Barden Reservoir Dam

VISUAL INSPECTION / EVALUATION REPORT

Dam Name:	**Barden Reservoir Dam**
State Dam ID#:	**#164**
Owner:	**Providence Water**
Town:	**Scituate**
Consultant:	**Pare Corporation**
Date of Inspection:	**October 24, 2024**

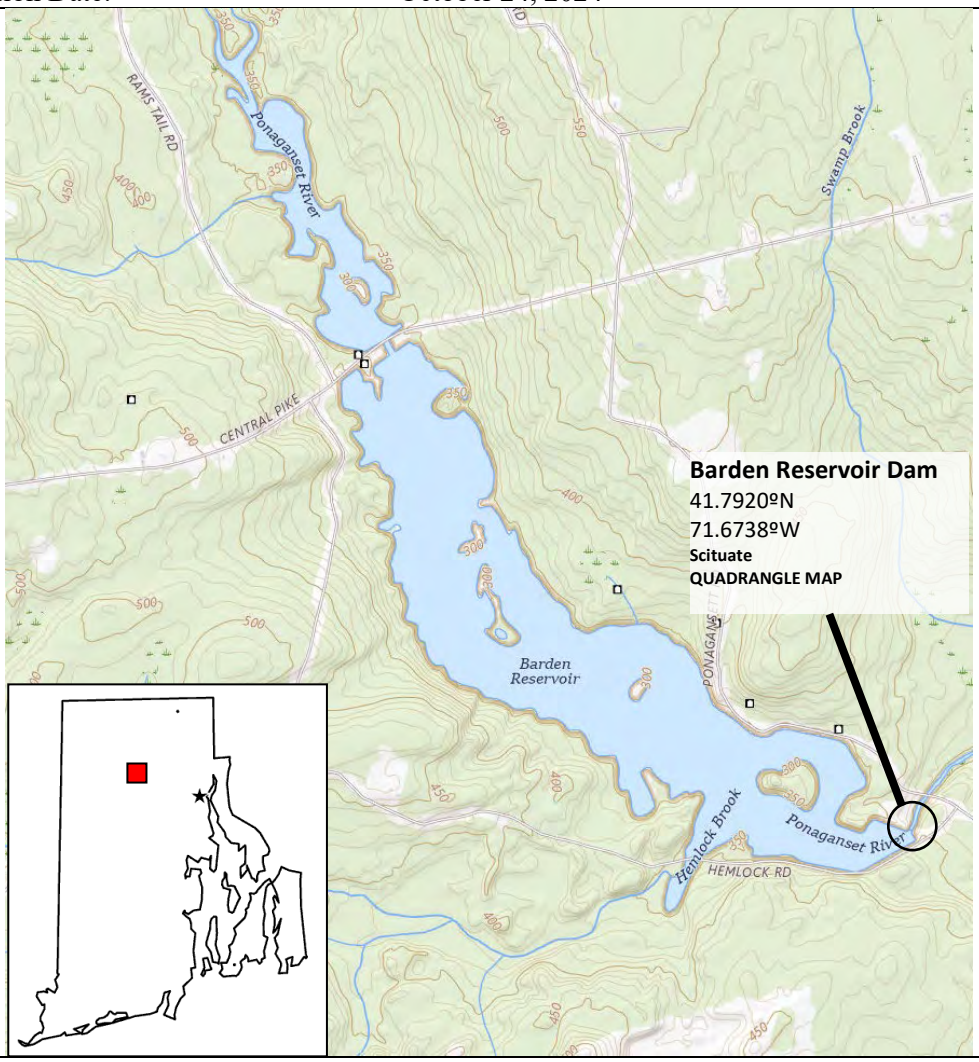
Prepared by:

PARE CORPORATION

10 Lincoln Road, Suite 210
Foxboro, MA 02035

INSPECTION SUMMARY

Dam Name (No):	Barden Reservoir Dam #164
Location:	Scituate
Hazard Classification:	Significant
Embankment Condition:	Satisfactory
Spillway Condition:	Satisfactory
Low-Level Outlet Condition:	Satisfactory
Overall Condition:	Satisfactory
Inspector:	Matthew Dunn, PE, PLS, CFM
Inspection Date:	October 24, 2024



When describing the dam, "left" and "right" refer to the respective sides of the dam as viewed when facing downstream (with normal flow of water).

