'	24		
				22		
14				29		
15.0'				NIGHT OF TOOLS	DROVE 2" ID X 5' SOLID SPOON FROM 15.0' TO 20.0' & TOOK SAMPLE. 100% REC'Y. JETTED NX FLUSH CASING FROM 15.0' TO 20.0'	Soft, reddish-brown silty CLAY (CH), stratified with thin layers of SILT (ML), very sticky, moist. W.C. { CLAY = 62.1% SILT = 50.4%
16				WEIGHT OF TOOLS PLUS HAMMER		
	J5 (2 JARS)	2"	15.0' 20.0'			
18	B6				DROVE 2" ID X 5' SOLID SPOON FROM 20.0' TO	
20.0'						
	J7 (2 JARS)	2"	20.0' 21.5'	WEIGHT OF TOOLS	25.0' & TOOK SAMPLE. 80% REC'Y. JETTED NX FLUSH CASING FROM 20.0'	Same as above W.C. { CLAY = 63.0% SILT = 46.0%
21.5'				PLUS HAMM.	TO 25.0'	Soft to Med. compact reddish-brown silty-clayey, gravelly, SAND (SC), moist to wet (TILL)
22				6		
	J8 (2 JARS)	2"	21.5' 25.0'	20		
24				28	DROVE 2" ID X 5' SOLID SPOON FROM 25.0' TO 30.0' & TOOK SAMPLE. 70% REC'Y.	
25.0'						
26	J9 (2 JARS)	2"	25.0' 30.0'	10	JETTED NX FLUSH CASING FROM 25.0' TO 30.0'	Same as above W.C. = 11.7%
				19		

Site: FORK RIVER CONDUIT EXT. HARTFORD, CONN.	Boring No. FD-4	Page 3 of 5

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	28		2"	25.0' 30.0'	35 62 73	DROVE 2" ID X 5' SOLID SPOON FROM 30.0' TO 35.0' & TOOK SAMPLE. 40% REC'Y.	same as above
30.0'					46 47	JETTED NX FLUSH CASING FROM 30.0' TO 35.0'	Compact, reddish-brown, silty, gravelly, SAND (SM), moist (Till)
		J10 (2 JARS)	2"	30.0' 35.0'	40 36 90	DROVE 2" ID X 5' SOLID SPOON FROM 35.0' TO 36.8' & TOOK SAMPLE. SAMPLE SPOON BOUNCING, 100% REC'Y. CHOPPED & WASHED FROM 36.8' TO 37.3'	W.C. = 8.9%
35.0		J11 (2 JARS)	2"	35.0 36.8	130 275	JETTED NX FLUSH CASING FROM 35.0' TO 37.3'	same as above.
36.8'						ROTARY DIAMOND DRILLED	
37.3'		NO SAMPLE		36.8 37.3		FROM 37.3' TO 40.0'	
		Box 1#	NX	37.3' 39.0'		W/NX 5' CORE BARREL FEED 175 LBS. TIME 25 MIN. WATER GREY BROWN HOLDING BLOCKED @ 40.0'	
39.0'		Box #1	NX	39.0' 40.0'	RUN 1.0 REC. 0.7 70%	NX BIT # 81B161	SHALE, dark gray, moderately hard, very fine grained, unweathered slightly weathered along widely scattered joints which dip at 60°. Bedding obscure.
40.0'						ROTARY DIAMOND DRILLED	
		Box #1	NX	40.0 45.0	RUN 5.0' REC. 4.2' 84%	W/NX 5' CORE BARREL FROM 40.0' TO 45.0' FEED 175 LBS. TIME 40 MIN. WATER GREY BLACK & WHITE MIXED. END OF RUN @ 45.0' NX BIT # 81B161	

Site: FOX RIVER CONDUIT EXT. HARTFORD, CONN.	Boring No. FD-4	Page 4 of 5

DEPTH	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
			40.0 45.0			
45.0				RUN 5.0	ROTARY DIAMOND DRILLED NX 5' CORE BARREL FROM 45.0' TO 50.0' FEED 175 LBS. TIME 25 MIN.	
	Box #1	NX	45.0 50.0	REC. 2.7	WATER- GREY BLACK & WHITE MIXED, HOLDING END OF RUN @ 50.0' NX BIT # 81B161	Color change to black 48.3' to 50.0'
				54%		Slightly weathered zone @ 53.6
50.0				RUN 5.0	ROTARY DIAMOND DRILLED NX 5' CORE BARREL FROM 50.0' TO 55.0' FEED 175 LBS. TIME 34 MIN.	
	Box #2	NX	50.0 55.0	REC. 4.8	WATER-GREY W/BROWN STREAKS HOLDING END OF RUN @ 55.0' NX BIT # 81B161	
				96%		SANDSTONE, light gray, moderately hard, unweathered. Conspicuous cross-bedding with variable dips. Calcareous.
55.0				RUN 5.0	ROTARY DIAMOND DRILLED NX 5' CORE BARREL FROM 55.0' TO 60.0' FEED 175 LBS. TIME 25 MIN.	
	Box #2	NX	55.0 60.0	REC. 4.3	WATER-GREY TO REDISH BROWN HOLDING END OF RUN @ 60.0' NX BIT # 81B161	SHALE, red-brown moderately hard fine grained unweathered. Weathered vertical seam at 58.0' scattered thin veins of calcite.
				86%		
60.0					BOTTOM OF EXPLORATION @ 60.0 BOTTOM ELEVATION PREDETERMINED.	

PARK RIVER CONDUIT EXT.

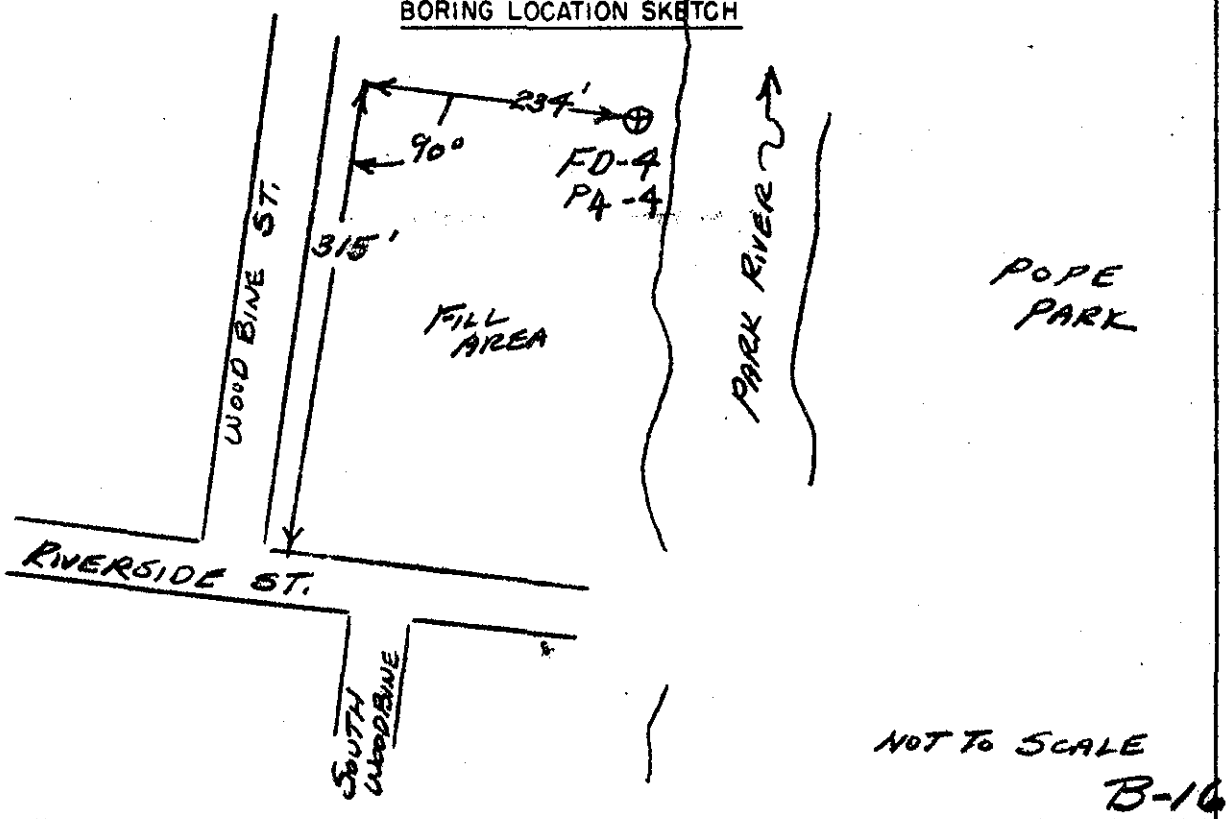
Site: HARTFORD, CONN.
Boring No: FD-4

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
2/29	1600	25.0'	25.0'	0.6'		READING 15 MIN. AFTER DRILLING
3/1	0800	25.0'	25.0'	11.5'		READING BEFORE DRILLING
3/1	1600	37.3'	37.3'	6.8'		READING 15 MIN. AFTER DRILLING.
3/2	0800	37.3'	37.3'	15.6'		READING BEFORE DRILLING
3/2	1600	37.3'	50.0'	9.0'		READING 15 MIN. AFTER DRILLING.
3/6	0800	37.3'	50.0'	11.6'		READING BEFORE DRILLING
3/6	1200	0.0	60.0'	3.8'		READING AFTER PULLING CASING.

Note: Depths are in feet below original ground

BORING LOCATION SKETCH



B-16

NED FORM 59 (Test)

Boring No. FD-5

PARK RIVER CONDUIT EXT.

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site HARTFORD, CONN Page 1 of 6 Pages
Boring No. FD-5 Desig. P-#7-2 Diam. (Casing) NX-FC
Co-ordinates: N 149,270 E 162,200

Elevation Top of Boring 39.5 M.S.L.* Hammer Wt. 350# Boring Started 3/1/72
Total Overburden Drilled 55.2 Feet Hammer Drop 18" Boring Completed 3/16/72
Elevation Top of Rock -15.7 M.S.L. Casing Left NONE
Total Rock Drilled 19.7 Feet Subsurface Water Data _____ Page 6
Elevation Bottom of Boring -35.4 ± M.S.L. Obs. Well NONE
Total Depth of Boring 74.9 Feet Drilled By CORPS OF ENGINEERS
Core Recovered 88.3 % No. Boxes 2 Mfg. Des. Drill CP-5
Core Recovered 17.4 Ft: NX Diam. 2 1/8 In. Inspected By: A. MERRILL
Soil Samples 2 1/2 In. Diam. 1 No. Classification By [redacted]
Soil Samples 2 In. Diam. 16 No. Classification By AMPLIFICATIONS BY LABORATORY CLASSIFIER [redacted]

DEPTH	1" = 2'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	2	J-1 (2 JARS)	2 1/2	0.0 TO 5.0	5, 8, 10, 17, 18	DROVE 2 1/2" I.D. X 5.0' SOLID SAMPLE SPOON 0.0' TO 5.0' & TOOK SAMPLE. REC. 100%. HOLE REMAINED OPEN.	Soft, gray-brown, stratified layers of sandy, silty, CLAY (CL) moist, roots (Probable Fill)
5.0	4						
	6	J-2 (2 JARS)	2"	5.0 TO 10.0	7, 9, 13, 12, 15	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 5.0' TO 10.0' & TOOK SAMPLE. REC. 80% JETTED NX-FC CSG FROM 0.0' TO 10.0'.	Same as above with coal & cinders (probable Fill)
10.0	8, 10						

GENERAL REMARKS: * TAKEN FROM PLAN CONTOURS. LOCATED NEXT TO NORTH BRANCH - PARK RIVER.

NED FORM 58 (Test) MAR 71 Boring No. FD-5

Site: PARK RIVER CONDUIT EXT. HARTFORD, CONN.	Boring No. FD-5 P-#7-2	Page 2 of 6

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
10.0	10				5	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 10.0' TO 15.0' & TOOK SAMPLE. REC. 30%	Soft, reddish-brown, stratified layers of sandy, silty, CLAY, (CH), (small amount of Gravel), moist
	12	J-3 (2 JARS)	2"	10.0 TO 15.0	9		
					6	JETTED NX-FC CSG FROM 10.0' TO 15.0'	
	14				4		
					4		
15.0					1	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 15.0' TO 20.0' & TOOK SAMPLE. REC. 100%	Soft, gray, sandy, SILT (ML), with roots and wood fibers, moist to wet.
	16	J-4 (2 JARS)	2"	15.0 TO 20.0	2		
					4	JETTED NX-FC CSG FROM 15.0' TO 20.0'	
18.0	18	J-5 (2 JARS)	2"	18.0 TO 20.0	4		Soft, reddish-brown, CLAY, (CH), stratified with layers of gray SILT (ML), moist to wet. W.C. { CLAY = 59.9% SILT = 53.8%
					4		
20.0	20				WGT. TOOLS	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 20.0' TO 25.0' & TOOK SAMPLE. REC. 100%	
	22	J-6 (2 JARS) B-7	2"	20.0 TO 25.0	1		Same as above.
	24				WEIGHT OF TOOLS + HAMMER	JETTED NX-FC CSG FROM 20.0' TO 25.0'	
25.0	26				WGT. TOOLS	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 25.0' TO 30.0' & TOOK SAMPLE. REC. 100%	
					WGT. TOOLS + HAMMER		

Site: PARK RIVER CONDUIT EXT. HARTFORD, CONN.

Boring No. FD 5 P-#7-2

DEPTH (1" = 2')	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
27, 29	J-8 (2 JARS) B-9	2"	25.0 TO 30.0	WEIGHT OF TOOLS & HAMMER	JETTED NX-FC CSG FROM 25.0' TO 30.0'.	Same as above (wet)
30.0, 31, 33	J-10 (2 JARS) B-11	2"	30.0 TO 35.0	WGT. OF TOOLS; WGT. TOOLS + HAMMER; 1; 2; 2'	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 30.0' TO 35.0' & TOOK SAMPLE. REC. 100%. JETTED NX-FC CSG FROM 30.0' TO 35.0'.	Same as above (wet)
35.0, 35, 37	J-12 (2 JARS) B-13	2"	35.0 TO 37.9	WGT. TOOLS; TOOLS + HAMMER; 3; 8	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 35.0' TO 40.0' & TOOK SAMPLE. REC. 100%. ~~JETTED NX-FC CSG~~	Same as above, (wet)
37.9, 39, 40.0	J-14 (2 JARS)	2"	37.9 TO 40.0	17; 16	FROM 35.0' TO 40.0'.	Medium compact to compact, reddish-brown, silty-clayey, gravelly, SAND (SC), moist (Till)
41, 43	J-15 (2 JARS)	2"	40.0 TO 45.0	8; 37; 33; 58	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 40.0' TO 45.0' & TOOK SAMPLE. REC. 100%. JETTED NX-FC CSG FROM 40.0' TO 45.0'.	Same as above W.C. 9.3%

Site: PARK RIVER CONDUIT EXT. HARTFORD, CONN.	Boring No. FD-5 P-#7-2	Page 4 of 6

DEPTH	1" = 2'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	44				81		
45.0	46	J-16 (2 JARS)	2"	45.0 TO 48.0	18 / 103	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 45.0' TO 48.0' & TOOK SAMPLE. REC. 100%	Compact, reddish-brown, silty-clayey, gravelly, SAND (SM), moist, (Till)
48.0	48				341	WASHED & CHOPPED FROM 48.0' TO 49.7'. NO CHANGE IN MATL INDICATED BY WASH WATER. JETTED NX-FC CSG FROM 45.0' TO 49.7'.	
49.7		WASHED & CHOPPED		48.0 TO 49.7		DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 49.7' TO 50.0' & TOOK SAMPLE. REC. 100%	same as above
50.0	50	J-17	2"	49.7/50.0	240	DROVE 1½" I.D. X 5.0' SOLID SAMPLE SPOON 50.0' TO 52.2' & TOOK SAMPLE. REC. 100%.	same as above W.C. = 10.3%
		J-18	1½	50.0 TO 52.2	32 / 85	REFUSAL @ 52.2'.	
52.2	52				300	ROTARY DRILLED W/NX STANDARD BIT 52.2 TO 53.0'. NO REC. - BIT #03B64. WASH WATER & DRILL BEHAVIOR CONTINUED TO INDICATE SAME TILL.	
53.0	54	WASHED & CHOPPED		53.0 TO 55.0		JETTED NX-FC CSG FROM 49.7' TO 53.0'. WASHED & CHOPPED FROM 53.0' TO 55.0'. NO CHANGE IN MATL. JETTED NX-FC CSG FROM 53.0' TO 55.0'. DROVE 1½" I.D. X 5.0' SOLID SAMPLE SPOON 55.0'-55.2'. REC. 100%, REF @ 55.2'.	same as above.
55.2	56	CORE BOX #1	NX	55.2 TO 57.0	RAN 1.8' REC. 1.1' 100%	DRILLED W/NX STANDARD BIT #03B64. HYD. FEED. - 20 MIN DRILL TIME - REDDISH BROWN WATER & HOLDING - BIT BLOCKED.	TOP of ROCK ↗ SHALE, red-brown moderately hard fine grained, unweathered with slight weathering along scattered joints. Bedding dip 15°±.
57.0	58	CORE BOX #1	NX	57.0 TO 59.9	RAN 2.9' REC. 2.9' 100%	DRILLED W/NX STANDARD BIT #91R7. HYD. FEED. 30 MIN. DRILL TIME. REDDISH BROWN WATER & HOLDING. BIT BLOCKED @ 59.9'.	
59.9	60						
	61						

Test)

Boring No. FD-5

B-20

Site: PARK RIVER CONDUIT EXT HARTFORD, CONN.	Boring No. FD-5	P. #7-2	Page 5 of 6

DEPTH (F = 2')	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
61				RAN 5.0	DRILLED W/NX STANDARD BIT #91R7. HYD. FEED.	
63	CORE BOX #1	NX	59.9 TO 64.9	REC. 4.5	49 MIN. DRILL TIME. REDDISH BROWN WATER HOLDING.	
				100%	COMP. RUN @ 64.9'.	
64.9 / 65				RAN 5.0	DRILLED W/NX STANDARD BIT #91R7 FROM 64.9' TO 69.9'. HYD. FEED.	
67	CORE BOX #2	NX	64.9 TO 69.9	REC. 5.0	51 MIN. DRILL TIME. REDDISH BROWN WATER HOLDING.	
69				100%	COMP. RUN @ 69.9'.	SANDSTONE red-brown moderately hard fine grained unweathered Cross-bedded with varying dips.
69.9 / 71				RAN 5.0	DRILLED W/ NX STANDARD BIT #91R7 FROM 69.9' TO 74.9'. HYD. FEED.	
73	CORE BOX #2	NX	69.9 TO 74.9	REC. 3.9	52 MIN. DRILL TIME. REDDISH BROWN WATER HOLDING.	
				78%	COMP. RUN @ 74.9'.	
74.9					BOTTOM OF EXPLORATION @ 74.9'. DEPTH CONSIDERED SUFFICIENT.	

NED FORM 58A (Test) MAR 71

Boring No. FD-5

PARK RIVER CONDUIT EXT.

Site: HARTFORD, CONN.

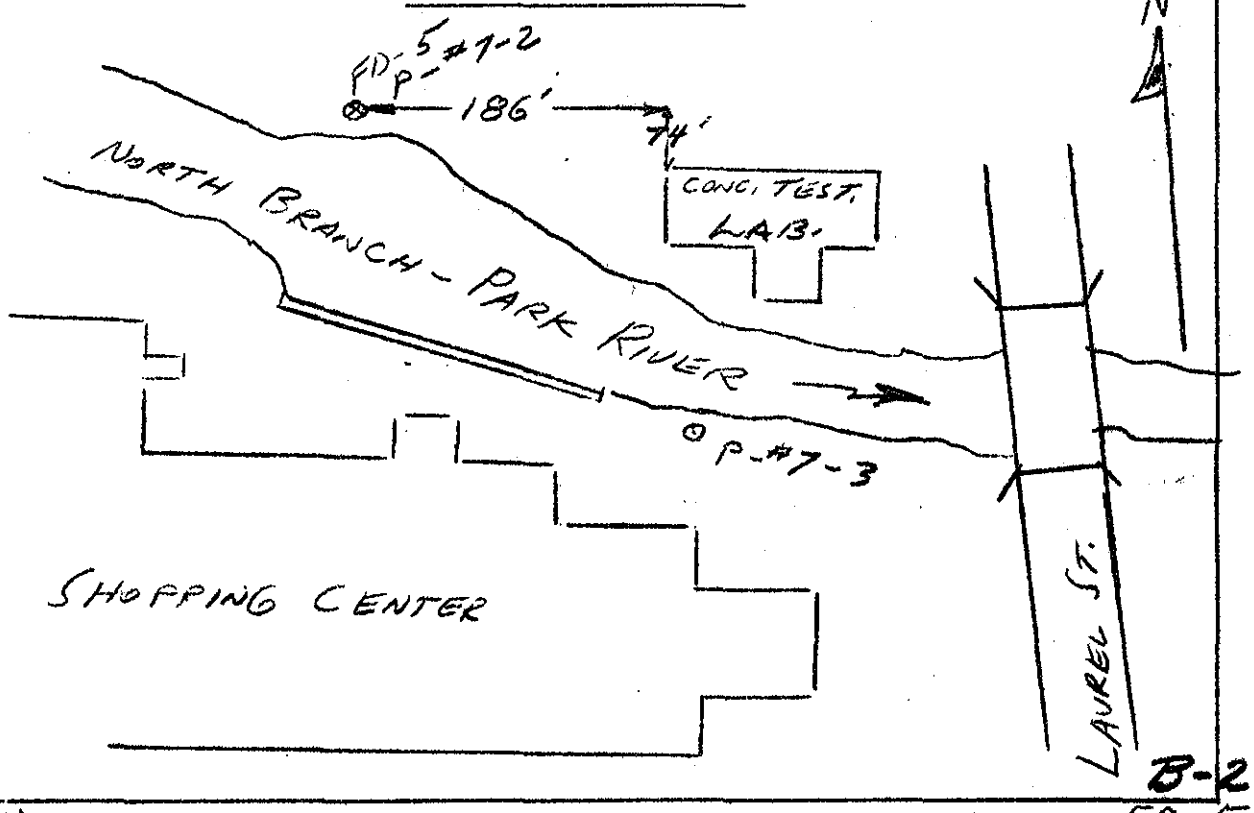
Boring No: FD-5 P.#7-2

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
3/1	1600	10.0'	10.0'	0.0'	—	CSG FILLED W/ WATER - 1/4 HR AFTER
3/2	0800	10.0'	10.0'	0.0'	—	CSG PLUGGED
3/3	1600	35.0'	35.0'	5.4'	—	CSG FILLED - 1/4 HR AFTER
3/6	0800	35.0'	35.0'	11.0'	—	BEFORE DRILLING
3/6	1600	45.0'	45.0'	6.3'	—	CSG FILLED - 1/4 HR AFTER.
3/7	0800	45.0'	45.0'	9.6'	—	BEFORE DRILLING
3/9	0800	50.0'	52.2'	9.8'	—	" "
3/13	0800	50.0'	53.0'	9.0'	—	" "
3/13	1600	55.2'	57.0'	4.8'	—	CSG FILLED - 1/4 HR AFTER
3/14	0800	55.2'	57.0'	6.4'	—	BEFORE DRILLING
3/14	1600	55.2'	64.9'	1.3'	—	CSG FILLED - 1/4 HR AFTER
3/16	0800	55.2'	64.9'	7.3'	—	BEFORE DRILLING

Note: Depths are in feet below original ground

BORING LOCATION SKETCH NOT TO SCALE



Test)

Boring No. FD-5

U.S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site PARK RIVER CONDUIT EXT HARTFORD, CONN. Page 1 of 6 Pages
Hole No. FD-6 Desig. P7-4 Diam. (Casing) NX F.C.
Co-ordinates: N 148,988 E 162,696

Elevation Top of Boring 37.4 M.S.L. Hammer Wt. 350# Boring Started 3/7/72
Total Overburden Drilled 46.7 Feet Hammer Drop 18" Boring Completed 3/13/72
Elevation Top of Rock -9.3 M.S.L. Casing Left NONE
Total Rock Drilled 17.9 Feet Avg. Subsurface Water Depth _____ Elev. _____
Elevation Bottom of Boring -27.2 M.S.L. Obs. Well NONE
Total Depth of Boring 64.6 Feet Drilled By U.S. ARMY CORP OF ENGG.
Core Recovered 92.1 % No. Boxes 2 Mfg. Des. Drill S&H 40 C
Core Recovered 16.5 Ft: NX Diam. 2 1/8 In. Inspected By: W. SWIFT
Soil Samples 2 1/2" In. Diam. 2 No. Classification By: [redacted]
Soil Samples 2" In. Diam. 17 No. Classification By: AMPLIFICATIONS BY LABORATORY CLASSIFIER [redacted]

DEPTH	1" = 2'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	2	J1	2 1/2"	0.0' 2.5'	9, 8, 7	DROVE 2 1/2" IDX5' SOLID SPOON FROM 0.0' TO 5.0' & TOOK SAMPLE. 100% REC'Y. HOLE OPEN TO 5.0'	Loose, black, silty SAND, with cinders, moist. (Fill)
2.5'	4	J2	2 1/2"	2.5' 5.0'	7, 11, 12		Loose, brown, silty fine SAND, with layer of Clay, organics, cinders & brick, moist (Fill)
5.0'	6, 8	J3 (2 JARS)	2"	5.0' 8.3'	4, 4, 5	DROVE 2" IDX5' SOLID SPOON FROM 5.0' TO 10.0' & TOOK SAMPLE. 100% REC. JETTED NX FLUSH CASING FROM 0.0' TO 10.0'	Soft, reddish-brown, silty CLAY (CL) moist (Probable Fill)
8.3'		J4 (2 JARS)	2"	8.3' 10.0'	7, 9		Loose, reddish-brown, sandy SILT, (ML) stratified - Ashes - moist. (Probable Fill)
10.0'							

GENERAL REMARKS: BORING LOCATED IN FILLED PARKING LOT, AT TOP OF EMBANKMENT, ADJACENT TO NORTH BRANCH OF PARK RIVER.

NED FORM 58 MAR 71 (Test) Boring No. FD-6

Site: PAT RIVER CONDUIT EXT. HARTFORD, CONN.

Boring No. FD-6

DEPTH (1" = 2')	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. OR CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
10.3	J5	2"	10.3			Loose, reddish-brown SILT (ML), Trace of brick & ashes, moist. (Probable Fill)
				2	DROVE 2" ID X 5' SOLID SPOON FROM 10.0' TO 15.0' & TOOK SAMPLE. 100% REC'Y.	
				4	JETTED NX FLUSH CASING FROM 10.0' TO 15.0'	Loose, reddish-brown, organic SILT (OL) wet.
12	J6 (2 JARS)	2"	10.3 15.0	8		
				8		
14				7		
15.0						
				WEIGHT OF TOOLS	DROVE 2" ID X 5' SOLID SPOON FROM 15.0' TO 20.0' & TOOK SAMPLE. 30% REC'Y. JETTED NX FLUSH CASING FROM 15.0' TO 20.0'	Loose, gray-black, fiberous, organic SILT (OL), wet.
16						
	J7 (2 JARS)	2"	15.0 20.0			
18				4		
				5	DROVE 2" ID X 5' SOLID SPOON FROM 20.0' TO 25.0' & TOOK SAMPLE. 40% REC'Y. JETTED NX FLUSH CASING	
20.0	J8 (2 JARS)	2"	20.0 21.4	1		Loose, gray-black, laminated, fiberous, sandy SILT, (OL), wet, leaf layers.
21.4				2	FROM 20.0' TO 25.0'	VERY SOFT reddish-brown, silty CLAY, (CL), stratified with layers of gray SILT (ML), wet.
22				4		
	J9 (2 JARS)	2"	21.4 25.0	3		silt layers = ½" thick Clay layers 1" thick
24				4	DROVE 2" ID X 5' SOLID SPOON FROM 25.0' TO 30.0' & TOOK SAMPLE.	
25.0				WEIGHT OF TOOLS	100% REC'Y. JETTED NX FLUSH CASING FROM 25.0' TO 30.0'	Same as above. Material in jars sloughed - thickness apparent to what Field inspector describes.
26	J10 (2 JARS) B11	2"	25.0 30.0	WEIGHT OF TOOLS & HAMMER		

(Test)

Boring No. FD-6

Site: PA. RIVER CONDUIT EXT. HARTFORD, CONN.

Boring No. FD-6

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. OR CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	1"=2'						
	28		2"	25.0, 30.0	WEIGHT OF TOOLS PLUS HAMMER	DROVE 2" IDX5' SOLID SPOON FROM 30.0' TO 35.0' & TOOK SAMPLE.	same as above
30.0'							
	32	J12 (2 JARS) B13	2"	30.0, 34.4	WEIGHT OF TOOLS	100% REC'Y. JETTED NX FLUSH JOINT CASING FROM 30.0' TO 35.0'	Soft, reddish-brown CLAY (CL), stratified with reddish-brown, SILT (ML) layer, wet.
					4		
	34				5	DROVE 2" IDX5' SOLID SPOON FROM 35.0' TO	
34.4'							
35.0'		J14	2"	34.4, 35.0	5	40.0' & TOOK SAMPLE.	Medium stiff to stiff, reddish-brown, sandy, gravelly, CLAY (CL), moist
	36	J15 (2 JARS)	2"	35.0, 40.0	29	SAMPLE WAS LOST ON FIRST DRIVE. OVERDROVE TO 41.0' ON SECOND DRIVE. 100% REC'Y. JETTED NX FLUSH CASING FROM 35.0' TO 40.0'	
					28		
					91		same as above.
	38				40		
					31	DROVE 2" IDX5' SOLID	
40.0'		NO SAMPLE	2"	40.0, 40.7	28	SPOON FROM 40.0' TO 44.0' & TOOK SAMPLE.	
40.7'							weathered cobble
41.0'		J16	2"	41.0, 41.6	28		
41.6'		J17	2"	41.0, 41.6	29	100% REC'Y.	Medium stiff, reddish-brown, SILT (ML), moist
	42				29	JETTED NX FLUSH CASING FROM 40.0' TO 45.0'	
		J18 (2 JARS)	2"	41.6, 44.0	35		Stiff, reddish-brown, silty, sandy, GRAVEL (GM), moist.
					108		
44.0							

NED FORM 55BA(Test) MAR 71

Boring No. FD-6

Site: PA RIVER CONDUIT EXT. HARTFORD, CONN.	Boring No. FD-6	Page 4 of 6

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	1"=2'						
45.0'		No Sample		44.0 45.0		DROVE 2" ID X 5' SOLID SPOON FROM 45.0' TO 46.7' & TOOK SAMPLE.	
	46	J19 (2 JARS)	2"	45.0 46.7	64 / 165	100% REC'Y. REFUSAL @ 46.7' 100 BLOWS NO PENETRATION. JETTED NX FLUSH CASING FROM 45.0' TO 46.7'	same as above. Top of Rock ?
46.7'	48	Box #1	NX	46.7 51.4	RUN 4.7' REC. 4.1 87%	ROTARY DIAMOND DRILLED NX 5' CORE BARREL FROM 46.7' TO 51.4' FEED - 175 LBS. DRILL TIME - 65 MIN. WATER - REDISH BROWN, HOLDING. BIT BLOCKED @ 51.4' BIT # NX 81B161	SHALE, dark red-brown moderately hard fine grained unweathered to slightly weathered. Along scattered irregular seams. obscure bedding.
51.4'	50						
	52	Box #1	NX	51.4 56.4	RUN 5.0 REC. 4.4 88%	ROTARY DIAMOND DRILLED NX 5' CORE BARREL FROM 51.4' TO 56.4' FEED - 175 LBS. DRILL TIME - 50 MIN. WATER REDISH BROWN HOLDING. END OF RUN @ 56.4' BIT # NX 91R7	Sandy Cross-bedded zone from 60.0 to 61.0
	54						
	56						
56.4'	58	Box #2	NX	56.4 61.4	RUN 5.0 REC. 4.8 96%	ROTARY DIAMOND DRILLED NX 5' CORE BARREL FROM 56.4' TO 61.4' FEED - 175 LBS. DRILL TIME - 60 MIN. WATER - REDISH BROWN W/ LIGHT BROWN SEAM HOLDING. END OF RUN @ 61.4' BIT NX #91R7	
	60						

Site: PAR RIVER CONDUIT EXT. HARTFORD, CONN.

Boring No. FD-6

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH	BLOWS PER FT. CORE RECOVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	F=2'					ROTARY DIAMOND DRILLED	
61.4'							
	62				RUN 3.2'	NX 5' CORE BARREL FROM 61.4' TO 64.6' FEED-175 LBS. TIME - 40 MIN.	Clay filled seam at 64.4'.
		BOX #2	NX	61.4' 64.6'	REC. 3.2'	WATER-REDDISH BROWN HOLDING. BLOCKED @ 64.6'	
	64				100%	NX BIT # 91R7	
64.6'						BOTTOM OF EXPLORATION @ 64.6' BOTTOM ELEVATION PREDETERMINED	

PARK RIVER CONDUIT EXT.

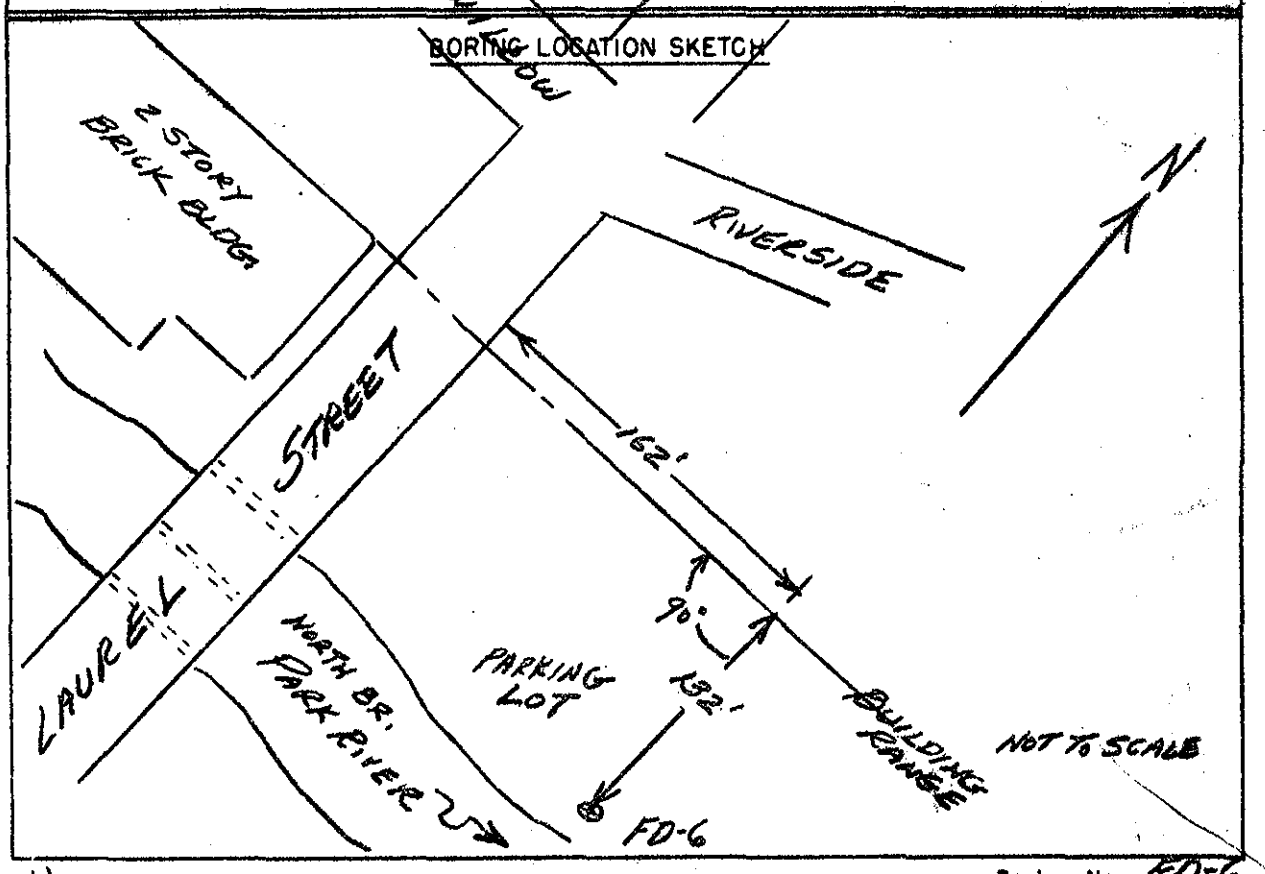
Site: HARTFORD, CONN.
Boring No: FD-6

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
3/10	[illegible]	46.7'	56.4'	11.1'		READING ~~[illegible]~~ 5 MINUTES AFTER DRILLING.
3/13	0800	46.7'	56.4'	10.1'		READING BEFORE DRILLING
3/13	1300	46.7'	64.6'	9.2'		READING 30 MIN. AFTER DRILLING.

Note: Depths are in feet below original ground

BORING LOCATION SKETCH



U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site PARK RIVER CONDUIT EXT. HARTFORD, CONN. Page 1 of 7 Pages

Hole No. FD-7 Desig. P7-1 Diam. (Casing) NX F.C.

Co-ordinates: N 149,326 E 161,931

Elevation Top of Boring 45.4 M.S.L.
Total Overburden Drilled 89.6 Feet
Elevation Top of Rock ____ M.S.L.
Total Rock Drilled NONE Feet
Elevation Bottom of Boring -44.2 M.S.L.
Total Depth of Boring 89.6 Feet
Core Recovered — % No. Boxes 1
Core Recovered — Ft. — Diam. — In.
Soil Samples 2½ In. Diam. 1 No.
Soil Samples 2 In. Diam. 3½ No.

Hammer Wt. 350# Boring Started 3/14/72
Hammer Drop 18"
Casing Left NONE Boring Completed 3/23/72
Avg. Subsurface Water Depth ____ Elev. ____
Obs. Well NONE (FINNERTY)
Drilled By U.S. ARMY CORP OF ENGS.
Mfg. Des. Drill SH 40C #1
Inspected By: W. SWIFT & A. MERRILL
Classification By: [redacted]
Classification By: AMPLIFICATIONS BY LABORATORY CLASSIFIER [redacted]

DEPTH	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
1" = 2'						
	J1 (2 JARS)	2½"	0.0 5.0	5	DROVE 2½" ID X 5' SOLID SPOON FROM 0.0' TO 5.0' & TOOK SAMPLE. 100% REC'Y. HOLE OPEN TO 5.0'	Loose, reddish-brown, silty, clayey, gravelly SAND, pieces of metal, coal, and organics, moist (Fill)
				19		
2				21		
				16		
4				16		
5.0'	J2	2"	5.0 9.6'	5	DROVE 2" ID X 5' SOLID SPOON FROM 5.0' TO 10.0' & TOOK SAMPLE. 100% REC'Y. JETTED NX FLUSH CASING FROM 0.0' TO 10.0'	
6				7		
				6		
8				6		
				9		
9.6' 10.0	J3	2"	9.6 10.0			Loose, brown, silty med. to fine SAND (SP) moist

GENERAL REMARKS: BORING LOCATED ON FILL AREA, AT TOP OF EMBANKMENT.

Site: MAX RIVER CONDUIT EXT. HARTFORD, CONN.	Boring No. FD-7	Page 2 of 7

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. CORE REC'V	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
		J4	2"	10.0' 11.1'	4	DROVE 2" ID X 5' SOLID SPOON FROM 10.0' TO 15.0' & TOOK SAMPLE.	Same as above, few pieces of gravel and wet.
11.1'							
	12	J5 (2 JARS) B6	2"	11.1' 15.0'	7	100% REC'Y. JETTED NX FLUSH CASING FROM 10.0' TO 15.0'	Medium stiff, gray-brown, stratified layers of lean CLAY, (CL) moist
					16		
					21		
	14				26		
15.0'							
	16	J7 (2 JARS) B8	2"	15.0' 20.0'	1	DROVE 2" ID X 5' SOLID SPOON FROM 15.0' TO 20.0' & TOOK SAMPLE. 100% REC'Y. JETTED NX FLUSH CASING FROM 15.0' TO 20.0'	Soft, gray-brown, CLAY (CL), stratified w/thin layers of reddish fine sand, moist.
					3		
					3		
	18				4		
					6	DROVE 2" ID X 5' SOLID SPOON FROM 20.0' TO 25.0' & TOOK SAMPLE.	
20.0'							
	22	J9 (2 JARS) B10	2"	20.0' 25.0'	WEIGHT OF TOOLS PLUS HAMMER	100% REC'Y. JETTED NX FLUSH CASING FROM 20.0' TO 25.0'	Soft, gray-brown, CLAY (CH), stratified with 1/4 inch layers of gray SILT (ML), moist (Sample in jars sloughed, difficult to seperate SILT from CLAY)
	24				6	DROVE 2" ID X 5' SOLID SPOON FROM 25.0' TO 30.0' & TOOK SAMPLE.	
					6		
25.0'							
	26	J11 (2 JARS) B12	2"	25.0' 30.0'	WEIGHT OF TOOLS PLUS HAMMER	100% REC'Y. JETTED NX FLUSH CASING FROM 25.0' TO 30.0'	Soft, gray-brown, CLAY (CH), with thin layers of reddish fine SAND, moist. (clay- Wn = 68.9%)

Site: A[illegible]K RIVER CONDUIT EXT. HARTFORD, CONN.	Boring No. FD-7	Page 3 of 7

DEPTH	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
28		2"	25.0' 30.0'	WEIGHT OF TOOLS PLUS HAMMER		
				3		
				4	DROVE 2" IDX5' SOLID SPOON FROM 30.0' TO 35.0' & TOOK SAMPLE.	
30.0'					JETTED NX FLUSH CASING FROM 30.0' TO 35.0'	Soft, reddish-brown, CLAY (CH), stratified with layers of gray-brown, SILT (ML) moist.
32	J13 (2 JARS) B14	2"	30.0' 35.0'	WEIGHT OF TOOLS PLUS HAMMER		
34				3	DROVE 2" IDX5' SOLID	
35.0'					SPOON FROM 35.0' TO 40.0' & TOOK SAMPLE.	
36					JETTED NX FLUSH CASING FROM 35.0' TO 40.0'	same as above
38	J15 (2 JARS) B16	2"	35.0' 40.0'	WEIGHT OF TOOLS PLUS HAMMER		
				6		
				5	DROVE 2" IDX5' SOLID	
40.0'					SPOON FROM 40.0' TO 45.0' & TOOK SAMPLE.	same as above
42	J17 (2 JARS) B18	2"	40.0' 45.0'	WEIGHT OF TOOLS PLUS HAMMER	JETTED NX FLUSH CASING FROM 40.0' TO 45.0'	(W_n = 60.9% CLAY) (W_n = 42.8% SILT) M.A.
				3		

Site: K RIVER CONDUIT EXT. HARTFORD, CONN.	Boring No. FD-7	Page 4 of 7

DEPTH	CORE/SAMPLE NO.	SIZE	DEPTH	BLOWS PER FT. OR CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
45.0'		2"	40.0 45.0	3	DROVE 2" ID X 5' SOLID	
				WEIGHT OF TOOLS	SPOON FROM 45.0' TO 50.0' & TOOK SAMPLE. 70% REC'Y.	
	J19 (2 JARS) B20	2"	45.0 50.0	WEIGHT OF TOOLS PLUS HAMMER	JETTED NX FLUSH CASING FROM 45.0' TO 50.0'	same as above
50.0'					DROVE 2" ID X 5' SOLID	
				WEIGHT OF TOOLS	SPOON FROM 50.0' TO 55.0' & TOOK SAMPLE. 100% REC'Y.	
	J21 (2 JARS) B22	2"	50.0 55.0		JETTED NX FLUSH CASING FROM 50.0' TO 55.0	same as above
				4	DROVE 2" ID X 5' SOLID	
55.0'					SPOON FROM 55.0' TO 60.0' & TOOK SAMPLE. 100% REC'Y.	
	J23 (2 JARS) B24	2"	55.0 60.0	WEIGHT OF TOOLS PLUS HAMMER	JETTED NX FLUSH CASING FROM 55.0' TO 60.0'	same as above
				10	DROVE 2" ID X 5' SOLID	
60.0'		2"	60.0 62.7	WEIGHT OF TOOLS	SPOON FROM 60.0' TO 65.0' & TOOK SAMPLE.	

Site: P[illegible] RIVER CONDUIT EXT. HARTFORD, CONN.

Boring No. FD-7

Page 5 of 7

DEPTH	CORE/SAMPLE NO.	SIZE	DEPTH	BLOWS PER FT. CORE REC'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
62	J25 (2 JARS)	2"	60.0' 62.7'	WEIGHT OF TOOLS PLUS HAMMER	100% REC'Y. JETTED NX FLUSH CASING FROM 60.0' TO 65.0'	Same as above (wet)
62.7'				7		Soft, reddish-brown, gravelly, sandy, CLAY (CL), moist
64	J26 (2 JARS)	2"	62.7 65.0'	6		
				7	DROVE 2" IDX5' SOLID	
65.0'				7	SPOON FROM 65.0' TO 70.0' & TOOK SAMPLE. 100% REC'Y.	
66				7	JETTED NX FLUSH CASING FROM 65.0' TO 70.0'	same as above (soft to stiff)
68	J27 (2 JARS)	2"	65.0' 70.0'	17		
				47	DROVE 2" IDX5' SOLID SPOON FROM 70.0' TO 72.7' & TOOK SAMPLE.	
				87		
70.0'				45	REFUSAL @ 72.7' 100 BLOWS NO PENETRATION.	same as above (stiff to very hard) M.A.
72	J28 (2 JARS)	2"	70.0' 72.7'	121	ROTARY DIAMOND DRILLED NX "M" SERIES CORE BARREL FROM 72.7' TO 75.0' & TOOK SAMPLE.	
				224		
72.7'					DRILLED NX FLUSH CASING FROM 70.0' TO 75.0'	same as above.
74	J29 (2 JARS)	NX	72.7' 75.0'		DROVE 2" IDX5' SOLID SPOON FROM 75.0' TO 78.2' & TOOK SAMPLE.	
75.0'				55	DISCONTINUED SAMPLING MATERIAL COMPACT.	Very hard, reddish-brown, gravelly, silty-clayey, SAND (SM), moist (Till)
76	J30 (2 JARS)	2"	75.0 78.2	218	ROTARY DIAMOND DRILLED NX "M" SERIES CORE BARREL FROM 78.2' TO 80.4'	
				173		

NED FORM 58A (Test) MAR 71

Boring No. FD-7

Site: PM RIVER CONDUIT EXT. HARTFORD, CONN.	Boring No. FD-7	Page 6 of 7

DEPTH	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECOVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
78.2'	J31	NX "M"	78.2 80.4		DRILLED NX FLUSH, CASING FROM 75.0' TO 80.4' DROVE 2" ID X 5' SOLID SPOON FROM 80.4' TO	Compact to very compact, reddish-brown, gravelly, sandy, SILT (ML), moist.
80.4'	J32	2"	80.4 84.0	22 / 57 / 122 / 225	84.0' & TOOK SAMPLE. DRILLED NX FLUSH CASING FROM 80.4' TO 84.0' DROVE 2" ID X 5' SOLID SPOON FROM 84.0' TO 84.1' REFUSAL @ 84.1' 100 BLOWS NO PENETRATION. ROTARY DRILLED NX "M" SERIES	Compact to very compact, reddish-brown, silty, clayey, gravelly, SAND (SM) moist (Till)
84.0'						Same as above
84.1'	Box #1	NX "M"	84.1 89.0		CORE BARREL FROM 84.1' TO 89.0'. DROVE 2" ID X 5' SOLID SPOON FROM 89.0' TO 89.6' & TOOK SAMPLE. DISCONTINUED SAMPLING, COMPACT MAT'L.	Cobbles & Gravel
89.0'	J34	2"	89.0 89.6	166		same as J-32
89.6'					BOTTOM OF EXPLORATION @ 89.6' BOTTOM ELEVATION PREDETERMINED.	

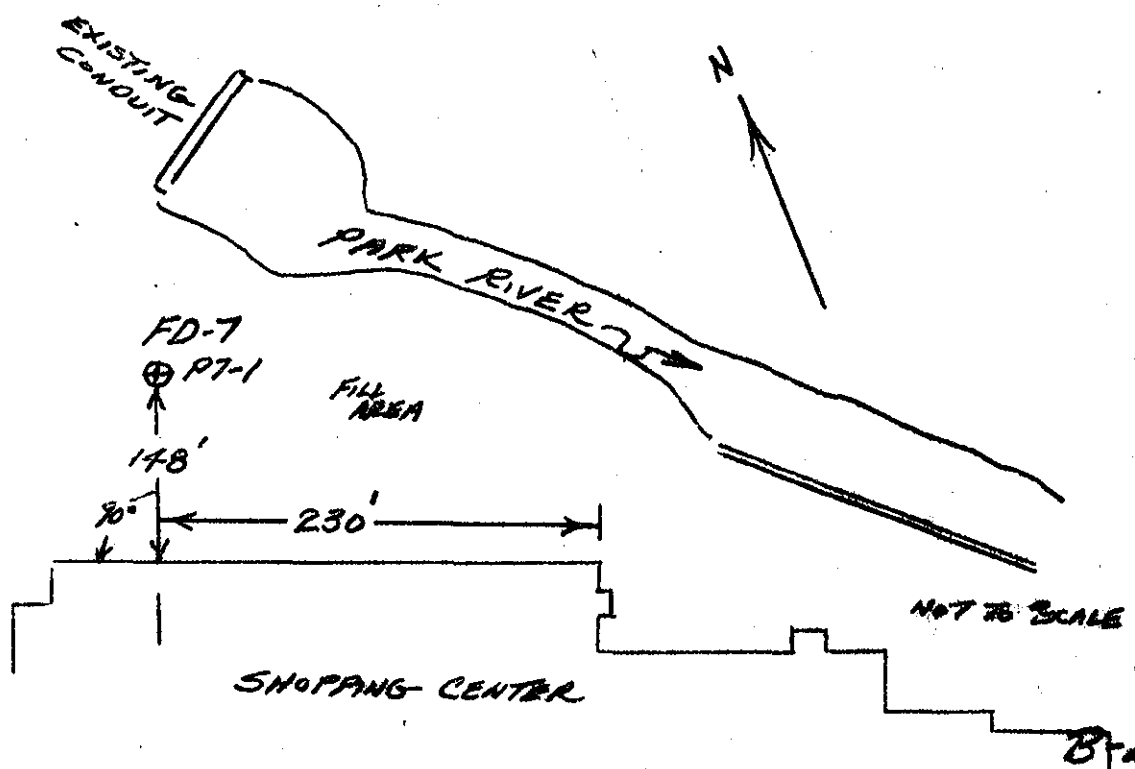
Site: PARK RIVER CONDUIT EXT. HARTFORD, CONN.
Boring No: FD-7

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
3/20	0800	45.0'	45.0'	10.6'		READING BEFORE DRILLING
3/20	1600	70.0'	72.7'	10.5'		READING 15 MIN. AFTER DRILLING.
3/21	0900	70.0'	72.7'	10.5'		READING BEFORE DRILLING
3/23	0900	80.4'	80.4'	9.3'		READING BEFORE DRILLING
3/23	1500	85.0'	89.6'	14.6'		READING 15 MIN. AFTER DRILLING.

Note: Depths are in feet below original ground

BORING LOCATION SKETCH



NED FORM 59 (Test)

Boring No. FD-7

PARK RIVER CONDUIT EXT.

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site HARTFORD CONN. Page 1 of 6 Pages
Boring No. FD-8 Desig P#7-3 Diam. (Casing) NX-FC
Co-ordinates: N 149,018 E 162,342

Elevation Top of Boring 40.1 M.S.L.* Hammer Wt. 350# Boring Started 3/20/72
Total Overburden Drilled 55.0 Feet Hammer Drop 18" Boring Completed 3/29/72
Elevation Top of Rock -14.9 M.S.L. Casing Left NONE
Total Rock Drilled 10.0 Feet Subsurface Water Data _____ Page 6
Elevation Bottom of Boring -24.9 M.S.L. Obs. Well NONE
Total Depth of Boring 65.0 Feet Drilled By CORPS OF ENGINEERS
Core Recovered 87.0 % No. Boxes 1 Mfg. Des. Drill CP-5
Core Recovered 8.7 Ft: NX Diam. 2 1/8 In. Inspected By: A. MERRILL
Soil Samples 2 1/2 In. Diam. 2 No. Classification By: [redacted]
Soil Samples 2 In. Diam. 15 No. Classification By: AMPLIFICATIONS BY LABORATORY CLASSIFIER [redacted]
" " 1 1/2 " " 0 "

DEPTH	1" = 2'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
0.3		No Sample				Drove 2 1/2" I.D. X 5.0'	Bituminous Asphalt Pav't
		J-1	2 1/2	0.3 to 2.3	26 / 9	Solid Sample Spoon 0.0' to 5.0' & took sample. Rec. 80% ±	Loose, dark brown, gravelly, silty, C-F, SAND (SM), with coal, cinders, brick, concrete fragments. (Fill)
2.3	2				24	Hole Remained Open.	
	4	J-2	2 1/2	2.3 to 5.0	32 / 27		Same as above
5.0	6				12	Drove 2" I.D. X 5.0' Solid Sample Spoon 5.0' to 10.0' & took sample.	
		J-3	2"	5.0 to 10.0	15 / 17	Rec. small sample (10%) Jetted NX-FC casing from 0.0' to 10.0'.	Same as above
	8				17		
10.0	10				20		

GENERAL REMARKS: * ELEV. TAKEN FROM PLAN CONTOURS.
BORING LOCATED NEXT TO NORTH BRANCH - PARK RIVER.

