

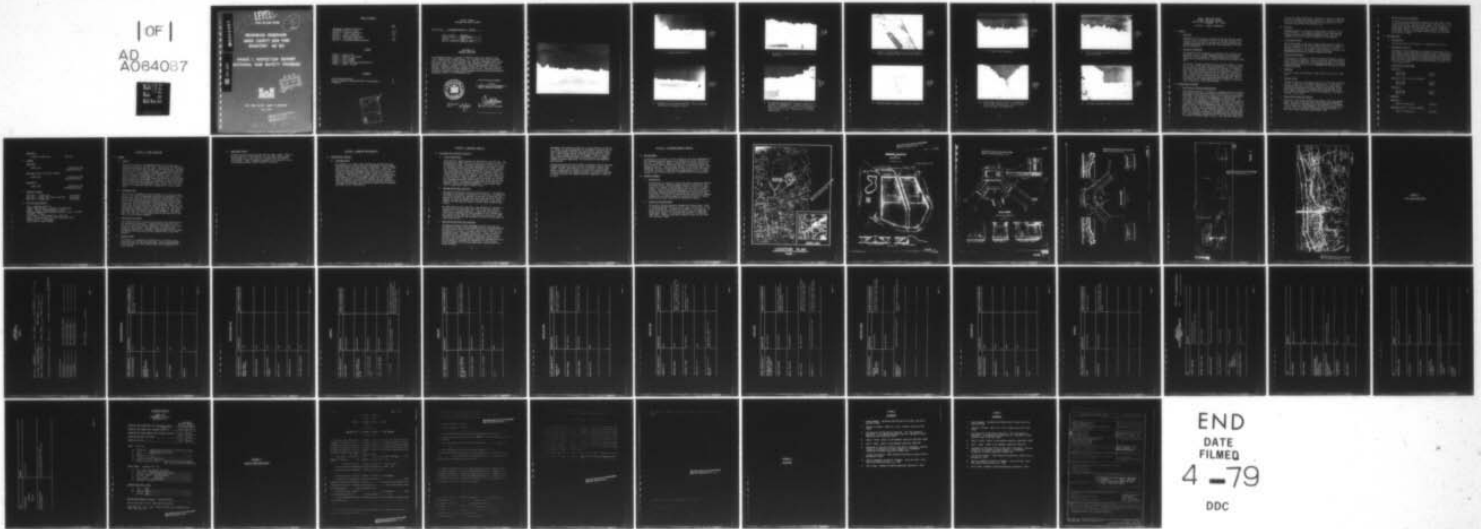
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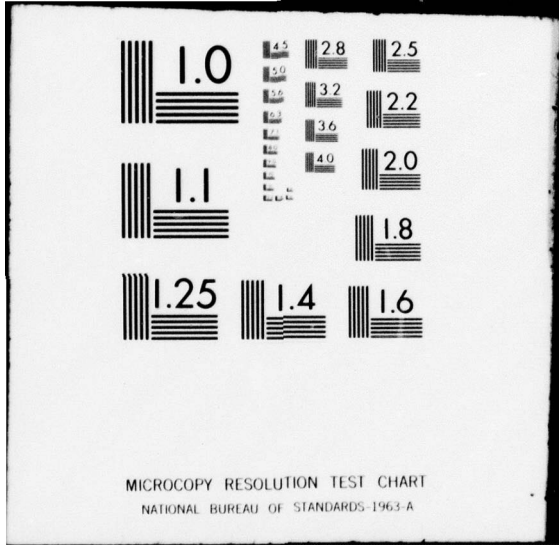
NEW YORK STATE DEPT OF ENVIRONMENTAL CONSERVATION ALBANY F/6 13/2  
NATIONAL DAM SAFETY PROGRAM. RIDGEWOOD RESERVOIR (NY 160); LONG--ETC(U)  
JUL 78 J B STETSON DACW51-78-C-0035

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~~LEVEL~~  
LONG ISLAND BASIN

*Handwritten:* 14

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**RIDGEWOOD RESERVOIR  
KINGS COUNTY NEW YORK  
INVENTORY NO 160**

**PHASE I INSPECTION REPORT  
NATIONAL DAM SAFETY PROGRAM**

DDC  
REGISTERED  
FEB 1 1979  
C



**NEW YORK DISTRICT CORPS OF ENGINEERS**

**JULY 1978**

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ACCESSION for

NTIS  White Section

BDC  Buff Section

UNANNOUNCED

JUSTIFICATION \_\_\_\_\_

BY \_\_\_\_\_

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SPECIAL

A



PHASE I REPORT  
NATIONAL DAM SAFETY PROGRAM

Name of Dam Ridgewood Reservoir - NY 160

State Located New York  
County Located Kings County  
Stream None  
Date of Inspection June 22, 1978

ASSESSMENT OF  
GENERAL CONDITIONS

The Ridgewood Reservoir, located in Brooklyn, serves as a backup to the city's aqueduct water supply system. It is perched above the surrounding terrain and receives no off-site drainage. The main embankment areas are to the north, east, south and southeast. The embankment is generally in good condition, however, a number of large trees on the embankment should be removed. Vandalism has been a constant problem for the owner over the last few years, and riprap has been removed at one location. Security measures should be increased to prevent further damage to the structure and to prevent additional erosion of the embankment face.



Approved By:  
Date:

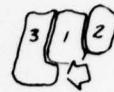
*28 July 78*

Dale Engineering Company

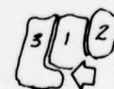
*John B. Stetson*  
John B. Stetson, President

*Clark H. Benn*  
Col. Clark H. Benn  
New York District Engineer

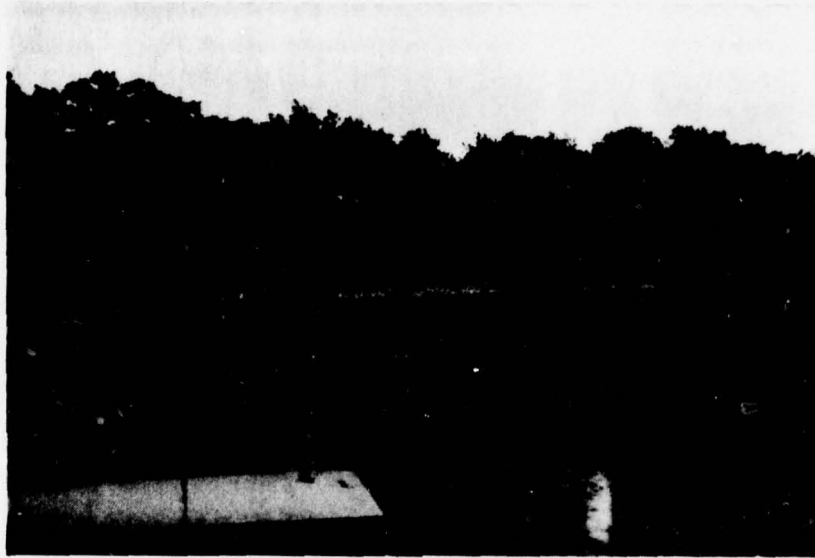




1. View across basin #3.



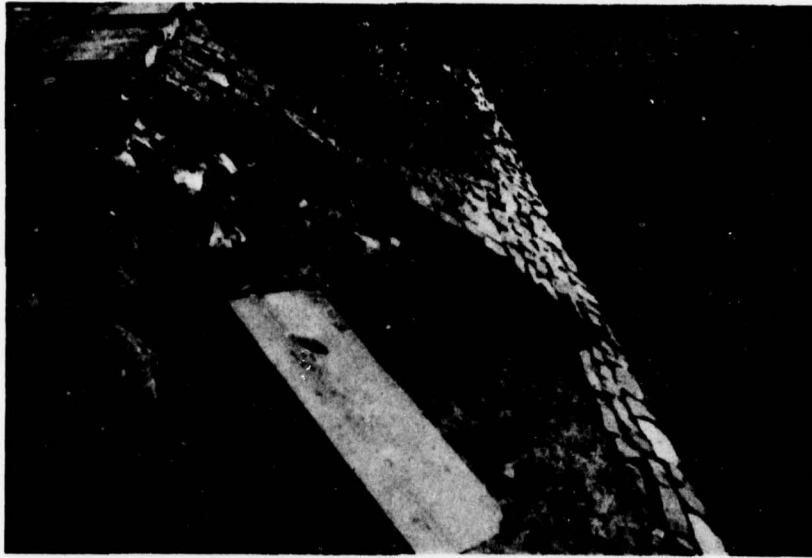
2. Another view across basin #3. Notice general condition of riprap is good.