PREFACE

The assessment of the general condition of the dam reported herein was based upon available data and visual inspections. Detailed investigations and analyses involving topographic mapping, subsurface investigations, testing and detailed computational evaluations were beyond the scope of this report unless reported otherwise.

In reviewing this report, it should be realized that the reported condition of the dam was based on observations of field conditions at the time of inspection, along with data available to the inspection team.

It is critical to note that the condition of the dam is evolutionary in nature and depends on numerous and constantly changing internal and external conditions. It would be incorrect to assume that the reported 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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ATTACHMENTS:

Common Dam Safety Definitions
References and Resources
Visual Dam Inspection Limitations
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Figure 1: Site Sketch

1.0 DESCRIPTION OF PROJECT

1.1 General

1.1.1 Authority

The Providence Water Supply Board (PW) has retained Pare Corporation (Pare) of Foxboro, Massachusetts and Lincoln, Rhode Island to perform a visual inspection and develop a report of conditions for the Barden Reservoir Dam in Scituate, Rhode Island. This inspection and report were performed in accordance with current Rhode Island laws.

1.1.2 Purpose of Work

The purpose of this investigation was to inspect and evaluate the present condition of the dam and appurtenant structures in accordance with current dam safety regulations to provide information that will assist in both prioritizing dam repair needs and planning/conducting maintenance and operation.

The investigation was divided into three parts: 1) obtain and review reports, investigations, and data pertaining to the dam and appurtenant structures available within the Rhode Island Department of Environmental Management files; 2) perform a visual inspection of the site; and; 3) prepare and submit a final report presenting the evaluation of the structure, including recommendations and remedial actions.

1.1.3 Definitions

To provide the reader with a better understanding of the report, definitions of commonly used terms associated with dams are provided at the end of this report. Many of these terms may be included in this report. The terms are presented under common categories associated with dams which include: 1) orientation; 2) dam components; 3) hazard classification; 4) general; and 5) condition rating.

1.2 Description of Project

1.2.1 Location

The Barden Reservoir Dam is located in the Town of Scituate, approximately 3.3 miles west of the Town center. The dam impounds water along the Ponagansett River to form Barden Reservoir. The dam is located along the southern edge of the impoundment near coordinates 41.7920ºN/71.6738ºW. Please refer to the inspection summary for a locus plan depicting the area of the dam and its immediate surroundings.

To reach the dam from I-295, take Exit 9c for US-6 W. After 3.2 miles, take a slight left turn onto Danielson Pike. After 1.9 miles, take a slight left onto Rockland Road and continue onto RI-102 S / RI-14 W after 3.2 miles. Take a right turn onto Ponagansett Road after 1.5 miles. Access to the dam and spillway is from a dirt road off of Ponagansett Road.

1.2.2 Owner/Caretaker

The dam is owned and operated by Providence Water. Mr. Leo Fontaine is the current caretaker for the dam.

1.2.3 Purpose of the Dam

Barden Reservoir Dam currently impounds water for water supply purposes.

1.2.4 Description of the Dam and Appurtenances

The following description is paraphrased from a Risk Assessment/Structural Analysis Prepared by GZA GeoEnvironmental, Inc., dated April 20, 2004:

> Barden Reservoir Dam is an earthen embankment structure with a concrete core, approximately 430 feet long with a maximum structural height of about 37 feet[1] and a hydraulic height of about 32 feet[2]. The crest of the dam is approximately 16 feet wide, contains two rows of concrete paving blocks to accommodate authorized vehicular traffic. The upstream face of the dam is comprised mostly of a vertical stone masonry wall, with a sloped earthen embankment section near the left abutment. The downstream slope, about 2.5H:1V, is earthen and terminates at a low masonry retaining wall at the toe of the dam. To provide added protection during an overtopping event, the entire embankment from the upstream wall to the downstream toe is protected with a buried armor system consisting of articulated concrete blocks (ACBs). A constructed toe drain is located at the left side along the toe of the dam.
>
> There is an 81.5-ft long broad crested, arch-shaped masonry primary spillway founded upon bedrock at the right abutment of the dam. The weir crest is at an elevation of 347.3 feet[3], about 7.2 feet below the top of the dam elevation of 354.5 feet. A newly installed (early 2000) auxiliary spillway, constructed of articulated concrete blocks (ACBs) at a crest elevation about 2 feet below the crest of the dam and covered by about 1 foot of soil, is located near the dam's left abutment. Discharge from the auxiliary spillway flows to a rip rapped overflow channel which extends from the old mill sluiceway to the primary spillway channel.
>
> Two outlet gatehouses are present near the upstream face of the dam, one at the left primary spillway abutment ("draw-off") and the second near the midpoint of the dam ("mill supply"). The outlet works at the primary spillway's left abutment consists of a 30-inch diameter cast iron conduit controlled by a manually operated sluice gate. The outlet discharges to the spillway channel at the left spillway abutment. The outlet works at the midpoint of the dam were once used to supply water to a downstream mill complex. This outlet discharges to two, 4-foot stone masonry box culverts at an old mill sluiceway, which are also controlled by manually operated sluice gates situated on the upstream side. Both gatehouses, gate stems/stem guides, and the dual 4-foot stone masonry box culverts were rehabilitated as part of an improvements project performed in early 2000. The gates at the former mill water supply outlet works were also replaced.

1.2.5 Slope Stability

The 2019 report has indicated that improvements were made to the dam in the early 2000s to improve the slope stability of the dam. Improvements to the dam consisted of flattening the downstream slope to 2.5H:1V, constructing a stone wall at the toe of the dam, and placing articulated concrete block overtopping protection on the left side of the embankment. Details analysis of the updated improvement was not available for review during the preparation of this report. Based on the current visual inspection, the slopes appeared to be stable.

[1] The structural height is measured from the top of the upstream wall (El. 352.3+/-) to the downstream invert of the draw-off structure (El. 315.3+/-).
[2] The hydraulic height is measured from the crest of the primary spillway (El. 347.3+/-) to the downstream invert of the draw-off structure (El. 315.3+/-).
[3] NGVD 1929

1.2.6 Hydraulic Capacity

As indicated in the 2019 report, "GZA Geoenvironmental, Inc. performed a hydrologic and hydraulic analysis of Barben Reservoir Dam in 2004. The analysis reportedly showed that the dam has adequate hydraulic capacity to safely pass the 100-year event with 1.5 feet of freeboard. The report was not available for review, although a 2016 Memorandum by Fuss & O'Neill title "Review and Assessment of PWSB Dam Hydrologic & Hydraulic Evaluations" was available for review and summarized the findings of the 2004 study."

1.2.7 Operations and Maintenance

A formal operation manual reportedly exists for the dam but was not available for review at the time of the inspection. The operable components of the dam include the "Mill Supply" low level outlet structure and the "Draw-off" outlet. The structures are reportedly well maintained and operational.

1.2.8 Hazard Potential Classification

In accordance with current classification procedures under the State of Rhode Island dam safety rules and regulations, Barden Reservoir Dam has been classified as a SIGNIFICANT hazard potential dam by RIDEM.

2.0 INSPECTION

2.1 Visual Inspection

The Barden Reservoir Dam was inspected on October 24, 2024. At the time of the inspection, the weather was sunny with temperatures near 60°F. Photographs to document the conditions during the inspection were taken and are included at the end of this report.

2.1.1 General Findings

In general, the Barden Reservoir Dam was found to be in Satisfactory condition as defined by RI DEM's current rating guidelines. Observations are identified in more detail in the sections below:

2.1.2 Dam Embankment

In general, the dam was found in Satisfactory condition as defined by RI DEM's current rating guidelines. The following was observed along the dam embankment:

Upstream Slope

- The upstream wall appeared in good condition with good alignment and good jointing between stones.
- Minor vegetative growth was noted within the riprap at the left end of the dam.

Crest

- The contact with the abutments appeared good.
- The crest appeared well maintained and had good grass coverage except the portion left of the spillway where some bare areas and areas of tire rutting were noted.

Downstream Slope

- In general, the downstream slope is covered with a healthy stand of well-maintained grass.
- Isolated areas of turf damage were noted along the downstream slope, approximately 20 feet left of the spillway.

Drains

- The toe drain outlet was observed flowing at approximately 0.5 GPM. Some flocculant build up was noted within the outlet pipe, approximately 1-inch thick.

