

July 28, 2021

Mr. Paul Marinelli
Department of Conservation and Recreation
Office of Dam Safety
251 Causeway Street, Suite 800
Boston, MA 02114

Re: **Follow-Up Inspection – July 2021**
Danielson Mill Dam (MA03351)
Medfield, Massachusetts
(PARE Project No.: 21032.00 / Task 700)

Dear Mr. Marinelli:

On behalf of Town of Medfield (Owner), Pare Corporation (Pare) completed a follow-up inspection of the Danielson Mill Dam located in Medfield, Massachusetts on July 8, 2021. Based upon the observed conditions, the dam appears to remain in **Poor** condition with deficiencies similar in nature and extent as those observed during previous inspections.

The sinkholes and voids reported within the December 2020 FUI that were the result of elevated impoundment levels in early December 2020 have since been filled; Refer to the December 2020 FUI for information relative to the leakage and sinkhole conditions that were prevalent during that FUI. No leakage was observed through areas of the spillway channel that were noted during the December FUI.

Danielson Mill Dam consists of a roughly 225-foot long earthen embankment dam with a 4-foot wide stop log controlled spillway channel. The dam has a hydraulic height of approximately 6 feet and a maximum structural height of approximately 7 feet. Danielson Mill Dam is currently classified as a **Small** sized, **Significant** (Class II) hazard potential dam. As indicated within the June 2020 Phase I Inspection Report, the dam was found to be in Poor condition and to have the following deficiencies:

1. Overgrown vegetation, including large leaning trees, along the upstream and downstream slopes, and along abutment slopes
2. Cracked mortar, slight stone separation, settling, and voids along the upstream masonry walls
3. Bare areas along the crest
4. Unprotected section of the upstream slope with scarping up to 12-inches deep
5. Areas of previously reported seepage along the downstream toe and downstream area
6. Failed sections of the right downstream masonry wall
7. Voids, up to 48-inches deep, within the downstream left stone wall
8. Significant deterioration of the stone training walls including voids, potential bulge, previously reported leakage, and subsidence of soils behind walls
9. Significant deterioration of the concrete training walls including potential movement, significant deterioration of the timber, and subsidence of soils behind walls
10. No EAP (draft under review by the Town)
11. Insufficient capacity to pass the SDF
12. No O&M Manual
13. Additional maintenance deficiencies and potential dam safety concerns, as identified herein.





Mr. Paul Marinelli

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July 28, 2021

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 present condition of the dam will continue to represent the condition of the dam at some point in the future.

We trust that the attached Follow-up Inspection Form meets the requirements of the follow up inspection for the Danielson Mill Dam. Should you have any questions please feel free to contact me at 508.543.1755 or via email at mdunn@parecorp.com.

Sincerely,

PARE CORPORATION

Matthew Dunn, P.E., CFM
Senior Project Engineer



Attachment: Poor Condition Dam Follow-Up Inspection Form (with attachments)



**Commonwealth of Massachusetts
Department of Conservation and Recreation
Office of Dam Safety Poor Condition Dam Follow-up Inspection Form**

Dam Name: Danielson Mill Dam
Dam Owner: Town of Medfield
Nat. ID Number: MA03351
Hazard Potential: Significant (Class II)
Location of Dam (town): Medfield
Coordinate location (lat,long): 42.17054°N/71.29507°W
Date of Inspection: July 8, 2021
Weather: 75°F, Partly Cloudy

Consultant Inspector(s): Pare Corporation, Matthew Dunn P.E., CFM

Others in Attendance at Field Inspection: My Linh Pham (Pare Corporation)

Attachments: Figure 1: Locus Plan
Figure 2: Aerial Plan
Figure 3: Site Sketch
Photographs
Inspection Limitations

I. Previous Inspection date/Overall Condition:

- December 3, 2020 Poor Condition Follow-Up Inspection (Pare Corporation) / Poor
- June 30, 2020 Phase I Inspection (Pare Corporation) / Poor
- February 28, 2020 Poor Condition Follow-Up Inspection (Pare Corporation) / Poor
- August 23, 2019 Poor Condition Follow-Up Inspection (Pare Corporation) / Poor
- October 18, 2017 Poor Condition Follow-Up Inspection (Tighe & Bond, Inc) / Poor
- November 25, 2014 Phase I Inspection (Polaris Consultants, LLC) / Poor

