CONNECTICUT RIVER FLOOD CONTROL

FARMINGTON RIVER BASIN

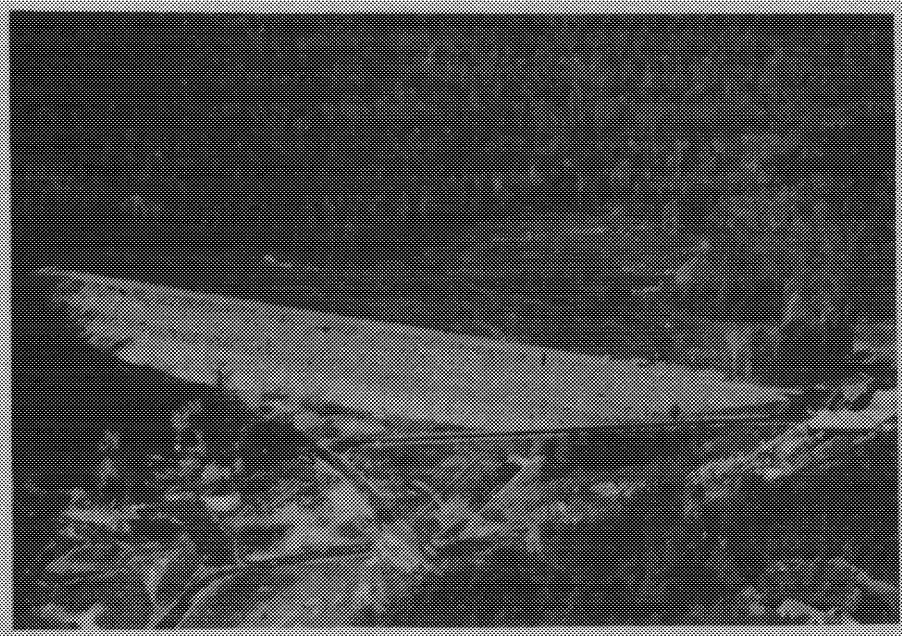
OPERATION AND MAINTENANCE MANUAL

FOR

FLOOD PROTECTION WORKS

SUCKER BROOK DAM

WINCHESTER CONNECTICUT



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

MAY 1971

SUCKER BROOK DAM

FARMINGTON RIVER BASIN
WINCHESTER, CONNECTICUT

OPERATION

AND

MAINTENANCE

MANUAL

U. S. ARMY ENGINEER DIVISION
NEW ENGLAND
OFFICE OF THE DIVISION ENGINEER
WALTHAM, MASSACHUSETTS

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FOREWORD

The Sucker Brook project was authorized as a single purpose flood control reservoir. The dam and reservoir area will be maintained by the State of Connecticut and was designed to operate automatically. This project together with Mad River Dam provides protection to Winsted and communities on the Still River downstream of Winsted.

Effective control of floods by the Sucker Brook Dam is not assured solely by the construction of the project. To perform the functions for which it was designed, it must be maintained carefully during periods of normal river stages and monitored properly during flood periods. This cannot be stressed too highly since large damages may be incurred through failure of a critical element in flood time, caused by deterioration or damage that could have been corrected by timely maintenance.

Necessary maintenance and operation require that responsible local persons have a thorough understanding of the project's components, recommended methods of maintenance and operating procedures.

It is the purpose of this manual to provide complete information so that all parties may fully understand their responsibilities in maintaining and operating the flood protection system in accordance with the regulations prescribed by the Secretary of the Army as amplified by this manual.

The general flood control Regulations for Maintenance and Operation of Flood Control Works quoted herein were approved by the Acting Secretary of War on 9 August 1944. Upon establishment of the Department of Defense, the improvement of rivers for flood control and other purposes became the responsibility of the Secretary of the Army. Reference herein to the Secretary of War and War Department shall therefore be construed to mean, respectively, the Secretary of the Army and the Department of the Army. Where reference is made to the District Engineer in the Regulations included in this manual, it shall be construed to mean the Division Engineer, U. S. Army Engineer Division, New England.

The State of Connecticut furnished assurance that it will maintain and operate Sucker Brook Dam in accordance with regulations prescribed by the Secretary of War, as required by law, will appoint a permanent committee consisting of or headed by an official hereinafter called in this Manual the "Superintendent", who shall be responsible for the development and maintenance of, and directly in charge of, an organization responsible for the efficient operation and maintenance of all of the structures and facilities during flood periods and for continuous inspection and maintenance of the project works during periods of low water, all without cost to the United States.

OPERATION AND MAINTENANCE MANUAL

SUCKER BROOK DAM
WINCHESTER, CONNECTICUT

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A. GENERAL

1. PURPOSE

The purpose of this manual is to present detailed information to be used as a guide in complying with "Flood Control Regulations-Maintenance and Operation of Flood Control Works", as approved by the Acting Secretary of War on 9 August 1944, and published in this volume as Appendix A.

The State of Connecticut, by executing assurances of local cooperation, has agreed to maintain and operate the completed Sucker Brook Dam Project in accordance with these regulations.

The regulations, intended to cover all local protection projects constructed by the Department of the Army throughout the United States, are general in nature and obviously cannot give detailed instructions for maintenance and operation of a specific project. The details, as set forth in this manual, supplement the Regulations to insure maximum protection against floods for which the project was designed. Failure to maintain the operate the project, as required by the Regulations and as detailed herein, can result in severe property losses, loss of life, and the waste of funds invested by citizens in a valuable flood control system.

2. PROJECT AUTHORIZATION

The Sucker Brook Dam Project was authorized by the Flood Control Act of 14 July 1960 (Public Law 86-645, 86th Congress, 2nd Session) in accordance with recommendations of the Chief of Engineers as set forth in House Document No. 443, 86th Congress, 2nd Session.

3. PROJECT LOCATION

The Sucker Brook Dam Project is located within the town of Winchester and two air miles southwest of Winsted, Connecticut. The reservoir is formed by a dam located on Sucker Brook about 400 feet upstream of its confluence with Highland Lake. All structures are within the town of Winchester, Connecticut.

4. DESCRIPTION OF PROJECT (See Appendix D, Plate No. D-1)

Major project components consist of (1) a compacted earth fill dam, located on Sucker Brook, founded largely on rock near the left abutment; (2) outlet works consisting of intake channel, inlet structure, a 3' x 3' (inside dimension) conduit, outlet structure and outlet channel; (3) a chute type spillway located in left abutment of the dam; (4) relocation of Sucker Brook Road including bridge across spillway discharge channel; (5) two 72" culverts from outlet works to Highland

Lake; (6) a 14-inch water pipe for diversion of flows from outlet works back to old Sucker Brook stream bed; and (7) brook relocation including diversion dike and outlet works. Sucker Brook Dam reduces flood damage along Highland Lake Stream and has some effect on flood damages along the Mad and Still Rivers.

5. DESCRIPTION OF RESERVOIR

The reservoir is a dry bed reservoir and extends upstream along Sucker Brook about 0.6 miles. The total drainage area of Sucker Brook at the dam is 3.43 square miles. The Sucker Brook Dam reservoir pool at spillway crest elevation of 935.0 m.s.l. has an area of 53.5 acres and a storage capacity of 1,482 acre feet equivalent to 8.1 inches of runoff from the drainage area. A tabulation of the reservoir data is as follows:

Location	Elevations ft., m.s.l.	Area Acres	Acre Feet	Inches on Drainage Area
River Bed at Site	881	-	-	-
Spillway Crest	935.0	53.5	1,482	8.1
Maximum Surcharge	944.2	61.5	1,995	10.9
Top of Dam	949.0	65.5	2,280	12.5

Area Capacity Curves (Plate No. 3) under Appendix D is included to give a more complete picture of the area and storage capacities.

6. HIGHLAND LAKE DAM MODIFICATION

As part of local interest assurances, Highland Lake Dam is to be modified in a manner satisfactory to the Chief of Engineers to provide additional flood protection for Winsted, Conn. The work consists in general of several dikes, floodwalls, and spillway channel protection. A plan of the required modifications is as shown on Plate D-6 of Appendix D. It is anticipated the modification will be completed prior to summer of 1972.

7. CONSTRUCTION HISTORY

Construction of Sucker Brook Dam and Appurtenant Structures was started in September 1966 and substantially completed in June 1970. The work was accomplished by Gary Excavating, Incorporated of Bramford, Conn.

8. PLANS

Full-size tracings of "as-built" construction drawings have been provided the State of Connecticut. Drawings covering salient features of the project are included for reference. (Appendix D, Plates Nos. D-7 thru D-20).

9. LOCAL COOPERATION

The Act authorizing Sucker Brook Dam Project required that responsible local interests give assurances to the United States of America, prior to initiation of construction, that they would:

(a) Furnish without cost to the United States all lands, easement, and rights-of-way necessary to the construction of the project.

(b) Hold and save the United States free from damages due to the construction work.

(c) Maintain and operate all of the works after completion in accordance with regulations prescribed by the Secretary of the Army.

(d) Establish encroachment lines along Highland Lake Stream beyond which, in the direction of the waterway, no obstruction or encroachment shall be placed unless authorized by the Connecticut Water Resources Commission; and (e) Modify Highland Lake Dam in a manner satisfactory to the Chief of Engineers to provide additional flood protection for Winsted, Connecticut. The assurances of the State of Connecticut are contained in Appendix B. This manual is to assist the State of Connecticut in fulfilling the requirements of (c) above in their responsibilities for maintaining and operating the project.

10. GENERAL RULES AND REGULATIONS

Paragraph 208.10 (a) of the regulations prescribed by the Secretary of War gives general rules for the maintenance and operation of structures and facilities constructed by the United States for local flood protection. Applicable portions are quoted below to avoid the necessity for cross reference and are further defined by remarks under each quotation.

"(1) The structures and facilities constructed by the United States for local flood protection shall be maintained continuously in such a manner and operated at such times and for such periods as may be necessary to obtain the maximum benefits."

These requirements cannot be overstressed, and the State authorities must make adequate provisions for funds, personnel, equipment and materials to allow the proper maintenance and operation of the flood protective works.

"(2) The State, political subdivision thereof, or other responsible local agency, which furnished assurance that it would maintain and operate flood control works in accordance with regulations prescribed by the Secretary of War, as required by law, shall appoint

a permanent committee consisting of or headed by an official hereinafter called the 'Superintendent', who shall be responsible for the development and maintenance of, and directly in charge of, an organization responsible for the efficient operation and maintenance of all of the structures and facilities during flood periods, and for continuous inspection and maintenance of the project works during the periods of low water, all without cost to the United States."

The committee should be composed of competent members, preferably men experienced in engineering or construction work of a nature similar to the flood protection works. The committee must be given broad authority to carry out its responsibilities. The name, address, and office and home telephone numbers of the Superintendent, and any changes thereof, shall be promptly furnished the Division Engineer.

"(3) A reserve supply of materials needed during a flood emergency shall be kept on hand at all times."

Three men should be available to meet any ordinary emergency that may occur during flood periods. Borrow pits for embankment gravel and rock materials should be secured and sources of additional supplies of materials, tools, and equipment should be well established in order that these articles can be obtained quickly in case of an emergency.

"(4) No encroachment or trespass which will adversely affect the efficient operation or maintenance of the project works shall be permitted upon the rights-of-way for the protective facilities".

The disposal of rubbish, erection of fenc es, or barriers, or any form of trespassing on the project shall be prohibited.

"(5) No improvement shall be passed over, under, or through the walls, levees, improved channels or floodways, nor shall any excavation or construction be permitted within the limits of the project right-of-way, nor shall any change be made in any feature of the works without prior determination by the District Engineer of the War Department or his authorized representatives that such improvement, excavation, construction, or alteration will not adversely affect the functioning of the protective facilities. Such improvements or alterations as may be desirable and permissible under the above determination shall be constructed in accordance with standard engineering practice. Advice regarding the effect of proposed improvements or alterations on the functioning of the project and information concerning methods of construction acceptable under standard engineering practice shall be obtained from the District Engineer or, if otherwise obtained, shall be submitted for his approval. Drawings, or prints showing such improvements or alterations as finally constructed shall be furnished the District Engineer after completion of the work."

Any contemplated improvements or alterations as outlined above must be submitted to the U. S. Army Engineer Division, Waltham, Massachusetts, Attention: Operations Division, and the approval of the Division Engineer obtained prior to the State authorizing work. All requests for approval shall be in writing and complete drawings in duplicate, one set of which shall be in reproducible form, must be submitted along with a full description of the work intended. The State shall furnish the Division Engineer "as-built" drawings, in duplicate, of the completed work.

"(6) It shall be the duty of the Superintendent to submit a semi-annual report to the District Engineer covering inspection, maintenance, and operation of the protective works."

See paragraph 13 of this manual for instructions on submitting reports.

"(7) The District Engineer or his authorized representatives shall have access at all times to all portions of the protective works."

Qualified representatives of the Division Engineer will make semi-annual inspections in Spring and Fall of the protective works to determine if the project is being properly operated and maintained by the State. "Follow-up" inspections, when necessary, will be made to determine if deficiencies observed during the semi-annual inspections have been corrected. A report with the results of each inspection will be furnished to the State for appropriate action.

"(8) Maintenance measures or repairs which the District Engineer deems necessary shall be promptly taken or made."

The State should maintain the facilities and keep them in good repair and not wait for the Division Engineer to call such matters to its attention. Upon request, the Division Office will advise the State how to make any major repairs to the facilities.

"(9) Appropriate measures shall be taken by local authorities to insure that the activities of all local organizations operating public or private facilities connected with the protective works are coordinated with those of the Superintendent's organization during flood periods.

"(10) The War Department will furnish local interests with an Operation and Maintenance Manual for each completed project, or separate useful part thereof, to assist them in carrying out their obligations under these regulations."

The flood control committee should familiarize itself with the contents of this manual. The State authorities are encouraged to call on the Division Office of the Corps of Engineers for any additional advice or instructions required by them in carrying out the State's obligations for maintaining and operating the flood protection facilities.

11. MAINTENANCE

(a) The word "maintenance" as used in this manual applies to the upkeep, repair and care of the work constructed by the United States and turned over to the State of Connecticut. If the work is neglected, there will be deterioration and possible failure in flood time when there is dire need of dependable protection.

(b) Satisfactory and dependable operation depends on constant maintenance. The organization that performs maintenance must be familiar with various parts of the system and will be in a position to use them effectively in time of stress.

(c) Maintenance includes regular inspection of the entire system. The purpose of an inspection is to detect any deterioration or faulty operation that indicates a need for repair or replacement. This does not mean a casual automobile trip to places easily accessible, but actually walking over every part of the system.

(d) In addition to inspection, dam equipment and gates require testing at stated intervals to discover the difficulties that may develop or the part that will not work when it should.

(e) Each of the major features of the project is discussed separately. Particular emphasis is placed on those points which, based on experience with special project features, require special attention.

12. OPERATION

No flood control operation is required as the dam will operate as an automatic detention basin with flood flows, exceeding the capacity of the conduit under varying heads, being stored in the reservoir. The sluice gate bottom lip is set at a one foot opening. The one foot gate opening will not be changed without the approval of the Reservoir Control Center. Operation in this manual refers to the actual use of the various features of the protective works during flood periods. It is intended that the procedure outlined herein will

be sufficient to insure optimum protection from floods. Advice relative to the project may be obtained at any time from the Reservoir Control Center of the New England Division Office (Telephone No. 617-894-2400, Ext. 627).

The National Weather Service maintains the River Forecast Center at Hartford, Connecticut, and is the official agency for issuing flood warnings and flood forecasts in the Farmington River Basin. Arrangements should be made with the River Forecast Center, 135 High Street, Hartford, Connecticut 06101 (Telephone No. 203-244-2014) to keep informed on flood predictions.

13. INSPECTION AND REPORTS

The regulations prescribed by the Secretary of the Army require semi-annual reports be submitted by the Superintendent to the Division Engineer, covering inspection, maintenance and operation. This requirement will be enforced by the Division Engineer. Inspection of the flood protective facilities shall be made during and following floods, and at intervals not exceeding 90 days as required by the regulations.

To assist the Superintendent in making his inspection and reports, a check list has been prepared and is enclosed in Appendix C. Also enclosed in Appendix C is NED Form 513, to be accomplished at 90 day intervals and submitted with the semi-annual report. Additional copies of NED Form 513 are available from the Division Engineer.

The semi-annual reports shall be submitted in triplicate to the Division Engineer, ATTN: Operations Division, each February and August. The reports will be submitted in letter form with copies of the inspection forms covering the inspections made during the period of the report. The reports shall cover the following points:

(a) A description of the maintenance work performed in the preceding six months.

(b) The number and classification of men working on maintenance, regularly and intermittently.

(c) Description of any work performed by contract on the repair or improvement of the project.

(d) Description of use or operation of the system during the period being reported.

(e) Suggestions relative to public cooperation and comments concerning public sentiment on the protection obtained are considered pertinent and desirable data for inclusion in the report, but such data is not required.

B. DAM AND APPURTENANT STRUCTURES

14. DESCRIPTION

The dam, located on Sucker Brook about 400 feet upstream of its confluence with Highland Lake, is composed of a compacted earth fill embankment 1,160 feet in length and having a maximum height of 68 feet above stream bed at centerline of dam. (See Appendix, Plate D-1 relative to pertinent data). The top elevation is at 949.0 feet above m.s.l. which provided for a 9.8-foot spillway surcharge and a 4.8-foot freeboard. The top surface of the dam is 20 feet, accommodating a 16-foot gravel surface roadway. The upstream slope is 1 vertical on 3 horizontal below service road and 1 vertical on 2.5 horizontal. The embankment slopes, both upstream and downstream, are protected by a layer of rock protection over gravel bedding. Seepage through the foundation soil is controlled by the impervious foundation cutoff to bedrock and a sand fill foundation drain. Seepage through the foundation bedrock is controlled by a grout curtain. The embankment consists of downstream and upstream zones of rock protection on gravel bedding, compacted impervious, pervious and random fill zones, and a sand fill horizontal drainage blanket.

Access to the top of dam is from relocated Sucker Brook Road on the left abutment. A paved parking area is provided adjacent to the dam. A service road leads from the right abutment to the inlet structure. Chain link fences, 4 feet high, are constructed around parking area and along both sides of spillway intake and discharge channels and with a 12-foot gate across top of dam adjacent to parking area. A log boom is located upstream of the dam and staff gages are installed along the slope of dam on the left abutment.

The outlet works is located near the left abutment and under the dam and consists of an intake channel, an inlet structure, a conduit (with permanently set gate) largely founded on rock under the dam, an outlet structure, and an outlet channel, meeting the spillway discharge channel. The flood control project was designed so as not to require operation of the sluice gate druing floods. The inlet channel is 11.5 feet wide and 1,015 feet long with bottom elevation at 880 feet, m.s.l. The inlet structure contains trash bars and discharges into the gated conduit with the gate locked at a one-foot opening.

The inlet and outlet structures are of reinforced concrete. The conduit is of reinforced concrete, is located under the dam, and is 3 feet by 3 feet square, (inside dimension) and approximately 426 feet in length with upstream invert of 881.0 feet m.s.l. and slopes about 0.12 percent. The outlet channel is 14 feet wide and 216 feet in length and slopes to elevation 876.0 in 216 feet at which point it flows into the spillway discharge channel.

The 3' x 3' concrete conduit was considered to be the minimum practical size for inspection and maintenance purposes. However, a conduit of this size would be too large for effective flood control. Therefore a gate located at the upstream end of the conduit and locked in a partial opening of 1 foot was found to meet the necessary discharge design criteria and has been adopted for use.

The spillway is a chute type located in left abutment. The weir is an ogee shaped concrete structure founded on rock at the high point in the approach channel. The length of the weir is 60 feet with the top at elevation 935.0 feet, m.s.l. The height of the weir above the maximum elevation of approach channel is 5 feet. The approach channel slopes down into the reservoir at 1.0 percent grade for drainage. The spillway chute or discharge channel, excavated in rock is 704 feet in length, and slopes from elevation 930.0 at the weir to elevation 9.0 in 302 feet, and from there to invert elevation 876.0 in 209 feet at which point it runs level for about 209 feet and passes under Wakefield Boulevard in dual 72-inch B.C.C.M.P. culverts for a distance of about 86 feet, at which point the channel discharges into Highland Lake. A description of the fish ladder is included under Appendix E.

A bubble-type recording gage is installed in the Bubble Gage Shelter for reading and recording reservoir stages. The Bubble Gage Shelter is a concrete structure constructed adjacent to the upstream edge of the top of the dam. The recording gage is connected to the upstream face of the inlet structure by means of a 3/8" polyethylene tubing inside a 2-inch galvanized pipe which is embedded in the gravel bedding layer of the dam and the concrete inlet structure.