2.1.3 Appurtenant Structures

The appurtenant structures at the dam consist of the primary spillway, auxiliary spillway, and "Mill Supply" and "Draw-off" outlets. The following was noted during the inspection:

Spillway

- The spillway appeared in satisfactory condition.

- The water level was just below the spillway crest elevation during the time of the inspection, no flow was noted over the crest.
- Minor vegetative growth was noted within joints along the spillway crest, training walls, and downstream channel.
- Minor leakage was noted along on the downstream face of the spillway crest; however, the leakage did not appear to be transporting sediment and appeared consistent with typical leakage through a stone masonry structure.
- Minor erosion was noted at the end of the right downstream training wall.

Auxiliary Spillway

- Riprap appeared in good condition with minor vegetation growth throughout.
- The crest is covered with healthy and well-maintained grass.

Outlets

- Audible flow was noted within the left outlet of the Mill Supply outlet system, suggesting that the gate within the gatehouse is not seated fully.
- The outlet of the "Draw-off" was operated with ease during the inspection; turbid flow with iron oxide staining was released upon initial operation but cleared within approximately 15 seconds of discharge through the conduit.

2.1.4 Downstream Area

Flows from the dam travels downstream to Ponagansett Road (approximately 470 feet downstream), then to Route 102 (3,700 feet) where it meets the Scituate Reservoir. Downstream areas are mostly wooded with dense tree coverage.

2.1.5 Reservoir Area

Barden Reservoir Dam impounds water along the Ponagansett River to form an irregularly shaped pond (11,000 foot long by 1,000-foot-wide impoundment) as indicated on the Locus Plan in the Inspection Summary. The dam is located within the southeastern portion of the impoundment. The reservoir's perimeter is moderately sloped and is generally wooded with some low density, residential development.

2.2 Caretaker Interview

Mr. Leo Fontaine of Providence Water was available during the inspection to answer questions related to the history, operation and maintenance of the dam. Information provided by Mr. Fontaine has been incorporated within this report.

2.3 Operation and Maintenance Procedures

2.3.1 Operational Procedures

A formal operations and maintenance (O&M) plan was reportedly prepared for Barden Reservoir Dam by Fuss and O'Neill Inc. in April 2016. The O&M was not available for review during the preparation of this report.

2.3.2 Maintenance of Dam and Operating Facilities

Operable components include the low-level outlet left of the primary spillway and the "Mill Supply" structure near the center of the embankment. Providence Water reports that both low level outlets are operable and are adjusted on an as needed basis.

3.0 ASSESSMENTS AND RECOMMENDATIONS

3.1 Assessments

Based upon the visual inspection and review of available information, Barden Reservoir Dam was found to have an overall condition of Satisfactory as defined by current RIDEM rating guidelines.

The Barden Reservoir Dam was found to have the following deficiencies:

1. Areas of turf damage observed on the dam crest isolated areas along the dam's downstream slope.

The last inspection was completed by Tighe & Bond on October 7, 2019. Since this inspection, the Owner has continued regular maintenance activities and informal inspections at the dam. The following table presents the recommendations presented in the last Phase I inspection, with an updated comment

Previous Recommendation	***Updated Recommendation***
Backfill ruts at the dam crest and at isolated areas along downstream embankment slope. Seed backfilled areas to establish grass cover.	Ongoing / Similar recommendation
Remove vegetation observed growing in the "Mill Supply" low level outlet discharge area / riprap swale.	Ongoing / Similar recommendation
Cut trees and brush on and within 15 feet of the dam and grub stumps and roots on and within 15 feet of embankments. Backfill voids with appropriate material.	One sapling was observed and does not warrant removal (far enough beyond the limits of the dam)
Place rodent screen at the toe drain outlet at the left primary spillway downstream training wall.	Rodent screen has been installed; some deterioration noted; potential concern for obstruction.
Monitor efflorescence, minor voids, minor cracking, and vegetation growing at primary spillway training wall.	Not observed
Monitor leakage through primary spillway through stone blocks.	Observed; flow rates do not currently appear to currently represent a stability concern.
Continue to monitor the site for vandalism. Graffiti does not impact structural stability of dam, but more destructive vandalism could be problematic.	Ongoing
Remove wasp nest from "Mill Supply" gatehouse.	Not observed
Backfill the eroded area at the end of the right downstream training wall either with riprap or soil (with grass cover).	Area does not appear to warrant remedial action at this time / monitor area as part of routine monitoring.