NED FORM 58 (Test) MAR 71

Boring No. FD-8

Site: PARK RIVER CONDUIT EXT. HARTFORD, CONN.	Boring No. FD 8 P-#7-3	Page 2 of 6

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
10.0	10				11	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 10.0' TO 15.0'. NO SAMPLE RECOVERED.	
	12				8		
		NO SAMPLE		10.0 TO 15.0	6	REPEATED RUN - NO SAMPLE.	
	14				7	JETTED NX-FC CSG FROM 10.0' TO 15.0'.	
15.0					10		
		J-4	2"	15.0 TO 15.9	2	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 15.0' TO 20.0' & TOOK SAMPLE. REC. 100%.	Very soft, reddish-brown, CLAY (CH), with layers of gray-brown, SILT (ML) moist. Wn { CLAY = 66.8% SILT = 46.9%
15.9	16				1		
		J-5 (2 JARS)	2"	15.9 TO 20.0	1		
	18	B-6			2	JETTED NX-FC CSG FROM 15.0' TO 20.0'.	same as above
					1		
20.0	20					DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 20.0' TO 25.0' & TOOK SAMPLE. REC. 100%. JETTED NX-FC CSG FROM 20.0' TO 25.0'.	
	22	J-7 (2 JARS)	2"	20.0 TO 25.0	WEIGHT OF TOOLS & HAMMER		same as above
		B-8					
	24						
25.0					3		
	26				WEIGHT OF TOOLS & HAMMER	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 25.0' TO 30.0' & TOOK SAMPLE. REC. 100%.	same as above
	27						

Site: PARK RIVER CONDUIT EXT. HARTFORD, CONN.	Boring No. FD-8 P-P7-3	Page 3 of 6

DEPTH	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
27, 29, 30.0	J-9 (2 JARS), B-10	2"	25.0 TO 30.0	WEIGHT OF TOOLS & HAMMER	JETTED NX-FC CSG FROM 25.0' TO 30.0'.	Same as above. Wn { CLAY = 72.6%, SILT = 40.4%
31, 31.7	J-11	2"	30.0 TO 31.7	WGT. OF TOOLS & HAMMER	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 30.0' TO 35.0' & TOOK SAMPLE. REC. SMALL SAMPLE. REC. 30% ±.	Same as above
33, 35.0, 35	J-12	2"	31.7 TO 35.0	10, 13, 14, 20	JETTED NX-FC CSG FROM 30.0' TO 35.0'.	Medium compact, reddish-brown, silty-clayey, gravelly SAND (SM), moist (TILL)
37, 39, 40.0	J-13 (2 JARS)	2"	35.0 TO 40.0	3, 11, 22, 38, 44	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 35.0' TO 40.0' & TOOK SAMPLE. REC. 80% ±. JETTED NX-FC CSG FROM 35.0' TO 40.0'.	Same as above. Wn = 12.0%
41, 43, 44	J-14 (2 JARS)	2"	40.0 TO 45.0	4, 8, 10, 16	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 40.0' TO 45.0' & TOOK SAMPLE. REC. 40% ±. JETTED NX-FC CSG FROM 40.0' TO 45.0'.	Same as above

Site: PARK RIVER CONDUIT EXT. HARTFORD, CONN.	Boring No. FD-8 P-#7-3	Page 4 of 6

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	1"=2'						
	44				18		
45.0						DRIVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 45.0' TO 50.0' 6' TOOK SAMPLE, REC. 80%	Medium compact to compact, silty-clayey, gravelly, SAND (SM) moist (T.11) Wn = 13.8%
	46				7		
		J-15 (2 JARS)	2"	45.0 TO 50.0	12	JETTED NX-FC CIG FROM 45.0' TO 50.0'	
	48				15		
					27		
					43		
50.0	50					DRIVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 50.0 TO 52.0' 6' TOOK SAMPLE, REC. 100% REFUSAL @ 52.0'	
		J-16 (2 JARS)	2"	50.0 TO 52.0	49		Same as above
					168		
52.0	52	WASHED 6' CHOPPED				WASHED 6' CHOPPED FROM 52.0' TO 53.9' WASH WATER CONTINUED TO INDICATE SAME MAT'L. JETTED NX-FC CIG FROM 53.0' TO 54.0'	
53.9							
54.0	54					DRIVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 54.0' TO 55.0' 6' TOOK SAMPLE, REC. 100%. REF. @ 55.0' JETTED NX-FC CIG FROM 54.0' TO 55.0' DRILLED W/NX STANDARD BIT # 03864 FROM 55.0 TO 56.3' HYD. FEED, 14 MIN. DRILL TIME, REDDISH BROWN WATER & HEAVING. BIT BLOCKED @ 56.3' DRILLED W/ SHORT BIT # 03864 FROM 56.3' TO 56.6' - BIT BLOCKED - NO REC. DRILLED W/NX STANDARD BIT # 91R7 FROM 56.6' TO 58.0' HYD. FEED, 17 MIN. DRILL TIME. REDDISH BROWN WATER & HEAVING. BIT BLOCKED @ 58.0' DRILLED W/ SHORT BIT # 91R7 FROM 58.0' TO 58.3' BIT BLOCKED @ 58.3' DRILLED W/NX STANDARD BIT # 91R7 FROM 58.3' TO 63.2' HYD. FEED. 53 MIN. DRILL TIME. REDDISH BROWN WATER &	
		J-17 (2)	2"	54.0 TO 55.0	256		Same as above. Top of Rock?
55.0		CORE BOX #1	NX	55.0 TO 56.3	RAN 1.3' REC. 0.8' 61%		SHALE, red-brown moderately hard, fine grained, unweathered with clay filled seams to 58.0' irregular clay filled seams at 60.8' 63.4' 64.5' and 64.8'.
56.3	56						
56.6		NO RECOVERY					
		CORE BOX #1	NX	56.6 TO 58.0	RAN 1.4' REC. 1.0' 71%		
58.0	58						
58.3		BOX #1	NX	58.3 TO 63.2	100%		
		CORE BOX #1	NX	58.3 TO 63.2	RAN 4.9' REC. 4.9' 100%		
	60						
	61						

Test)

Boring No. FD-8

Site: Park River Conduit Ext. Hartford, Conn.	Boring No. FD-8 P-P7-2	Page 5 of 6

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	61					HOLDING.	Sandy Zone at 59.4 with Cross-bedding in sandstone 60.9 to 62.5. Dip of bedding obscure to low angle Calcareous throughout
						Comp. Run @ 63.2'	
63.2	63					DRILLED w/ NX STANDARD	
		CORE BOX #1	NX	63.2 TO 65.0	RAN 1.8' REC.	BIT # 91R7 FROM 63.2' TO 65.0'. HYD. FEED. 24 MIN. DRILL TIME. REDDISH BROWN WATER & HOLDING.	
65.0	65					Comp. Run @ 65.0'	
						BOTTOM OF EXPLORATION @ 65.0' - DEPTH CONSIDERED SUFFICIENT.	

PARK RIVER CONDUIT EXT.

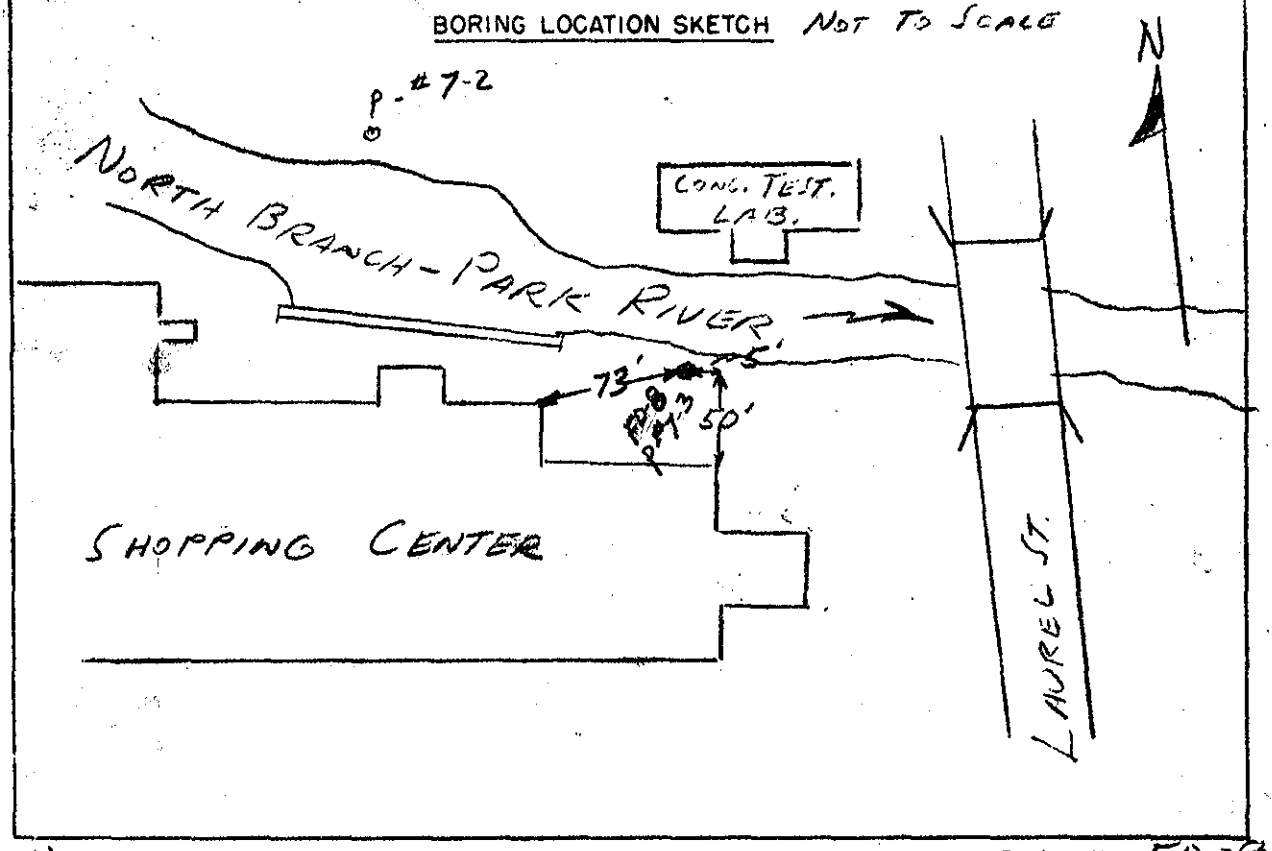
Site: HARTFORD, CONN.
Boring No: FD-B P-#7-3

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
3/20	1600	30.0'	30.0'	4.1'	—	CSG FILLED W/WATER - 1/4 HR AFTER
3/21	0800	30.0'	30.0'	10.1'	—	BEFORE DRILLING
3/21	1600	50.0'	53.9'	9.9'	—	CSG FILLED - 1/4 HR AFTER
3/22	0800	50.0'	53.9'	11.7'	—	BEFORE DRILLING
3/23	0800	54.0'	54.0'	11.6'	—	BEFORE DRILLING
3/27	1600	55.0'	58.0'	13.9'	—	CSG FILLED - 1/4 HR AFTER
3/28	0900	55.0'	58.0'	13.1'	—	BEFORE DRILLING.
3/28	1600	55.0'	65.0'	13.1'	—	1/4 HR AFTER COMPLETION
3/29	0900	55.0'	65.0'	13.5'	—	BEFORE PULLING CSG.

Note: Depths are in feet below original ground

BORING LOCATION SKETCH NOT TO SCALE



Test)

Boring No. FD-B

PARK RIVER CONDUIT EXTENSION

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site Box Conduit, Hartford, Conn. Page 1 of 8 Pages

Boring No. ED-9 Desig. P-9-1 Diam. (Casing) NX-FC

Co-ordinates: N 152,064 E 160,672

Elevation Top of Boring _____ M.S.L.
Total Overburden Drilled 104.6 Feet
Elevation Top of Rock UNKNOWN M.S.L.
Total Rock Drilled NONE Feet
Elevation Bottom of Boring _____ M.S.L.
Total Depth of Boring 104.6' Feet
Core Recovered — % No. Boxes —
Core Recovered — Ft. — Diam. — In.
Soil Samples 2 1/2 In. Diam. 1 No.
Soil Samples 2 In. Diam. 36 No.

Hammer Wt. #350 Boring Started 8/3/73
Hammer Drop 18" Boring Completed 8/13/73
Casing Left NONE
Subsurface Water Data _____ Page 8
Obs. Well NONE
Drilled By CORPS OF ENGINEERS
Mfg. Des. Drill CP-3
Inspected By: A. MERRILL
Classification By: _____
Classification By: _____

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	1" = 2'						
0.4		None	2 1/2	0.0-0.4		DROVE 2 1/2" I.D. X 5.0' SOLID SAMPLE SPOON 0.0' TO 5.0' & TOOK SAMPLE. REC'D ± 40%. HOLE REMAINED OPEN.	TOPSOIL
					6		
	2	J-1	2 1/2	0.4 TO 5.0	6		DARK BROWN SILTY GRAVELLY C-F SAND (SM), FILL, MOIST, W/ COAL ASHES, ROCK FRAGMENTS, & COAL FRAGS.
					5		
	4				5		
					3		
5.0							
	6	J-2	2"	5.0 TO 6.5	3	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 5.0' TO 10.0' & TOOK SAMPLE. REC'D ± 40% JETTED NX-FC CSG FROM 0.0' TO 10.0'.	
6.5					5		~~REDDISH BROWN, FINE SANDY SILTY CLAY (CL), MOIST,~~ DARK, GRAY-BROWN SILT (ML) SOME FINE ROOTS
	8	J-3	2"	6.5 TO 10.0	11		
		J-4R			14		
10.0	10				13		

GENERAL REMARKS: BORING LOCATED ON BANK OF PARK RIVER.

Site: Box Conduit Park River

Boring No. FD-9

DEPTH	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
10.0 (10, 12, 14)	J-5	2"	10.0 to 15.0	7, 8, 8, 13, 12	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 10.0' TO 15.0' & REC'D SMALL SAMPLE. REC'D ± 5% JETTED NX-FC CSG FROM 10.0' TO 15.0'.	REDDISH BROWN, FINE ~~SANDY~~ SILTY CLAY (CH) ~~(CL)~~, MOIST. (VERY LITTLE SAMPLE)
15.0 (16, 18)	J-6 (2) J-7R	2"	15.0 to 20.0	4, 3, 3, 4, 4	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 15.0' TO 20.0' & TOOK SAMPLE. REC'D ± 70% JETTED NX-FC CSG FROM 15.0' TO 20.0'.	(W/ STRATIFIED LAYERS OF GREY SILT (ML) 1/2" TO PAPER THIN)
20.0 (22, 23.3, 24)	J-8 (2) J-9R	2"	20.0 to 25.0	OF, WEIGHT OF TOOLS, 4, 6	PENETRATION BY WEIGHT OF TOOLS FROM 20.0' TO 23.3'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 23.3' TO 25.0' & TOOK SAMPLE. REC'D ± 80%. JETTED NX-FC CSG FROM 20.0' TO 25.0'.	(W/ SILT LAYERS FROM 2" TO 1/4")
25.0 (26, 27)				WEIGHT OF TOOLS	PENETRATION BY WEIGHT OF TOOLS FROM 25.0' TO 28.6'. DROVE 2" I.D. X 5.0' SOLID SAMPLE	(W/ SILT LAYERS FROM 2" TO 1/4")

Site: ARK RIVER BOX CONDUIT

Boring No. FD-9

DEPTH (ft. 2')	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
27 28.6 29 30.0	J-10 (2) J-11R	2"	25.0 TO 30.0	WEIGHT OF TOOLS 2 4	SPOON 28.6' TO 30.0' & TOOK SAMPLE. REC'D ± 90%. JETTED NX-FC CSG FROM 25.0' TO 30.0'	REDDISH BROWN ~~FINE~~ (CH) ~~SANDY~~ SILTY CLAY (~~CL~~) MOIST, W/ STRATIFIED LAYERS OF GREY SILT (ML) 2" TO 1/4" THICK.
31 33 33.3 35.0 35	J-12 (2) J-13R	2"	30.0 TO 35.0	WEIGHT OF HAMMER & TOOLS 3 6	PENETRATION BY WEIGHT OF HAMMER & TOOLS 30.0' TO 33.3'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 30.0' TO 35.0' & TOOK SAMPLE. REC'D ± 90% JETTED NX-FC CSG FROM 30.0' TO 35.0'.	(W/ SILT LAYERS FROM 2" TO 1/4")
37 38.1 39 40.0	J-14 (2) J-15R	2"	35.0 TO 40.0	WEIGHT OF HAMMER & TOOLS 5 5	PENETRATION BY WGT OF HAMMER & TOOLS 35.0' TO 38.1'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 38.1' TO 40.0' & TOOK SAMPLE. REC'D ± 90%. JETTED NX-FC CSG FROM 35.0' TO 40.0'.	(W/ SILT LAYERS 1" TO PAPER THIN)
41 43 43.3 44	J-16 (2) J-17R	2"	40.0 TO 45.0	WEIGHT OF HAMMER & TOOLS 5	PENETRATION BY WGT OF HAMMER & TOOLS 40.0' TO 43.3'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 43.3' TO 45.0' & TOOK SAMPLE. JETTED NX-FC CSG	(W/ SILT LAYERS 1" TO PAPER THIN)

Site: PARK RIVER BOX CONDUIT

Boring No. FD-9

DEPTH (1" = 2')	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
44				5	FROM 40.0' TO 45.0'	REDDISH BROWN, FINE SANDY SILTY CLAY (CH) (CL), MOIST, W/ STRATIFIED LAYERS OF GREY SILT (ML) 1" TO PAPER THIN.
45.0				WGT TOOLS + HAMMER	PENETRATION BY WGT OF TOOLS + HAMMER 45.0' TO 46.1'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 45.0' TO 50.0' & TOOK SAMPLE. REC'D ± 90% JETTED NX-FC CSG FROM 45.0' TO 50.0'.	
46.1 46	J-18 (2)	2"	45.0 TO 50.0	3		
48	J-19R			3		
				4		
				4		
50.0 50				WEIGHT OF TOOLS + HAMMER	PENETRATION BY WGT OF HAMMER & TOOLS 50.0' TO 53.5'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 53.5' TO 55.0' & TOOK SAMPLE. REC'D ± 90% JETTED NX-FC CSG FROM 50.0' TO 55.0'.	(W/ SILT LAYERS 1" TO PAPER THIN)
52	J-20 (2)	2"	50.0 TO 55.0			
	J-21R					
53.5				6		
54						
				6		
55.0				WEIGHT OF TOOLS + HAMMER	PENETRATION BY WGT OF HAMMER & TOOLS 55.0' TO 57.3'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 57.3' TO 55.0' & TOOK SAMPLE. REC'D ± 90% JETTED NX-FC CSG FROM 55.0' TO 60.0'.	(W/ SILT LAYERS 1" TO PAPER THIN)
56						
57.3	J-22 (2)	2"	55.0 TO 60.0	3		
58	J-23R			4		
				5		
60.0 60				WGT of HAMMER + TOOLS	PENETRATION BY WGT OF HAMMER + TOOLS	

Site: PARK RIVER, HARTFORD, CONN.

Boring No. FD-9

DEPTH (ft. 2')	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
61 62.8 63	J-24 (2) J-25R	2"	60.0 to 65.0	WGT TOOLS + HAMMER 6 7 10	60.0' TO 62.8', DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 62.8' TO 65.0' & TOOK SAMPLE. REC'D ± 90%. JETTED NX-FC CSG FROM 60.0' TO 65.0'.	REDDISH BROWN FINE ~~SANDY~~ SILTY CLAY (CH) ~~(CL)~~, MOIST, W/ LAYERS OF GREY SILT (ML) 1" TO PAPER THIN.
65.0 65						
67 67.3 69	J-26 (2) J-27R	2"	65.0 to 70.0	WGT TOOLS + HAMMER 6 8 8	PENETRATION BY WGT OF HAMMER & TOOLS 65.0' TO 67.3', DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 67.3' TO 70.0' & TOOK SAMPLE. REC'D ± 90%. JETTED NX-FC CSG FROM 65.0' TO 70.0'.	(W/ SILT LAYERS 1" TO PAPER THIN)
70.0						
71.0 71 73	J-28 (2) J-29R	2"	70.0 to 75.0	WGT TOOLS + HAMMER 6 5 7 9	PENETRATION BY WGT OF HAMMER & TOOLS 70.0' TO 71.0'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 71.0' TO 75.0' & TOOK SAMPLE. REC'D ± 90%. JETTED NX-FC CSG 70.0' TO 75.0'.	(W/ SILT LAYERS 1/4" TO PAPER THIN)
75.0 75						
76.8 77 78	J-30	2"	75.0 to 76.8	11 14 19	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 75.0' TO 80.0' & TOOK SAMPLE. REC'D ± 60%. JETTED NX-FC CSG 75.0' TO 80.0'.	(NO SILT LAYERS) ↓ REDDISH BROWN GRAVELLY SILTY C-F SAND (SM), TILL, MOIST.

Site: PARK RIVER
HARTFORD, CONN.

Boring No. FD-9

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	78						Reddish-brown sandy, SILT (ML) moist
		J-31	2"	76.8 to 80.0	32		
		J-32R			44		
80.0	80						
					61	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 80.0' to 85.0' & TOOK SAMPLE. RECD ± 70%	
		J-33 (2)	2"	80.0 to 85.0	53		
	82	J-34R			38	JETTED NX-FC CSG 80.0' to 85.0'	
					33		REDDISH BROWN GRAVELLY SILTY C-F SAND (SM), TILL, moist.
	84				27		
85.0						DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 85.0' to 90.0' & TOOK SAMPLE. RECD ± 80%	
	86				33		
		J-35 (2)	2"	85.0 to 90.0	38	JETTED NX-FC CSG 85.0' to 90.0'. AFTER JETTING, SAND ROSE 5.0' UP IN CSG (TO 85.0').	
	88	J-36R			46		
					51		
					57		
90.0	90						
					45	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 90.0' to 95.0' & RECD SMALL SAMPLE. RECD ± 10%	
					34		
	92	J-37	2"	90.0 to 95.0	42	JETTED NX-FC CSG 90.0' to 95.0'. SAND ROSE 5.0' UP INTO CSG AFTER JETTING CSG & WASHING IT OUT.	
					46		
	94				59		
95.0	95						

Site: PARK RIVER HARTFORD, CONN.

Boring No. FD-9

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	1" = 2'						
95.0	95				23	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 95.0' TO 100.0'. NO SAMPLE REC'D.	
					42	(LOST SAMPLE BUMPING OUT BECAUSE SPOON GROUTED	
	97	NONE	2"	95.0 TO 100.0	47	BY SAND RISING IN CSG.) JETTED NX-FC CSG 95.0	REDDISH BROWN, GRAVELLY SILTY C-F SAND (SM), TILL, MOIST.
					36	TO 100.0' - WASHED OUT CSG TO 100.0'. SAND ROSE	
	99				29	5.0' UP INTO CSG (TO 95.0) AFTER WASHING OUT TO 100.0'.	
100.0							
					39	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 100.0' TO 104.6.	
	101					NO SAMPLE REC'D - REPEATED	
				100.0 TO 104.6	84	RUN USING 1 1/2" I.D. SOLID	
		NONE	2"			SAMPLE SPOON — NO RECIVY.	
					68	JETTED NX-FC CSG 100.0'	
	103					TO 104.6'. REFUSAL	
					71	@ 104.6' (100 BLOWS W/	
104.6					128	SAMPLE SPOON - NO PENETRATION)	

BOTTOM OF EXPLORATION @ 104.6' — DEPTH CONSIDERED SUFFICIENT.

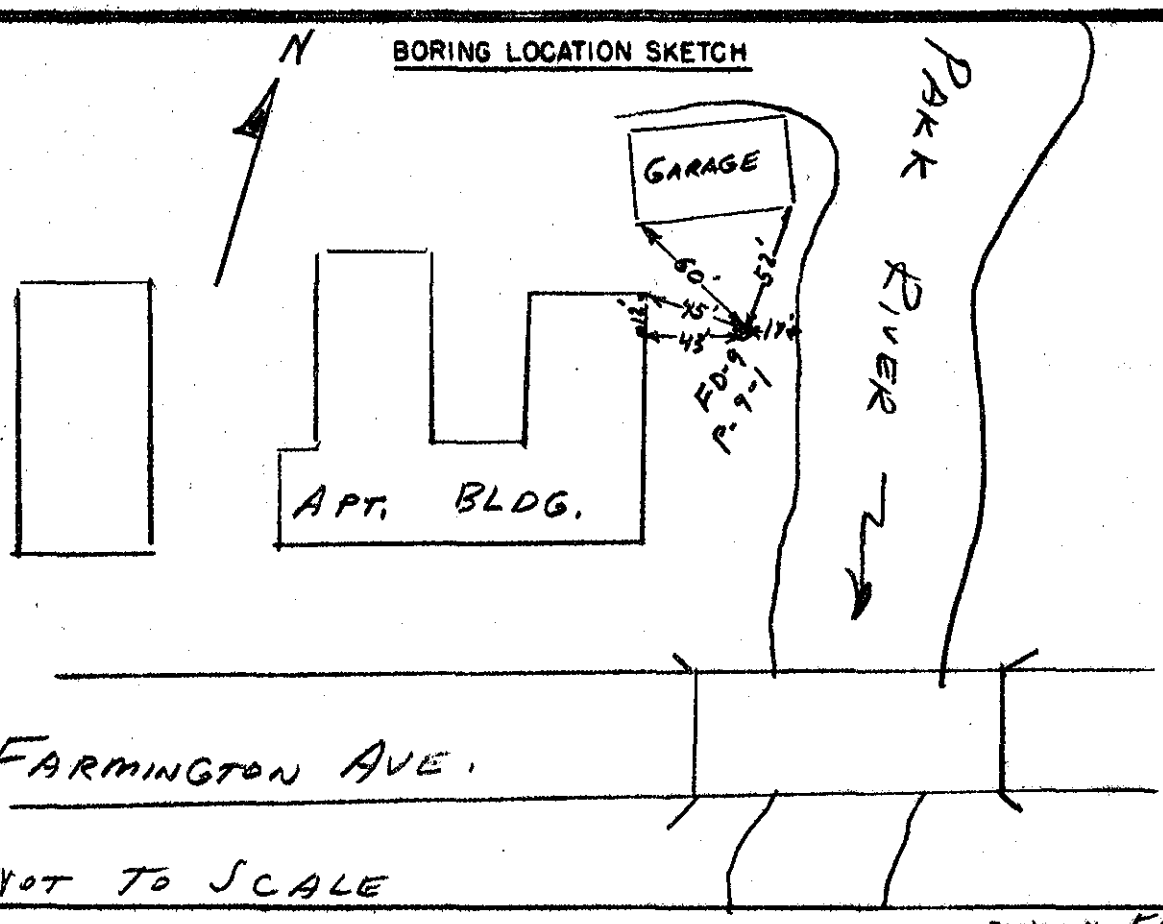
Site: HARTFORD, CONN.
Boring No: FD-9

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
8/6	0800	10.0'	10.0'	6.8'	—	TAKEN BEFORE DRILLING
8/7	0800	60.0'	60.0'	0.4'	—	TAKEN BEFORE DRILLING
8/8	0800	85.0'	85.0'	0.4'	—	TAKEN BEFORE DRILLING
8/9	0800	95.0'	95.0'	0.3'	—	TAKEN BEFORE DRILLING
8/10	0800	100.0'	100.0'	0.4'	—	TAKEN BEFORE DRILLING
8/13	1130	—	104.6'	11.6'	—	AFTER PULLING CSG

Note: Depths are in feet below original ground

BORING LOCATION SKETCH



U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

PARK RIVER CONDUIT EXTENSION
Site Box Cont. J — Page 1 of 8 Pages
HARTFORD, CONN.
Boring No. FD-10 Desig. P-9-3 Diam. (Casing) BX-FC / NX-FC
Co-ordinates: N 152,357 E 160,632

Elevation Top of Boring _____ M.S.L.
Total Overburden Drilled 94.6 Feet
Elevation Top of Rock _____ M.S.L.
Total Rock Drilled 6.5 Feet
Elevation Bottom of Boring _____ M.S.L.
Total Depth of Boring 101.1 Feet
Core Recovered 45 % No. Boxes 2
Core Recovered 2.9 Ft: NX/BX Diam. 2 1/8 / 1 5/8 In.
Soil Samples 2 1/2 In. Diam. 1 No.
Soil Samples 2 In. Diam. 35 No.

Hammer Wt. #350 Boring Started 8/14/73
Hammer Drop 18"
Boring Completed 8/24/73
Casing Left 10.0' BX-FC (Bottom @ 97.4')
Subsurface Water Data _____ Page 8
Obs. Well NONE
Drilled By CORPS OF ENGINEERS
Mfg. Des. Drill CP-3
Inspected By: A. MERRILL
Classification By: _____
Classification By: _____

DEPTH (1" = 2')	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
0.9	NONE	2 1/2	0.0 TO 0.9	10	DROVE 2 1/2" I.D. X 5.0' SOLID SAMPLE SPOON 0.0' TO 5.0' & TOOK SAMPLE. REC'D ± 40%	TOPSOIL
2	J-1	2 1/2	0.9 TO 5.0	42		DARK BROWN GRAVELLY SILTY C-F SAND (SM), MOIST, W/ TRACES OF COAL FRAGMENTS & BRICK FRAGS., FILL.
4				49	HOLE REMAINED OPEN.	
5.0				55		
				42		
6	J-2 (2)	2"	5.0 TO 10.0	9	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 5.0' TO 10.0' & TOOK SAMPLE. REC'D ± 60%	REDDISH BROWN & GREY, ~~FINE SANDY~~ SILTY CLAY (CL), MOIST, STRATIFIED, stain spots
				13		
8	J-3R			14	JETTED NX-FC CSG FROM 0.0' TO 10.0'	
				16		
10.0 / 10				21		

GENERAL REMARKS: BORING LOCATED ON LAWN BEHIND APT. BLDG. NEAR PARK RIVER.

NED FORM 58 (Test) MAR 71

Boring No. FD-10

Site: PARK RIVER, HARTFORD, CONN.

Boring No. FD-10

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
10.0	10				3	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 10.0' TO 15.0' & TOOK	REDDISH BROWN & GREY, ~~FINE SANDY~~ SILTY
		J-4 (2)	2"	10.0 TO 15.0	3	SAMPLE. REC'D ± 70%	CLAY (~~CL~~ CH), MOIST,
	12				3	JETTED NX-FC CSG	VARVED, W/ SILT
		J-5R			3	FROM 10.0' TO 15.0'.	LAYERS 2" TO 1/4".
	14				4		
15.0					3		
	16			15.0 TO 20.0	WT. OF TOOLS + HAMMER	PENETRATION BY WGT. OF HAMMER & TOOLS FROM 15.0' TO 18.1',	W/ SILT LAYERS 2" TO 1/4"
		J-6 (2)	2"			DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON FROM 18.1' TO 20.0' &	
18.1	18	J-7R				TOOK SAMPLE. REC'D ± 80%	
					2	JETTED NX-FC CSG	
					3	FROM 15.0' TO 20.0'.	
20.0	20				WGT. OF TOOLS + HAMMER	PENETRATION BY WGT. OF HAMMER & TOOLS FROM 20.0' TO 23.0'.	SILT LAYERS 1" TO PAPER THIN
	22	J-8 (2)	2"	20.0 TO 25.0		DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON FROM 23.0' TO 25.0' &	
23.0		J-9R			4	TOOK SAMPLE. REC'D ± 80%	
	24					JETTED NX-FC CSG	
					5	FROM 20.0' TO 25.0'.	
25.0					WGT. OF TOOLS + HAMMER	PENETRATION BY WGT OF HAMMER & TOOLS FROM 25.0' TO 27.4'.	SILT LAYERS 1" TO PAPER THIN
	26					DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON	
	27						

Site: PARK RIVER, HARTFORD, CONN.

Boring No. FD-10

DEPTH (Ft.)	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
27.4 – 30.0	J-10 (2), J-11R	2"	25.0 TO 30.0	3, 3, 4	27.4' TO 30.0' S' TOOK SAMPLE. REC'D ± 90%. JETTED NX-FC CSG FROM 25.0' TO 30.0'.	REDDISH BROWN & GREY ~~SANDY~~ SILTY CLAY (CH) (CL), MOIST, VARVED, W/SILT LAYERS 1" TO PAPER THIN. (ML)
30.0 – 35.0	J-12 (2), J-13R	2"	30.0 TO 35.0	WGT. OF TOOLS + HAMMER	PENETRATION OF 2" I.D. X 5.0' SOLID SAMPLE SPOON BY WGT. OF TOOLS + HAMMER. TOOK SAMPLE. REC'D ± 90%. JETTED NX-FC CSG FROM 30.0' TO 35.0'.	SILT LAYERS 1" TO PAPER THIN
35.0 – 40.0	J-14 (2), J-15R	2"	35.0 TO 40.0	WGT. OF TOOLS + HAMMER, 2	PENETRATION BY WGT. OF HAMMER & TOOLS FROM 35.0' TO 39.3'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 39.3' TO 40.0' & TOOK SAMPLE. REC'D ± 90%. JETTED NX-FC CSG FROM 35.0' TO 40.0'.	SILT LAYERS 1" TO PAPER THIN
40.0 – 44.0	J-16 (2), J-17R	2"	40.0 TO 45.0	WGT. OF TOOLS + HAMMER	PENETRATION BY WGT. OF HAMMER & TOOLS FROM 40.0' TO 44.0'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 40.0' TO 44.0' & TOOK SAMPLE. REC'D ± 90%. JETTED NX-FC CSG.	SILT LAYERS 1" TO PAPER THIN

Site: PARK RIVER HARTFORD, CONN.

Boring No. FD-10

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
44.0	44				3	FROM 44.0 TO 45.0'.	SILT LAYERS 1" TO PAPER THIN
45.0	46	J-18 (2)	2"	45.0 TO 50.0	WGT. OF TOOLS + HAMMER	PENETRATION BY WGT OF HAMMER & TOOLS. FROM 45.0' TO 47.2'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 47.2' TO 50.0' & TOOK SAMPLE. REC'D ± 90% JETTED NX-FC CSG FROM 45.0' TO 50.0'.	REDDISH BROWN & GREY ~~FINE SANDY~~ SILTY CLAY (CH) ~~(CL)~~, MOIST, VARVED W/SILT LAYERS 1½" TO 1/4" (ML)
47.2		J-19R			4		
	48				4		
					4		
50.0	50						
52.1	52	J-20 (2)	2"	50.0 TO 55.0	WGT. OF TOOLS + HAMMER	PENETRATION BY WGT OF HAMMER & TOOLS FROM 50.0' TO 52.1'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 52.1' TO 55.0' & TOOK SAMPLE. REC'D ± 90% JETTED NX-FC CSG FROM 50.0' TO 55.0'.	SILT LAYERS 1½" TO 1/4"
		J-21R			4		
	54				4		
					5		
55.0	56	J-22 (2)	2"	55.0 TO 60.0	WGT OF TOOLS + HAMMER	PENETRATION BY WGT OF HAMMER & TOOLS FROM 55.0' TO 57.3'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 57.3' TO 60.0' & TOOK SAMPLE. REC'D ± 90% JETTED NX-FC CSG FROM 55.0' TO 60.0'.	SILT LAYERS 2" TO 1/4"
57.3		J-23R			4		
	58				4		
					4		
60.0	60				WGT. TOOLS + HAMMER	PENETRATION BY WGT OF HAMMER & TOOLS	SILT LAYERS 1" TO PAPER THIN
	61						

Site: PARK RIVER, HARTFORD, CONN.

Boring No. FD-10

DEPTH (1" = 2')	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
61, 62.0	J-24 (2)	2"	60.0 TO 65.0	WGT OF TOOLS + HAMMER; 3; 3; 4	FROM 60.0' TO 62.0' DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 62.0' TO 65.0' & TOOK SAMPLE. REC'D ± 70% JETTED NX-FC CSG FROM 60.0' TO 65.0'.	REDDISH BROWN & GREY ~~FINE SANDY~~ SILTY CLAY (CH) ~~(CL)~~, MOIST VARVED, W/SILT LAYERS 1" TO PAPER THIN. (MH)
63, J-25R, 65.0, 65						
65.8	J-26 (2)	2"	65.0 TO 70.0	WGT OF TOOLS + HAMMER; 4; 4; 5; 7	PENETRATION BY WGT OF HAMMER & TOOLS FROM 65.0' TO 65.8'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 65.8' TO 70.0' & TOOK SAMPLE. REC'D ± 90% JETTED NX-FC CSG FROM 65.0' TO 70.0'.	SILT LAYERS 1" TO PAPER THIN
67, J-27R, 69, 70.0						
71, 73, 75.0	J-28 (2), J-29R	2"	70.0 TO 75.0	2; 3; 4; 4; 6	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 70.0' TO 75.0' & TOOK SAMPLE. REC'D ± 80% JETTED NX-FC CSG FROM 70.0' TO 75.0'.	SILT LAYERS PAPER THIN
75, 77, 77.8, 78	J-30, J-31R	2"	75.0 TO 77.8	9; 12; 15	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 75.0' TO 80.0' & TOOK SAMPLE. REC'D ± 60% JETTED NX-FC CSG	REDDISH BROWN, FINE SANDY SILTY CLAY (CL), MOIST, STRATIFIED.

(SEE PAGE 6)

Site: PARK RIVER HARTFORD, CONN.

Boring No. FD-10

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	78					FROM 75.0' TO 80.0'	Reddish-brown silty ~~(70-90)~~, gravelly ~~(10-20)~~ SAND (SM)
		J-32	2"	77.8 TO 80.0	28		
					30		
80.0	80					DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 80.0' TO 85.0' 5' REC'D SMALL SAMPLE. REC'D ±15%	
					10		
					12		REDDISH BROWN, ~~GRAVELLY~~ SILTY C-F SAND (SM), TILL, MOIST.
	82	J-33	2"	80.0 TO 85.0	18	JETTED NX-FC CSG FROM 80.0' TO 85.0'.	
	84				28		
					34		
85.0						DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 85.0' TO 90.0'. NO SAMPLE REC'D.	
	86				42		
				85.0 TO 90.0	49	REPEATED RUN - NO SAMPLE	(WASH WATER CONTINUED TO INDICATE THE SAME REDDISH BROWN SILTY SAND.)
		NONE	2"		56	JETTED NX-FC CSG FROM 85.0' TO 90.0'.	
	88				61	OBSERVED WASH WATER - NO CHANGE IN MATL INDICATED.	
					76		
90.0	90					DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 90.0' TO 94.6' 5' TOOK SAMPLE. REC'D ±90%	Reddish-brown silty ~~(70-90)~~, sandy GRAVEL (GM) moist
					36		
		J-34 (2)	2"	90.0 TO 94.4	49	REFUSAL @ 94.6' - 100 BLOWS. NO PENETRATION. JETTED NX-FC CSG FROM 90.0' TO 94.6'.	
	92				105		
		J-35R			122		
	94						
94.4					114	ROTARY DRILLED W/NX M' SERIES BIT # 03B758	WEATHERED ROCK
94.6		J-36	2"	94.4 TO 94.6			TOP OF BEDROCK
	95						

Site: PARK RIVER
HARTFORD, CONN.

Boring No. FD-10

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	95				RAN 4.5	FROM 94.6' TO 99.1', HYD. FEED 65 MIN. TIME. REDDISH BR. TO GREY & HOLDING. BLOCKED @ 99.1'. CAVED @ 95.2'.	
	97	BOX #1	NX	94.6 TO 99.1	REC. 2.1 47%	DROPPED 10.0' OF BX-RC CSG IN HOLE. BOTTOM OF CSG @ 97.4'. HIGHLY FRACTURED, W/SEAMS, FRAGMENTS TO 0.1'. DRILLED W/BX 'M' SERIES BIT #641137 FROM 99.1' TO 100.3' HYD. FEED. 15 MIN. DRILL TIME REDDISH BR. TO GREY & HOLDING.	
99.1	99	BOX #2	BX	99.1 TO 100.3	RAN 1.2 REC. 0.8 67%	BLOCKED @ 100.3'. HIGHLY FRACT. FRAGS. TO 0.1'. DRILLED W/BX 'M' SERIES BIT #641137 FROM 100.3' TO 101.1'.	
100.3		NONE	BX	100.3 TO 101.1	RAN 0.8' NO REC.	HYD. FEED. 11 MIN. DRILL TIME REDDISH BR. TO GREY & HOLDING. CORE BARREL GROUTED @ 101.1'.	
101.1	101					LOST 4" OF CORE BARREL, CORE, CORE SPRING & BASKET, & DIAMOND BIT IN HOLE. MADE SEVERAL ATTEMPTS TO RETRIEVE BIT, W/NO SUCCESS.	

BOTTOM OF EXPLORATION @ 101.1' — UNABLE TO RETRIEVE BIT.

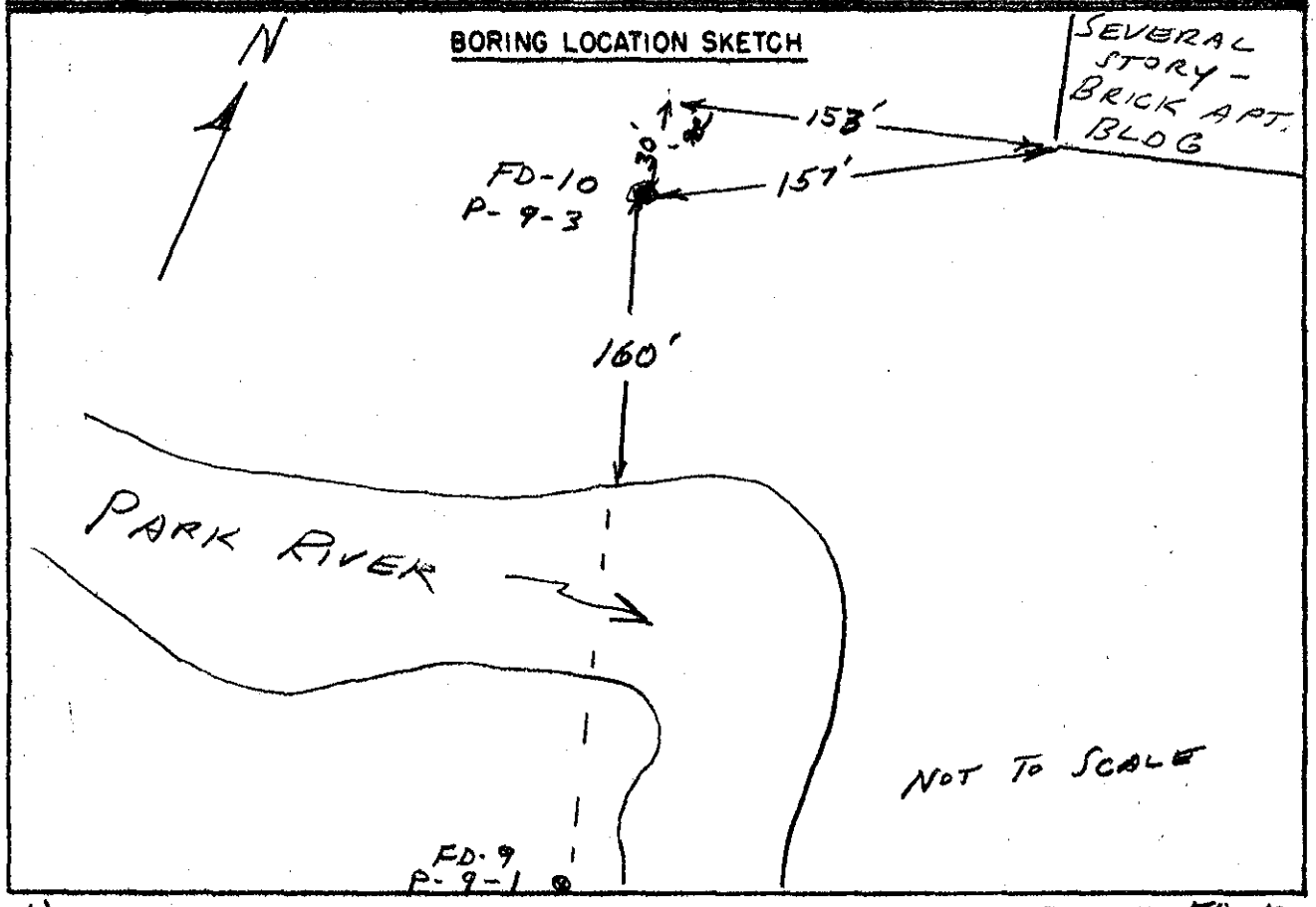
Site: HARTFORD, CONN.
Boring No: FD-10

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
8/15	0800	40.0'	40.0'	0.4'	—	BEFORE START OF DAY'S DRILLING
8/15	1600	60.0'	60.0'	0.0'	—	1/4 HR AFTER DRILLING
8/16	0800	60.0'	60.0'	0.0'	—	BEFORE DRILLING
8/17	0800	60.0'	60.0'	0.6'	—	BEFORE DRILLING
8/17	1600	85.0'	85.0'	4.0'	—	1/4 HR AFTER DRILLING
8/20	0800	85.0'	85.0'	2.3'	—	BEFORE DRILLING
8/20	1600	94.6'	94.6'	2.3'	—	1/4 HR AFTER DRILLING
8/21	0800	94.6'	94.6'	—	—	NONE TAKEN - TOOLS IN HOLE.
8/23	0800	94.6'	99.1'	4.0'	—	BEFORE DRILLING
8/24	0800	97.4	101.1'	4.1'	—	BEFORE PULLING CSG.

Note: Depths are in feet below original ground

BORING LOCATION SKETCH



)(Test)

Boring No. FD-10

S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

PARK RIVER CONDU EXTENSION
Site BOX CONDUIT HARTFORD, CONN. Page 1 of 9 Pages
Boring No. FD-11 Desig. P-9-4 Diam. (Casing) NX-EC
Co-ordinates: N 152,662 E 160,674

Elevation Top of Boring +50.7' M.S.L.* Hammer Wt. 350# Boring Started 8/27/73
Total Overburden Drilled 105.5 Feet Hammer Drop 18" Boring Completed 9/7/73
Elevation Top of Rock -54.8' M.S.L. Casing Left NONE
Total Rock Drilled 19.4 Feet Subsurface Water Data _____ Page 9
Elevation Bottom of Boring -74.2' M.S.L. Obs. Well NONE
Total Depth of Boring 124.9 Feet Drilled By CORPS OF ENGINEERS
Core Recovered 95 % No. Boxes 2 Mfg. Des. Drill CP-3
Core Recovered 18.4 Ft: NX Diam. 2 1/8 In. Inspected By: A. MERRILL
Soil Samples 2 1/2 In. Diam. 1 No. Classification By: _____
Soil Samples 2 In. Diam. 42 No. Classification By: _____

DEPTH	1" = 2'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
0.2	0	NONE	2 1/2	0.0-0.2		DROVE 2 1/2" I.D. X 5.0'	BIT. ASPHALT PAV'T.
					24	SOLID SAMPLE SPOON	
					12	0.0' TO 5.0' & TOOK	
	2	J-1	2 1/2	0.2 TO 5.0	17	SAMPLE. REC'D ± 40%	Dark-gray with REDDISH BROWN, Tinge ~~Silty~~ C-F SANDY GRAVEL (GP-~~GM~~)
						HOLE REMAINED OPEN.	
	4				22		
					29		
5.0							
					21	DROVE 2" I.D. X 5.0'.	FILL, MOIST.
	6					SOLID SAMPLE SPOON	
				5.0 TO 10.0	23	5.0' TO 10.0' & TOOK	
		J-2	2"			SAMPLE, REC'D ± 20%.	
	8				26	JETTED NX-EC CSG	
					25	FROM 0.0' TO 10.0'.	
10.0	10				26		

GENERAL REMARKS: BORING LOCATED IN PARKING LOT BEHIND MEDICAL CENTER.
* LOCATION & ELEV. BY N.E.D. SURVEY.

NED FORM 58 (Test) MAR 71

Boring No. FD-11

Site: YARK RIVER HARTFORD, CONN.	Boring No. FD-11	Page 2 of 9

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
10.0	10				7	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 10.0' TO 15.0' & TOOK SAMPLE. REC'D ± 20% JETTED NX-FC CSG FROM 10.0' TO 15.0'.	GREY ~~MH BROWN~~, ~~CF~~ ~~SANDY~~ SILT (ML), MOIST, FILL.
				10.0 TO 15.0	8		
	12	J-3	2"		7		
					12		
	14				14		
15.0							
					7	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 15.0' TO 20.0' & TOOK SAMPLE. REC'D ± 40%. JETTED NX-FC CSG FROM 15.0' TO 20.0'.	
	16						
		J-4	2"	15.0 TO 18.2	8		
					6		
18.2	18						
					9		DARK ~~BROWN~~ ~~GRAY~~ GRAY SILT (ML) ~~SILTY SAND~~ ~~(SM)~~ stratified fine sand layers MOIST, W/ ORGANICS (ROOTS), ORIG. GROUND.
		J-5	2"	18.2 TO 20.0	9		
20.0	20						
					8	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 20.0' TO 25.0' & TOOK SAMPLE. REC'D ± 80%. JETTED NX-FC CSG FROM 20.0' TO 25.0'.	
		J-6	2"	20.0 TO 22.2	12		
22.2	22						
					15		REDDISH BROWN & GREY ~~SILTY~~ ~~FINE~~ Varved (CH + ML) ~~SANDY~~ CLAY (~~CL~~), MOIST, VARVED, W/ SILT LAYERS 1/4" TO PAPER THIN.
		J-7 (2)	2"	22.2 TO 25.0	17		
	24	J-8R					
					16		
25.0							
	26				WT. OF TOOLS + HAMMER	PENETRATION BY WGT. OF HAMMER & TOOLS FROM 25.0' TO 26.3'.	
26.3							
	27				2	DROVE 2" I.D. X 5.0'	

(Test) Boring No. FD-11

Site: MARK RIVER HARTFORD CONN.

Boring No. FD-11

DEPTH (Ft. 2')	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
27	J-9 (2)	2"	26.3 to 30.0	3 / 3	FROM 26.3' TO 30.0' & TOOK SAMPLE. REC'D ± 90%. JETTED NX-FC CSG FROM 25.0' TO 30.0'.	REDDISH BROWN & GREY, ~~FINE SANDY SILTY~~ CLAY (~~CL~~) (CH), MOIST, VARVED, W/SILT LAYERS 1/4" TO PAPER THIN.
29	J-10R			4		
30.0						
31	J-11 (2)	2"	30.0 to 35.0	WGT. OF TOOLS + HAMMER	PENETRATION BY WGT OF HAMMER & TOOLS FROM 30.0' TO 33.2'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON FROM 33.2' TO 35.0' & TOOK SAMPLE. REC'D ± 90%. JETTED NX-FC CSG FROM 30.0' TO 35.0'.	SILT LAYERS (ML) 1/4" TO PAPER THIN
33	J-12R			2		
33.2				3		
35.0 35						
37	J-13 (2)	2"	35.0 to 40.0	WGT. OF TOOLS + HAMMER	PENETRATION BY WGT. OF HAMMER & TOOLS FROM 35.0' TO 38.7'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 38.7' TO 40.0' & TOOK SAMPLE. REC'D ± 90%. JETTED NX-FC CSG FROM 35.0' TO 40.0'.	SILT LAYERS 1/4" TO PAPER THIN
	J-14R					
38.7				2		
39				4		
40.0						
41	J-15 (2)	2"	40.0 to 45.0	WGT. OF TOOLS + HAMMER	PENETRATION BY WGT OF TOOLS & HAMMER FROM 40.0' TO 43.5'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 43.5' TO 45.0' & TOOK SAMPLE. REC'D ± 90% JETTED NX-FC CSG	SILT LAYERS 1/4" TO PAPER THIN
	J-16R					
43						
43.5				2		
44						

Site: PARK RIVER HARTFORD, CONN.	Boring No. FD-11	Page 4 of 9

DEPTH (Ft.)	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
44				3	FROM 40.0' TO 45.0'.	REDDISH BROWN & GREY, ~~FINE SANDY~~ ~~SILTY~~ CLAY (CH) ~~(CL)~~, MOIST, VARVED, W/ SILT LAYERS 1" TO 1/4" (MH)
45.0						
46				WGT. OF TOOLS + HAMMER	PENETRATION BY WGT OF TOOLS & HAMMER 45.0 TO 48.7'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 48.7' TO 50.0' & TOOK SAMPLE. REC'D ± 90% JETTED NX-FC CSG FROM 45.0' TO 50.0'.	
	J-17 (2)	2"	45.0 TO 50.0			
48	J-18R					
48.7				2		
				4		
50.0 50						
				WGT. OF TOOLS + HAMMER	PENETRATION BY WGT OF HAMMER & TOOLS 50.0' TO 54.3'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 54.3' TO 55.0' & TOOK SAMPLE. REC'D ± 90% JETTED NX-FC CSG FROM 50.0' TO 55.0'	SILT LAYERS 1" TO 1/4"
	J-19 (2)	2"	50.0 TO 55.0			
52	J-20R					
54						
54.3				4		
55.0						
56				WGT OF TOOLS + HAMMER	PENETRATION BY WGT OF HAMMER & TOOLS 55.0' TO 58.7'. DROVE 2" I.D. X 5.0 SOLID SAMPLE SPOON 58.7' TO 60.0' & TOOK SAMPLE. REC'D ± 90% JETTED NX-FC CSG FROM 55.0' TO 60.0'	SILT LAYERS 1" TO 1/4"
	J-21 (2)	2"	55.0 TO 60.0			
58	J-22R					
58.7				2		
				4		
60.0 60				WGT OF TOOLS + HAMMER	PENETRATION BY WGT OF HAMMER & TOOLS	SILT LAYERS 2" TO 1/4"
61						

Site: PARK RIVER HARTFORD, CONN.

Boring No. FD-11

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
1	61				WGT. OF TOOLS + HAMMER	FROM 60.0' TO 63.7'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 63.7' TO 65.0' & TOOK SAMPLE. REC'D ± 90% JETTED NX-FC CSG FROM 60.0' TO 65.0'.	REDDISH BROWN & GREY, ~~FINE SANDY SILTY~~ CLAY (CH) ~~(CL)~~ MOIST, VARVED, W/ SILT LAYERS 2" TO 1/4" (MH)
	63	J-23 (2)	2"	60.0 TO 65.0			
63.7		J-24R			2		
					4		
65.0	65				WGT. OF TOOLS + HAMMER	PENETRATION BY WGT OF HAMMER & TOOLS 65.0' TO 67.0'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 67.0' TO 70.0' & TOOK SAMPLE. REC'D ± 90% JETTED NX-FC CSG FROM 65.0' TO 70.0'.	SILT LAYERS 1" TO 1/4"
67.0	67	J-25 (2)	2"	65.0 TO 70.0	2		
		J-26R			3		
	69				4		
70.0							
	71				WGT. OF TOOLS + HAMMER	PENETRATION BY WGT OF HAMMER & TOOLS 70.0' TO 73.2'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 73.2' TO 75.0' & TOOK SAMPLE. REC'D ± 90% JETTED NX-FC CSG FROM 70.0' TO 75.0'.	SILT LAYERS 1/4" TO PAPER THIN
		J-27 (2)	2"	70.0 TO 75.0			
73.2	73	J-28R			4		
					6		
75.0	75				WGT. OF TOOLS + HAMMER	PENETRATION BY WGT OF HAMMER & TOOLS 75.0' TO 77.0'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 77.0' TO 80.0' & TOOK SAMPLE. REC'D ± 90%	PAPER THIN SILT LAYERS
		J-29 (2)	2"	75.0 TO 80.0			
77.0	77	J-30R			4		
	78						

Site: PARK RIVER HARTFORD, CONN.

Boring No. FD-11

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. OR CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	78				6	JETTED NX-FC CSG FROM 75.0' TO 80.0'.	REDDISH BROWN & GREY FINE SANDY SILTY CLAY (CL), MOIST, VARVED, W/ PAPER THIN SILT LAYERS
					6		
80.0	80				WGT. TOOLS	PENETRATION BY WGT OF HAMMER & TOOLS 80.0' TO 80.5'; DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 80.5' TO 85.0' & TOOK SAMPLE. REC'D ± 90%	
80.5					4		
		J-31			6		REDDISH BROWN ~~SILTY~~ SILT (ML); ~~FINE SAND (SM)~~, MOIST, STRATIFIED small amt. of sand & gravel
	82	(2)	2"	80.0 TO 85.0	7		
		J-32R				JETTED NX-FC CSG FROM 80.0' TO 85.0'.	
	84				10		
					12		
85.0							
		J-33	2"	85.0 TO 86.4	14	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 85.0' TO 90.0' & TOOK SAMPLE. REC'D ± 70%	
	86						
86.4					21		
		J-34	2"	86.4 TO 90.0	19	JETTED NX-FC CSG FROM 85.0' TO 90.0'.	
	88	J-35R			20		REDDISH BROWN GRAVELLY SILTY C-F SAND (SM), TILL, MOIST.
					36		
90.0	90				24	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 90.0' TO 95.0' & TOOK SAMPLE. REC'D ± 40%	
		J-36	2"	90.0 TO 95.0	31		
	92	J-37R			29	JETTED NX-FC CSG FROM 90.0' TO 95.0'.	
	94				35		
95.0	95				34		

(Test)

Boring No. FD-11

Site: PARK RIVER HARTFORD, CONN.