3. Closeup of riprap adjacent to overflow structure.

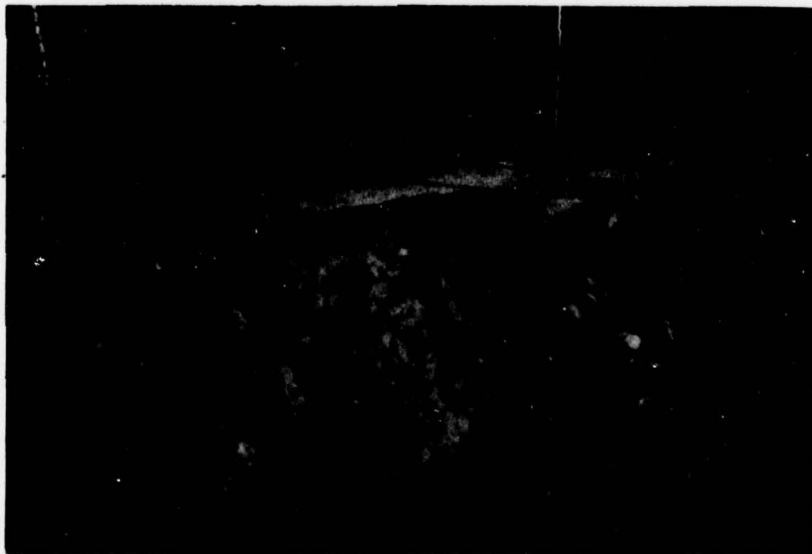


4. Foreground shows area of heavy vegetative growth on embankment. General condition of basins #1 and #3 is that of little growth. Basin #2 not in use; turned over to Parks Department.



3 1 2

5. Detail of area adjacent to overflow weir where riprap has been removed by vandals.



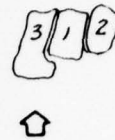
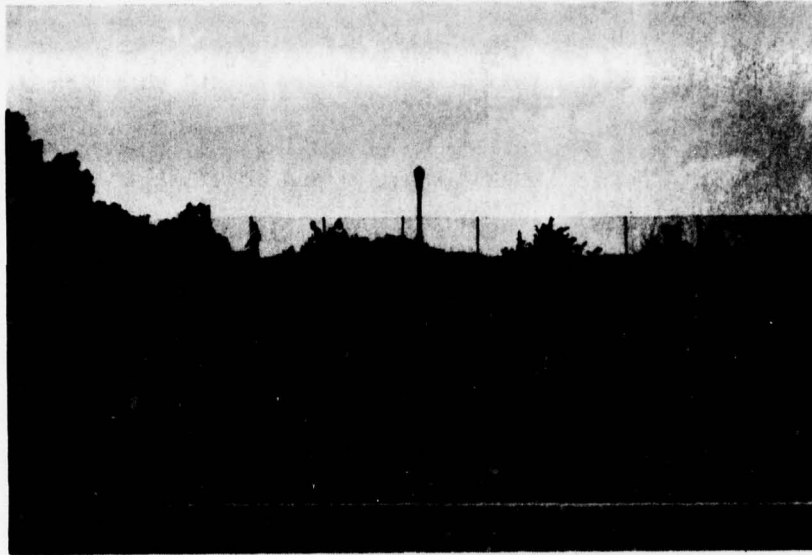
3 1 2

6. Another photo of area in picture number 5.

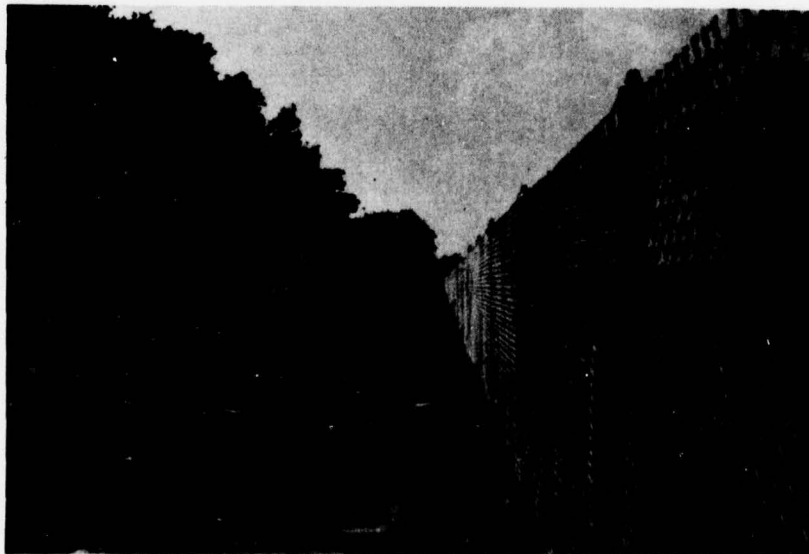
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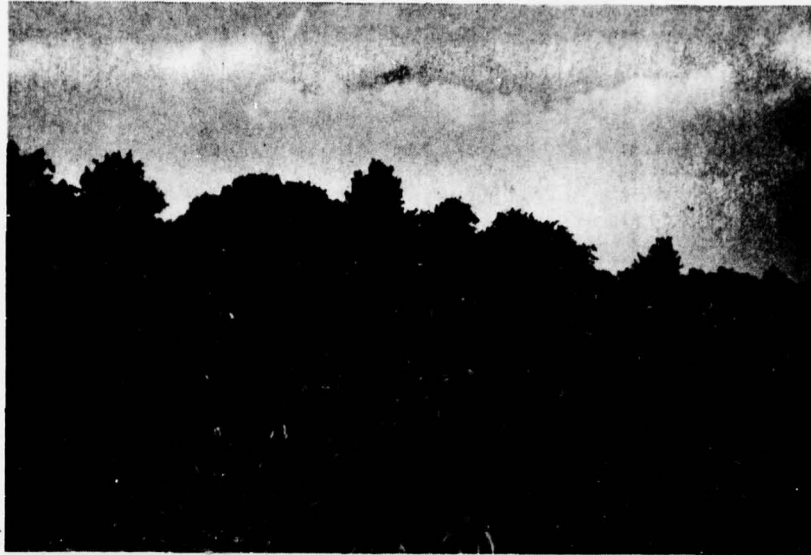




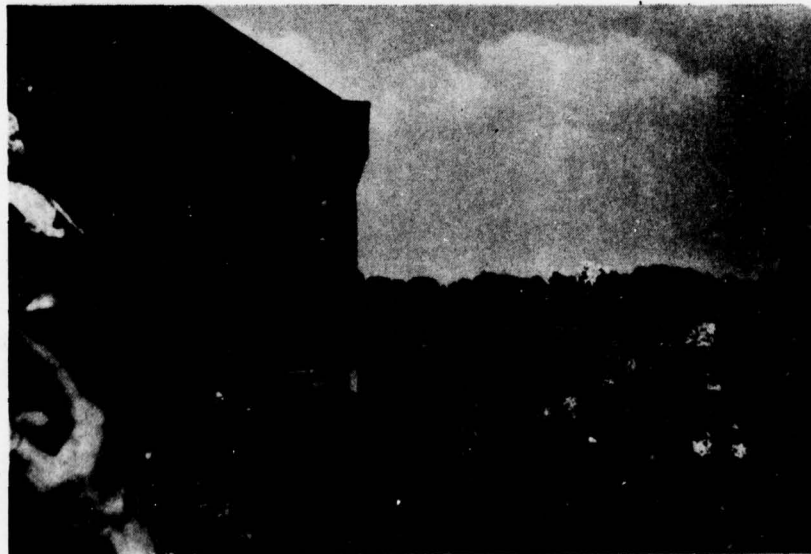
7. East side embankment.



8. View along fence at top of embankment on south side of basin #3. Notice large trees on side of embankment.



9. View of riprap in basin #1. In generally good condition.



10. Closeup from gate house in picture number 9.

PHASE I INSPECTION REPORT  
NATIONAL DAM SAFETY PROGRAM  
NAME OF DAM - RIDGEWOOD ID# - NY160

SECTION 1 - PROJECT INFORMATION

1.1 General

a. Authority

Authority for this report is provided by the National Dam Inspection Act, Public Law 92-367 of 1972. It has been prepared in accordance with a contract for professional services between Dale Engineering Company and The New York State Department of Environmental Conservation.

b. Purpose of Inspection

The purpose of this inspection is to evaluate the structural and hydraulic condition of the Ridgewood Reservoir and appurtenant structures, and to determine if the dam constitutes a hazard to human life or property and to transmit findings to the State of New York.