The following recommendations and remedial measures generally describe the recommended approach to address current deficiencies at the dam. Prior to undertaking recommended maintenance, repairs, or remedial measures, the applicability of environmental permits needs to be determined for activities that may occur within resource areas under the jurisdiction of RIDEM or other regulatory agencies.

3.2 Recommendations

The following tasks are recommended to address deficiencies noted during the inspection and the completion of this report. The repairs presented below should be implemented to maintain the integrity of the structure. If deferred these maintenance items could develop into larger deficiencies that are more costly to address.

1. Perform routine monitoring and maintenance activities at the dam, including:
    a. Routinely monitor and remove debris from the spillway system.
    b. Routinely mowing the grass along the crest and downstream slope.
        i. Restore areas of turf damage
    c. Routinely operate the gates of the Mill Supply and Draw Off outlet systems
        i. Consider addressing the leakage at the left gate of the Mill Supply outlet system if leakage results in lower than desired impoundment elevations.
    d. Monitoring the the dam for indications of changed conditions.
    e. Routinely cleaning the toe drain system

3.3 Alternatives

The following alternatives are presented based upon a conceptual review of the concerns. Additional studies and or considerations may indicate that some or all of the options presented below are not suitable for the conditions specific to this dam and dam site. In addition to the general activities, appropriate environmental permits will be required to complete many of the alternatives presented below.

All Recommendations: Breaching of the dam is always an alternative for addressing safety and stability concerns at the dam. However, given the current condition of the dam, and as the dam currently functions in the Providence Water supply Board water supply system, this alternative does not currently appear to be practicable.

COMMON DAM SAFETY DEFINITIONS

For a comprehensive list of dam engineering terminology and definitions refer to State of Rhode Island Rules and Regulations for Dam Safety, or other reference published by FERC, Dept. of the Interior Bureau of Reclamation, or FEMA.

Orientation

Upstream – Shall mean the side of the dam that borders the impoundment.
Downstream – Shall mean the high side of the dam, the side opposite the upstream side.
Right – Shall mean the area to the right when looking in the downstream direction.
Left – Shall mean the area to the left when looking in the downstream direction.

Dam Components

Dam – means any barrier made by humans, including appurtenant works, that impounds or diverts water.
Embankment – means the fill material, including but not limited to rock or earth, placed to provide a permanent barrier that impounds water.
Crest – Shall mean the top of the dam, usually provides a road or path across the dam.
Abutment – Shall mean that part of a valley side against which a dam is constructed. An artificial abutment is sometimes constructed as a concrete gravity section, to take the thrust of an arch dam where there is no suitable natural abutment.
Appurtenant Works – means any ancillary feature of a dam including such structures as dikes, training walls, spillways, either in the dam or separate there from, low level outlet works, and water conduits such as tunnels, channels, pipelines or penstocks, either through the dam or its abutments.
Spillway – means a structure, a low area in natural grade or any part of the dam which has been designed or relied upon to allow normal flow or major flood flow to pass over or through while being discharged from a reservoir.

Hazard Classification

High Hazard – means a dam where failure or misoperation will result in probable loss of human life.
Significant Hazard – means a dam where failure or misoperation results in no probable loss of human life but can cause major economic loss, disruption of lifeline facilities or impact other concerns detrimental to the public's health, safety or welfare. Examples of major economic loss include but are not limited to washout of a state or federal highway, washout of two or more municipal roads, loss of vehicular access to residences, (e.g. a dead end road whereby emergency personnel could no longer access residences beyond the washout area) or damage to a few structures.
Low Hazard – means a dam where failure or misoperation results in no probable loss of human life and low economic losses.

General

EAP – Emergency Action Plan – Shall mean a predetermined (and properly documented) plan of action to be taken to reduce the potential for property damage and/or loss of life in an area affected by an impending dam failure.

