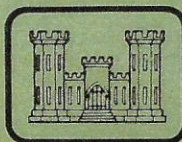


LAKE PETTIT DAM

ETOWAH RIVER BASIN

PHASE I INSPECTION REPORT NATIONAL DAM SAFETY PROGRAM

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Savannah District

JULY 24, 1979

LAKE PETTIT DAM
ETOWAH RIVER BASIN

Name of Dam: Lake Pettit Dam
County and State: Pickens, Georgia
Inventory Number: Ga. 685

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Prepared under contract with the Savannah District, U.S. Army
Corps of Engineers by Law Engineering Testing Company

FOR: Governor - State of Georgia

Date: 24 July 1979

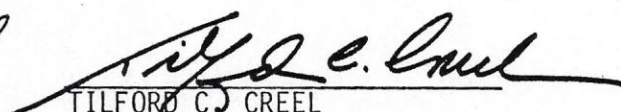
Report: Front Cover Color Code
Red - Urgency
Yellow - Phase II required
Green - Other

Back cover Color Code
Black - High Hazard Category
Blue - Significant Hazard Category

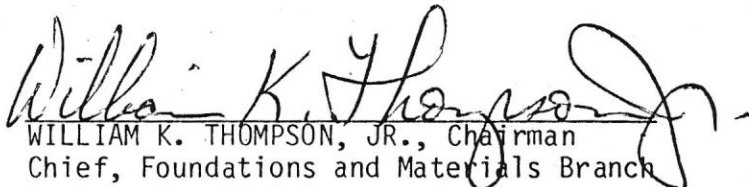
RECOMMEND APPROVAL:


APPROVED:



RALPH X. WHEELER
Chief, Engineering Division

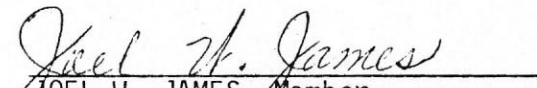

TILFORD C. CREEL
Colonel, Corps of Engineers
District Engineer

This Phase I Inspection Report on Lake Pettit Dam has been reviewed by the undersigned panel members. In our opinion, the reported findings, conclusions, and recommendations are consistent with OCE's Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgment and practice.



WILLIAM K. THOMPSON, JR., Chairman
Chief, Foundations and Materials Branch
Engineering Division


EARL E. WILLIAMS, Member
Chief, Structural Section
Engineering Division



FRANK C. MILLS, JR., Member
Assistant Chief
Construction Division

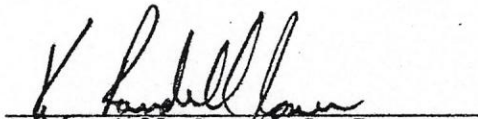

JOEL W. JAMES, Member
Hydrology and Hydraulics Branch
Engineering Division

Visual inspection of the Lake Pettit Dam, the collection of data used in this report, and the preparation of this report were by the following Law Engineering Testing Company personnel:


Haven L. Kicklighter, P.E.
Senior Engineer


William W. Whittaker, Jr.
Senior Engineering Technician


Brian Summers
Project Engineer


K. Randell Jones, P. E.
Project Hydrologist

PREFACE

This report is prepared under guidance contained in Department of the Army, Office of the Chief of Engineers, Recommended Guidelines for Safety Inspection of Dams, for a Phase I Investigation. The purpose of a Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation and analyses, involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. Additional data or data furnished containing incorrect information could alter the findings of this report. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

The analyses and recommendations included in this report are related to the hazard classification of the structure at the time of the report. Future changes in conditions downstream of the dam may change the classification of the structure from that presented herein. A change in hazard classification may also change the design flood to which the hydraulic and hydrologic analyses are based and may have a significant impact on the assessment of the safety of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

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PHASE I REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Lake Pettit Dam
State Located:	Georgia
County Located:	Pickens
Stream:	Pettit Creek
Date of Inspection:	24 July 1979

Brief Assessment: Based upon the field inspection and office studies, the dam will not be overtopped by the Recommended Spillway Design Flood and there are no obvious embankment deficiencies. Therefore, the dam meets the minimum accepted criteria and does not appear to pose an immediate danger to life or property. The minor seepage that is occurring should be monitored on a regular basis for any increase in activity. In addition, the regular maintenance should be continued.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
NAME OF DAM: PETTIT LAKE DAM - ID NUMBER: Ga. 685
SECTION 1 - PROJECT INFORMATION

1.1 General:

a. Authority: This report was prepared under authority of the National Dam Inspection Act, Public Law 92-367.

b. Purpose: This report provides a summary of the inspection and evaluation of the Pettit Lake Dam to determine if it constitutes a hazard to life and property.