Boring No. FD-11

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
95.0	95	J-38	2"	95.0 to 96.2	64 / 75	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 95.0' TO 96.2' & TOOK SAMPLE. REC'D ± 90% REFUSAL @ 96.2'. JETTED NX-FC CSG FROM 95.0' TO 96.2'	
96.2	97	Box #1	NX	96.2 to 100.5	RAN 4.3' / REC. 0.3' / 7%	DRILLED W/NX 'M' SERIES BIT # 03B758 96.2' TO 100.5'. REC'D 0.3' GRAV. WASH WATER & DRILL BEHAVIOR CONTINUED TO INDICATE THE SAME REDDISH BROWN SANDY TILL. JETTED NX-FC CSG FROM 96.2' TO 100.5'. WASHED OUT TO 100.5'.	REDDISH BROWN GRAVELLY SILTY C-F SAND (SM), TILL, MOIST.
100.5	101	J-39 / J-40R	2"	100.5 to 102.6	112 / 131 / 250	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 100.5' TO 102.6' & TOOK SAMPLE. REC'D ± 90%. REF @ 102.6'. JETTED NX-FC CSG FROM 100.5' TO 102.6'. WASHED & CHOPPED	
102.6	103	None	—	102.6 - 103.0	WASH & CHOP	FROM 102.6' TO 103.0' - NO CHANGE IN MAT'L. JETTED CSG TO 103.0'.	
103.0		J-41	2"	103.0 to 104.1	149 / 600	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 103.0' TO 104.1' & TOOK SAMPLE. REC'D ± 60% REF @ 104.1' WASHED & CHOPPED FROM 104.1'	
104.1		None	—	104.1 - 104.5	WASH & CHOP	TO 104.5' - NO CHANGE IN MAT'L. JETTED NX-FC CSG 103.0 TO 104.5'	
104.5	105	J-42	2"	104.5 - 105.1	142	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 104.5' TO 105.5' & TOOK SAMPLE. REC'D ± 70% REF. @ 105.5' JETTED NX-FC CSG 104.5' TO 105.5'	
105.1		J-43	2"	105.1 - 105.5	230		WEATHERED ROCK
105.5	107	Box #1	NX	105.5 to 108.6	RAN 3.1' / REC. 2.4' / 77%	DRILLED W/NX 'M' SERIES BIT # 03B758 105.5' TO 108.6'. HYD. FEED. 39 min. - DRILL TIME. LOOSING 100% - WATER. BIT BLOCKED @ 108.6' HIGHLY FRACTURED. 0.3' TO FRAGMENTS.	TOP OF BEDROCK
108.6	109	Box #1	NX	108.6 to 111.7	RAN 3.1' / REC. 2.8' / 90%	DRILLED W/NX 'M' SERIES BIT # 03B758 108.6' TO 111.7' HYD. FEED. 38 min. DRILL TIME. LOOSING 100% WATER. BIT BLOCKED @ 111.7' HIGHLY FRACT. 0.1' TO FRAGS.	
111.7	112					DRILLED W/NX 'M' SERIES	

Site: PARK RIVER HARTFORD, CONN.	Boring No. FD-11	Page 8 of 9

DEPTH	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECV'T	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
112	Box #1	NX	111.7 to 115.4	RAN 3.7' Rec. 2.9' 78%	BIT #03B758 111.7' TO 115.4' HYD. FEED. 42 MIN. DRILL TIME LOOSING 100% WATER BIT BLOCKED @ 115.4' HIGHLY FRACT. 0.4' TO FRAGS.	
114						
115.4						
116	Box #1	NX	115.4 to 120.4	RAN 5.0' Rec. 4.9' 98%	DRILLED W/NX "M" SERIES BIT #03B758 115.4' TO 120.4' HYD. FEED. 58 MIN. DRILL TIME LOOSING 100% WATER COMPLETED RUN @ 120.4' HIGHLY FRACT. 0.4' TO FRAGS.	
118						
120						
120.4						
122	Box #2	NX	120.4 to 124.9	RAN 4.5' Rec. 4.4' 98%	DRILLED W/NX 'M' SERIES BIT #03B758 120.4' TO 124.9'. HYD. FEED. 50 MIN. DRILL TIME. LOOSING 100% WATER BIT BLOCKED @ 124.9' HIGHLY FRACT. 0.5' TO FRAGS.	
124						
124.9					BOTTOM OF EXPLORATION @ 124.9' — DEPTH CONSIDERED SUFFICIENT.	

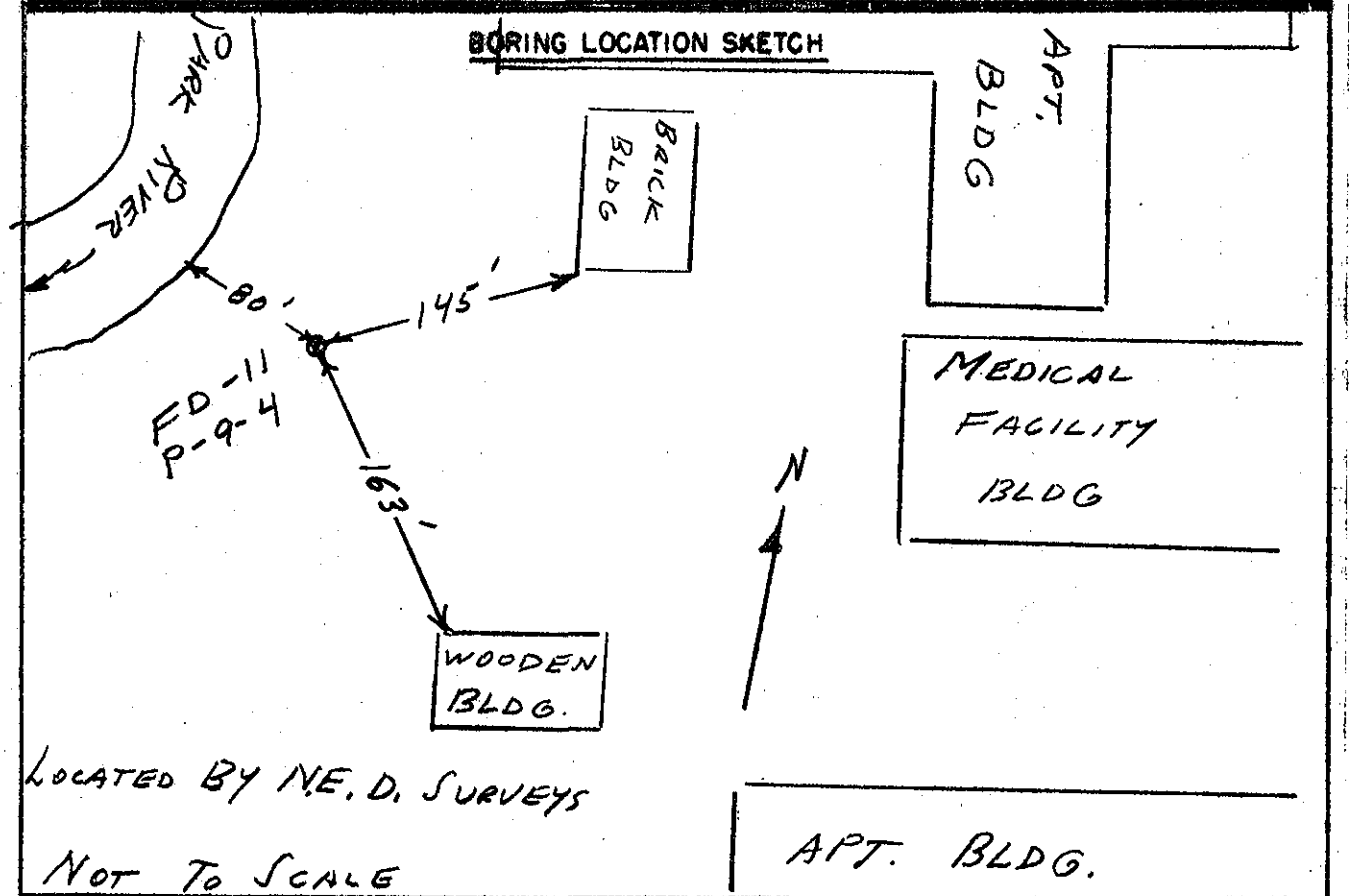
Site: HARTFORD, CONN.
Boring No: FD-11

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
8/28	0800	25.0'	25.0'	6.4'		BEFORE DRILLING
8/29	0800	65.0'	65.0'	—		NONE TAKEN - TOOLS IN HOLE
8/29	1630	95.0'	96.2'	0.4'		CSG FILLED W/WATER - 1/4 HR AFTER
8/30	0800	95.0'	96.2'	12.8'		BEFORE DRILLING
8/31	0800	100.5'	100.5'	15.7'		BEFORE DRILLING
9/4	0800	103.0'	103.0'	16.3'		BEFORE DRILLING
9/5	0800	105.5'	105.5'	17.4'		BEFORE DRILLING
9/6	0800	105.5'	115.4'	20.8'		BEFORE DRILLING
9/7	0800	105.5'	120.4'	20.7'		BEFORE DRILLING

Note: Depths are in feet below original ground

BORING LOCATION SKETCH



LOCATED BY N.E.D. SURVEYS

NOT TO SCALE

NED FORM 59 (Test) MAR 71

Boring No. FD-11

PARK RIVER CO[illegible]T EXTENSION

U. S. ARMY
CO[illegible]S OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site BOX CONDUIT HARTFORD, CONN. — Page 1 of 11 Pages

Boring No. FD-12 Desig. P-9-2A Diam. (Casing) NX-FC

Co-ordinates: N 152,218 E 160,757

Elevation Top of Boring _____ M.S.L.
Total Overburden Drilled 124.5 Feet
Elevation Top of Rock _____ M.S.L.
Total Rock Drilled 29.5 Feet
Elevation Bottom of Boring _____ M.S.L.
Total Depth of Boring 154.0 Feet
Core Recovered 79 % No. Boxes 2
Core Recovered 23.3 Ft: NX Diam. 2 1/8 In.
Soil Samples 2 1/2 In. Diam. 1 No.
Soil Samples 2 1/2 In. Diam. 1/2 No.

Hammer Wt. #350
Hammer Drop 18"
Casing Left NONE
Subsurface Water Data _____ Page 11
Obs. Well NONE
Drilled By CORPS OF ENGINEERS
Mfg. Des. Drill CP-3
Inspected By: A. MERRILL
Classification By:
Classification By:

Boring Started 9/10/73
Boring Completed 9/24/73

DEPTH	1" = 2'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
		NONE	2 1/2"	0.0 TO 0.8	10	DROVE 2 1/2" I.D. X 5.0' SOLID SAMPLE SPOON 0.0' TO 5.0' & TOOK SAMPLE. REC'D ± 80%	TOPSOIL
0.8							GRAY, SANDY, SILT (ML) CINDERS, RED BRICK FRAGS, ROOTS. (FILL)
	2	J-1	2 1/2"	0.8 TO 5.0	9		
					11		
	4				12	HOLE REMAINED OPEN.	BROWN GRAVELLY SILTY C-F SAND (SM), MOIST, FILL, W/ RUBBLE, (SUCH AS BRICK FRAGS, COAL CINDERS, WOOD FRAGS & COAL FRAGS).
					20		
5.0							
	6				16	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 5.0' TO 10.0' & TOOK SAMPLE. REC'D ± 40%.	
					21		
	8	J-2	2"	5.0 TO 10.0	17		
					35	JETTED NX-FC CSG FROM 0.0' TO 10.0'	
10.0	10				24		

GENERAL REMARKS: BORING LOCATED ON RIVER BANK BEHIND APT. BLDG.

NED FORM MAR 71 58 (Test)

Boring No. FD-12

Site: NRK RIVER HARTFORD, CONN.	Boring No. FD-12	Page 3 of 11

DEPTH	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
10.0 (10, 12, 14)	J-3	1½	10.0 to 15.0	10, 12, 12, 17, 21	DROVE 1½" I.D. X 5.0' SOLID SAMPLE SPOON 10.0' TO 15.0' & TOOK SAMPLE. RECV'D ± 20% JETTED NX-FC CSG FROM 10.0' TO 15.0'.	GREY-BROWN, ~~SILTY~~ SILT FINE SANDY ~~CLAY~~ (ML) ~~(CL)~~, MOIST, W/ ORGANICS & TRACES OF BRICK FRAGS, FILL.
15.0 (16, 18)	J-4	2"	15.0 to 20.0	12, 19, 24, 28, 29	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 15.0' TO 20.0' & TOOK SAMPLE. RECV'D ± 60% JETTED NX-FC CSG FROM 15.0' TO 20.0'.	
20.0 (20, 22, 24)	J-5 (2), J-6R	2"	20.0 to 25.0	3, 3, 2, 3, 3	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 20.0' TO 25.0' & TOOK SAMPLE. RECV'D ± 90% JETTED NX-FC CSG FROM 20.0' TO 25.0'.	REDDISH BROWN, & GREY, SILTY FINE SANDY CLAY (CH) ~~(CL)~~, MOIST, VARVED, W/ SILT LAYERS 1/4" TO PAPER THIN
25.0 (26, 27)				WGT. OF TOOL + HAMMER	PENETRATION BY WGT OF HAMMER & TOOLS FROM 25.0' TO 28.4'. DROVE 2" I.D. X 5.0' SOLID SAMPLE	SILT LAYERS 1" TO 1/4"

Site: Park River Hartford, Conn.	Boring No. FD-12	Page 3 of 11

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	27	J-7 (2) J-8R	2"	25.0 to 30.0	WGT. TOOLS + HAMMER; 1; 2	28.4' to 30.0' & took sample Rec'd ± 90%. Jetted NX-FC CSG from 25.0' to 30.0'.	Reddish Brown & Grey ~~Silty Fine Sandy~~ Clay (CH) ~~(CL)~~, moist, varved, w/ silt layers 1" to 1/4".
28.4	29						
30.0	31	J-9 (2) J-10R	2"	30.0 to 35.0	WGT. TOOLS + HAMMER; 2; 3	Penetration by wgt of hammer & tools from 30.0' to 33.0'. Drove 2" I.D. x 5.0' solid sample spoon from 33.0' to 35.0' & took sample. Rec'd ± 90%. Jetted NX-FC CSG from 30.0' to 35.0'.	Silt layers 1" to 1/4"
33.0	33						
35.0	35	J-11 (2) J-12R	2"	35.0 to 40.0	WGT. TOOLS + HAMMER; 2; 2	Penetration by wgt of hammer & tools from 35.0' to 38.1'. Drove 2" I.D. x 5.0' solid sample spoon 38.1' to 40.0' & took sample. Rec'd ± 90%. Jetted NX-FC CSG from 35.0' to 40.0'.	Silt layers 1" to 1/4"
	37						
38.1	39						
40.0	41	J-13 (2) J-14R	2"	40.0 to 45.0	WGT. TOOLS + HAMMER; 1; 2	Penetration by wgt. of hammer & tools from 40.0' to 42.4'. Drove 2" I.D. x 5.0' solid sample spoon 42.4' to 45.0' & took sample. Rec'd ± 90%. Jetted NX-FC CSG from 40.0' to 45.0'.	Silt layers 1" to 1/4"
42.4	43						
	44						

Site: PARK RIVER, HARTFORD CONN.

Boring No. FD-12

DEPTH (Ft. 2')	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
44				3		REDDISH BROWN & GREY, ~~SILTY FINE~~ (CH) ~~SANDY~~ CLAY (~~CL~~), MOIST, VARVED, W/SILT LAYERS 1" TO 1/4".
45.0						
46	J-15 (2)	2"	45.0 TO 50.0	WGT TOOLS + HAMMER	PENETRATION BY WGT. OF HAMMER & TOOLS FROM 45.0' TO 49.6'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 49.6' TO 50.0' & TOOK SAMPLE. REC'D ± 90%. JETTED NX-FC CSG FROM 45.0' TO 50.0'.	
48	J-16R					
49.6				2		
50.0 50						SILT LAYERS 1" TO 1/4"
52	J-17 (2)	2"	50.0 TO 55.0	WGT. TOOLS + HAMMER	PENETRATION BY WGT. OF HAMMER & TOOLS FROM 50.0' TO 53.6'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 53.6' TO 50.0' & TOOK SAMPLE. REC'D ± 90%. JETTED NX-FC CSG FROM 50.0' TO 55.0'.	
	J-18R					
53.6				3		
54				4		
55.0						SILT LAYERS 1" TO 1/4"
56	J-19 (2)	2"	55.0 TO 60.0	WGT. TOOLS + HAMMER	PENETRATION BY WGT. OF HAMMER & TOOLS FROM 55.0' TO 58.3'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 58.3' TO 60.0' & TOOK SAMPLE. REC'D ± 90%. JETTED NX-FC CSG FROM 55.0' TO 60.0'.	
58	J-20R					
58.3				4		
				4		
60.0 60				1	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON FROM	SILT LAYERS 1/4" TO PAPER THIN
61						

Site: PARK RIVER HARTFORD CONN.

Boring No. FD-12

DEPTH (Ft. 2')	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
61				2	60.0' TO 65.0' & TOOK SAMPLE REC'D ± 90%	REDDISH BROWN & GREY, ~~SILTY~~ ~~FINE~~ ~~SANDY~~ CLAY (CH) (~~CL~~), MOIST, VARVED, W/SILT LAYERS 1/4" TO PAPER THIN.
	J-21 (2)	2"	60.0 TO 65.0	4	JETTED NX-FC CSG FROM 60.0' TO 65.0'	
63	J-22R			4		
				4		
65.0 / 65				WGT. OF TOOLS + HAMMER	PENETRATION BY WGT. OF ~~HAMMER~~ & TOOLS FROM 65.0' TO 67.5', DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON FROM 67.5' TO 70.0' & TOOK SAMPLE. REC'D ± 90% JETTED NX-FC CSG FROM 65.0' TO 70.0'	SILT LAYERS 1/4" TO PAPER THIN
67	J-23 (2)	2"	65.0 TO 70.0	4		
67.5	J-24R			4		
69				6		
70.0				1	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON FROM 70.0' TO 75.0' & TOOK SAMPLE. REC'D ± 90% JETTED NX-FC CSG FROM 70.0' TO 75.0'	REDDISH BROWN ~~SILTY~~ ~~FINE~~ ~~SANDY~~ Varved CLAY (CH) (~~CL~~), MOIST, STRATIFIED.
71				4		
	J-25 (2)	2"	70.0 TO 75.0	4		
73	J-26R			6		
				6		
75.0 / 75				10	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON FROM 75.0' TO 80.0' & TOOK SAMPLE.	REDDISH BROWN ~~SILTY~~ FINE ~~SANDY~~ SILT (ML) (~~SM~~), MOIST.
	J-27	2"	75.0 TO 76.6	17		
76.6 / 77				22		REDDISH BROWN, ~~GRAVELLY~~ SILTY ~~C~~ M-F SAND (SM), TILL, MOIST.
78						

Site: PARK RIVER HARTFORD, CONN.

Boring No. FD-12

DEPTH	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
78	J-28	2"	76.6 to 80.0	28 / 46	REC'D ± 40% JETTED NX-FC CSG FROM 75.0' to 80.0'	REDDISH BROWN, ~~GRAVELLY~~ SILTY M-F SAND (SM), TILL, MOIST.
80.0 80				24	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON	Reddish-brown silty, gravelly, SAND (SP-SM) moist
82	J-29 J-30R	2"	80.0 to 85.0	26 / 30	80.0' TO 85.0' & TOOK SAMPLE. REC'D ± 40%	
84				30 / 56	JETTED NX-FC CSG FROM 80.0' TO 85.0'	
85.0				39	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON	REDDISH BROWN, ~~SILTY~~ GRAVELLY SILTY C-F SAND (SM), TILL, MOIST.
86	J-31	2"	85.0 to 90.0	39 / 42	85.0' TO 90.0' & REC'D SMALL SAMPLE, REC'D ± 30%	
88				48 / 46	JETTED NX-FC CSG FROM 85.0' TO 90.0'	
90.0 90				33	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON	
92	J-32	2"	90.0 to 95.0	32 / 37	90.0' TO 95.0' & REC'D SMALL SAMPLE, REC'D ± 30%.	
94				40 / 48	JETTED NX-FC CSG FROM 90.0' TO 95.0'	
95.0 95						

Site: NORK RIVER HARTFORD CONN.

Boring No. FD-12

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
95.0	95				47	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON FROM 95.0' TO 100.0' & REC'D	REDDISH BROWN, sandy, silty, ~~SILTY GRAVELLY~~ GRAVEL (GM) ~~C-F SAND (SM)~~,
	97	J-33	2"	95.0 TO 100.0	48	SMALL SAMPLE. REC'D ± 30%	
					30	JETTED NX-FC CSG	TILL, MOIST.
					56	FROM 95.0' TO 100.0'.	
	99						
100.0					56		
	101				71	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON FROM 100.0' TO 105.0' & TOOK	
		J-34	2"	100.0 TO 105.0	77	SAMPLE. REC'D ± 50%	
	103	J-35R			40	JETTED NX-FC CSG	
					36	FROM 100.0' TO 105.0'.	REDDISH BROWN,
					38		
105.0	105				49	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON FROM 105.0' TO 110.0' & ~~TOOK~~	~~SILTY C-F~~ SANDY silty GRAVEL (~~GR~~-GM),
	107	J-36	2"	105.0 TO 110.0	58	SAMPLE. REC'D ± 30%	TILL, MOIST.
					67	JETTED NX-FC CSG	
	109				117	FROM 105.0' TO 110.0'.	
					118		
110.0					60	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON FROM 110.0' TO 115.0' & TOOK	
	111						
	112				66		

Site: Park River Hartford Conn.

Boring No. FD-12

DEPTH	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
112	J-37 J-38R	2"	110.0 to 115.0	41 34 33	SAMPLE. REC'D 75% JETTED NX-FC CSG FROM 110.0' TO 115.0'.	REDDISH BROWN, SILTY C-F SANDY GRAVEL (GP-GM), TILL, MOIST.
114						
115.0						
116	J-39	2"	115.0 to 116.2	69	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 115.0' TO 120.0'. 5' TOOK SAMPLE. REC'D 100%	REDDISH BROWN, ~~SILTY FINE SAND (SM)~~ SILT (ML), TILL, MOIST.
116.2						
118	J-40 (2) J-41R	2"	116.2 to 120.0	58 52 64 69	JETTED NX-FC CSG FROM 115.0' TO 120.0'.	
119						
120.0						
120	J-42 (2) J-43R	2"	120.0 to 122.7	31 64 88	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 120.0' TO 124.5'. 5' TOOK SAMPLE. REC'D 100% REFUSAL @ 124.5' - 100 BLOWS - NO PENETRATION.	REDDISH BROWN, GRAVELLY SILTY C-F SAND (SM), TILL, MOIST.
122						
122.7						
124	J-44 (2)	2"	122.7 to 124.5	163 360	JETTED NX-FC CSG FROM 120.0' TO 124.5'.	WEATHERED ROCK
124.5						
126	Box #1	NX	124.5 to 129.0	RAN 4.5 REC. 2.9 64%	DRILLED W/ NX 'M' BIT 5' CORE BARREL FROM 124.5' TO 129.0'. BIT # 32K521 HYD. FEED DRILL TIME - 49 MIN. WATER - REDDISH BR. 5' HOLDING. BLOCKED @ 129.0' HIGHLY FRACTURED FRAGMENTS TO 0.3'	TOP OF BEDROCK
128						
129.0						

Site: F[illegible]ER RIVER HARTFORD, CONN.	Boring No. FD-12	Page 9 of 11

DEPTH	DEPTH f=2'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
129.0	129	Box #1	NX	129.0 TO 134.0	RAN 5.0' REC. 3.0' 60%	DRILLED W/NX 'M' BIT & CORE BARREL FROM 129.0' TO 134.0'. BIT # 32K521 HYD. FEED DRILL TIME - 52 MIN. WATER - REDDISH BR. & HOLDING COMP. RUN HIGHLY FRACT. FRAGS. TO 0.3'	
	131						
	133						
134.0	135	Box #1	NX	134.0 TO 139.0	RAN 5.0' REC. 3.9' 78%	DRILLED W/NX 'M' BIT & CORE BARREL FROM 134.0' TO 139.0'. BIT # 32K521 HYD. FEED DRILL TIME - 53 MIN. WATER - REDDISH BROWN & HOLDING. COMP. RUN HIGHLY FRACT. FRAGS. TO 0.2'	
	137						
139.0	139	Box #2	NX	139.0 TO 144.0	RAN 5.0' REC. 5.0' 100%	DRILLED W/NX 'M' BIT & CORE BARREL FROM 139.0' TO 144.0'. BIT # 32K521 HYD. FEED DRILL TIME - 58 MIN. WATER - REDDISH BROWN & HOLDING COMP. RUN HIGHLY FRACT. FRAGS. TO 0.3'	
	141						
	143						
144.0	146					DRILLED W/NX 'M' BIT & CORE BARREL FROM 144.0' TO 149.0'. BIT # 32K521. HYD. FEED.	

NED FORM 58A (Test) MAR 71

Boring No. FD-12

Site: PARK RIVER HARTFORD, CONN.	Boring No. FD-12	Page 10 of 11

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	146				RAN 5.0'	DRILL TIME - 58 MIN. WATER - REDDISH BROWN	
		BOX #2	NX	144.0 TO 149.0	REC. 3.8'	5' HOLDING. COMP. RUN. HIGHLY FRACT.	
	148				76%	FRAGS. TO 0.5'	
149.0							
	150				RAN 5.0'	DRILLED W/NX 'M' BIT 5' CORE BARREL FROM	
		BOX #2	NX	149.0 TO 154.0	REC. 4.7'	149.0' TO 154.0'. BIT #32K-521. HYD. FEED. DRILL TIME - 60 MIN.	
	152					WATER - LOST 100% COMP. RUN	
					94%	HIGHLY FRACT. FRAGS. TO 0.4'	
154.0	154						

BOTTOM OF EXPLORATION @ 154.0' - DEPTH CONSIDERED SUFFICIENT.

PARK RIVER

Site: HARTFORD, CONN.

Boring No: FD-12 P-9-2A

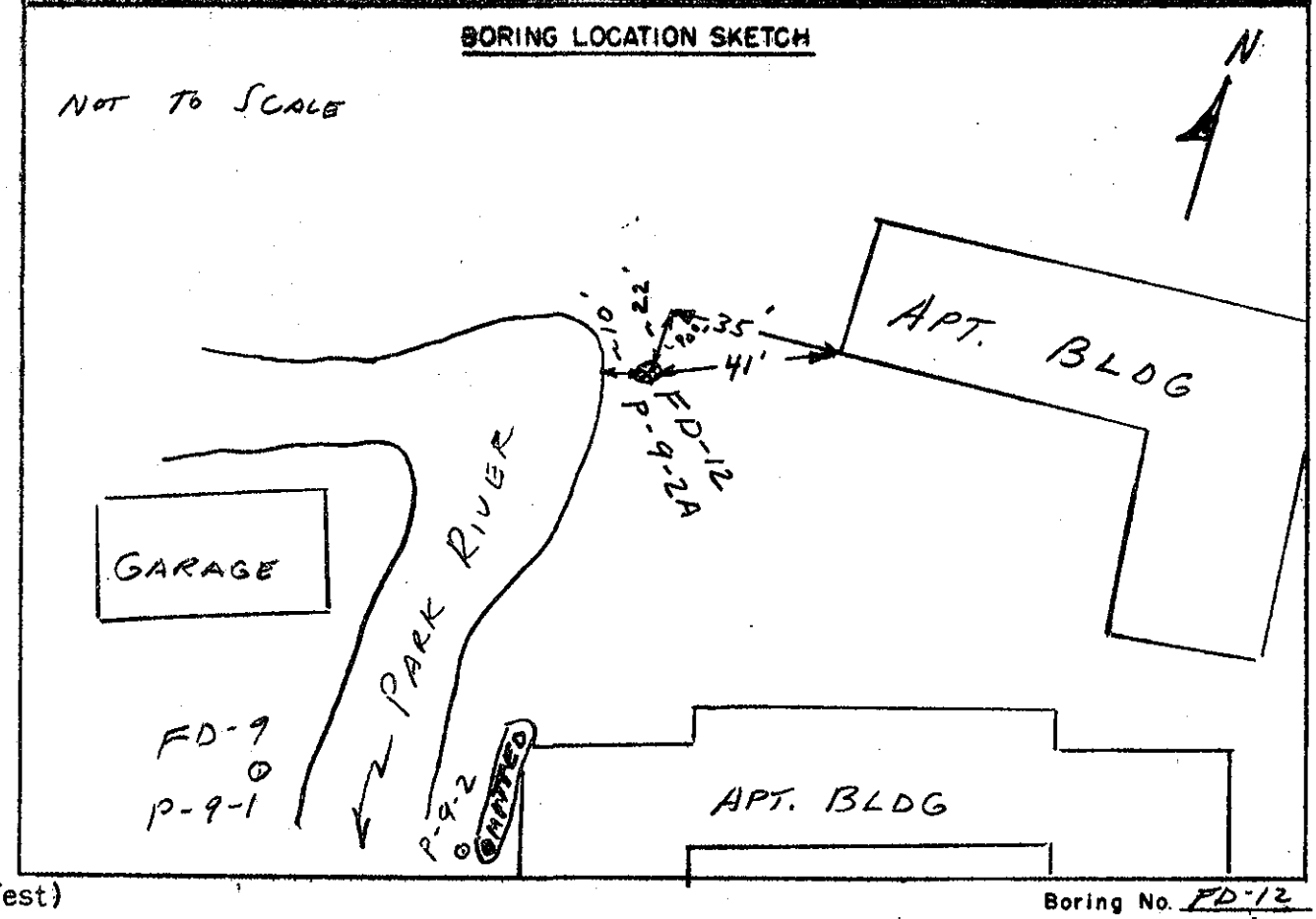
PAGE 11 OF 11

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
9/11	0800	15.0'	15.0'	10.6'		BEFORE DRILLING
9/11	1600	60.0'	60.0'	8.1'		CSG FILLED W/WATER 1/4 HR AFTER FILLING
9/12	0800	60.0'	60.0'	11.2'		BEFORE DRILLING
9/13	0800	95.0'	95.0'	11.0'		BEFORE DRILLING
9/14	0800	110.0'	110.0'	12.8'		BEFORE DRILLING
9/17	0800	120.0'	120.0'	—		TOOLS IN HOLE
9/19	0800	120.0'	120.0'	—		TOOLS IN HOLE
9/19	1600	124.5'	129.0'	13.0'		CSG FILLED W/WATER 1/4 HR AFTER FILLING
9/20	0800	124.5'	129.0'	13.0'		BEFORE DRILLING
9/21	0800	124.5'	139.0'	13.1'		BEFORE DRILLING
9/24	0800	124.5'	149.0'	13.1'		BEFORE DRILLING

Note: Depths are in feet below original ground

BORING LOCATION SKETCH



NED FORM 59 (Test) MAR 71

Boring No. FD-12

PARK RIVER CONDUIT EXTENSION

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site BOX CONDUIT, HARTFORD, CONN. Page 1 of 9 Pages

Boring No. FD-13 Desig. P-5-2 Diam. (Casing) 3 1/2" I.D. NX-FC / BX-FC

Co-ordinates: N 148,722 E 162,996

Elevation Top of Boring 60.5' M.S.L.* Hammer Wt. 350# Boring Started 9/26/73

Total Overburden Drilled 60.5 Feet Hammer Drop 18"

Elevation Top of Rock 0.0' M.S.L. Casing Left 10.0' (3 1/2" I.D.) Boring Completed 10/10/73 PRESSURE TEST — P. 7

Total Rock Drilled 31.2 Feet Subsurface Water Data _____ Page 8

Elevation Bottom of Boring -31.2' M.S.L. Obs. Well @ 77.9' (SEE PAGE 9)

Total Depth of Boring 91.7 Feet Drilled By CORPS OF ENGINEERS

Core Recovered 62.8% No. Boxes 3 Mfg. Des. Drill CP-3

Core Recovered 19.6 Ft: NX / BX / AX Diam. 2 1/8 / 1 5/8 / 1 3/16 in. Inspected By: A. MERRILL

Soil Samples 2 1/2 in. Diam. 3 No. Classification By:

Soil Samples 2 in. Diam. 23 No. Classification By:

DEPTH	1" = 2'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
		None	2 1/2	0.0 to 1.3	15	DROVE 2 1/2" I.D. X 5.0' SOLID SAMPLE SPOON	TOPSOIL
1.3							CLAY (CL)
	2	J-1	2 1/2	1.3 to 2.2	14	0.0' TO 5.0' 5' TOOK SAMPLE. REC'D ≈ 90%	BROWN, SILTY ~~FINE SAND~~ (~~SM~~), DRY, W/ ROOTS.
2.2							
		J-2			14		REDDISH BROWN & GREY, SILTY ~~FINE~~ ~~SANDY~~ CLAY (CL), DRY, STRATIFIED, W/ LAYERS OF ~~SILTY~~ FINE SAND. (SP)
		(2)	2 1/2	2.2 5.0	17	HOLE REMAINED OPEN.	
	4	J-3R					
5.0					26		
					14	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON	SILT LAYERS PAPER THIN
	6						
		J-4		5.0	19	5.0' TO 10.0' 5' TOOK	
		(2)	2"	TO 10.0		SAMPLE. REC'D ≈ 90%	
	8	J-5R			18	JETTED NX-FC CSG	
					26	FROM 0.0' TO 10.0'	
10.0	10				33		

GENERAL REMARKS: BORING LOCATED ON STEEP BANK ABOVE PARK RIVER IN POPE PARK. BORING LOCATED BY N.E.D. SURVEYS. *ELEVATION BY NED SURVEYS.

SILT LAYERS PAPER THIN

NED FORM 58 (Test) MAR 71

Boring No. FD-13

Site: PARK RIVER, HARTFORD, CONN.

Boring No. FD-13

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
10.0	10				8	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 10.0' TO 15.0' & TOOK SAMPLE. REC'D ± 60%	REDDISH BROWN & GREY SILTY ~~FINE SANDY~~ CLAY (CH) ~~(CL)~~, MOIST, W/ PAPER THIN ~~SILT~~ LAYERS, ~~& W/ LAYERS~~ OF ~~SILTY~~ FINE SAND (SP)
		J-6 (2) J-7R	2"	10.0 TO 15.0	8		
	12				7	JETTED NX-FC CSG FROM 10.0' TO 15.0'	
	14				7		
					6		
15.0					3	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 15.0' TO 20.0' & TOOK SAMPLE, REC'D ± 90%	SILT LAYERS 1/8" TO PAPER THIN
	16				4		
		J-8 (2) J-9R	2"	15.0 TO 20.0	4		
	18				3	JETTED NX-FC CSG FROM 15.0' TO 20.0'	
					3		
20.0	20				WEIGHT OF TOOLS + HAMMER	PENETRATION BY WGT. OF HAMMER & TOOLS FROM 20.0' TO 24.1'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 24.1' TO 25.0' & TOOK SAMPLE. REC'D ± 90%	SILT LAYERS 1/4" TO 1/8" Reddish-brown, CLAY (CH) stratified with layers of grayish-green SILT (ML) wet
	22	J-10 (2) J-11R	2"	20.0 TO 25.0			
24.1	24					JETTED NX-FC CSG FROM 20.0' TO 25.0'	
					3		
25.0					WT. OF TOOLS + HAMMER	PENETRATION BY WGT. OF HAMMER & TOOLS FROM 25.0' TO 27.1'. DROVE 2" I.D. X 5.0' SOLID SAMPLE	SILT LAYERS 1/2" TO 1/4"
	26						
	27						

Site: Park River Hartford, Conn.	Boring No. FD-13	Page 3 of 9

DEPTH	1" = 2'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
27.1	27	J-12 (2) J-13R	2"	25.0 to 30.0	3 / 3 / 3	SPOON 27.1' TO 30.0' & TOOK SAMPLE. REC'D ± 90%. JETTED NX-FC CSG FROM 25.0' TO 30.0'.	REDDISH BROWN & GREY, ~~SILTY FINE SANDY~~ CLAY (CH) ~~(CL)~~, MOIST, W/ SILT LAYERS 1/2" TO 1/4" (ML)
30.0	29						
33.0	31 / 33	J-14 (2) J-15R	2"	30.0 to 35.0	WGT. OF TOOLS + HAMMER / 2 / 3	PENETRATION BY WGT. OF HAMMER & TOOLS FROM 30.0' TO 33.0'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 33.0' TO 35.0' & TOOK SAMPLE. REC'D ± 90% JETTED NX-FC CSG FROM 30.0' TO 35.0'.	SILT LAYERS 1/2" TO 1/4"
35.0	35						
38.5	37 / 39	J-16 (2) J-17R	2"	35.0 to 40.0	WGT. OF TOOLS + HAMMER / 2 / 3	PENETRATION BY WGT. OF HAMMER & TOOLS FROM 35.0' TO 38.5'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 38.5' TO 40.0' & TOOK SAMPLE. REC'D ± 90% JETTED NX-FC CSG FROM 35.0' TO 40.0'.	SILT LAYERS 1/2" TO 1/4"
40.0	41						
43.2	43 / 44	J-18 (2) J-19R	2"	40.0 to 45.0	WGT. OF TOOLS + HAMMER / 3	PENETRATION BY WGT. OF HAMMER & TOOLS FROM 40.0' TO 43.2'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 43.2' TO 45.0' & TOOK SAMPLE. REC'D ± 90% JETTED NX-FC CSG	SILT LAYERS 1/4" TO PAPER THIN

Site: PARK RIVER, HARTFORD, CONN.

Boring No. FD-13

DEPTH (ft. 2')	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
44				4	FROM 40.0' TO 45.0'.	REDDISH BROWN & GREY, ~~SILTY FINE SANDY~~ (CH)
45.0						
46	J-20	2"	45.0 TO 46.9	2	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON FROM 45.0' TO 50.0' & TOOK SAMPLE. REC'D ± 30%	CLAY (~~CL~~), MOIST, W/ PAPER THIN SILT LAYERS (MH)
46.9				24		
48	J-21	2"	46.9 TO 50.0	53	JETTED NX-FC CSG FROM 45.0' TO 50.0'.	REDDISH BROWN ~~SILTY~~ GRAVELLY, SILTY, SAND (SM) ~~C-F SANDY GRAVEL~~
				47		
				56		
50.0 50	J-22 (2)	2"	50.0 TO 55.0	88	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON FROM 50.0' TO 55.0' & TOOK SAMPLE. REC'D ± 80%	(~~GP-GM~~), TILL, MOIST.
52				110		
	J-23R			104	JETTED NX-FC CSG FROM 50.0' TO 55.0'.	
54				237		
55.0				191	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 55.0' TO 57.0' & TOOK SAMPLE. REC'D ± 95%. REFUSAL @ 57.0'. JETTED NX-FC CSG FROM 55.0' TO 57.0'. DRILLED W/ NX 'M' SERIES BIT	
56	J-24 (2)	2"	55.0 TO 57.0	82		REDDISH BROWN ~~SILTY~~ SANDY GRAVELLY ~~C-F SAND~~ SILT (MH) (~~SM~~), TILL, MOIST.
	J-25R			310		
57.0						
58	BOX #1	NX	57.0 TO 60.0	0 6 0 0 0 (0.4' GRAVEL) 0.3'	# 32K521 FROM 57.0' TO 60.0'. REC'D 0.7' (0.3' COBBLE + 0.4' ASSORTED GRAV.) WASH WATER & DRILL BEHAVIOR CONTINUED TO INDICATE SAME MATL. JETTED NX-FC CSG FROM 57.0' TO 60.0'. DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 60.0' TO 60.5' & TOOK SAMPLE. REC'D 100%. REFUSAL @ 60.5'. DRILLED W/ NX 'M' SERIES BIT & CORE BARREL FROM	(WASH WATER & DRILL BEHAVIOR CONTINUED TO INDICATE SAME REDDISH BROWN SILTY SAND (SM), TILL).
60.0 60	J-26	2"	60.0-60.5	610		
60.5						TOP OF BEDROCK
61						

A(Test)

Boring No. FD-13

Site: Park River, Hartford, Conn.

Boring No. FD-13

DEPTH (Ft.)	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
66, 63, 64.2	Box #1	NX	60.5 to 64.2	Ran 3.7' Rec. 2.8' 76%	60.5' to 64.2'. Bit # 32K521 Hyd. Feed Drill Time - 43 min. Water - Loosing ± 70%, then lost 100% Bit blocked Highly fractured Fragments to 0.3'	SHALE, red-brown color change to gray 69.2' to 71.0'. Soft to moderately hard, massive with local thin bedded zones. Fresh to slightly weathered on open joint surfaces. Bedding dip where observed 20°± Slightly calcareous in zones with core highly broken throughout. High angle open joints at: 60.8' to 61.1' dip 50°, 70.2' to 70.5 dip 70°, 77.9' to 78.1 dip 70°
65, 67, 69, 69.2	Box #1	NX	64.2 to 69.2	Ran 5.0' Rec. 2.0' 40%	Drilled w/NX 'M' series Bit & core barrel from 64.2' to 69.2'. Bit # 3K521. Hyd. Feed Drill Time - 59 min. Water - Lost 100% Comp. Run Highly fract. Frags. to 0.5'	
71, 73, 73.3	Box #1	NX	69.2 to 73.3	Ran 4.1' Rec. 2.4' 59%	Drilled w/NX 'M' series Bit & core barrel from 69.2' to 73.3' Bit # 3PK522 Hyd. Feed - 44 min. drill time. Loosing 100% water Bit blocked Highly fractured Frags. to 0.3' w/ clay seams	
73.3	No Rec.	—	73.3 to 73.6	Ran 0.3	Drilled w/NX standard Bit # 11866B from 73.3' to	
73.6, 75, 75.5	Box #2	BX	73.6 to 75.5	Ran 1.9' Rec. 0.7' 37%	73.6' - No recovery. Drilled w/ BX 'M' series Bit # 641141 from 73.6' to 75.5'. Hyd. Feed. 20 min drill time. Lost 100% water. Bit blocked. Highly fract., Frags. to 0.2'	
77.0	Box #2	BX	75.5 to 77.0	Ran 1.5' Rec. 0.7' 47%	Drilled w/ BX 'M' series Bit # 641141 from 75.5' to 77.0'. Hyd. Feed. 20 min drill time. Lost 100% water. Bit blocked. Highly fract. Frags. to 0.3'	
77, 78	Box #2	BX	77.0 to 78.3	Ran 1.3' 100%	Drilled w/ BX 'M' Bit # 641141 from 77.0' to 78.3'. Hyd. Feed. 15 min. drill time. Water loss = 100%. Bit blocked.	

Site: PICK RIVER HARTFORD, CONN.

Boring No. FD-13

DEPTH (Ft. 2')	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
78					HIGHLY FRACT. FRAGS. TO 0.3'	
78.3	Box #2	BX	78.3 TO 81.4	RAN 3.1' Rec. 3.1' 100%	DRILLED W/ BX 'M' BIT # 641124 FROM 78.3' TO 81.4'. HYD. FEED. 32 MIN. DRILLING TIME WATER LOSS 100% BIT BLOCKED HIGHLY FRACT. FRAGS. TO 1.2'	High angle open joints at: 80.1' to 80.2' dip 45°,
81.4						
82	NO REC.	BX	81.4 TO 82.7	RAN 1.3' NO REC.	DRILLED W/ BX 'M' BIT # 641124 FROM 81.4' TO 82.7'. HYD. FEED. 15 MIN. DRILL TIME. LOOSING 100% WATER. BIT BLOCKED (BARREL GROUTED HAD TO BUMP OUT). NO RECOVERY.	
82.7						
84	Box #3	AX	82.7 TO 86.1	RAN 3.4' Rec. 2.8' 82%	DRILLED W/ AX 'M' SERIES BIT # 631435 FROM 82.7' TO 86.1'. HYD. FEED. 37 MIN. DRILLING TIME. 100% WATER LOSS BIT BLOCKED HIGHLY FRACT.-W/ SEAMS FRAGS. TO 0.3'	
86.1						Bedding dip increases to 30° at 86.1' to 90.8'
88	Box #3	AX	86.1 TO 89.3	RAN 3.2' Rec. 2.7' 84%	DRILLED W/ AX 'M' BIT # 631435 FROM 86.1' TO 89.3'. HYD. FEED. 36 MIN. DRILLING TIME. 100% WATER LOSS BIT BLOCKED HIGHLY FRACT. FRAGS. TO 0.6'	
89.3						
90	Box #3	AX	89.3 TO 90.8	RAN 1.5' Rec. 1.1' 73%	DRILLED W/ AX 'M' BIT # 631435 FROM 89.3' TO 90.8'. HYD. FEED - 17 MIN. DRILLING TIME 100% WATER LOSS - BIT BLOCKED HIGHLY FRACT. FRAGS. TO 0.8'	open slickenside joint dip 40° at 90.3'
90.8						
	NO REC.	AX	90.8 TO 91.7	RAN 0.9' NO REC.	DRILLED W/ AX 'M' BIT # 631435 FROM 90.8 TO 91.7'. HYD. FEED. 11 MIN. DRILL TIME 100% WATER LOSS. BIT BLOCKED	
91.7					CORE BARREL GROUTED - BUMPED BACK - LOST INNER TUBE + REAMING SHELL & DIAMOND BIT IN HOLE. NO RECOVERY. BOTTOM OF EXPLORATION @ 91.7' - DEPTH CONSIDERED SUFFICIENT.	

Corps of Engineers, U.S. Army

New England Division
Foundation and Materials Branch

Waltham, Massachusetts

FIELD LOG OF PRESSURE TEST FOR CORE BORING IN ROCK

Site PARK RIVER HARTFORD, CONN. Exploration No. FD-13 Page 7 Tested by A. MERRILL

Elev. Top of Hole 60.5' Depth Top of Rock 60.5' Elev. Top of Rock 0.0' Date 10/9/73

PRESSURE DROP TEST									CONSTANT PRESSURE - FLOW TEST					
Core Rec. %	Depth		Elapsed Time(min.&sec.).Pressure Drop,psi						Pres. psi	Time min.	Meter Reading		Volume of Flow	
	From	To	50	40	30	20	10	0			Start	End	Gal.	Gal/min.
	80.0	91.7	X	4 SEC.	13 SEC. TO HOLDING @ 22 LBS	=	=	=	50	5	14,371.0	14,377.1	6.1	1.2
*	75.0	80.0				X	X	20 SEC.	10	5	14,440.0	14,520.0	80.0	16.0

Additional Data and Remarks *UNABLE TO GET STEADY PRESSURE ABOVE 10 LBS IN ZONE TEST FROM 75.0' TO 80.0'.

NED FORM DEC 63 50

REPLACES EDITION OF OCT 51 WHICH MAY BE USED UNTIL EXHAUSTED

PARK RIVER

Site: HARTFORD, Conn.

Boring No: FD-13

PAGE 8 OF 9

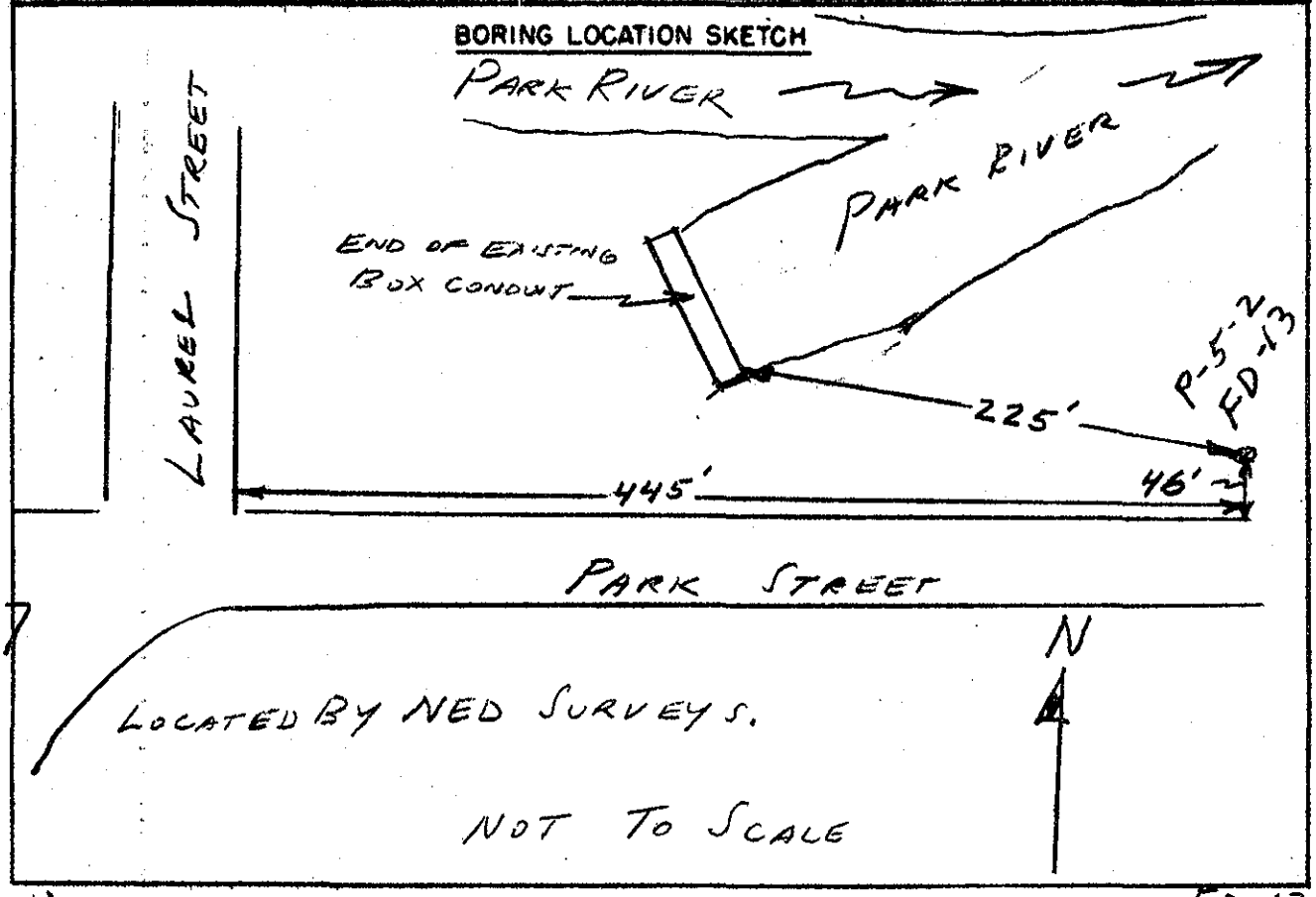
SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
9/27	0800	15.0'	15.0'	2.8'		CSG PLUGGED
9/28	0800	55.0'	55.0'	—		NO READING TAKEN - CSG PLUGGED
10/1	0800	60.0'	60.0'	—		NO READING TAKEN - TOOLS IN HOLE
10/2	0800	60.5'	73.3'	36.2'		BEFORE START OF DRILLING
10/3	0800	74.5'	75.5'	—		NO READING TAKEN - TOOLS IN HOLE
10/4	0800	74.5'	82.7'	36.2'		BEFORE DRILLING
10/5	0800	74.5'	90.8	36.0'		" "
10/9	0800	74.5'	91.7'	36.2'		BEFORE PRESSURE TESTING
10/10	0800	74.5'	91.7'	36.1'		BEFORE INSTALLING O.W.
10/11	0800	—	—	36.6'		AFTER " "

(NOTE: FOR INFORMATION ON WELL, SEE PAGE 9.)

Note: Depths are in feet below original ground

BORING LOCATION SKETCH



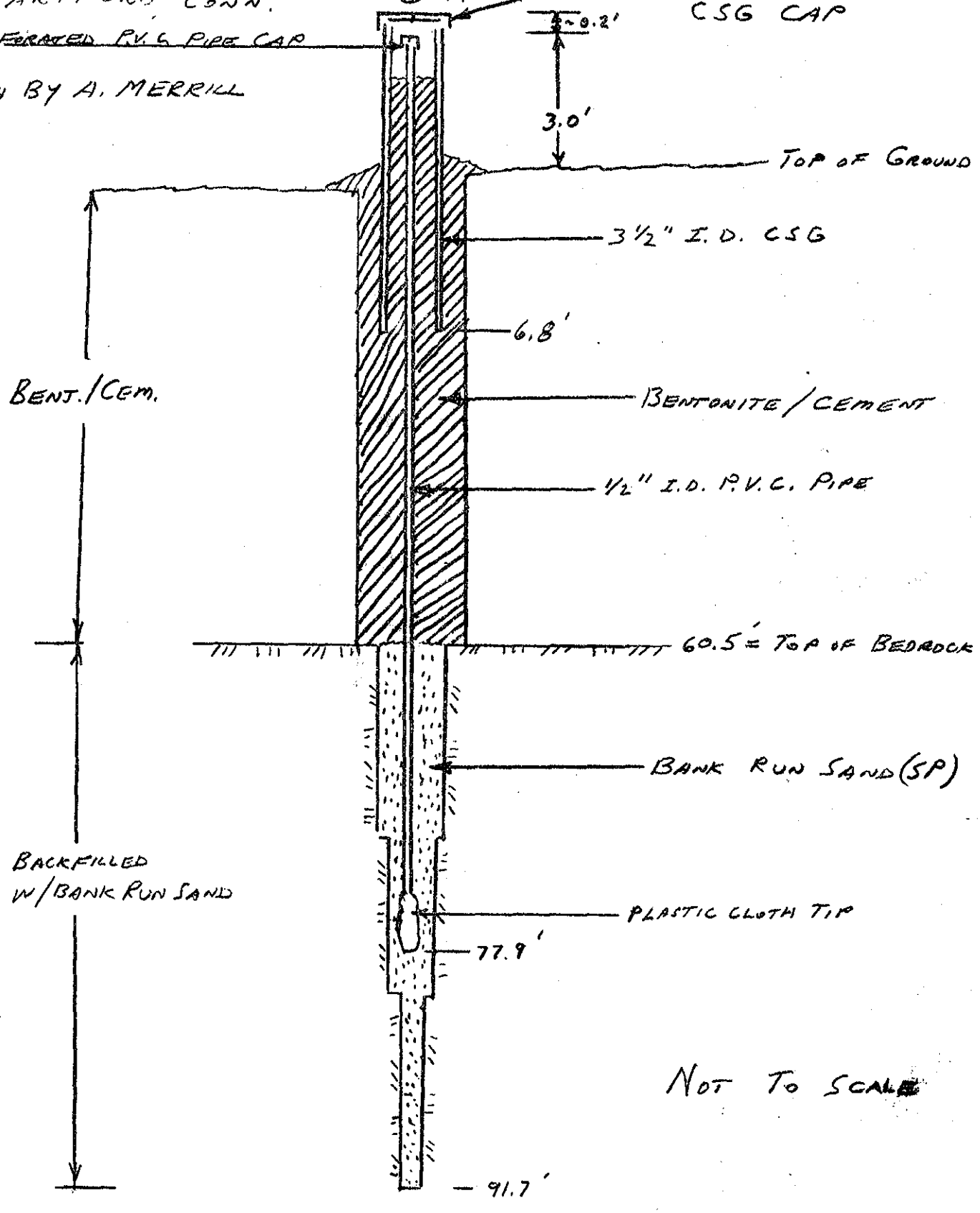
(Test)

Boring No. FD-13

PARK RIVER
HARTFORD, CONN.