O&M Manual – Operations and Maintenance Manual; Document identifying routine maintenance and operational procedures under normal and storm conditions.
Normal Pool – Shall mean the elevation of the impoundment during normal operating conditions.
Acre-foot – Shall mean a unit of volumetric measure that would cover one acre to a depth of one foot. It is equal to 43,560 cubic feet. One million U.S. gallons = 3.068 acre feet.
Height of Dam– means the vertical distance from the elevation of the uppermost surface of a dam to the lowest point of natural ground, including any stream channel, along the downstream toe of the dam.
Hydraulic Height – means the height to which water rises behind a dam and the difference between the lowest point in the original streambed at the axis of the dam and the maximum controllable water surface.
Maximum Water Storage Elevation – means the maximum elevation of water surface which can be contained by the dam without overtopping the embankment section.
Spillway Design Flood (SDF) – Shall mean the flood used in the design of a dam and its appurtenant works particularly for sizing the spillway and outlet works, and for determining maximum temporary storage and height of dam requirements.
Maximum Storage Capacity – The volume of water contained in the impoundment at maximum water storage elevation.
Normal Storage Capacity – The volume of water contained in the impoundment at normal water storage elevation.

Condition Rating

Unsafe – Means the condition of a regulated dam, as determined by the Director, is such that an unreasonable risk of failure exists that will result in a probable loss of human life or major economic loss. Among the conditions that would result in this determination are: excessive vegetation that does not allow the Director to perform a complete visual inspection of a dam, excessive seepage or piping, significant erosion problems, inadequate spillway capacity, inadequate capacity and/or condition of control structure(s) or serious structural deficiencies, including movement of the structure or major cracking.
Poor – A component that has deteriorated beyond a maintenance issue and requires repair.; the component no longer functions as it was originally intended.
Fair – Means a component that requires maintenance
Good – Meeting minimum guidelines where no irregularities are observed and the component appears to be maintained properly.

REFERENCES AND RESOURCES

The following reports were located during the file review completed at RIDEM Offices in Providence, Rhode Island and within Pare's project archives:

1. "Barden Reservoir Dam Visual Inspection / Evaluation Report", Tighe & Bond, October 8, 2019.
2. "Review and Assessment of PWSB Dam Hydrologic & Hydraulic Evaluations", Fuss & O'Neill, April 11, 2016.
3. "Review and Assessment of Previous Subsurface Investigations and Stability Evaluations", Fuss & O'Neill, April 11, 2016.
4. "Barden Reservoir Dam Inspection / Evaluation Report", Fuss & O'Neill, April 8, 2014.
5. "Barden Reservoir Dam Visual Inspection / Evaluation Report", Pare Corporation, July 27, 2012.

The following were referenced during the completion of the visual inspection and preparation of this report and the development of the recommendations presented herein:

1. "Design of Small Dams", United States Department of the Interior Bureau of Reclamation, 1987.
2. "ER 110-2-106 - Recommended Guidelines for Safety Inspection of Dams", Department of the Army, September 26, 1979.
3. "Guidelines for Reporting the Performance of Dams" National Performance of Dams Program, August 1994.

The following provides an abbreviated list of resources for dam owners to locate additional information pertaining to dam safety, regulations, maintenance, operations, and other information relevant to the ownership responsibilities associated with their dam.

1. RIDEM Office of Compliance and Inspection Website: http://www.dem.ri.gov/programs/benviron/compinsp/
2. "Dam Owner's Guide to Plant Impact on Earthen Dams" *FEMA L-263, September 2005.*
3. "Technical Manual for Dam Owners: Impacts of Plants on Earthen Dams" *FEMA 534, September 2005.*
4. "Dam Safety: An Owners Guidance Manual" *FEMA 145, December 1986.*
5. Association of Dam Safety Officials – Website: www.asdso.org/.
6. "Dam Ownership – Responsibility and Liability", ASDSO.

VISUAL DAM INSPECTION LIMITATIONS

Visual Inspection

1. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigations and analyses involving topographic mapping, subsurface investigations, testing and detailed computational evaluations are beyond the scope of this report.

2. 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. In cases where an impoundment is 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.

3. It is critical to note that the condition of the 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.

Use of Report

1. The applicability of environmental permits needs to be determined prior to undertaking maintenance activities that may occur within resource areas under the jurisdiction of any regulatory agency.

2. This report has been prepared for the exclusive use of the RIDEM for specific application to the referenced dam site in accordance with generally accepted engineering practices. No other warranty, expressed or implied, is made.