This Phase I inspection report does not relieve an Owner or Operator of a dam of the legal duties, obligations or liabilities associated with the ownership or operation of the dam. In addition, due to the limited scope of services for these Phase I investigations, the investigators had to rely upon the data furnished to them. Therefore, this investigation is limited to visual inspection, review of data prepared by others, and simplified hydraulic and structural stability evaluations where appropriate. The investigators do not assume responsibility for defects or deficiencies in the dam or in the data provided.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam and Appurtenances

The Ridgewood Reservoir is formed by a compacted earth fill embankment with a clay puddled core which surrounds the entire reservoir. The height of this structure varies up to a maximum of approximately 30 feet. The length of the embankment is approximately 1.5 miles and covers the entire circumference of the reservoir. The top width of the embankment is a minimum of 20 feet. The reservoir is divided into three separate basins by a dividing wall similar in construction to the main embankment except for the width at the top which is 15 feet. At the time of the inspection, Basin No. 2 has been out of service for approximately 14 years. Basins No. 1 and 3 are still presently in use. The interslopes of the reservoir were lined with two feet of earthen clay puddle material (see Reference No. 1 for background discussion) over which was layed three inches of concrete and eight inches of brick. The slope was covered with

a stone and grouted with mortar. Basins No. 1 and 3 are connected by a 36 inch siphon which allows the basins to operate at the same elevation. Overflows from the reservoir are conducted into the storm drainage system of the adjacent area.

b. Location

Ridgewood Reservoir is located in the Borough of Brooklyn in the City of New York. The reservoir extends from the Inter-Borough Parkway on the north to Highland Boulevard on the south and is founded by lands of the national cemetery on the southeast.

c. Size Classification

The maximum height of the dam is about 30 feet and the storage capacity is estimated to be 218 acre feet for Basin No. 1, 456 acre feet for Basin No. 3, for a total of 674 acre feet in service. Therefore, the dam is in the small sized category as defined by the Recommended Guidelines for Safety Inspection of Dams.

d. Hazard Classification

The reservoir is located in a heavily developed residential portion of the Borough of Brooklyn. Failure of the dam could cause considerable loss of property and life, therefore, the dam is in the high hazard category as defined by the Recommended Guidelines for Safety Inspection of Dams.

e. Ownership

The dam is owned by the Bureau of Water Supply of the City of New York.

f. Purpose of Dam

The dam is used as a distribution reservoir for the water supply of the City of New York. At present, the reservoir is used only for standby purposes and is actively connected to the water supply system for approximately 10 days per year during periods of high water demand. Basin No. 2 has been drained and has been turned over to the Parks Department of the City of New York. No usage is now made of this basin.

g. Design and Construction History

Basins No. 1 and 2 were constructed by Henry S. Wells and Company under a contract in June of 1856. This project was completed in 1858. The work was designed by the Chief Engineer, Mr. Kirkwood. In 1891, Basin No. 3 was completed. The facility has been in constant use until the present time except for the abandonment of Basin No. 2 which took place approximately 1964.



h. Normal Operational Procedures

No specific relevant operating information has been given. There is an operating staff on the site full time. The facility is continually maintained. Drainage of the reservoir is by gravity. In recent years the reservoir has been used to provide summertime backup water supply. In the winter, the reservoir is reportedly drawn down. Eventually the owner intends to phase out the reservoir and draw it down.

1.3 PERTINENT DATA

a. Drainage Area

The drainage area of the reservoir is approximately 75 acres.

b. Discharge at Dam Site

Discharges at the overflow weir are related to operations of the water supply system rather than by rainfall events. There have been no reported historical operating conditions which have endangered the condition of the reservoir or caused overtopping of the embankment. Inflows to the reservoir are controlled by staff personnel stationed at the reservoir and by other personnel at control points in the supply system.

c. Elevation (feet above MSL)

Basin No. 1

Top of dam	174.16
Normal pool	170.16

Basin No. 2 (Not in service, emptied)

Top of dam	174.86
Normal pool	170.86

Basin No. 3

Top of dam	174.16
Normal pool	170.16

d. Reservoir

Basin No. 1

Length of normal pool	1150 feet
-----------------------	-----------

Basin No. 2 (Not in service, emptied)

Length of normal pool	1150 feet
-----------------------	-----------



Basin No. 3

Length of normal pool 1300 feet

e. Storage

Basin No. 1

Normal pool 218.86 acre feet  
71,500,000 gallons

Basin No. 2 (Not in service, emptied)

Normal pool 254.06 acre feet  
83,000,000 gallons

Basin No. 3

Normal pool 456.06 acre feet  
149,500,000 gallons

f. Reservoir Surface

Basin No. 1 - Normal pool 13.73 acres  
Basin No. 2 - Normal pool (Not in service) 11.85 acres  
Basin No. 3 - Normal pool 24.49 acres

g. Dam (all three basins)

Type - Compacted earth fill.  
Length - Approximately 1.5 miles in circumference.  
Height - Varies. High embankment to east.  
Freeboard between normal reservoir and top of dam - 4.0 feet.  
Top width - 20 feet.  
Side Slopes - 1-1/2 horizontal to 1 vertical.  
Zoning - Compacted earth fill with clay puddle core.  
Impervious core - Clay puddle.  
Grout curtain - None recorded.

## SECTION 2 - VISUAL INSPECTION

### 2.1 SUMMARY

#### a. General

The visual inspection of Ridgewood Reservoir in the Borough of Brooklyn took place on June 22, 1978. The reservoir has undergone continued maintenance over the years. Vandals have been a constant problem at the site in the last few years. Three basins constitute this reservoir. Basin Number 2 has been abandoned and turned over to the City's Parks Department, Basins Number 1 and 3 are in use. There is no water in Basin Number 2. The reservoir is currently used as backup for the Borough system and during 1977 was used only about 10 days during the summer. The reservoir basins are perched above the existing terrain and have virtually no runoff area above the pool other than the embankment slope. Basins 1 and 3 are connected via a siphon which was not in operation at time of inspection.

#### b. Impoundment Dam

The reservoir impoundment visually conforms to the plans provided herein. The reservoir embankment surrounds the impoundments of the three basins. The outside of the basins are fenced with a path. The path was walked with visual inspection of the adjacent riprap areas. The riprap was generally in good condition and fairly well maintained. One area contained in the photographs shown in this report near the overflow weir has been continually vandalized, the riprap being removed to provide an illegal swim area. The exterior embankment was inspected and a significant number of large trees were found near the top and sides of the embankment. The embankment cover crop was in fairly good condition and there was no evidence of erosion and/or movement.

#### c. Appurtenant Structures

The overflow weir was in service at the time of the inspection but no discharge was occurring. A siphon connecting Basins 1 and 3 was not in service at time of inspection. The access cover to the siphon has been removed. The cover should be replaced, even though the siphon area is enclosed in the perimeter fencing system. The downtake structure was visually inspected with no particular comments.

#### d. Reservoir Area

The reservoir is completely riprapped and is in generally good condition except for the one area noted. Small to medium heights of foliage exist with the riprap at most of the impounding surfaces, however.

e. Downstream Channel

Overflow from the reservoir enters the city sewer system. Flow into the reservoir is controlled via the city water supply system. The drainage area of the reservoir is effectively the reservoir surface area. There is adequate freeboard in the reservoir to contain probable maximum rainfall without overtopping.

## SECTION 3 - HYDROLOGY AND HYDRAULICS

### 3.1 EVALUATION OF FEATURES

#### a. Experience Data

The reservoir is a water supply holding area perched above the surrounding terrain and has only the impoundments interior embankment for runoff, the area of which is only minor. Based on information given by the operations staff, there will be more than sufficient operations freeboard with the reservoir to store a PMP rainfall of approximately 25-30 inches without overtopping the embankment. The only way the reservoir would be overtopped would be by operator error on the aqueduct supply end of the system. Since the reservoir is continually staffed, with the reservoir level in continual observation and with the aqueduct operators in continued radio contact, this possibility seems remote and beyond the scope of this investigation.