FD-13

SKETCH BY A. MERRILL



U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

PARK RIVER CONDUIT EXTENSION

Site BOX CONDUIT HARTFORD, CONN. Page 1 of 5 Pages

Boring No. FD-14 Desig. P-5-1 Diam. (Casing) NX-FC

Co-ordinates: N 148,860 E 162,779

Elevation Top of Boring 29.8' M.S.L.* Hammer Wt. 350# Boring Started 10/11/73

Total Overburden Drilled 38.1 Feet Hammer Drop 18" Boring Completed 10/16/73

Elevation Top of Rock -8.3' M.S.L. Casing Left NONE

Total Rock Drilled 19.0 Feet Subsurface Water Data _____ Page 5

Elevation Bottom of Boring -27.3' M.S.L. Obs. Well NONE

Total Depth of Boring 57.1 Feet Drilled By CORPS OF ENGINEERS

Core Recovered 91.1 % No. Boxes 2 Mfg. Des. Drill CP-3

Core Recovered 17.3 Ft : NX Diam. 2 1/8 In. Inspected By: A. MERRILL

Soil Samples 2 1/2 In. Diam. 1 No. Classification By: _____

Soil Samples 2 In. Diam. 15 No. Classification By: _____

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	1"=2'						
					21	DROVE 2 1/2" I.D. X 5.0' SOLID SAMPLE SPOON 0.0' TO 5.0' & TOOK SAMPLE. REC'D ≈ 80%	
	2	J-1	2 1/2	0.0 TO 5.0	25		
					25	HOLE REMAINED OPEN.	BROWN, GRAVELLY SILTY C-F SAND (SM), MOIST, FILL, W/ TRACES OF BRICK FRAGS. & COAL FRAGS.
	4				36		
5.0					32		
					28	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON 5.0' TO 10.0' & TOOK SAMPLE. REC'D ≈ 60%	
	6				24		
		J-2	2"	5.0 TO 10.0	18	JETTED NX-FC CSG FROM 0.0' TO 10.0'.	
	8				14		
10.0	10				12		

GENERAL REMARKS: *LOCATION & ELEV. BY NED SURVEYS. BORING LOCATED IN CENTER OF NARROW STRIP OF LAND BETWEEN BRANCHES OF PARK RIVER @ END OF EXISTING CONDUIT.

Site: PARK RIVER, HARTFORD, CONN.

Boring No. FD-14

DEPTH (1"=2')	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
10.0	J-3	2"	10.0 TO 11.5	WGT OF + HAMMER TOOLS	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON FROM 11.9' TO 15.0' AFTER PENETRATION BY WEIGHT OF HAMMER & TOOLS.	GREY, ~~FINE SANDY~~ BROWN, SILTY (ML) ~~SILTY~~ CLAY (~~CL~~), MOIST, W/ ORGANICS.
11.5						
11.9				4		
12	J-4 (2) J5R	2"	11.5 TO 15.0	3	FROM 10.0' TO 11.9', TOOK SAMPLE, REC'D ± 90%	REDDISH BROWN & GREY, ~~FINE SANDY SILTY~~ CLAY (~~CL~~) (CH), MOIST, VARVED, W/ SILT (ML) LAYERS 1/4" TO PAPER THIN.
14				3	JETTED NX-FC CSG FROM 10.0' TO 15.0'.	
				5		
15.0						
				1	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON FROM 15.0' TO 20.0' & TOOK SAMPLE, REC'D ± 90%	SILT LAYERS 1/4" TO 1/8"
16	J-6 (2) J-7R	2"	15.0 TO 20.0	2		
				2	JETTED NX-FC CSG FROM 15.0' TO 20.0'.	
18				2		
				4		
20.0	J-8	2"	20.0-20.5	4	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON FROM 20.0' TO 25.0' & TOOK SAMPLE. REC'D ± 60%	SILT LAYERS 1/4" TO PAPER THIN
20.5						
				18		
22	J-9 J-10R	2"	20.5 TO 25.0	21		REDDISH BROWN, GRAVELLY CLAY~~EY~~ C-F SAND (SC), TILL, MOIST.
				35	JETTED NX-FC CSG FROM 20.0' TO 25.0'.	
24				24		
25.0						
				10	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON FROM 25.0' TO 30.0' &	
26				22		
27						

Site: PARK RIVER, HARTFORD, CONN.

Boring No. FD-14

DEPTH (Ft. 2')	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
27, 29	J-11 (2), J-12R	2"	25.0 to 30.0	29, 32, 33	TOOK SAMPLE. REC'D ± 80%. JETTED NX-FC CSG FROM 25.0' TO 30.0'.	REDDISH BROWN, GRAVELLY CLAYEY C-F SAND (SC), TILL, moist.
30.0; 31, 33	J-13 (2), J-14R	2"	30.0 to 35.0	14, 19, 21, 23, 34	DROVE 2" I.D. X 5.0' SOLID SAMPLE SPOON FROM 30.0' TO 35.0'. TOOK SAMPLE, REC'D ± 78%. JETTED NX-FC CSG FROM 30.0' TO 35.0'. DROVE 2" I.D. X 5.0' SOLID	Reddish-brown, sandy, gravelly, CLAY (CL), moist
35.0; 35, 37	J-15 (2), J-16R	2"	35.0 to 38.0	28, 36, 67	SAMPLE SPOON 35.0' TO 38.0'. TOOK SAMPLE. REC'D ± 90%. REFUSAL @ 38.0'. JETTED NX-FC CSG FROM 35.0' TO 38.1'.	REDDISH BROWN, gravelly, clayey, SAND (SC) ~~CLAYEY C-F SANDY GRAVEL (GP-GM)~~, TILL, moist.
38.0; 38.1; 39, 41	BOX #1	NX	38.1 to 42.1	RAN 4.0', REC. 3.6', 90%	DRILLED W/ NX 'M' SERIES BIT # 3PK522 FROM 38.1' TO 42.1'. HYD. FEED, 42 MIN. DRILLING TIME. WATER - REDDISH BROWN & HOLDING. BIT BLOCKED. HIGHLY FRACTURED FRAGMENTS TO 0.3'	TOP OF BEDROCK
42.1; 43, 44					DRILLED W/ NX 'M' SERIES BIT # 3PK522 FROM 42.1' TO 47.1'. HYD. FEED, 54 MIN. DRILLING TIME.	

Site: ARK RIVER HARTFORD, CONN.	Boring No. FD-14	Page 4 of 5

DEPTH	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
44	Box #1	NX	42.1 TO 47.1	RAN 5.0' REC. 4.8' 96%	WATER - REDDISH BROWN 5' HOLDING. COMP. RUN. HIGHLY FRACT. FRAGS. TO 0.3'	
46						
47.1						
48	Box #1	NX	47.1 TO 52.1	RAN 5.0' REC. 4.4' 88%	DRILLED W/ NX 'M' SERIES BIT # 3PK522 FROM 47.1' TO 52.1'. HYD. FEED, 53 MIN. DRILLING TIME. WATER - REDDISH BROWN 5' HOLDING. COMP. RUN HIGHLY FRACT. FRAGS. TO 0.2'	
50						
52.1 52						
54	Box #2	NX	52.1 TO 57.1	RAN 5.0' REC. 4.5' 90%	DRILLED W/NX 'M' SERIES BIT # 3PK522 FROM 52.1' TO 57.1'. HYD. FEED, 54 MIN. DRILLING TIME. WATER - REDDISH BROWN 5' HOLDING. HIGHLY FRACT. FRAGS. TO 0.3'	
56						
57.1					BOTTOM OF EXPLORATION @ 57.1' - DEPTH CONSIDERED SUFFICIENT	

Site: PARK RIVER, HARTFORD, CONN.
Boring No: FD-14

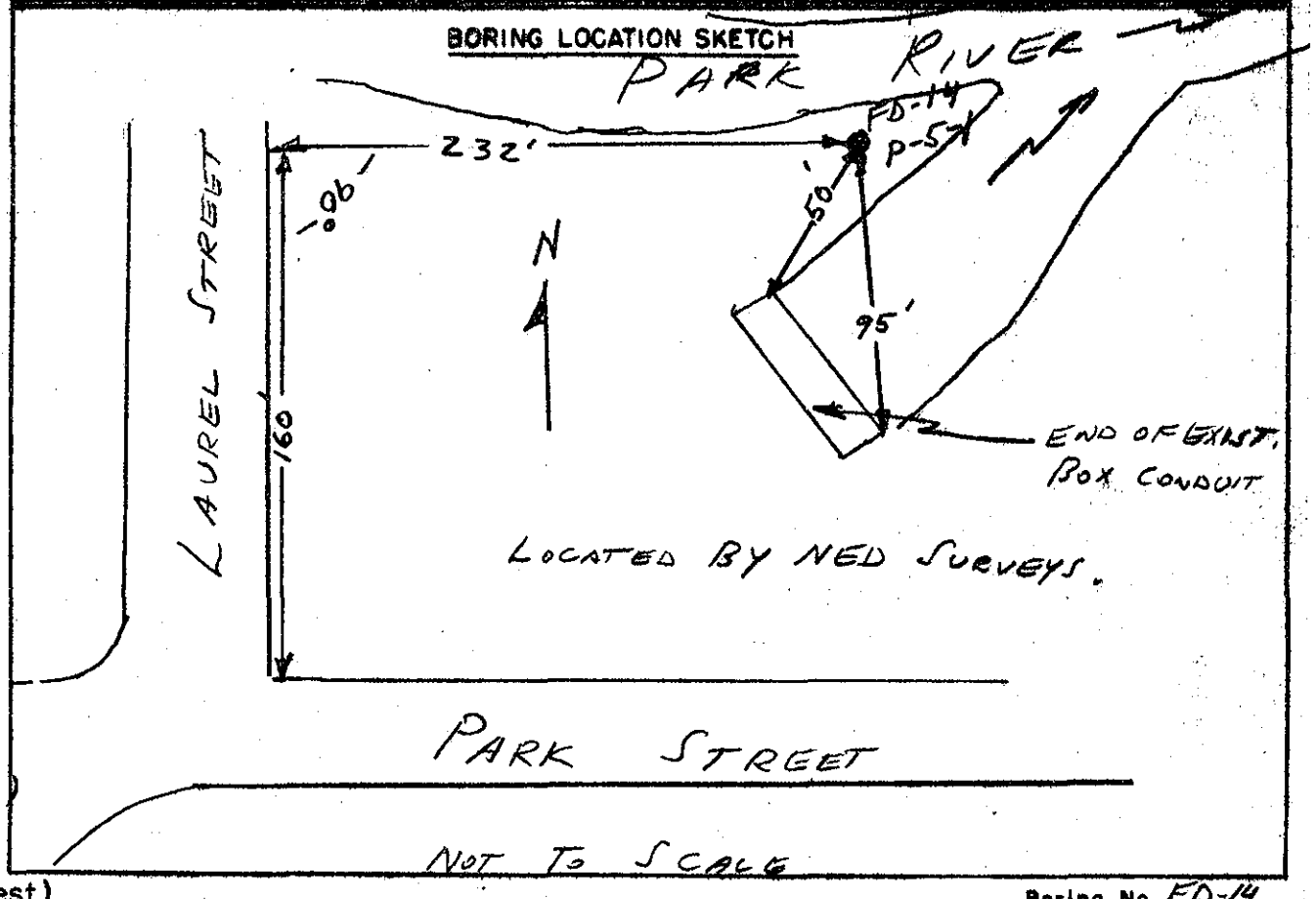
PAGE 1 OF 5

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
10/12	0800	25.0'	25.0'	9.6'		BEFORE START OF DRILLING
10/15	0800	38.1'	42.1'	9.4'		" " " "
10/16	0800	38.1'	57.1'	9.5'		BEFORE PULLING CSG.

Note: Depths are in feet below original ground

BORING LOCATION SKETCH



NED FORM 59 (Test) MAR 71

Boring No. FD-14

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site: Park River Flood Control Extension, Hartford, Conn. — Page 1 of 6 Pages used

Boring No. FD-15 Desig. PW-1 Diam. (Casing) NX & J

Co-ordinates: N _____ E _____

Elevation Top of Boring: 46± M.S.L.
Total Overburden Drilled: _____ Feet
Elevation Top of Rock: _____ M.S.L.
Total Rock Drilled: _____ Feet
Elevation Bottom of Boring: _____ M.S.L.
Total Depth of Boring: 93.7 Feet
Core Recovered: N/A % No. Boxes: _____
Core Recovered: N/A Ft: ____ Diam. ____ in.
Soil Samples: 2½" ID x 5 in. Diam. 3 No.
Soil Samples: 2" ID x 5 / 1½" ID x 5 in. Diam. 8 No.

Hammer Wt. 350 LBS Boring Started 6/19/74
Hammer Drop 18" Boring Completed 6/19/74
Casing Left: _____
Subsurface Water Data: _____ Page _____
Obs. Well: _____
Drilled By: Carl E. Finnerty
Mfg. Des. Drill: CP-3
Inspected By: Michael H. Rodergast
Classification By: _____
Classification By: _____

DEPTH (1" = 2')	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
0.15	None		0.0–0.15			BLACKTOP
	T-1 (1)	2½" I D x 5	0.15–2.0	33, 9	DROVE DRY THE 2½" ID x 5 SOLID SAMPLE SPOON, BY IMPACT OF 350 LB. HAMMER FALLING 18" EACH BLOW, FROM 0.0 TO 5.0.	REDDISH BROWN - SILTY - C-F SANDY - GRAVEL Dry (GM)
2.0	T-2 (2)	5" I D x 5	2.0–4.3	21, 20	PULLED SPOON AND TOOK SAMPLE. 100% RECOVERY. HOLE OPEN TO 5.0.	DARK BROWN - SILTY - FINE SAND Moist w/roots & brick (SM)
4.3	T-3 (1)		4.3–5.0	16		GREY-GREEN - FINE SANDY - SILT Moist (ML)
5.0	T-4 (1)	2" I D x 5	5.0–5.8	6	DROVE DRY THE 2" ID x 5 SOLID SAMPLE SPOON FROM 5.0 TO 10.0.	GREY - ~~GRAVELLY~~ - SILT Moist
5.8	T-5 (2)	5" I D x 5	5.8–10.0	5, 13, 103, 98	PULLED SPOON AND TOOK SAMPLE. 100% RECOVERY. HOLE OPEN TO 10.0	BROWN - SILTY - C-F SAND Moist w/some gravel concrete, brick, wood, oil & tar. ~FILL~ FILL COMPRISED 70% OF RECOVERY
10.0						

GENERAL REMARKS: HOLE DRILLED NEAR EXTREME OF BIT. PARKING LOT IN REAR OF #410 FARMINGTON AVENUE NEAR TREE LINE. (SEE SKETCH)

NED FORM 58 (Test) MAR 71

Boring No. FD-15

Site: PARK RIVER CONDUIT EXTENSION, HARTFORD, CONN.	Boring No. FD-15	Page 2 of 6

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	1" = 2'						
10.5		J-6 (1)	1½"	10.5	8	DROVE DRY THE 1½" ID x 5' SOLID SAMPLE SPOON FROM 10.0 TO 15.0'.	GREY - SILTY - C-F SAND Moist w/ashes (SM)
			3		8	PULLED SPOON AND TOOK SAMPLE.	
	12	J-7 (1)	0		7	30% RECOVERY	~ FILL ~
			x			HOLE OPEN TO 15.0'.	
			5"	13.5	5		
13.5	14	J-8 (1)		15.0	7		GREY BROWN - FINE SANDY - SILT Moist (ML)
15.0			1½"	15.0	5	DROVE DRY THE 1½" ID x 5' SOLID SAMPLE SPOON FROM 15.0 TO 20.0.	
	16		I		6	PULLED SPOON NO RECOVERY	
			0		8	THREE ATTEMPTS TO GET SAMPLE IN VAIN.	~ NO SAMPLE ~
		NONE	x			HOLE CAVED	
	18		5		11	JETTED NXS CASING TO 20.0'.	
					14		
20.0	20		2"	20.0	13	DROVE DRY THE 2" ID x 5' SOLID SAMPLE SPOON FROM 20.0 TO 25.0.	GREY BROWN - FINE SANDY - CLAY (CL) Moist, in plug w/occas. M-C. SAND
			1½"		16	PULLED SPOON NO RECOVERY	
	22	J-9 (1)	I		19	DROVE 1½" ID x 5' SOLID SAMPLE SPOON FROM 20.0 TO 25.0.	
			0		17	PULLED SPOON RECOVERED 10%.	
			x				
	24		6"	25.0	19	JETTED NXS CASING TO 25.0'.	
25.0			2"	25.0	WEIGHT OF HAMMER	PENETRATION FROM 25.0 TO 26.6 BY WEIGHT OF TOOLS & HAMMER	GREY BROWN - CLAY Moist (CH)
	26	J-10 (2)	I				
			0				
26.6		J-11-R	x 5	30.0	1	DROVE 2" ID x 5' SOLID SAMPLE SPOON FROM 25.0'	

Site: FORK RIVER CONDUIT EXTENSION
HARTFORD, CONN.

Boring No. FD-15

DEPTH		CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECOVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
27.0			2"	25.0		TO 30.0.	REDDISH BROWN- CLAY
			1		3	PULLED SPOON AND TOOK	Moist (CL)
	28	F-10				SAMPLE	varved (CL)
		in	0		3	100% RECOVERY	
		1				SET UP TO MACHINE PROBE	
			x			TO REFUSAL.	
		F-11-R			4		
		111	5	30.0			
30.0						ORDERED TO GET 5' OF CLAY AND THEN MACHINE PROBE TO REFUSAL. NO SAMPLING DESIRED	
	SCALE 1" = 4'					MACHINE PROBING INFO:	
30.0				30.0		PENETRATION OF AW RODS FROM 30.0 TO 35.8 BY WEIGHT OF RODS AND 350 LB HAMMER.	
			A		WEIGHT OF RODS & HAMMER		
			W				
34.0							
			O				
35.8			P		1		
			E		3	DRIVE AW RODS FROM 35.8	
			N		4	TO 93.7 BY IMPACT OF 350	
38.0					4	LB. HAMMER FALLING 18"	
		None			4	EACH BLOW.	No Sample
			E		3	AT 93.7 SOLID REFUSAL 100	
			N		4	BLOWS NO PENETRATION.	
			D				
42.0					6		
					6		
			R		4		
			O		6		
46.0			D		6		
			S		6		
					5		
					6		
50.0					7		
					7		
					7		
54.0				54.0	7		

Site: PARK RIVER CONDUIT RETENTION HARTFORD, CONN.

Boring No. FD-15

DEPTH 1" = 4'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
54.0			30.0	7		
				9		
				10		
		A		8		
58.0	A	W		9		
				9		
	W			11		
		O		11		
62.0		P		10		
		E		10		
		N		32		
				26		
66.0				24		
		E		20		
		N		18		
		D		18		
70.0				18		
				18		
		R		16		
		O		17		
74.0		D		19		
		S		19		
				19		
78.0				19		
				20		
				18		
				23		
82.0				19		
				19		
				24		
				23		
86.0				27		
				40		
88.0			93.7	55		

Site:	Boring No.	Page 5 of 6
FREE RIVER CONDUIT EXTENTION HARTFORD, CONN	FD-15	

DEPTH	1" = 4'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
88.4			AW	80.0	40		
			OPUN		75		
		Nons			58		
			UND		65		
92.0					85		
			RODS	93.7	225		
93.7							

CESSATION OF MACHINE PROBING @ 93.7'
REFUSAL ENCOUNTERED @ 93.7 - 100 BLOWS
NO PENETRATION.

PARK RIVER CONDUIT EXTENTION

Site: [illegible]

Boring No: FD-15

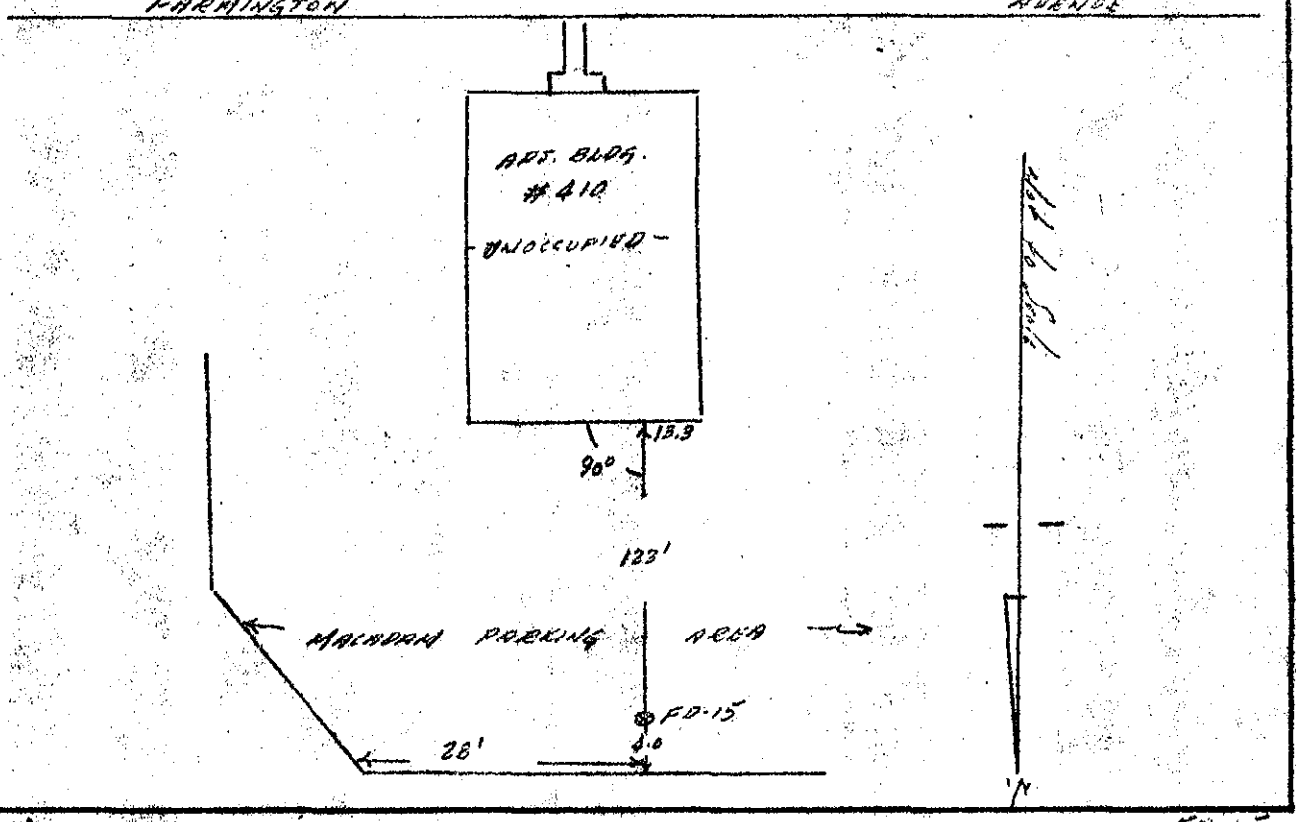
SUBSURFACE WATER OBSERVATIONS

PAGE 6 OF 6

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
6/20	0900	30.0'	93.7'	18.0'		After Pulling A.W.
						Rods - Before Bumping
						Out NXFJ Casing

Note: Depths are in feet below original ground

BORING LOCATION SKETCH



Test)

Boring No. FD-15

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site [illegible] Page 1 of 5 Pages

Boring No. FD-16 Desig. RT-2 Diam. (Casing) N x F.I.

Co-ordinates: N _____ E _____

Elevation Top of Boring 44± M.S.L.
Total Overburden Drilled _____ Feet
Elevation Top of Rock _____ M.S.L.
Total Rock Drilled _____ Feet
Elevation Bottom of Boring _____ M.S.L.
Total Depth of Boring 93.8' Feet
Core Recovered N/A % No. Boxes _____
Core Recovered N/A Ft: _____ Diam. _____ In.
Soil Samples 2½" ID x 5 In. Diam. 1 No.
Soil Samples 2" ID x 5 In. Diam. 6 No.

Hammer Wt. 350 LB. Boring Started 6/20/74
Hammer Drop 18" Boring Completed 6/20/74
Casing Left None
Subsurface Water Date _____ Page _____
Obs. Well None
Drilled By CoE (Finnerty)
Mfg. Des. Drill CP-3
Inspected By: Michael M. Pendergast
Classification By: _____
Classification By: _____

DEPTH	1" = 2'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
		None	0.0	0.0	5	DROVE DRY THE 2½" ID x 5 SOLID SAMPLE SPOON BY IMPACT OF 350 LB. HAMMER FALLING 18" EACH BLOW.	TOPSOIL
1.0			2½" I D x 5	1.0	3	PULLED SPOON AND TOOL SAMPLE 100% RECOVERY.	BROWNISH GREY - CINDERS w/glass, tar & oil
	2				3	HOLE OPEN TO 5.0'	
		J-1 (2)			2		
	4			5.0	4		
5.0			2" I D x 5	5.0	4	DROVE DRY THE 2" ID x 5' SOLID SAMPLE SPOON FROM 5.0 TO 10.0.	
	6	J-2 (2)			4	PULLED SPOON AND TOOL SAMPLE. 100% RECOVERY.	
7.5				7.5	14	HOLE OPEN TO 10.0.	~~REDDISH BROWN - SILTY~~ GRAVEL SAND Moist w/wood & porcelain chips.
	8	J-3 (2)			11		
10.0	7			10.0	13		

GENERAL REMARKS: HOLE LOCATED AT EDGE OF SOIL PARKING AREA IN REAR OF OCCUPIED APARTMENT BUILDING. (SEE SKETCH)

NED FORM 58 (Test) MAR 71

Boring No. FD-16

Site: PARK RIVER CONDUIT EXTENSION HARTFORD, CONN.	Boring No. FD-16	Page 2 of 5

DEPTH	1" = 2'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
		~~T-4~~	1½"	10.0	2	DROVE DRY THE 1½" ID×5 SOLID SAMPLE SPOON FROM 10.0 TO 15.0.	GREY BLACK - CINDERS W/COAL.
			I		2	PULLED SPOON AND TOOL.	~ FILL ~
	12		D		2	SAMPLE, 85% RECOVERY	
		T-4 (1)	×			JETTED NXFJ. CASING	
			5		2	TO 15.0'.	
	14				3		
15.0		T-5 (1)	2"	15.0 / 15.5	2	DROVE DRY THE 2" ID×5 SOLID SAMPLE SPOON FROM 15.0' TO 20.0'.	RED - CLAYEY - GRAVEL Moist (GC)
15.5	16		I	16.5	3	PULLED SPOON AND TOOL SAMPLE, 100% RECOVERY.	REDDISH BROWN - FINE SANDY - ~~SILTY~~ - CLAY (CL)
		T-6 (2)	D		3	JETTED NXFJ CASING TO	
	18		×		4	20.0'.	
19.5		T-7 (1)	5	19.5 / 19.5 / 20.0	5		GREY FINE SANDY - SILT Moist (ML)
20.0						CLAY ENCOUNTERED AT 15.5' BEGAN MACHINE PROBING AT 20.0 NO SAMPLING DESIRED	
	SCALE 1" = 4'					~ MACHINE PROBING INFO ~	
20.0				20.0 / 21.3	WEIGHT OF HAMMER	PENETRATION FROM 20.0 TO 21.3' BY WEIGHT OF TOOLS AND HAMMER	
21.3			AW	21.3	4	DROVE AW RODS FROM 21.3 TO 93.8' BY IMPACT OF 350 LB. HAMMER FALLING 18" EACH BLOW.	
			OPEN		4		
					3		
24.0			END		3		
		None			6	AT 93.8' SOLID REFUSAL 100 BLOWS NO PENETRATION	NO SAMPLE
					5		
			RODS		4		
28.0					5		
				93.8	5		

(Test)

Boring No. FD-16

Site: PARK RIVER CONDUIT EXTENTION HARTFORD, CONN

Boring No. FD-16

DEPTH	1" = 4'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
30.0				30.0	8		
			A		6		
			U		6		
					6		
34.0					6		
					9		
			G		8		
			P		8		
38.0			E		8		
			U		8		
					11		
					10		
42.0					10		
			E		10		
			N		10		
			D		13		
46.0		None			11		
					11		
					12		
					11		
50.0			R		15		
			O		14		
			D		14		
			S		13		
54.0					10		
					16		
					16		
					16		
58.0					17		
					17		
					21		
					20		
62.0					18		
				63.8	18		

Site: PARK RIVER CONDUIT EXTENTION
HARTFORD, CONN.

Boring No. FD-16

DEPTH (1" = 4')	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
64.0			20.0	17		
		A		29		
66.0		H		29		
				25		
				24		
		O		20		
70.0				32		
		D		27		
		E		29		
		N		27		
74.0				24		
				30		
				30		
		E		30		
		N		30		
78.0		O		30		
	None			27		
				30		
				33		
82.0				34		
		E		31		
				33		
		O		44		
		S		45		
86.0				44		
				45		
				42		
90.0				90		
				128		
				156		
93.8'			93.8	82		

CESSATION OF MACHINE PUSHING @ 93.8'
REFUSAL ENCOUNTERED @ 93.8' 100 BLOWS
NO PENETRATION.

PARK RIVER CONDUIT EXTENSION

Site: [illegible]

Boring No: FD 16

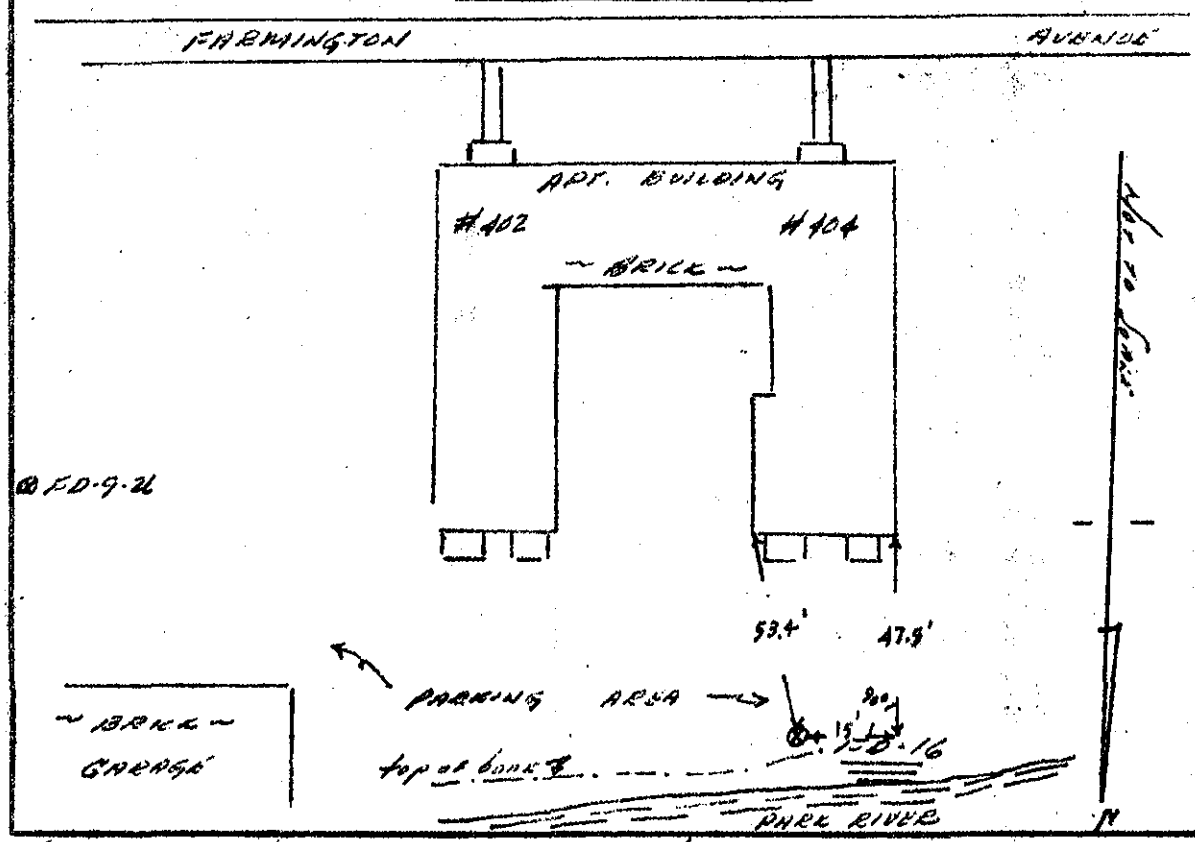
SUBSURFACE WATER OBSERVATIONS

Page 5 of 5

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
6/21	1030	20.0	93.8	16.8'		After Pulling All
						Rods Before Bumping
						Out Casing

Note: Depths are in feet below original ground.

BORING LOCATION SKETCH



NED FORM 59 (Test) MAR 71

Boring No. FD-16

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site PARK RIVER FLOOD EXTENSION HARTFORD, CONN. Page 1 of 5 Pages

Boring No. FP-17 Desig. PH-3 Diam. (Casing) None / 2½" WGS

Co-ordinates: N _____ E _____

Elevation Top of Boring 48± M.S.L.
Total Overburden Drilled _____ Feet
Elevation Top of Rock _____ M.S.L.
Total Rock Drilled _____ Feet
Elevation Bottom of Boring _____ M.S.L.
Total Depth of Boring 101.0 Feet
Core Recovered _____ % No. Boxes _____
Core Recovered _____ Ft. _____ Diam. _____ In.
Soil Samples 2½" ID x 5' In. Diam. 2 No.
Soil Samples 2" ID x 5' In. Diam. 2 No.
1½" ID x 5' 2

Hammer Wt. 350 LBS. Boring Started 6/24/74
Hammer Drop 18" Boring Completed 6/24/74
Casing Left None
Subsurface Water Data _____ Page _____
Obs. Well None
Drilled By Cole (Foundry)
Mfg. Des. Drill CP-3
Inspected By: Michael M. Rodriguez
Classification By: _____
Classification By: _____

DEPTH (1" = 2')	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
0.2	None	2½"	0.2–4.0	32	DROVE DRY THE 2½" ID x 5 SOLID SAMPLE SPOON, BY IMPACT OF 350 LB. HAMMER FALLING 18" EACH BLOW, FROM 0.0 TO 5.0'.	PAVEMENT RED-SILTY GRAVELLY C-F SAND (SM) Dry
2	T-1 (1)	5'		20		
				11	PULLED SPOON AND TOOK SAMPLE. 100% RECOVERY	
				12	HOLE OPEN TO 5.0'.	
4.0	T-2 (1)		4.0–5.0	12		GREY-FINE SANDY-SILT Moist (ML)
5.0		2"	5.0–9.5	5	DROVE THE 2" ID x 5 S.S. SPOON FROM 5.0' TO 10.0'	GREY-FINE SANDY-SILT (ML) Moist stratified
6				5	PULLED SPOON AND TOOK SAMPLE. 50% RECOVERY.	
	T-3 (1)	5'		11	HOLE OPEN TO 10.0'.	
8				15		
9.5	T-4 (1)		9.5–10.0	26		GREY-BROWN-SILT (ML) (SL) Moist

GENERAL REMARKS: HOLE LOCATED ON MACADAM PARKING AREA AT EDGE OF DRIVEWAY - NEAR CONCRETE RETAINING WALL ON WOODLAND AVENUE PROPERTY (WOODLAND MANOR)
SEE SKETCH!

NED FORM 58 (Test) MAR 71

Boring No. FP-17

Site: PARK RIVER CONDUIT EXTENSION, HARTFORD CONN.	Boring No. FD-17 (PW-3)	Page 2 of 5

DEPTH (1" = 2')	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
		1 1/2"	10.0	5	DROVE THE 1 1/2" ID x 5' S.S. SPOON FROM 10.0 TO 15.0'	GREY-BROWN-CLAY (CH) Dry varved (CH)
		I		11	PULLED SPOON AND TOOK SAMPLE. 100% RECOVERY.	reddish color in varves.
12	T-5 (2)	D		15	HOLE OPEN TO 15.0'	
	ϕ	A		18		
18	T-6-R (1)	5		21		
15.0'			15.0		BOTTOM OF SOIL SAMPLING AT 15.0' INTO CLAY — BEGINNING OF MACHINE PROBING AT 15.0' — SCALE 1" = 4' —	
15.0'		A	15.0	4	DROVE DRY THE AW OPEN END DRILL ROD FROM 15.0' TO 101' BY IMPACT OF 350 LB. HAMMER FALLING 18" EACH BLOW.	
		W		5		
				3		
		O		3		
19.0		P		2	AT 101' SOLID REFUSAL	
		E		7	100 BLOWS NO PENETRATION	
		N		10		
				10		
23.0		E		3		
		N		3		No Samples Desired
	None	D		9		
				7		
27.0				6		
		D		7		
		R		6		
		I		7		
31.0		L		7		
		L		10		
				9		
		R		8		
35.0		O		8		
		D		8		
37.0 TD			101			

Site: PARK RIVER CONDUIT EXTENSION, HARTFORD, CONN.

Boring No. FD-17 (PW-3)

DEPTH (1" = 4')	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
37.0		A W O P E N E N D	15.07	8	CONTINUED MACHINE PROBING	
				10		
				9		
				13		
41.0				12		
				11		
				12		
				11		
45.0				10		
				11		
				11		
				11		
49.0				16		
				15		
				18		
				18		
53.0	None	D R I L L		17		No Samples Desired
				16		
				20		
				20		
57.0				20		
				22		
				20		
		R O D S		20		
61.0				23		
				25		
				24		
				23		
65.0				23		
				27		
				29		
				31		
69.0				30		
71.6			101'	37		

Site: PARK RIVER CONDUIT EXTENSION HARTFORD CONN.	Boring No. F0-17 (PA1-3)	Page 4 of 5

DEPTH (1" = 4')	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
71.0'		A	15.0	45	CONTINUED MACHINE	
		LL		46	PROBING.	
				42		
				36		
75.0		O		45		
		P		43		
		E		48		
		N		48		
79.0				48		
				45		
		E		53		
		N		75		
83.0		D		135		
				131		
				147		No Samples Desired
		D		97		
87.0	None	R		80		
		I		77		
		L		68		
		L		83		
91.0				85		
				93		
		R		123		
		O		88		
		D		97		
95.0				100		
				102		
				188		
99.0				102		
101.0'			101'	198		

CESSATION OF MACHINE PROBING AT 101'
SOLID REFUSAL @ 101' 100 BLOWS NO PENETRATION.

(Test)

Boring No. F0-17

Site: [illegible]

Boring No: FD-17

SUBSURFACE WATER OBSERVATIONS

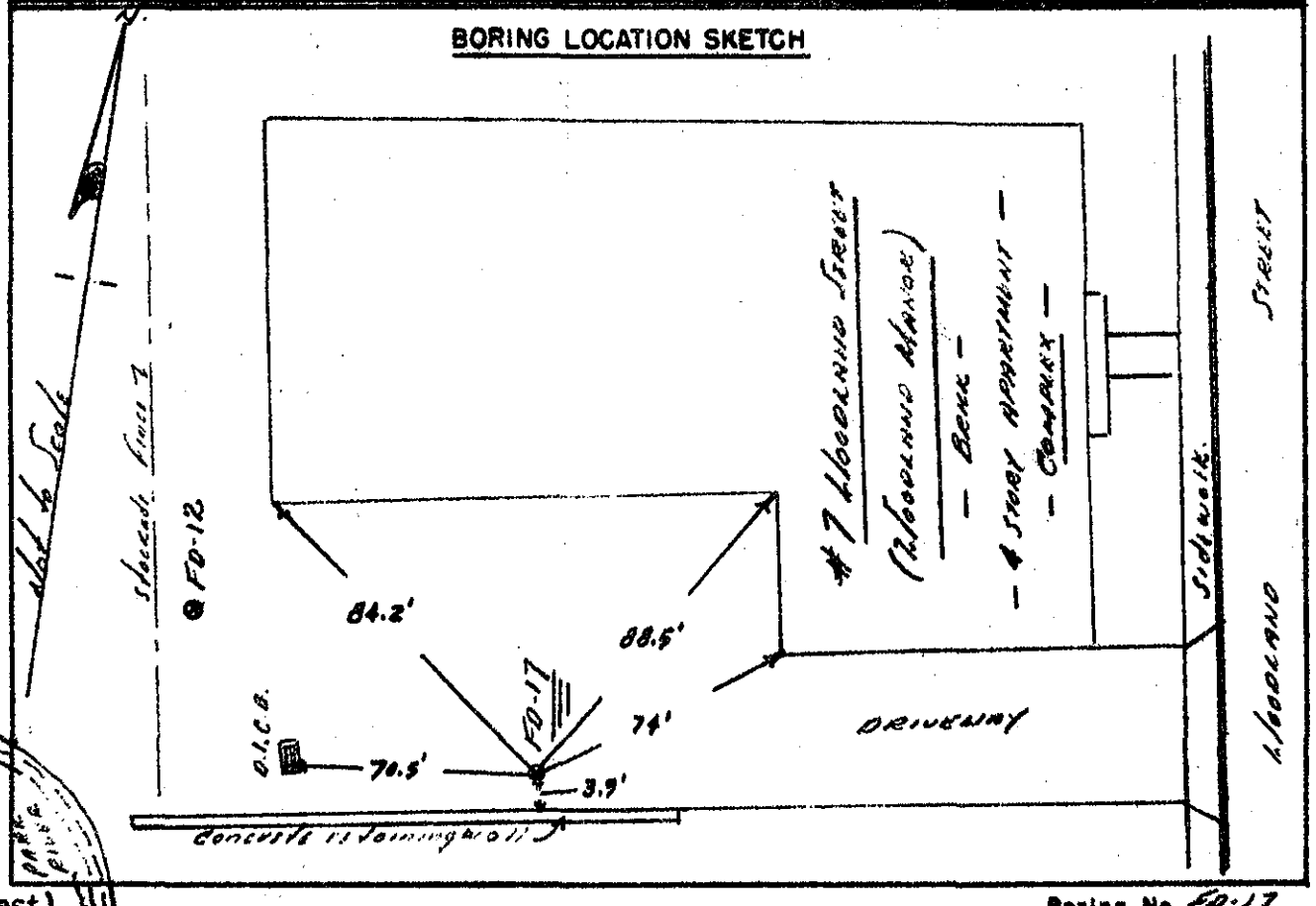
Page 5 of 5

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
6/24		None	101'	Unknown		Hole Caved

Note: Depths are in feet below original ground

AVERAGE SUBSURFACE WATER ELEV. _____

BORING LOCATION SKETCH



NED FORM 59 (Test) MAR 71

Boring No. FD-17

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site PARK RIVER BOX CONDUIT HARTFORD, CONN. Page 1 of 5 Pages

Boring No. FD-18 Desig. FC-2 Diam. (Casing) NXFJ

Co-ordinates: N 150,927 E 165,075

Elevation Top of Boring 45.3± M.S.L.
Total Overburden Drilled _____ Feet
Elevation Top of Rock _____ M.S.L.
Total Rock Drilled 20.0' Feet
Elevation Bottom of Boring _____ M.S.L.
Total Depth of Boring 50.4 Feet
Core Recovered 97 % No. Boxes 2
Core Recovered 19.5 Ft: NX Diam. ____ In.
Soil Samples 2½" ID×5 In. Diam. 3 No.
Soil Samples 2" ID×5 / 2½" ID×5 In. Diam. 10 / 2 No.

Hammer Wt. 350 LBS Boring Started 7/18/74
Hammer Drop 18" Boring Completed 7/22/74
Casing Left NONE
Subsurface Water Data _____ Page _____
Obs. Well None
Drilled By Corps of Engineers (Finnerty)
Mfg. Des. Drill CP-3
Inspected By: Michael H. Pendergast
Classification By: _____
Classification By: _____

DEPTH	1" = 2'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
0.3		None	2	0.3		DROVE, DRY THE 2½" ID×5 SOLID SAMPLE SPOON FROM 0.0 TO 5.0, BY IMPACT OF 350 LB. HAMMER FALLING 18" EACH BLOW.	MACADAM
		J-1 (1)	2½"	0.3 / 1.0	164		BROWN-SILTY-SANDY-GRAVEL FILL (GM) Dry (bessecourse)
1.0		J-2 (1)	I	1.0 / 2.5	20		~~RED-SANDY-SILT~~ ~~Dry~~ SAME as ABOVE (ML) FILL
2.5	2	J-3 (1)	D × 5	2.5 / 5.0	12	PULLED SPOON AND TOOK SAMPLE. 100% RECOVERY.	BROWN-BLACK-SILTY-C-F SAND (SM) Dry w/ cinders & accas. gravel. (FILL)
					12	HOLE OPEN TO 5.0.	
	4				7		
5.0		J-4 (1)	2" I D	5.0 / 7.5	4	DROVE THE 2" ID×5 S.S. SPOON FROM 5.0 TO 10.0.	
	6				4	PULLED SPOON AND TOOK SAMPLE. 60% RECOVERY.	
7.5		J-5 (1)	× 5	7.5 / 10.0	12	HOLE OPEN TO 10.0'.	RED-FINE SANDY-SILT. Dry in plug w/ accas. gravel (ML) FILL
	8				21		
					25		

GENERAL REMARKS: HOLE LOCATED NEAR TOP OF BANK OF PARK RIVER ON MACADAM PARKING SURFACE AT REAR OF 340 CAPITAL AVE. (State of Conn. Offices in Bldg.) SEE SKETCH.

NED FORM 58 (Test) MAR 71

Boring No. FD-18

Site: PARK RIVER BOX CONDUIT HARTFORD, CONN.	Boring No. FD-18	Page 2 of 5

DEPTH	1" = 2'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
		J-6 (1)	1½"	10.0 / 11.0	15	DROVE DRY THE 1½" ID×5 S.S. SPOON FROM 10.0 TO 15.0.	
11.0			I	11.0	6	PULLED SPOON AND TOOK SAMPLE 60% RECOVERY.	GREY BLACK - CINDERS Dry (FILL)
	12		D		6		
		J-7 (1)	× 5		6	JETTED NXFJ CASING TO 15.0.	
	14			15.0	6		
15.0			2"	15.0	2	DROVE DRY THE 2" ID×5 S.S. SPOON FROM 15.0 TO 20.0.	
	16	J-8 (1)	I		7	PULLED SPOON AND TOOK SAMPLE 60% RECOVERY.	
17.0		J-9 (1)	D ×	17.0 / 18.0	10	JETTED NXFJ CASING TO 20.0.	RED - GRAVELLY - SILTY - CLAY Moist FILL (CL)
18.0	18	J-10 (1)	5	18.0 / 20.0	10 / 10		GREY BLACK - CINDERS Moist w/ashes & pottery chips FILL
20.0	20	J-11 (1)	2"	20.0 / 21.0	3	DROVE DRY THE 2" ID×5 S.S. SPOON FROM 20.0 TO 24.2.	GREY ~~GRAVELLY~~ - ~~C.F.~~ SILTY SAND ~~SILT~~ Moist in plug (SM) (~~ML~~)
21.0		J-12 (1)	I	21.0 / 21.4	4	AT 24.2 SOLID REFUSAL 100 BLOWS NO PENETRATION	ORANGE - ~~SILTY~~ - GRAVELLY - ~~C.F.~~ SANDY CLAY CL Wet w/pottery chip (~~CL~~) (FILL) minimal stain
21.4		J-13 (1)		21.4 / 22.0			
22.0	22	J-14 (2)	D × 5	22.0 / 24.2	26 / 120 / 390	PULLED SPOON AND TOOK SAMPLE 100% RECOVERY. JETTED NXFJ CASING TO 24.2 SET UP TO CORE	REDDISH BROWN - SILTY - C.F. SAND Moist (SM)
							RED - GRAVELLY - ~~C.F.~~ SILTY FINE SAND ~~SILT~~ SM Dry (~~ML~~)
24.2	24	BOX 1	NXM	24.2 / 24.7	111 / 111 CORED	ROTARY DIAMOND DRILLED HVY. GRAVEL FROM 24.2 TO 24.7 RAN 0.5 REC. 0.2 40% NO WASH RETURN BIT NO: NXM 4P 3314 10 MINS. TO DRILL	HEAVY GRAVEL
24.7			4 P 3 3 1 4	24.7	CORED	ROTARY DIAMOND DRILLED OVB. FROM 24.7 TO 25.8. NO RECOVERY OR WASH RETURN. BIT NO NXM 4P 3314 20 MINS. TO DRILL.	- NO RECOVERY -
NO SCALE	~~26~~	NONE					
25.8	26			25.8			

(Test)

Boring No. FD-18

Site: PARK RIVER BOX CONDUIT HARTFORD CONN.	Boring No. FD-18	Page 3 of 5

DEPTH	1" = 2	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	25.0						
25.8	26	J-15 (")	2" I D x 5	25.8	70	DROVE 2" ID x 5 S.S. SPOON FROM 25.8 TO 30.0'	GRAVEL.
					28		
					36	PULLED SPOON AND ONLY RECOVERED ONE PIECE OF GRAVEL. PIECE HAD BEEN DRILLED PREVIOUSLY PLUGGING SPOON.	
	28				60		
				30.0	255	JETTED NXFJ CASING TO 30.0.	
30.0	30	NONE	2" ID x 5	30.0 / 30.4	220	DROVE 2" ID x 5 S.S. SPOON FROM 30.0 TO 30.4 AT 30.4' SOLID REFUSAL NO RECOVERY JETTED NXFJ CASING TO 30.4 SET UP TO CORE	NO SAMPLE
30.4		Box 1	NXM 4P 3314	30.4	CORED	ROTARY DIAMOND DRILLED BEDROCK FROM 30.4 TO 35.4 USING NXM SERIES BORTZ BIT NO 4P 3314 RAN 5.0 REC. 4.9 98% HYD FEED - SLOW - 300 LBS. 100% WASH RETURN (RED) DRILLING TIME 40 MINS. 0.4 to PIECES.	TOP OF SOLID. B/R @ 30.4'. SHALE red-brown soft to moderately hard, slightly calcareous in zones, fresh to slightly weathered on open joints. Highly broken and fractured 30.4 to 33.4'. Random Core breaks 2" to 3" C.C. throughout.
	32						
	34			35.4			
35.4	36	Box 1	NXM 4P 3314	35.4	CORED	ROTARY DIAMOND DRILLED BEDROCK FROM 35.4' TO 39.0' USING NXM SERIES BORTZ BIT NO. 4P 3314. BIT BLOCKED. RAN 3.6 REC. 3.6 100% 100% WASH WATER RETURN DRILLING TIME: 35 MINS. 0.3 TO PIECES.	
	38			39.0			
39.0	40	Box 1	NXM 4P 3314	39.0 / 41.4	CORED	ROTARY DIAMOND DRILLED BEDROCK FROM 39.0 TO 41.4. USING NXM SERIES BORTZ BIT NO: 4P 3314 - BLOCKED. RAN 2.4 REC. 2.3 96% 100% WATER RETURN (RED) DRILLING TIME: 20 MINS	Tight Joint dip 70°, 46.1 to 46.7
41.4	42.0	Box 2	NXM	41.4	CORED	ROTARY DIAMOND DRILLED BEDROCK FROM 41.4' TO 45.9'	

NED FORM 58A (Test) MAR 71

Boring No. FD-18

Site: PARK RIVER BOX CONDUIT HARTFORD, CONN	Boring No. FD-18	Page 4 of 5

DEPTH	1" = 2'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
42.0		BOX 2	NXM 4 P 3 3 1 4	41.4 – 45.9	CORED	USING NXM SERIES BARREL AND HORTZ BIT NO: 4 P 3314. BIT BLOCKED RAN 4.5 REC 4.3 95% 100% WASH RETURN (RED). DRILLING TIME: 50 MINS HYD. FEED - SLOW - 220 LBS. PRESSURE. 0.2 to PIECES.	
45.9	46	BOX 2	NXM 4 P 3 3 1 4	45.9 – 47.5	CORED	ROTARY DIAMOND DRILLED FROM 45.9' TO 47.5'. BIT BLOCKED RAN 1.6 REC. 1.5 94% 100% WASH RETURN (RED) 0.3 TO PIECES 20 MINS	
47.5	48	BOX 2	NXM 4 P 3 3 1 4	47.5 – 50.4	CORED	ROTARY DIAMOND DRILLED FROM 47.5 TO 50.4'. RAN 2.9 REC. 2.9 100% 100% WASH RETURN (RED) HYD FEED - MEDIUM 30 MINS, TO DRILL. 0.5 TO PIECES.	
50.4	50						

BOTTOM OF DRILLHOLE @ 50.4'
Depth Considered Sufficient

Test)

Boring No. FD-18

PARK RIVER BOX CONDUIT

Site: [illegible]

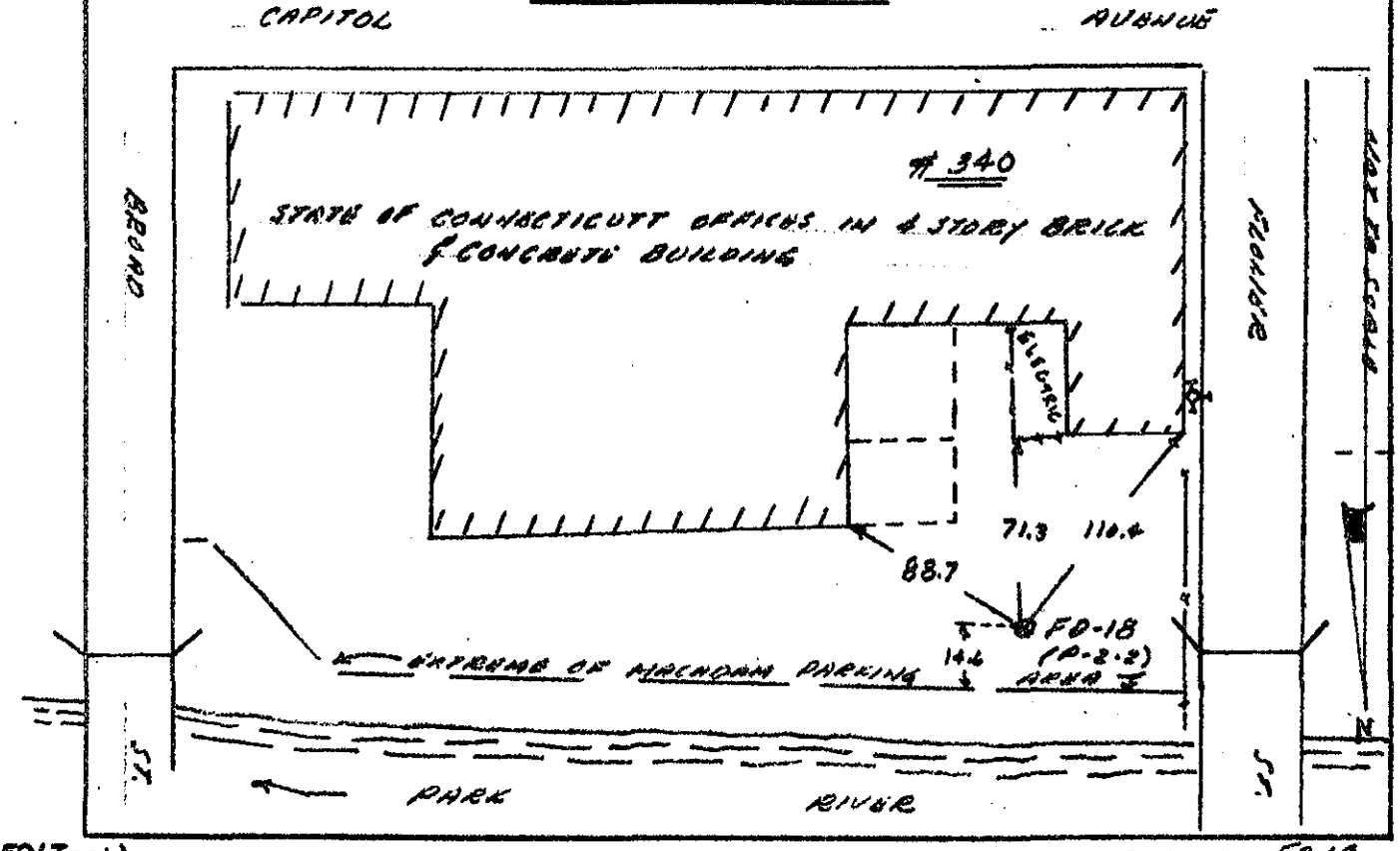
Boring No: FD-18

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
7/19	0800	24.2	24.2	20.4		
7/22	0800	30.4	41.4	24.0		

Note: Depths are in feet below original ground

BORING LOCATION SKETCH



NED FORM 59 (Test) MAR 71

Boring No. FD-18

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site: Park River Box Culvert, Hartford County — Page 1 of 4 Pages

Boring No. FD-19 Desig. D-2-1 Diam. (Casing) NXPT

Co-ordinates: N 506 029 E 165 461

Elevation Top of Boring: 48± M.S.L.
Total Overburden Drilled: ____ Feet
Elevation Top of Rock: ____ M.S.L.
Total Rock Drilled: 20.0 Feet
Elevation Bottom of Boring: ____ M.S.L.
Total Depth of Boring: 42.7' Feet
Core Recovered: 98 % No. Boxes: 2
Core Recovered: 18.2 Ft: NX Diam. ____ In.
Soil Samples: 2½" ID x 5" In. Diam. 4 No.
Soil Samples: 2" ID x 5 / 1½" ID x 5 In. Diam. 5 / 2 No.