3. This report has been prepared for this project by Pare. This report is for preliminary evaluation purposes only and is not necessarily sufficient to support design of repairs or recommendations or to prepare an accurate bid.

Photo No. 1.: Overview of the impoundment from right of the spillway looking upstream.

Photo No. 2.: Overview of the dam from the upstream right abutment looking left.

Photo No. 3.: Overview of the upstream side from the "Mill Supply" gatehouse looking left.

Photo No. 4.: Overview of the upstream side from the "Mill Supply" gatehouse looking right.

Photo No. 5.: Overview of the left abutment.

Photo No. 6.: Dam crest from near the left abutment looking right.

Photo No. 7.: Overview of the downstream slope from near the left abutment looking right.

Photo No. 8.: Downstream slope from left of spillway channel looking upstream Note isolated areas of turf damage.

Photo No. 9.: Approach to the spillway looking downstream.

Photo No. 10.: Overview of the spillway from the downstream channel looking upstream.

Photo No. 11.: Minor leakage through stone masonry blocks of the spillway.

Photo No. 12.: Overview of left downstream training wall of the spillway.

Photo No. 13.: Overview of the right downstream training wall of the spillway.

Photo No. 14.: Area of previously reported erosion at the end of the right downstream training wall of the spillway.

Photo No. 15.: Overview of the exterior of the gatehouse of the "Draw-Off" outlet system.

Photo No. 16.: Overview of the interior of the gatehouse of the "Draw-Off" outlet system..

Photo No. 17.: View of the outlet end of the conduit of the "Draw-Off" outlet system.

Photo No. 18.: Discharges through the outlet conduit following operations of the gate valve within the gatehouse; note that the iron oxide staining within conduit was flushed out after approximately 15 seconds of flowing.

Photo No. 19.: Overview of the exterior of the gatehouse of the “Mill Supply” outlet system.

Photo No. 20.: Overview of the interior of the gatehouse of the “Mill Supply” outlet system.

Photo No. 21.: View of the interior of the left discharge conduit of the "Mill Supply" outlet system from the downstream end looking upstream.

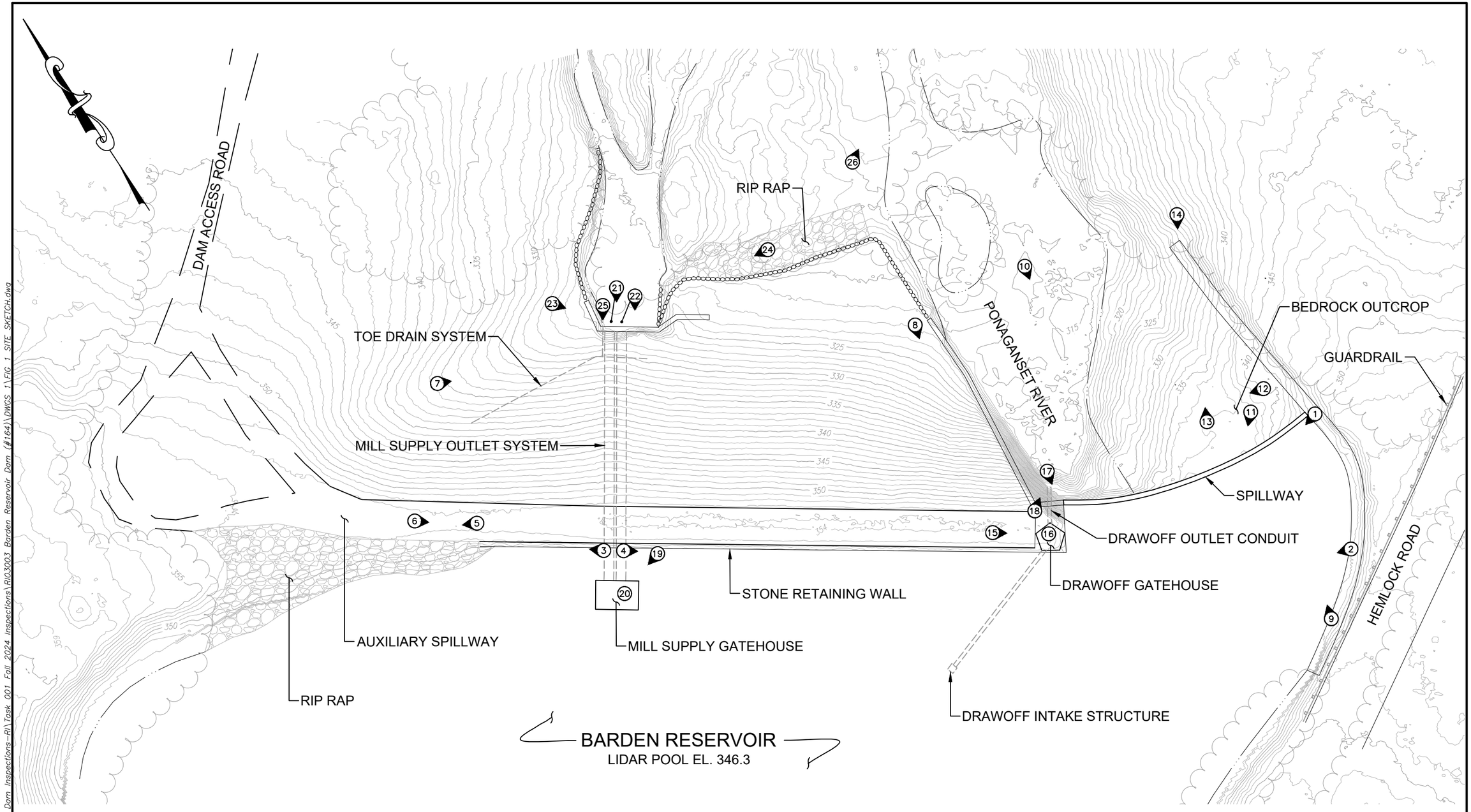
Photo No. 22.: View of the interior of the right discharge conduit of the "Mill Supply" outlet system from the downstream end looking upstream.