1.2 General Description of Project:

The Pettit Lake Dam is an earthen dam which was constructed in 1972. It is located on a tributary of Pettit Creek in the Etowah River Basin. The dam is approximately 900 feet in length, and is 125 feet high. The crest width varies only slightly, averaging around 35 feet.

The reservoir has a normal water surface of approximately 105 acres and is primarily used for recreation. It is located within Pickens County and is owned by Big Canoe Corporation, Big Canoe, Georgia.

The primary spillway is constructed about 250 feet from the left abutment. It consists of a double 4x7 foot concrete box culvert. The culvert passes under a road and exits into a stepped grouted channel which passes the water down to the toe of the dam.

The emergency spillway is a channel approximately 300 feet wide located in the same area as the primary spillway. The crest elevation of the emergency spillway is approximately 6 feet below the top of the dam.

1.3 Classification:

a. Size classification: The dam is in the "large" size category, based on its height.

b. Hazard Classification: The dam is in the "high" hazard category, due to the extensive development including commercial, recreational and residential within 1 mile below the dam.

1.4 Dam History:

The information in this section was compiled through a telephone interview with Mr. Mickey Ghalager of Big Canoe Corporation. The Lake Pettit Dam was designed by Baldwin and Cranston Associates, Inc. of Augusta Georgia and was constructed in 1972 by Lothridge Construction Company. According to Mr. Ghalager the dam has never been overtopped, breached, or had any associated problems. The normal pool is approximately 95 feet deep. The only renovations made to the dam were additional trench drains to help remove wetness from the toe of the dam.

1.5 Pertinent Data:

A. Drainage Basin:

1.	Drainage Area	1,010 AC
2.	Hydrologic Soil Group	59% B, 41% C
3.	Hydraulic Length	10,000 FT
4.	Elevation Drop	1,103 FT

B. Reservoir Characteristics:

1.	Surface Area (Top of Dam)	136 AC
2.	Surface Area (Normal Pool)	105 AC
3.	Storage (Top of Dam)	5,960 AC FT
4.	Storage (Normal Pool)	4,600 AC FT
5.	Normal Pool Elevation (USGS)	1,635.0 FT MSL

C. Dam:

1.	Length	900 FT
2.	Height	125 FT
3.	Top Width	35 FT (Average)
4.	Side Slopes	
	a. Upstream	1V on 3.4H
	b. Downstream	1V on 2.0H
5.	Crest Elevation (Lowest Point)	1,646.6 FT MSL

D. Primary Spillway:

1.	Type	Box Culvert
2.	Crest Elevation (Emergency Crest)	1,635.0 FT MSL
3.	Discharge	322 CFS

E. Emergency Spillway:

1. Type	Roadway Abutment
2. Crest Elevation	1,640 FT MSL
3. Discharge (Top of Dam)	5,450 CFS

SECTION 2 - VISUAL INSPECTION

2.1 General:

The reservoir was approximately at normal pool level during the field inspection on 24 July 1979. A detailed checklist was prepared and is presented in Appendix A.

2.2 Dam:

The dam is partially covered by heavy undergrowth, primarily lespedeza. The crest width is fairly uniform, averaging around 35 feet. Vertical and horizontal alignment are uniform. A paved private road traverses the entire crest of the dam. The overall condition of the crest is good with no cracks noted.

The upstream slope is a uniform 1V on 3.4H. No evidence of sloughs, subsidences or bulges were noted. Riprap is present for wave protection. There is no evidence of sloughing due to wave action.

The downstream slope is relatively uniform 1V on 2H slope with 5 berms from 10 to 20 feet wide spaced evenly down the slope. Concrete swales are located on the two lower berms and at the toe of the dam. The upper slope is covered by thick lespedeza while the area below is covered by grass and weeds. No sloughs, subsidences, depressions, or bulges were noted. A slight amount of seepage was discovered near the left abutment along the lower portion of the slope.