Hammer Wt. 350 LBS. Boring Started 7/23/74
Hammer Drop 18"
Casing Left Alone Boring Completed 7/24/74
Subsurface Water Data: ____ Page ____
Obs. Well: None
Drilled By: Corps of Engineers (Finnerty)
Mfg. Des. Drill: CP-3
Inspected By: Michael M. Pandergast
Classification By: ____
Classification By: ____

DEPTH (1" = 2')	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	None	2½"	0 / 1.0	5	DROVE DRY THE 2½" ID x 5' SOLID SAMPLE SPOON, BY IMPACT OF 350 LB. HAMMER FALLING 18" EACH BLOW, FROM 0.0 TO 5.0.	TOPSOIL
1.0		1	1.0	8		LIGHT BROWN & BLACK - SILTY - Fine SAND Moist (SM)
2	T-1 (2)	0		7	PULLED SPOON AND TOOK SAMPLE.	
3.0		x	3.0		100% RECOVERY	REDDISH BROWN - SILTY - C-F SAND Moist w/some gravel & cinders (SM)
	T-2 (2)	5'	3.0 / 4.0	15	HOLE OPEN TO 5.0'	
4.0 4	T-3 (1)		4.0 / 4.8	15		RED VITRIFIED CLAY PIPE Dry ~Probably abandoned~
4.8	T-4 (1)		4.8-5.0			
5.0		2"	5.0	5	DROVE DRY THE 2" ID x 5' S.S. SPOON FROM 5.0 TO 10.0.	GRAY BLACK - CINDERS & COAL.
6		1		6	PULLED SPOON AND TOOK SAMPLE. 20% RECOVERY.	RED - GRAVELLY - C-F SANDY - ~~Clay~~ SILT (ML) Moist in plug (ML)
	T-5 (1)	0		12	HOLE OPEN TO 10.0	
8		x		9		
		5		6		
10.0			10.0			

GENERAL REMARKS: HOLE LOCATED ON NORTH SIDE OF CAPITAL AVENUE OPPOSITE HOUSE # 315. IN GRASS AREA 2' NORTH OF NORTH INSIDE EDGE OF CONC. SIDEWALK NEAR TOP OF BANK.
~SEE SKETCH~

NED FORM 58 (Test) MAR 71

Boring No. FD-19

Site: PARK RIVER BOX CONDUIT HARTFORD, CONN.	Boring No. FD-19	Page 2 of 4

DEPTH	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
10.0		1½"	10.0	3	DROVE 1½" ID×5 S.S. SPOON FROM 10.0 TO 15.0.	REDDISH BROWN - SANDY - ~~CLAY~~ SILT (ML) (CL)
		I		3	PULLED SPOON AND TOOK SAMPLE 20% RECOVERY.	Moist in plug trace of cinders
12	J-6 (1)	D		4	JETTED N×FJ CASING FROM 0.0 TO 15.0.	
		×		4	ONE FOOT OF MATERIAL IN CASING WASH & CHOPPED CLEAN TO 15.0.	
14		5	14.9	8		REDDISH BROWN - ~~CLAYEY M-F SAND~~ ~~Moist in plug~~ SAME AS ABOVE (SC)
14.9 / 15.0	J-7 (1)		14.9-15.0			
		2"	15.0	4	DROVE 2" ID×5' S.S SPOON DRY FROM 15.0 TO 20.0	BROWN - GRAVELLY - FINE SANDY - SILT (ML)
16		I		12	PULLED SPOON AND TOOK SAMPLE 40% RECOVERY.	Moist in plug.
	J-8 (1)	D		9	JETTED N×FJ CASING TO 20.0.	
18		×		10		REDDISH BROWN - ~~C-F SANDY GRAVELLY CLAY~~ Moist in plug (CL) w/cinders SAME AS ABOVE
		5	19.0			
19.0	J-9 (1)		19.0 / 20.0	12		
20.0 / 20.2	J-10 (1)	2"	20-20.2			
		I	20.2	11	DROVE 2" ID×5 S.S. SPOON FROM 20.0 TO 22.7. AT 22.7 SOLID REFUSAL 100 BLOWS NO PENETRATION.	RED - SILTY - SANDY - GRAVEL Moist w/wood (GM)
		D		33	PULLED SPOON TOOK SAMPLE 100% RECOVERY.	
22	J-11 (1)	×		180	JETTED N×FJ CASING TO 22.7 SET UP TO CORE @ 22.7	RED WEATHERED ROCK
		5	22.7			
22.7		N × M	22.7	C	ROTARY DIAMOND DRILLED BEDROCK FROM 22.7 TO 27.7 USING N×M SERIES BORTZ BIT NO. 3PV 541 AND D.T. CORE BARREL. END OF RUN.	TOP OF SOLID BEDROCK @ 22.7'
24		3		O	RAN 5.0 REC. 4.6 92%	SHALE, red. brown soft to moderately hard, slightly Calcareous in Zones and Joint fillings
	BOX 1	P V		R	WASH RETURN 100% (RED) 45 MINUTES TO DRILL	
		5		E	HYD. FEED - MEDIUM - 220 LBS. PRESSURE.	
26		4		D	0.4 TO PIECES.	
		1	27.7			

(Test)

Boring No. FD-19

Site: PARK RIVER BOX CONDUIT, HARTFORD, CONN.

Boring No. FO-19

DEPTH (1" = 2')	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
27.0						
27.7	Box 1	N X M 3 P V 5 4 1	27.7 – 32.7	C O R E	ROTARY DIAMOND DRILLED BEDROCK FROM 27.7 TO 32.7 USING NXM SERIES BORTZ BIT NO: 3PV541 AND D.T. CORE BARREL. END OF RUN RAN 5.0 REC. 5.0 100% WASH WATER RETURN 100% RED IN COLOR. 35 MINUTES TO DRILL HYD. PRESSURE - MEDIUM FEED 220 LB. PRESSURE 1.15' TO PIECES.	Massive to thin bedded, in zones below 34.9. Fresh to slightly weathered along some joint surfaces. Bedding dip horizontal to 5°±.
32.7	Box 2	N X M 3 P V 5 4 1	32.7 – 34.9	C O R E	ROTARY DIAMOND DRILLED BEDROCK FROM 32.7 TO 34.9' USING NXM SERIES BORTZ BIT NO. 3PV541 AND D.T CORE BARREL - BIT BLOCKED RAN 2.2 REC. 2.1 96% WASH WATER RED 100% RETURN 30 MINUTES TO DRILL HYD. PRESSURE - MEDIUM FEED - 220 LBS.	Random, open high angle joints at 22.7 to 23.1, dip 60°, 24.6 to 24.5 dip 70°, 27.3 to 27.7, dip 70° 32.6' to 32.7', dip 90°, 32.0' to 33.4', dip 90°, 38.2' to 38.3' dip 45°, ~~38.7' to 39.0' dip 65°~~, 39.3' to 39.9' dip 35°
34.9	Box 2	N X M 4 0 3 B 7 5 8	34.9 – 39.6	C O R E	ROTARY DIAMOND DRILLED BEDROCK FROM 34.9 TO 39.6 USING NXM SERIES BORTZ BIT NO. 03B758 AND D.T CORE BARREL - BIT BLOCKED - RAN 4.7 REC 4.4 94% WASH WATER RETURN 100% RED IN COLOR. 1 HOUR DRILLING TIME HYD. PRESSURE - MEDIUM FEED 220 LB. PRESSURE. 0.3 TO PIECES.	
39.6	Box 2	N X M 0 3 B 7 5 8	39.6 – 42.7	C O R E	ROTARY DIAMOND DRILLED BEDROCK FROM 39.6' TO 42.7' USING NXM SERIES BORTZ BIT NO 03B758 AND D.T. CORE BARREL. END OF HOLE. RAN 3.1 REC. 3.1 100% WASH WATER RED 100% RETURN 20 MINUTES TO DRILL HYD. PRESSURE - MEDIUM FEED - 220 LBS. 0.25' TO PIECES.	
42.7					BOTTOM OF EXPLORATION @ 42.7' Depth Considered Sufficient	

PARK RIVER FD CONDUIT

Site: HARTFORD-CONN.

Boring No: FD-19

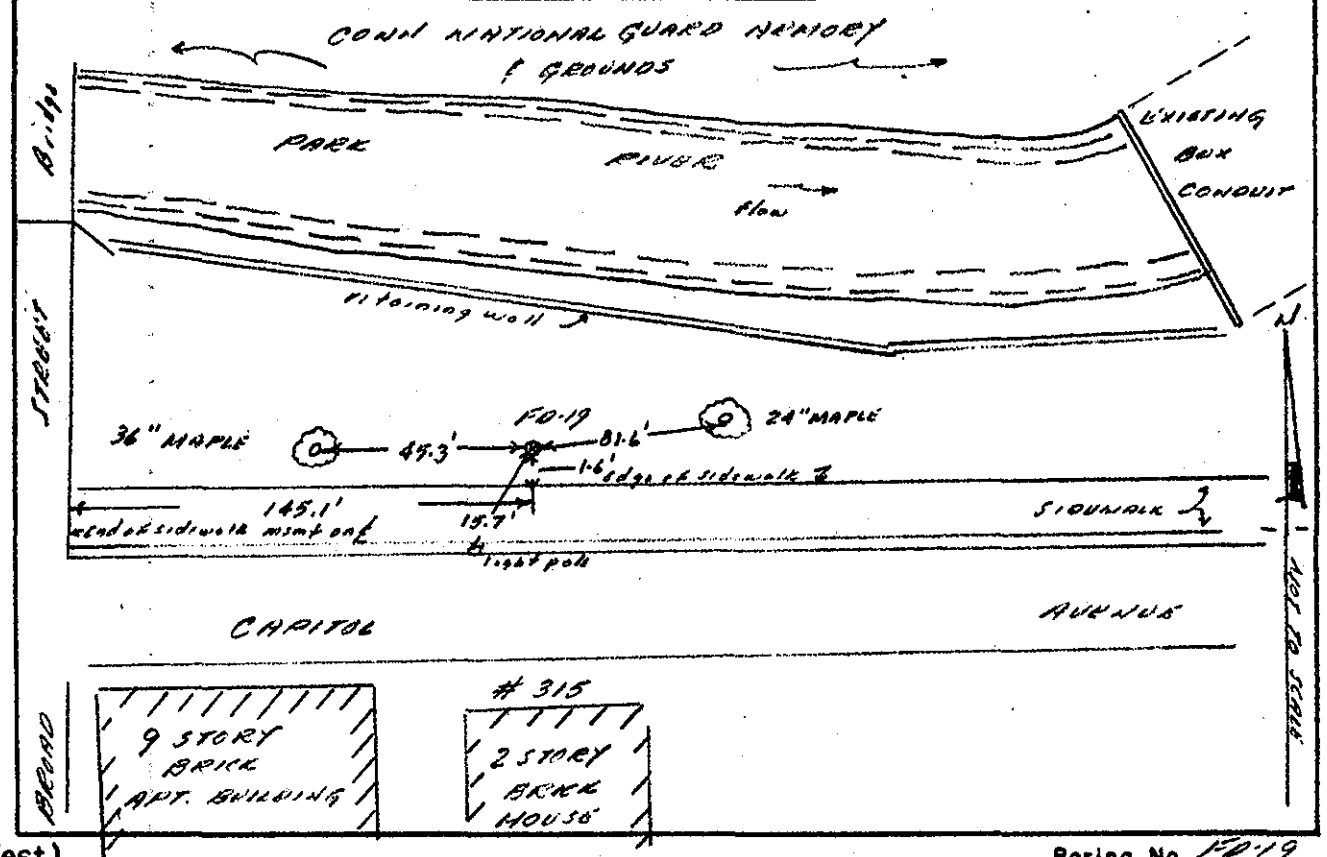
SUBSURFACE WATER OBSERVATIONS

Page 4 of 4

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
7/24	0800	22.7'	32.7'	20.6'		BEFORE PUTING TOOLS IN HOLE

Note: Depths are in feet below original ground

BORING LOCATION SKETCH



(Test)

Boring No. FD-19

APPENDIX C

PILE LOAD TESTS

GREATER HARTFORD AREA

C-1 List of Projects

C-2 Summary of Results

C-3 Summary of Results

C-4 Summary of Results

C-5 Pile Load Test Location-Plan
Conduit Section 8

C-6 Pile Load Test Result

C-7 Test Pile Driving Record

CONNECTICUT STATE HW. DEPT

LIST OF PROJECTS

TOWN	PROJECT No	IDENTIFICATION
EAST HARTFORD	42-132	Interchange Rtes. I-84, 2, 5. ("Can O' Worms")
	-133	
	-134	
	-135	
HARTFORD	63-127	Rte. I-91 over Warwarme Ave.
	63-136	Rte. I-84 (Sect. I)
	63-137	Rte. I-84 (Sect. II)
	63-138	Rte. I-84 (Sect. III)
	63-161	Rte. I-91 (Dutch Point)
	63-141	Rte. I-84 (Sect. V)
	63-192	Rte. I-84 (Sect. V)
	63-184	Rte. I-84 (Sect. VI)
WEST HARTFORD	63-151	Rte. I-84

SUMMARY OF RESULTS

PILE SIZE		10BP42	12BP53	12BP74	14BP73	14BP89	TOTALS
Nº of tests on rock.		8	19	2	1	2	32
Nº of tests in till.		8	4	4	0	1	17
Lengths Tested on Rock:	Max.	160'	132'	136'	126'	126'	
	Min.	14'	35'	28'	126'	113'	
	Ave.	73.4'	82.6'	82'	126'	119.5	
Lengths Tested in Till:	Max.	121'	71'	107'	—	81'	
	Min.	27'	25'	23'	—	81'	
	Ave.	67.6'	45.8'	47.0'	—	81'	
2X Design Stress on Rock (psi.)	Max.	24,300	25,400	18,400	13,000	15,300	
	Min.	17,800	18,000	18,000	13,000	15,300	
	Ave.	20,600	20,182	18,200	13,000	15,300	
2X Design Stress in Till (psi.)	Max.	24,300	18,000	18,400	—	15,300	
	Min.	17,800	14,100	15,750	—	15,300	
	Ave.	21,381	17,025	17,538	—	15,300	
Hammer Energy @ Refusal - R	Max.	15,000	26,000	26,000	10,900	24,000	
	Min.	10,000	12,000	19,500	10,900	24,000	
Hammer Energy @ Refusal - T	Max.	15,100	19,500	26,000	—	24,000	
	Min.	10,000	15,000	15,000	—	24 000	
Net Settlement on Rock	Max.	.49"	.29"	.13"	.06"	.053"	
	Min.	.065"	0"	.05"	.06"	.018"	
Net Settlement in Till	Max.	1.35"	.67"	1.035"	—	.26"	
	Min.	.02"	.105"	.11"	—	.26"	
Total Nº of tests		16	23	6	1	3	49

EPARED	PREPARED BY J.L. Petroski	FORM NO. DES 3 ED. 2-62 STATE HIGHWAY DEPARTMENT STATE OF CONNECTICUT	ORGANIZATION UNIT NO.	WORK ORDER NO.
ECKED	CHECKED BY S.M. Pazdziora	COMPUTATION SHEET		SHEET NO.

ECT: PLT'S ON STEEL-H PILES END-BEARING IN TILL

PILE SIZE	PROJECT No	PLT FOLDER No	2X DESIGN STRESS (PSI)	HAMMER ENERGY @ REFUSAL	TESTED LENGTH	NET SETTLEMENT	REMARKS
10BP42	63-136	63.7	17,800	15,000'#	27'	.065"	
	63-138	63.21	17,800	10,000'#	71'	.35"	S.F. @ Δ=.25" = 1.96
	"	63.22	17,800	12,000'#	32'	.02"	
	63-184	63.32	24,300	13,300'#	121'	1.2"	S.F. @ Δ=.25" = 1.86
	"	63.33	24,300	10,900'#	117'	1.35"	S.F. @ Δ=.25" = 1.89
	"	63.35	22,350	12,000'#	42'	.22"	
	"	63.36	24,300	10,000'#	68'	.35"	S.F. @ Δ=.25" = 1.97
	"	63.37	22,400	15,100'#	63'	.52"	S.F. @ Δ=.25" = 1.86
12BP53	42-134	42.4	14,100	15,100'#	71'	.13"	
	63-137	63.15	18,000	19,500'#	25'	.67"	S.F. @ Δ=.25" = 1.86
	"	63.17	18,000	19,500'#	52'	.11"	
	63-151	63.25	18,000	15,000'#	35'	.105"	
12BP74	63-137	63.12	15,750	15,000'#	28'	.235"	
	"	63.13	18,000	19,500'#	30'	1.035"	S.F. @ Δ=.25" = 1.50
	"	63.16	18,000	19,500'#	23'	.11"	
	63-141	63.43	18,400	26,000'#	107'	.11"	
14BP73			NONE				
14BP89	63-192	63.40	15,300	24,000'#	81'	.26"	IN CASING FOR $\frac{2L}{3}$

PARED	PREPARED BY J.L. Petroski	FORM NO. DES 3 ED. 2-62 STATE HIGHWAY DEPARTMENT STATE OF CONNECTICUT	ORGANIZATION UNIT NO.	WORK ORDER NO.
CKED	CHECKED BY S.M. Pazdziora	COMPUTATION SHEET		SHEET NO.

ECT: PLT'S ON STEEL-H PILES END-BEARING ON BEDROCK

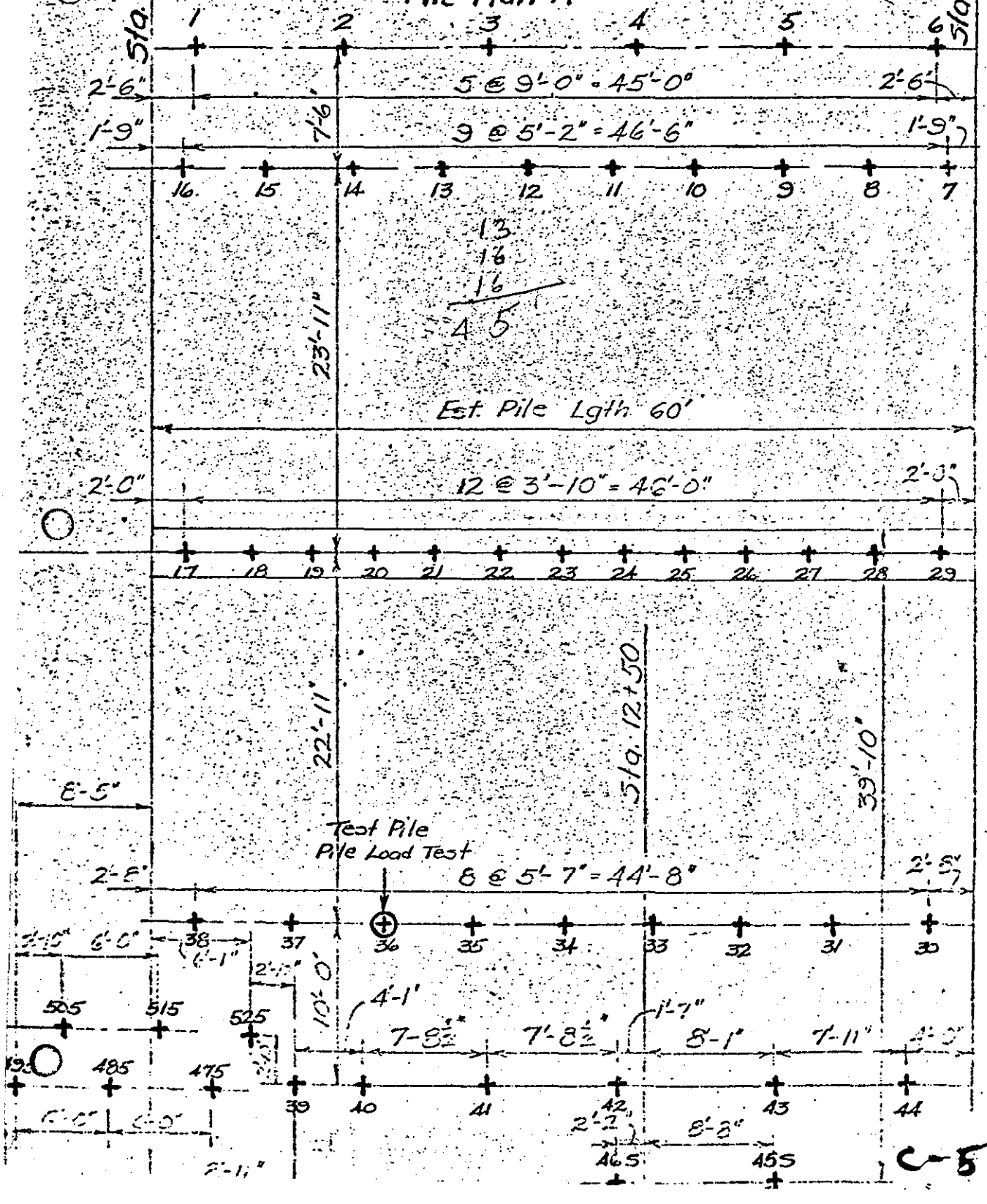
PILE SIZE	PROJECT Nº	PLT FOLDER Nº	2X DESIGN STRESS (PSI)	HAMMER ENERGY @ REFUSAL	TESTED LENGTH	NET SETTLEMENT	REMARKS
10BP42	63-136	63.8	17,800	15,000'#	58'	.065"	
	"	63.11	19,400	15,000'#	34'	.257"	
	63-138	63.18	17,800	10,000'#	70'	.107"	
	63-151	63.23	19,900	15,000'#	130'	.43"	S.F.@ Δ=.25" = 1.98
	"	63.24	17,800	15,000'#	44'	.08"	
	"	63.26	23,500	15,000'#	14'	.49"	S.F.@ Δ=.25" = 1.98
	63-184	63.31	24,300	12,000'#	160'	.45"	S.F.@ Δ=.25" = 1.97
	"	63.34	24,300	12,400'#	77'	.18"	
12BP53	42-133	42.1	18,000	12,000'#	69'	.02"	
	42-132	42.2	18,000	13,600'#	102'	.02"	
	42-134	42.3	18,000	13,000'#	90'	.09"	
	42-135	42.5	18,000	12,500'#	123'	.02"	
	"	42.6	18,000	14,300'#	89'	.05"	
	42-134	42.7	18,000	12,000'#	83'	.05"	
	42-132	42.8	18,000	13,600'#	83'	0"	
	63-127	63.4	24,400	22,500'#	86'	.07"	
	"	63.5	24,400	22,500'#	93'	.05"	
	"	63.6	24,400	22,500'#	87'	.05"	
	63-136	63.9	18,000	15,000'#	60'	.065"	
	"	63.10	18,000	15,000'#	35'	.05"	
	63-138	63.19	18,000	12,000'#	63'	.03"	
	"	63.20	18,000	12,000'#	66'	.004"	
	63-161	63.27	19,250	19,600'#	88'	.29"	
	"	63.28	25,200	21,000'#	96'	.08"	
	"	63.29	25,400	22,000'#	68'	.23"	
	"	63.30	24,400	21,000'#	57'	.10"	
	63-141	63.41	18,000	26,000'#	132'	.08"	
12BP74	63-137	63.14	18,000	19,500'#	28'	.05"	
	63-141	63.42	18,400	26,000'#	136'	.13"	
14BP73	42-135	42.9	13,000	10,900'#	126'	.04"	
14BP89	63-192	63.38	15,300	24,000'#	126'	.053"	IN CASING FOR 2L/3
	"	63.39	[illegible]	24,000'#	113'	.015"	[illegible]

C-4

North Branch Conduit 8

State Project 63-192 (1965)

Pile Plan A

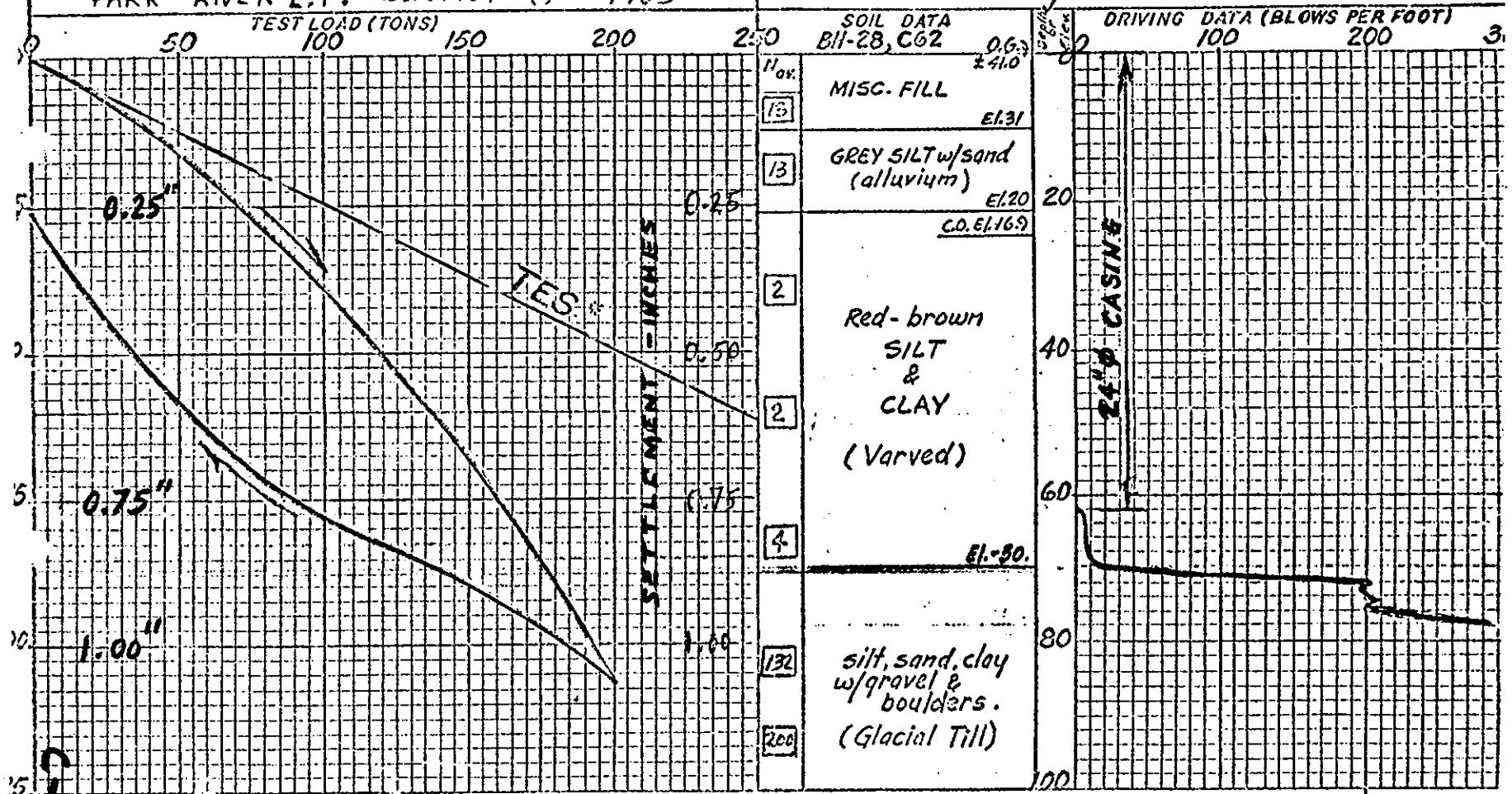


TOWN HARTFORD
PROJECT RTE. I-84
PROJECT NO. 63-192
SOILS ENG'R. SMP
PARK RIVER L.P. SECTION 8 - 1965

STRUCTURE NBPR CONDUIT
SUBSTR. UNIT ±12+34, 25' Rt.
DATE DRIVEN 7 APRIL 1965
TEST PERIOD 12-15 APRIL 1965

PILE TYPE STEEL-H
PILE SIZE & WEIGHT 14BP89
DRIVEN LENGTH **55'-(81')
EXIST. GR. ELEV. ±41.0
TIP ELEV. -37.7

HAMMER MODEL MKT C826
RAM WT. & STROKE 8,000#-18"
ENERGY (ACTUAL) 24,000'#
BLOWS/MIN. (ACTUAL) 90±



REMARKS: 1. ** PILE DRIVEN AND LOAD-TESTED FROM ORIGINAL GROUND. 2. PILE WAS BOOTSTRAPPED TO 4 ANCHOR PILES W/ SUPPLEMENTARY DEAD LOAD. 3. PILE IN 24" φ CASING FOR 76 % OF LENGTH TO REDUCE SKIN FRICTION EFFECT. 4. PILE DESIGN LOAD = 100 T. 5. NET Δ = .26" 6. TES* = THEORETICAL ELASTIC SHORTENING. (DOES NOT INCLUDE SHORTENING DUE TO COLUMN ACTION IN CASING.)

TYPE CODE
EB-T

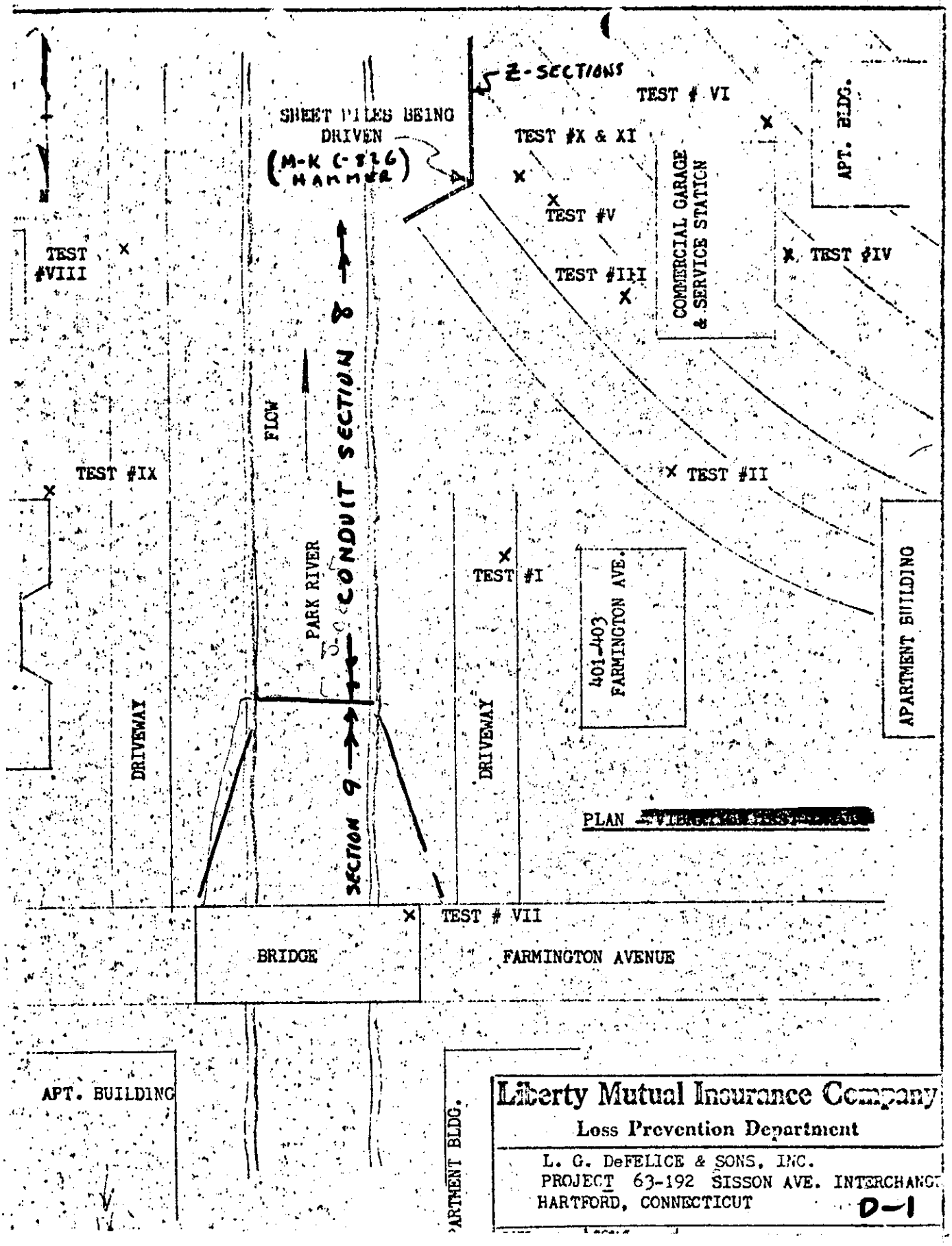
C6

APPENDIX D

PILE DRIVING VIBRATION TEST

D-1 PLAN

D-2 PLOT-ENERGY RATIO V_S DISTANCE

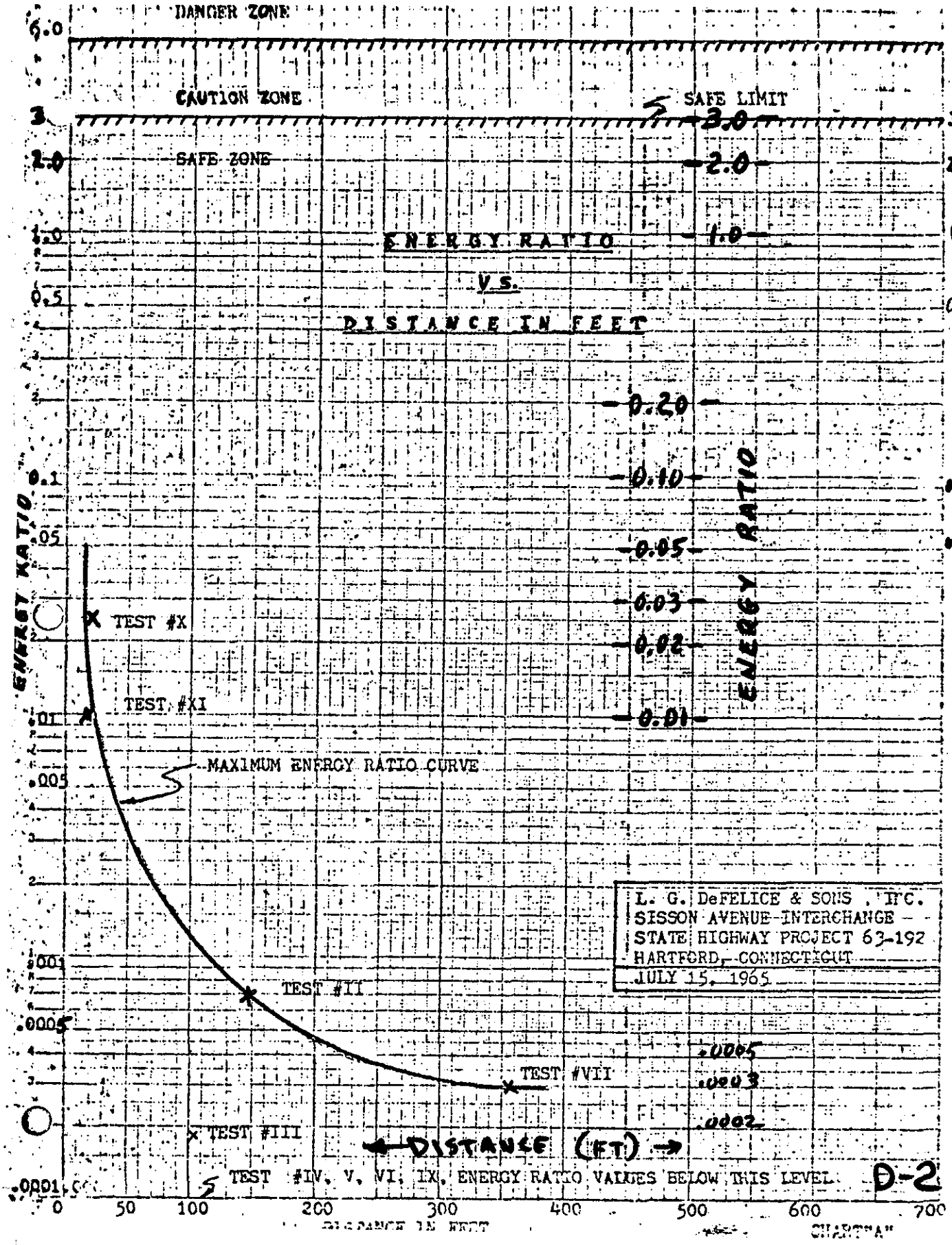


Liberty Mutual Insurance Company

Loss Prevention Department

L. G. DeFELICE & SONS, INC.
PROJECT 63-192 SISSON AVE. INTERCHANGE
HARTFORD, CONNECTICUT

D-1


DANGER ZONE
CAUTION ZONE
SAFE ZONE
SAFE LIMIT
3.0
2.0
1.0
ENERGY RATIO
VS.
DISTANCE IN FEET
0.20
0.10
0.05
0.03
0.02
0.01
ENERGY RATIO
ENERGY RATIO
TEST #X
TEST #XI
MAXIMUM ENERGY RATIO CURVE
TEST #II
TEST #VII
TEST #III
.0005
.0003
.0002
DISTANCE (FT)
TEST #IV, V, VI, IX, ENERGY RATIO VALUES BELOW THIS LEVEL
L. G. DeFELICE & SONS, INC.
SISSON AVENUE INTERCHANGE
STATE HIGHWAY PROJECT 63-192
HARTFORD, CONNECTICUT
JULY 15, 1965
D-2
0
50
100
200
300
400
500
600
700
DISTANCE IN FEET

APPENDIX E

MATERIAL USEAGE CHART

NED FORM 223
27 Sept 49

NEW ENGLAND DIVISION,
CORPS OF ENGINEERS, U.S. ARMY

SUBJECT PARK RIVER H.P. BOX CONDUIT
COMPUTATION MATERIAL USAGE CHART
COMPUTED BY ____ CHECKED BY ____ DATE ____
PAGE ____

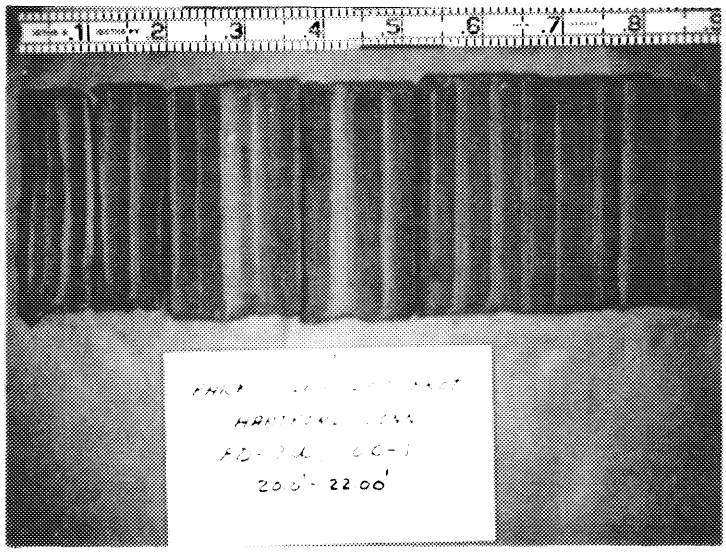
PRELIMINARY CHART

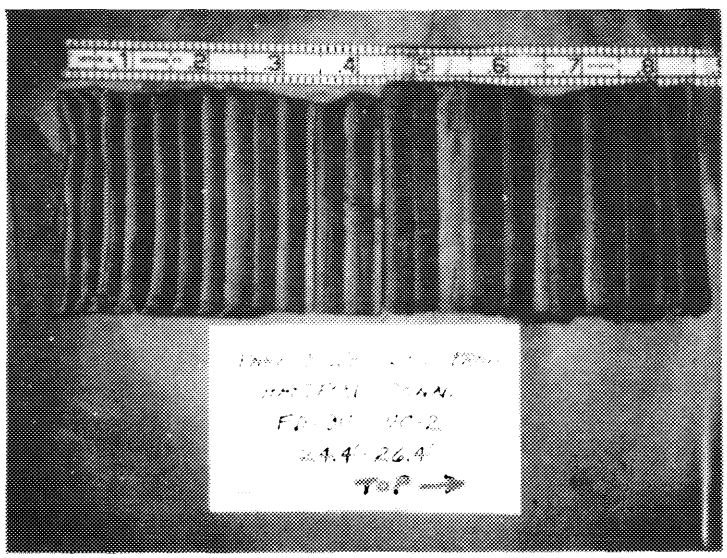
BOX CONDUIT SECTION No.	REQUIRED EARTH EXCAVATION CUBIC YARDS					EARTH FILL MATERIAL CUBIC YARDS	
	EXISTING FILLS 1	TILL 2	VARVED CLAY 3	MATERIALS FROM COLUMNS 1, 2, 3 WASTE	USEABLE EARTH FILL	FROM REQUIRED EXCAVATION	FROM CONTRACTOR'S SOURCE
2	31 000	5 000	0	9 000	27 000	27 000	14 000
4	44 000	4 000	33 000	20 000	61 000	61 000	41 000
5	1 000	0	5 000	2 000	4 000	4 000	2 000
JUNCTION	6 000	0	6 000	4 000	8 000	8 000	0
7	51 000	0	34 000	22 000	63 000	63 000	19 000
9	14 000	0	3 000	5 000	12 000	10 000	0
	147 000	9 000	81 000	62,000	175,000	173,000	76,000
				TOTAL = 237,000		TOTAL = 249,000	

APPENDIX F

SELECTED LABORATORY TEST DATA

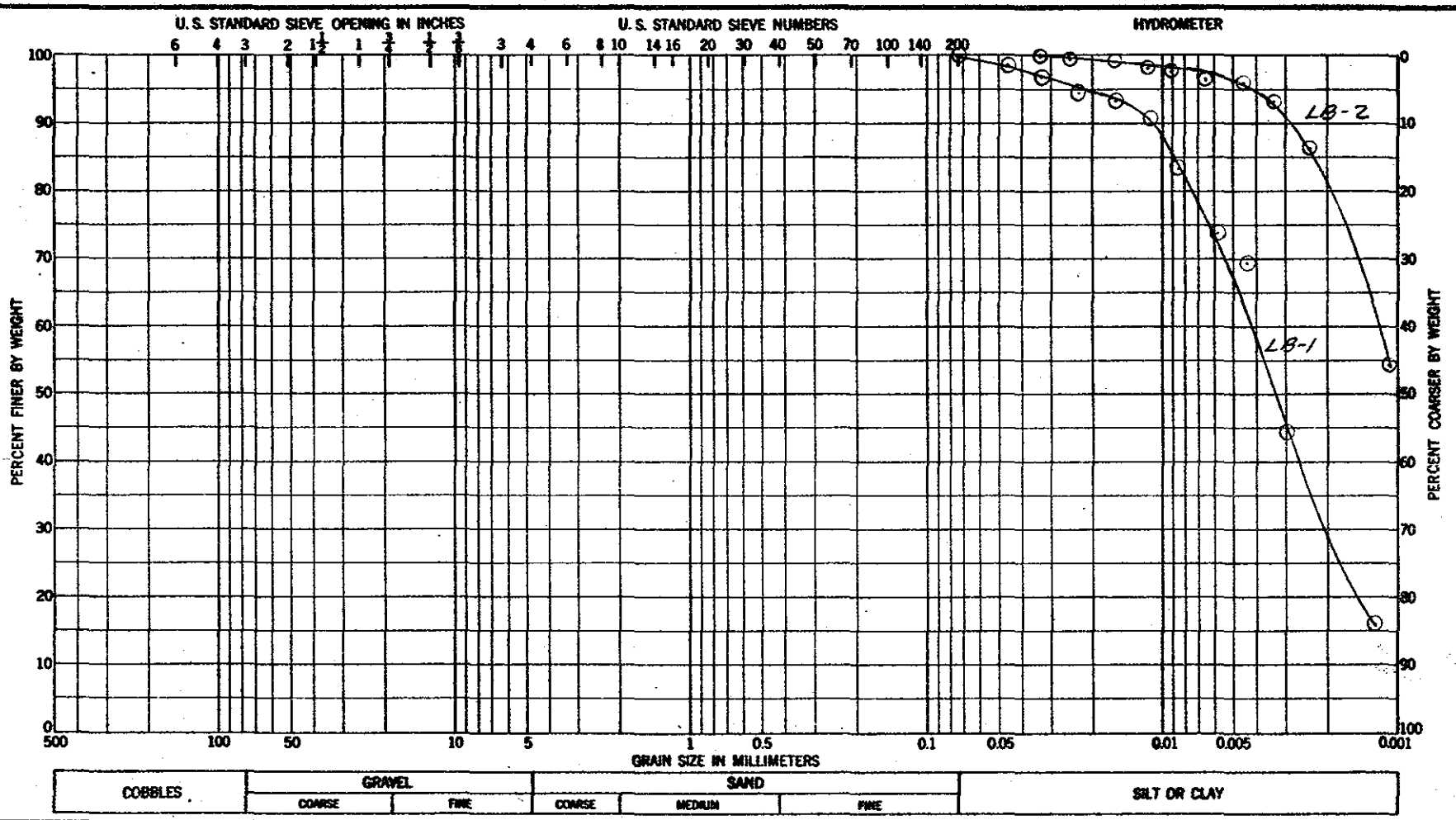
F-1	PHOTOGRAPH, VARVED CLAY
F-2 Thru F-13	BORING FD-7U, SHEAR & CONSOLIDATION.
F-14 Thru F-24	BORING FD-9U, SHEAR & CONSOLIDATION.
F-25 Thru F-39	BORING FD-13U, SHEAR & CONSOLIDATION.





PARTIALLY DRIED SPECIMENS OF VARVED CLAY

TYPICAL PHOTOGRAPHS



Sample No.	Blow or Depth	Classification	Nat w %	LL	PL	PI
UC-2; LB-1	22.2'-24.2'	SILT (ML)	G=2.77	44	29	15
UC-2; LB-2	22.2'-24.2'	CLAY (CH)	G=2.80	80	34	46

Project: Park River, Hartford, Conn.

Area:

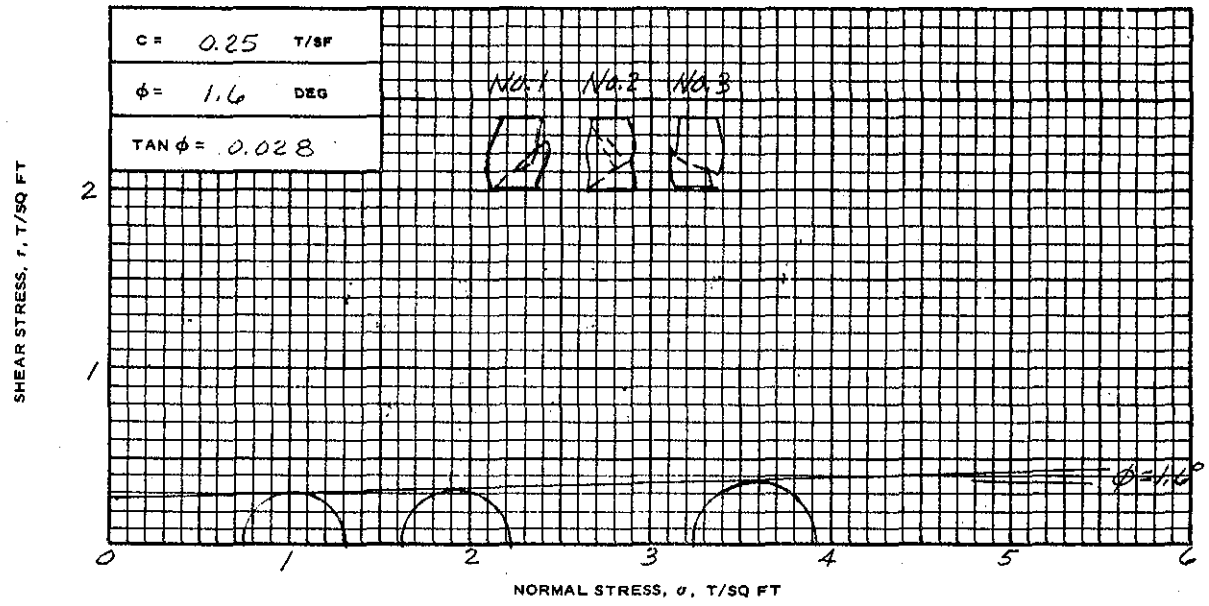
Boring No.: FD-7U; UC-2

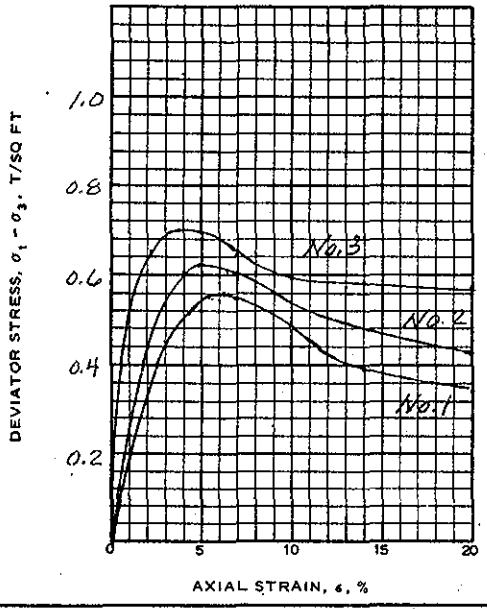
Date: November, 1974

GRADATION CURVES

ENG FORM 1 MAY 63 2087

F-2





SPECIMEN NO.			1	2	3	
INITIAL	WATER CONTENT, %	w_o	63.7	62.9	64.6	
	DRY DENSITY LB/ CU FT	γ_{d_o}	61.4	62.1	61.0	
	SATURATION, %	S_o	97	97	97	
	VOID RATIO	e_o	1.838	1.806	1.854	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γ_{d_c}				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_b				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.75	1.62	3.24	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.56	0.62	0.70	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	6.2	4.9	3.7	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$	0.38*	0.47*	0.58*	
INITIAL DIAMETER, IN.		D_o	1.43	1.43	1.43	
INITIAL HEIGHT, IN.		H_o	3.13	3.18	3.15	

CONTROLLED- strain TEST

DESCRIPTION OF SPECIMENS Varved CLAY (CH)

LL	PL	PI	Gs 2.79	TYPE OF SPECIMEN Undisturbed	TYPE OF TEST Q

REMARKS: * Stress @ 15% strain.
70 TO 80% HORIZONTAL
CLAY VARVES.

PROJECT Park River Conduit
Hartford, Conn.

