



E-FILED Nov.13, 2014
-Submission ID: 528879
-Docket(s) No.: P-3185-000

November 13, 2014

Mr. Gerald L. Cross, P.E.
FERC - Office of Energy Projects
Division of Dam Safety and Inspections
New York Regional Office
19 West 34th Street, Suite 400
New York, NY 10001-3006

Re: Webster-Pembroke Dam P-3185-NH
Pembroke Hydro Associates, LP
Status Update on Removal of Pembroke Dam- Request for Review and Approval for Partial
Decommissioning

Dear Mr. Cross,

On behalf of Pembroke Hydro Associates, LP (Licensee), Eagle Creek Renewable Energy has prepared this update related to the status of the Pembroke partial dam removal. Attached with this submittal is a letter report to the Commission from the Licensee's consultant (Kleinschmidt). An identical report was sent to the State of New Hampshire Department of Environmental Safety Dam Bureau Review via email on November 12, 2014.

The Licensee agrees with the conclusions of this report and plans to continue consultation with the state of New Hampshire regarding this matter. Additionally, the Licensee plans to further update the Commission after state of New Hampshire has responded to our request for approval to decommission the dam.

If you have any questions or concerns regarding this matter, please contact Mr. Ken Kemp, VP Project at Eagle Creek Renewable Energy New Jersey Office (973) 998-8400 or email ken.kemp@eaglecreekre.com.

Sincerely,
Eagle Creek Renewable Energy
Agent for Licensee

For Mr. Robert Gates
Senior VP of Operations

Attachment: November 12, 2014 Kleinschmidt report Partial Removal Pembroke Dam

cc: Ken Kemp, CDSE
Mark Sherbino, Operation Manager
FILE: 14-11-12_DS_ECRE_PMBK_Propose Revision of Dam Removal



November 12, 2014

Mr. Gerald L. Cross, Regional Engineer
Federal Energy Regulatory Commission
19 West 34th Street, Suite 400
New York, NY 10001

Pembroke Dam - NID No. NH00377, FERC No. P-3185
Partial Removal of Pembroke Dam

Dear Gerry:

Kleinschmidt Associates (Kleinschmidt) is submitting this report, on behalf of Eagle Creek Renewable Energy (Eagle Creek), detailing the proposed removal of a section of the Pembroke Dam on the Suncook River in Suncook, NH. Kleinschmidt requests the Federal Energy Regulatory Commission (FERC) review and approve decommissioning of the Pembroke Dam per the following proposed removal.

The reason for the partial removal is to sufficiently eliminate any hazard from dam failure or damage to adjacent property resulting from impounded levels during high flow events. The proposed partial removal addresses the upstream impact caused by the dam during the project design flood flow (100-year storm). Further, analyses has indicated that failure of the remaining portion of the dam under flood flow conditions would not have any significant downstream impact.

BACKGROUND

The Pembroke Dam is a stone masonry dam constructed on a bypass section of the Suncook River downstream of the Webster Dam (Figure 1). The bypass section of the river sees the minimum flow release from the Webster Dam and also spillways releases from the Webster Dam. Although part of the Pembroke Hydroelectric Project, FERC P-3185, the dam is not a primary water retaining structure. Pembroke Dam is not required for continued project operations.

There is a low level waste gate at the base of the Pembroke Dam that has been removed and is open at all times. The minimum flow release passes through this opening and there is no impounded water to speak of during normal conditions. During high flow conditions, the flow in the bypass reach exceeds the capacity of the low level opening and the impounded water level rises to spill over the crest of the Pembroke Dam. High flow conditions in the last decade have caused overtopping of a stone masonry and concrete training wall along the right bank of the

bypass reach at the dam. Flood flows from overtopping have threatened a condominium building adjacent to the Pembroke Dam right abutment.

PROPOSED REMOVAL

The HEC-RAS model obtained from the UGSG was analyzed for steady flow results under the 100-year and 500-year flood conditions. Kleinschmidt used the flood conditions in an unsteady flow model to determine the water surface elevation upstream of the Pembroke Dam under existing conditions as well as with a removed section of the Pembroke dam.

The proposed removed section of dam is a trapezoidal shape, located approximately in the center of the dam. The point of the V is located at the current low level outlet. The removed section would be approximately 30-ft-wide at the spillway crest elevation (Figures 2 and 3).

The model was also run under flood flow conditions assuming a failure of the remaining portion of the dam (Figure 4). The purpose of this breach was to determine if there are any downstream impacts if a significant portion of the remaining dam were to breach during flood conditions. Both a 100-year and 500-year flood condition were reviewed.

RESULTS

Headwater elevations were determined for the existing and removal conditions for both flood flows to determine if the removal scenario eliminated the potential flooding hazard to the condominiums located on the right riverbank near the dam. The condominiums are protected against flood flows at the dam by the stone masonry and concrete training wall, with a top of wall elevation of approximately 259 ft (Figure 5).

Existing headwater elevations under 100-year and 500-year flood conditions were determined to be 258.9 ft and 263.3 ft, respectively. Headwater elevations for the removal scenario during 100-yr and 500-yr flood conditions were found to be 255.7 ft (Figure 5) and 260.3 ft, respectively. With the partial removal, there would be no flood impact at the project design flow. The 500-year condition results show a reduction in water level of approximately 3 feet, however flood flows at this recurrence interval will result in some overtopping, which would threaten the condominium building located adjacent to the right abutment. The following table summarizes the upstream impact results:

SCENARIO	HEADWATER ELEVATIONS (FT)		FREEBOARD BELOW TRAINING WALL (FT)	
	100-YEAR	500-YEAR	100-YEAR	500-YEAR
Existing	258.9	263.3	0.1	-4.3
Removal	255.7	260.3	3.3	-1.3
Change	-3.2	-3.0		

The following table compares the tailwater flows and surface elevations during the 100-year and 500-year storms for the existing, removal, and breach scenarios. The tailwater surface elevation is the elevation of the water surface immediately downstream of the Pembroke dam.