## SECTION 4 - STRUCTURAL STABILITY

### 4.1 Evaluation of Structural Stability

#### a. Visual Observations

This reservoir complex consists of three basins, side by side. The easterly basin, empty and out of service for a number of years, is overgrown with reeds. The central and westerly basins are in use. All perimeter and basin dividing embankments, and slopes in areas of (originally) basin excavation, are generally in good condition with no evidence of structural movement or cracking. Reservoir side slopes have been provided with riprap, observed to be in serviceable condition with the exception of limited areas where the riprap has been displaced by vandals. Minor erosion is occurring at such locations. Heavy growth of small to medium size foliage has developed through the riprap across much of the two inservice basin perimeters. Examination of downstream slopes indicate no seepage is occurring through embankments. Large, mature trees exist on downstream slopes at several areas.

#### b. Geology and Seismic Stability

The reservoir location is sited in glacial material. The general thickness of the glacial soil material in this area is at least 100 feet (drilling records). Bedrock is indicated at about 500 feet beneath the surface. Between the bedrock and the glacial cover are deposits of Upper Cretaceous sand, clay and gravel. The glacial deposits are the source of most of the well water pumped on Long Island.

No known faults exist in the area. One earthquake is recorded as having occurred in 1878 about five miles to the north with an intensity of V (Modified Mercalli). Two others are recorded in 1884 as occurring about ten miles southwest of the reservoir with an intensity of VII (MM) and in 1893 with an intensity of V (MM). These three earthquakes were apparently centered in areas where no known faults exist.

#### c. Data Review and Stability Evaluation

The design drawings indicate embankment sections have been constructed with a puddle core and puddle base for the downstream half on the structure, and an earth shell having side slopes of 1-1/2 horizontal on 1 vertical. A stone riprap lining is indicated for impounding slopes. Embankment widths vary. Slopes in areas of excavation are (to have been) constructed with a puddle lining overlaid with concrete and rubble. Information on the type of materials used for the upstream and downstream embankment sections, and the method of placement and compaction, is not provided. Visually compared, the existing construction conforms with the design drawings.



Embankments and impounding slopes are in good condition structurally. Riprap linings are generally in serviceable condition, the exception being where stone work has been manually removed (vandalism). Heavy foliage present increases the opportunity for stone-work to be dislodged and erosion to commence. Areas of missing riprap should be reconstructed, and foliage should be trimmed/removed to prevent opportunity for future erosion and embankment deterioration.

Limited earthquake activity of minor to moderate intensity has been recorded as occurring in the past for this general area of Long Island. However, the reservoir site is located in Seismic Zone 1 which is conventionally assumed to present no earthquake hazard. Properly maintained, the reservoir's earth structures are expected to retain stability for loading conditions comparable to those of the past.

## SECTION 5 - ASSESSMENT/REMEDIAL MEASURES

### 5.1 DAM ASSESSMENT

On the basis of the Phase I visual examination, the earth embankment of the Ridgewood Reservoir appears to be adequate for normal reservoir operation. A substantial amount of riprap near the overflow outlet has been removed by vandals leaving the bank of the embankment exposed and subject to erosion. Trees have been planted in the exposed face of the embankment and are a possible source of root intrusion into the center of the dam structure. Vandalism from neighborhood youths is a severe problem in this area and has been a constant problem to the dam owner.

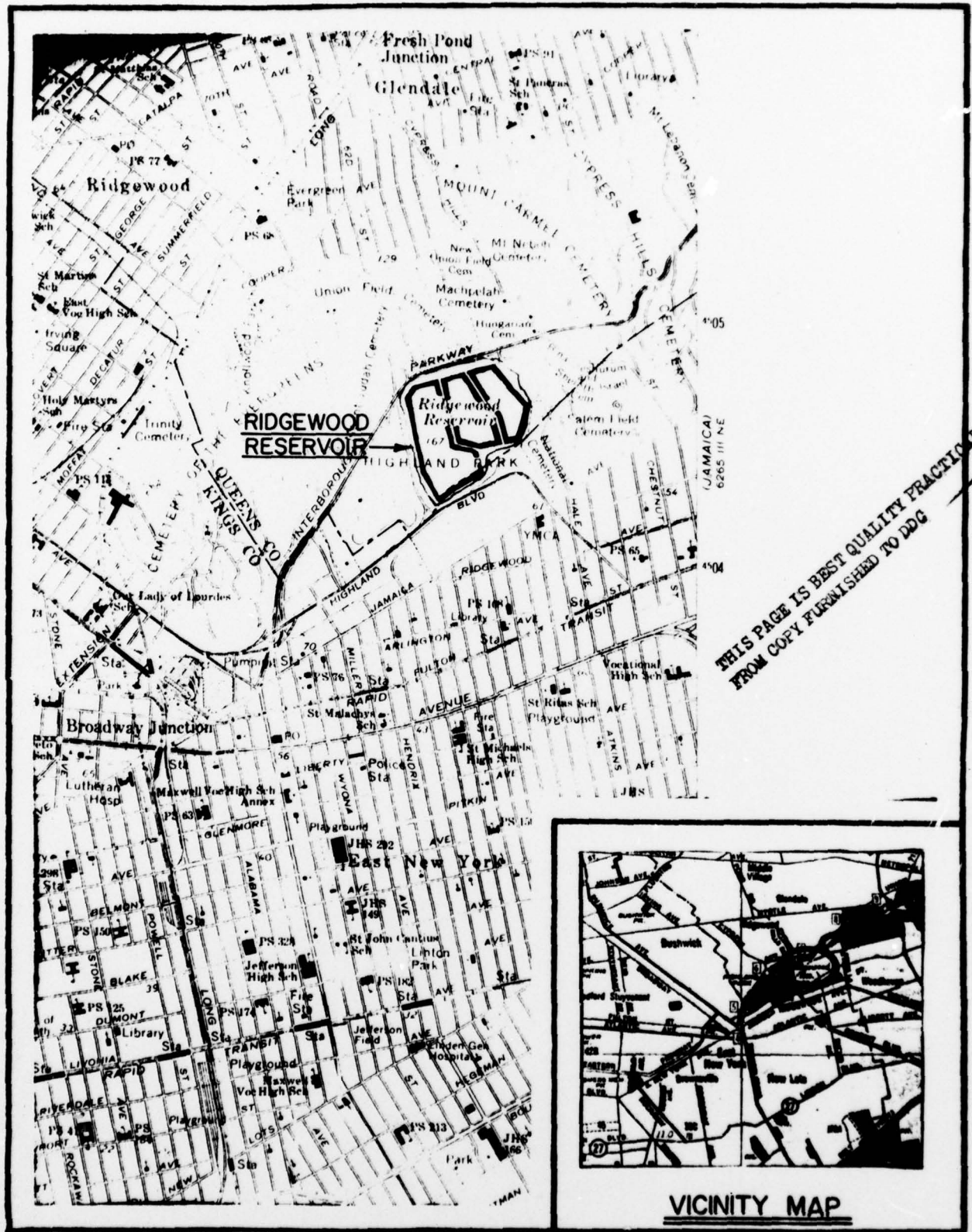
### 5.2 REMEDIAL MEASURES

#### a. Alternatives

Riprap should be repaired in those areas where vandals have removed the stone facing. Security measures should be increased in the reservoir to prevent further damage to the structure. The siphon access cover should be located and put back in place for safety reasons. Trees on the outside embankment slopes should be cut and the stumps removed along with any brush that exists on the downstream face. In addition to eliminating the possibility of seepage through the root system, removal of excessive growth will enable better future visual inspection of the exterior slopes.

#### b. Operation and Maintenance

No specific relevant operating information has been given. There is an operating staff on the site full time. The facility is continually maintained. Drainage of the reservoir is by gravity. In recent years the reservoir has been used to provide summertime backup water supply. In the winter the reservoir is reportedly drawn down. Eventually the owner intends to phase out the reservoir and draw it down.