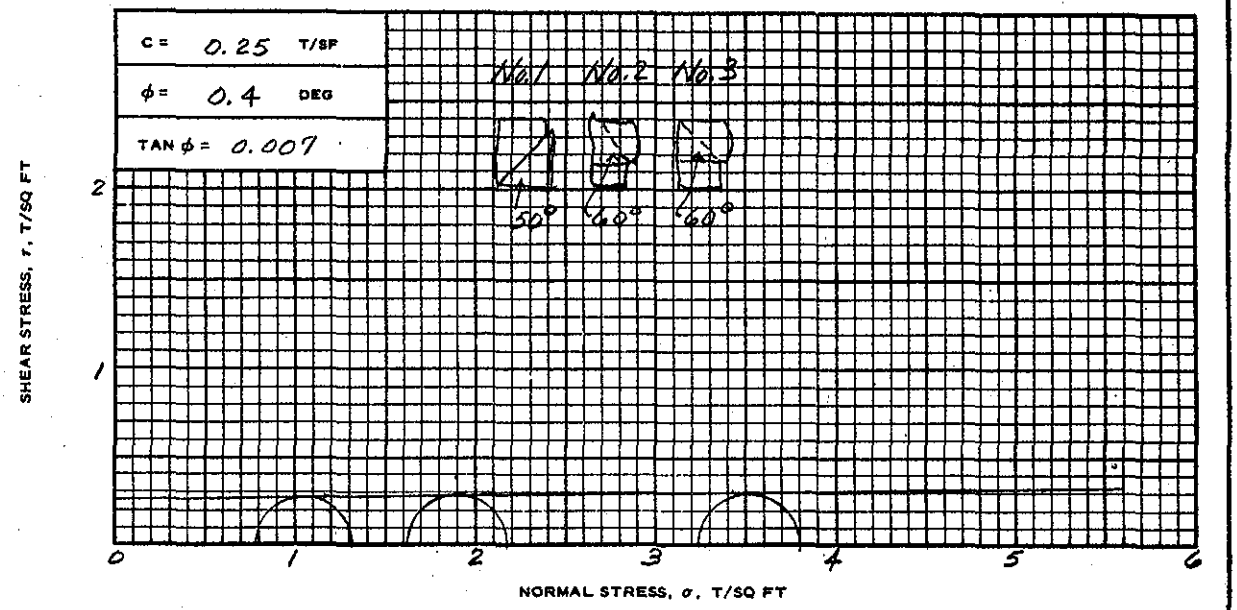
BORING NO. FD-706 SAMPLE NO. UC-1

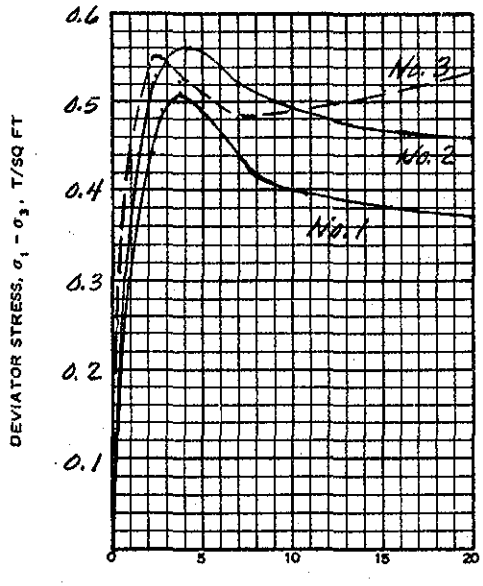
DEPTH/ELEV 20.0'- 22.0'

LABORATORY NED DATE May 1974

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)





SPECIMEN NO.			1	2	3	
INITIAL	WATER CONTENT, %	w_o	61.3	61.3	61.3	
	DRY DENSITY LB/ CU FT	γ_{d_o}	64.7	64.2	64.1	
	SATURATION, %	S_o	100	100	100	
	VOID RATIO	e_o	1.683	1.702	1.707	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γ_{d_c}				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.79	1.62	3.24	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.51	0.56	0.55	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	3.7	4.3	2.2	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$	0.39*	0.46*	0.52*	
INITIAL DIAMETER, IN.		D_o	1.43	1.43	1.41	
INITIAL HEIGHT, IN.		H_o	3.21	3.23	3.15	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Varved CLAY(CH) - Approx. 30% silt and 70% clay - All layers in specimen horizontal

LL | PL | PI | Gs 2.78 | TYPE OF SPECIMEN Undisturbed | TYPE OF TEST Q

REMARKS: * Stress @ 15% strain

PROJECT Park River Conduit
Hartford, Conn.

BORING NO. FD-7U | SAMPLE NO. UC-3

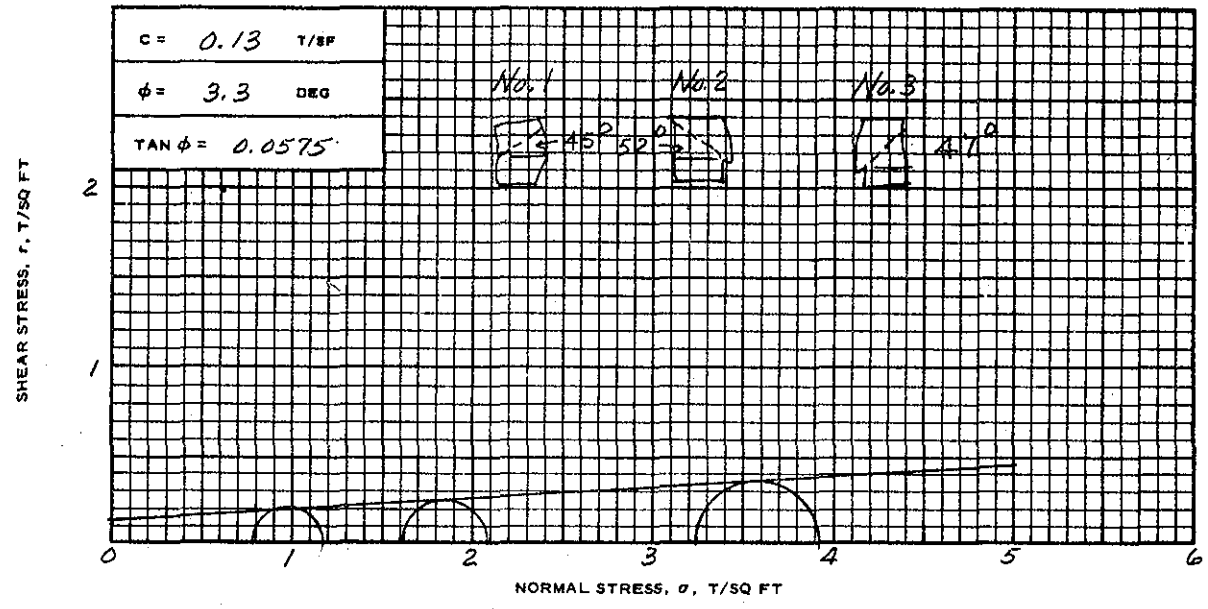
DEPTH/ELEV 24.9'-26.9'

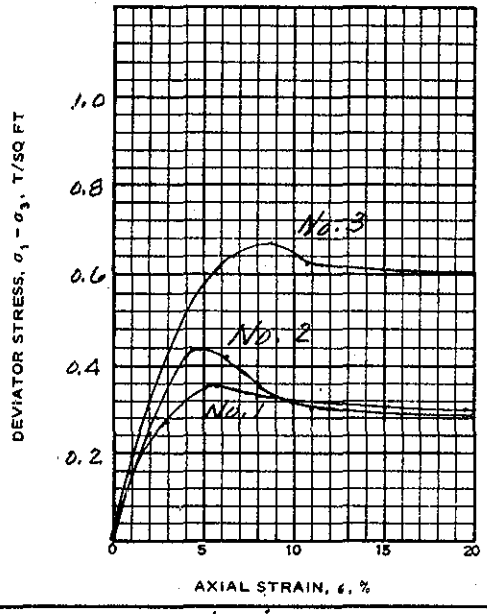
LABORATORY NED | DATE July 1974

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT. (EM 1110-2-1906)

F-4





SPECIMEN NO.			1	2	3	
INITIAL	WATER CONTENT, %	w_o	51.8	51.8	51.8	
	DRY DENSITY LB/ CU FT	γ_{d_o}	71.0	70.4	71.9	
	SATURATION, %	S_o	100	98	100	
	VOID RATIO	e_o	1.451	1.473	1.422	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γ_{d_c}				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.79	1.62	3.24	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.36	0.44	0.67	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	5.5	4.3	8.6	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$	0.31*	0.31*	0.61*	
INITIAL DIAMETER, IN.		D_o	1.42	1.42	1.40	
INITIAL HEIGHT, IN.		H_o	3.27	3.15	3.19	

CONTROLLED- strain TEST

DESCRIPTION OF SPECIMENS Varved CLAY (CH) - Approx. 40% silt and 60% clay - layers in specimen slope to North 5° to 10°

LL	PL	PI	G_s 2.79	TYPE OF SPECIMEN Undisturbed	TYPE OF TEST Q

REMARKS: * stress @ 15% strain.

PROJECT Park River Conduit
Hartford, Conn.

BORING NO. FD-7U SAMPLE NO. UC-4

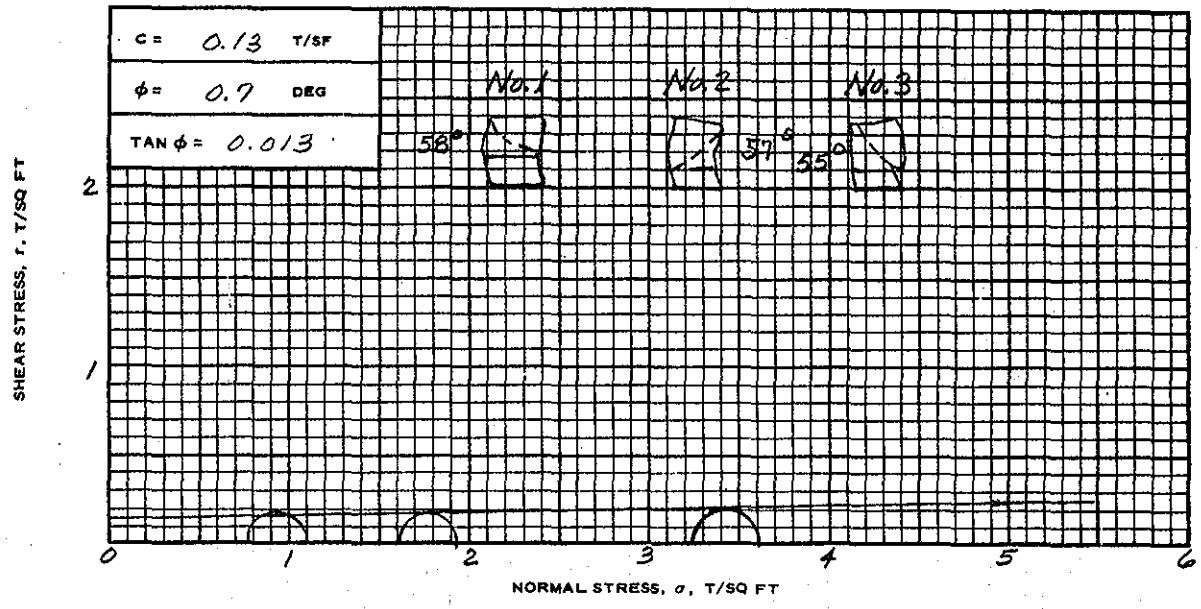
DEPTH/~~ELEV~~ 32.0'-34.0'

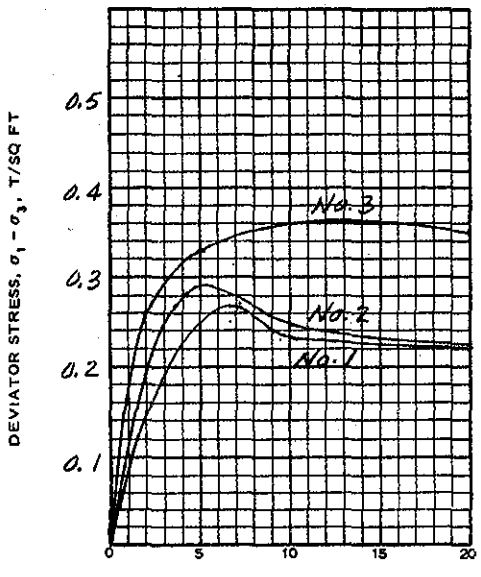
LABORATORY NED DATE July 1974

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

F-5





SPECIMEN NO.			1	2	3	
INITIAL	WATER CONTENT, %	w_o	49.6	49.6	48.2	
	DRY DENSITY LB/CU FT	γd_o	73.0	70.2	75.5	
	SATURATION, %	S_o	99	93	100	
	VOID RATIO	e_o	1.419	1.515	1.340	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.79	1.62	3.24	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.27	0.29	0.36	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	6.8	4.9	13.8	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$	0.23*	0.23*	0.35*	
INITIAL DIAMETER, IN.		D_o	1.41	1.43	1.45	
INITIAL HEIGHT, IN.		H_o	3.11	3.27	3.19	

CONTROLLED- strain TEST

DESCRIPTION OF SPECIMENS Varved CLAY and SILT: – Approx. 35% Clay (CH) & 65% SILT (ML) in specimen. – layers slope about 5° to south

LL	PL	PI	Gs 2.83	TYPE OF SPECIMEN Undisturbed	TYPE OF TEST Q

REMARKS: * Stress @ 15% strain

PROJECT Park River Conduit
Hartford, Conn.

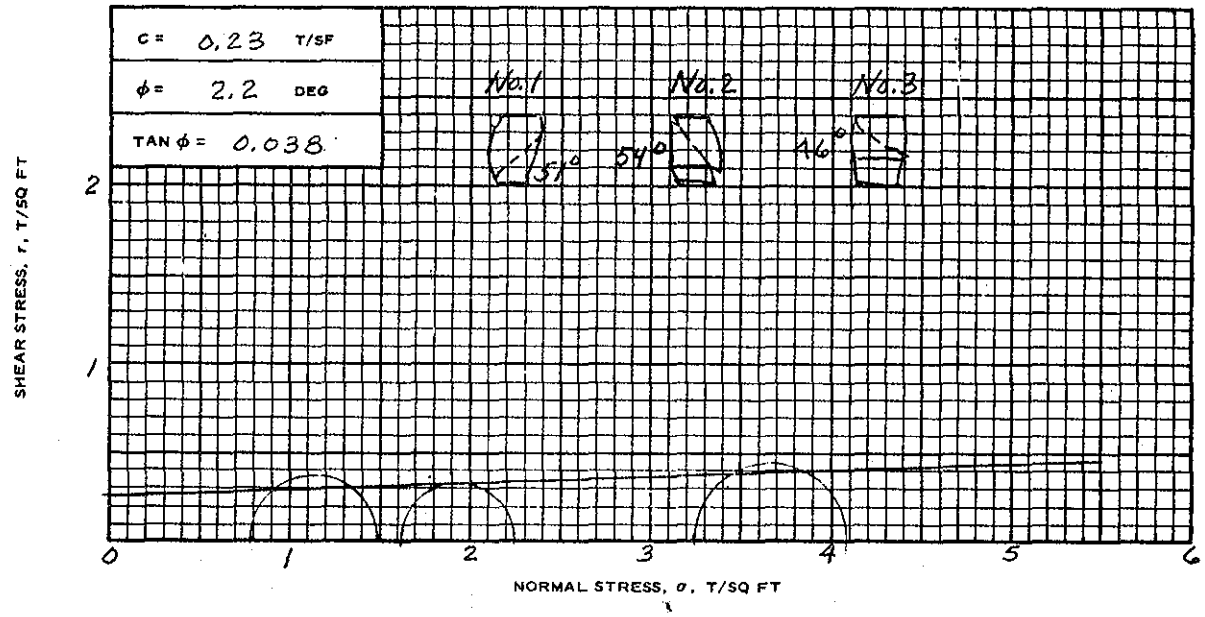
BORING NO. FD-7U SAMPLE NO. UC-6

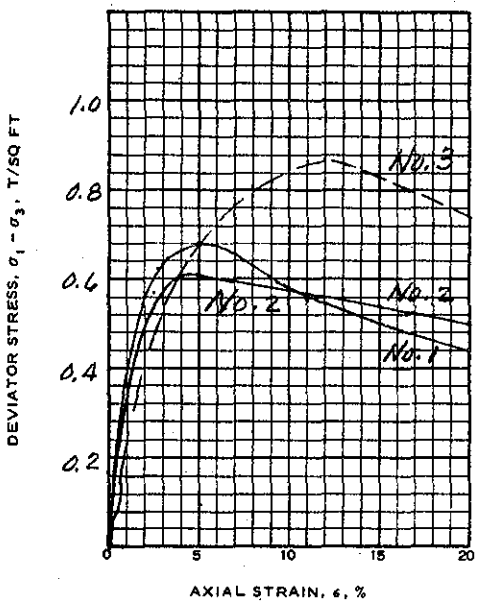
DEPTH/ELEV 42.0'-44.0'

LABORATORY NED DATE July 1974

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)





SPECIMEN NO.			1	2	3	
INITIAL	WATER CONTENT, %	w_o	58.3	47.8	44.9	
	DRY DENSITY LB/ CU FT	γ_{d_o}	69.2	73.0	76.2	
	SATURATION, %	S_o	100	96	97	
	VOID RATIO	e_o	1.524	1.395	1.293	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γ_{d_c}				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.79	1.62	3.24	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.68	0.61	0.87	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	4.9	4.9	12.3	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$	0.51*	0.54*	0.83*	
INITIAL DIAMETER, IN.		D_o	1.41	1.41	1.43	
INITIAL HEIGHT, IN.		H_o	3.19	3.15	3.27	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Varved SILT (ML) & CLAY (CH): - Approx. 45% silt and 55% clay. - All layers horizontal

LL	PL	PI	Gs 2.80	TYPE OF SPECIMEN Undisturbed	TYPE OF TEST Q

REMARKS: * Stress @ 15% strain

PROJECT Park River Conduit Hartford, Conn.

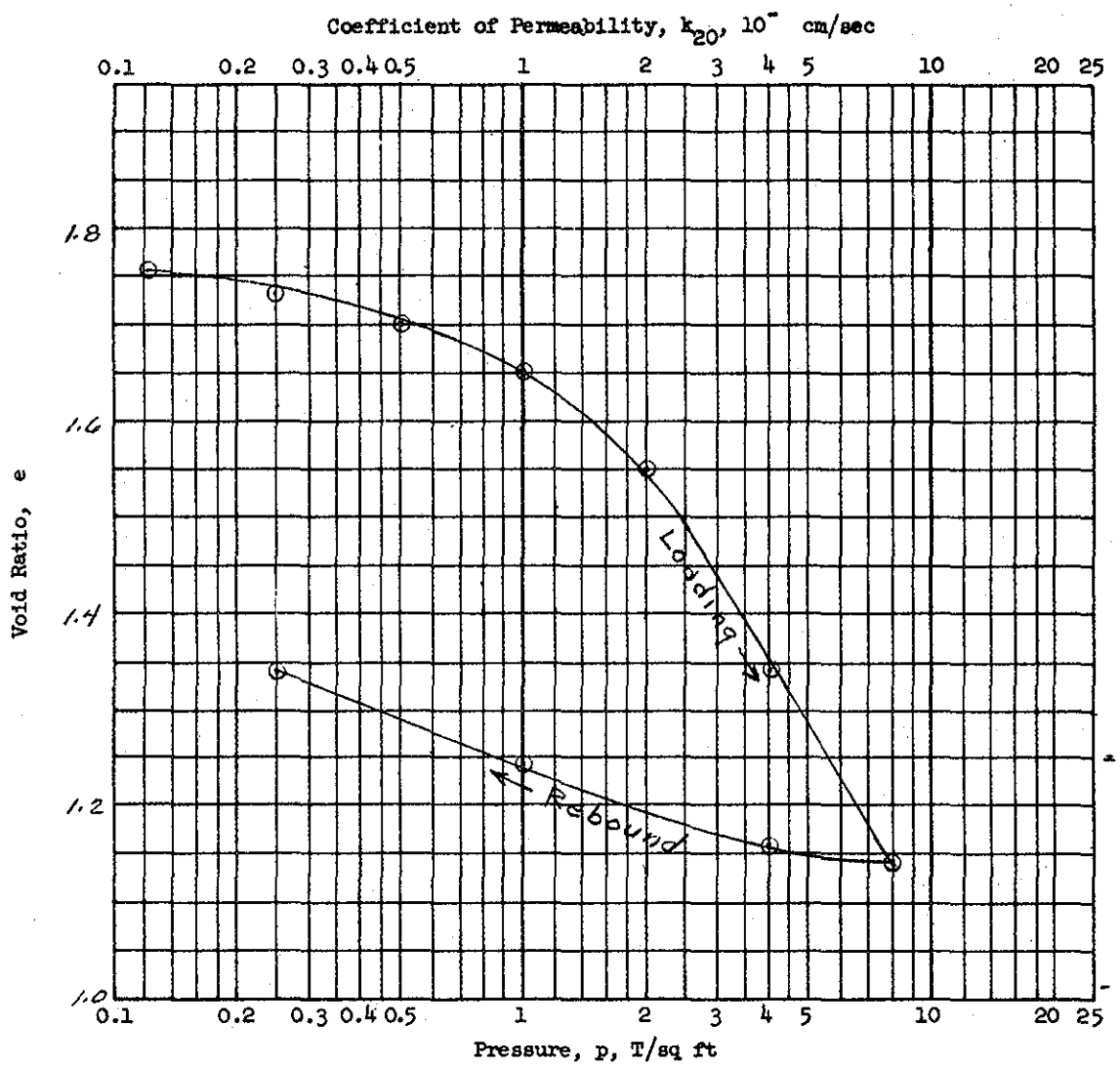
BORING NO. FD-76 SAMPLE NO. UC-9

DEPTH/~~ELEV~~ 52.0' - 54.0'

LABORATORY NED DATE July 1974

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)



Type of Specimen *Undisturbed*		Before Test		After Test	
Diam *4.43* in.	Ht *1.0* in.	Water Content, w_o	*63.6* %	w_f	*57.0* %
Overburden Pressure, p_o	T/sq ft	Void Ratio, e_o	*1.778*	e_f	*1.474*
Preconsol. Pressure, p_c	T/sq ft	Saturation, S_o	*100* %	S_f	*100* %
Compression Index, C_c *0.70*		Dry Density, γ_d	*62.7* lb/ft^3		
Classification *Varved CLAY (CH)*		k_{20} at e_o =	$\times 10^{-}$ cm/sec		

LL	G_s *2.79*
PL	D_{10}

Project *Park River Conduit*	
Hartford, Conn.	
Area	
Boring No. *FD-7U*	Sample No. *UC-2*
Depth El *22.19'-24.24'*	Date *May 1974*

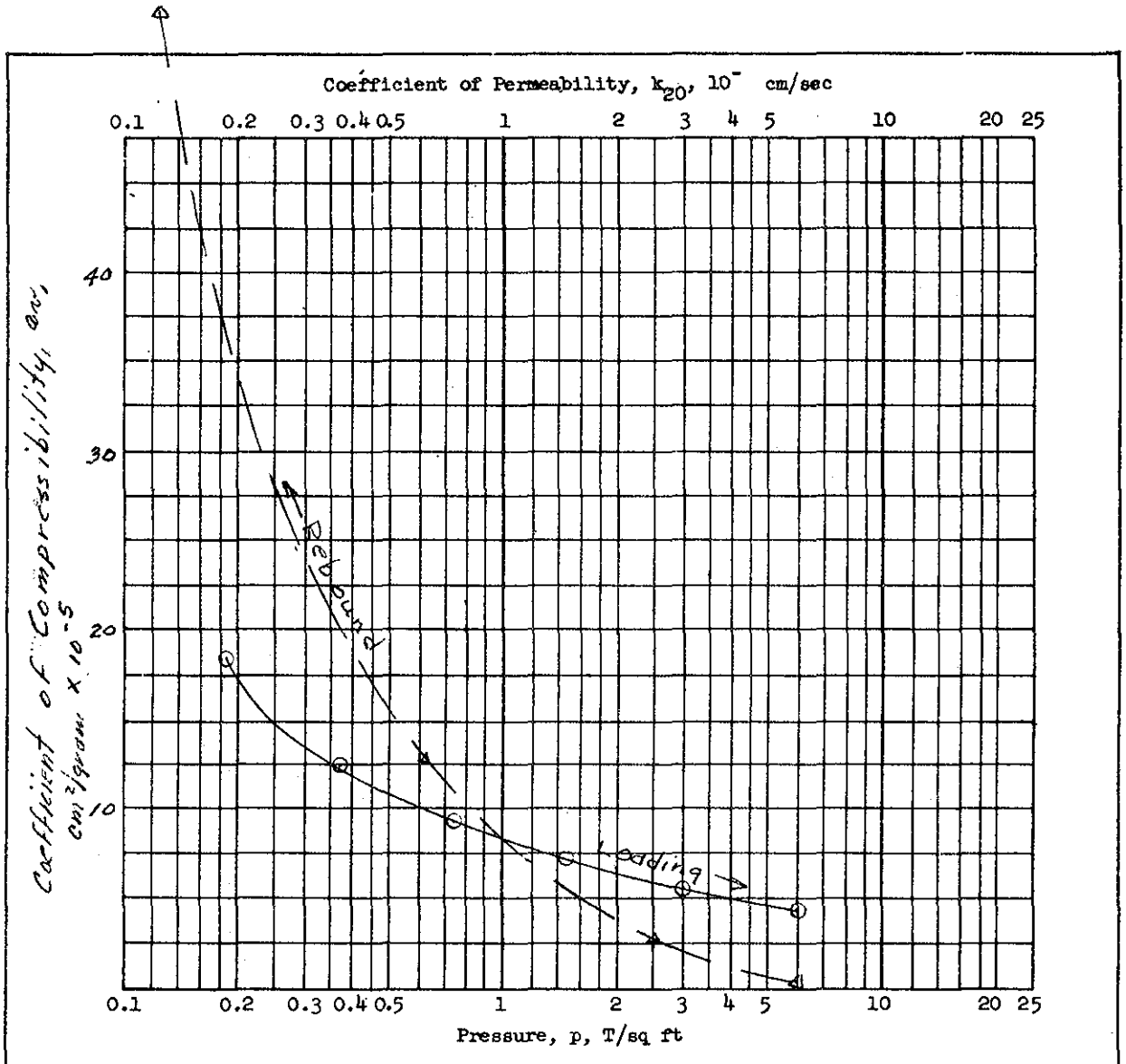
Remarks *70 TO 80 % OF VARVES ARE CLAY. HORIZ. VARVES.*

CONSOLIDATION TEST REPORT

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE.

Sheet 1 of 8

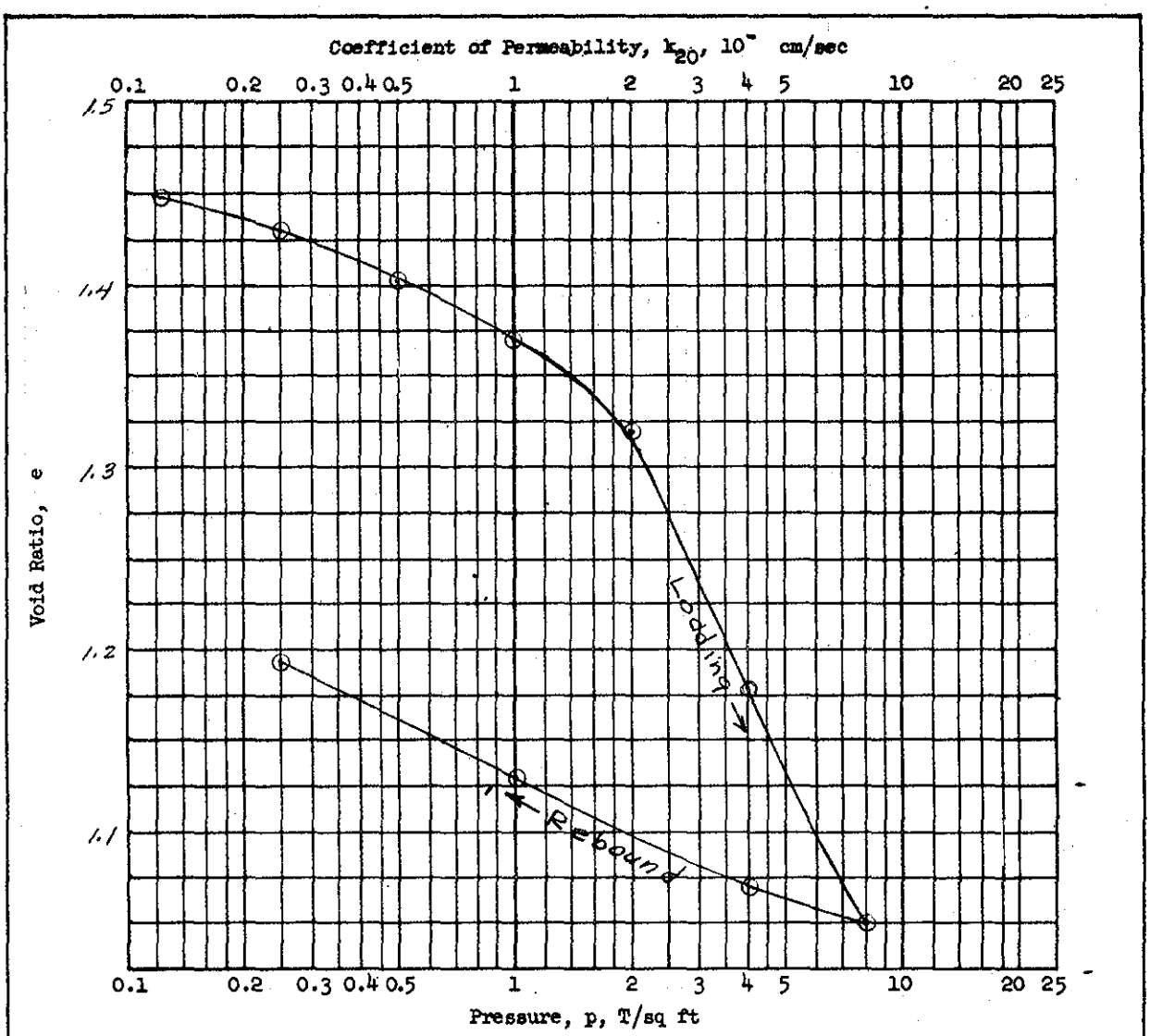
F-8



Type of Specimen *Undisturbed*		Before Test		After Test	
Diam *4.43* in.	Ht *1.0* in.	Water Content, w_o	*63.6* %	w_f	*57.0* %
Overburden Pressure, p_o	T/sq ft	Void Ratio, e_o	*1.778*	e_f	*1.474*
Preconsol. Pressure, p_c	T/sq ft	Saturation, S_o	*100* %	S_f	*100* %
Compression Index, C_c *0.70*		Dry Density, γ_d	*62.7* lb/ft³		
Classification *Varved CLAY (CH)*		k_{20} at e_o =	x 10^{-} cm/sec		
LL	G_s *2.79*	Project *Park River Conduit*			
PL	D_{10}	*Hartford, Conn.*			
Remarks *70 TO 80% OF*		Area			
VARVES ARE CLAY. HORIZ.		Boring No. *FD-74*		Sample No. *UC-2*	
VARVES.		Depth El *22.19' - 24.24'*		Date *May 1974*	
		CONSOLIDATION TEST REPORT			

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE.

Sheet 2 of 8



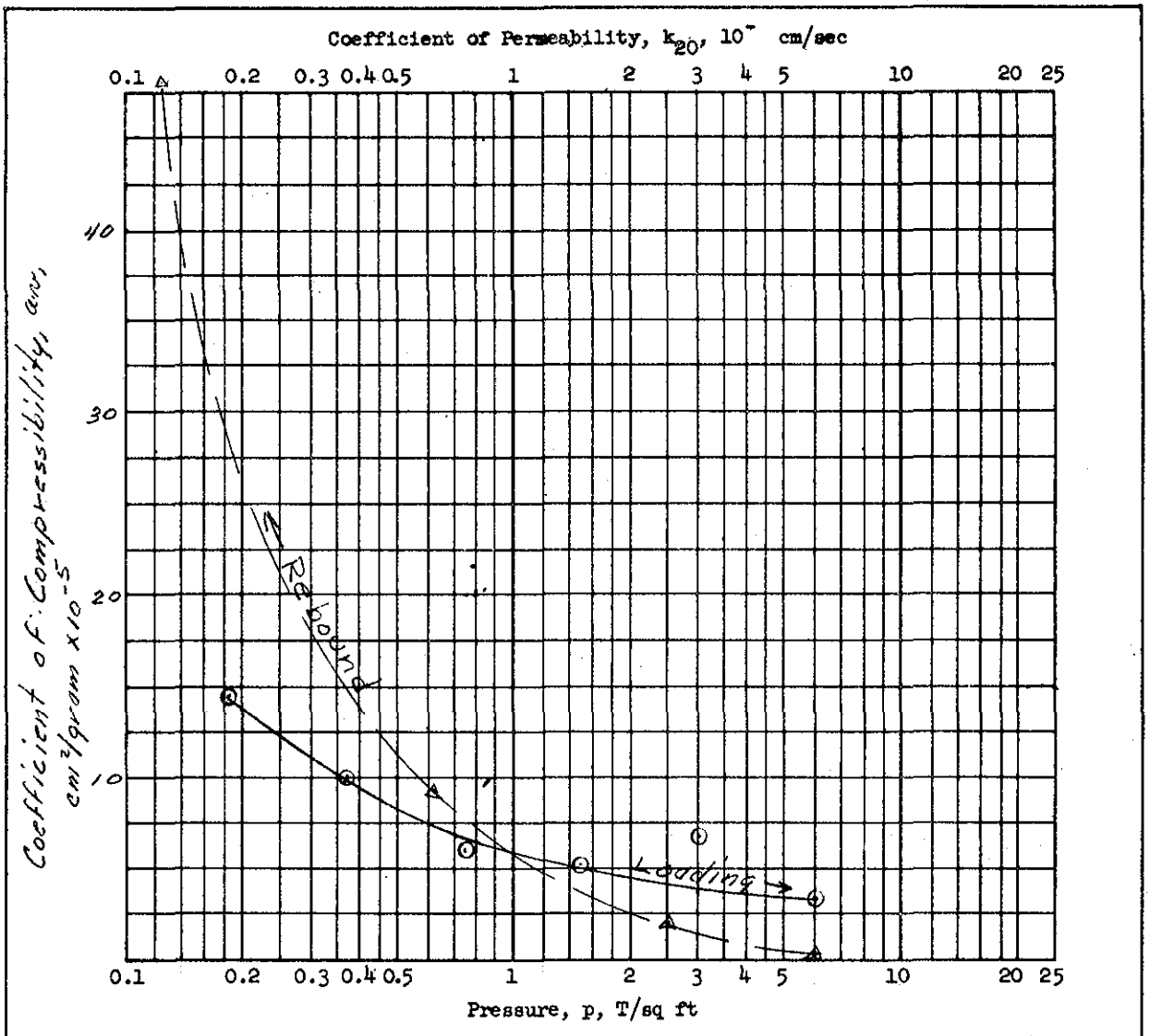
Type of Specimen *Undisturbed*		Before Test		After Test	
Diam *4.43* in.	Ht *1.0* in.	Water Content, w_o	*52.6* %	w_f	*42.7* %
Overburden Pressure, p_o	T/sq ft	Void Ratio, e_o	*1.469*	e_f	*1.313*
Preconsol. Pressure, p_c	T/sq ft	Saturation, S_o	*100* %	S_f	*100* %
Compression Index, C_c *0.47*		Dry Density, γ_d	*70.6* lb/ft^3		
Classification *Varved CLAY (CH)*		k_{20} at e_o =	$\times 10^{-}$ cm/sec		
LL	G_s *2.79*	Project *Park River Conduit*			
PL	D_{10}	*Hartford, Conn.*			
Remarks *50 TO 60% OF VARVES*		Area			
ARE CLAY DIPPING 30° SOUTH.		Boring No. *FD-74*		Sample No. *UC-5*	
		Depth El *34.98'-36.96'*		Date *May 1974*	

CONSOLIDATION TEST REPORT

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE. *(TRANSLUCENT)* 0 3424

sheet 1 of 9

F-10



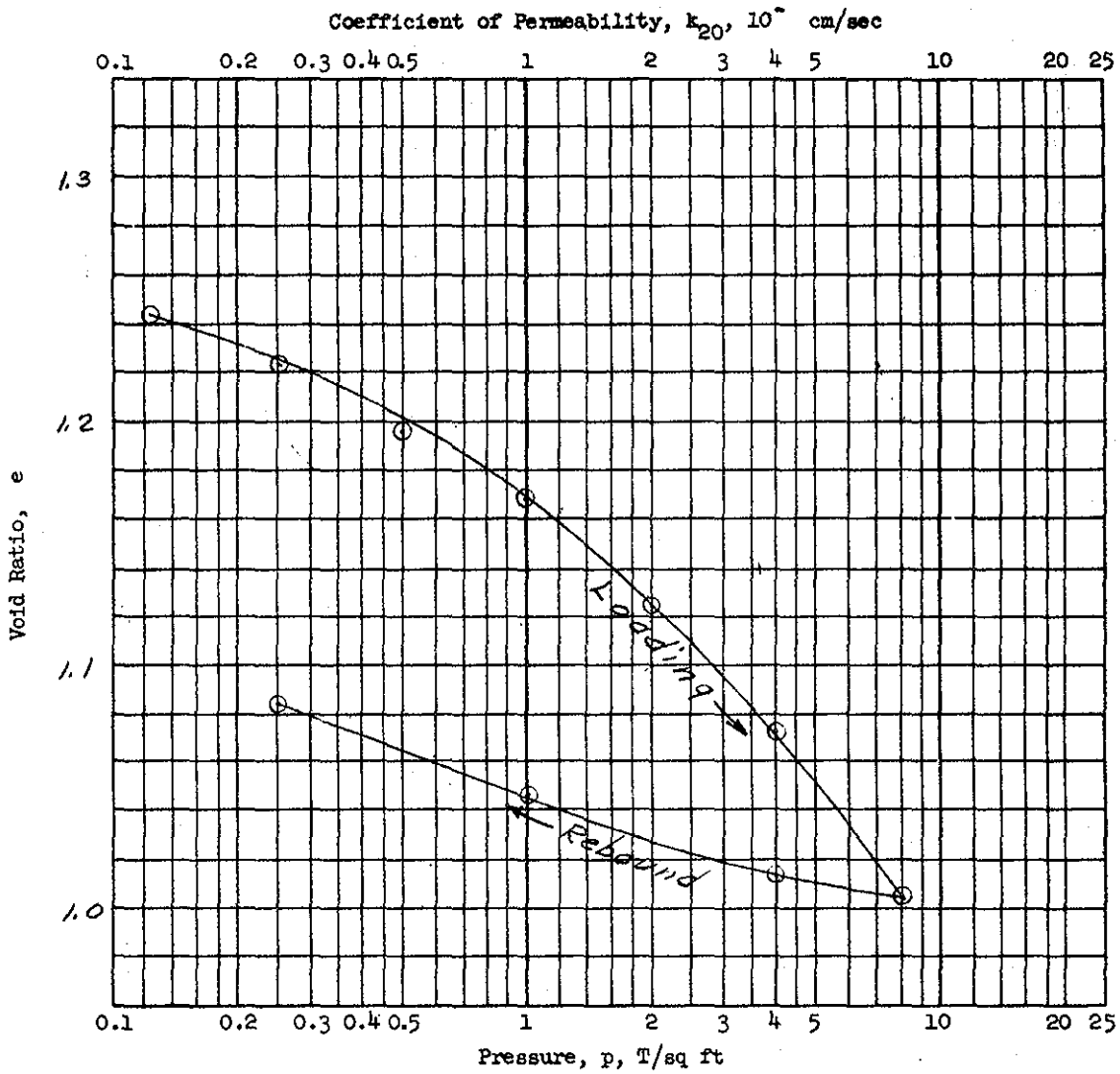
Type of Specimen *Undisturbed*		Before Test		After Test	
Diam *4.43* in.	Ht *1.0* in.	Water Content, w_o	*52.6* %	w_f	*47.7* %
Overburden Pressure, p_o	T/sq ft	Void Ratio, e_o	*1.469*	e_f	*1.313*
Preconsol. Pressure, p_c	T/sq ft	Saturation, S_o	*100* %	S_f	*100* %
Compression Index, C_c *0.42*		Dry Density, γ_d	*70.6* lb/ft³		
Classification *Varved CLAY (CH)*		k_{20} at e_o =	x 10^{-} cm/sec		
LL	G_s *2.79*	Project *Park River Conduit*			
PL	D_{10}	*Hartford, Conn.*			
Remarks *50 TO 60% OF VARVES*		Area			
ARE CLAY DIPPING 30° SOUTH.		Boring No. *FD-7U*		Sample No. *UC-5*	
		Depth El *34.98'-36.96'*		Date *May 1974*	

CONSOLIDATION TEST REPORT

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE. *(TRANSLUCENT)* G 3424

Sheet 2 of 9

F-11

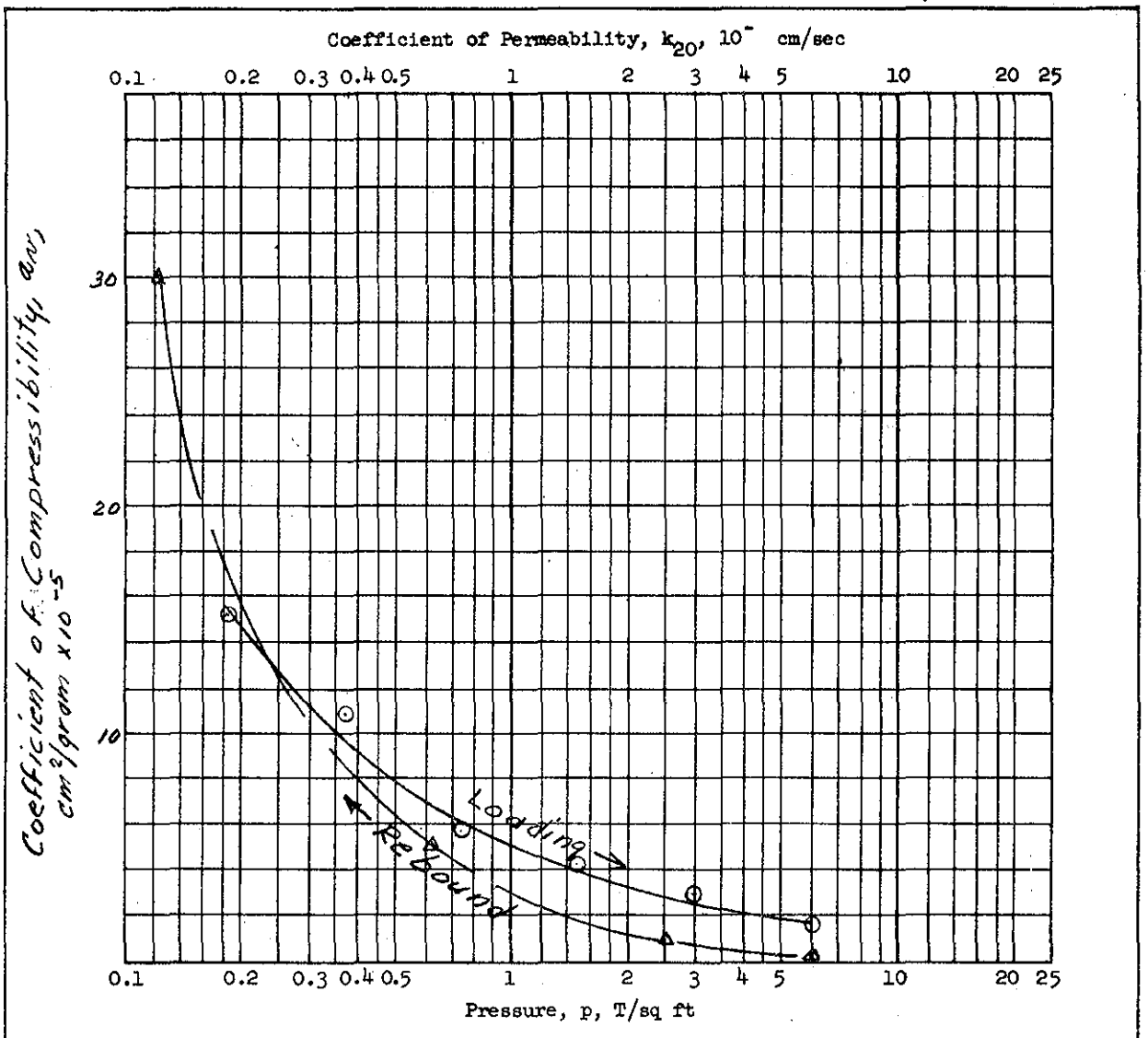


Type of Specimen *Undisturbed*		Before Test		After Test	
Diam *4.43* in.	Ht *1.0* in.	Water Content, w_o	*44.8* %	w_f	*39.4* %
Overburden Pressure, p_o	T/sq ft	Void Ratio, e_o	*1.273*	e_f	*1.161*
Preconsol. Pressure, p_c	T/sq ft	Saturation, S_o	*100* %	S_f	*96.5* %
Compression Index, C_c *0.22*		Dry Density, γ_d	*78.1* lb/ft^3		
Classification *Varved CLAY(CH)**		k_{20} at e_o =	$\times 10^{-}$ cm/sec		
LL	G_s *2.79*	Project *Park River Conduit*			
PL	D_{10}	*Hartford, Conn.*			
Remarks * *Approximately*		Area			
45% silt & 55% clay		Boring No. *FD-74*		Sample No. *UC-8*	
in specimen		Depth ~~Elt~~ *46.5' - 48.5'*		Date *July 1974*	
		CONSOLIDATION TEST REPORT			

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

Sheet 1 of 6

F-12



Type of Specimen *Undisturbed*		Before Test		After Test	
Diam *4.43* in.	Ht *1.0* in.	Water Content, w_o	*44.8* %	w_f	*39.4* %
Overburden Pressure, p_o	T/sq ft	Void Ratio, e_o	*1.273*	e_f	*1.161*
Preconsol. Pressure, p_c	T/sq ft	Saturation, S_o	*100* %	S_f	*96.5* %
Compression Index, C_c *0.22*		Dry Density, γ_d	*78.1* lb/ft³		
Classification *Varved CLAY (CH)**		k_{20} at e_o =	× 10^{-} cm/sec		
LL	G_s *2.79*	Project *Park River Conduit*			
PL	D_{10}	*Hartford, Conn.*			
Remarks * *Approximately*		Area			
45% silt & 55% clay		Boring No. *FD-7U*		Sample No. *UC-8*	
in specimen.		Depth *46.5' - 48.5'*		Date *July 1974*	

CONSOLIDATION TEST REPORT

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

Sheet 2 of 6

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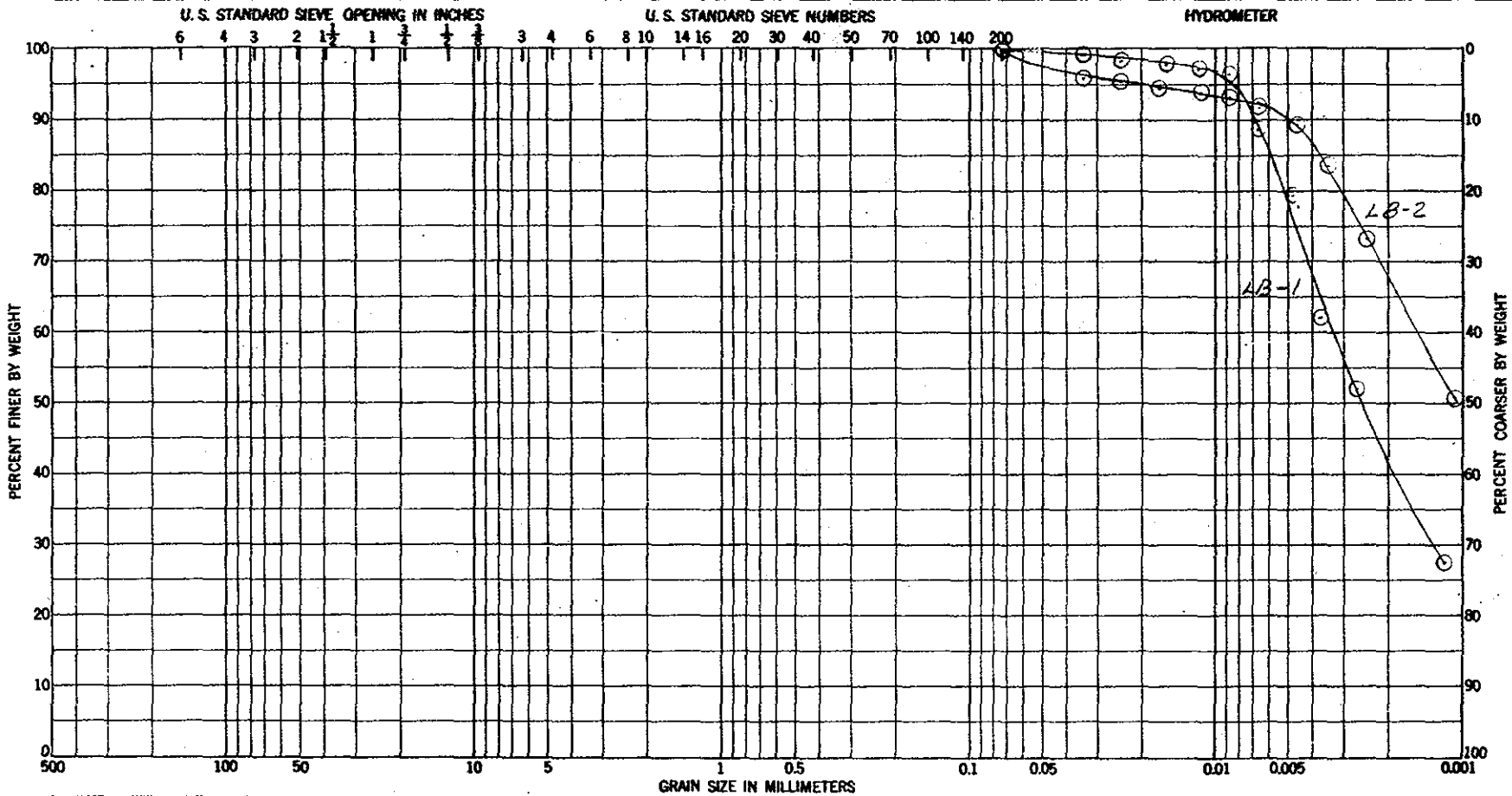


COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev or Depth	Classification	Nat-w-%	LL	PL	PI
UC-3; LB-1	26.6'-28.6'	SILT (ML)	G=2.73	43	27	16
UC-3; LB-2	26.6'-28.6'	CLAY (CH)	G=2.76	56	26	30

Project: Park River, Hartford, Conn.

Area:

Boring No.: FD-96; UC-3

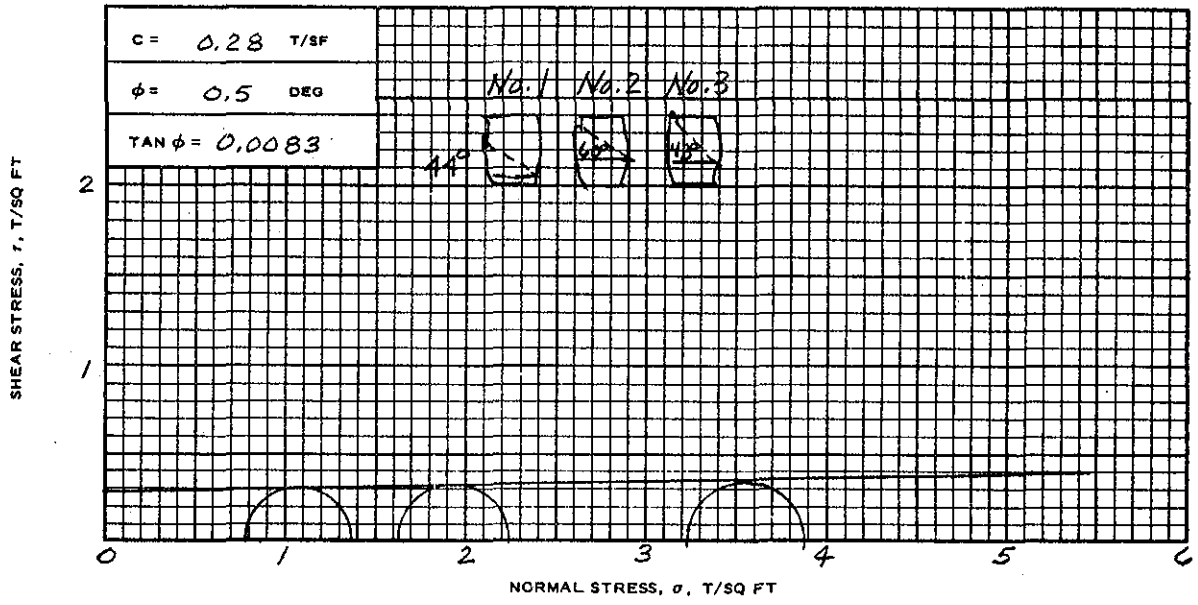
Date: November 1974

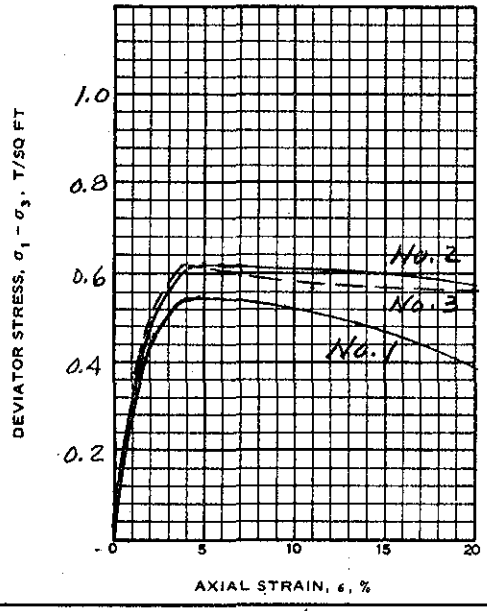
GRADATION CURVES

ENG FORM 1 MAY 63 2087

T-4

C = 0.28 T/SF	
ϕ = 0.5 DEG	
TAN ϕ = 0.0083	





SPECIMEN NO.			1	2	3	
INITIAL	WATER CONTENT, %	w_o	58.5	58.5	58.4	
	DRY DENSITY LB/ CU FT	γ_{d_o}	66.9	65.0	65.5	
	SATURATION, %	S_o	100	97	98	
	VOID RATIO	e_o	1.613	1.690	1.670	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γ_{d_c}				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.79	1.62	3.24	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.55	0.62	0.62	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	4.9	4.9	3.7	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$	0.47*	0.60*	0.57*	
INITIAL DIAMETER, IN.		D_o	1.40	1.41	1.43	
INITIAL HEIGHT, IN.		H_o	3.31	3.19	3.11	

CONTROLLED- strain TEST

DESCRIPTION OF SPECIMENS Layers of SILT (ML) and CLAY (CH): approx. 50% of each material. - All layers horizontal

LL	PL	PI	Gs 2.80	TYPE OF SPECIMEN Undisturbed	TYPE OF TEST Q

REMARKS: * stress @ 15% strain.

PROJECT Park River Conduit Hartford, Conn.