As part of the general contract, about 1/4 mile of Sucker Brook Road has been relocated and crosses the spillway discharge channel. The bridge is of reinforced concrete design with prestressed beams and poured concrete deck and curbs. The bridge provides a roadway of 28 feet and is approximately 86 feet in length.

A small brook which drains the southernmost part of the watershed and previously entered Sucker Brook just upstream of Wakefield

Boulevard has been relocated and now enters Sucker Brook upstream of the dam. The relocation includes a diversion dike, concrete inlet and outlet structure, a 550-foot long, 48-inch C.M. pipe conduit, and an outlet channel. The upper end of the relocated channel is designed to carry a flow of about 750 c.f.s; this conservative design was considered essential as the dam is located just below the upper end of the relocated channel and any channel overflow would present a threat to the dam embankment.

A water service line consisting of 14-inch cast iron pipe complete with valve and valve box diverts water during summer months from the outstructure to original Sucker Brook downstream of dam. (See Paragraph 15b (9) below). The stop logs will be installed by the State of Connecticut in the structure to provide the necessary water for diversion. When the water diversion is not required, the stop logs shall be removed. The stop logs, when not in use, will be stored by the State of Connecticut.

15. MAINTENANCE AND INSPECTION

All inspection and maintenance by State of Connecticut unless otherwise stated.

a. Dam and Brook Relocation Diversion Dike and Road Embankments.

(1) Slopes. (Cover Rock and Grass) - The slopes of the dam, including other structures protected by rock protection, must be carefully watched for settlement or erosion. Slopes shall be kept free of debris; rock protection slopes shall be kept free of vegetation.

Burrowing animals constitute a hazard to any embankment. Although there is little probability of rodent holes beneath a layer of rock protection placed on gravel bedding, the Superintendent should watch for rodents along the slopes and destroy them. Gravel slopes shall be maintained in a smooth even plane. Grassed slopes shall be moved three or four times a year in order to maintain a good sod.

(2) Gutters and Ditches. - These shall be kept in effective condition with displaced rock promptly replaced. Principal hazard is from erosion at edges, caused by flows beyond the capacity of the gutter. Failure is progressive and rapid.

(3) Retaining Walls. - In the instances where the slopes are confined by a retaining wall, it shall be inspected monthly with inspections progressively increased to daily when the pool level is

equal to half the height of the dam. Any movement, cracks or seepages through or around the wall must be noted, promptly reported, and corrected.

(4) Inspection During Floods. -

(a) The behavior of the dam during floods is of vital importance and interest. Periods of storage are the times of danger and, if weaknesses develop, it is essential that they be noted and prompt corrective action taken. The Superintendent must recognize that a condition which is of minor importance with a relatively low head may assume serious proportions with increasing pool levels, and he must be constantly alert to note, report, and correct even minor failures or changes in the conditions of the embankment. Results of a single careful inspection of the embankment during a flood can be more significant and valuable than a great number of equally careful inspections when the embankment is not impounding water.

(b) When the reservoir is filling or storing water, the Superintendent will inspect the exposed faces of the dam with particular attention to the downstream face, the dam abutments and the area adjacent to downstream face of dam for "springs", sand boils, subsidence, sloughing of embankment or abutments, or other indication of leakage through, around, or under the dam. Any evidence of leakage or movement of material shall be reported immediately, particularly where leakage, even though slight, appears to develop at an increasing rate.

(c) When the reservoir is being drawn down, the Superintendent will inspect the exposed faces of the dam, with particular attention to the upstream face and abutments for slides or indications of incipient slides.

(d) During the first filling of the reservoir during flood periods, and each time the reservoir is filled to a higher level than previously experienced, inspection of the downstream area shall be particularly detailed and conducted at least twice daily and at least three times weekly until two weeks after completion of drawdown. During subsequent filling, storage and drawdown periods, inspections of the embankment may be conducted less frequently, but when the water is within 15 feet of the top of the spillway, never less than once a day during filling and storage nor once a week during drawdown.

b. Outlet Works and Spillway.

(1) Concrete. - The concrete structures, including 3' x 3' conduit, shall be carefully inspected at intervals of six months and after each major filling operation. The inspection shall include a survey of the general conditions of the concrete surfaces, noting location and extent of cracks, crazing and spalling, and other types of deterioration or disintegration that may have developed. Surfaces adjacent to cracks shall be inspected for differential movement; similar inspections shall be made of construction and expansion joints. Any point or points of leakage will be noted and the condition of all water passages inspected for evidence of erosion or cavitation. The exposed portion of embedded items and the concrete adjacent thereto shall be carefully inspected. Any condition requiring or suspected to require corrective action shall be brought to the attention of the Division Engineer immediately. The inspection shall be made a matter of record with report submitted to the Division Engineer, including a sketch showing the location and nature of the defects.

(2) Rock Protection. - Rock shall be kept free from debris and vegetation; dislodged rock must be promptly replaced.

(3) Grassed Slopes. - Monthly inspections shall be made of all grassed slopes and other grassed areas to note subsidences, slides, erosions, etc. All grassed areas shall be mowed at least three or four times a year. On many areas it will be necessary to mow two or more times a year to keep up the appearance and discourage the growth of weeds. When necessary to reestablish turf, the seeding operation will start at the earliest practicable date in the spring or fall to obtain the greatest possible protection against erosion. Areas requiring seeding shall be dressed to proper grade, and irregularities in the surface removed. The surface should then be raked or harrowed parallel to the contour of the slope (never up and down) to a depth of three quarters of an inch. Debris shall always be removed promptly; deposits of debris are unsightly, detrimental to growth of grass and encourage the nesting of rats and other burrowing animals.

(4) Trash Racks. - When the flow through the trash racks is at a minimum in the summer, trash racks, including racks at brook relocation intake structure, shall be inspected and repainted as required. All debris collecting at the racks shall be removed.

(5) Log Boom. - Log boom shall be inspected monthly for broken logs, or evidences of rot near the holes that contain the ends of the boom chains, damaged cables, or chains, etc. When

operating during large inflows into the reservoir, the log boom will be under stress and must be at full strength at all times. Spare boom logs shall be available. All debris collecting behind this log boom shall be removed during inspection and especially after large inflows into the reservoir.

(6) Gages. (Excluding Recording) - Staff gages shall be inspected every spring and fall to insure that they are securely fastened, clean and otherwise in usable condition. When necessary, they will be removed, repainted and reset by the Superintendent. In the case of disturbance by drift or from other causes, the gage will be reestablished or checked by leveling, and the leveling notes made a matter of record. Complete check of the leveling of the several sections shall be accomplished by survey parties. Elevations will be taken to 0.01 feet; determinations will be made by two bench marks free from any disturbance.

(7) Gages. (Recording only) - The maintenance and operation of the pool recorder will be the responsibility of the U.S. Geological Survey in Hartford, Connecticut. The recording pool charts will be changed by the U.S. Geological Survey during the first week of each month and forwarded to the Reservoir Control Center, New England Division, Corps of Engineers. From these charts, the Reservoir Control Center will prepare monthly reports of reservoir regulation for the Sucker Brook project. Copies of the monthly reports will be furnished to the State of Connecticut. To help insure a continuous record, however, the State shall visit the bubble gage shelter during its periodic inspections of the dam to see that the recording instruments are functioning properly; that is, the pen is inking properly, the chart has not stopped, and the readings on the counter indicator and pool chart agree with the outside staff gage reading. The U.S. Geological Survey Office in Hartford should be informed about any discrepancies in the stage readings or if the recorder appears to be operating improperly. Due to the complex nature of this recording instrument, adjustments should be made by U.S.G.S. personnel only.

(8) Fences. - Fences will be painted when determined to be necessary by the Division Engineer.

(9) Stop Log Structure. - The purpose of the stop log structure is to provide a pool of water in the outlet works in order to divert water through the 14-inch water service pipe during summer months to original Sucker Brook stream bed downstream of the dam. The installation of the 3-foot long logs in the smaller opening section up to El. 883 will be sufficient. The timing of installation

and removal of these stop logs must be coordinated with the Connecticut Board of Fisheries and Game for passage of fish for spawning during both the spring and fall months from Highland Lake up Sucker Brook. Some species of fish (rainbow trout) spawn in the spring; other species (brown trout and kokanee salmon) spawn in the fall. The logs must not be placed until spring spawning is over and shall be removed prior to fall spawning. Placing and removal of logs will be by the State of Connecticut. The stop logs shall be inspected during installation and removal operation.

c. Outlet Works and Gate Operating Equipment.

(1) A careful inspection of the entire outlet works should be made twice a year. Notes should be made of observations, such as cracks in the masonry or concrete, spalling of the concrete, etc. The trash rack is a movable type and is normally locked in position.

(2) All metal work on equipment, gratings, railings, ladders, etc., shall be kept neatly painted.

(3) Gate and Guides.

(a) The gate and hoist shall be thoroughly lubricated every six months, or more often if required. The gate is locked at a one-foot opening with stop collars. The operating handle for the gate hoist is stored in the Bubble Gage Shelter.

(b) All rusted metal on the gate shall be thoroughly wire-brushed and spot painted at periodic intervals with approved paint.

d. Water Service Pipe. - Valve which controls flow will be checked for easy operation every three months. Cage at pipe inlet will be cleaned each spring prior to installing stop logs. For diversion see Paragraph b.(9) above.

e. Access Roads.

(1) Surfacing. - Roads, including relocated Sucker Brook Road and parking area will be resurfaced periodically with the type of wearing surface with which roads were originally constructed. The Superintendent will be responsible for keeping surfaces of paved roads sealed by application of a bituminous material.

(2) Slopes. - Slopes will be kept in a well maintained condition as outlined for slopes under b.(3).

(3) Drainage. - Culverts, including Wakefield Boulevard culverts and the brook relocation conduit, and gutters shall be kept cleaned out at all times. Partially collapsed gutters shall be replaced in the working season following failure. In the winter, openings shall be made in the snow on all grades at frequent intervals, to permit water to run into the ditches.

f. Fish Ladder. See Appendix E.

g. Reservoir Area.

(1) Roads. - Roads that may exist in the reservoir area will be kept open and in passable shape to the extent practicable, but particularly in the season of forest fires in order that they may be used for fire fighting and inspections. Holes and bad ruts will be filled in, and brook crossings kept in repair. Brush will be kept trimmed back and, if possible, cut back in a sufficient distance so that a swath may be cut on each side of the road with a tractor once a year to prevent the growth of brush.

(2) Fires. - During times when there is a danger of forest fires, the Superintendent shall be on the alert for fires in the reservoir.

(3) Removal of Dead and Down Timber. - The reservoir area, particularly in the lower levels, will be kept cleared of all down and dead timber.

16. SUCKER BROOK ROAD BRIDGE

a. Description.

On the relocated Sucker Brook Road there is a bridge crossing the spillway discharge channel. The highway structure was designed and constructed by the Corps of Engineers and constructed as part of the dam project.

b. Maintenance.

Modifications to the structure which could encroach on clearance should be coordinated with the Division Engineer. This bridge will be maintained by the State of Connecticut.

c. Operation.

During a flood, observations for debris should be made at the bridge. Equipment should be available within reasonable time and distance to assist in debris removal where necessary.

17. OPERATION PLAN

a. Project Operations.

A considered and practical plan for maintenance and surveillance of project should be in readiness at all times. The project operates automatically at all times, including during floods.

b. Cooperation.

Representatives of the Division Engineer stand ready to assist the State in the operation of the project. This in no way lessens the responsibility of the State of Connecticut in operating the project.

APPENDIX A

Regulations Prescribed by the
Secretary of the Army

TITLE 33—NAVIGATION AND NAVIGABLE WATERS

Chapter II—Corps of Engineers, War Department

PART 208—FLOOD CONTROL REGULATIONS

MAINTENANCE AND OPERATION OF FLOOD CONTROL WORKS

Pursuant to the provisions of section 3 of the Act of Congress approved June 22, 1936, as amended and supplemented (49 Stat. 1571; 50 Stat. 877; and 55 Stat. 638; 33 U. S. C. 701c; 701c-1), the following regulations are hereby prescribed to govern the maintenance and operation of flood control works:

§ 208.10 *Local flood protection works; maintenance and operation of structures and facilities*—(a) *General.* (1) The structures and facilities constructed by the United States for local flood protection shall be continuously maintained in such a manner and operated at such times and for such periods as may be necessary to obtain the maximum benefits.

(2) The State, political subdivision thereof, or other responsible local agency, which furnished assurance that it will maintain and operate flood control works in accordance with regulations prescribed by the Secretary of War, as required by law, shall appoint a permanent committee consisting of or headed by an official hereinafter called the "Superintendent," who shall be responsible for the development and maintenance of, and directly in charge of, an organization responsible for the efficient operation and maintenance of all of the structures and facilities during flood periods and for continuous inspection and maintenance of the project works during periods of low water, all without cost to the United States.

(3) A reserve supply of materials needed during a flood emergency shall be kept on hand at all times.

(4) No encroachment or trespass which will adversely affect the efficient operation or maintenance of the project works shall be permitted upon the rights-of-way for the protective facilities.

(5) No improvement shall be passed over, under, or through the walls, levees, improved channels or floodways, nor shall any excavation or construction be permitted within the limits of the project right-of-way, nor shall any change be made in any feature of the works without prior determination by the District Engineer of the War Department or his authorized representative that such improvement, excavation, construction, or alteration will not adversely affect the functioning of the protective facilities. Such improvements or alterations as may be found to be desirable and permissible under the above determination shall be constructed in accordance with standard engineering practice. Advice regarding the effect of proposed improvements or alterations on the functioning of the project and information concerning methods of construction acceptable under standard engineering practice shall be obtained from the District Engineer or, if otherwise obtained, shall be submitted for his approval. Drawings or prints showing such improvements or alterations as finally constructed shall be furnished the District Engineer after completion of the work.

(6) It shall be the duty of the superintendent to submit a semiannual report to the District Engineer covering inspection, maintenance, and operation of the protective works.

(7) The District Engineer or his authorized representatives shall have access at all times to all portions of the protective works.

(8) Maintenance measures or repairs which the District Engineer deems necessary shall be promptly taken or made.

(9) Appropriate measures shall be taken by local authorities to insure that the activities of all local organizations operating public or private facilities connected with the protective works are coordinated with those of the Superintendent's organization during flood periods.

(10) The War Department will furnish local interests with an Operation and Maintenance Manual for each completed project, or separate useful part thereof, to assist them in carrying out their obligations under these regulations.

(b) *Levees*—(1) *Maintenance.* The Superintendent shall provide at all times such maintenance as may be required to insure serviceability of the structures in time of flood. Measures shall be taken to promote the growth of sod, exterminate burrowing animals, and to provide for routine mowing of the grass and weeds, removal of wild growth and drift deposits, and repair of damage caused by erosion or other forces. Where practicable, measures shall be taken to retard bank erosion by planting of willows or other suitable growth on areas riverward of the levees. Periodic inspections shall be made by the Superintendent to insure that the above maintenance measures are being effectively carried out and, further, to be certain that:

(i) No unusual settlement, sloughing, or material loss of grade or levee cross section has taken place;

(ii) No caving has occurred on either the land side or the river side of the levee which might affect the stability of the levee section;

(iii) No seepage, saturated areas, or sand boils are occurring;

(iv) Toe drainage systems and pressure relief wells are in good working condition, and that such facilities are not becoming clogged;

(v) Drains through the levees and gates on said drains are in good working condition;

(vi) No revetment work or riprap has been displaced, washed out, or removed;

(vii) No action is being taken; such as burning grass and weeds during inappropriate seasons, which will retard or destroy the growth of sod;

(viii) Access roads to and on the levee are being properly maintained;

(ix) Cattle guards and gates are in good condition;

(x) Crown of levee is shaped so as to drain readily, and roadway thereon, if any, is well shaped and maintained;

(xi) There is no unauthorized grazing or vehicular traffic on the levees;

(xii) Encroachments are not being made on the levee right-of-way which might endanger the structure or hinder its proper and efficient functioning durin times of emergency.

Such inspections shall be made immediately prior to the beginning of the flood season; immediately following each major high water period, and otherwise at intervals not exceeding 90 days; and such intermediate times as may be necessary to insure the best possible care of the levee. Immediate steps will be taken to correct dangerous conditions disclosed by such inspections. Regular maintenance repair measures shall be accomplished during the appropriate season as scheduled by the Superintendent.

(2) *Operation.* During flood periods the levee shall be patrolled continuously to locate possible sand boils or unusual wetness of the landward slope and to be certain that:

(i) There are no indications of slides or sloughs developing;

(ii) Wave wash or scouring action is not occurring;

(iii) No low reaches of levee exist which may be overtopped;

(iv) No other conditions exist which might endanger the structure.

Appropriate advance measures will be taken to insure the availability of adequate labor and materials to meet all contingencies. Immediate steps will be taken to control any condition which endangers the levee and to repair the damaged section.

(c) *Flood walls.*—(1) *Maintenance.* Periodic inspections shall be made by the Superintendent to be certain that:

(i) No seepage, saturated areas, or sand boils are occurring;

(ii) No undue settlement has occurred which affects the stability of the wall or its water tightness;

(iii) No trees exist, the roots of which might extend under the wall and offer accelerated seepage paths;

(iv) The concrete has not undergone cracking, chipping, or breaking to an extent which might affect the stability of the wall or its water tightness;

(v) There are no encroachments upon the right-of-way which might endanger the structure or hinder its functioning in time of flood;

(vi) Care is being exercised to prevent accumulation of trash and debris adjacent to walls, and to insure that no fires are being built near them;

(vii) No bank caving conditions exist riverward of the wall which might endanger its stability;

(viii) Toe drainage systems and pressure relief wells are in good working condition, and that such facilities are not becoming clogged.

Such inspections shall be made immediately prior to the beginning of the flood season, immediately following each major high water period, and otherwise at intervals not exceeding 90 days. Measures to eliminate encroachments and effect repairs found necessary by such inspections shall be undertaken immediately. All repairs shall be accomplished by methods acceptable in standard engineering practice.

(2) *Operation.* Continuous patrol of the wall shall be maintained during flood periods to locate possible leakage at monolith joints or seepage underneath the wall. Floating plant or boats will not be allowed to lie against or tie up to the wall. Should it become necessary during a flood emergency to pass anchor cables over the wall, adequate measures shall be taken to protect the concrete and construction joints. Immediate steps shall be taken to correct any condition which endangers the stability of the wall.

(d) *Drainage structures*—(1) *Maintenance.* Adequate measures shall be taken to insure that inlet and outlet channels are kept open and that trash, drift, or debris is not allowed to accumulate near drainage structures. Flap gates and manually operated gates and valves on

drainage structures shall be examined, oiled, and trial operated at least once every 90 days. Where drainage structures are provided with stop log or other emergency closures, the condition of the equipment and its housing shall be inspected regularly and a trial installation of the emergency closure shall be made at least once each year. Periodic inspections shall be made by the Superintendent to be certain that:

(i) Pipes, gates, operating mechanism, riprap, and headwalls are in good condition;

(ii) Inlet and outlet channels are open;

(iii) Care is being exercised to prevent the accumulation of trash and debris near the structures and that no fires are being built near bituminous coated pipes;

(iv) Erosion is not occurring adjacent to the structure which might endanger its water tightness or stability.

Immediate steps will be taken to repair damage, replace missing or broken parts, or remedy adverse conditions disclosed by such inspections.

(2) *Operation.* Whenever high water conditions impend, all gates will be inspected a short time before water reaches the invert of the pipe and any object which might prevent closure of the gate shall be removed. Automatic gates shall be closely observed until it has been ascertained that they are securely closed. Manually operated gates and valves shall be closed as necessary to prevent inflow of flood water. All drainage structures in levees shall be inspected frequently during floods to ascertain whether seepage is taking place along the lines of their contact with the embankment. Immediate steps shall be taken to correct any adverse condition.

(e) *Closure structures*—(1) *Maintenance.* Closure structures for traffic openings shall be inspected by the superintendent every 90 days to be certain that:

(i) No parts are missing;

(ii) Metal parts are adequately covered with paint;

(iii) All movable parts are in satisfactory working order,

(iv) Proper closure can be made promptly when necessary;

(v) Sufficient materials are on hand for the erection of sand bag closures and that the location of such materials will be readily accessible in times of emergency.

Tools and parts shall not be removed for other use. Trial erections of one or more closure structures shall be made once each year, alternating the structures chosen so that each gate will be erected at least once in each 3-year period. Trial erection of all closure structures shall be made whenever a change is made in key operating personnel. Where railroad operation makes trial erection of a closure structure infeasible, rigorous inspection and drill of operating personnel may be substituted therefor. Trial erection of sand bag closures is not required. Closure materials will be carefully checked prior to and following flood periods, and damaged or missing parts shall be repaired or replaced immediately.