II. Previous Inspection Deficiencies:

1. Overgrown vegetation, including large leaning trees, along the upstream and downstream slopes, and along abutment slopes
2. Cracked mortar, slight stone separation, settling, and voids along the upstream masonry walls
3. Bare areas along the crest
4. Unprotected section of the upstream slope with scarping up to 12-inches deep
5. Areas of previously reported seepage along the downstream toe and downstream area
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13. Additional maintenance deficiencies and potential dam safety concerns, as identified herein



- III. Overall Condition of Dam at the Time of the Current Follow-up Inspection:**
- a. State the current condition:** Poor
 - b. Have conditions changed since the previous inspection?** No
- IV. Comparison of Current Conditions to Condition Listed in Previous Phase I Inspection Report:**
- a. Have any of the deficiencies listed in the previous Phase I Inspection Report worsened?** No (See December 2020 FUI for elevated impoundment related damage that has since been addressed)
 - b. If yes, list the changes.**
 - i. No** (See December 2020 FUI for elevated impoundment related damage that has since been addressed)
 - c. Are there any additional deficiencies that have been identified in the current inspection?** No (See December 2020 FUI for elevated impoundment related damage that has since been addressed)
 - d. If yes, list the deficiencies and describe.**
 - i. No** (See December 2020 FUI for elevated impoundment related damage that has since been addressed)
- V. Dam Safety Orders:**
- Certificate of Non-Compliance and Dam Safety Order – November 9, 2015
- VI. Maintenance:**
- 1. Indicate if there exists an operation and maintenance plan for the dam.** No formal operations and maintenance plan is known to exist.
 - 2. Indicate if it appears the dam is being maintained.** The Owner maintains vegetation along the crest and performs a general cleanup of the site including debris from the spillway. The Owner also performs routine inspections after significant rain events.
- VII. Recommendations:**

Based on the visual observations during this Follow-Up Inspection and previous Phase I Inspection, Pare recommends the following be completed at the dam:

- Studies and Analyses*
 - a) Prepare an Operations and Maintenance (O&M) Manual
 - b) Develop/implement monitoring plan for sinkholes in area of the spillway
 - c) Evaluate seepage and saturation along the downstream side of the dam.
 - d) Complete a stability analysis for the embankment and gravity walls.
- Recurring Monitoring and Maintenance*
 - a) Perform routine monitoring and inspections to check for indications of increasing and/or new deficiencies at the dam. Continue the 6-month poor condition follow up inspections (Next Required: December 2021. Complete a Phase I Inspection (Next required June 2025)).
 - i. Given the elevated impoundment level and resulting overtopping and sinkhole development that occurred in November 2020, it is recommended that forecasts be monitored on a routine basis and pre-storm operations of the spillway stop logs be completed in advance of forecast storm events.*
 - b) Perform routine maintenance activities.



- c) Review and Update the EAP

iii. *Repairs*

- a) Remove the irregular downstream boulder wall and replace with an earthen slope.
- b) Clear and grub areas of unwanted vegetation. Fill resulting holes.
- c) Provide riprap slope protection along the upstream slope.

iv. *Remedial Measures*

- a) Modify the dam to accommodate the 100-year SDF.
- b) Pending result of the seepage evaluation, develop and install a seepage mitigation system at the dam to address the seepage concerns along the downstream side of the dam.
- c) Rehabilitate / reconstruct the spillway system to address the noted concerns.