SCENARIO	100-YEAR STORM TAILWATER		500-YEAR STORM TAILWATER	
	FLOW (CFS)	ELEVATION (FT)	FLOW (CFS)	ELEVATION (FT)
Existing	15,747.0	236.05	24,521.0	237.06
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Breach	15,860.2	236.07	24,650.6	237.08

The results show there is little to no impact downstream of Pembroke Dam if the remaining portion of the left abutment wall were to fail under flood conditions.

The HEC-RAS model data is included on the enclosed CD for your review

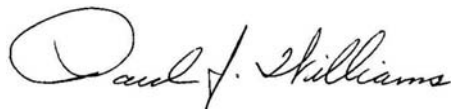
CONCLUSION

Based on the model results, a partial trapezoidal removal removes possible hazards due to a failure of the remaining portions of the dam. Under the project design flood flow, the removal eliminates the possibility of damage to adjacent properties upstream of the dam.

If you have any questions or require additional information regarding this submittal, please contact me at 207.487.3328 (email: Paul.Williams@KleinschmidtGroup.com)

Sincerely,

KLEINSCHMIDT ASSOCIATES



Paul J. Williams, P.E.

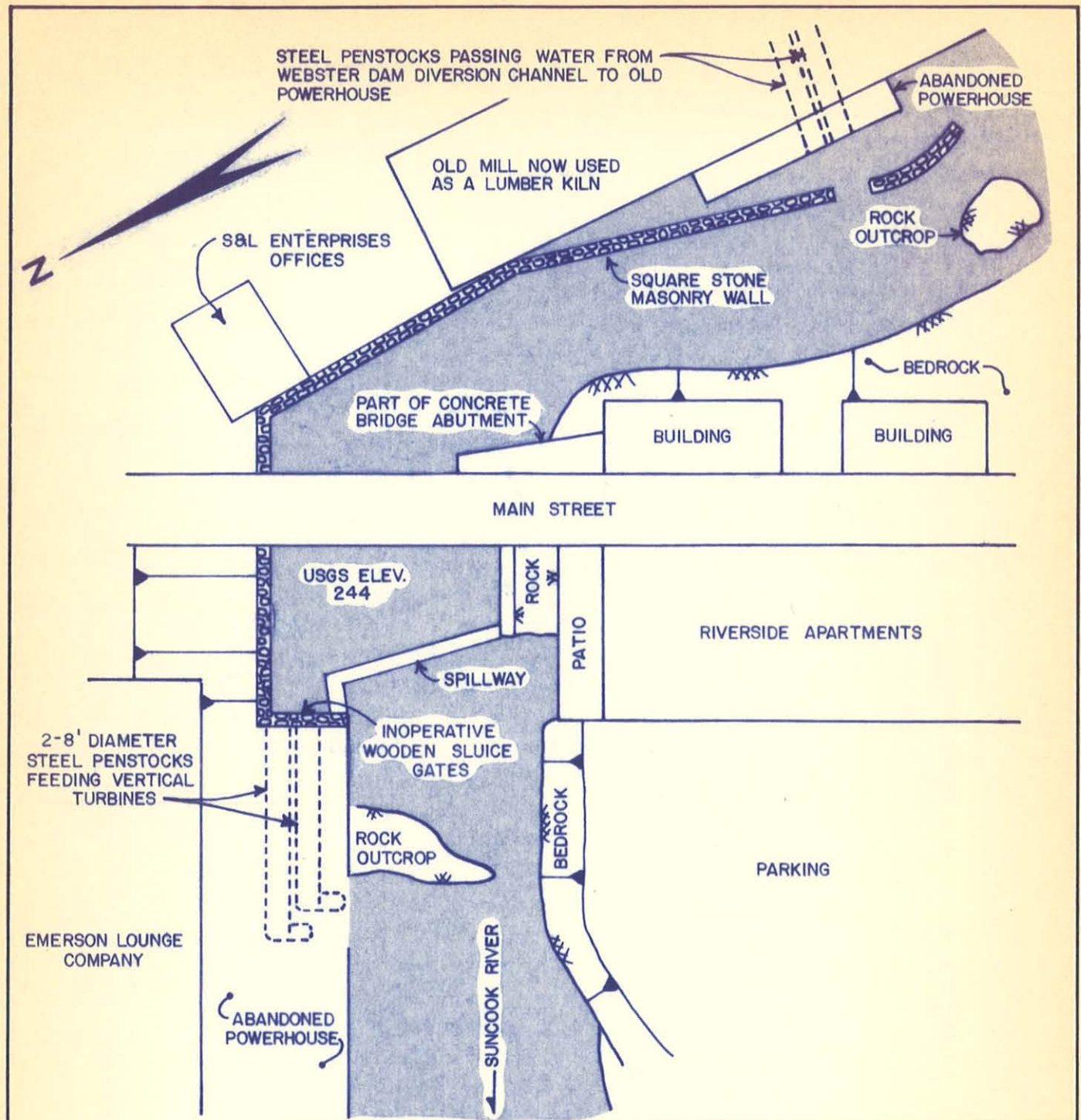
PJW:FHW

Attachments: Figures 1-5

HEC-RAS Project Files Data CD (provided under separate cover)

ATTACHMENT 1

FIGURES 1-5



GOLDBERG, ZOINO, DUNNICLIFF & ASSOC., INC.
GEOTECHNICAL CONSULTANTS
NEWTON UPPER FALLS, MASS.