(2) *Operation.* Erection of each movable closure shall be started in sufficient time to permit completion before flood waters reach the top of the structure sill. Information regarding the proper method of erecting each individual closure structure, together with an estimate of the time required by an experienced crew to complete its erection will be given in the Operation and Maintenance Manual which will be furnished local interests upon completion of the project. Closure structures will be inspected frequently during flood periods to ascertain that no undue leakage is occurring and that drains provided to care for ordinary leakage are functioning properly. Boats or floating plant shall not be allowed to tie up to closure structures or to discharge passengers or cargo over them.

(f) *Pumping plants*—(1) *Maintenance.* Pumping plants shall be inspected by the Superintendent at intervals not to exceed 30 days during flood seasons and 90 days during off-flood seasons to insure that all equipment is in order for instant use. At regular intervals, proper measures shall be taken to provide for cleaning plant, buildings, and equipment, repainting as necessary, and lubricating all machinery Adequate supplies of lubricants for all types of machines, fuel for gasoline or diesel powered equipment, and flash lights or lanterns for emergency lighting shall be kept on hand at all times. Telephone service shall be maintained at pumping plants. All equipment, including switch gear, transformers, motors, pumps, valves, and gates shall be trial operated and checked at least once every 90 days. Megger tests of all insulation shall be made whenever wiring has been subjected to undue dampness and otherwise at intervals not to exceed one year. A record shall be kept showing the results of such tests. Wiring disclosed to be in an unsatisfactory condition by such tests shall be brought to a satisfactory condition or shall be promptly replaced. Diesel and gasoline engines shall be started at such intervals and allowed to run for such length of time as may be necessary to insure their serviceability in times of emergency. Only skilled electricians and mechanics shall be employed on tests and repairs. Operating personnel for the plant shall be present during tests. Any equipment removed from the station for repair or replacement shall be returned or replaced as soon as practicable and shall be trial operated after reinstallation. Repairs requiring removal of equipment from the plant shall be made during off-flood seasons insofar as practicable.

(2) *Operation.* Competent operators shall be on duty at pumping plants whenever it appears that necessity for pump operation is imminent. The operator shall thoroughly inspect, trial operate, and place in readiness all plant equipment. The operator shall be familiar with the equipment manufacturers' instructions and drawings and with the "Operating Instructions" for each station. The equipment shall be operated in accordance with the above-mentioned "Operating Instructions" and care shall be exercised that proper lubrication is being supplied all equipment, and that no overheating, undue vibration or noise is occurring. Immediately upon final recession of flood waters, the pumping station shall be thoroughly cleaned, pump house sumps flushed, and equipment thoroughly inspected, oiled and greased. A record or log of pumping plant operation shall be kept for each station, a copy of which shall be furnished the District Engineer following each flood.

(g) *Channels and floodways* — (1) *Maintenance.* Periodic inspections of improved channels and floodways shall be made by the Superintendent to be certain that:

(i) The channel or floodway is clear of debris, weeds, and wild growth;

(ii) The channel or floodway is not being restricted by the depositing of waste materials, building of unauthorized structures or other encroachments;

(iii) The capacity of the channel or floodway is not being reduced by the formation of shoals;

(iv) Banks are not being damaged by rain or wave wash, and that no sloughing of banks has occurred;

(v) Riprap sections and deflection dikes and walls are in good condition;

(vi) Approach and egress channels adjacent to the improved channel or floodway are sufficiently clear of obstructions and debris to permit proper functioning of the project works.

Such inspections shall be made prior to the beginning of the flood season and otherwise at intervals not to exceed 90 days. Immediate steps will be taken to remedy any adverse conditions disclosed by such inspections. Measures will be taken by the Superintendent to promote the growth of grass on bank slopes and earth deflection dikes. The Superintendent shall provide for periodic repair and cleaning of debris basins, check dams, and related structures as may be necessary.

(2) *Operation.* Both banks of the channel shall be patrolled during periods of high water, and measures shall be taken to protect those reaches being attacked by the current or by wave wash. Appropriate measures shall be taken to prevent the formation of jams of ice or debris. Large objects which become lodged against the bank shall be removed. The improved channel or floodway shall be thoroughly inspected immediately following each major high water period. As soon as practicable thereafter, all snags and other debris shall be removed and all damage to banks, riprap, deflection dikes and walls, drainage outlets, or other flood control structures repaired.

(h) *Miscellaneous facilities* — (1) *Maintenance.* Miscellaneous structures and facilities constructed as a part of the protective works and other structures and facilities which function as a part of, or affect the efficient functioning of the protective works, shall be periodically inspected by the Superintendent and appropriate maintenance measures taken. Damaged or unserviceable parts shall be repaired or replaced without delay. Areas used for ponding in connection with pumping plants or for temporary storage of interior run-off during flood periods shall not be allowed to become filled with silt, debris, or dumped material. The Superintendent shall take proper steps to prevent restriction of bridge openings and, where practicable, shall provide for temporary raising during floods of bridges which restrict channel capacities during high flows.

(2) *Operation.* Miscellaneous facilities shall be operated to prevent or reduce flooding during periods of high water. Those facilities constructed as a part of the protective works shall not be used for purposes other than flood protection without approval of the District Engineer unless designed therefor. (49 Stat. 1571, 50 Stat. 877; and 55 Stat. 638; 33 U.S.C. 701c; 701c-1) (Regs. 9 August 1944, CE SPEWF)

[SEAL] J. A. ULIO,
Major General,
The Adjutant General.

[F. R. Doc. 44-12285; Filed, August 16, 1944; 9:44 a. m.]

APPENDIX B

Assurance of Local Cooperation
Assurance of the Water Resources Commission
State of Connecticut

ASSURANCE
OF THE
STATE OF CONNECTICUT
SUCKER BROOK DAM AND RESERVOIR

WHEREAS, the project for the improvement of Farmington River and tributaries is authorized by Act of Congress approved July 14, 1960, Public Law 86-645, substantially in accordance with plans and recommendations of the Chief of Engineers and House Document No. 443, 86th Congress; and

WHEREAS, said authorization includes the construction of a reservoir on Sucker Brook in the State of Connecticut about 400 feet above its confluence with Highland Lake in the Town of Winchester, Connecticut, for flood control, generally in accordance with plans accompanying said House Document No. 443 and

WHEREAS, said improvement is authorized subject to the condition that prior to construction responsible local interests will furnish certain assurances satisfactory to the Secretary of the Army; and

WHEREAS, local interests desiring the prosecution of the project are agreeable that the required assurances be executed;

NOW, THEREFORE, the State of Connecticut, acting by and through its Water Resources Commission, hereby assures the Secretary of the Army that it will:

(1) Provide without cost to the United States all lands, easements, and rights-of-way necessary for the construction of the project;

(2) Hold and save the United States free from damages due to the construction works;

(3) Maintain and operate all the works after completion in accordance with regulations prescribed by the Secretary of the Army;

(4) Establish encroachment lines along Highland Lake Stream beyond which, in the direction of the waterway, no obstruction or encroachment shall be placed unless authorized by the Connecticut Water Resources Commission;

(5) Modify Highland Lake Dam in a manner satisfactory to the Chief of Engineers to provide additional flood protection for Winsted, Connecticut; and

(6) Assume at least 20% of the cost (except costs of planning, design, and acquisition of water rights) of the completed project allocated to the production of local flood control benefits, payable either as construction proceeds or pursuant to a contract providing for repayment with interest within 50 years. The actual cost, or fair market value of lands, easements, rights-of-way, and work performed or services rendered prior to completion of construction of the project which are furnished by a non-Federal entity, including the cost of Modification of Highland Lake Dam, as contemplated in Condition No. 5 above, shall be included in the project cost and in the share of the cost to be borne by the non-Federal entity.

(7) The following procedures will be utilized in connection with land acquisitions accomplished by the State:

a. Appraisal reports procured by the State pertaining to lands, easements, and rights-of-way to be acquired for the project shall be submitted to and be approved by the Division Engineer or the Chief, Real Estate Division before negotiations between owners and State are commenced.

b. Payments in excess of the approved, appraised values will not be made by the State until concurrence in such excess payments is received from the Division Engineer or the Chief, Real Estate Division.

IN WITNESS WHEREOF, the State of Connecticut, acting by and through its Water Resources Commission, has executed this Assurance this 22nd day of June, 1966.

STATE OF CONNECTICUT

Approved: As to form:

Deputy Attorney General

By Edward J. McDonough
CHAIRMAN

William A. Hess
DIRECTOR

MEMBER

ACCEPTANCE

30 June 1966

The within Assurance is hereby accepted for and on behalf of the United States of America.

REMI O. RENIER
Colonel, Corps of Engineers
Acting Division Engineer

FUNDS AVAILABLE

AUTHORIZED SIGNATURE

DATE 7/21/66

APPROVED BY DEPARTMENT OF
AGRICULTURE & NATURAL RESOURCES

Commissioner

APPROVED BY DEPARTMENT OF
FINANCE AND CONTROL

Commissioner JUL 22 1966

This Assurance is prepared in accordance with the authority of the Water Resources Commission as stated in Section 25-80 of the 1963 Supplement to the General Statutes

APPENDIX C

Inspection Report Forms
and
Check List

LOCAL FLOOD PROTECTION PROJECT INSPECTION REPORT

Project:

aintaining Agency:

ype Inspection: _____Semi-Annual Staff ____90 Day Interim

iver Basin: Date of Inspection

Feature	Sat	Unsat	Deficiencies
PUMPING STATIONS - STRUCTURES			
NTERIOR			
XTERIOR			
PUMPS - MOTORS - ENGINES			
RIAL OPERATED			
ENERAL CONDITION			
OWER SOURCE			
NSULATION TESTS			
IETAL INTAKES/OUTLETS			
ATE VALVES			
GATES - DRAINAGE STRUCTURES			
RIAL OPERATED			
ENERAL CONDITION			
UBRICATION			
DIKES - DAMS			
ENERAL CONDITION			
LOPES/EROSION			
AND BOILS/CAVING			
RESPASSING			
LOPE PROTECTION			
RAINS			
STOP-LOGS - LOG BOOM			
ONDITION OF LOGS			
VAILABILITY OF LOGS			
IGHWAY SLOTS			
TORAGE FACILITIES			
CHANNELS - OUTLET WORKS CHANNEL			
ANKS			
BSTRUCTION CONTROL			

D FORM JAN. 66 513

Feature	Sat	Unsat	Deficiencies
CONCRETE STRUCTURES			
JRFACE			
ETTLEMENT			
OINTS			
RAINS			
MISCELLANEOUS			
MERGENCY OPER. PLAN			
MERGENCY EQUIPMENT			
EMI-ANNUAL REPORT			

Inspection Party:

Photographs Taken:

Remarks & Additional Comments:

(Indicate Here Observations, Discussions, Specific Feature Deficiencies, Recommendations and any other pertinent information. Use Continuation Sheet if necessary.)

ALL APPLICABLE ITEMS. IF UNSAT INDICATE SPECIFIC DEFICIENCIES. INDICATE IF NOT APPLICABLE.

ATE	INSPECTED BY: TYPED NAME & TITLE	SIGNATURE

FLOOD CONTROL WORKS
SUCKER BROOK DAM
INSPECTION REPORT

CHECK LIST

Use with NED Form 513 - Local Flood Protection Project Inspection Report

1. Pumping Stations Structures - mark Use for Bubble Gage Shelter

2. Pumps - Motors - Engines - mark N/A

3. Gates - Drainage Structures - Use for Sluice Gate

4. Dikes - Dams - Change to read "Dam and Brook Relocation Diversion Dike"

   a. General Condition

      (1) Slopes and top
      (2) Gutters and ditches
      (3) Relocated road embankments
      (4) Staff Gages
      (5) Chain link fencing
      (6) Parking area
      (7) 14" Cast Iron water service pipe and valve

   b. Side slopes - erosion
   c. Caving banks
   d. Sand boils
   e. Trespassing
   f. Rock protection

5. Stop Logs - Log Boom

   a. Condition of logs
   b. Availability of logs
   c. Condition of stop log slots
   d. Storage facilities
   e. Condition of log boom cable, chains and anchorage
   f. Removal of debris

6. Channels - Outlet Works Channel - (Applies to brook relocation, spillway and dam outlet works channels)

   a. Riprap - Change to Rock Protection
   b. Banks and side controls
   c. Obstruction control

7. Concrete Structures - Add "applies to intake and outlet structures for dam outlet works and for brook relocation, spillway weir and training walls"

   a. Surface deterioration
   b. Settlement or other movement
   c. Joints
   d. Spalling or cracking
   e. Drains and weep holes
   f. General condition of spillway channel, outlet work structures, and walls

8. Miscellaneous

   a. Condition of bridge - relocated Sucker Brook Road
   b. Sand bags
   c. Emergency equipment (gate operating handle and tools)
   d. Conduits - (Applies to dam conduit, brook diversion conduit, and culverts under Wakefield Blvd.)
   e. Trash racks (inlet structure, dam, and inlet structure brook relocation)

9. Remarks - Include any additional comments desired including:

   a. Have all deficiencies in previous inspection report been corrected?
   b. Has any high water been experienced since last inspection report?

APPENDIX D

PLANS

LIST OF PLATES

Plate No.	Description
D-1	Pertinent Data
D-2	Watershed Map
D-3	Area - Capacity Curves
D-4	Spillway Rating Curve & Crest Discharge Coefficient
D-5	Outlet Rating Curves
D-6	Modifications to Highland Lake Dam
D-7	Reservoir Map
D-8	General Plan
D-9	Outlet Works, Plan & Profile
D-10	Outlet Works, Inlet Structure
D-11	Outlet Works, Conduit, Plan & Sections No. 1
D-12	Outlet Works, Conduit, Plan & Sections No. 2
D-13	Outlet Works, Concrete Details
D-14	Wakefield Boulevard Culverts
D-15	Spillway, Profile & Sections
D-16	Spillway, Parking Area & Bridge, Plan & Sections
D-17	Brook Relocation, Plan, Profile & Sections
D-18	Brook Relocation, Inlet Structure
D-19	Brook Relocation, Outlet Structure
D-20	Bubble Gage Shelter

PERTINENT DATA
SUCKER BROOK DAM AND RESERVOIR

LOCATION	Sucker Brook, Winchester, Connecticut
DRAINAGE AREAS	Sucker Brook Dam 3.43 square miles Highland Lake Dam 7.0 square miles Highland Lake Stream 7.3 square miles

RESERVOIR STORAGES

	Flood Control Pool
Full Pool Elevation (ft, msl)	935.0
Capacity (acre-feet)	1,480
(inches)	8.1
Full Pool Area (acres)	53.5

EMBANKMENT FEATURES

Type	Rolled earth fill with rock slope protection
Length (ft)	1,160
Top Elevation (ft, msl)	949
Maximum Height (ft)	68
Top Width (ft)	20
Slopes	1 on 2.5 to 1 on 3

SPILLWAY FEATURES

Type	Chute spillway, ogee weir
Crest Length (ft)	60
Crest Elevation (ft, msl)	935.0

SPILLWAY DESIGN FLOOD

Peak Inflow (cfs)	6,500
Peak Outflow (cfs)	6,400
Maximum Surcharge (ft. above crest)	9.2 (El. 944.2) (1)

OUTLET WORKS

Type	Reinforced concrete
Size of Conduit	3'-0" x 3'-0"
Length of Conduit (ft)	426
Conduit Inlet Invert Elevation (ft, msl)	881.0
Number of Gates	None (2)
Capacity Discharge of Outlet Reservoir at Spillway Crest (cfs)	115
Downstream Channel Capacity (cfs)	Discharges into Highland Lake

LAND ACQUISITION

Fee Taking Elevation (ft, msl)	940 (5 ft. above spillway crest) or 300 ft. horizontally from full pool, whichever is greater.

MAXIMUM POOL LEVEL	Dam Not Completed
PROJECT COST	$2,660,000 (Est.)
DATE OF COMPLETION	June 1970
MAINTAINED BY	State of Connecticut

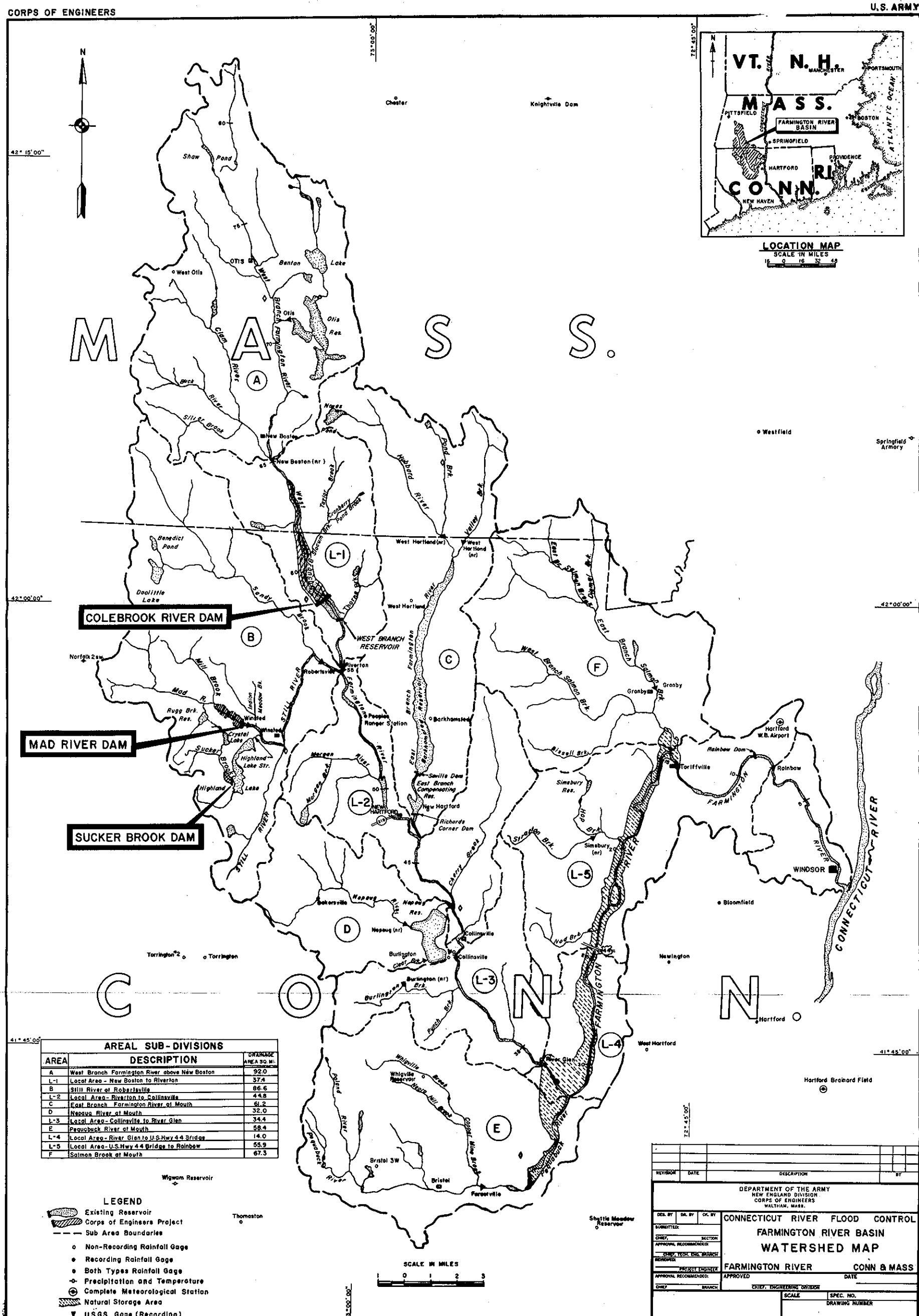
(1) At maximum surcharge elevation 944.2 ft, msl, the total storage utilized is 1,995 a.f. (10.9 in.) and area inundated is 61.5 acres.

(2) No flood control gates; a 3' x 3' sluice gate locked in a partially open setting of about one foot to control the desired discharge.

Note: Diverted brook is carried into the reservoir area in a 48" diameter corrugated metal pipe, approximately 530 feet in length.