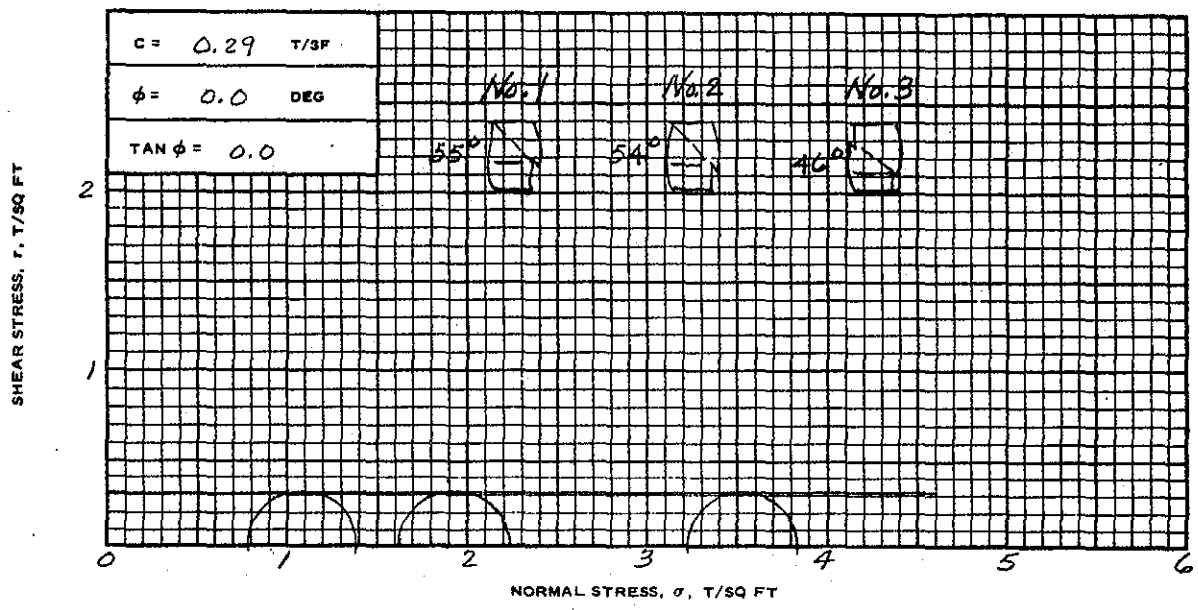
BORING NO. FD-9U SAMPLE NO. UC-1

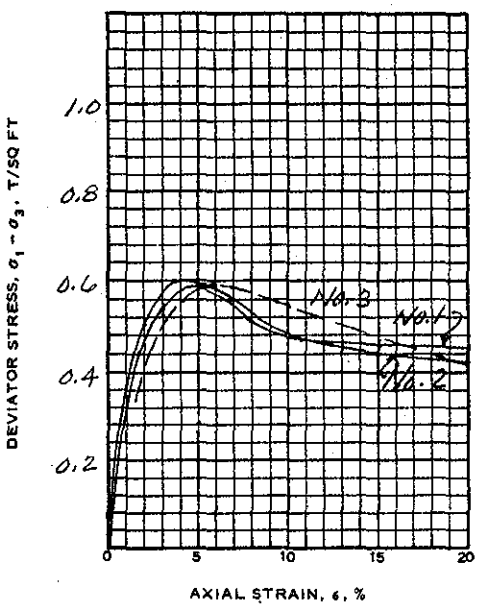
DEPTH/~~ELEV~~ 22.5' - 24.5'

LABORATORY NED DATE July 1974

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)





SPECIMEN NO.			1	2	3	
INITIAL	WATER CONTENT, %	w_o	60.4	60.4	60.5	
	DRY DENSITY LB/ CU FT	γd_o	65.3	64.6	66.0	
	SATURATION, %	S_o	100	99	100	
	VOID RATIO	e_o	1.675	1.704	1.649	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.79	1.62	3.24	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.59	0.60	0.59	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	4.9	3.7	6.2	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$	0.46*	0.44*	0.47*	
INITIAL DIAMETER, IN.		D_o	1.41	1.43	1.43	
INITIAL HEIGHT, IN.		H_o	3.23	3.27	3.31	

CONTROLLED- strain TEST

DESCRIPTION OF SPECIMENS Layers of SILT(ML) and CLAY(CH): approx. 50% of each material.- All layers horizontal

LL | PL | PI | Gs 2.80 | TYPE OF SPECIMEN Undisturbed | TYPE OF TEST Q

REMARKS: * stress @ 15% strain.

PROJECT Park River Conduit
Hartford, Conn.

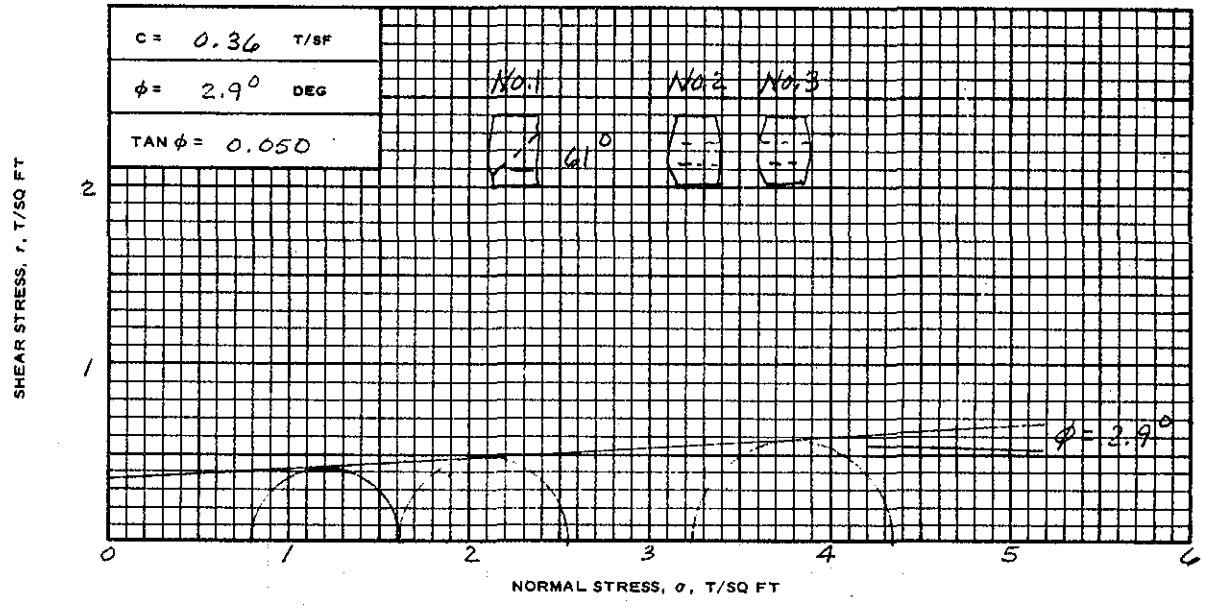
BORING NO. FD-9U | SAMPLE NO. UC-3

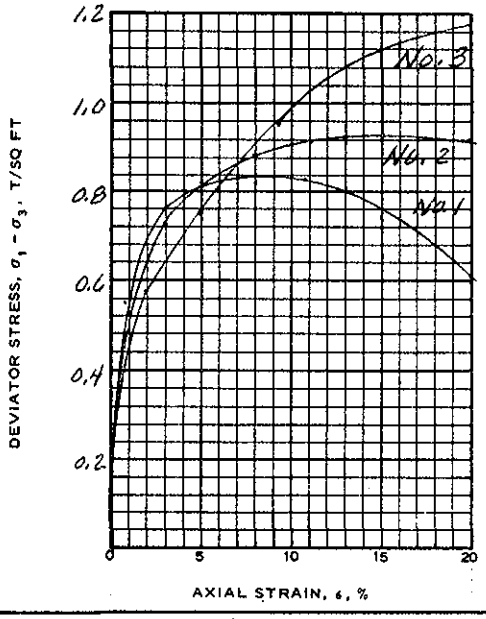
DEPTH/~~ELEV~~ 26.6'- 28.6'

LABORATORY NED | DATE July 1974

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)





SPECIMEN NO.			1	2	3	
INITIAL	WATER CONTENT, %	w_o	35.0	35.0	36.7	
	DRY DENSITY LB/ CU FT	γ_{d_o}	89.1	85.9	87.6	
	SATURATION, %	S_o	100	95	100	
	VOID RATIO	e_o	0.961	1.034	0.994	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γ_{d_c}				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.79	1.62	3.24	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.83	0.93*	1.12*	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	11	15	15	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$	0.75*	—	—	
INITIAL DIAMETER, IN.		D_o	1.39	1.39	1.39	
INITIAL HEIGHT, IN.		H_o	3.27	3.23	3.27	

CONTROLLED- strain TEST

DESCRIPTION OF SPECIMENS Varved layers of SILT (ML) and CLAY (CH); approximately 50% of each material; all layers horizontal

LL	PL	PI	Gs 2.80	TYPE OF SPECIMEN Undisturbed	TYPE OF TEST Q

REMARKS: * stress @ 15% axial strain.

PROJECT Park River Conduit, Hartford, Conn.

BORING NO. FD-94 SAMPLE NO. UC-5

DEPTH/~~ELEV~~ 38.0'- 40.0'

LABORATORY NED DATE Sept. 1974

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

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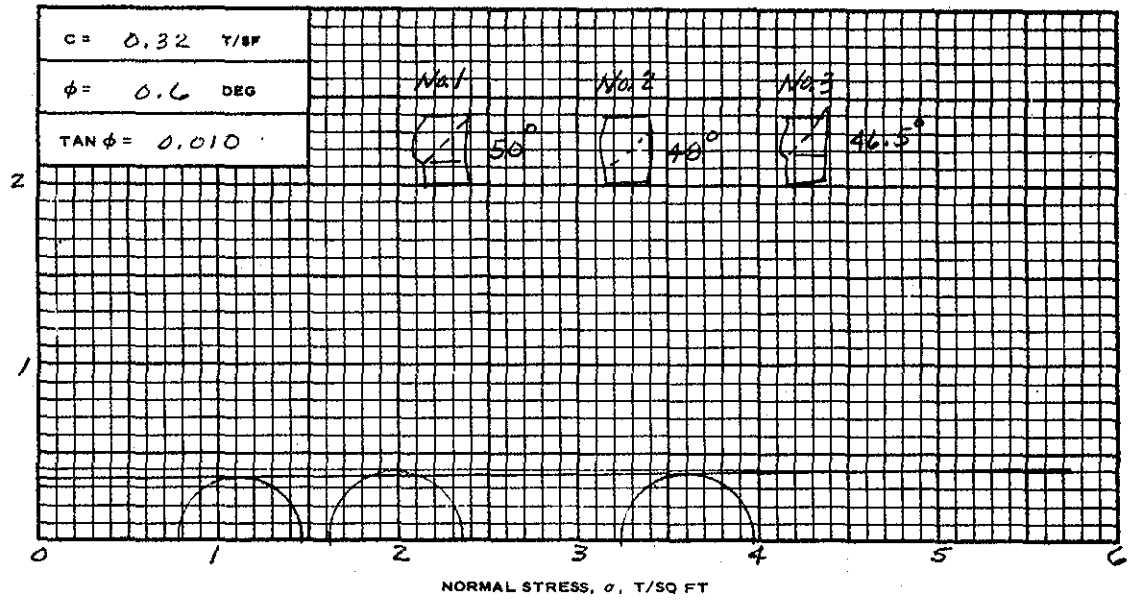
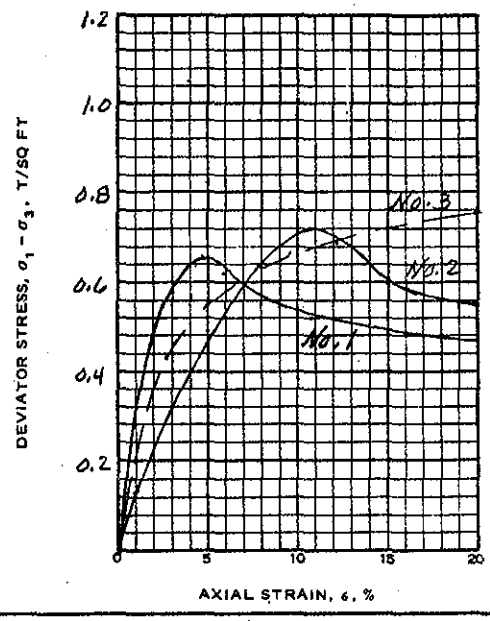
C =	0.32 T/SF
ϕ =	0.6 DEG
TAN ϕ =	0.010





SPECIMEN NO.			1	2	3	
INITIAL	WATER CONTENT, %	w_o	48.5	51.3	49.9	
	DRY DENSITY LB/ CU FT	γd_o	78.0	79.8	75.3	
	SATURATION, %	S_o	100	100	100	
	VOID RATIO	e_o	1.209	1.158	1.286	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.79	1.62	3.24	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.66	0.72	0.72*	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	5	11	15	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$	0.58*	0.60	—	
INITIAL DIAMETER, IN.		D_o	1.35	1.41	1.41	
INITIAL HEIGHT, IN.		H_o	3.27	3.23	3.11	

CONTROLLED- strain TEST

DESCRIPTION OF SPECIMENS Varved layers of SILT (ML) and CLAY (CL); - approximately 55% silt and 45% clay. - All layers horizontal

LL	PL	PI	Gs 2.76	TYPE OF SPECIMEN Undisturbed	TYPE OF TEST Q

REMARKS: *Stress @ 15% axial strain

PROJECT Park River Conduit
Hartford, Conn.

BORING NO. FD-96 SAMPLE NO. UC-7

DEPTH/~~ELEV~~ 50.1 – 52.1

LABORATORY NED DATE Sept. 1974

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

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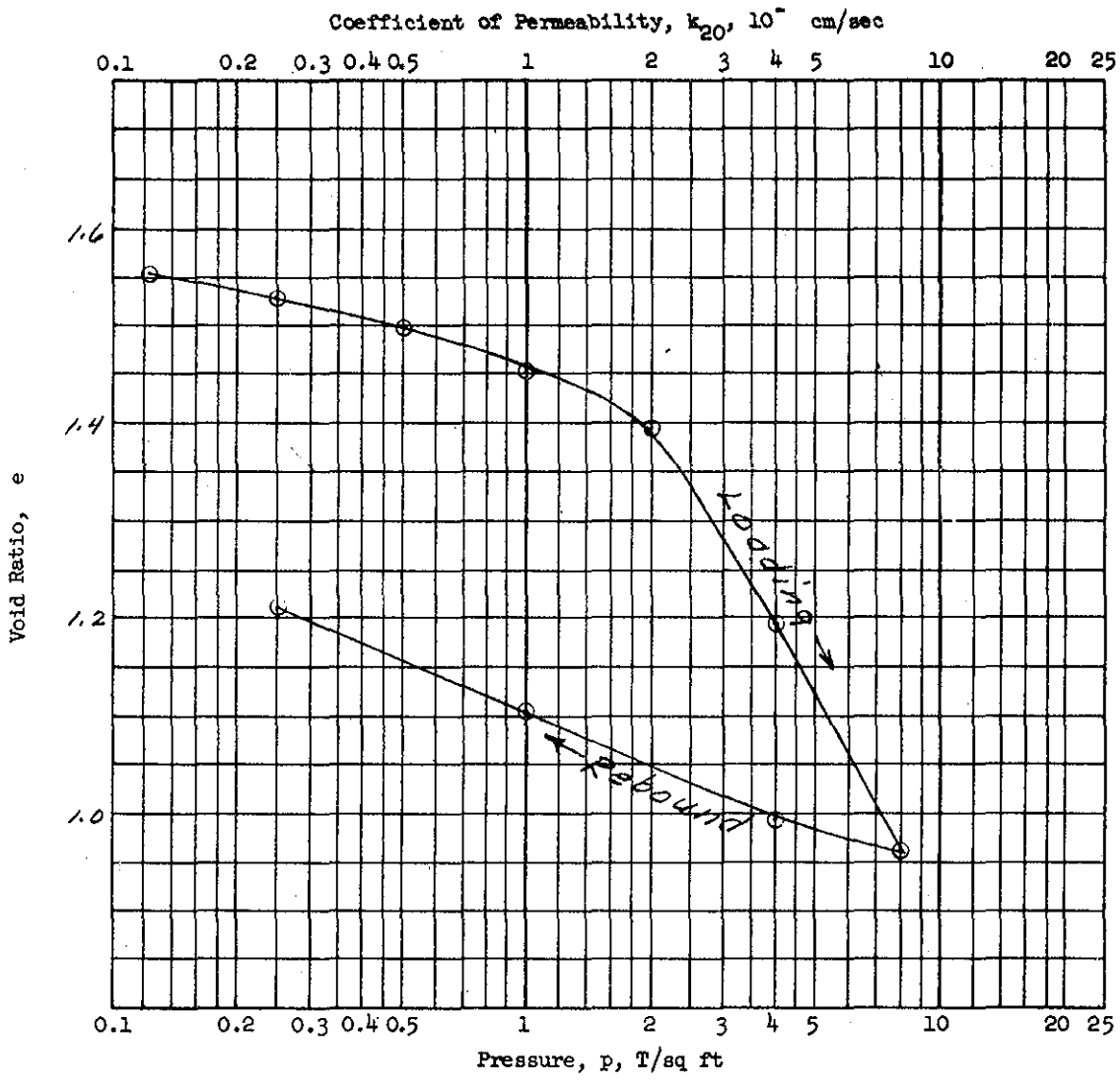

Type of Specimen *Undisturbed*		Before Test		After Test	
Diam *4.43* in.	Ht *1.0* in.	Water Content, w_o	*59.3* %	w_f	*53.0* %
Overburden Pressure, p_o	T/sq ft	Void Ratio, e_o	*1.632*	e_f	*1.385*
Preconsol. Pressure, p_c	T/sq ft	Saturation, S_o	*100* %	S_f	*100* %
Compression Index, C_c *0.75*		Dry Density, γ_d	*66.2* lb/ft^3		
Classification *Varved CLAY (CH)* *		k_{20} at e_o =	$\times 10^{-}$ cm/sec		
LL	G_s *2.81*	Project *Park River Conduit*			
PL	D_{10}	*Hartford, Conn.*			
Remarks * *Approximately*		Area			
65% clay and 35% silt in specimen		Boring No. *FD-9U*		Sample No. *UC-2*	
		Depth *24.4' - 26.4'*		Date *July 1974*	
		CONSOLIDATION TEST REPORT			

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE. *(TRANSLUCENT)*

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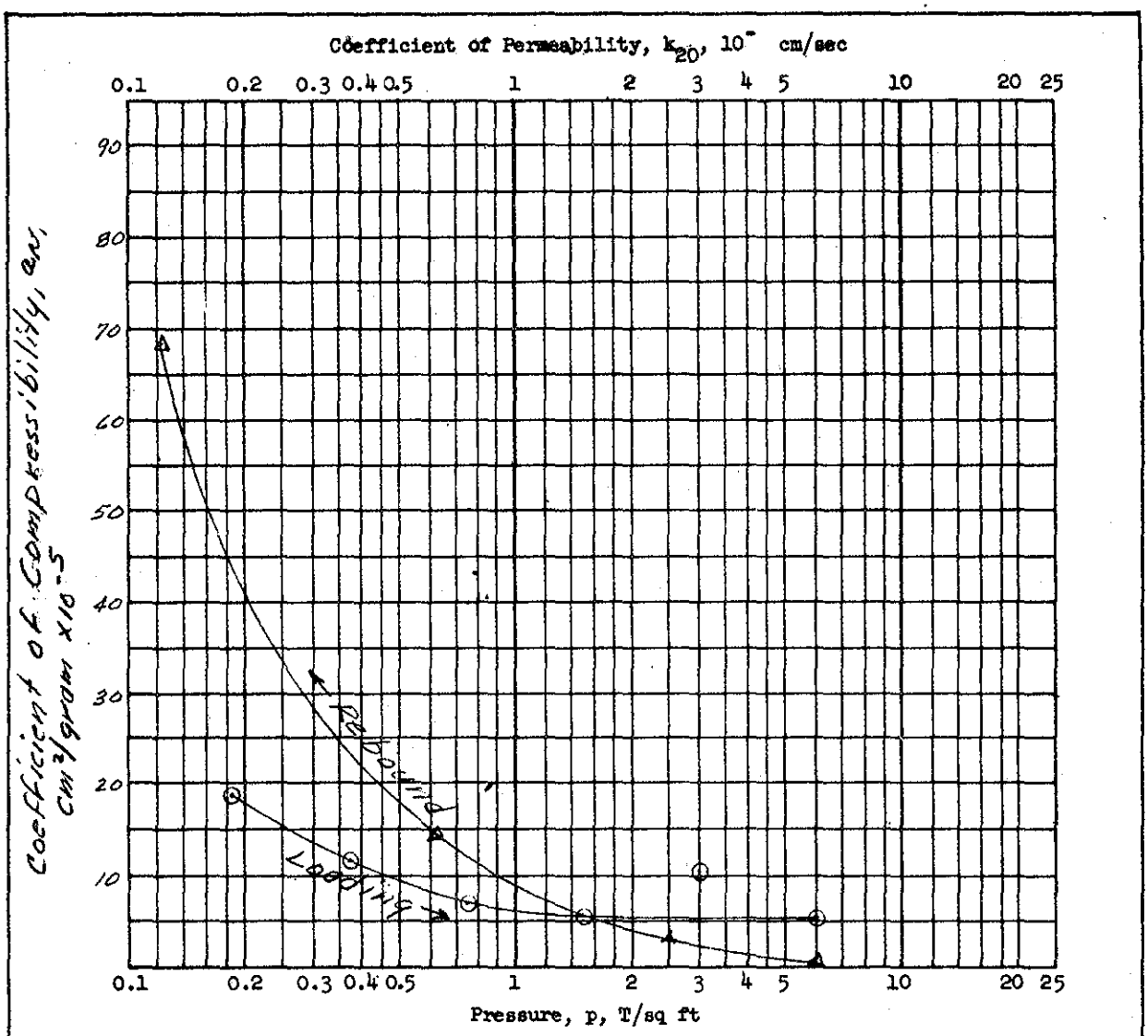
Sheet 1 of 8



Type of Specimen *Undisturbed*		Before Test		After Test	
Diam *4.43* in.	Ht *1.0* in.	Water Content, w_o	*59.3* %	w_f	*53.0* %
Overburden Pressure, p_o	T/sq ft	Void Ratio, e_o	*1.632*	e_f	*1.385*
Preconsol. Pressure, p_c	T/sq ft	Saturation, S_o	*100* %	S_f	*100* %
Compression Index, C_c *0.75*		Dry Density, γ_d	*66.2* lb/ft³		
Classification *Varved CLAY (CH)**		k_{20} at e_o =	× 10^{-} cm/sec		
LL	G_s *2.81*	Project *Park River Conduit*			
PL	D_{10}	*Hartford, Conn.*			
Remarks **Approximately*		Area			
65% clay and 35%		Boring No. *FD-9U*		Sample No. *UC-2*	
silt in specimen		Depth *24.4'-26.4'*		Date *July 1974*	
		CONSOLIDATION TEST REPORT			

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) 0 3424

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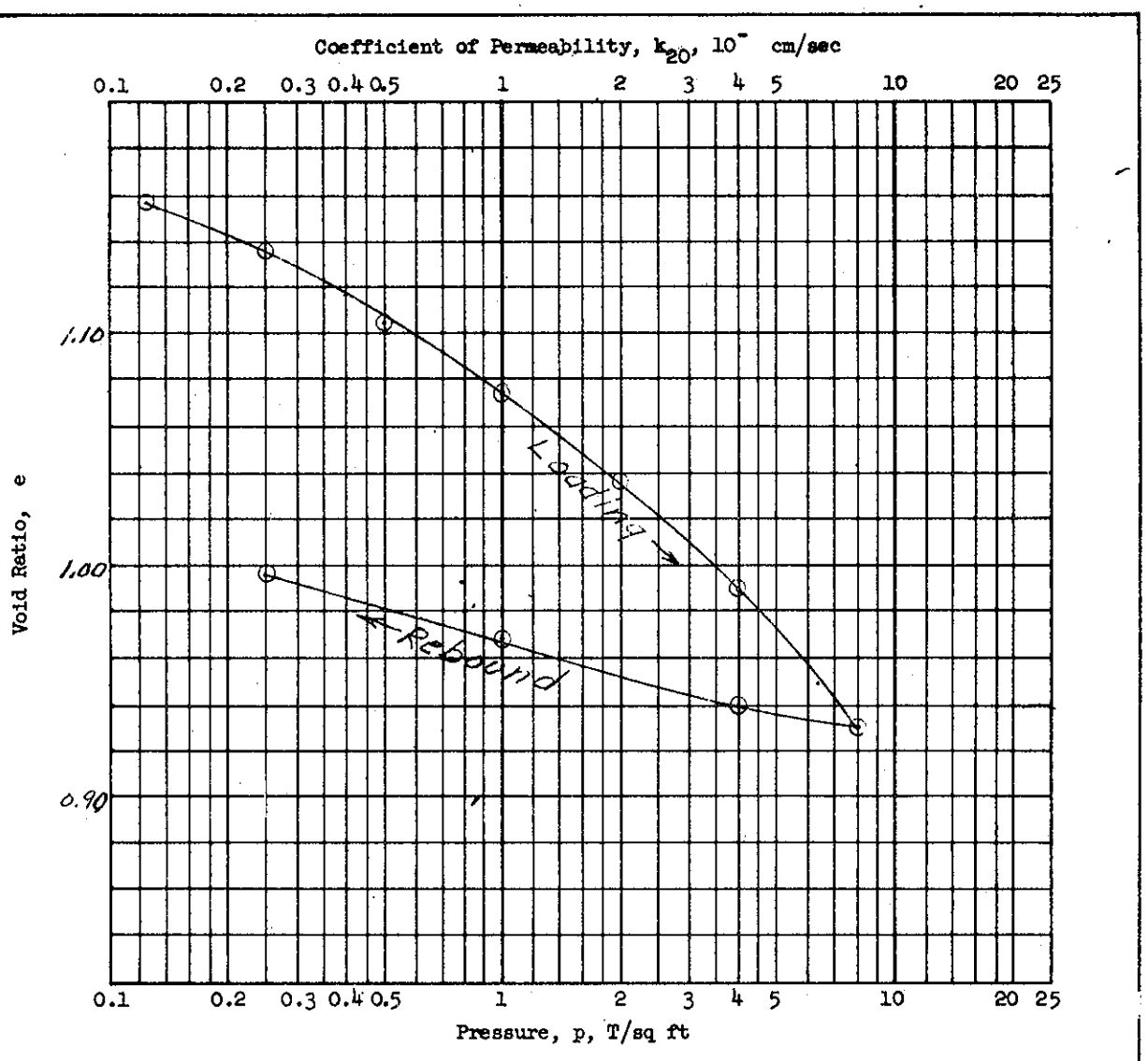
Sheet 2 of 8



Type of Specimen *Undisturbed*		Before Test		After Test	
Diam *4.43* in.	Ht *1.0* in.	Water Content, w_o	*43.7* %	w_f	*36.4* %
Overburden Pressure, p_o	T/sq ft	Void Ratio, e_o	*1.222*	e_f	*1.106*
Preconsol. Pressure, p_c	T/sq ft	Saturation, S_o	*100* %	S_f	*92.4* %
Compression Index, C_c *0.20*		Dry Density, γ_d	*78.6* lb/ft^3		
Classification *clayey SILT (ML)**		k_{20} at e_o =	× 10^{-} cm/sec		
LL	G_s *2.78*	Project *Park River Conduit*			
PL	D_{10}	*Hartford, Conn.*			
Remarks ** Varved; approx. 40% clay and 60% silt in specimen*		Area			
		Boring No. *FD-94*		Sample No. *UC-5*	
		Depth *38.0' - 40.0'*		Date *July 1974*	

CONSOLIDATION TEST REPORT

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) 0 3424

Sheet 1 of 6

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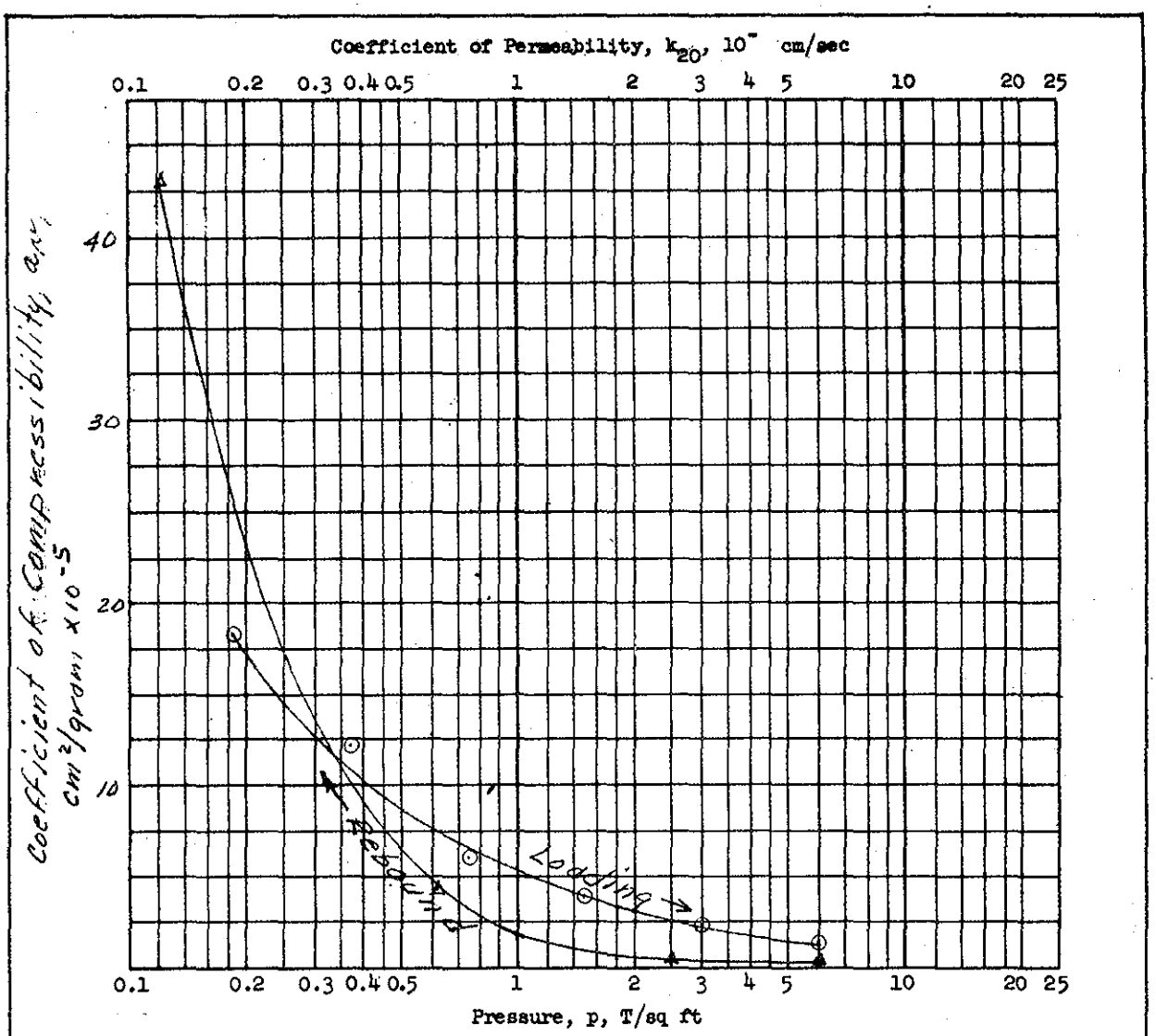

Type of Specimen *Undisturbed*		Before Test		After Test	
Diam *4.43* in.	Ht *1.0* in.	Water Content, w_o	*43.7* %	w_f	*36.4* %
Overburden Pressure, p_o	T/sq ft	Void Ratio, e_o	*1.222*	e_f	*1.106*
Preconsol. Pressure, p_c	T/sq ft	Saturation, S_o	*100* %	S_f	*92.4* %
Compression Index, C_c *0.20*		Dry Density, γ_d	*78.6* lb/ft^3		
Classification *clayey silt (ML)* *		k_{20} at e_o =	$\times 10^{-}$ cm/sec		
LL	G_s *2.78*	Project *Park River Conduit*			
PL	D_{10}	*Hartford, Conn.*			
Remarks * *Varved; approx.*		Area			
40% clay and 60%		Boring No. *FD-94*		Sample No. *UC-5*	
silt in specimen.		Depth *38.0'-40.0'*		Date *July 1974*	
		CONSOLIDATION TEST REPORT			

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE. *(TRANSLUCENT)* 0 3424

sheet 2 of 6

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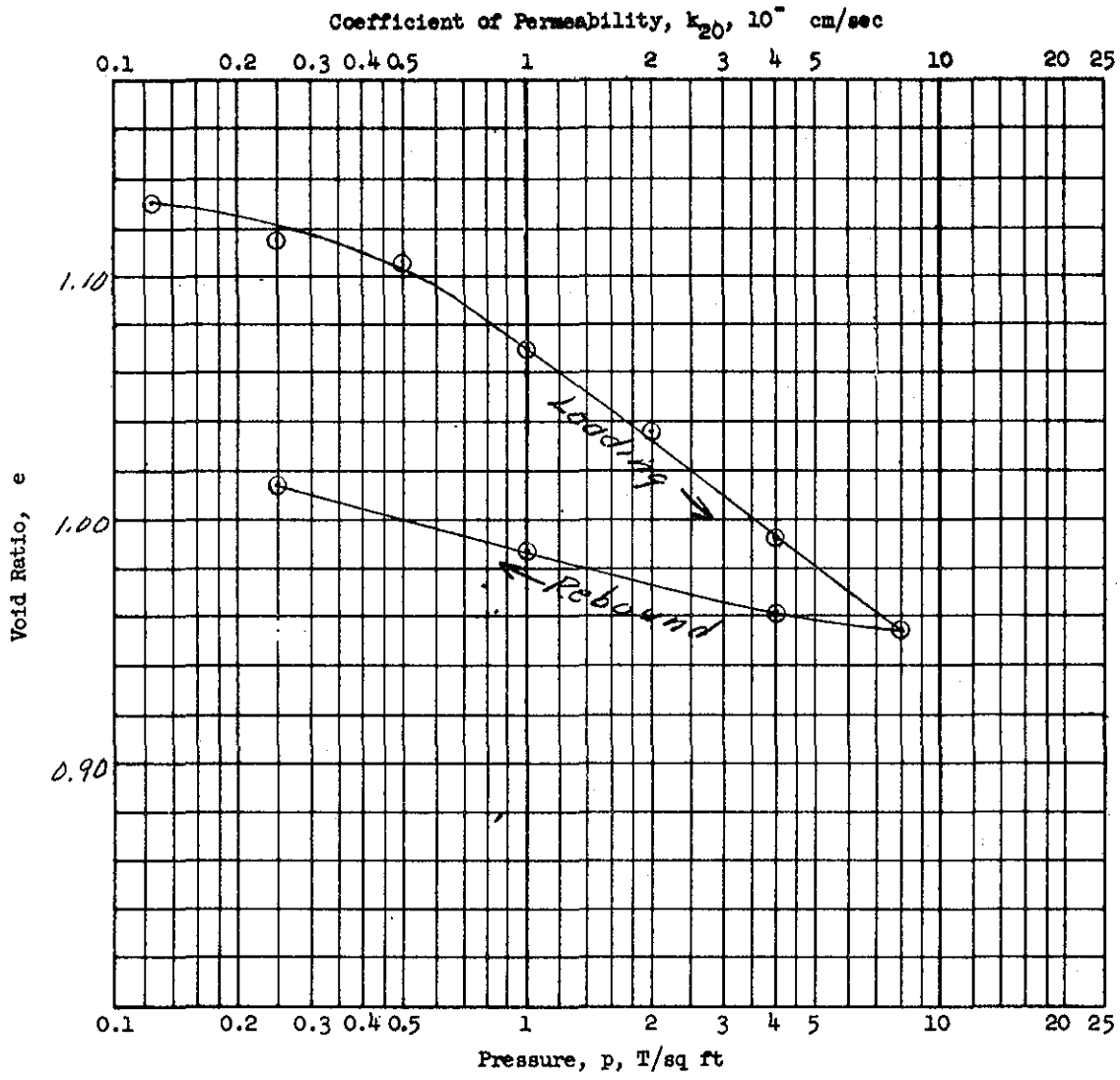

Type of Specimen *Undisturbed*		Before Test		After Test	
Diam *2.50* in.	Ht *1.0* in.	Water Content, w_o	*44.7* %	w_f	*38.4* %
Overburden Pressure, p_o	T/sq ft	Void Ratio, e_o	*1.174*	e_f	*1.062*
Preconsol. Pressure, p_c	T/sq ft	Saturation, S_o	*100* %	S_f	*100* %
Compression Index, C_c *0.13*		Dry Density, γ_d	*79.2* lb/ft^3		
Classification *CLAY (CH) & SILT (ML)**		k_{20} at e_o =	× 10^{-} cm/sec		
LL	G_s *2.77*	Project *Park River Conduit*			
PL	D_{10}	*Hartford, Conn.*			
Remarks * *Varved; approx. 30% clay and 70% silt in specimen*		Area			
		Boring No. *FD-9U*		Sample No. *UC-8*	
		Depth El *52.8'-54.8'*		Date *July 1974*	
		CONSOLIDATION TEST REPORT			

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE. *(TRANSLUCENT)* G 3424

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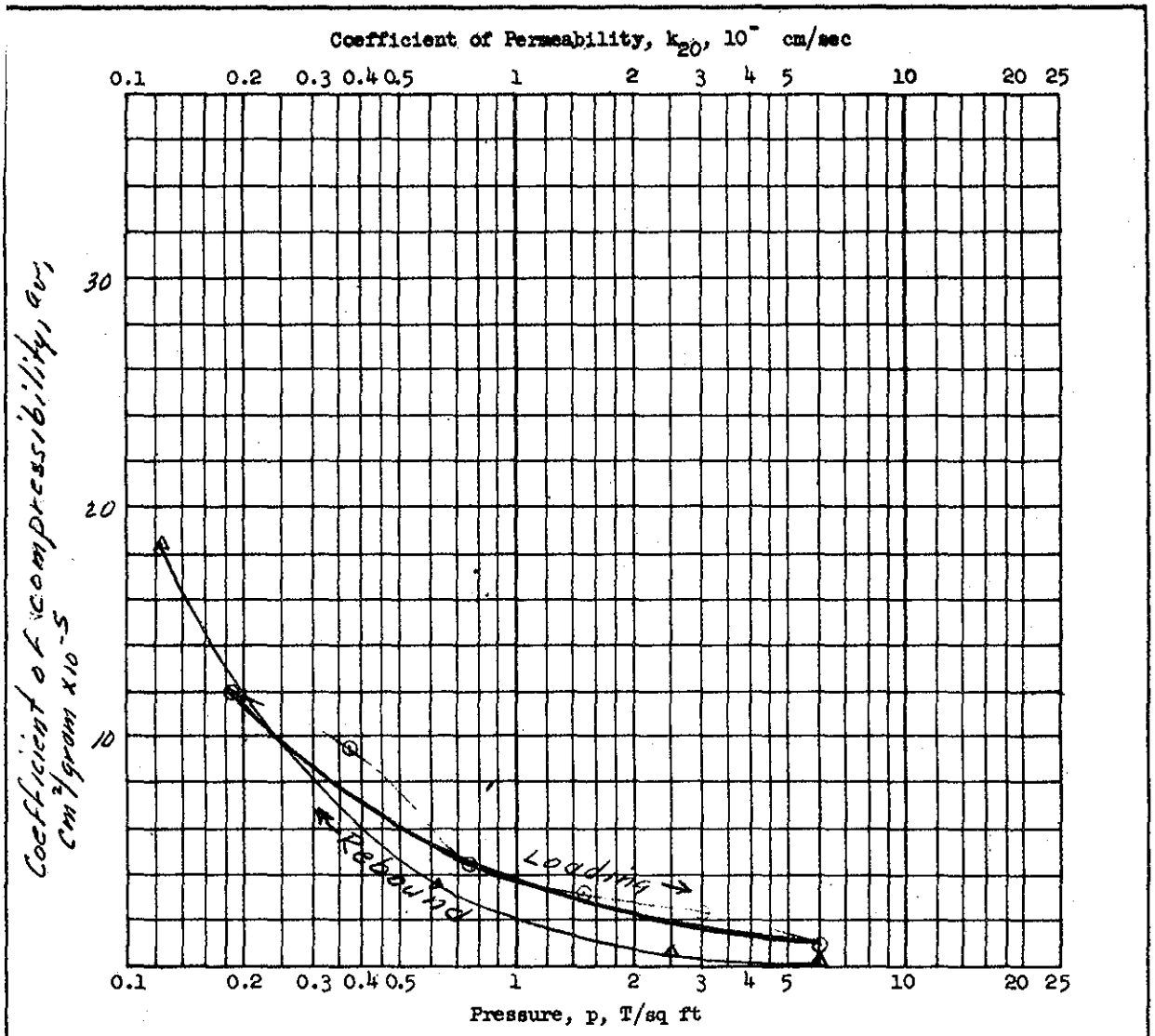
Sheet 1 of 5



Type of Specimen *Undisturbed*		Before Test		After Test	
Diam *2.50* in.	Ht *1.0* in.	Water Content, w_o	*44.7* %	w_f	*38.4* %
Overburden Pressure, p_o	T/sq ft	Void Ratio, e_o	*1.174*	e_f	*1.062*
Preconsol. Pressure, p_c	T/sq ft	Saturation, S_o	*100* %	S_f	*100* %
Compression Index, C_c *0.13*		Dry Density, γ_d	*79.2* lb/ft³		
Classification *CLAY (CH) & SILT (ML)**		k_{20} at e_o =	× 10^{-} cm/sec		
LL	G_s *2.77*	Project *Park River Conduit*			
PL	D_{10}	*Hartford, Conn.*			
Remarks * *Varved; approx.*		Area			
30% clay and 70%		Boring No. *FD-9U*		Sample No. *UC-8*	
silt in specimen		Depth *52.8'-54.8'*		Date *July 1974*	
		CONSOLIDATION TEST REPORT			

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) 0 3424

Sheet 2 of 5

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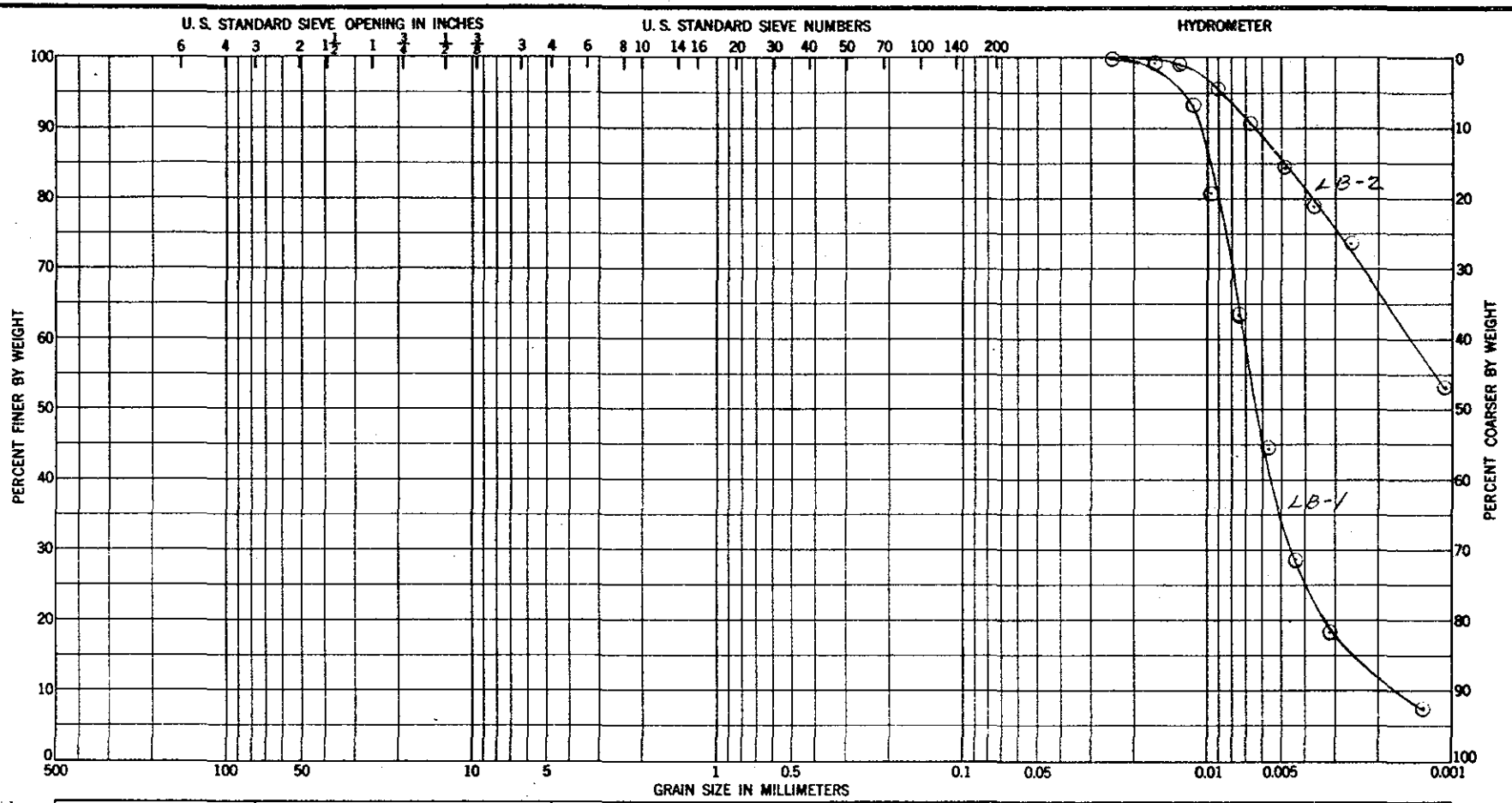

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev or Depth	Classification	~~Nat w %~~	LL	PL	PI
UC-3, LB-1	29.5'-31.5'	SILT (ML)	G=2.76	35	31	4
UC-3, LB-2	29.5'-31.5'	CLAY (CH)		68	28	40

Project: Park River, Hartford, Conn

Area:

Boring No.: FD-13U

Date: November, 1974

GRADATION CURVES

ENG FORM 1 MAY 63 2087

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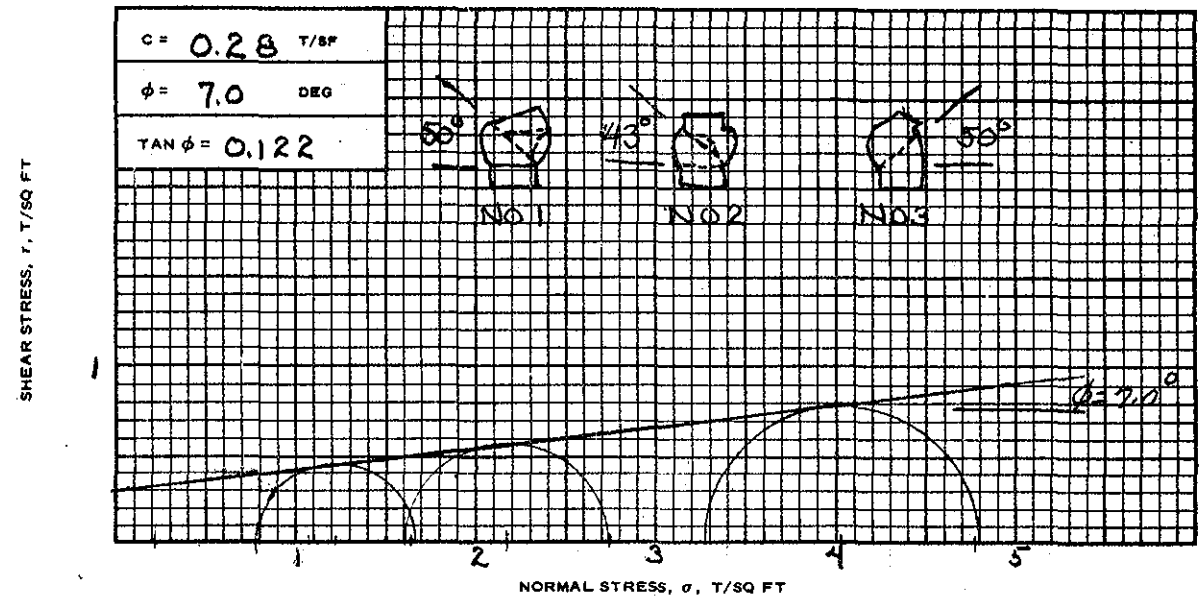
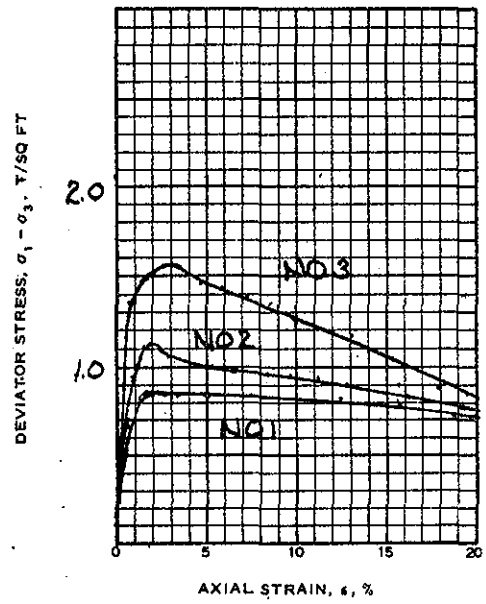




SPECIMEN NO.			1	2	3	
INITIAL	WATER CONTENT, %	w_o	58.5	55.5	61.0	
	DRY DENSITY LB/ CU FT	γ_{d_o}	67.5	67.4	65.5	
	SATURATION, %	S_o	100	99	100	
	VOID RATIO	e_o	1.526	1.528	1.602	
BEFORE SHEAR	WATER CONTENT, %	w_c	57.5	50.6	49.4	
	DRY DENSITY LB/CU FT	γ_{d_c}	66.3	71.6	72.5	
	SATURATION, %	S_c	100	100	100	
	VOID RATIO	e_c	1.569	1.380	1.349	
	FINAL BACK PRESSURE, T/SQ FT	u_o	7.20	7.20	7.20	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.79	1.62	3.24	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.86	1.12	1.54	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	12	12	15	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$	0.79	0.82	0.96	*
INITIAL DIAMETER, IN.		D_o	1.39	1.41	1.40	
INITIAL HEIGHT, IN.		H_o	3.18	3.16	3.18	

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS VARVED LAYERS OF SILT (ML) AND CLAY (CH) APPROX. 55% SILT AND 45% CLAY – LAYERS SLOPE TO SOUTH APPROX 5°

LL | PL | PI | Gs 2.73 | TYPE OF SPECIMEN UNDISTURBED | TYPE OF TEST R

REMARKS: * STRESS @ 15% STRAIN

PROJECT PARK RIVER CONDUIT
HARTFORD CONN

BORING NO. FD-13-U | SAMPLE NO. UC-1

DEPTH/ELEV 25.1' TO 27.1'

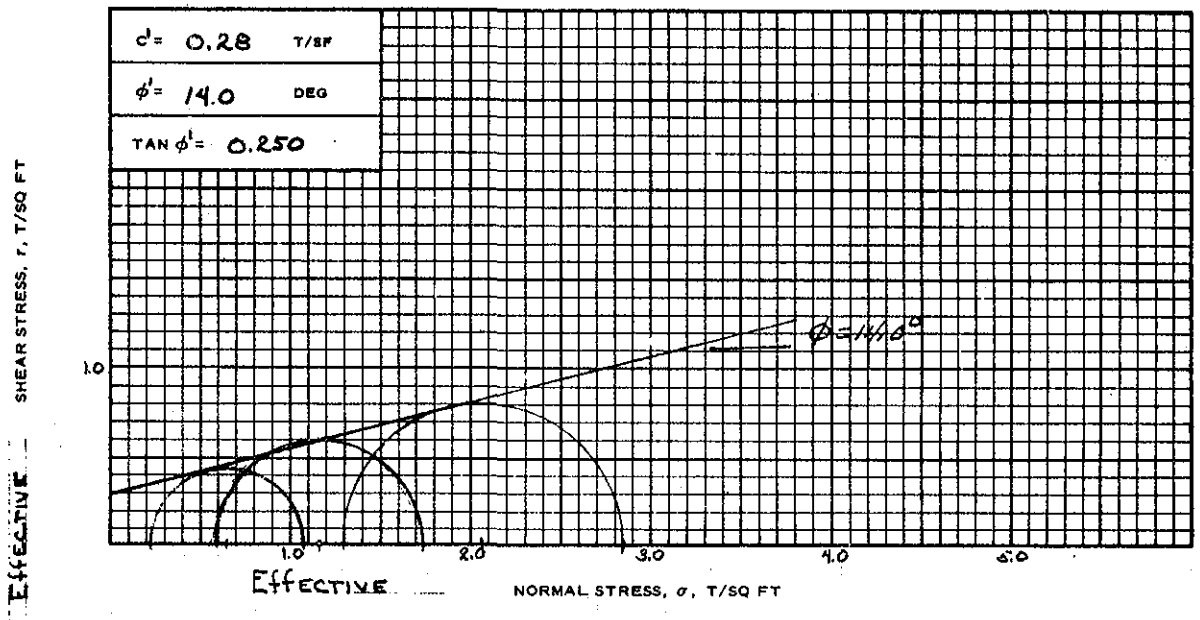
SHEET 1 of 2

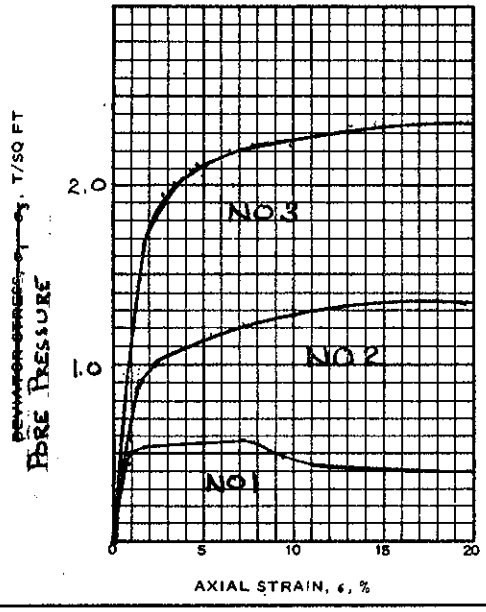
LABORATORY NED | DATE SEPT 1974

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

F-26





SPECIMEN NO.			1	2	3	
INITIAL	WATER CONTENT, %	w_o	58.5	55.5	61.0	
	DRY DENSITY LB/ CU FT	γ_{d_o}	67.5	67.4	65.5	
	SATURATION, %	S_o	100	99	100	
	VOID RATIO	e_o	1.526	1.528	1.602	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γ_{d_c}				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.22	0.64	1.31	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$				
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f				
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
~~INITIAL DIAMETER, IN.~~ MAJ PRIN STRESS, TSF		σ_σ	0.86	1.12	1.54	
~~INITIAL HEIGHT, IN.~~ PORE PRESS TSF		u_σ	0.57	0.98	1.93	*

CONTROLLED- STRAIN TEST

DESCRIPTION OF SPECIMENS VARVED LAYERS of SILT(ML) AND CLAY(CH) APPROX. 55% SILT AND 45% CLAY – LAYERS SLOPE TO SOUTH APPROX 5°

LL	PL	PI	G_s 2.73	TYPE OF SPECIMEN UNDISTURBED	TYPE OF TEST R

REMARKS:

* PORE PRESSURE @ SAME % STRAIN AS MAJOR PRINCIPAL STRESS

SHEET 2 of 2

PROJECT PARK RIVER CONDUIT HARTFORD CONN.