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

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

FIGURE 1 SITE PLAN

FILE No. 2201

PEMBROKE DAM

SCALE 1" = 50'

DATE NOVEMBER 1978

Figure 1

Figure 2



Figure 3: Partial Removal - HEC-RAS Dam Cross-Section

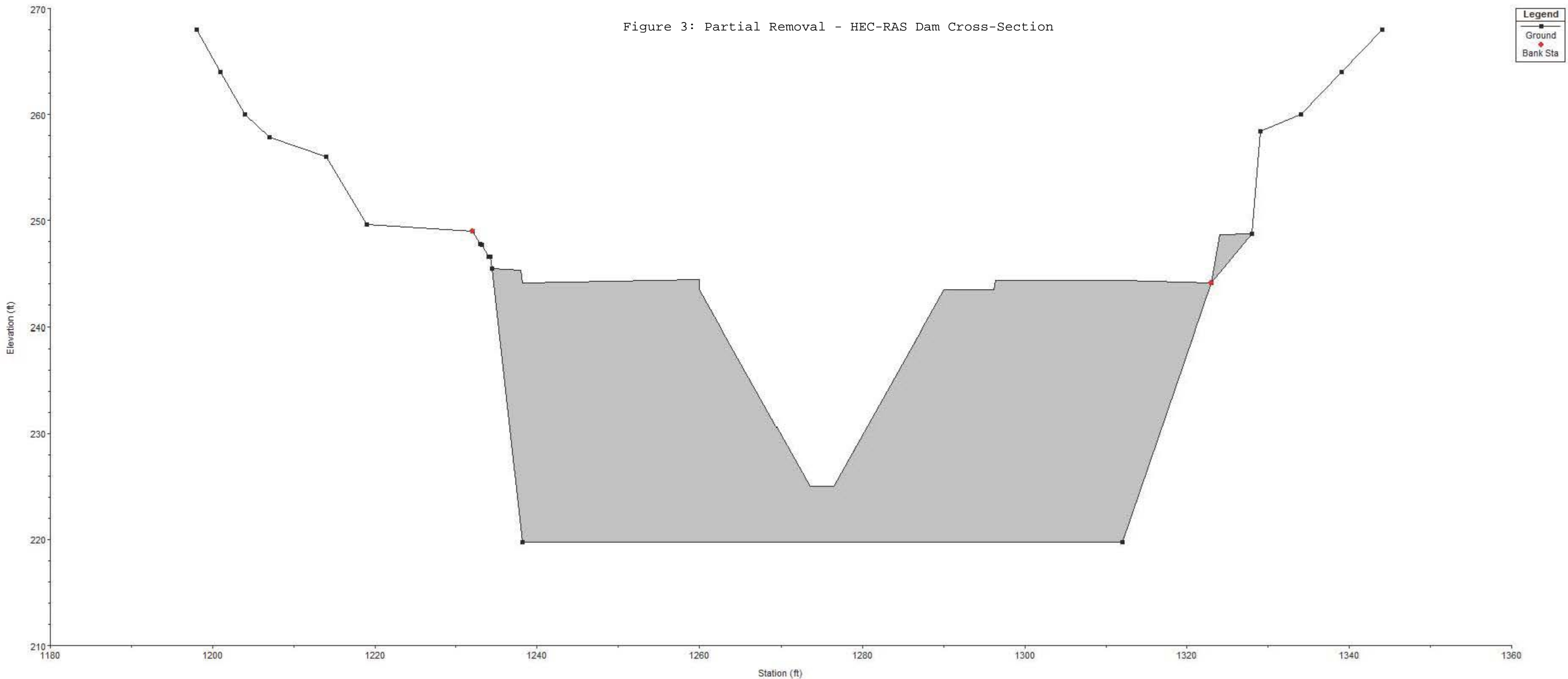
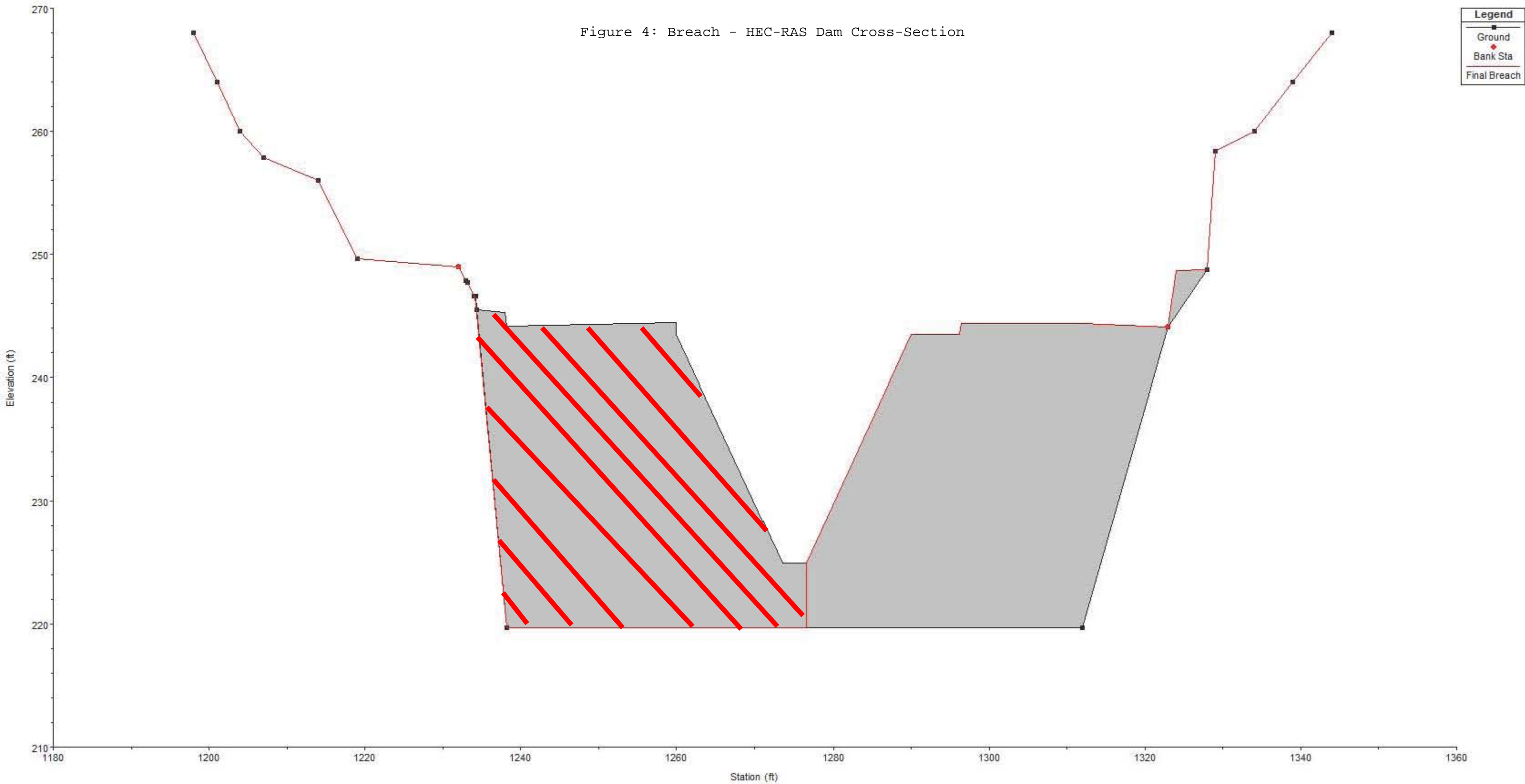
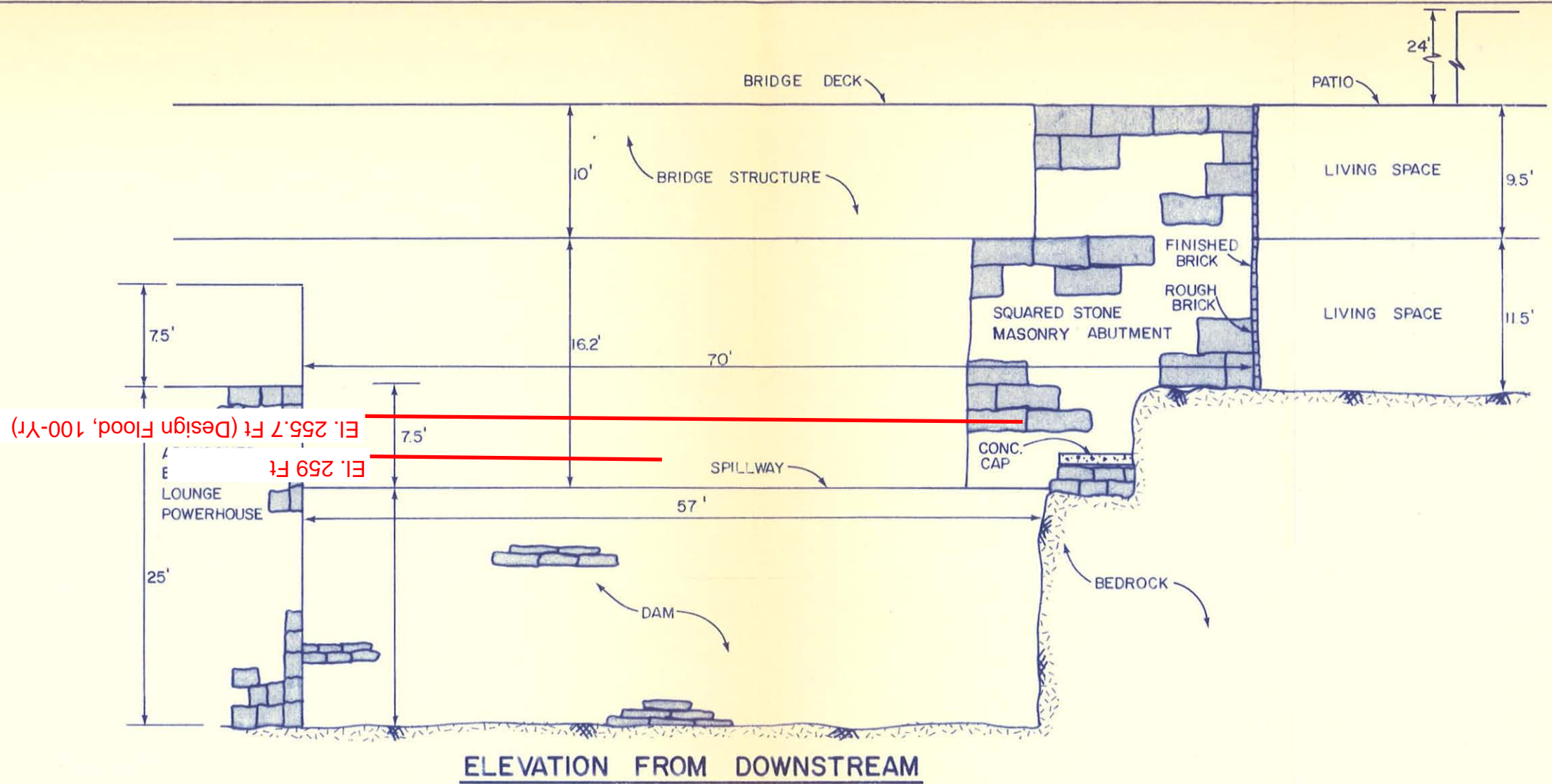
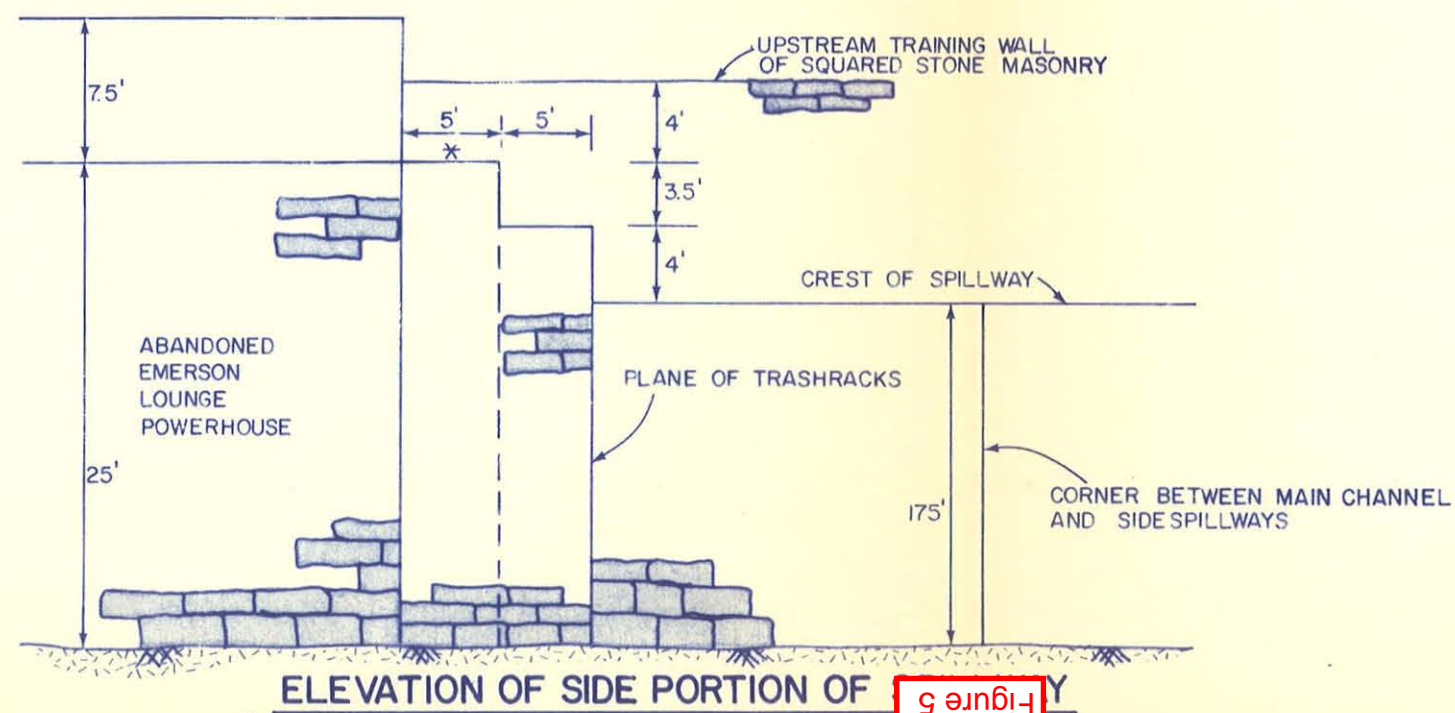