CORPS OF ENGINEERS

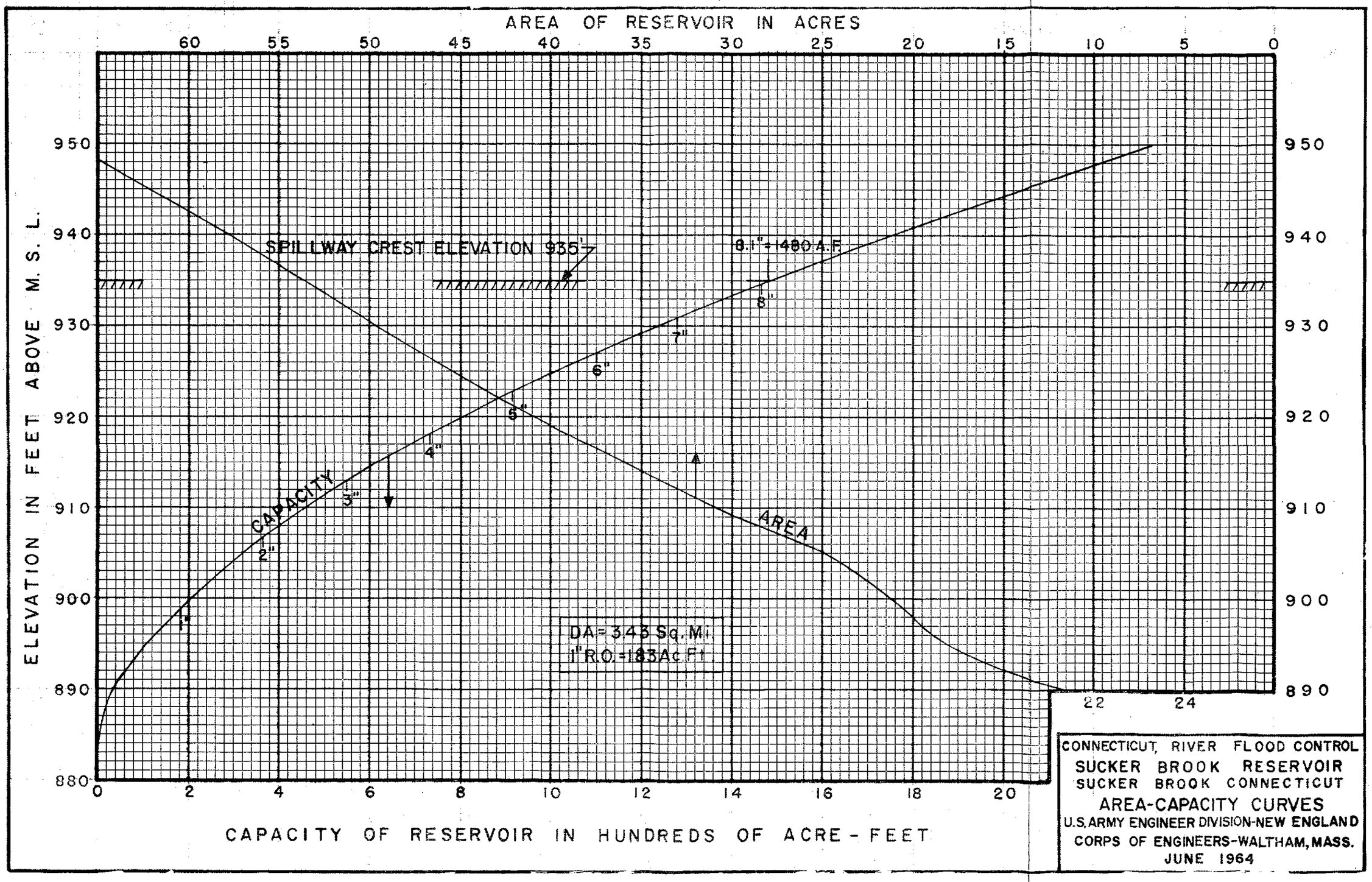
U.S. ARMY



AREAL SUB-DIVISIONS

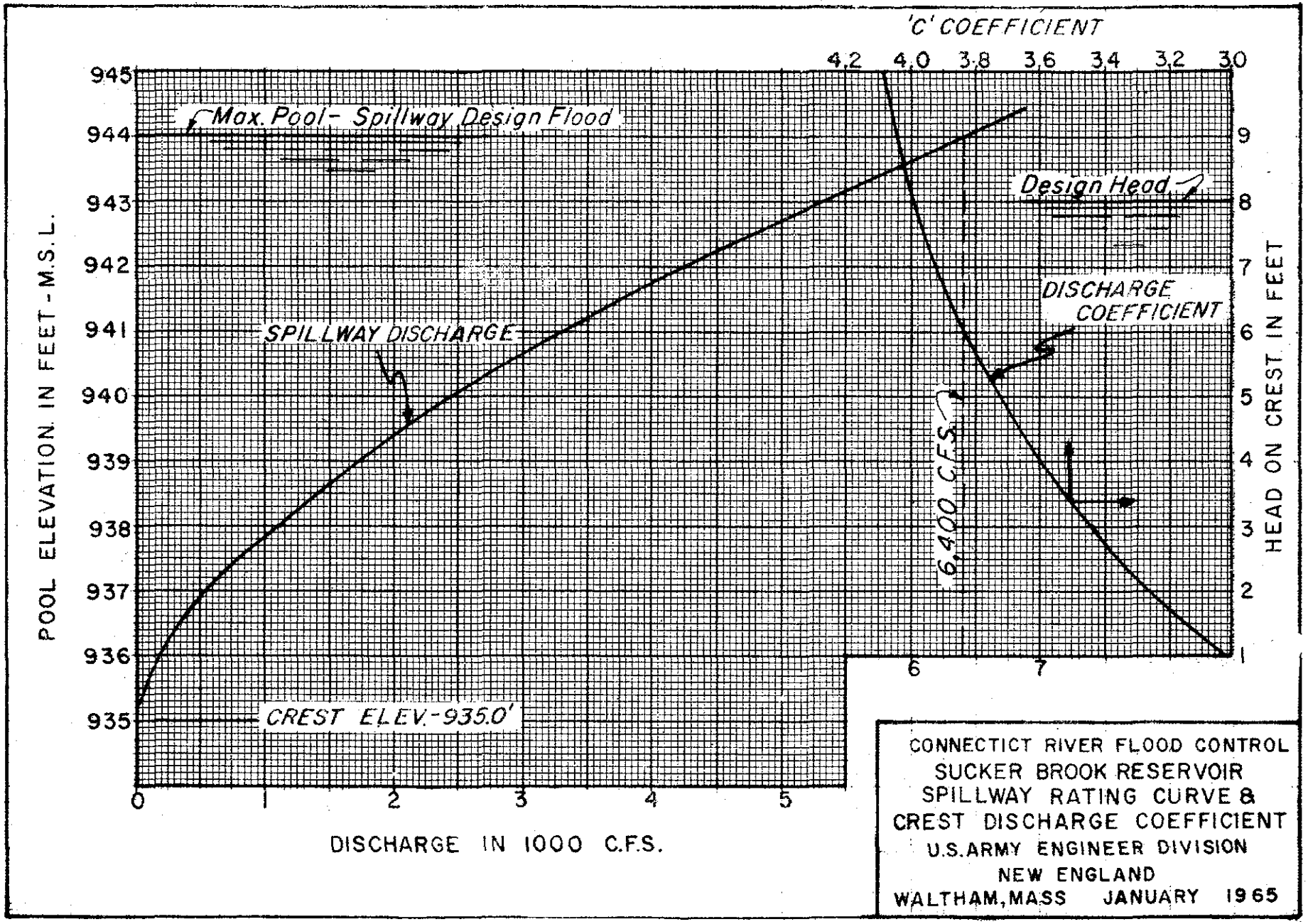
AREA	DESCRIPTION	DRAINAGE AREA SQ. MI.
A	West Branch Farmington River above New Boston	92.0
L-1	Local Area - New Boston to Riverton	37.4
B	Still River at Robertsville	86.6
L-2	Local Area - Riverton to Collinsville	44.8
C	East Branch Farmington River at Mouth	61.2
D	Nepaug River at Mouth	32.0
L-3	Local Area - Collinsville to River Glen	34.4
E	Pequabuck River at Mouth	58.4
L-4	Local Area - River Glen to U.S. Hwy 44 Bridge	14.0
L-5	Local Area - U.S. Hwy 44 Bridge to Rainbow	55.9
F	Salmon Brook at Mouth	67.3

PLATE D-2



CONNECTICUT RIVER FLOOD CONTROL
SUCKER BROOK RESERVOIR
SUCKER BROOK CONNECTICUT
AREA-CAPACITY CURVES
U.S. ARMY ENGINEER DIVISION-NEW ENGLAND
CORPS OF ENGINEERS-WALTHAM, MASS.
JUNE 1964

PLATE D-3



CONNECTICT RIVER FLOOD CONTROL
SUCKER BROOK RESERVOIR
SPILLWAY RATING CURVE &
CREST DISCHARGE COEFFICIENT
U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
WALTHAM, MASS JANUARY 1965

PLATE D-4

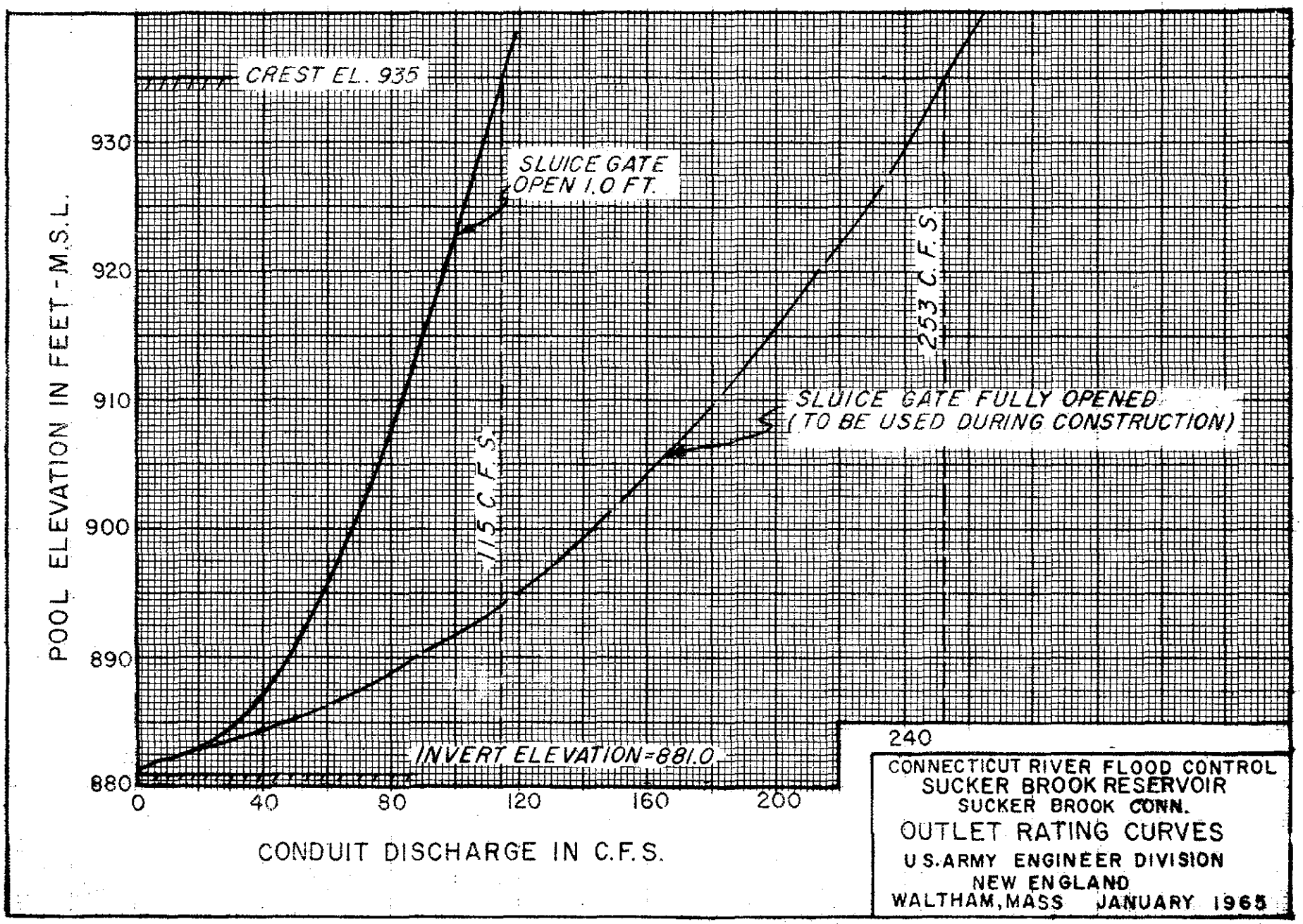
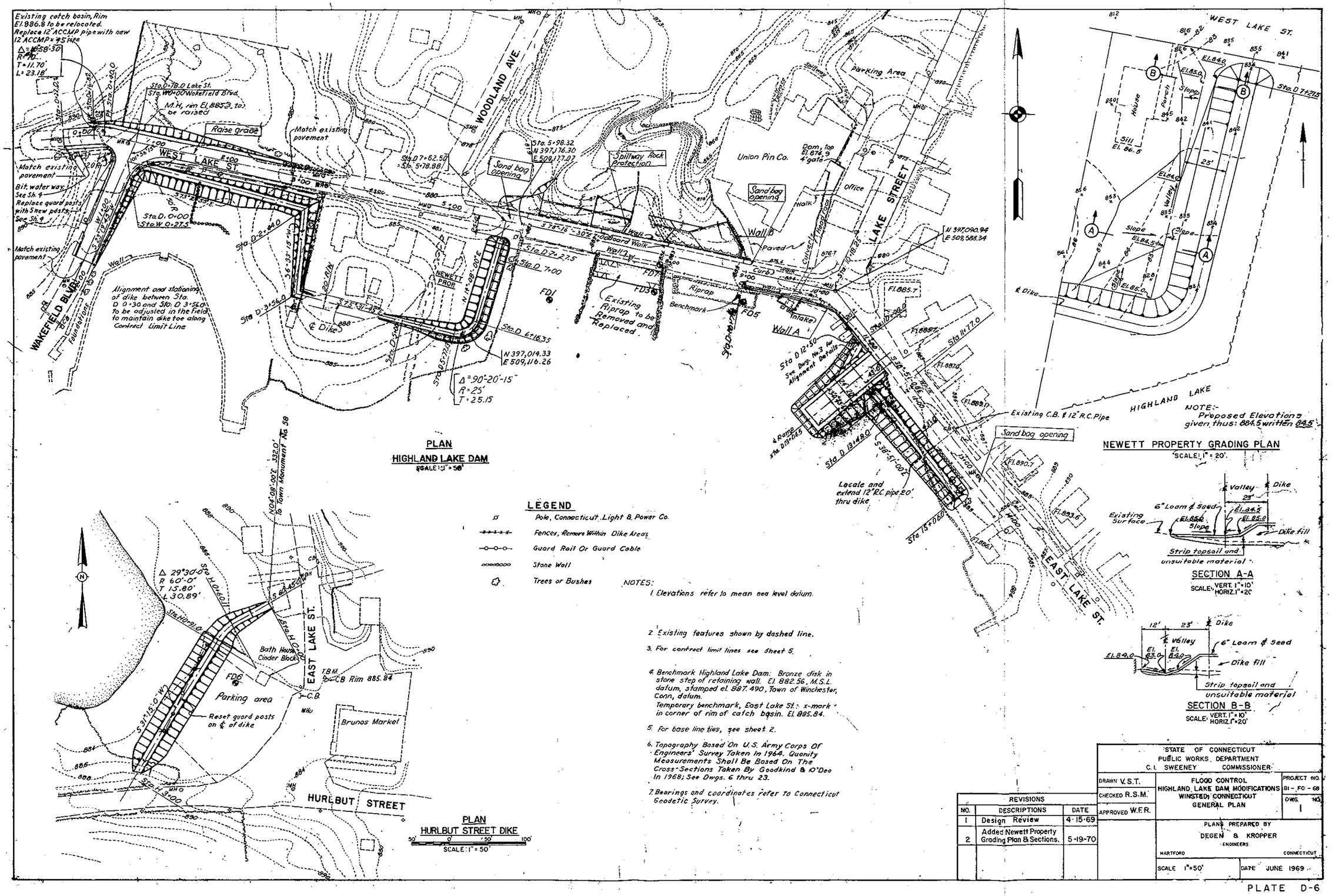

CREST EL. 935
SLUICE GATE OPEN 1.0 FT.
SLUICE GATE FULLY OPENED (TO BE USED DURING CONSTRUCTION)
115 C.F.S.
253 C.F.S.
INVERT ELEVATION=881.0
POOL ELEVATION IN FEET-M.S.L.
930
920
910
900
890
880
0
40
80
120
160
200
240
CONDUIT DISCHARGE IN C.F.S.
CONNECTICUT RIVER FLOOD CONTROL
SUCKER BROOK RESERVOIR
SUCKER BROOK CONN.
OUTLET RATING CURVES
U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
WALTHAM, MASS JANUARY 1965

PLATE D-5



LEGEND

- Pole, Connecticut Light & Power Co.
- Fences, Remove Within Dike Areas
- Guard Rail Or Guard Cable
- Stone Wall
- Trees or Bushes

NOTES:

1. Elevations refer to mean sea level datum.
2. Existing features shown by dashed line.
3. For contract limit lines see Sheet 5.
4. Benchmark Highland Lake Dam: Bronze disk in stone step of retaining wall. El. 882.56, M.S.L. datum, stamped el. 887.490, Town of Winchester, Conn. datum.
   Temporary benchmark, East Lake St.: x-mark in corner of rim of catch basin. El. 885.84.
5. For base line ties, see sheet 2.
6. Topography Based On U.S. Army Corps Of Engineers' Survey Taken In 1964. Quanity Measurements Shall Be Based On The Cross-Sections Taken By Goodkind & O'Dea In 1968; See Dwgs. 6 thru 23.
7. Bearings and coordinates refer to Connecticut Geodetic Survey.

REVISIONS		
NO.	DESCRIPTIONS	DATE
1	Design Review	4-15-69
2	Added Newett Property Grading Plan & Sections.	5-19-70

STATE OF CONNECTICUT
PUBLIC WORKS DEPARTMENT
C. I. SWEENEY COMMISSIONER

DRAWN V.S.T.
CHECKED R.S.M.
APPROVED W.F.R.

FLOOD CONTROL
HIGHLAND LAKE DAM MODIFICATIONS
WINSTED, CONNECTICUT
GENERAL PLAN

PROJECT NO. BI - FC - 68
DWG. NO. 1

PLANS PREPARED BY
DEGEN & KROPPER
ENGINEERS
HARTFORD CONNECTICUT

SCALE 1" = 50' DATE JUNE 1969

PLATE D-6

CORPS OF ENGINEERS — U. S. ARMY

LIMIT OF CONTRACTOR'S WORK AREA

SUCKER BROOK ROAD RELOCATION

BRIDGE

SPILLWAY

WEIR (CREST EL. 935)

OUTLET WORKS

SERVICE RD.

SPOIL FILL

2-72" CULVERTS

CHANNEL

HIGHLAND LAKE W.S. El. 882.5 (FULL POOL)

DAM (TOP EL. 949)

WATER SERVICE PIPE

48" C.M. PIPE

BROOK RELOCATION

BORROW AREA (See Sheet 40)

GRAPHIC SCALE 1" = 100'

LEGEND - EXTERIOR FEATURES

NEW	EXISTING	DESCRIPTION
900	900	CONTOURS
x914.0	914.0	ELEVATIONS
F		FENCE
		TREE LINE
		DITCH - GRADE TO DRAIN
		ROCK OR LEDGE OUTCROP
		LIMIT OF CONTRACTOR'S WORK AREA
		EARTH CUT AND ROCK CUT
		" FILL
		" SURFACE (SECTION)
		ASSUMED BED ROCK SURFACE OR ROCK CUT (SECTION)
		EARTH CUT WITH ROCK PROTECTION
		EARTH FILL WITH ROCK PROTECTION
GR		CABLE GUIDE RAIL
		STAFF GAGE

GENERAL NOTES

1. Elevations refer to Mean Sea Level Datum.
2. Plane Coordinates refer to Connecticut Lambert Grid System.
3. Figures in hexagons indicate Item No. under which payment will be made.
4. For control, see Sheet 3.

REVISION	DATE	DESCRIPTION	BY
		Final Field Corrections	

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

DES. BY M.Z. | DR. BY E.J.K. | CK. BY M.Z.

SUBMITTED: CHIEF, LAYOUT SECTION

REVIEWED: PROJECT ENGINEER

PROJECTED: CHIEF, DESIGN BRANCH

APPROVED: CHIEF, ENGINEERING DIVISION

CONNECTICUT RIVER FLOOD CONTROL
SUCKER BROOK DAM
RESERVOIR MAP AND LIMIT OF CONTRACTOR'S WORK AREA

SUCKER BROOK — CONNECTICUT

DATE JUNE 1966

SCALE: 1" = 100' | SPEC. NO. CIV. ENG. 19-016-66-70

DRAWING NUMBER CON-52

SHEET 2

CORPS OF ENGINEERS — U. S. ARMY

℄ OUTLET WORKS

BROOK RELOCATION (See Sheet 27)

48" ϕ C.M. Pipe

Outlet Structure

Spoil to El. 886 El. 885.0

Inlet Channel

Log Boom Clearing Limits

West Anchor

Toe of Spoil Fill

Log Boom (See Sheet 33)

Spoil Fill

Toe of Dam

Limit of rock protection ?