No evidence of erosion or seepage was noted at the abutments. Small 6-inch diameter plastic pipes were noted near the toe of the dam along the lower berms. From discussions with Mr. Ghalager, it was learned that these are the additional toe drains added in 1976. A slight flow of water was noted.

2.3 Spillways:

The primary spillway is a double 4 x 7 foot concrete box culvert. It is located approximately 250 feet from the left abutment. The crest is about 10 feet below the crest of the dam. Discharge from the culvert is carried to the downstream channel by a stepped grout channel. The stilling pool has been riprapped to protect against erosion. The culvert is partially blocked by pipes that run perpendicular to the water flow. A 24-inch diameter pipe crosses the entrance to the culvert and a 12-inch pipe crosses the exit.

The emergency spillway is a low area in the roadway over the primary spillway. The crest is approximately 6 feet below the top of the dam. The emergency spillway has trees growing along the edge of the road, that could restrict water flow.

A 30-inch concrete pipe for low level control was located on the upstream slope near the center of the dam. It has a 24-inch square sluice gate that can be opened by a valve located on the dam crest.

2.4 Downstream Channel:

The floodplain downstream is reasonably steep and narrow, typical of mountain terrain. Pettit Creek passes through the Big Canoe development immediately below the dam and then proceeds through mostly rural undeveloped land.

2.5 Reservoir:

The reservoir area is reasonably steep on all sides. Beyond the immediate area of the reservoir some private residences are contained within the drainage basin, but it is primarily undeveloped.

2.6 Evaluation:

The general condition of the dam is satisfactory. The only visual problem with the dam is the slight seepage.

SECTION 3 - OPERATIONAL PROCEDURES

3.1 Procedures:

Normal operation of the reservoir consists of allowing normal flow to discharge through the primary spillway. Storm flow is discharged through the primary spillway and emergency spillway. These require no regulation. A low-level control exists which is capable of draining the lake.

3.2 Maintenance of Dam:

The dam is maintained on a regular basis.

3.3 Warning System:

There is no warning system.

3.4 Evaluation:

The dam is well maintained.

SECTION 4 - ENGINEERING DATA

4.1 General:

Design and construction information can be obtained from Big Canoe Inc. through Mr. Ghalager and from Baldwin and Cranston Associates. A copy of design plans have been obtained and will be maintained in the project files. A review of these plans with our field data shows close agreement with the exception that the downstream slope is shown 1V on 2.5H on the drawings instead of the 1V on 2H measured in the field. The drawings indicated that a cutoff trench to bedrock and a foundation trench drain were to be installed.

SECTION 5 - HYDROLOGY AND HYDRAULIC ANALYSIS

5.1 Evaluation Features:

a. Design Data: Design data is available for review from Baldwin and Cranston Associates.

b. Experience Data: Emergency spillway has never been utilized.

c. Visual Observations: There was no evidence of dam distress due to overtopping.

d. Flood Routing Data:

<u>Design Storm</u>	<u>PMF</u>
Duration of Storm	6 Hr.
Precipitation Depths	30.3 In.
Runoff Depth	25.9 In.
Peak Inflow	
Into Reservoir	16600 CFS
Peak Discharge	4400 CFS
Maximum Flood Elev.	1646 Ft.
Depth of Overtopping	-- Ft.
Duration of Overtopping	-- Hr.
Freeboard (Maximum Pool to Dam Crest)	0.6 Ft.

e. Evaluation:

Because of the size of the dam and the downstream development, the Recommended Spillway Design Flood is the Probable Maximum Flood (PMF). The calculations indicate that the available storage and/or spillway capacity are sufficient to handle the PMF generated by the 6 hr. Probable Maximum Precipitation (PMP) event.

SECTION 6 - STABILITY

6.1 Conventional Static Stability:

The engineering data required for an analytical stability analysis is not available without extensive embankment and foundation exploration. Consequently, the assessment of the stability of the embankment must be made on the basis of visual evidence and judgment. Since no signs of distress were observed, it appears that the structure is statically stable.

6.2 Conventional Seismic Stability:

In accordance with the guidelines furnished for a Phase I Investigation, a seismic stability analysis is not required for this dam since the dam is located in Zone 2 and adequate margins of safety appear to exist for static conditions.