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# LOCATION PLAN

FIGURE 1



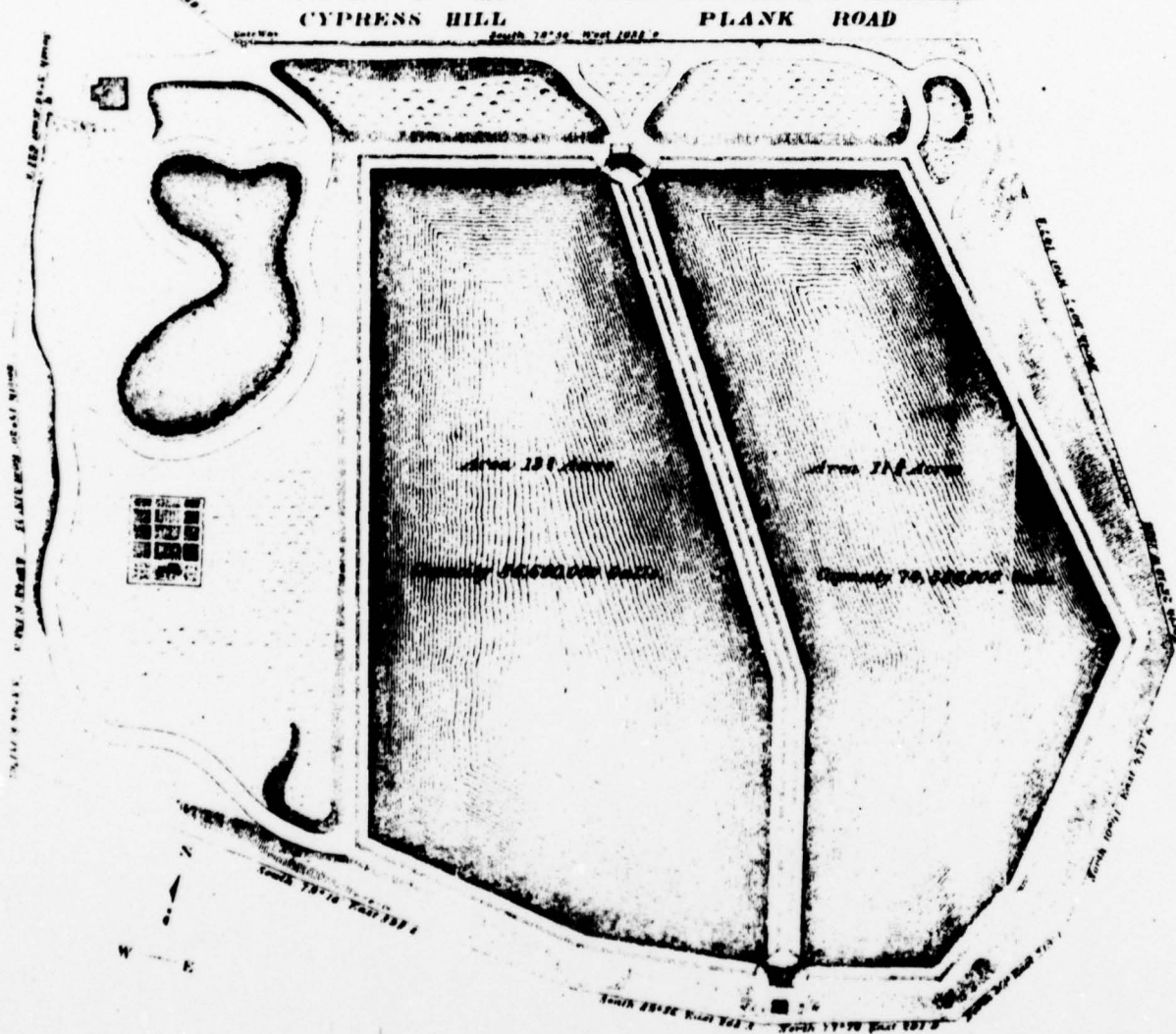
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Plate No 3

### RIDGEWOOD RESERVOIR AND GROUNDS.

Scale 200 feet = 1 inch

Area of Grounds 689 Acres.



DIVISION EMBANKMENT.

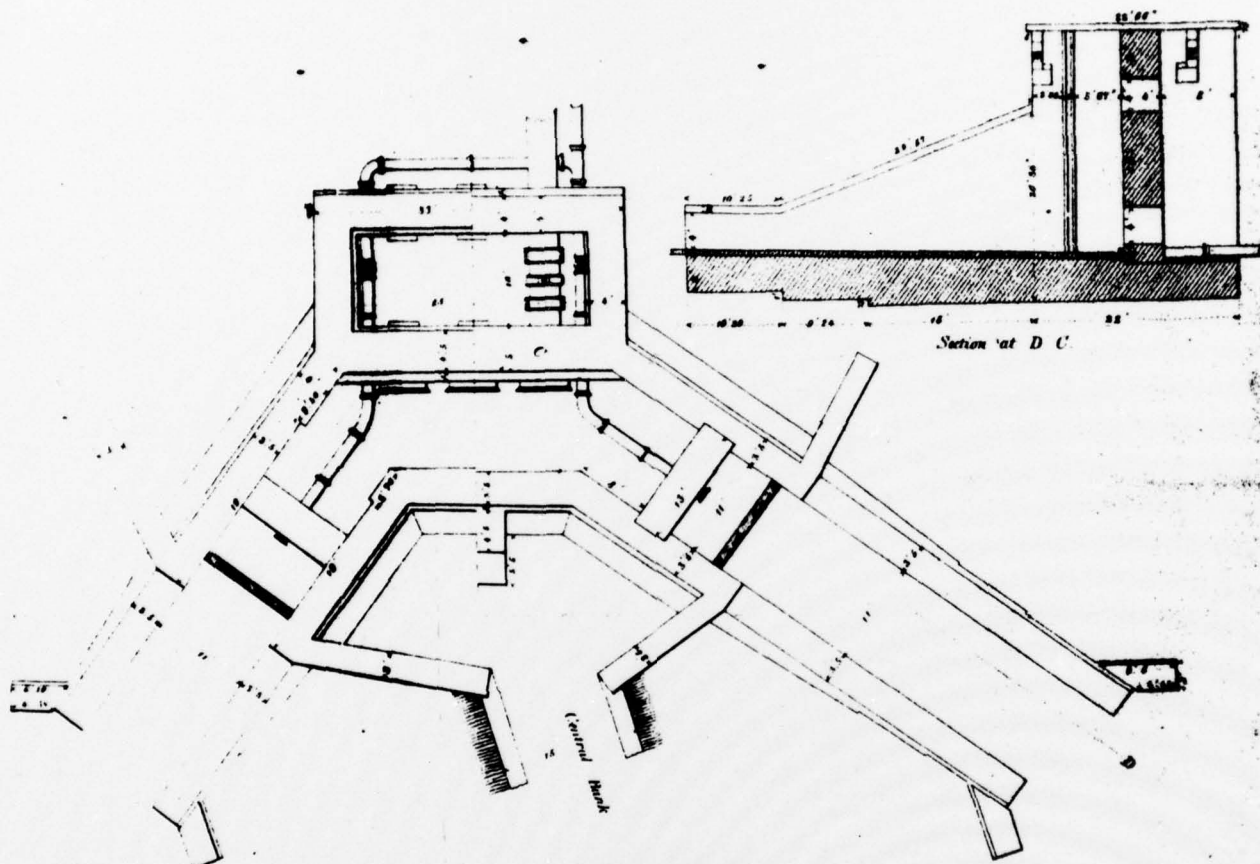


SIDE EMBANKMENT.