Service Road

DAM

Rock Toe

Turnaround Area

℄ Dam ?

Change in slope

Top of Dam El. 949.0

℄ Dam

℄ RACE TRACK

Rock Toe

Crushed Stone

SUCKER BROOK ROAD

Pole #1339

16" C.I. Water Service Pipe

Pole #1332

Match to exist. road

WAKEFIELD BLVD.

Garage

Shed

House

Fireplace

Conc. ret. wall

2-72" Dia. C.M.P. Culverts (See Sheet 15)

Channel Excavation

W.S. March 1966

HIGHLAND LAKE

W.S. El. 6.5 (Full Pool)

Limit of clearing for Log Boom El. 880.0

Inlet Structure

Turnaround Area

El. 895.0

West Wall

Staff Gages (See Sheet 83)

Retaining Wall

Bubble Dome Shelter (See Sheet 31)

Parking Area

Approach Channel

Log Boom Clearing Limits

Drain Ditch

East Anchor

SPILLWAY

Large rocks

Cable guide rail

Cul-de-sac

End construction. Match to existing road

Rebuild existing road

Sta. 13+90 End of Road Relocation.

℄ SUCKER BROOK ROAD RELOCATION

Bridge

Outlet Structure

Outlet Channel

4' Chain Link Fence

12' Double swing gate

8' Single swing gate

Discharge channel

Old Rock barn

Stone South

Rock barn

Bloasted rock above ground grade will be removed.

5' min. to rock toe

SS may be vary in rock

3'-0"

Meet grade at Old Sucker Brook.

DRAINAGE DITCH

STA. 5+25± to 7+25±

NOTES

For General Notes, see Sheet 2

For Control, see Sheet 3

REVISION	DATE	DESCRIPTION	BY
		Final Field Corrections	
2	6-3-69	Slope and Retaining Wall revised.	
1	8-12-66	Payment Item No. revised. (Am. #1)	

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

DES. BY M. Z. | DR. BY A. G. | CK. BY S.J.C.

SUBMITTED: CHIEF, LAYOUT SECTION

REVIEWED: PROJECT ENGINEER

PROJECTED: CHIEF, DESIGN BRANCH

CONNECTICUT RIVER FLOOD CONTROL
SUCKER BROOK DAM
GENERAL PLAN

SUCKER BROOK — CONNECTICUT

APPROVED: CHIEF, ENGINEERING DIVISION — DATE JUNE 1966

SCALE 1" = 50' — SPEC. NO. CIV. ENG. 19-016-66-70

DRAWING NUMBER CON-52

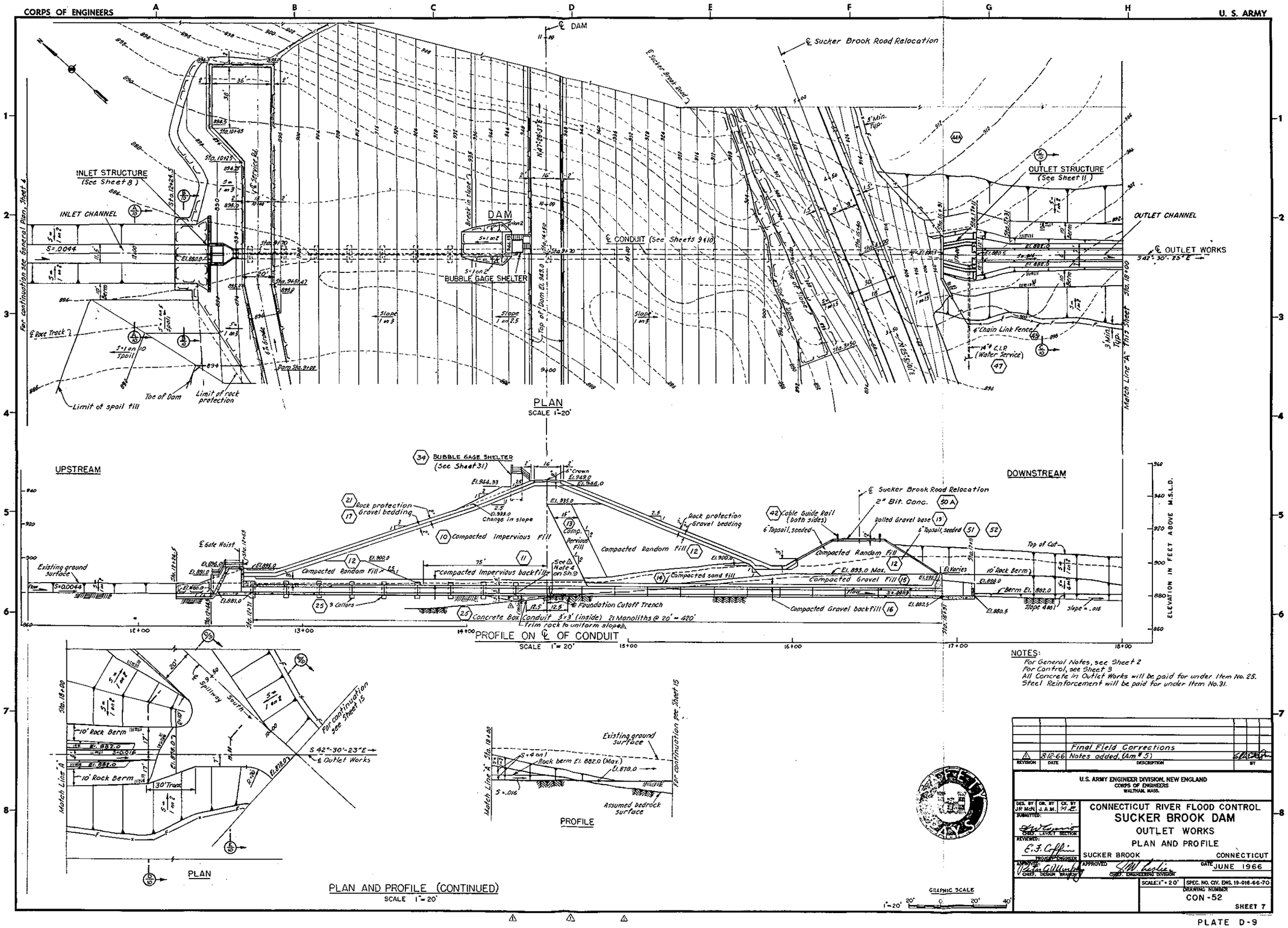
SHEET 4

PLATE D-8

PLAN
SCALE 1" = 50'

GRAPHIC SCALE 1" = 50'

CORPS OF ENGINEERS — U. S. ARMY



REVISION	DATE	DESCRIPTION	BY
1	8-12-66	Final Field Corrections Notes added. (Am. # 5)	

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

DES. BY J.P. McN. | DR. BY J.A.M. | CK. BY W.E.

SUBMITTED: Chief, Civil Section

REVIEWED: E.J. Coffin, Project Engineer

APPROVED: Chief, Design Branch

APPROVED: Chief, Engineering Division

CONNECTICUT RIVER FLOOD CONTROL
SUCKER BROOK DAM
OUTLET WORKS
PLAN AND PROFILE

SUCKER BROOK — CONNECTICUT

DATE JUNE 1966

SCALE: 1" = 20'

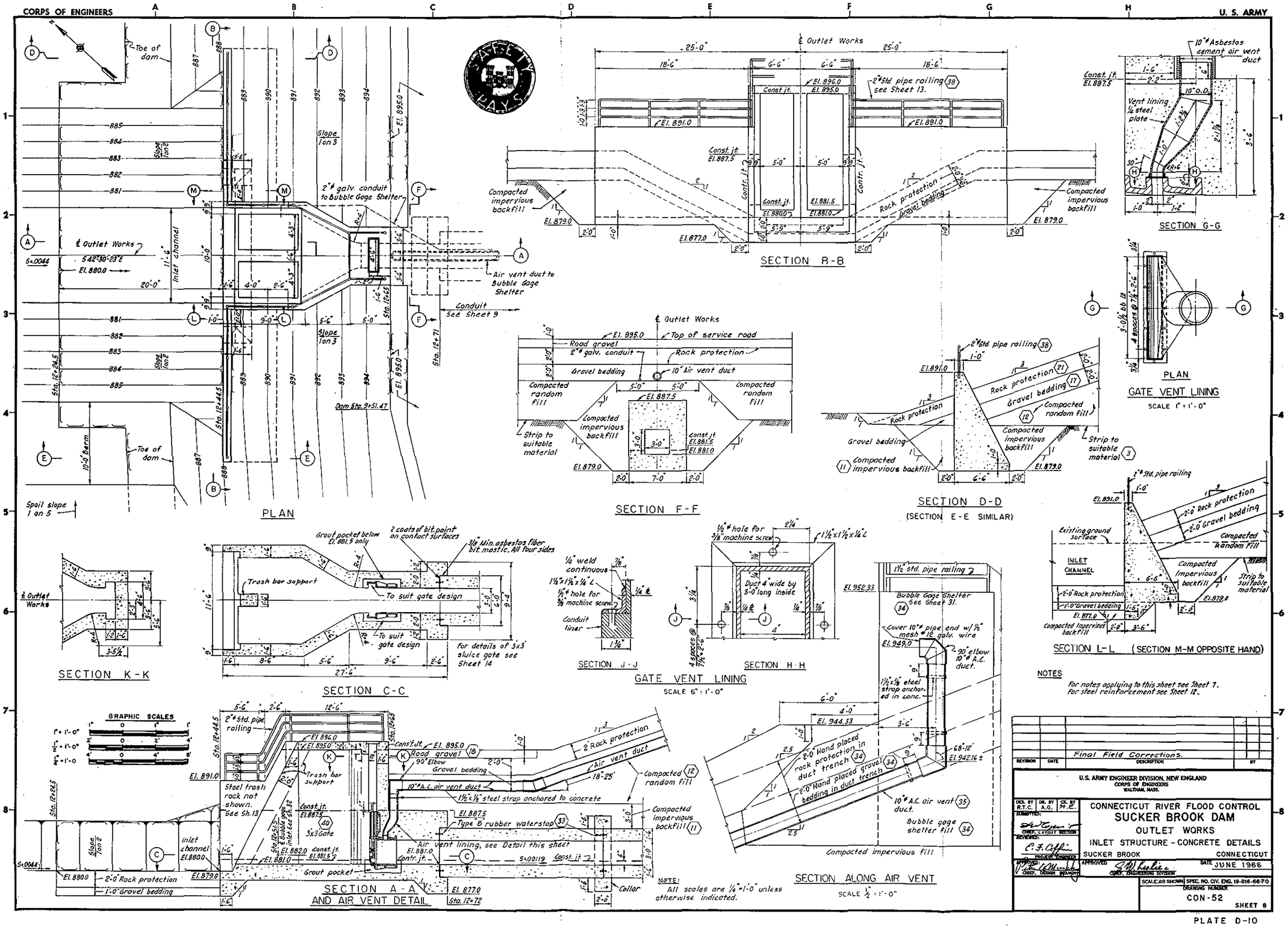
SPEC. NO. CIV. ENG. 19-016-66-70

DRAWING NUMBER CON-52

SHEET 7

PLATE D-9

CORPS OF ENGINEERS — U. S. ARMY



NOTES

For notes applying to this sheet see Sheet 7.
For steel reinforcement see Sheet 12.

REVISION	DATE	DESCRIPTION	BY
		Final Field Corrections.	

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

DES. BY R.T.C. — DR. BY A.G. — CK. BY M.E.
SUBMITTED: CHIEF, LAYOUT SECTION
REVIEWED: CHIEF, DESIGN BRANCH
APPROVED: CHIEF, DESIGN BRANCH
APPROVED: CHIEF, ENGINEERING DIVISION

CONNECTICUT RIVER FLOOD CONTROL
SUCKER BROOK DAM
OUTLET WORKS
INLET STRUCTURE - CONCRETE DETAILS
SUCKER BROOK — CONNECTICUT
DATE JUNE 1966
SCALE: AS SHOWN — SPEC. NO. CIV. ENG. 19-016-66-70
DRAWING NUMBER CON-52
SHEET 8

PLATE D-10

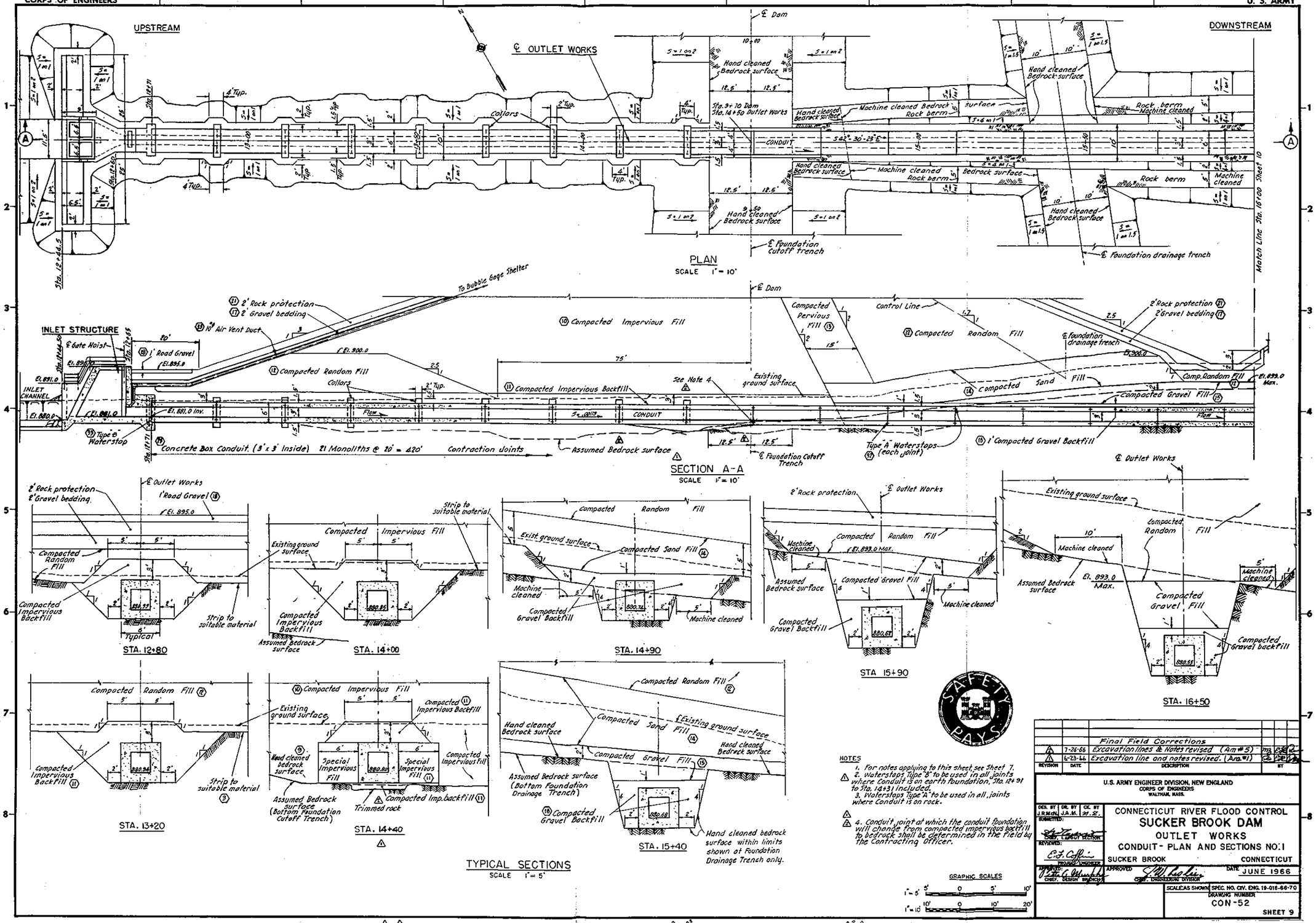
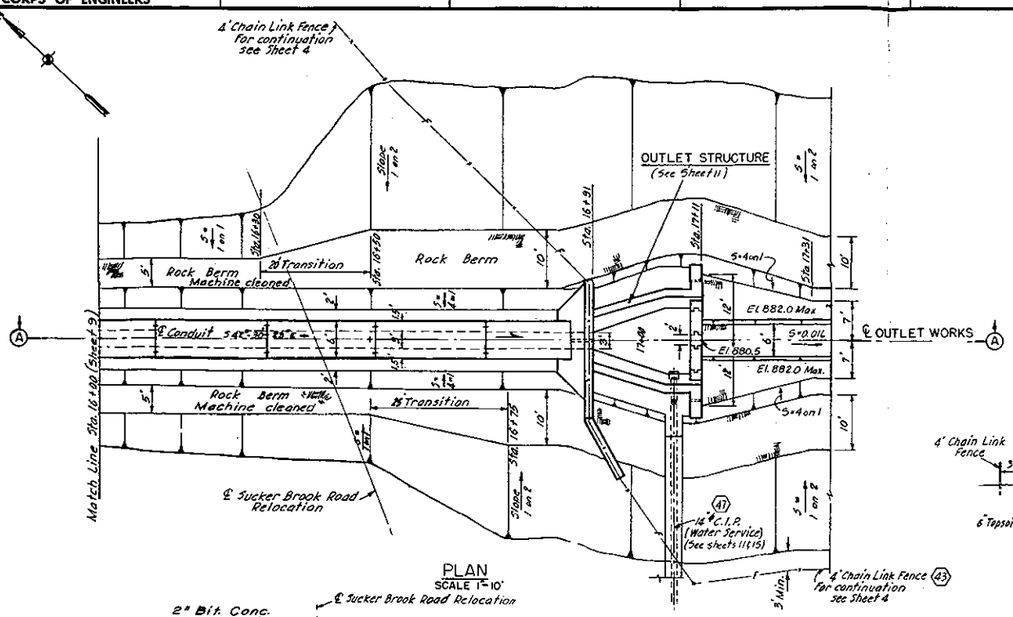
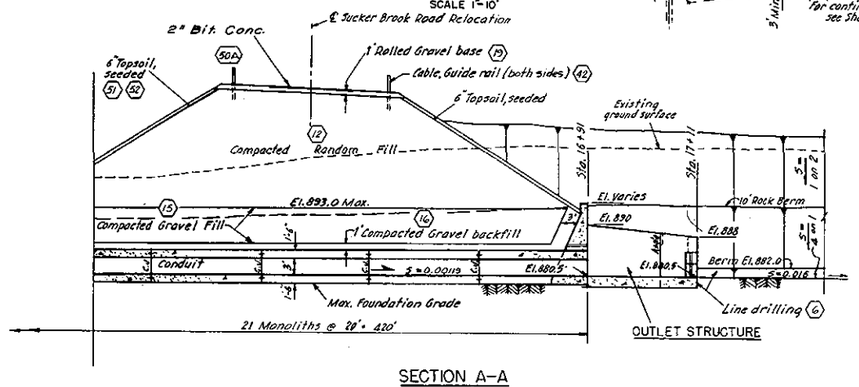

CORPS OF ENGINEERS
U. S. ARMY
UPSTREAM
DOWNSTREAM
℄ OUTLET WORKS
PLAN
SCALE 1" = 10'
SECTION A-A
SCALE 1" = 10'
TYPICAL SECTIONS
SCALE 1" = 5'
INLET STRUCTURE
STA. 12+80
STA. 13+20
STA. 14+00
STA. 14+40
STA. 14+90
STA. 15+40
STA 15+90
STA. 16+50
Match Line Sta. 16+00 Sheet 10
NOTES
1. For notes applying to this sheet, see Sheet 7.
2. Waterstops Type "B" to be used in all joints where Conduit is on earth foundation, Sta. 12+91 to Sta. 14+31 included.
3. Waterstops Type "A" to be used in all joints where Conduit is on rock.
4. Conduit joint at which the conduit foundation will change from compacted impervious backfill to bedrock shall be determined in the field by the Contracting Officer.
GRAPHIC SCALES
Final Field Corrections
7-26-66 Excavation lines & Notes revised (Am #5)
6-23-66 Excavation line and notes revised. (Am. #1)
U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.
CONNECTICUT RIVER FLOOD CONTROL
SUCKER BROOK DAM
OUTLET WORKS
CONDUIT - PLAN AND SECTIONS NO. 1
SUCKER BROOK
CONNECTICUT
JUNE 1966
SCALE AS SHOWN
SPEC. NO. CIV. ENG. 19-016-66-70
DRAWING NUMBER
CON-52
SHEET 9