SECTION 7 - ASSESSMENT/REMEDIAL MEASURES

7.1 Dam Assessment:

a. **Safety:** Based upon the field inspection and office studies made of the dam, it is concluded that the dam meets the minimum accepted criteria and does not appear to pose an immediate hazard to life or property at this time.

b. **Adequacy of Information:** This report and its conclusions are based upon a visual inspection, previous design studies, and office studies.

c. **Urgency:** The dam does not appear to pose an immediate hazard to life or property.

d. **Necessity for Phase II:** None.

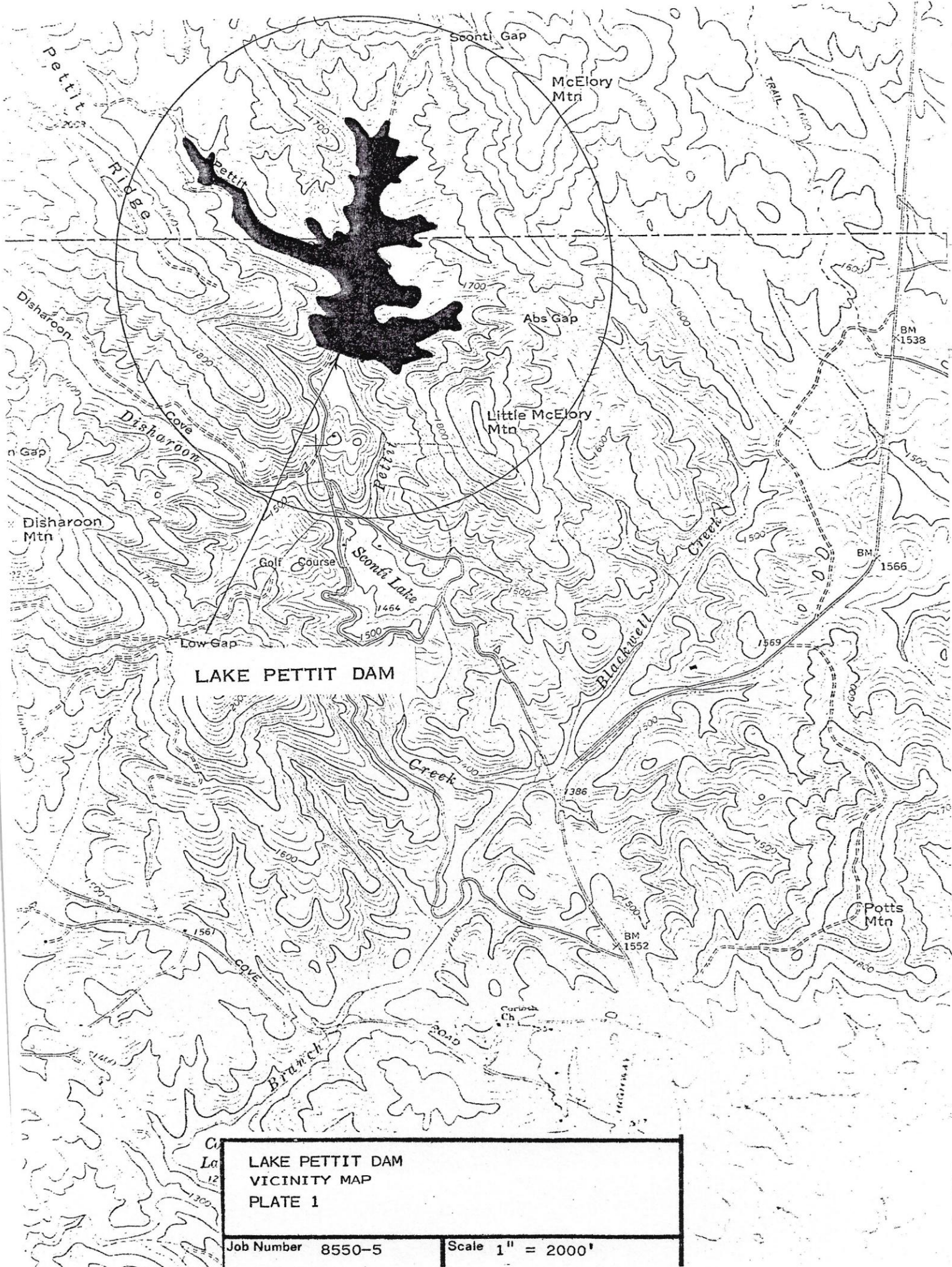
7.2 Recommendations:

a. The regular maintenance program should be continued.

b. The seepage that is occurring should be monitored on a regular basis for any indication of increased activity.