Scale 32 feet = 1 inch

FIGURE 2

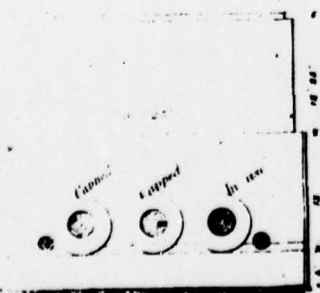
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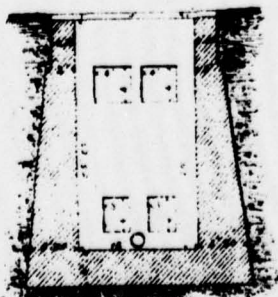
**EFFLUX CHAMBER,**

**RIDGEWOOD RESERVOIR.**

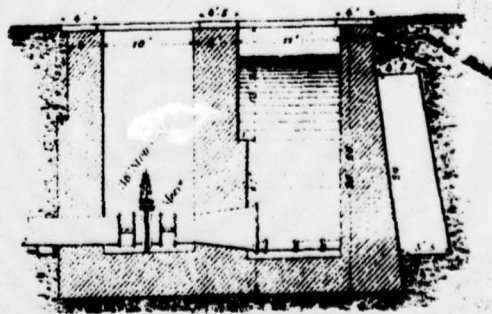
Scale 15 Feet to 1 Inch



Elevation of Frontwall of Chamber



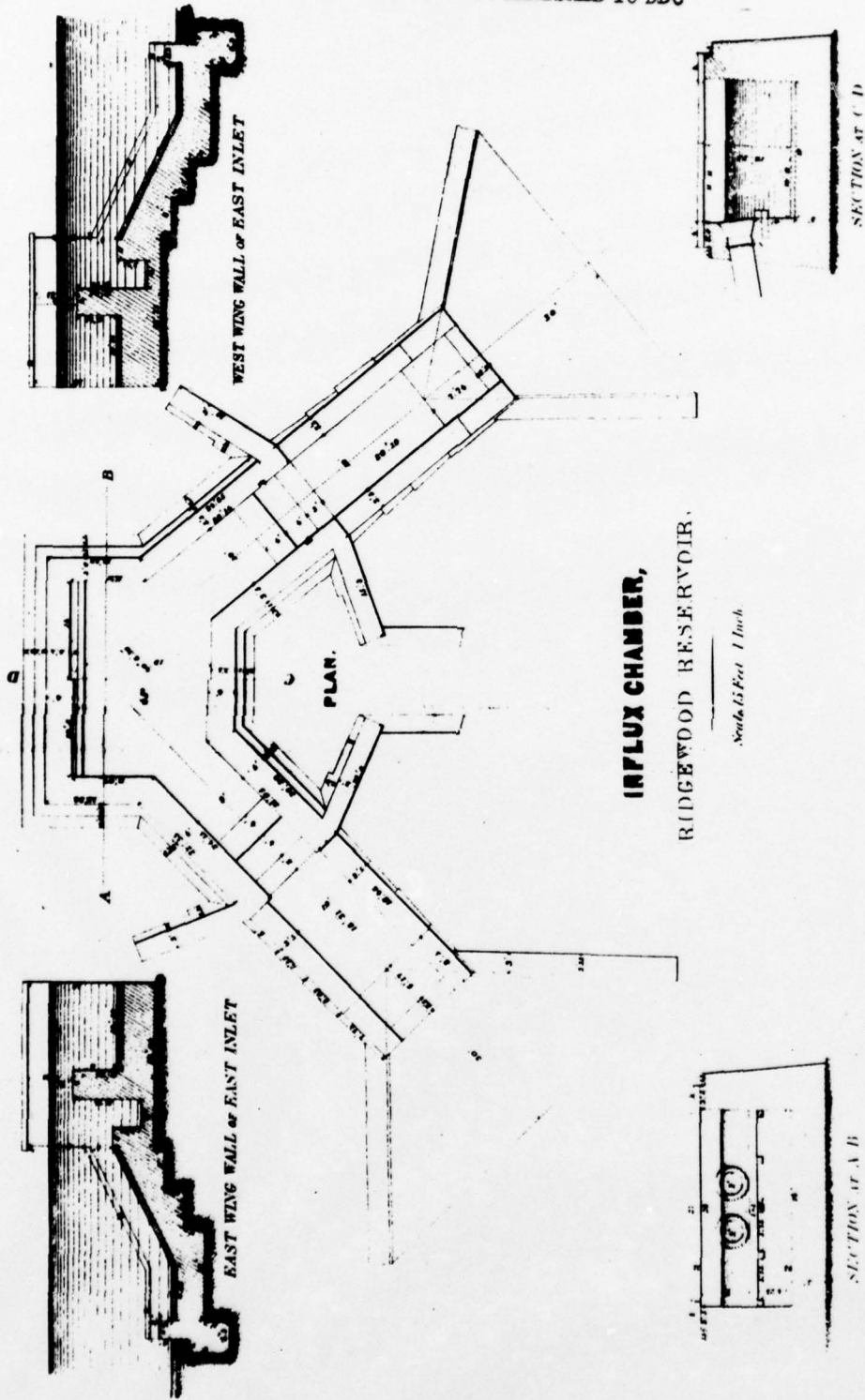
Section of Granite Pier



Section through Chambers

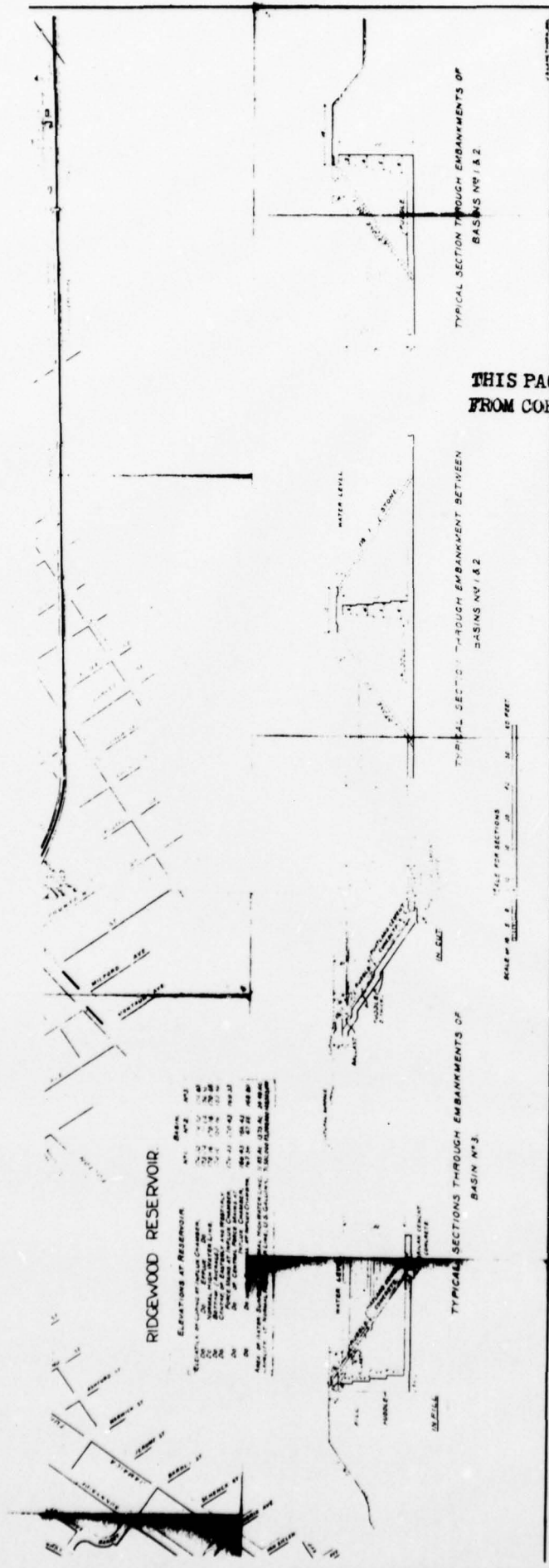


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**INFLUX CHAMBER,**  
RIDGEWOOD RESERVOIR.

**FIGURE 4**



**RIDGEWOOD RESERVOIR.**

ELEVATIONS AT RESERVOIR

NO.	NO.	NO.
1	2	3
4	5	6
7	8	9
10	11	12
13	14	15
16	17	18
19	20	21
22	23	24
25	26	27
28	29	30
31	32	33
34	35	36
37	38	39
40	41	42
43	44	45
46	47	48
49	50	51
52	53	54
55	56	57
58	59	60
61	62	63
64	65	66
67	68	69
70	71	72
73	74	75
76	77	78
79	80	81
82	83	84
85	86	87
88	89	90
91	92	93
94	95	96
97	98	99
100	101	102