PLATE D-11

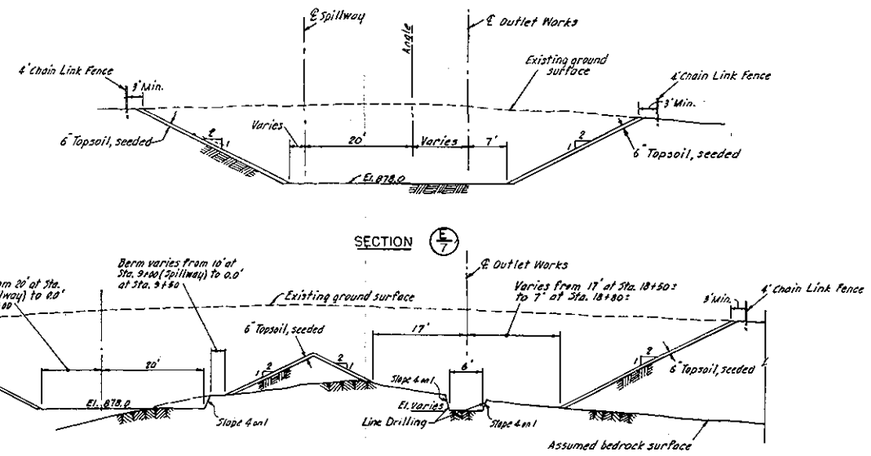
CORPS OF ENGINEERS — U. S. ARMY



PLAN
SCALE 1"=10'

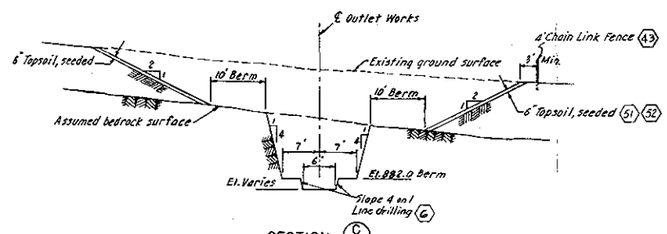


SECTION A-A
SCALE 1"=10'

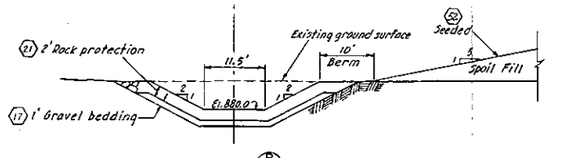


SECTION E/7

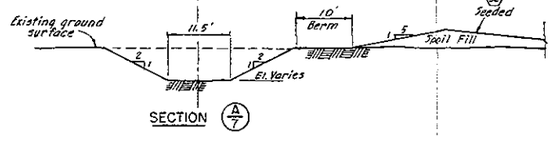
SECTION D/7



SECTION C/7



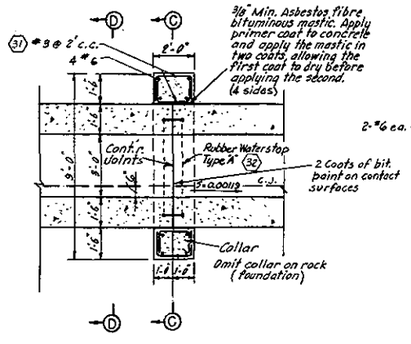
SECTION B/7



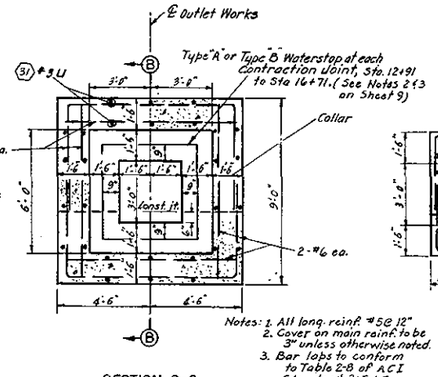
SECTION A/7

TYPICAL SECTIONS
SCALE 1"=10'

NOTE:
For Notes applying to this sheet, see sheet 7

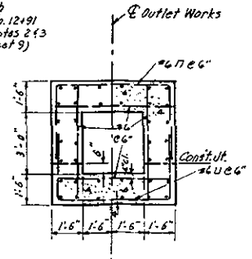


SECTION B-B



SECTION C-C

Notes: 1. All long. reinf. #5 @ 12"
2. Cover on main reinf. to be 3" unless otherwise noted.
3. Bar lobs to conform to Table 2-B of ACI Standard 315-65



SECTION D-D

CONDUIT—CONCRETE DETAILS
SCALE 3/8" = 1'-0"

GRAPHIC SCALES

REVISION	DATE	DESCRIPTION	BY
		Final Field Corrections	

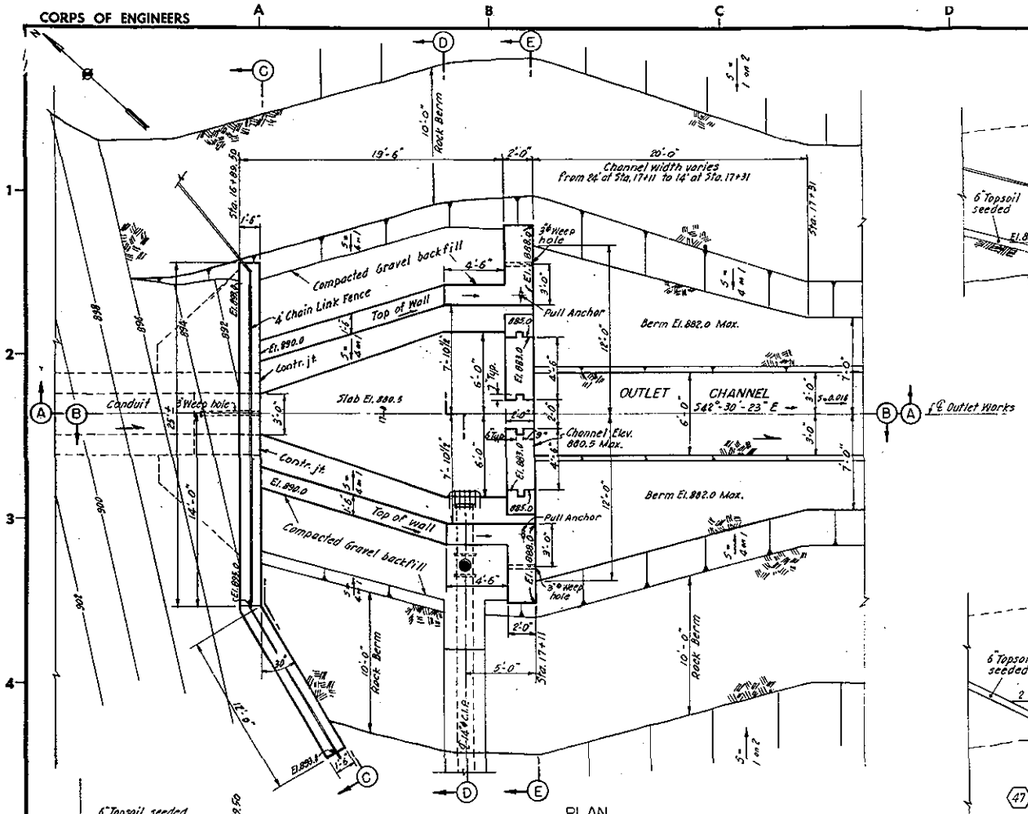
U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

DES. BY J.R.McN. | DR. BY J.A.M. | CK. BY
SUBMITTED: CHIEF, LAYOUT SECTION
REVIEWED: PROJECT ENGINEER
APPROVED: CHIEF, DESIGN BRANCH
APPROVED: CHIEF, ENGINEERING DIVISION

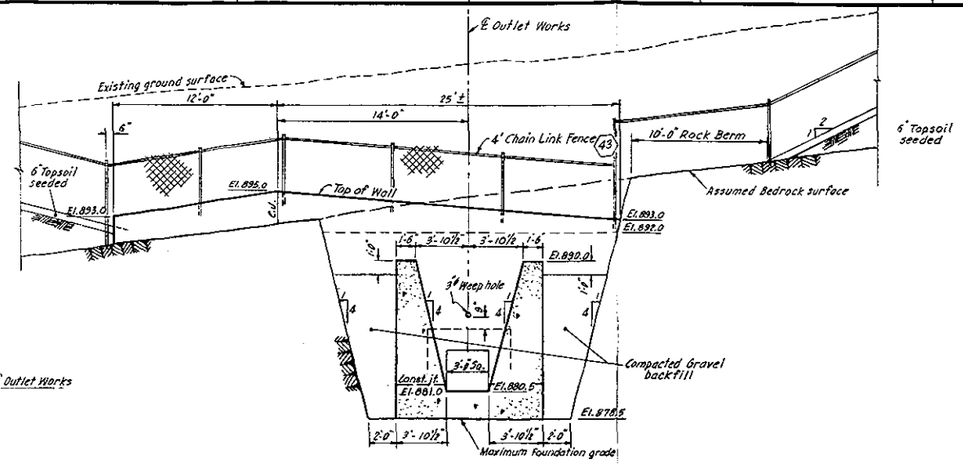
CONNECTICUT RIVER FLOOD CONTROL
SUCKER BROOK DAM
OUTLET WORKS
CONDUIT - PLAN AND SECTIONS NO 2
SUCKER BROOK — CONNECTICUT
DATE JUNE 1966
SCALE AS SHOWN | SPEC. NO. CIV. ENG. 19-016-66-70
DRAWING NUMBER CON-52
SHEET 10

PLATE D-12

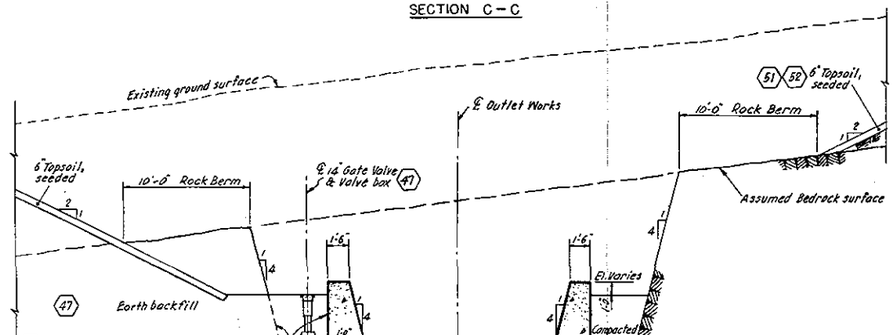
CORPS OF ENGINEERS — U. S. ARMY



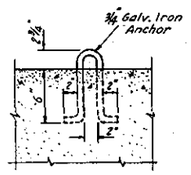
PLAN
SCALE 1/4"=1'-0"



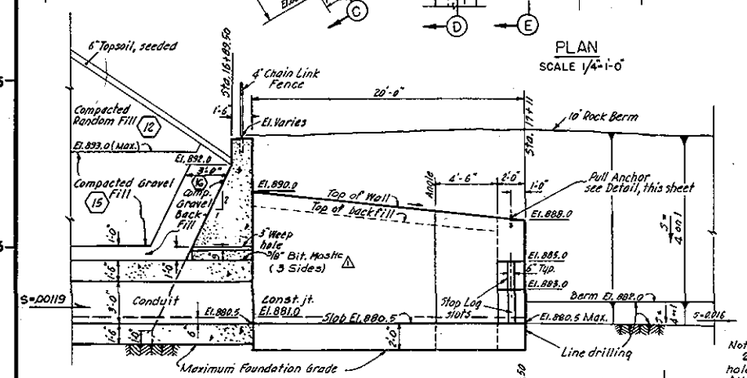
SECTION C—C



SECTION D—D

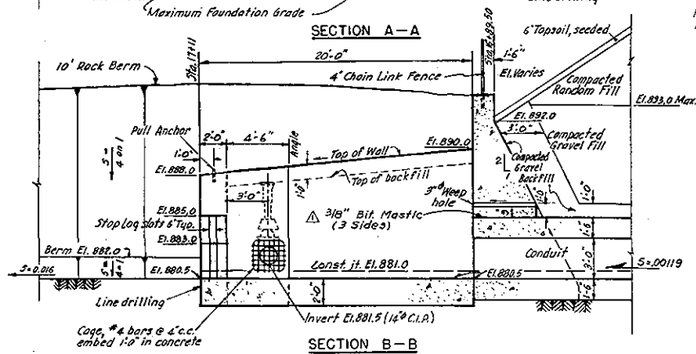


PULL ANCHOR
NO SCALE
(2 Required)

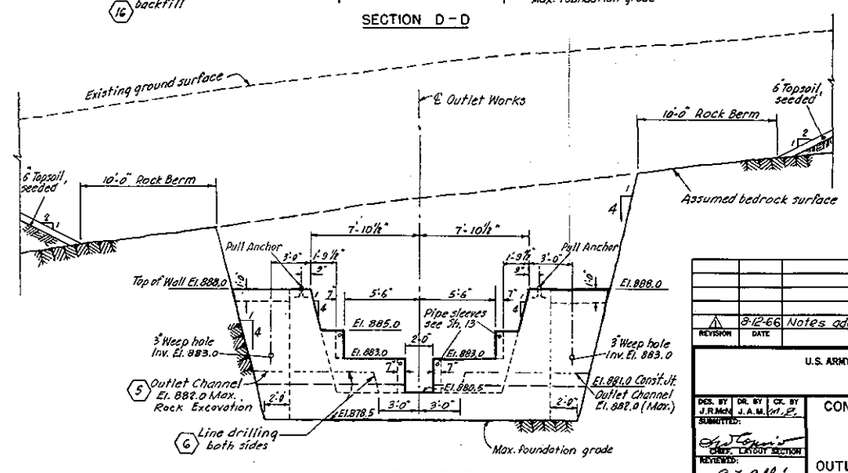


SECTION A—A

Note:
2'x2'x2' bagged stones placed at weep holes. To be paid for under Item No. 16. All weepholes to be sloped to drain.



SECTION B—B



SECTION E—E

TYPICAL SECTIONS
SCALE 1/4"=1'-0"

GRAPHIC SCALE 1/4"=1'-0" 0 4' 8'

NOTE
For notes applying to this Sheet, see Sheet 7.

REVISION	DATE	DESCRIPTION	BY
1	8-12-66	Notes added (Am. #1)	

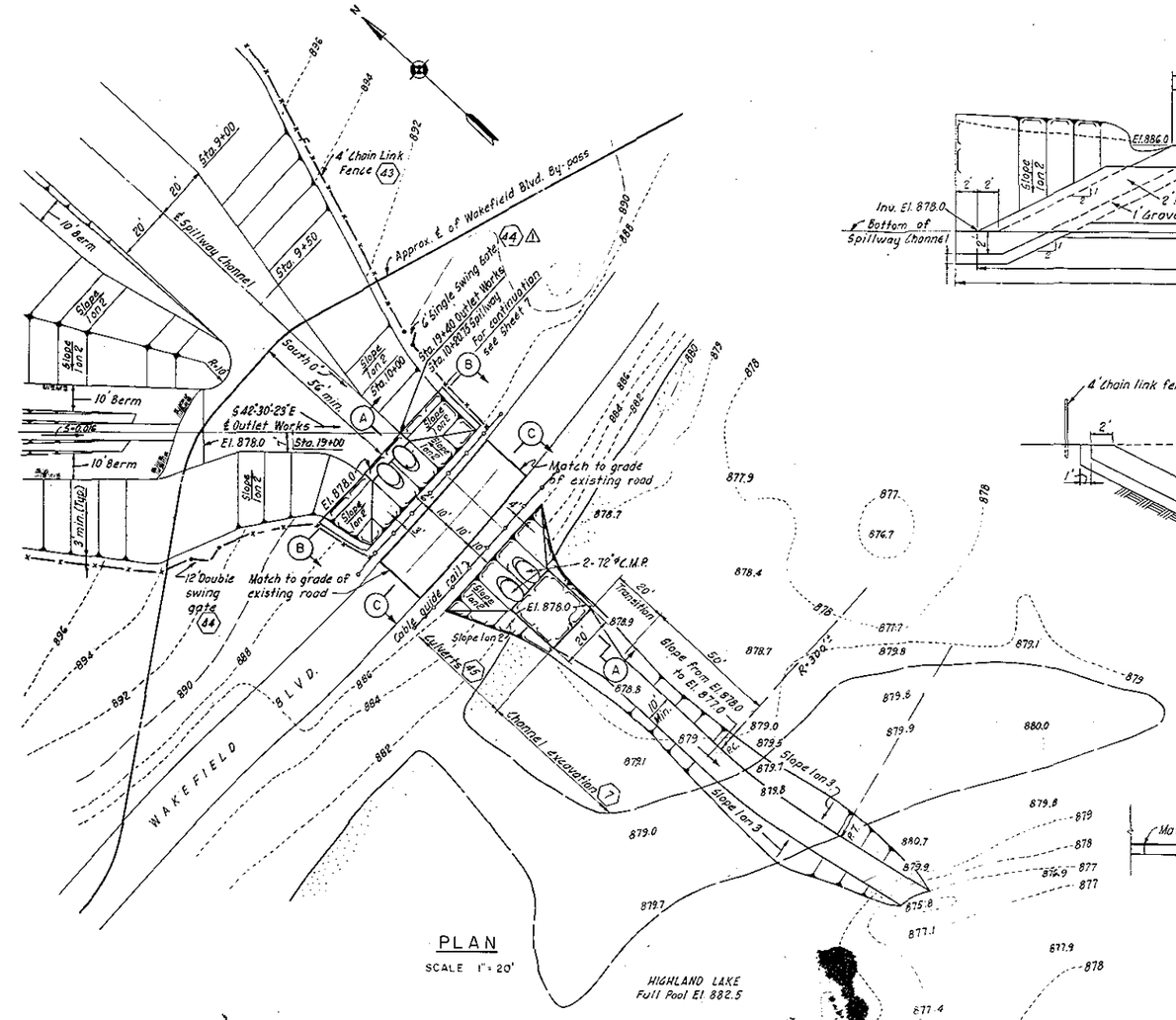
U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

DES. BY J.R.McN. DR. BY J.A.M. CK. BY
SUBMITTED: CHIEF, LAYOUT SECTION
REVIEWED: PROJECT ENGINEER
APPROVED: CHIEF, DESIGN BRANCH
APPROVED: CHIEF, ENGINEERING DIVISION

CONNECTICUT RIVER FLOOD CONTROL
SUCKER BROOK DAM
OUTLET WORKS
OUTLET STRUCTURE - CONCRETE DETAILS
SUCKER BROOK — CONNECTICUT
DATE JUNE 1966
SCALE: 1/4"=1'-0" SPEC. NO. CIV. ENG. 19-016-66-70
DRAWING NUMBER CON-52
SHEET 11

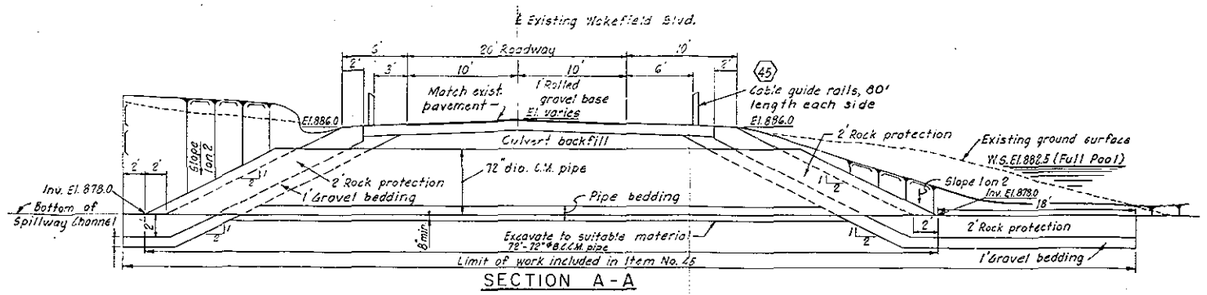
PLATE D-13

CORPS OF ENGINEERS — U. S. ARMY



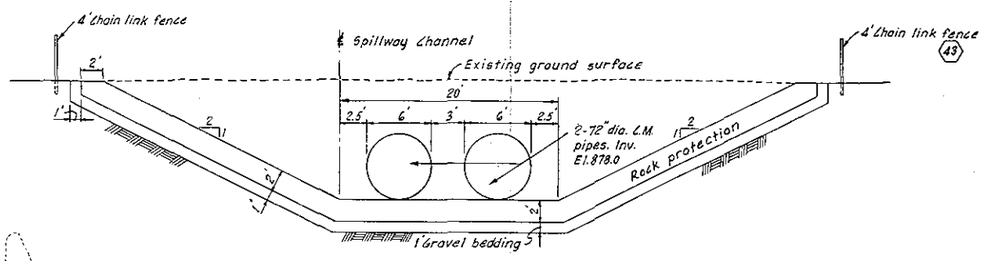
PLAN

SCALE 1" = 20'



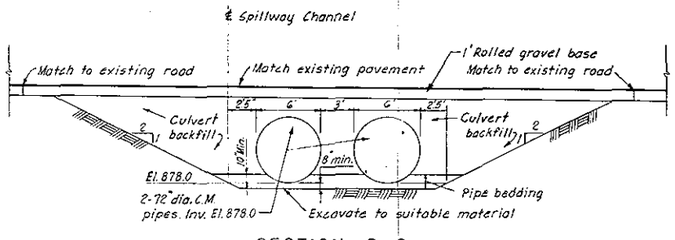
SECTION A-A

SCALE 1" = 5'



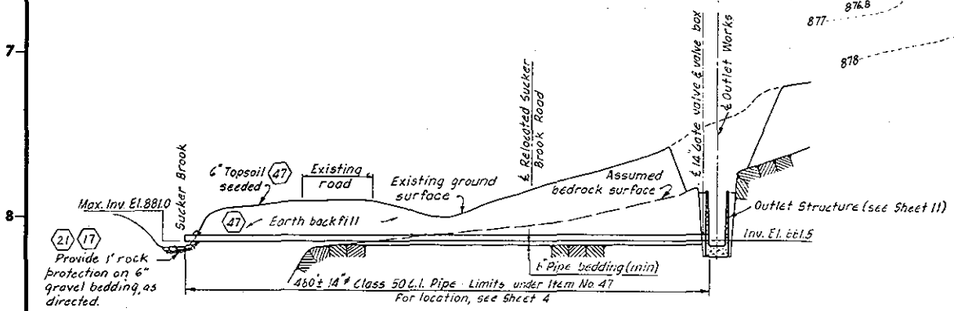
SECTION B-B

SCALE 1" = 5'



SECTION C-C

SCALE 1" = 5'



PROFILE ALONG ℄ OF 14" WATER SERVICE PIPE (47)

NOT TO SCALE

NOTES

For control, see Sheet 3

All work in connection with the installation of the 2-72" dia. C.M. pipes complete, will be paid for under Item No. 45.