Photo No. 23.: Downstream headwall and channel of the discharge conduits of the "Mill Supply" outlet system.

Photo No. 24.: "Old Mill Channel" riprap diversion swale that extends from the downstream channel to the "Mill Supply" outlet system to the downstream channel of the spillway.

Photo No. 25.: Toe drain outfall at the "Mill Supply" low level outlet headwall. Note the iron oxide staining and the chewed-out bottom of the rodent screen.

Photo No. 26.: Downstream channel of the spillway from where the "Old Mill Channel" diversion channel converges with the downstream channel of the spillway looking downstream.



NOTES AND LEGEND

1. PLAN DEVELOPED FROM NOTES DEVELOPED DURING THE INSPECTION AND AVAILABLE USGS LIDAR. INFORMATION IS PROVIDED FOR REFERENCE PURPOSES ONLY.
2. ELEVATIONS FROM AVAILABLE LIDAR REFERENCE THE NAVD 1988 VERTICAL DATUM.

(#) DENOTES APPROXIMATE LOCATION AND DIRECTION OF PHOTOGRAPH.

1+00 BASELINE AND STATIONING

SITE SKETCH

SCALE: 1"=40'±

PARE
PARE CORPORATION
ENGINEERS - SCIENTISTS - PLANNERS
8 BLACKSTONE VALLEY PLACE 10 LINCOLN ROAD, SUITE 210
LINCOLN, RI 02865 FOXBORO, MA 02035
401-334-4100 508-543-1755
14 ROBALA ROAD, SUITE 3B
HOLYOKE, MA 01040
413-503-3440

SCALE ADJUSTMENT GUIDE

0" 1"

BAR IS ONE INCH ON ORIGINAL DRAWING.

BARDEN RESERVOIR DAM
RI03003 / RI DAM #164
SCITUATE, RHODE ISLAND
OWNER: PROVIDENCE WATER SUPPLY BOARD

REVISIONS:

PROJECT NO.:	14256.56
DATE:	JANUARY 2025
SCALE:	AS NOTED
DESIGNED BY:	MLP
CHECKED BY:	MED
DRAWN BY:	LMC
APPROVED BY:	ARO

SITE SKETCH

FIGURE NO.: 1

Y:\JOBS\14 Jobs\14256.56 ProvWater-FY24&25 Dam Inspections-RI\Task 001 Fall 2024 Inspections\RI03003 Barden Reservoir Dam (#164)\DWGS 1\FIG 1 SITE SKETCH.dwg