VIII. Other Comments or Observations:

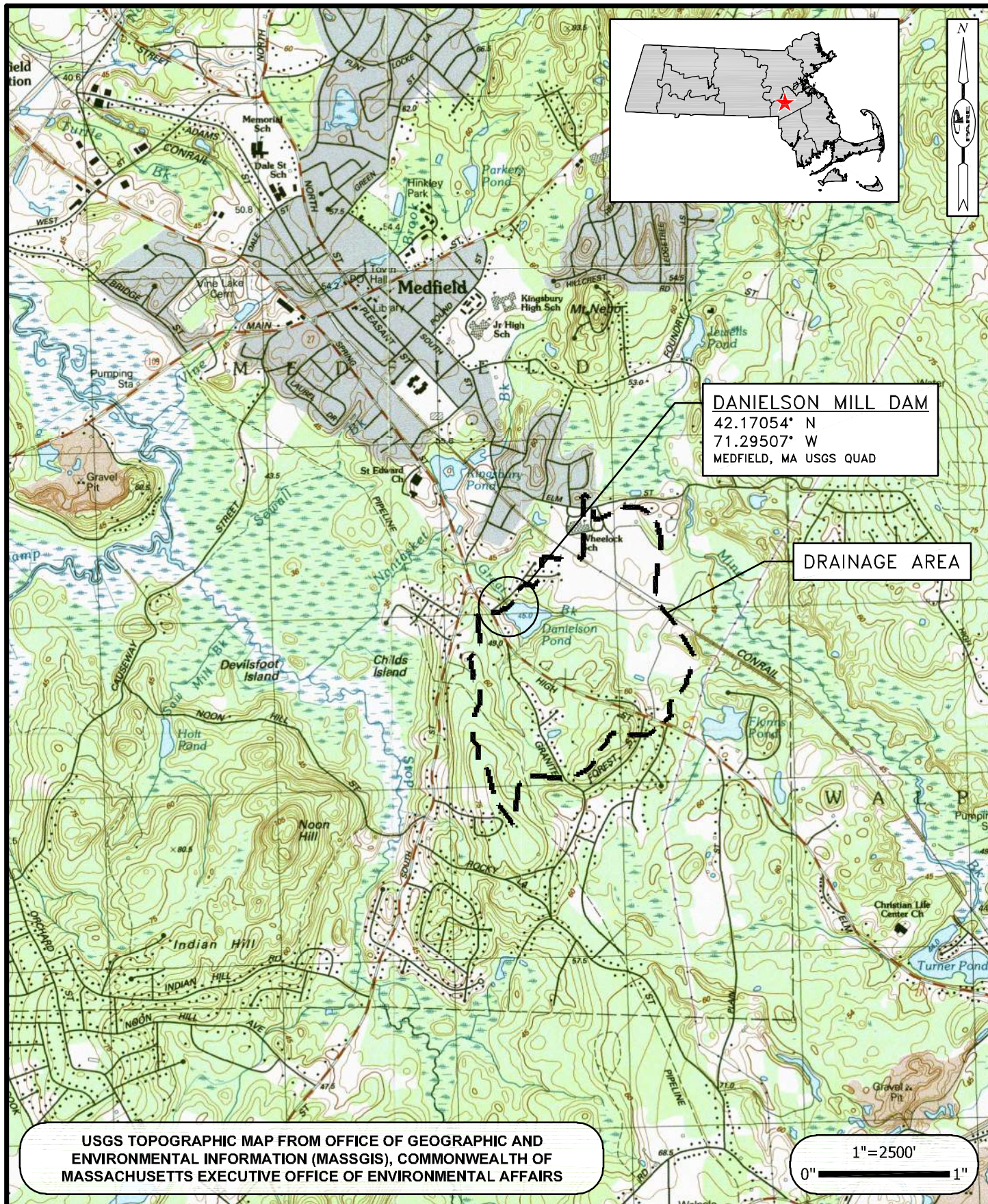
- a. *During the December 2020 FUI, there were new observations made associated with high impoundment levels during late November of 2020 that forced overtopping flow, leakage, as well as the following voids that were identified:*
 - i. *Behind upstream right return wall – approximately 15 inches deep; probed to right training wall of spillway (2.8 feet) and to the right of the sinkhole (2.4 feet)*
 - ii. *Behind right training wall, centerline embankment – probed to 2.4 feet deep; horizontal extent not clear*
 - iii. *Behind right training wall downstream of the downstream fence line – probed to 2 feet deep; horizontal extent not clear*
- b. The following observations were made during the current FUI:
 - i. Damage resulting from the overtopping referenced within the December 202 FUI have apparently since been addressed. There were no apparent signs of continued subsidence in these areas.
 - ii. Flows over the spillway stop logs limited a detailed inspection of the spillway controls and channel; however, there were no significant changes apparent.