All work in connection with the installation of the water service pipe, except for rock excavation, will be paid for under Item No. 47.

Rock excavation will be paid for under Item No. 5

GRAPHIC SCALES

1" = 5' : 5' 0 5' 10'

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

SAFETY PAYS

REVISION	DATE	DESCRIPTION	BY
1	8-12-66	Payment Item No. revised. (Am. # 1.)	

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

DES. BY J.R. McN. | DR. BY A.G. | CK. BY M. Z.

SUBMITTED: CHIEF, LAYOUT SECTION

REVIEWED: PROJECT ENGINEER

APPROVED: CHIEF, DESIGN BRANCH

APPROVED: CHIEF, ENGINEERING DIVISION

CONNECTICUT RIVER FLOOD CONTROL

SUCKER BROOK DAM

WAKEFIELD BOULEVARD CULVERTS

PLAN AND SECTIONS

SUCKER BROOK — CONNECTICUT

DATE JUNE 1966

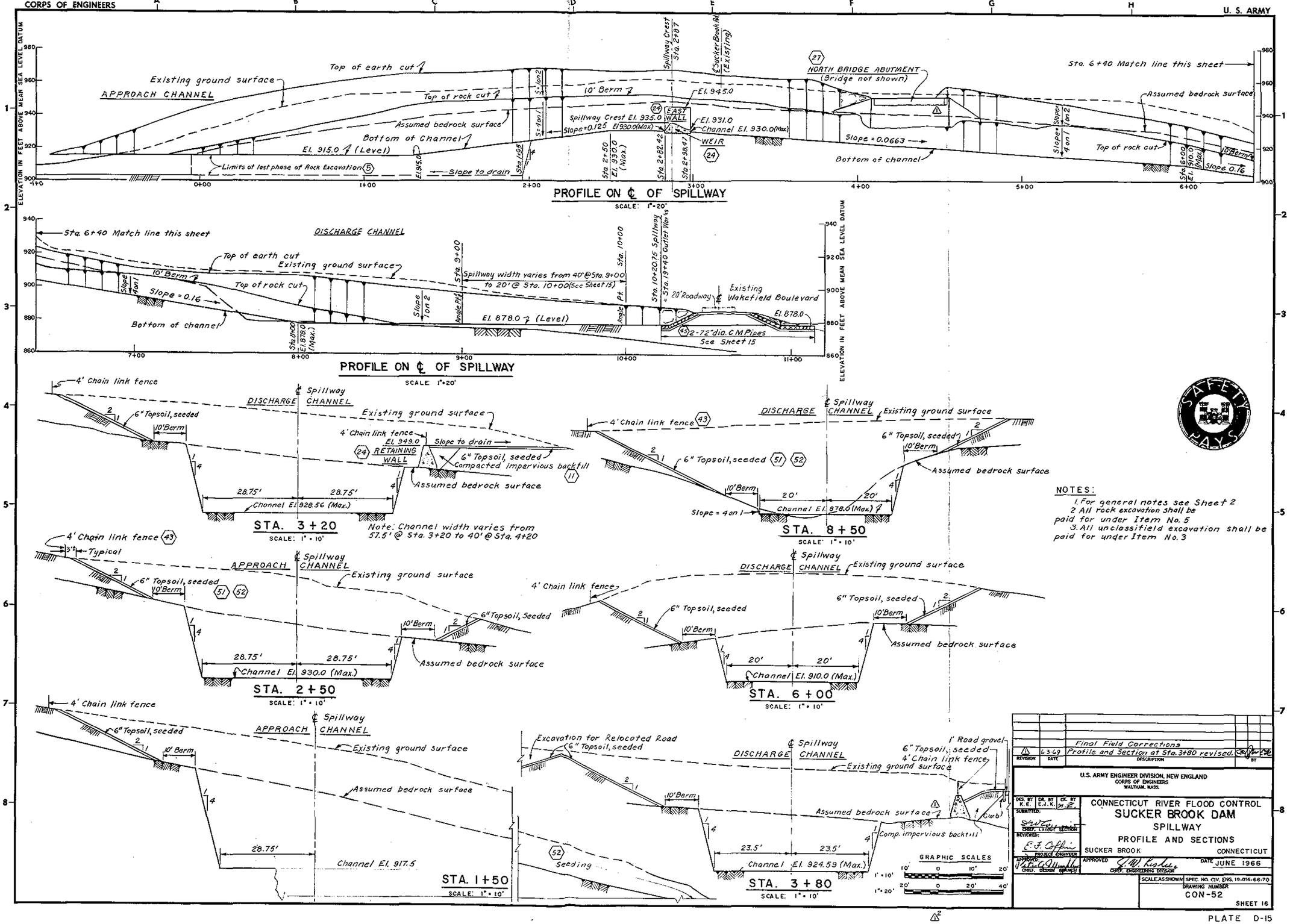
SCALE AS SHOWN | SPEC. NO. CIV. ENG. 19-016-66-70

DRAWING NUMBER CON-52

SHEET 15

PLATE D-14

CORPS OF ENGINEERS — U. S. ARMY



NOTES:

1. For general notes see Sheet 2
2. All rock excavation shall be paid for under Item No. 5
3. All unclassifield excavation shall be paid for under Item No. 3

REVISION	DATE	DESCRIPTION	BY
1	6-3-69	Final Field Corrections Profile and Section at Sta. 3+80 revised.	

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

DES. BY K.E. | DR. BY E.J.K. | CK. BY

SUBMITTED: CHIEF, CONST. SECTION

REVIEWED: PROJECT ENGINEER

APPROVED: CHIEF, DESIGN BRANCH

CONNECTICUT RIVER FLOOD CONTROL
SUCKER BROOK DAM
SPILLWAY
PROFILE AND SECTIONS

SUCKER BROOK — CONNECTICUT

APPROVED: CHIEF, ENGINEERING DIVISION — DATE JUNE 1966

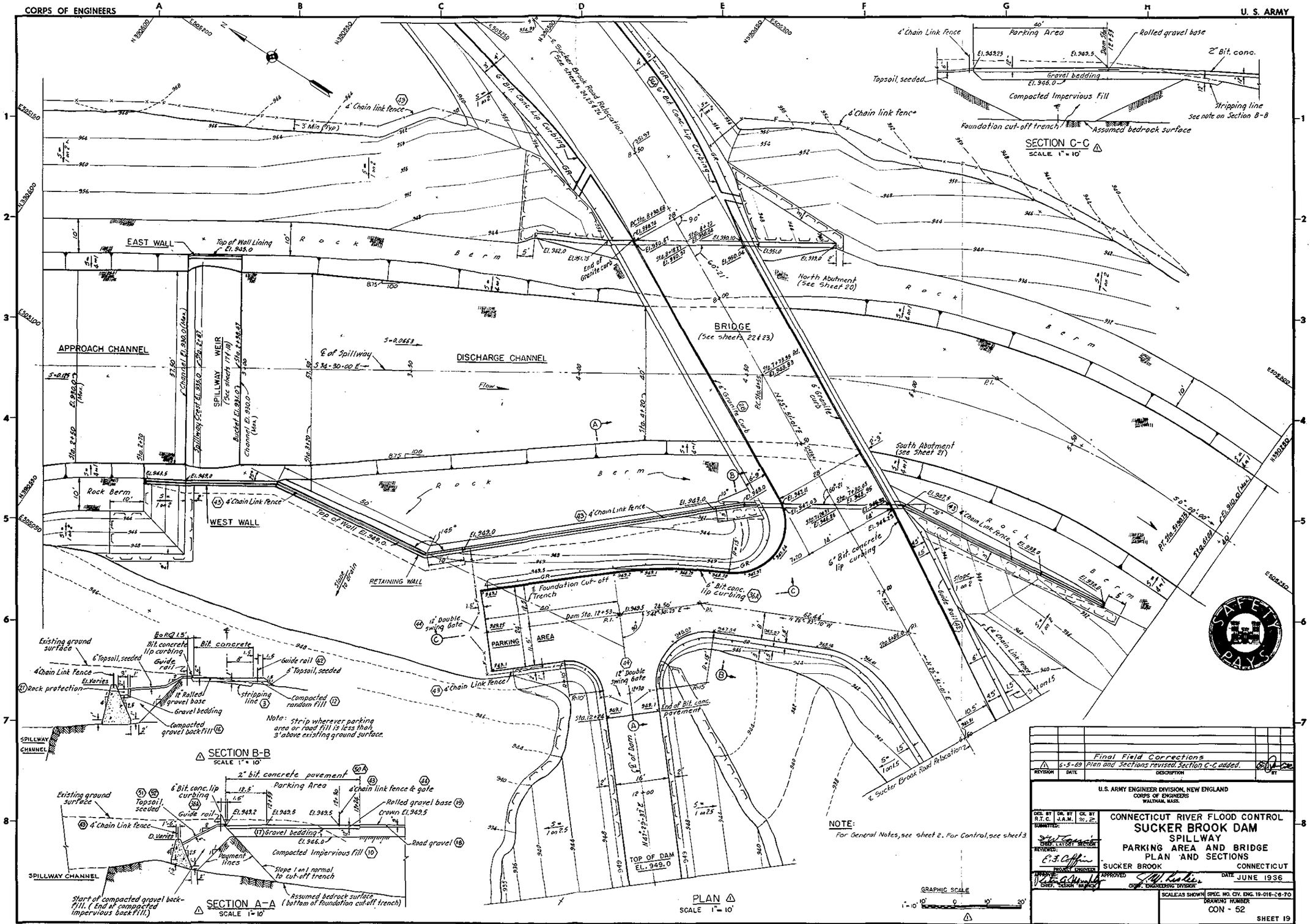
SCALE: AS SHOWN | SPEC. NO. CIV. ENG. 19-016-66-70

DRAWING NUMBER CON-52

SHEET 16

PLATE D-15

CORPS OF ENGINEERS — U. S. ARMY



REVISION	DATE	DESCRIPTION	BY
		Final Field Corrections	
1	6-5-69	Plan and Sections revised. Section C-C added.	

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

DES. BY R.T.C. — DR. BY J.A.M. — CK. BY
SUBMITTED: CHIEF, LATOST SECTION
REVIEWED: PROJECT ENGINEER
APPROVED: CHIEF, DESIGN BRANCH — APPROVED: CHIEF, ENGINEERING DIVISION

CONNECTICUT RIVER FLOOD CONTROL
SUCKER BROOK DAM
SPILLWAY
PARKING AREA AND BRIDGE
PLAN AND SECTIONS

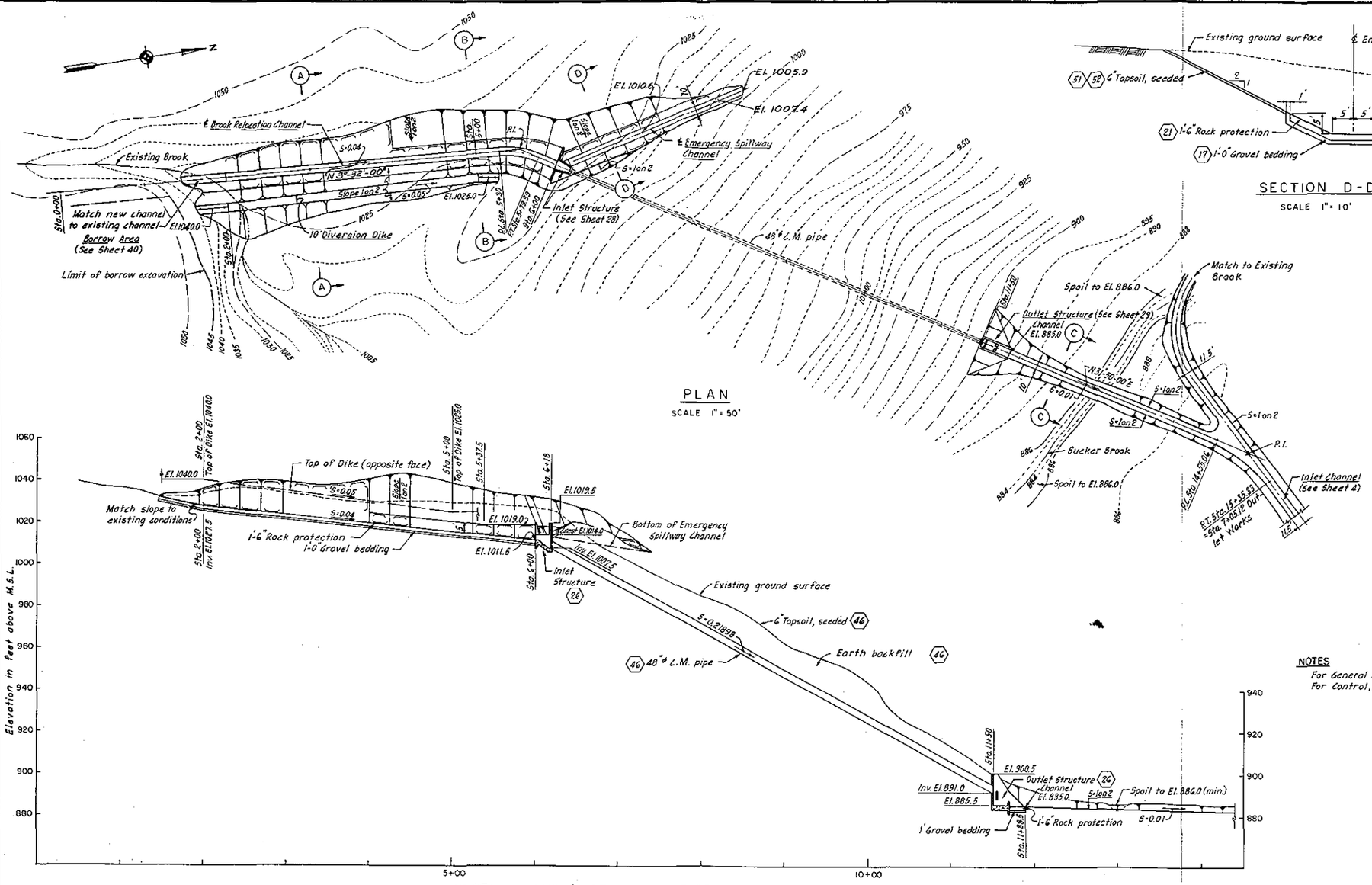
SUCKER BROOK — CONNECTICUT

DATE JUNE 1936

SCALE AS SHOWN — SPEC. NO. CIV. ENG. 19-016-26-70
DRAWING NUMBER CON - 52
SHEET 19

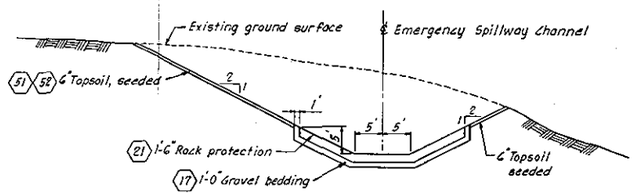
PLATE D-16

CORPS OF ENGINEERS — U. S. ARMY

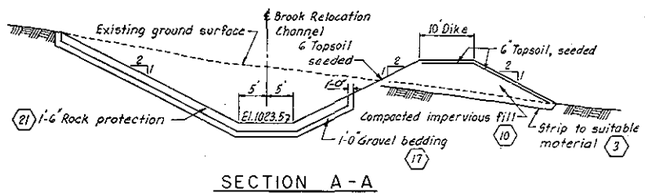


PLAN
SCALE 1" = 50'

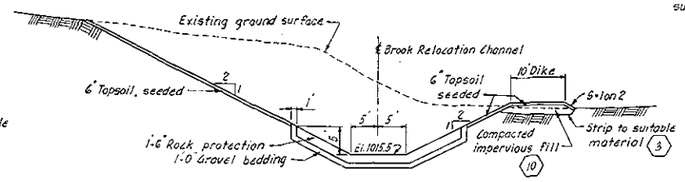
PROFILE ALONG ℄ OF BROOK RELOCATION CHANNEL
SCALE HOR 1" = 50' VERT 1" = 20'



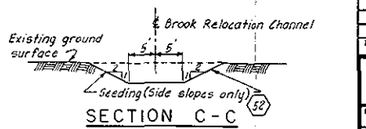
SECTION D-D
SCALE 1" = 10'



SECTION A-A
SCALE 1" = 10'



SECTION B-B
SCALE 1" = 10'



SECTION C-C
SCALE 1" = 10'

GRAPHIC SCALES
1" = 100' 100' 0 100' 200'
1" = 20' 20' 0 20' 40'
1" = 50' 50' 0 50' 100'

NOTES
For General Notes, see Sheet 2.
For Control, see Sheet 3.