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FIGURE 5

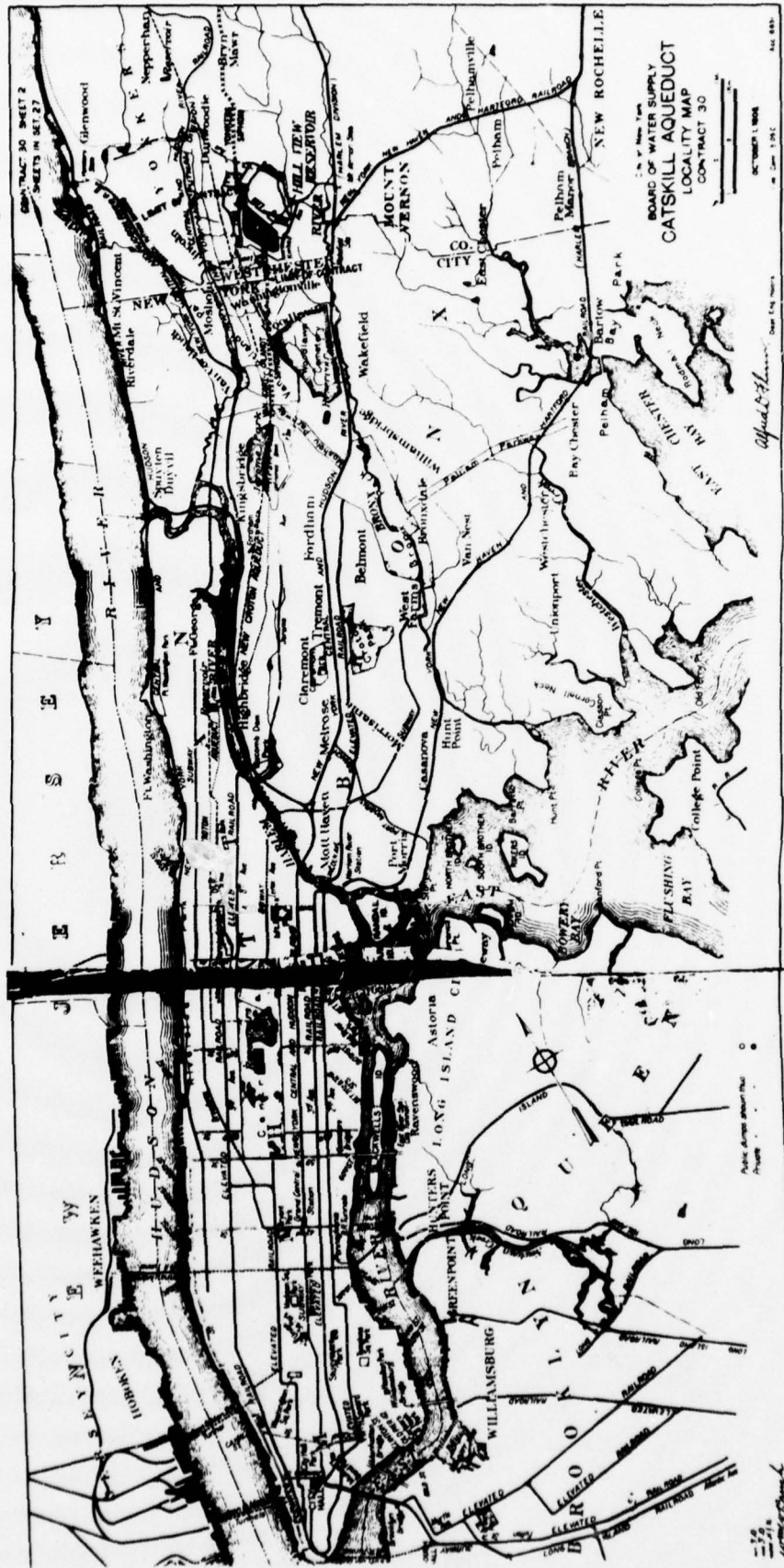


FIGURE 6

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APPENDIX A  
FIELD INSPECTION REPORT



CHECK LIST  
VISUAL INSPECTION

PHASE 1

Name Dam Ridgewood County Kings State New York ID # \_\_\_\_\_

Type of Dam Earthen Impoundment Hazard Category 1

Date(s) Inspection June 16, 1978 Weather Sunny Temperature 80°

Pool Elevation at Time of Inspection 171 M.S.L. Tailwater at Time of Inspection Not applicable.

Inspection Personnel:

Gordon Fleming N.Y.C. Bureau of Water Supply

N. F. Dunlevy Dale Engineering Company

Dave McCarthy Dale Engineering Company

F. W. Byszewski Dale Engineering Company

Neal F. Dunlevy Recorder

CONCRETE/MASONRY DAMS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
ANY NOTICEABLE SEEPAGE	N/A	Water supply reservoir perched on hilltop.
STRUCTURE TO ABUTMENT/EMBANKMENT JUNCTIONS	N/A	
DRAINS	N/A	
WATER PASSAGES	N/A	
FOUNDATION	N/A	

CONCRETE/MASONRY DAMS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS CONCRETE SURFACES	N/A	
STRUCTURAL CRACKING	N/A	
VERTICAL & HORIZONTAL ALIGNMENT	N/A	
MONOLITH JOINTS	N/A	
CONSTRUCTION JOINTS	N/A	
STAFF GAGE OF RECORDER	N/A	

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS	None observed.	
UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE	None observed.	
SLOUGHING OR EROSION OF EMBANKMENT AND ABUTMENT SLOPES	None observed.	
VERTICAL AND HORIZONTAL ALIGNMENT OF THE CREST	None observed.	
RIPRAP FAILURES	Areas of riprap removed by vandals for access to swimming.	This has been a continuing problem with the Bureau of Water Supply. The Bureau has been performing continual maintenance effort.



EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
JUNCTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM	Good condition.	Consisted of inspection of toe around base of perched reservoir.
ANY NOTICEABLE SEEPAGE	None observed.	
STAFF GAGE AND RECORDER	Closed water supply system.	
DRAINS	None.	

UNGATED SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE WEIR MASONRY	Good condition.	Into overflow discharge pipe 48 inches in diameter.
APPROACH CHANNEL	Good condition.	
DISCHARGE CHANNEL	None observed.	Discharges into sewer system.
BRIDGE AND PIERS	None.	

GATED SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE SILL	None	
APPROACH CHANNEL	None	Reservoir discharges into intake tower. Inflow into reservoir via 48" diameter Myrtle Ave. main.
DISCHARGE CHANNEL	Not observed.	Discharges into N.Y.C. water supply system.
BRIDGE AND PIERS	None	
GATES AND OPERATION EQUIPMENT	Performed by reservoir staff. Staff is full time.	

OUTLET WORKS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CRACKING AND SPALLING OF CONCRETE SURFACES IN OUTLET CONDUIT	Not observable.	
INTAKE STRUCTURE	Not observable.	Intake house was inspected. Hydraulic components were submerged below floor.
OUTLET STRUCTURE	Not observable.	
OUTLET CHANNEL	Not observable.	Closed system. N.Y.C. water supply. Reservoir currently only used 10 days per year for peak support.
EMERGENCY GATE	Controlled by reservoir's staff.	Inflow into reservoir controlled via Bureau's supply master control.



DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	Not applicable.	Closed reservoir system for water supply. Overflow into sewer system.
SLOPES	Not applicable.	
APPROXIMATE NO. OF HOMES AND POPULATION	Incorporated limits of Brooklyn.	Significant flood damage potential exists.

INSTRUMENTATION

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
MONUMENTATION/SURVEYS	None.	
OBSERVATION WELLS	None.	
WEIRS	None.	
PIEZOMETERS	None.	
OTHER		

RESERVOIR

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	Not applicable.	Reservoir perched.
SEDIMENTATION	Not applicable.	Only treated water gets into reservoir through water supply tunnel.

**CHECK LIST**  
**ENGINEERING DATA**  
DESIGN, CONSTRUCTION, OPERATION  
PHASE 1

NAME OF DAM Ridgewood Reservoir

ID # \_\_\_\_\_

ITEM	REMARKS
AS-BUILT DRAWINGS	Limited data available. See N.Y.C. Bureau of Water Supply.
REGIONAL VICINITY MAP	See this report.
CONSTRUCTION HISTORY	See text this report and references.
TYPICAL SECTIONS OF DAM	See this report.
OUTLETS - PLAN - DETAILS - CONSTRAINTS - DISCHARGE RATINGS	See this report.
RAINFALL/RESERVOIR RECORDS	Available at site.



ITEM	REMARKS
DESIGN REPORTS	None available.
GEOLOGY REPORTS	None.
DESIGN COMPUTATIONS HYDROLOGY & HYDRAULICS DAM STABILITY SEEPAGE STUDIES	None.
MATERIALS INVESTIGATIONS BORING RECORDS LABORATORY FIELD	Limited data available. See N.Y.C. Bureau of Water Supply.
POST-CONSTRUCTION SURVEYS OF DAM	None.
BORROW SOURCES	Not known.