IX. Updated Site Sketch with Photo Locations: Attached

X. Updated Photos: Attached

XI. Copy of Locus Map from Phase I Report: Figure 1: Locus Plan attached

XII. Other applicable attachment: Figure 2: Aerial Plan, Inspection Limitations

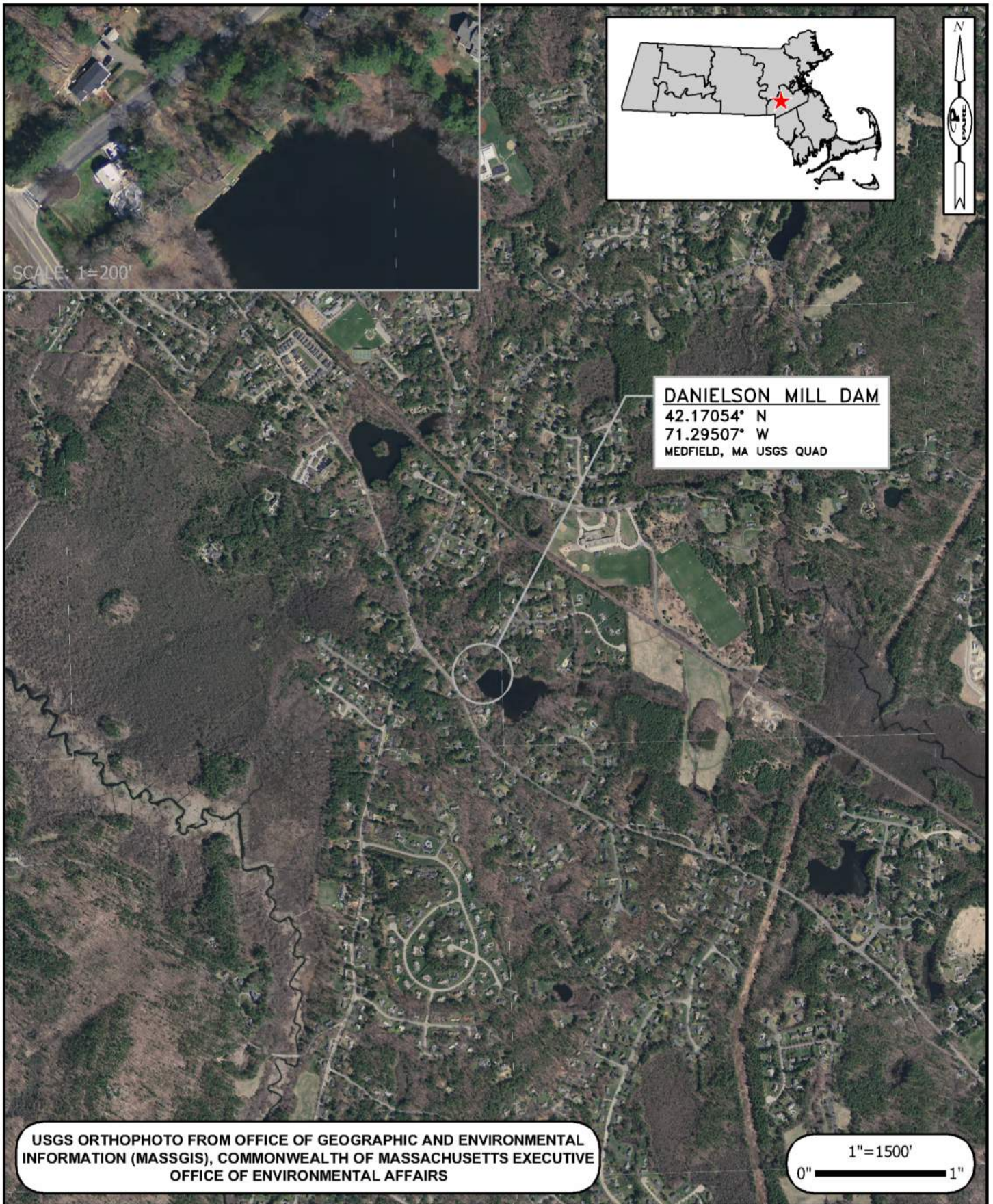


DANIELSON MILL DAM
 MA03351
 MEDFIELD, MASSACHUSETTS
 OWNER : TOWN OF MEDFIELD

LOCUS PLAN

JUNE 2020