REVISION	DATE	DESCRIPTION	BY
		Final Field Corrections	

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

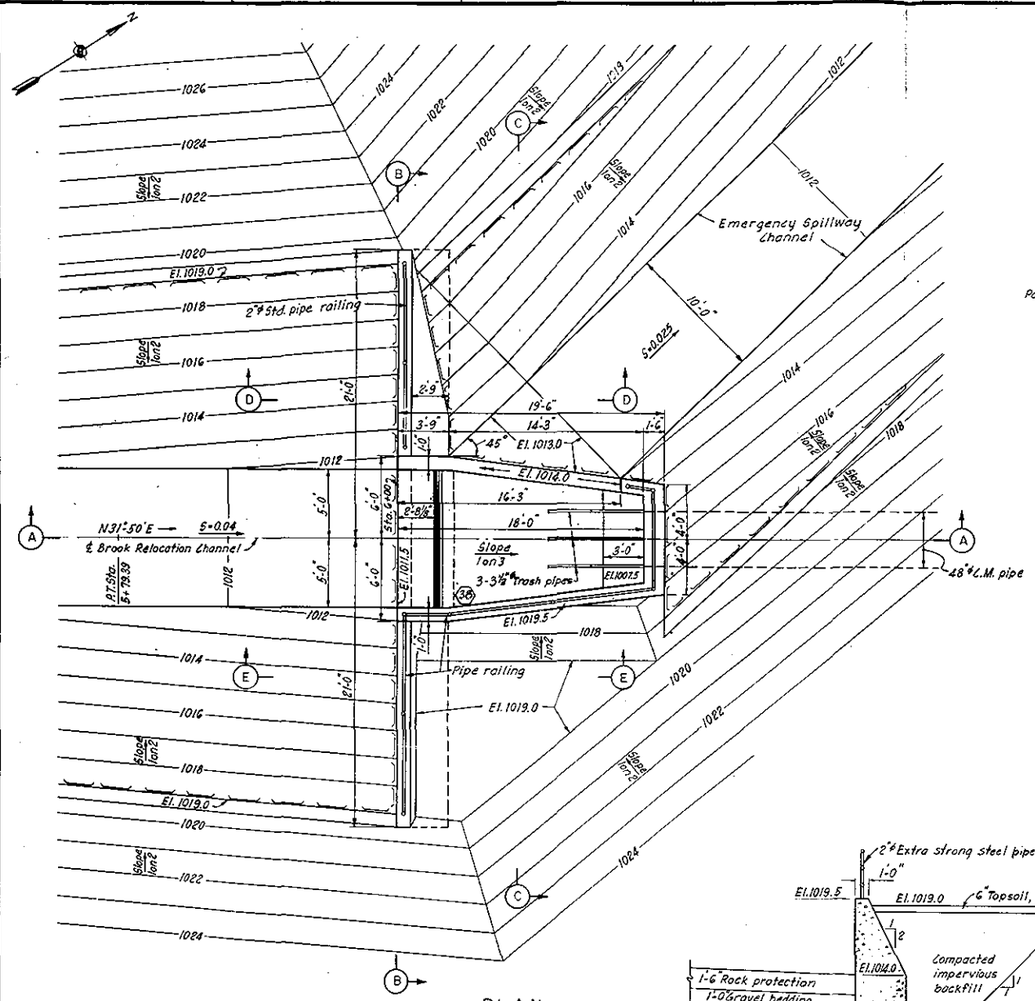
DES. BY K.E. — DR. BY A.G. — CK. BY M.Z.
SUBMITTED: CHIEF, LAYOUT SECTION
REVIEWED: PROJECT ENGINEER
APPROVED: CHIEF, DESIGN BRANCH
APPROVED: CHIEF, ENGINEERING DIVISION

CONNECTICUT RIVER FLOOD CONTROL
SUCKER BROOK DAM
BROOK RELOCATION
PLAN, PROFILE AND SECTIONS

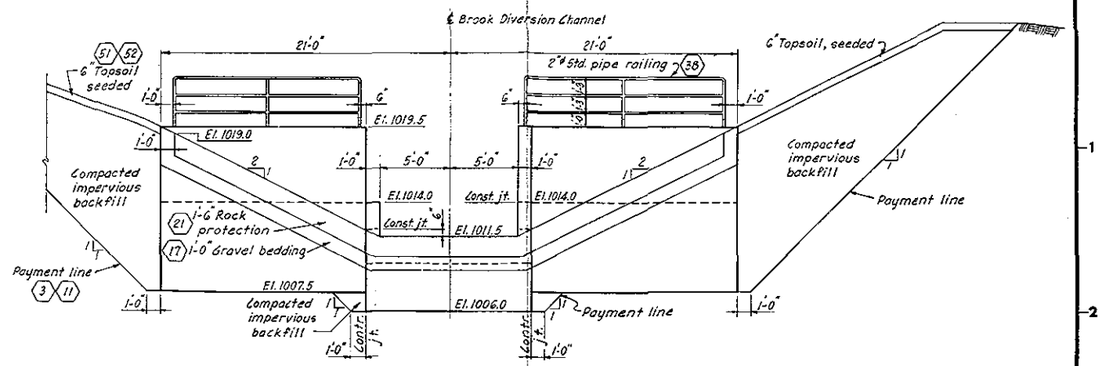
SUCKER BROOK — CONNECTICUT
DATE JUNE 1966
SCALE AS SHOWN — SPEC. NO. CIV. ENG. 19-016-66-70
DRAWING NUMBER CON-52
SHEET 27

PLATE D-17

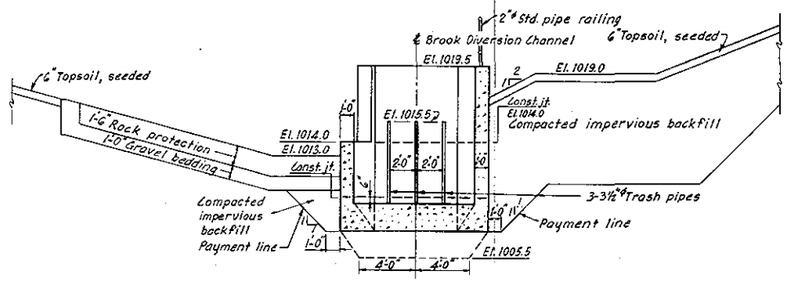
CORPS OF ENGINEERS — U. S. ARMY



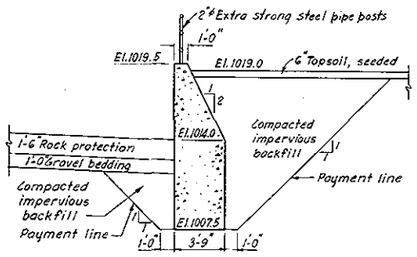
PLAN



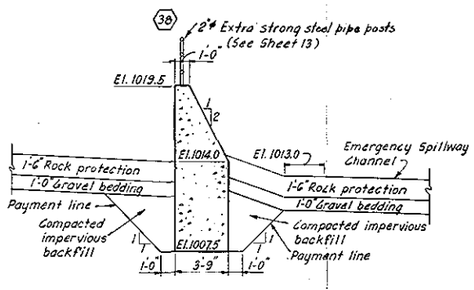
SECTION B-B



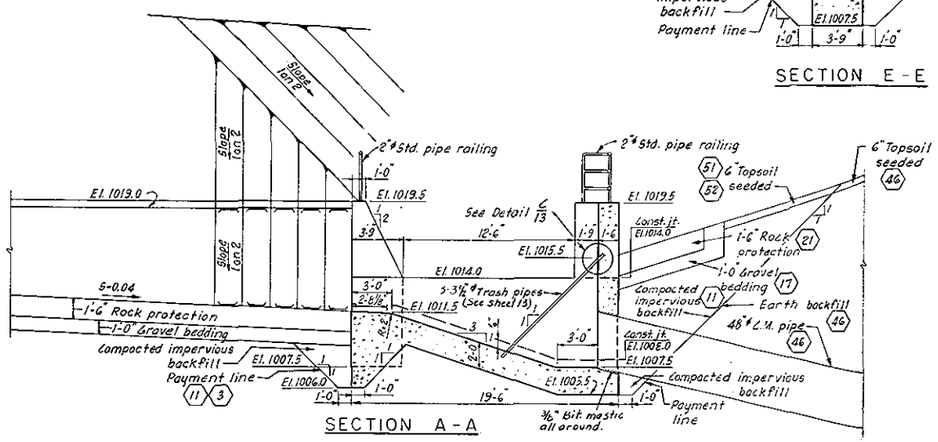
SECTION C-C



SECTION E-E



SECTION D-D



SECTION A-A

NOTES

For control, see Sheet 3.
All concrete shown on this sheet will be paid for under Item No. 26.
For steel reinforcement see Sheet 30.
All steel pipe posts for railing to be extra strong.

GRAPHIC SCALES 1"=1'-0"

REVISION	DATE	DESCRIPTION	BY
		Final Field Correction	

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

DES. BY D.W.C. | DR. BY A.G. | CK. BY 27.2

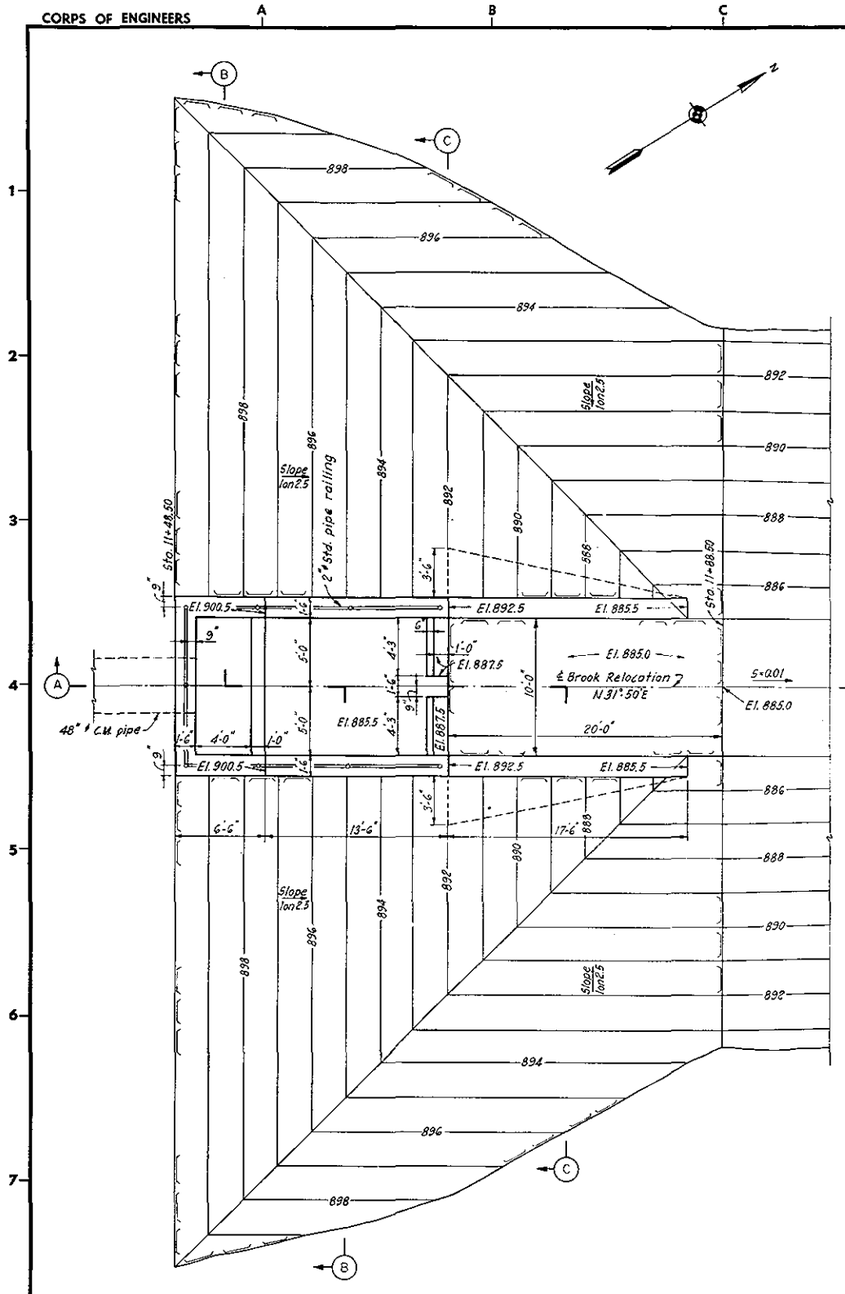
SUBMITTED: CHIEF, LAYOUT SECTION
REVIEWED: PROJ. ENGINEER
APPROVED: CHIEF, DESIGN BRANCH
APPROVED: CHIEF, ENGINEERING DIVISION

CONNECTICUT RIVER FLOOD CONTROL
SUCKER BROOK DAM
BROOK RELOCATION
INLET STRUCTURE - CONCRETE DETAIL
SUCKER BROOK — CONNECTICUT

DATE JUNE 1966
SCALE 1"=1'-0"
SPEC. NO. CIV. ENG. 19-016-66-70
DRAWING NUMBER CON-52
SHEET 28

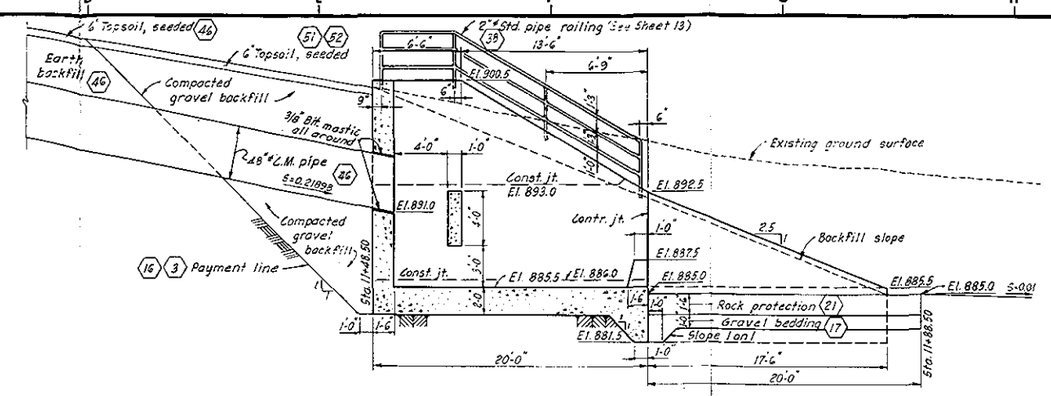
PLATE D-18

CORPS OF ENGINEERS — U. S. ARMY

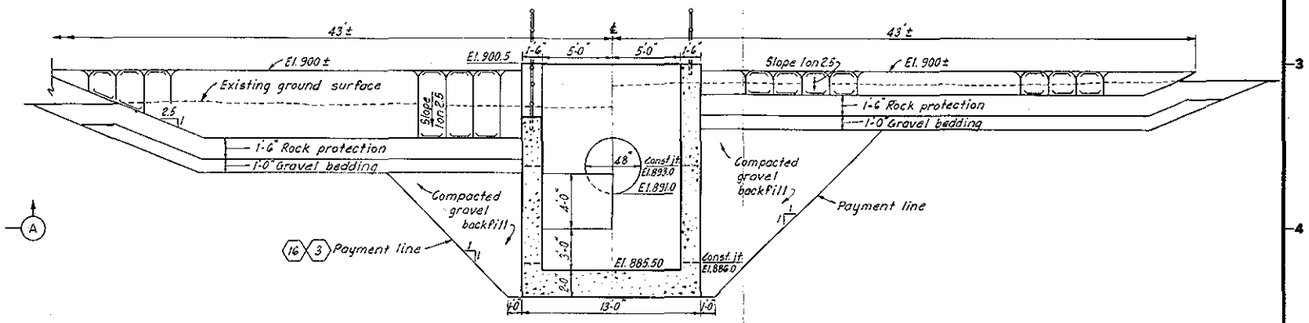


PLAN

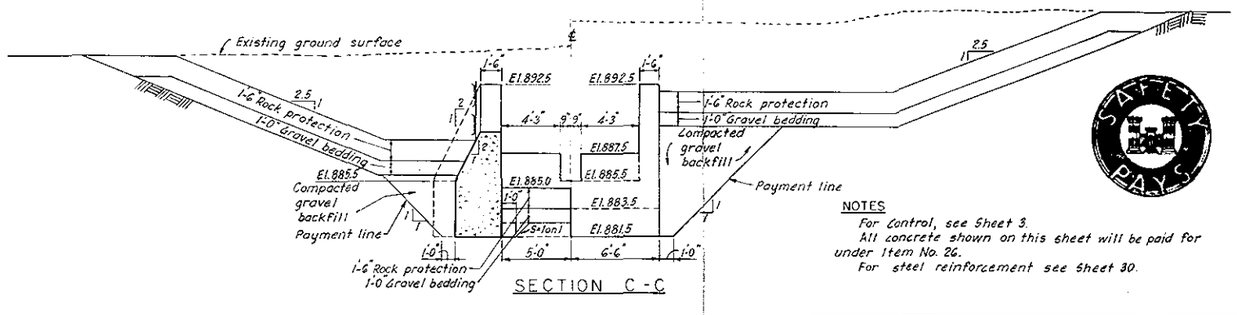
SCALE: 1/4" = 1'-0"



SECTION A-A



SECTION B-B



SECTION C-C

NOTES

For control, see Sheet 3.
All concrete shown on this sheet will be paid for under Item No. 26.
For steel reinforcement see Sheet 30.

GRAPHIC SCALE

1/4" = 1'-0" 4' 0 4' 8'

REVISION	DATE	DESCRIPTION	BY
		Final Field Corrections	

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

DES. BY D.W.C. | DR. BY A.G. | CK. BY K.E.

SUBMITTED: CHIEF, LAYOUT SECTION
REVIEWED: PROJECT ENGINEER
APPROVED: CHIEF, DESIGN BRANCH
APPROVED: CHIEF, ENGINEERING DIVISION

CONNECTICUT RIVER FLOOD CONTROL
SUCKER BROOK DAM
BROOK RELOCATION
OUTLET STRUCTURE
CONCRETE DETAIL

SUCKER BROOK — CONNECTICUT

DATE JUNE 1966

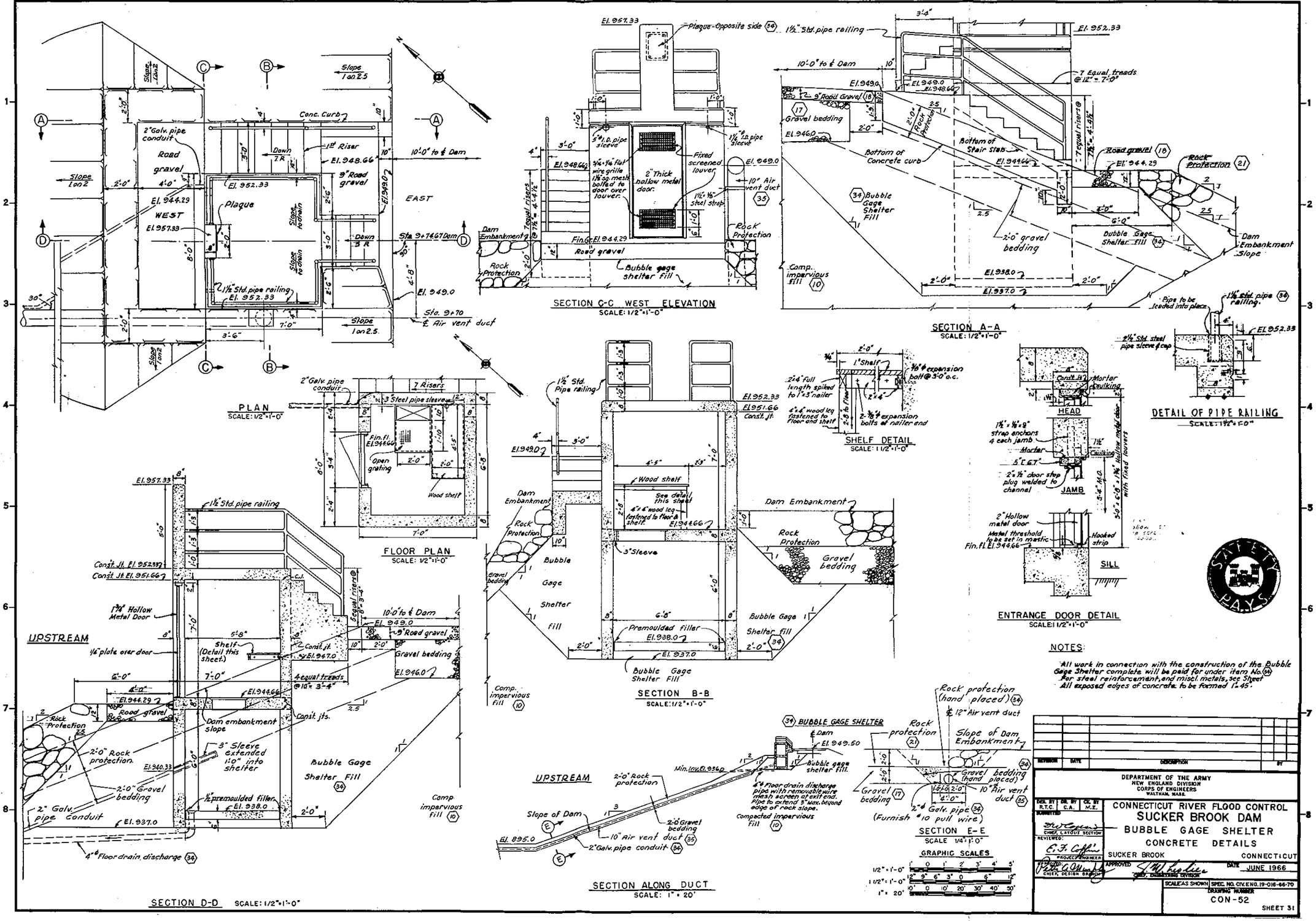
SCALE: 1/4" = 1'-0" | SPEC. NO. CIV. ENG. 19-016-66-70

DRAWING NUMBER
CON - 52

SHEET 29

PLATE D-19

CORPS OF ENGINEERS — U. S. ARMY



NOTES:

All work in connection with the construction of the Bubble Gage Shelter complete will be paid for under item No. 34.
For steel reinforcement, and miscl. metals, see Sheet
All exposed edges of concrete to be formed 1:45.

REVISION	DATE	DESCRIPTION	BY

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

DES. BY R.T.C. | DR. BY C.A. | CK. BY M.Z.

SUBMITTED: CHIEF, LAYOUT SECTION
REVIEWED: E. F. Coffin, PROJECT ENGINEER
CHIEF, DESIGN BRANCH
APPROVED: CHIEF, ENGINEERING DIVISION

CONNECTICUT RIVER FLOOD CONTROL
SUCKER BROOK DAM
BUBBLE GAGE SHELTER
CONCRETE DETAILS

SUCKER BROOK — CONNECTICUT

DATE JUNE 1966

SCALE: AS SHOWN | SPEC. NO. CIV. ENG. 19-016-66-70

DRAWING NUMBER CON-52

SHEET 31

PLATE D-20

APPENDIX E

FISH LADDER

FISH LADDER

The fish ladder has not been designed or constructed at the time of preparation of the Operation and Maintenance Manual for Sucker Brook.

When the ladder has been constructed, Appendix E will be prepared covering its maintenance and operation.