ITEM	REMARKS
MONITORING SYSTEMS	Full time reservoir staff.
MODIFICATIONS	None known.
HIGH POOL RECORDS	General records available at reservoir.
POST CONSTRUCTION ENGINEERING STUDIES AND REPORTS	See N.Y.C. Bureau of Water Supply.
PRIOR ACCIDENTS OR FAILURE OF DAM DESCRIPTION REPORTS	None known.
MAINTENANCE OPERATION: RECORDS	At N.Y.C. Bureau of Water Supply.

ITEM	REMARKS
SPILLWAY PLAN SECTIONS DETAILS	Not applicable.
OPERATING EQUIPMENT PLANS & DETAILS	At N.Y.C. Bureau of Water Supply. Limited data described in this report.

RIDGEWOOD RESERVOIR

CHECK LIST  
HYDROLOGIC & HYDRAULIC  
ENGINEERING DATA

	Pool Area*	
	Basin 2	Basin 3
DRAINAGE AREA CHARACTERISTICS: <u>None-Water supply reservoir.</u>	<u>13.73 ac.</u>	<u>24.49 ac.</u>
ELEVATION TOP NORMAL POOL (STORAGE CAPACITY):	<u>173.64 ft.</u>	<u>174.86 ft.</u>
ELEVATION TOP FLOOD CONTROL POOL (STORAGE CAPACITY):	<u>173.64</u>	<u>174.86</u>
ELEVATION MAXIMUM DESIGN POOL:	<u>173.64</u>	<u>174.86</u>
ELEVATION TOP DAM:	<u>173.64</u>	<u>174.86</u>

CREST: (Overflow)

- a. Elevation 48-inch pipe discharges into Myrtle Ave. Sewer.
- b. Type Reinforced concrete pipe.
- c. Width ----
- d. Length ----
- e. Location Spillover See plans.
- f. Number and Type of Gates 1 (Reservoir balanced with siphon, not in use at time of inspection.)

OUTLET WORKS: (Drawdown Facility)

- a. Type Pipe size unknown (see plans).
- b. Location Below Efflux Chamber House
- c. Entrance Inverts 150 feet approx.
- d. Exit Inverts Not known.
- e. Emergency Draindown Facilities -----

HYDROMETEOROLOGICAL GATES:

- a. Type None
- b. Location None
- c. Records None

MAXIMUM NON-DAMAGING DISCHARGE: Not applicable.

Inflow controlled by N.Y.C. Water Board operations.

\*Note Basin No. 1 not in use. Property turned over to Department of Parks, New York City.

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APPENDIX B

PREVIOUS INSPECTION REPORTS

STATE OF NEW YORK

DEPARTMENT OF

State Engineer and Surveyor

ALBANY

Report of a Structure Impounding Water

To assist in carrying out the provisions of Section 22 of the Conservation Law, being Chapter LXXV of the Consolidated Laws of New York State, relating to safeguarding life and property and the erection, reconstruction, or maintenance of structures for impounding water, owners of such structures are requested to fill out as completely as possible this report form for each such dam or reservoir owned within the State of New York for which no plans or reports relative thereto are on file in this Department, and to return this report form, together with prints or photographs explanatory thereof to this department.

The Ridgwood Reservoir

1. The structure is on Cypress Hills flowing into in the Borough in the Town of Brooklyn City of New York and

(Give exact distance and direction from a well-known bridge, dam, village main cross-roads or mouth of a stream)

2. Is any part of the structure built upon or does its pond flood any State lands? No

3. The name and address of the owner is City of New York

4. The structure is used for distributing water for water supply

5. The material of the right bank, in the direction with the current, is; at the spillway crest elevation this material has a top slope of inches vertical to a foot horizontal on the center line of the structure, a vertical thickness at this elevation of feet, and the top surface extends for a vertical height of feet above the spillway crest.

6. The material of the left bank is; has a top slope of inches to a foot horizontal, a thickness of feet and a height of feet.

7. The natural material of the bed on which the structure rests is (clay, sand, gravel, boulders, granite, shale, slate, limestone, etc.)

8. State the character of the bed and the banks in respect to the hardness, perviousness, water bearing, effect of exposure to air and to water, uniformity, etc.

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10. If the bed is in layers, are the layers horizontal or inclined? If inclined, give the position of the horizontal outcropping relative to the axis of the main structure and the inclination of the layers in a plane perpendicular to the horizontal outcropping?

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11. What is the thickness of the layers?.....

12. Are there any porous seams or fissures?.....

13. The watershed at the above structure and draining into the pond formed thereby is.....

14. The pond area at the spillway crest elevation is 50.07 acres and the pond impounds 40,000 cubic feet of water.

15. The maximum known flow of the stream at the structure was.....cubic feet per sec

(Date)

16. Has the spillway capacity ever been exceeded by a high flow? No

Can any possible flood flow from the pond otherwise than through the wastes noted under 17 and 18 report?..... If so, give the location, the length and the elevation relative to the spillway crest, the character and slopes of the ground of such possible wastes.....

17. State if any damage to life or to any buildings, roads or other property could be caused by any failure of the above structure. Describe the location, the character and the use of buildings below the structure which might be damaged by any failure of the structure; of roads adjacent to or crossing the stream below the structure, giving the lowest elevation of the roadway above the stream bed and giving the shape, the height, the width of stream openings; and of any embankments or steep slopes that any flood could pass over. Also describe the character and use made of the ground below the structure.....

18. WASTES. The spillway of the above structure is.....feet long in the clear; the crest is held at the right end by a.....the top of which is.....feet above the spillway crest, and has a top width of.....feet; and at the left end by a.....the top of which is.....feet above the spillway crest, and has a top width of.....feet.

19. There is also for flood discharge a pipe.....inches inside diameter and the bottom is.....feet below the spillway crest; and a (sluice, gate outlet).....feet wide in the clear and.....feet high, and the bottom is.....feet below the spillway crest.

11. Material. Show the ordinary flow in an apron built of .....  
feet thick. The downstream side of the apron has a thickness of ..... feet  
.....  
12. Time and money works and which are liable to cause its failure in high flows? .....

13. Sections. On the back of this report make a sketch to scale for each different cross-section of the above  
structure at the greatest depth; giving the height and the depth from the surface of the foundation, the bottom width,  
the top width (for a concrete or masonry spillway at two feet below the crest), the elevation of the top in reference  
to the spillway crest, the length of the section, and the material of which the section is constructed; on the spillway  
apron show a cross section of the apron, giving its width, thickness and material, and show the abutment or wash  
wall at the end of the spillway, giving its heights and thickness. Mark each section with a capital letter. Also  
draw a plan; show the above sections by their top lines, giving the mark and the length of each; the openings by  
their horizontal dimensions; the abutments by their top width and top lengths from the upstream face of the spill-  
way section; and outline the apron. Also sketch an elevation of each end of the structure with a cross section of  
the banks, giving the depth and width excavated into the banks.

14. Water Supply. The waters impounded by the above structure have ~~not~~ been used for a public water  
supply since <sup>1890</sup> ~~1890~~ the City of New York except Basin 3 since 1892

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For also see profiles of the Ridgeood Reservoir see print attached hereto.

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The above information is correct to the best of my knowledge and belief.

\_\_\_\_\_  
(Name)

\_\_\_\_\_  
(Date)

\_\_\_\_\_

\_\_\_\_\_  
(Date)

APPENDIX C

REFERENCES

## APPENDIX

### REFERENCES

1. Edward Wegmann: The Design and Construction of Dams, John Wiley and Sons (1918)
2. Charles H. Weidner: Water for a City - Rutgers University Press (1974)
3. The University of the State of New York - The State Education Department - State Museum and Science Service - Geological Survey: Geological Map of New York (1961)
4. James C. Duane: Report to the Aqueduct Commission 1887-1895 (1895)
5. John F. Cowan: Report to the Aqueduct Commission 1895-1907
6. Department of the Army, Office of the Chief of Engineers. National Program of Investigation of Dams; Appendix D: Recommended Guidelines for Safety Inspection of Dams, 1976
7. Linsley and Franzini: Water Resources Engineering, Second Edition, McGraw-Hill (1972)
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7. AUTHOR(s) <b>10</b> John B. Stetson		6. PERFORMING ORG. REPORT NUMBER
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14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) Department of the Army 26 Federal Plaza / New York District, CofE New York, New York 10007		12. REPORT DATE <b>11</b> 28 July 1978
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization. Ridgewood Reservoir was judged to be safe.		