Figure 4: Breach - HEC-RAS Dam Cross-Section





ELEVATION FROM DOWNSTREAM



ELEVATION OF SIDE PORTION OF

* HIGH WATER 2yrs AGO
HIGHEST IN 32yrs ±.

GOLDBERG, ZOINO, DUNNICLIFF & ASSOC., INC. GEOTECHNICAL CONSULTANTS NEWTON UPPER FALLS, MASS.		U.S.ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM , MASS.	
NATIONAL PROGRAM OF INSPECTION OF NON-FED.DAMS			
FIGURE 3			
ELEVATION VIEWS			
PEMBROKE DAM		NEW HAMPSHIRE	
		SCALE	1" = 10'
		DATE	

ATTACHMENT 2

HEC-RAS PROJECT FILES

**DATA CD
(PROVIDED UNDER SEPARATE COVER)**



November 12, 2014

VIA E-MAIL

Mr. Chuck Corliss
New Hampshire Department of Environmental Safety
Dam Bureau
29 Hazen Drive
Concord, NH 03301

Pembroke Dam - NID No. NH00377, FERC No. P-3185
Partial Removal of Pembroke Dam

Dear Chuck:

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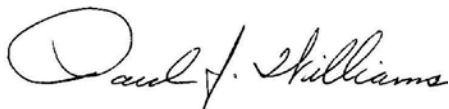
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Sincerely,

KLEINSCHMIDT ASSOCIATES



Paul J. Williams, P.E.