PLATES

<u>NUMBER</u>	<u>DESCRIPTION</u>
1	Vicinity Map
2	Plan View
3	Profile
4	Cross Section



LAKE PETTIT DAM

**LAKE PETTIT DAM
VICINITY MAP
PLATE 1**

Job Number 8550-5

Scale 1" = 2000'

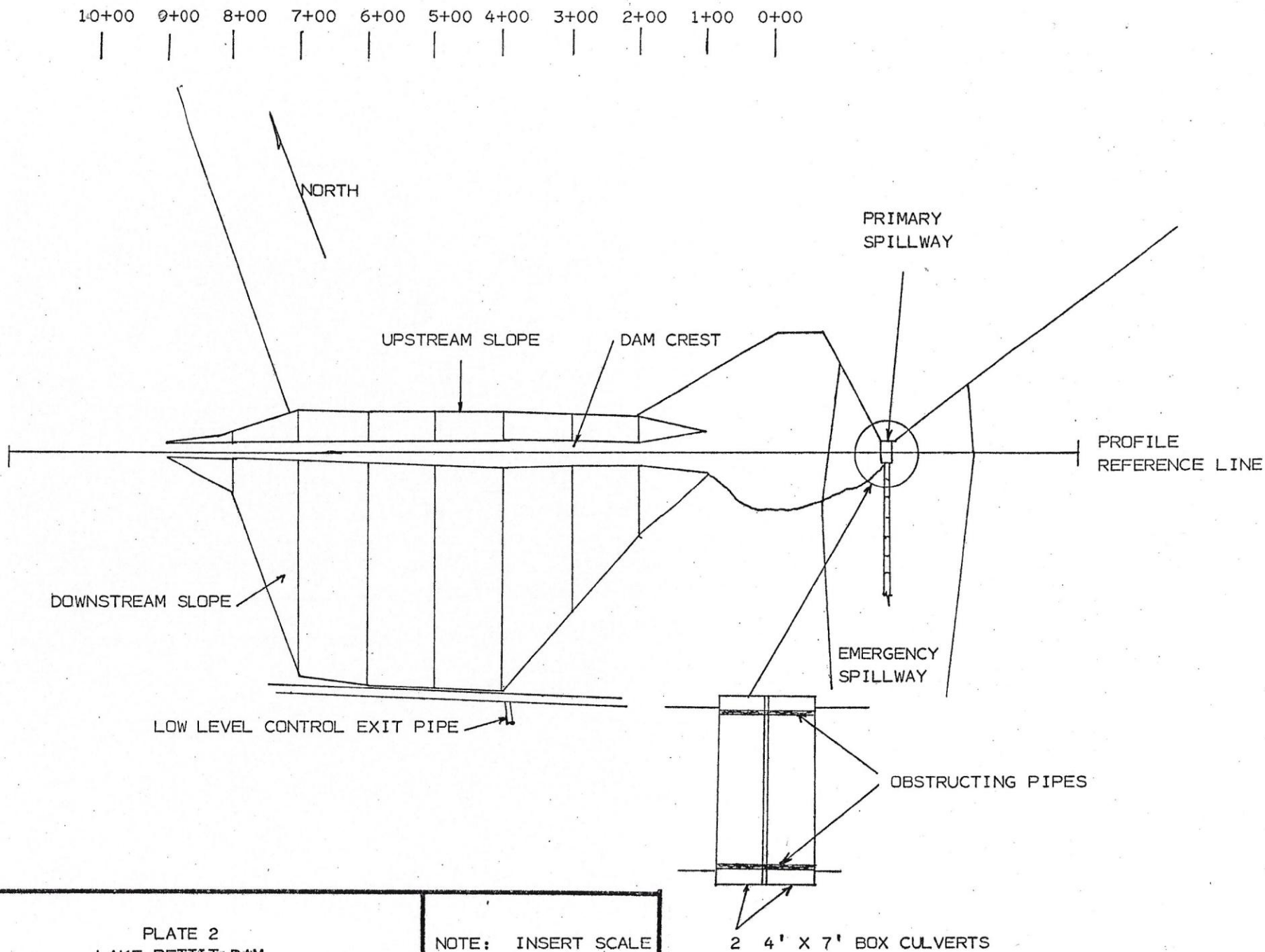


PLATE 2 LAKE PETTIT DAM PLAN SECTION		NOTE: INSERT SCALE 1" = 20'
Job Number 8550 - 5	Scale 1" = 200'	