BORING NO. FD-13-U SAMPLE NO. UC-1

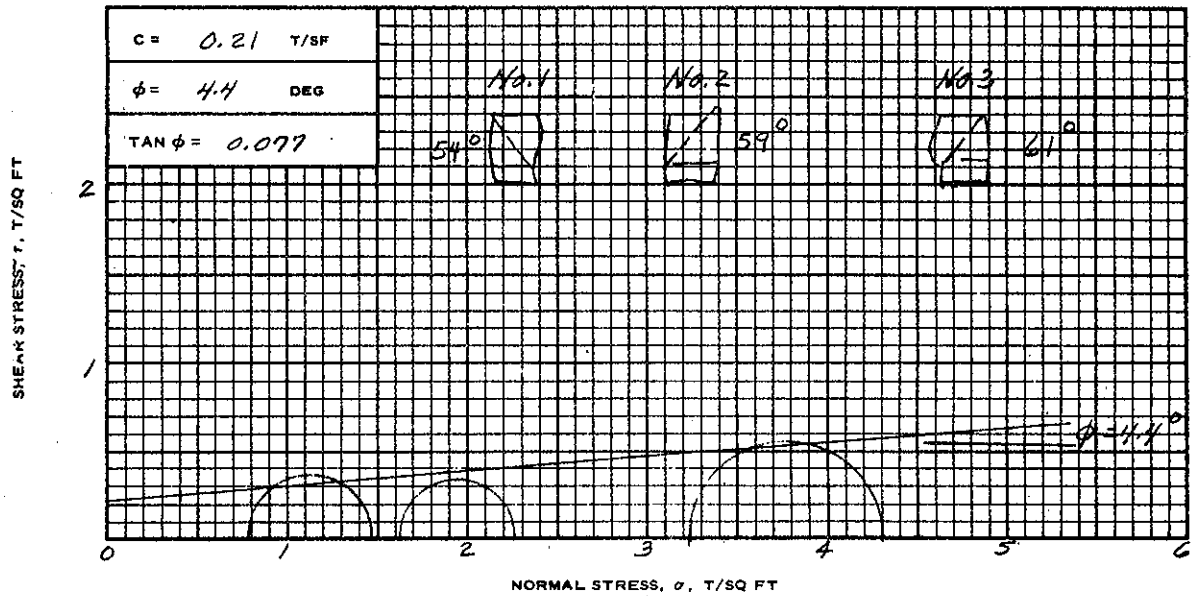
DEPTH/ELEV 25.1' TO 27.1'

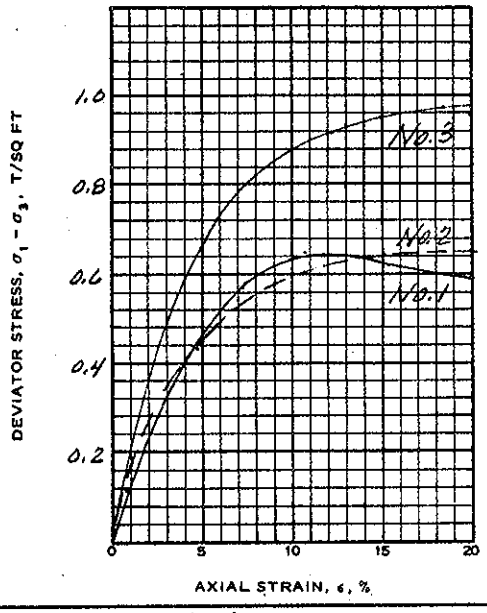
LABORATORY NED DATE SEPT 1974

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

C = 0.21 T/SF	
ϕ = 4.4 DEG	
TAN ϕ = 0.077	





SPECIMEN NO.			1	2	3	
INITIAL	WATER CONTENT, %	w_o	54.8	54.7	54.7	
	DRY DENSITY LB/ CU FT	γ_{d_o}	72.4	72.1	73.2	
	SATURATION, %	S_o	100	100	100	
	VOID RATIO	e_o	1.352	1.362	1.327	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γ_{d_c}				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.79	1.62	3.24	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.65	0.64*	0.95*	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	11	15	15	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$	0.61*	—	—	
INITIAL DIAMETER, IN.		D_o	1.40	1.42	1.38	
INITIAL HEIGHT, IN.		H_o	3.27	3.23	3.23	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Varved layers of SILT (ML) and CLAY (CH); approx. 55% silt and 45% clay; - Layers slope to south, approx. 5°

LL	PL	PI	G_s 2.73	TYPE OF SPECIMEN Undisturbed	TYPE OF TEST Q

REMARKS: * stress @ 15% axial strain.

PROJECT Park River, Hartford, Conn.

BORING NO. FD-13U SAMPLE NO. UC-1

DEPTH/~~ELEV~~ 25.1'-27.1'

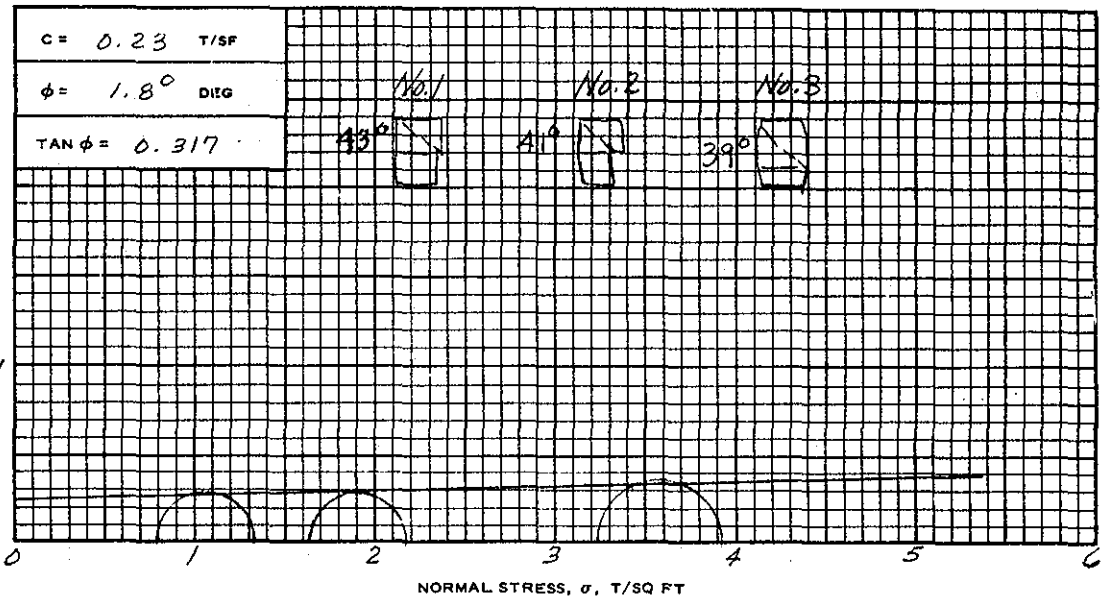
LABORATORY NED DATE Sept. 1974

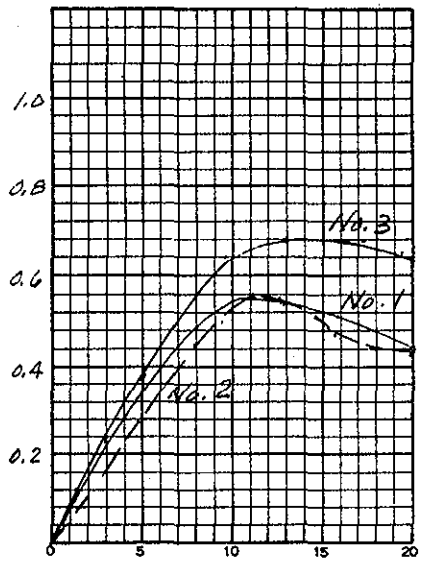
TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

F-28

C = 0.23 T/SF	
ϕ = 1.8° DEG	
TAN ϕ = 0.317	





SPECIMEN NO.			1	2	3	
INITIAL	WATER CONTENT, %	w_o	47.1	47.1	47.1	
	DRY DENSITY LB/ CU FT	γd_o	74.5	75.1	76.2	
	SATURATION, %	S_o	100	99	100	
	VOID RATIO	e_o	1.304	1.325	1.294	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.79	1.62	3.24	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.55	0.56	0.68	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	10.8	11.0	12.3	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$	0.52*	0.46*	0.67*	
INITIAL DIAMETER, IN.		D_o	1.44	1.43	1.43	
INITIAL HEIGHT, IN.		H_o	3.07	3.15	3.07	

CONTROLLED- strain TEST

DESCRIPTION OF SPECIMENS Varved layers of SILT (ML) and CLAY (CH); - approx 60% silt and 40% clay. - layers slope toward south 5°±

LL	PL	PI	G_s 2.80	TYPE OF SPECIMEN Undisturbed	TYPE OF TEST Q

REMARKS: * stress @ 15% strain

PROJECT Park River Conduit
Hartford, Conn.

BORING NO. FD-134 SAMPLE NO. UC-2

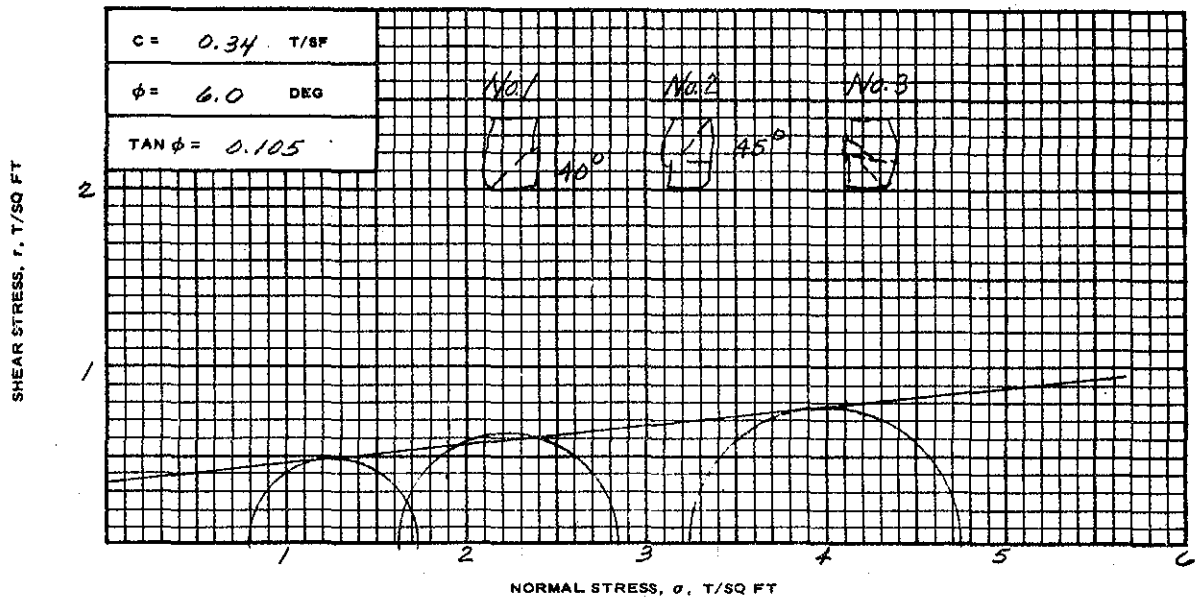
DEPTH/~~ELEV~~ 27.4'- 29.4'

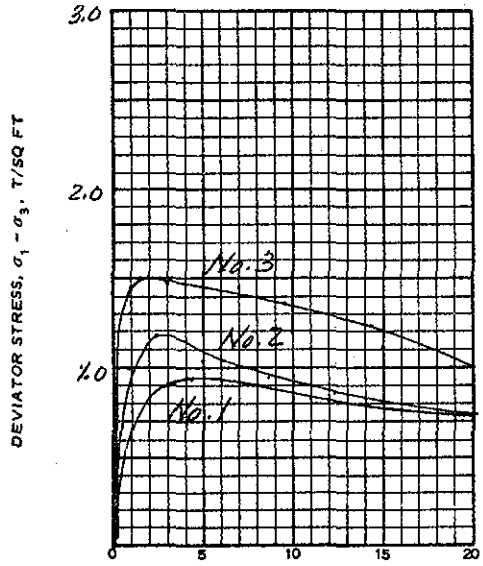
LABORATORY NED DATE July 1974

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

C =	0.34 T/SF
ϕ =	6.0 DEG
TAN ϕ =	0.105





SPECIMEN NO.			1	2	3	
INITIAL	WATER CONTENT, %	w_o	54.8	52.9	55.4	
	DRY DENSITY LB/ CU FT	γ_{d_o}	70.0	70.8	69.8	
	SATURATION, %	S_o	100	100	100	
	VOID RATIO	e_o	1.495	1.468	1.504	
BEFORE SHEAR	WATER CONTENT, %	w_c	53.8	54.0	48.0	
	DRY DENSITY LB/CU FT	γ_{d_c}	69.7	69.5	74.6	
	SATURATION, %	S_c	100	100	100	
	VOID RATIO	e_c	1.506	1.513	1.343	
	FINAL BACK PRESSURE, T/SQ FT	u_o	7.20	7.20	7.20	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.79	1.62	3.24	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.93	1.19	1.50	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	26	15	9	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$	0.79*	0.77*	1.21*	
INITIAL DIAMETER, IN.		D_o	1.41	1.41	1.41	
INITIAL HEIGHT, IN.		H_o	3.15	3.19	3.17	

CONTROLLED- strain TEST

DESCRIPTION OF SPECIMENS Varved layers of SILT (ML) and CLAY (CH); approx. 60% silt and 40% clay. - layers slope toward south 5°±

LL	PL	PI	G_s 2.80	TYPE OF SPECIMEN Undisturbed	TYPE OF TEST R

REMARKS: *Stress @ 15% strain.

See Sheet 2 of 2 for additional information

PROJECT Park River Conduit
Hartford, Conn.

BORING NO. FD-13U SAMPLE NO. UC-2

DEPTH/~~ELEV~~ 27.4'- 29.4'

LABORATORY NED DATE July 1974

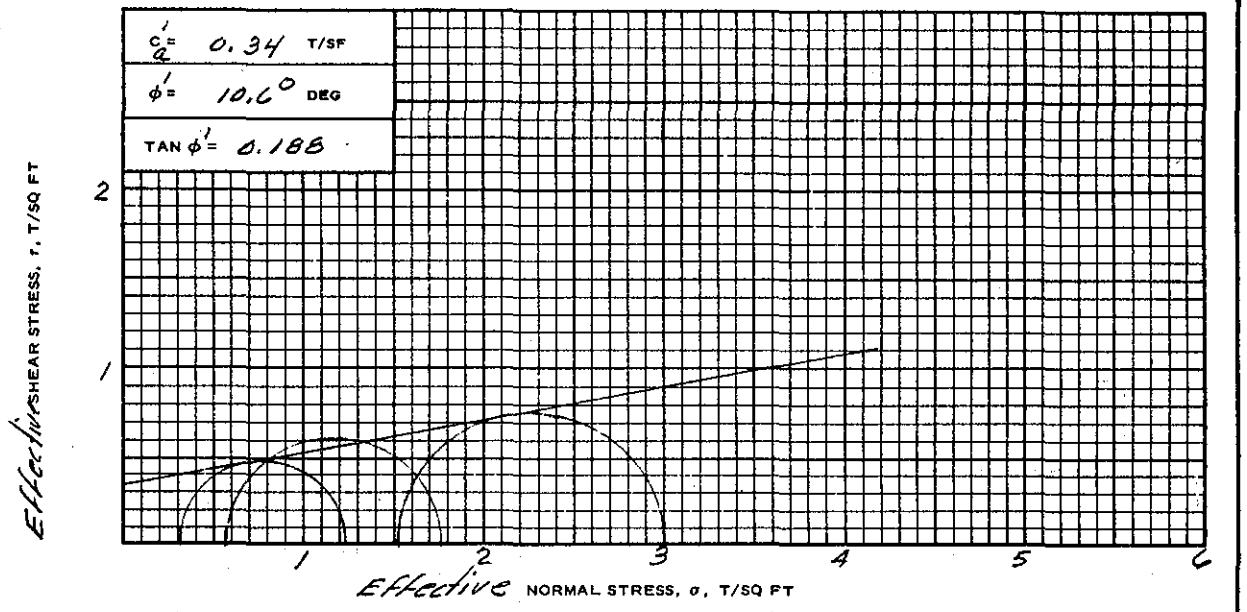
TRIAXIAL COMPRESSION TEST REPORT

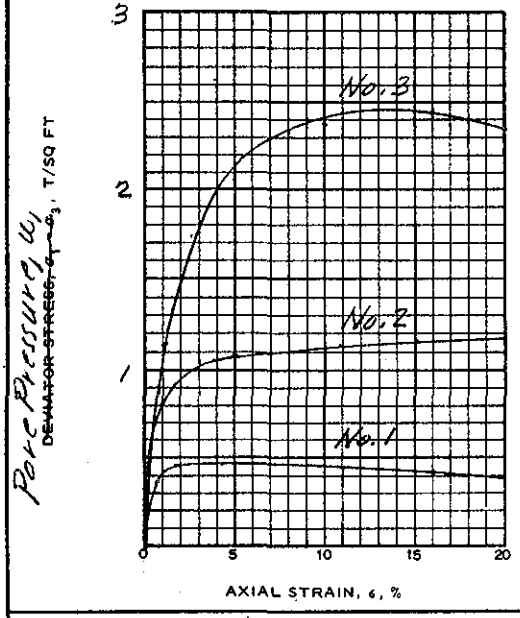
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

c_a' = 0.34 T/SF

ϕ' = 10.6° DEG

TAN ϕ' = 0.188





SPECIMEN NO.			1	2	3	
INITIAL	WATER CONTENT, %	w_o	54.8	52.9	55.4	
	DRY DENSITY LB/ CU FT	γd_o	70.0	70.8	69.8	
	SATURATION, %	S_o	100	100	100	
	VOID RATIO	e_o	1.495	1.468	1.504	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.31	0.57	1.51	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$				
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f				
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
~~INITIAL DIAMETER, IN.~~ Maj. Prin. Stress, Tsf.		σ_{1f}	1.24	1.76	3.01	
~~INITIAL HEIGHT, IN.~~ Pore Press., Tsf.		u_f	0.48*	1.05*	1.73*	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Varved layers of SILT(ML) and CLAY(CH); approx. 60% silt and 40% clay. - layers slope toward south 5°±

LL	PL	PI	Gs 2.80	TYPE OF SPECIMEN Undisturbed	TYPE OF TEST $\bar{R}$

REMARKS: *Pore Pressure @ same % strain as Major Principal Stress

See Sheet 1 of 2 for additional information

PROJECT Park River Conduit
Hartford, Conn.

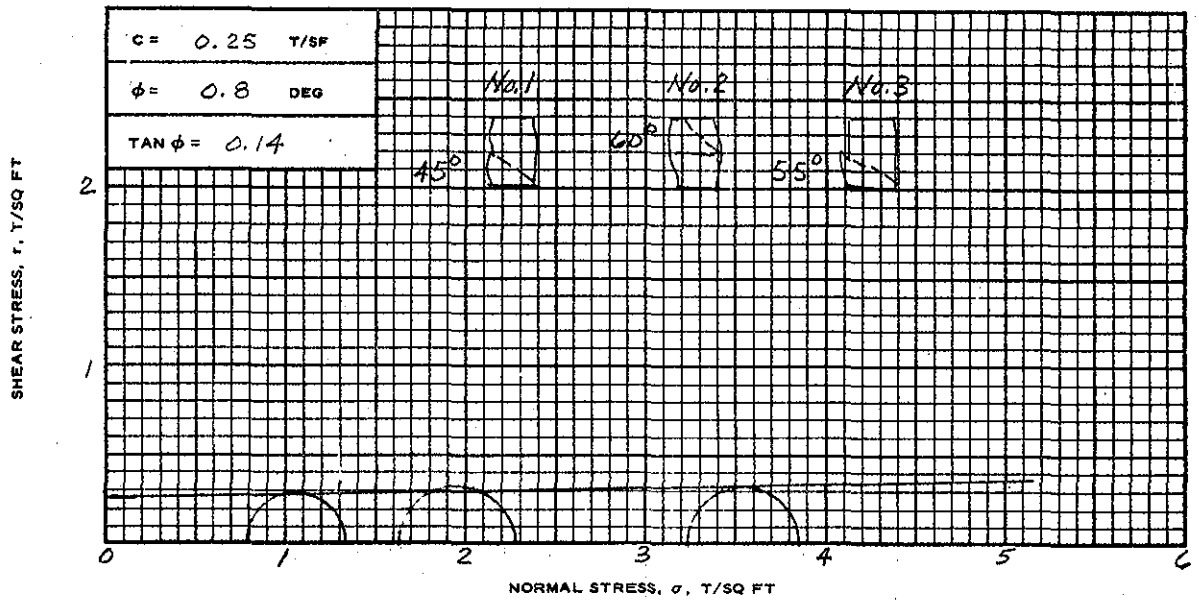
BORING NO. FD-13 U SAMPLE NO. UC-2

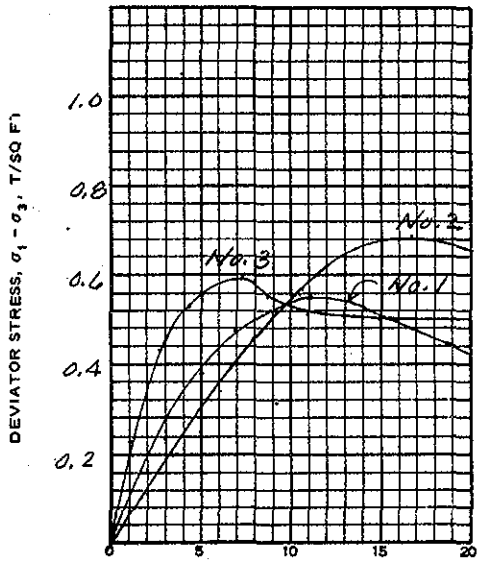
DEPTH/~~ELEV~~ 27.4'- 29.4'

LABORATORY NED DATE July 1974

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)





SPECIMEN NO.			1	2	3	
INITIAL	WATER CONTENT, %	w_o	49.0	49.0	49.0	
	DRY DENSITY LB/ CU FT	γd_o	80.7	77.0	75.0	
	SATURATION, %	S_o	100	100	100	
	VOID RATIO	e_o	1.165	1.268	1.330	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.79	1.62	3.24	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.55	0.68*	0.59	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	11	15	7	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$	0.51*	—	0.50*	
INITIAL DIAMETER, IN.		D_o	1.33	1.42	1.41	
INITIAL HEIGHT, IN.		H_o	3.15	3.27	3.23	

CONTROLLED- strain TEST

DESCRIPTION OF SPECIMENS Varved layers of SILT (ML) and CLAY (CL): - approx. 55% silt and 45% clay in specimens. - All layers horizontal

LL	PL	PI	G_s 2.80	TYPE OF SPECIMEN Undisturbed	TYPE OF TEST Q

REMARKS: * Stress @ 15% strain.

PROJECT Park River Conduit
Hartford, Conn.

BORING NO. FD-13U SAMPLE NO. UC-3

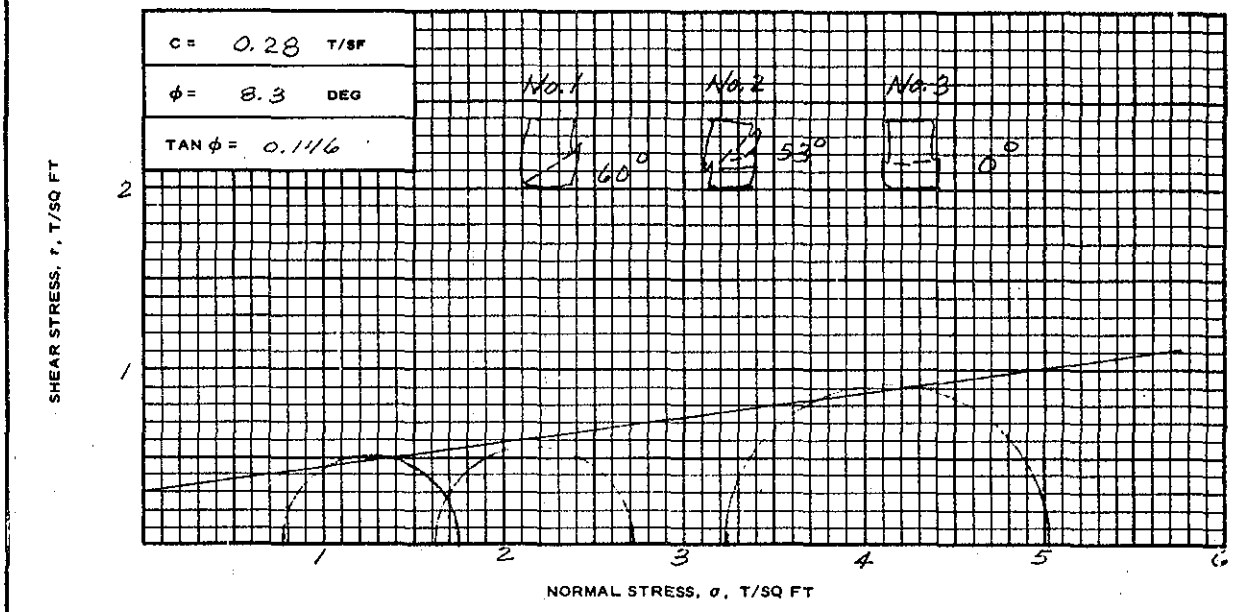
DEPTH/~~ELEV~~ 29.5'-31.5'

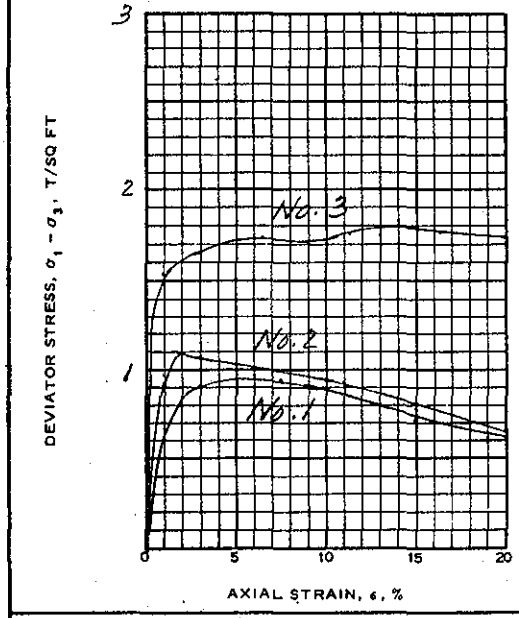
LABORATORY NED DATE July 1974

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

F-32





SPECIMEN NO.			1	2	3	
INITIAL	WATER CONTENT, %	w_o	50.1	50.8	55.4	
	DRY DENSITY LB/ CU FT	γ_{d_o}	74.4	74.8	71.0	
	SATURATION, %	S_o	100	100	100	
	VOID RATIO	e_o	1.349	1.337	1.460	
BEFORE SHEAR	WATER CONTENT, %	w_c	48.7	47.5	48.3	
	DRY DENSITY LB/CU FT	γ_{d_c}	74.0	75.0	74.3	
	SATURATION, %	S_c	100	100	100	
	VOID RATIO	e_c	1.360	1.330	1.351	
	FINAL BACK PRESSURE, T/SQ FT	u_o	7.20	7.20	7.20	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.79	1.62	3.24	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.94	1.10	1.74	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	44	11	61	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$	0.71*	0.78*	1.79*	
INITIAL DIAMETER, IN.		D_o	1.40	1.40	1.41	
INITIAL HEIGHT, IN.		H_o	3.18	3.14	3.13	

CONTROLLED- strain TEST

DESCRIPTION OF SPECIMENS Varved layers of SILT (ML) and CLAY (CL). - approx. 55% silt and 45% clay in specimens. - All layers horizontal

LL	PL	PI	Gs 2.80	TYPE OF SPECIMEN Undisturbed	TYPE OF TEST R

REMARKS: * Stress @ 15% strain.

See Sheet 2 of 2 for additional information

PROJECT Park River Conduit, Hartford, Conn.

BORING NO. FD-13U SAMPLE NO. UC-3

DEPTH/~~ELEV~~ 29.5'-31.5'

LABORATORY NED DATE July 1974

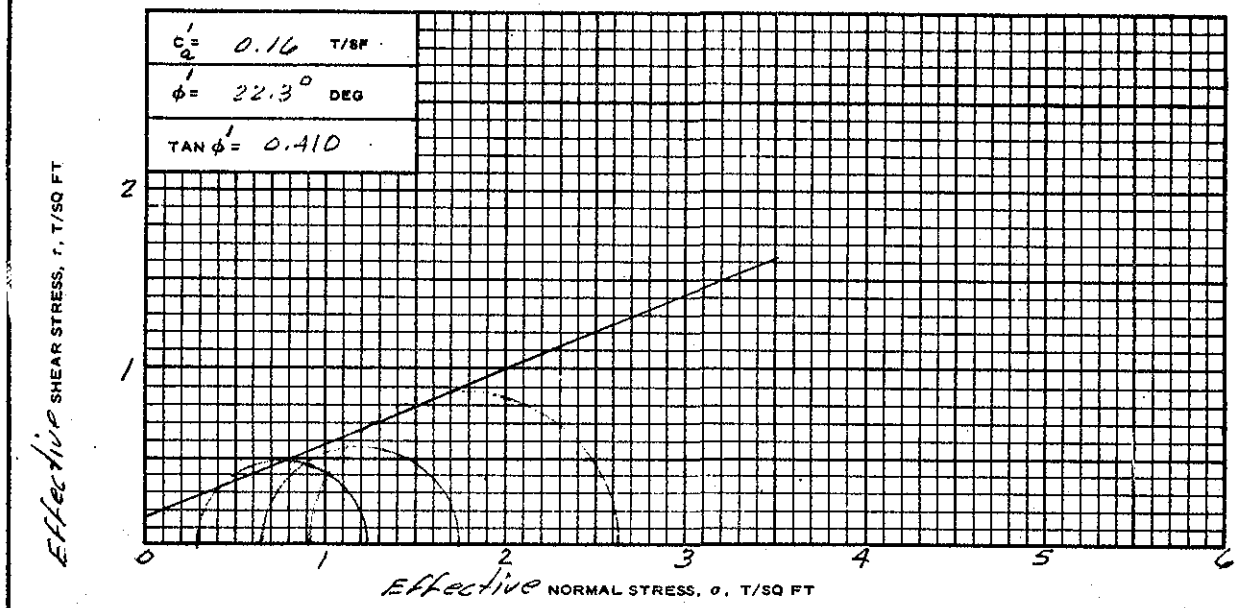
TRIAXIAL COMPRESSION TEST REPORT

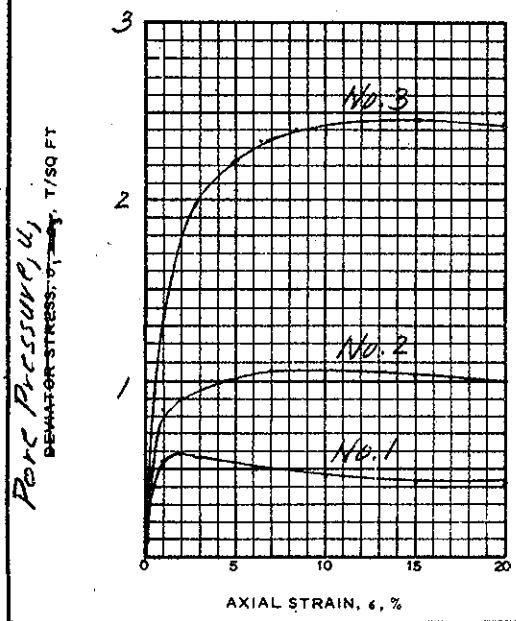
ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

c'_a = 0.16 T/SF

ϕ' = 22.3° DEG

TAN ϕ' = 0.410





SPECIMEN NO.			1	2	3	
INITIAL	WATER CONTENT, %	w_o	50.1	50.8	55.4	
	DRY DENSITY LB/ CU FT	γ_{d_o}	74.4	74.8	71.0	
	SATURATION, %	S_o	100	100	100	
	VOID RATIO	e_o	1.349	1.337	1.460	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γ_{d_c}				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.29	0.65	0.91	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$				
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f				
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
~~INITIAL DIAMETER, IN.~~ Maj. Prin. Stress, TSF		D_o	1.23	1.75	2.65	
~~INITIAL HEIGHT, IN.~~ Pore Press., TSF		H_o	0.50*	0.97*	2.33	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Varved layers of SILT(ML) and CLAY(CL). - approx. 55% silt and 45% clay in specimens. - All layers horizontal

LL	PL	PI	Gs	TYPE OF SPECIMEN Undisturbed	TYPE OF TEST R

REMARKS: * Pore Pressure @ same % strain as Major Principal stress.

See Sheet 1 of 2 for additional information

PROJECT Park River Conduit, Hartford, Conn.

BORING NO. FD-13U SAMPLE NO. UC-3

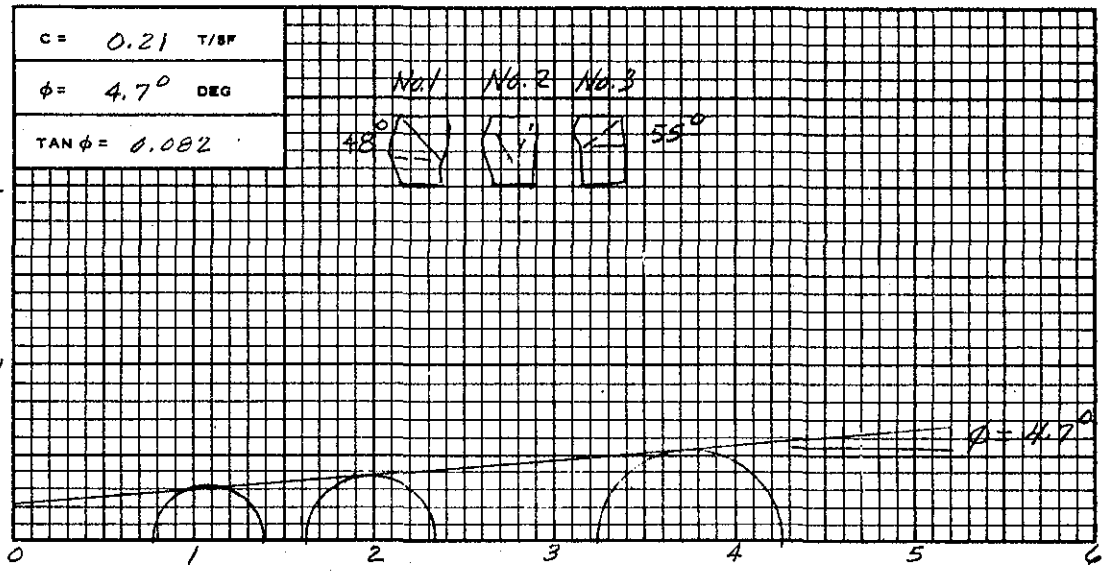
DEPTH/~~ELEV~~ 29.5'- 31.5'

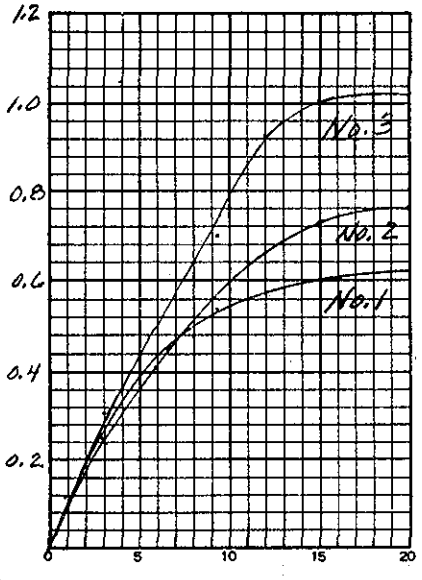
LABORATORY NED DATE July 1974

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

c = 0.21 T/SF	
ϕ = 4.7° DEG	
TAN ϕ = 0.082	





SPECIMEN NO.			1	2	3	
INITIAL	WATER CONTENT, %	w_o	50.9	50.9	50.9	
	DRY DENSITY LB/ CU FT	γd_o	74.2	73.8	76.7	
	SATURATION, %	S_o	100	100	100	
	VOID RATIO	e_o	1.346	1.358	1.269	
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	U_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	0.79	1.62	3.24	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	0.60*	0.73*	1.01*	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	15	15	15	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$	—	—	—	
INITIAL DIAMETER, IN.		D_o	1.42	1.42	1.39	
INITIAL HEIGHT, IN.		H_o	3.27	3.31	3.27	

CONTROLLED- strain TEST

DESCRIPTION OF SPECIMENS Varved layers of SILT (ML) and CLAY (CH); approx. 55% silt and 45% clay. - All layers horizontal

LL	PL	PI	Gs 2.79	TYPE OF SPECIMEN Undisturbed	TYPE OF TEST Q

REMARKS: *Stress @ 15% axial strain.

PROJECT Park River, Hartford, Conn.

BORING NO. FD-13U SAMPLE NO. UC-4

DEPTH/~~ELEV~~ 31.9' - 33.9'

LABORATORY NED DATE Sept. 1974

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT (EM 1110-2-1906)

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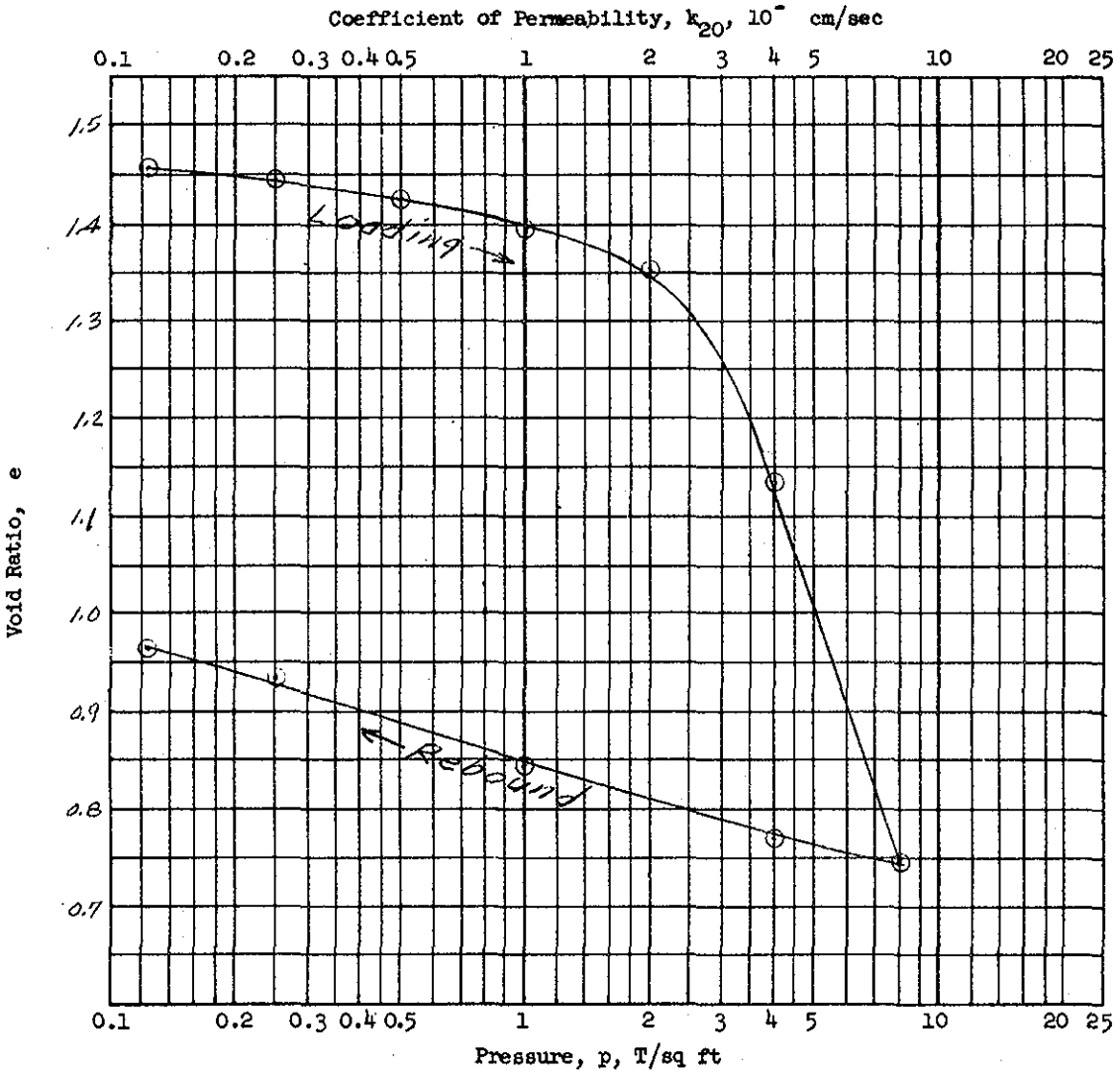

Type of Specimen *Undisturbed*		Before Test		After Test	
Diam *4.43* in.	Ht *1.0* in.	Water Content, w_o	*51.9* %	w_f	*49.4* %
Overburden Pressure, p_o	T/sq ft	Void Ratio, e_o	*1.475*	e_f	*0.967*
Preconsol. Pressure, p_c	T/sq ft	Saturation, S_o	*99* %	S_f	*100+* %
Compression Index, C_c *1.24*		Dry Density, γ_d	*70.6* lb/ft^3		
Classification *Varved SILT (ML) & CLAY (CH)**		k_{20} at e_o =	$\times 10^{-}$ cm/sec		
LL	G_s *2.80*	Project *Park River*			
PL	D_{10}	*Hartford, Conn*			
Remarks **Approximately 55% silt and 45% clay in specimen.*		Area			
		Boring No. *FD-13U*		Sample No. *UC-2*	
		Depth *27.4' - 29.4'*		Date *Sept. 1974*	

CONSOLIDATION TEST REPORT

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE.

Sheet 1 of 8

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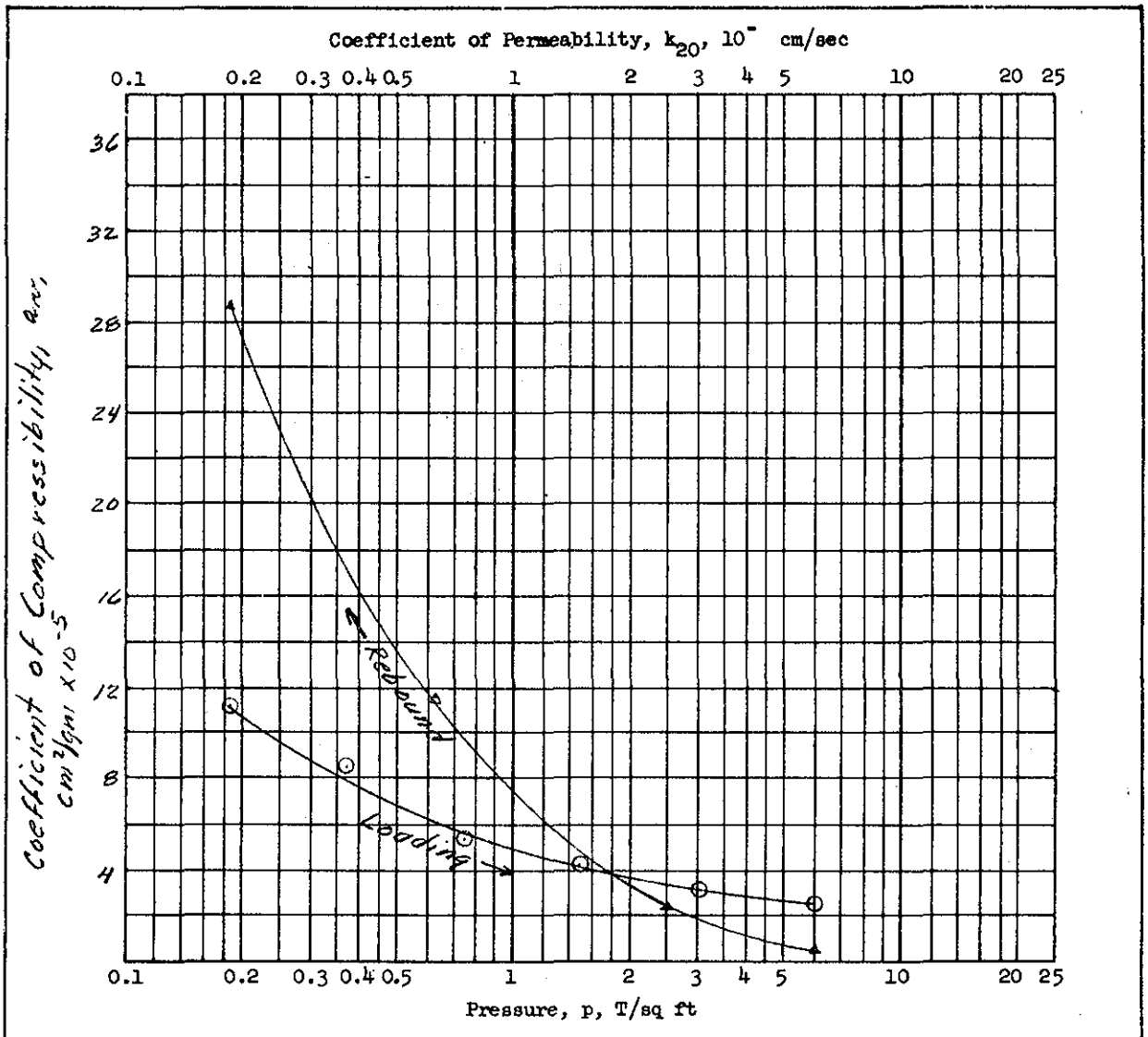

Type of Specimen *Undisturbed*		Before Test		After Test	
Diam *4.43* in.	Ht *1.0* in.	Water Content, w_o	*51.9* %	w_f	*49.4* %
Overburden Pressure, p_o	T/sq ft	Void Ratio, e_o	*1.475*	e_f	*0.967*
Preconsol. Pressure, p_c	T/sq ft	Saturation, S_o	*99* %	S_f	*100+* %
Compression Index, C_c		Dry Density, γ_d	*70.6* lb/ft^3		
Classification *Varved SILT (ML) & CLAY (CH)**		k_{20} at e_o =	$\times 10^{-}$ cm/sec		
LL	G_s *2.80*	Project *Park River*			
PL	D_{10}	*Hartford, Conn.*			
Remarks **Approximately 55% silt and 45% clay in specimen.*		Area			
		Boring No. *FD-13U*		Sample No. *UC-2*	
		Depth *27.4'-29.4'*		Date *Sept. 1974*	
		CONSOLIDATION TEST REPORT			

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE.

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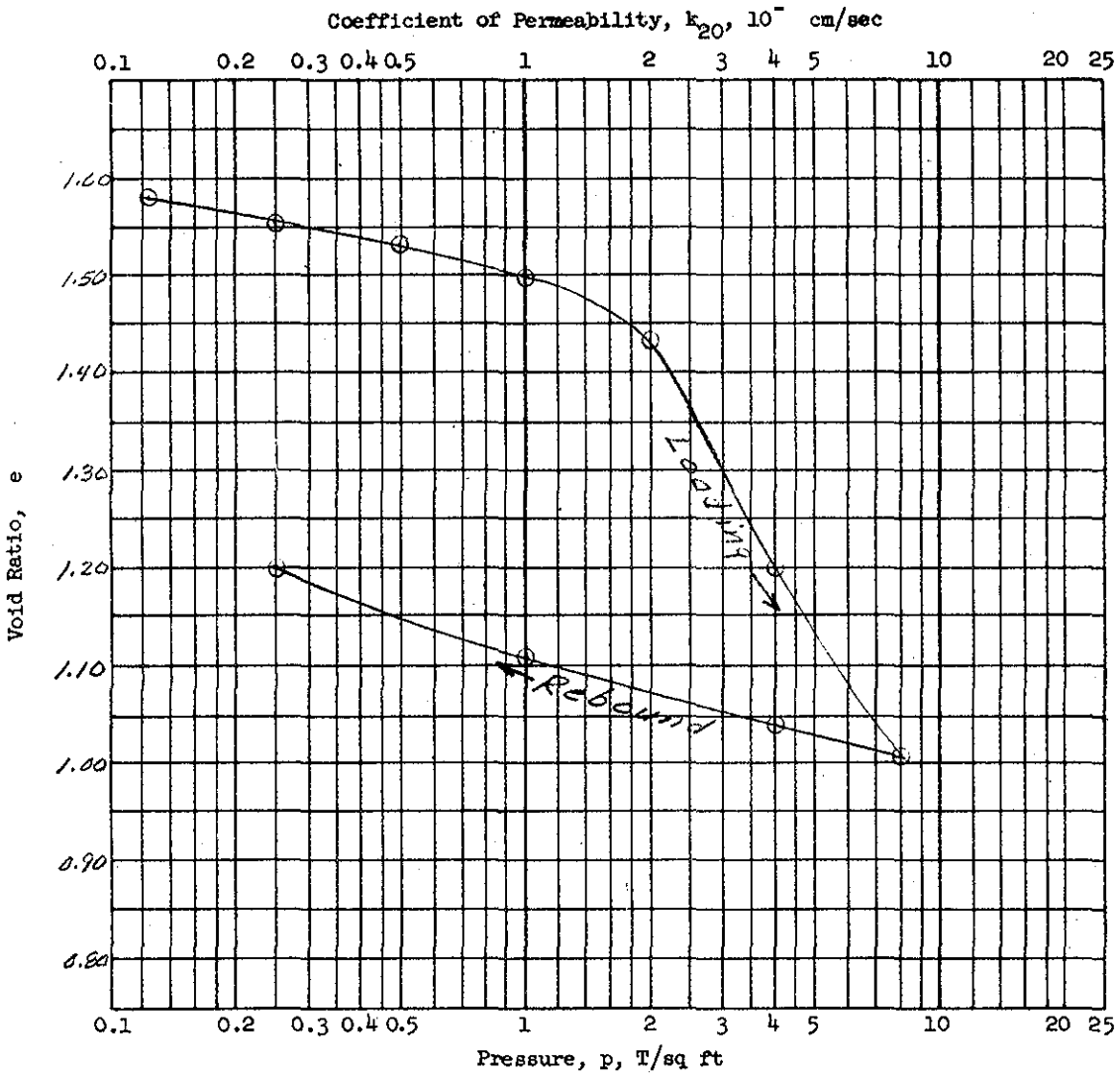

Type of Specimen *Undisturbed*		Before Test		After Test	
Diam *4.43* in.	Ht *1.0* in.	Water Content, w_o	*57.9* %	w_f	*49.1* %
Overburden Pressure, p_o	T/sq ft	Void Ratio, e_o	*1.604*	e_f	*1.241*
Preconsol. Pressure, p_c	T/sq ft	Saturation, S_o	*100* %	S_f	*100* %
Compression Index, C_c *0.41*		Dry Density, γ_d	*67.1* lb/ft^3		
Classification *Varved SILT(ML) & CLAY(CH)*		k_{20} at e_o =	$\times 10^{-}$ cm/sec		
LL	G_s *2.80*	Project *Park River*			
PL	D_{10}	*Hartford, Conn.*			
Remarks **Approximately*		Area			
60% SILT and 40% CLAY		Boring No. *FD-134*		Sample No. *UC-3*	
in specimen		Depth *29.5' - 31.5'*		Date *Sept. 1974*	

CONSOLIDATION TEST REPORT

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE.

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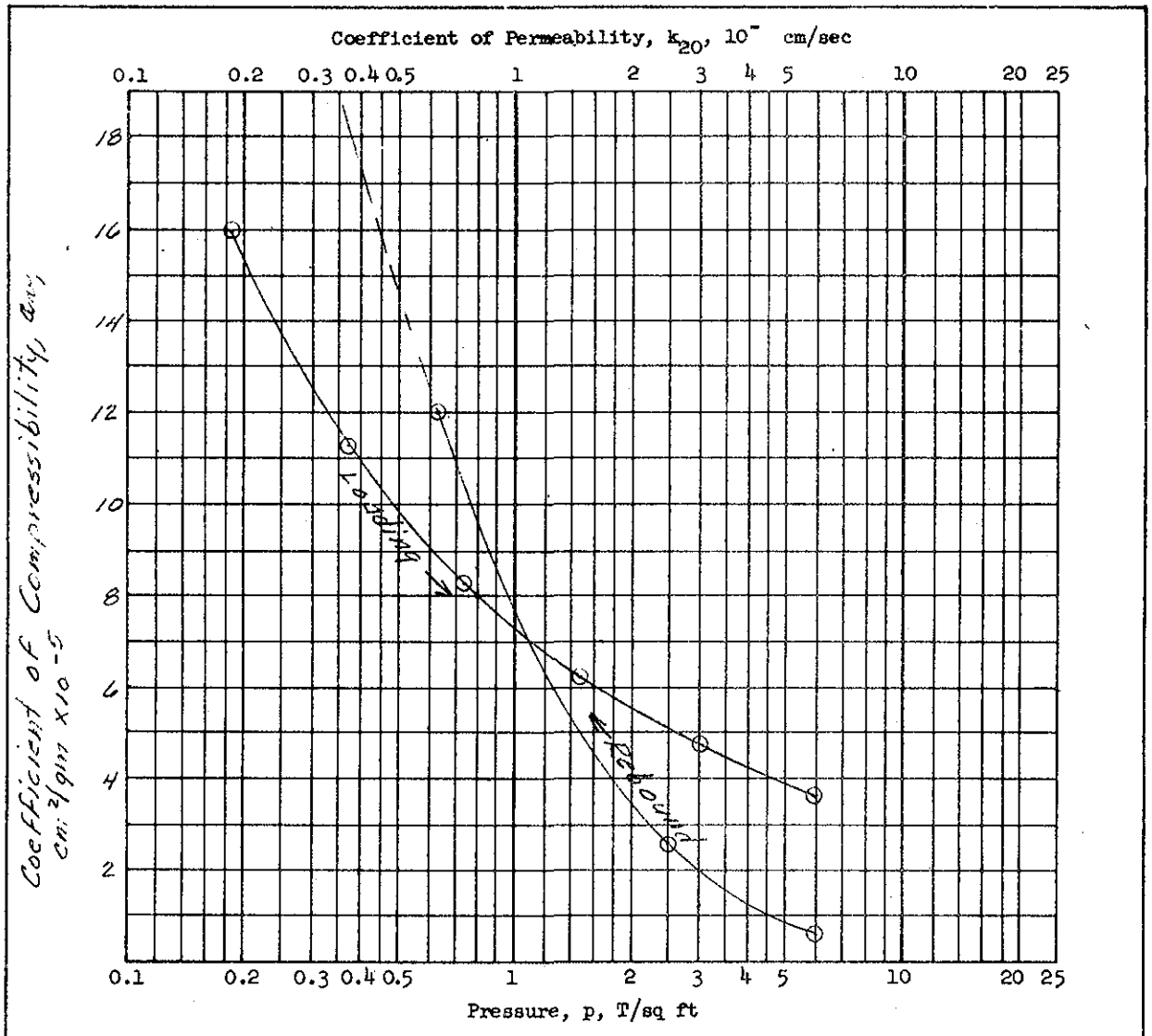

Type of Specimen *Undisturbed*		Before Test		After Test	
Diam *4.43* in.	Ht *1.0* in.	Water Content, w_o	*57.9* %	w_f	*49.1* %
Overburden Pressure, p_o	T/sq ft	Void Ratio, e_o	*1.604*	e_f	*1.241*
Preconsol. Pressure, p_c	T/sq ft	Saturation, S_o	*100* %	S_f	*100* %
Compression Index, C_c *0.71*		Dry Density, γ_d	*67.1* lb/ft³		
Classification *Varved SILT (ML) & CLAY (CH)**		k_{20} at e_o =	× 10^{-} cm/sec		
LL	G_s *2.80*	Project *Park River*			
PL	D_{10}	*Hartford, Conn.*			
Remarks **Approximately*		Area			
60% SILT and 40% CLAY		Boring No. *FD-13U*		Sample No. *UC-3*	
in specimen		Depth *29.5'-31.5'*		Date *Sept. 1974*	
		CONSOLIDATION TEST REPORT			

ENG FORM 1 MAY 63 2090 PREVIOUS EDITIONS ARE OBSOLETE.

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