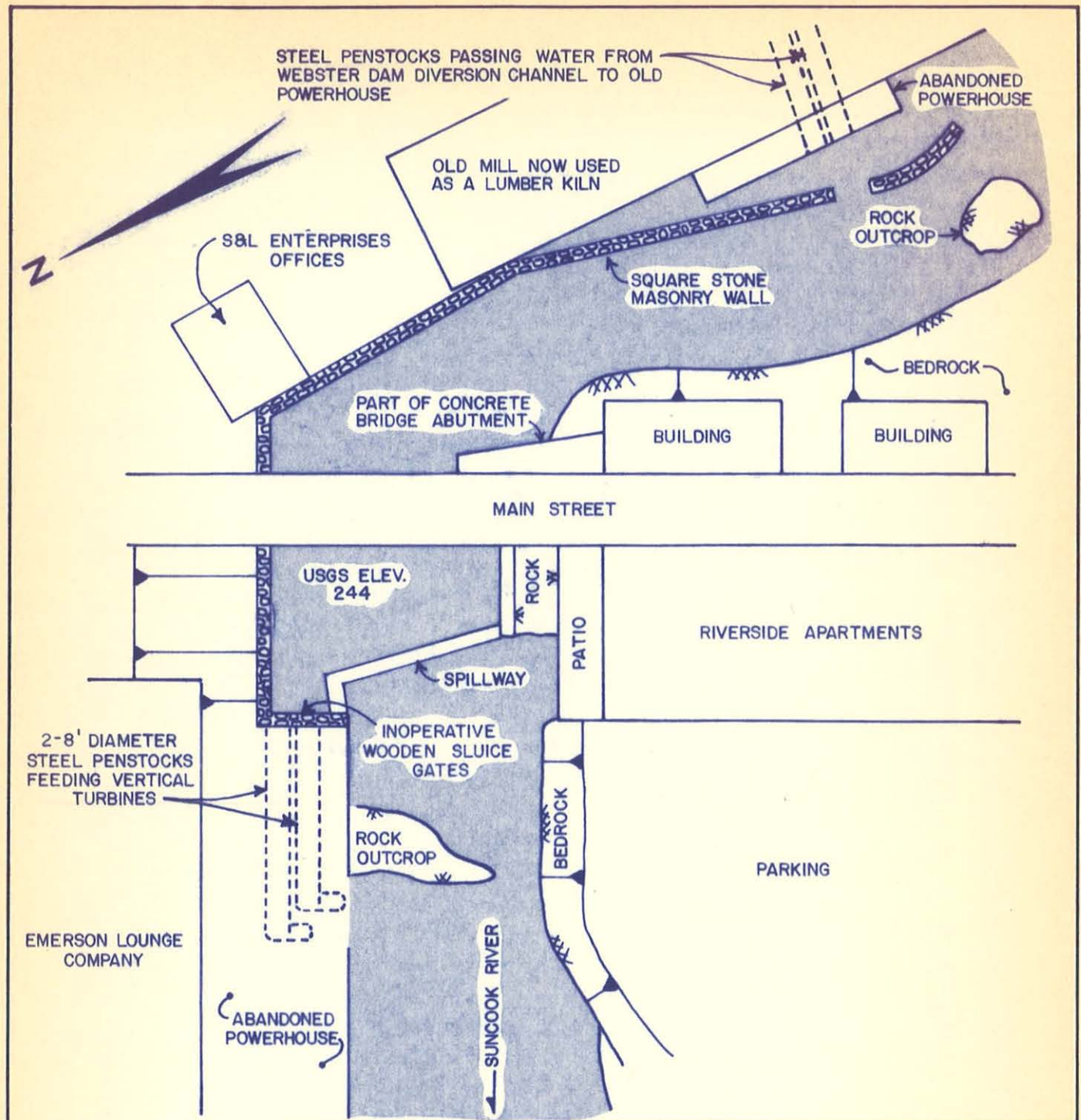
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FIGURES 1-5



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FIGURE 1 SITE PLAN

FILE No. 2201

PEMBROKE DAM

SCALE 1" = 50'

DATE NOVEMBER 1978

Figure 1

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Figure 3: Partial Removal - HEC-RAS Dam Cross-Section