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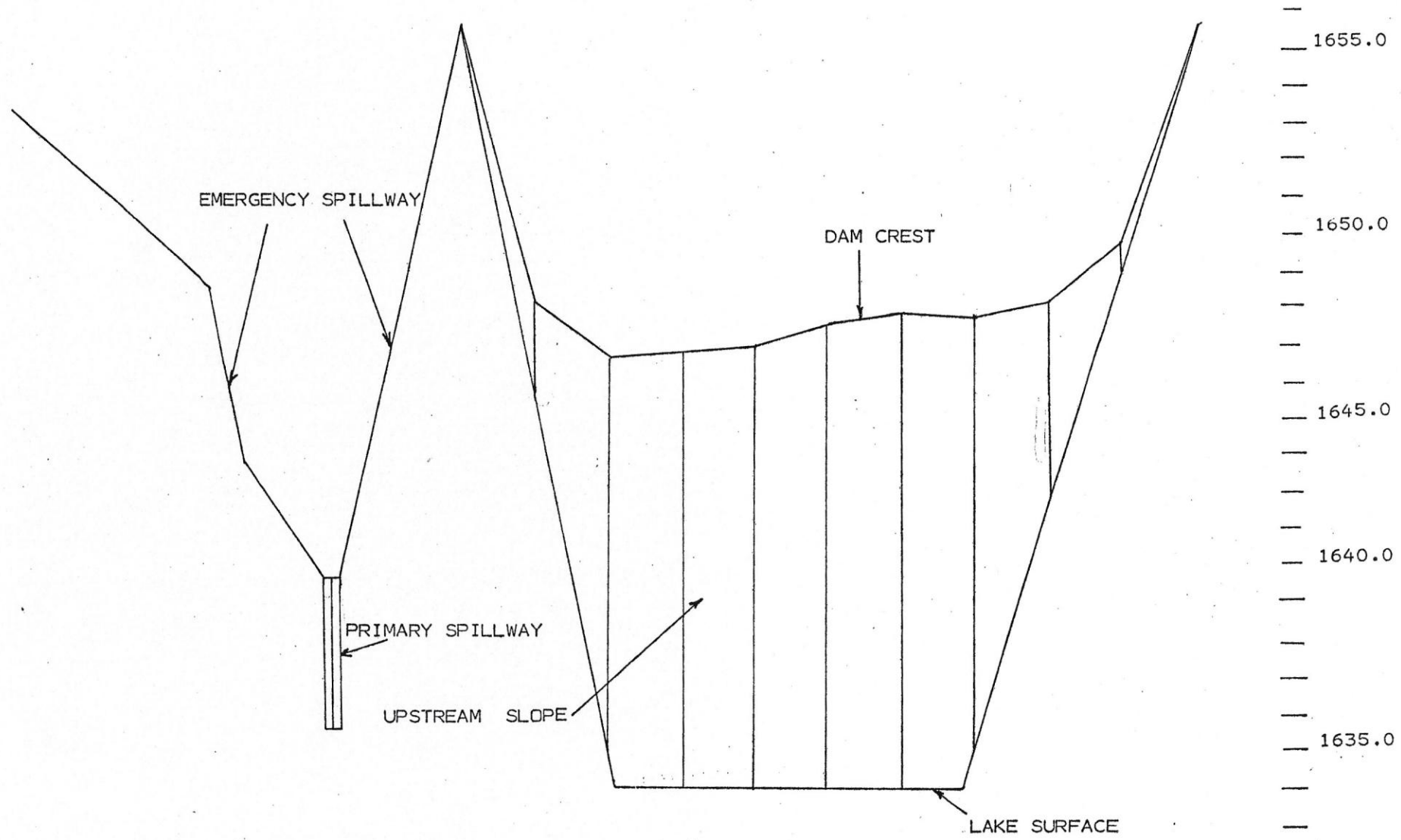


PLATE 3 LAKE PETTIT DAM PROFILE	
Job Number	Scale
8550 - 5	1" = 200'