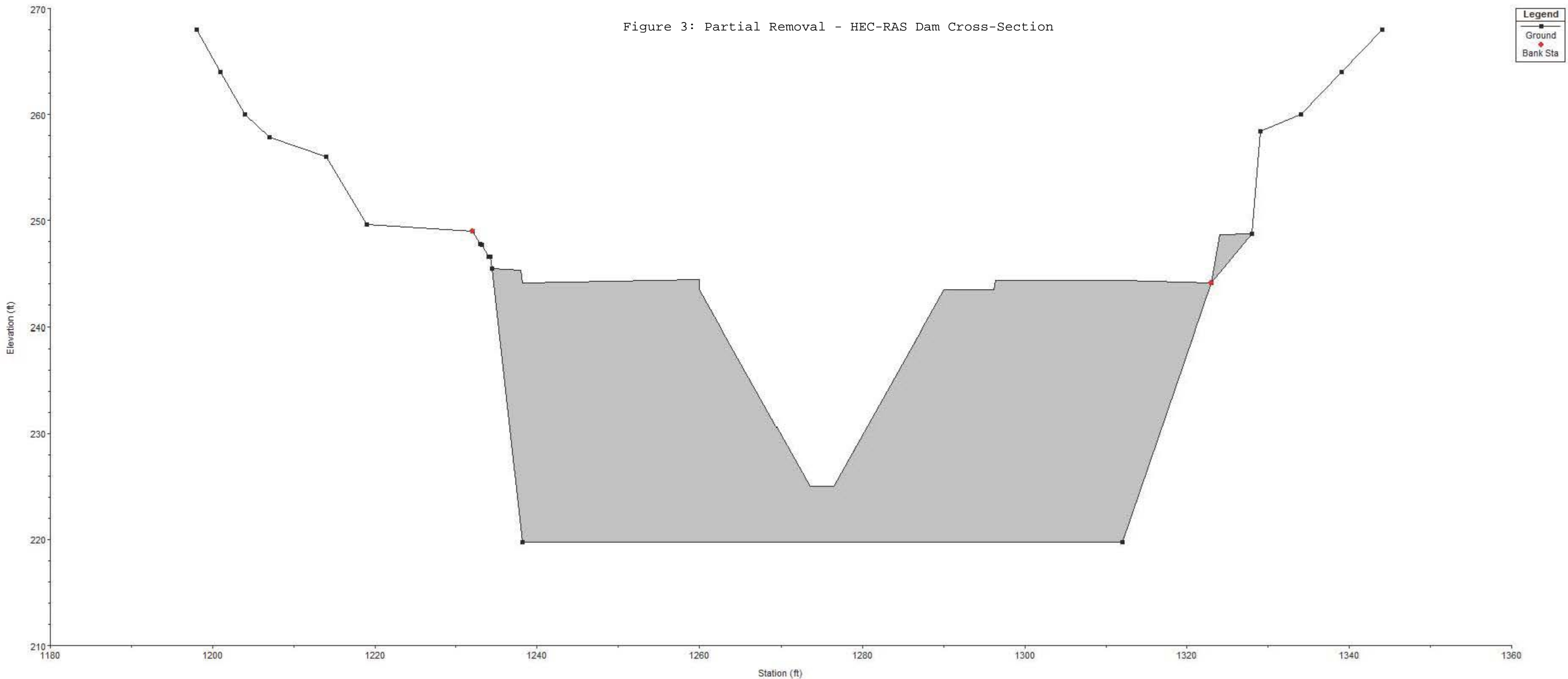
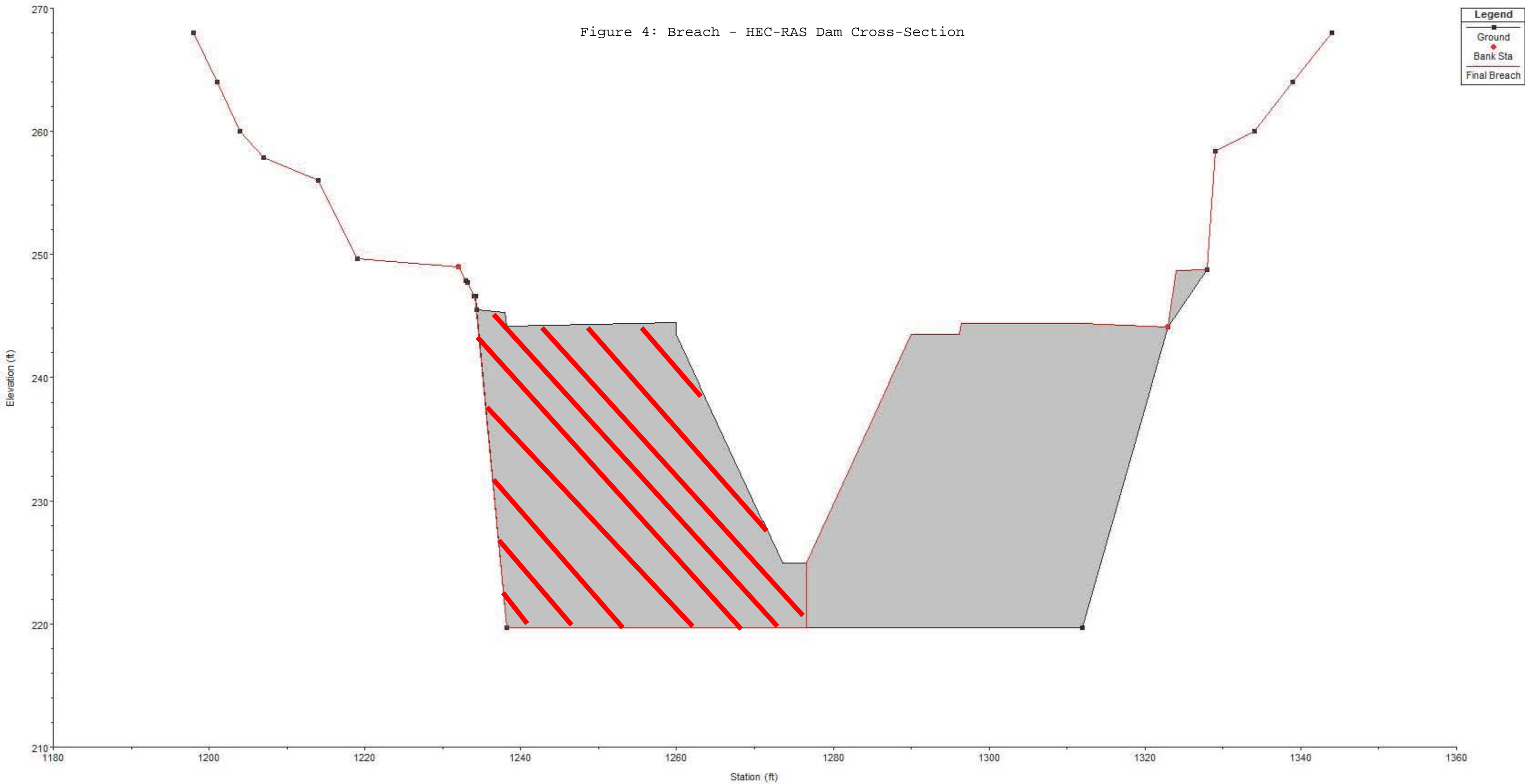
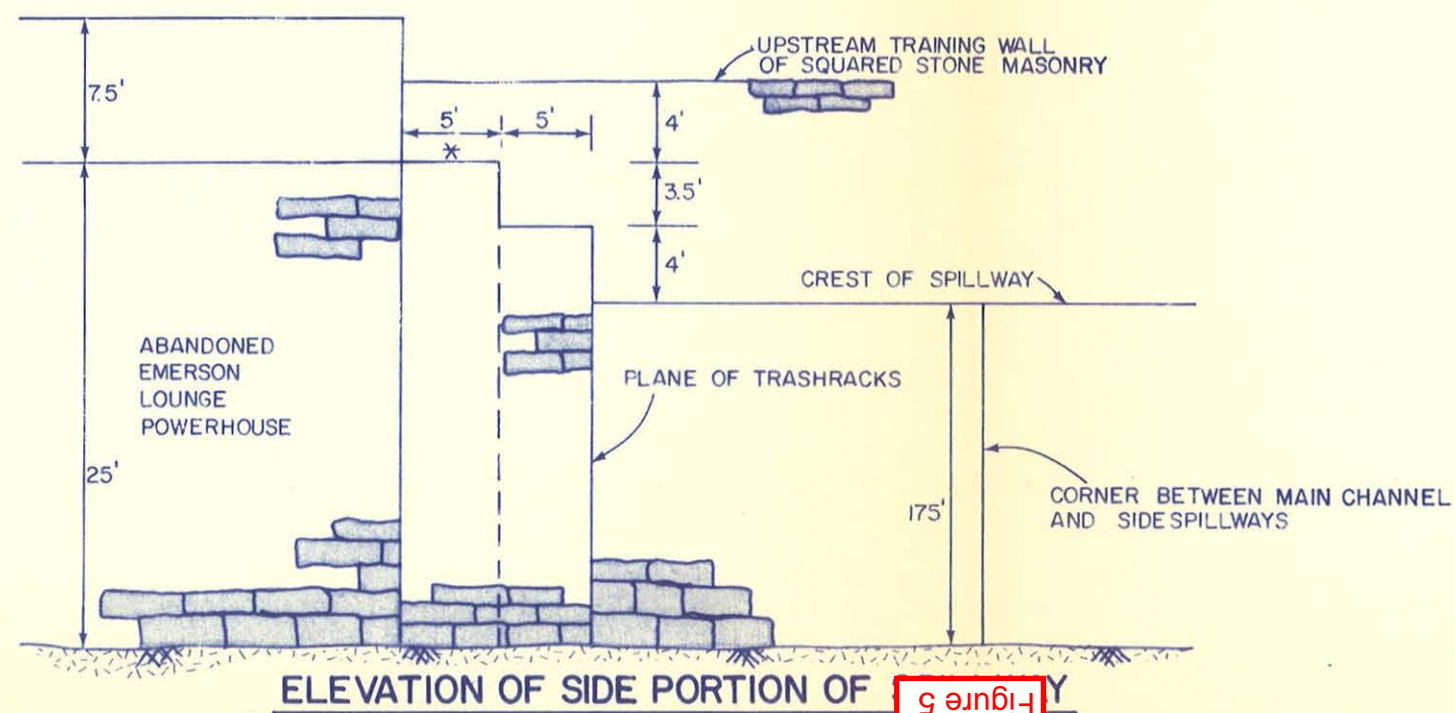
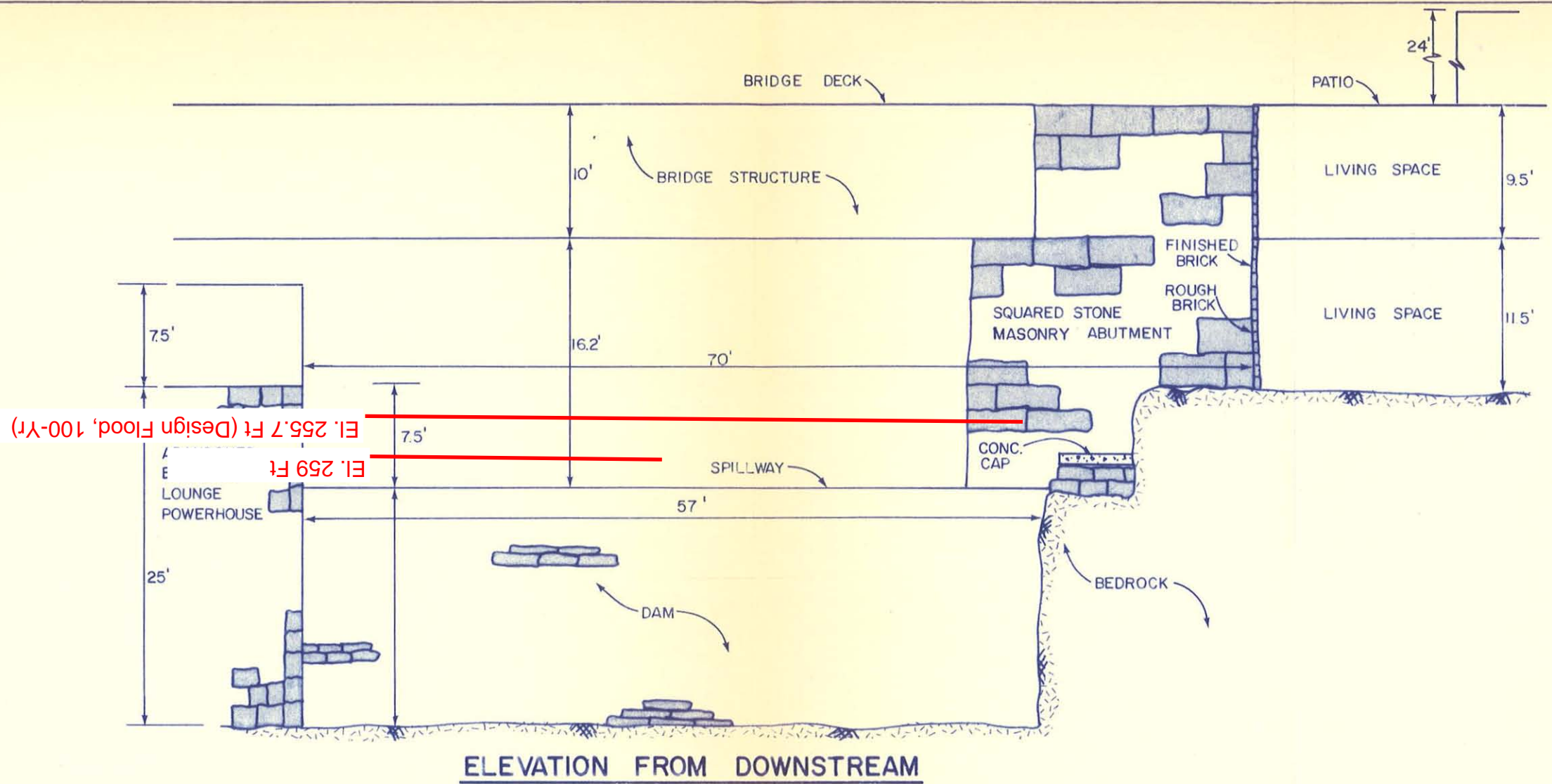


Figure 4: Breach - HEC-RAS Dam Cross-Section





* HIGH WATER 2yrs AGO
HIGHEST IN 32yrs ±.

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NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS FIGURE 3 ELEVATION VIEWS			
PEMBROKE DAM		NEW HAMPSHIRE	
		SCALE	1" = 10'
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ATTACHMENT 2

HEC-RAS PROJECT FILES

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