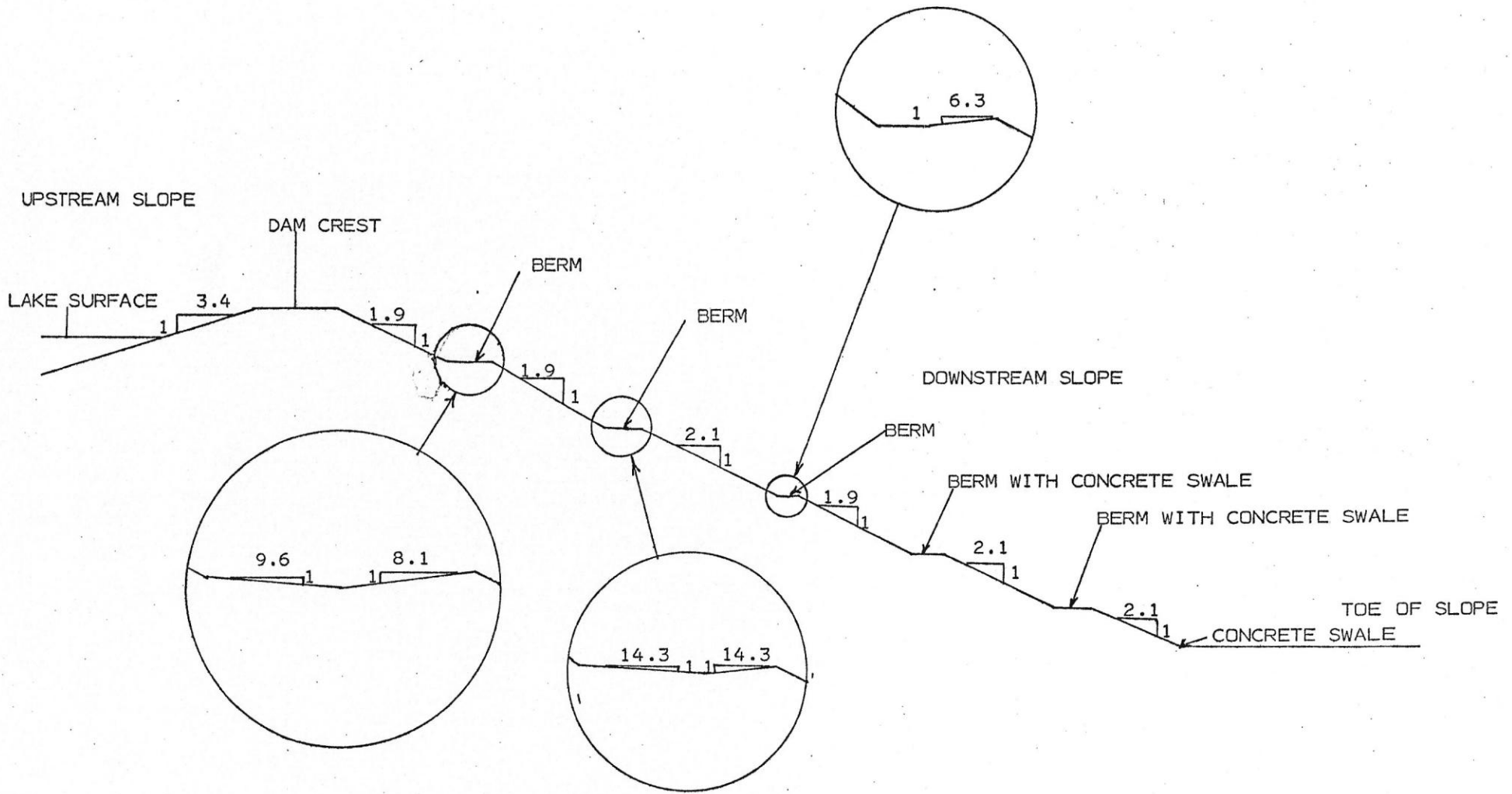


PLATE 4 LAKE PETTIT DAM TYPICAL CROSS SECTION		NOTE: INSET SCALE 1" = 10'
Job Number 8550 - 5	Scale 1" = 60'	

Primary Spillway

The spillway is composed of Twin 6'x5' box culverts. The culverts are obstructed by a 24" pipe running along the direction of the Road. The culvert is preceded by a weir 1.5' above the bottom of the culvert.

Elevation View