FIGURE 1



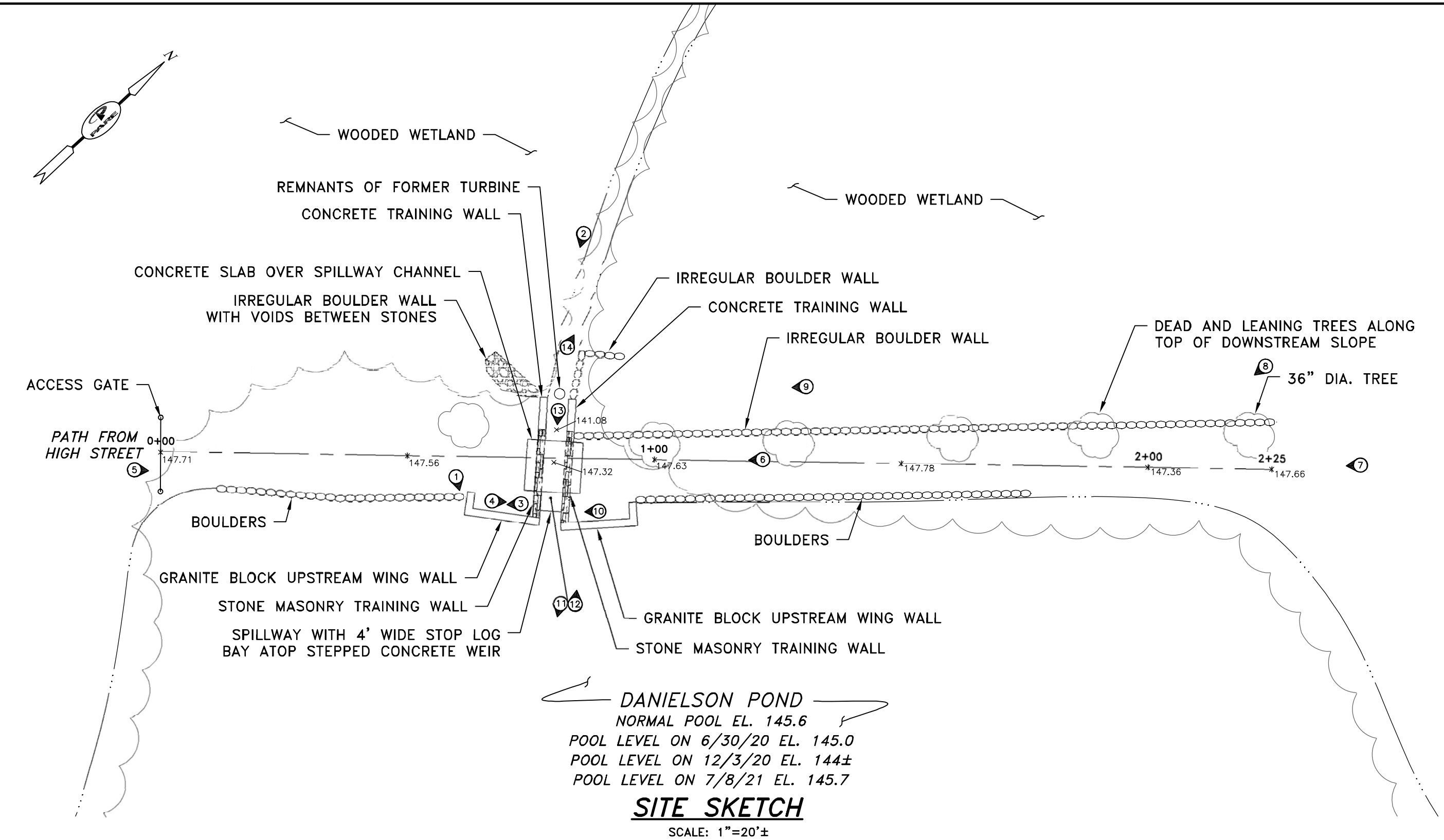
DANIELSON MILL DAM
MA03351
MEDFIELD, MASSACHUSETTS
OWNER : TOWN OF MEDFIELD

AERIAL PLAN

JUNE 2020

FIGURE 2

X:\JOBS\21 JOBS\21032.00 Medfield-DanielsonPondDamConceptDesign-MA\Reports\July2021\FUJ\DWG\FIG 3 SITE SKETCH.dwg



NOTES AND LEGEND

1. PLAN DEVELOPED FROM NOTES TAKEN DURING THE INSPECTION, PREVIOUS SITE SKETCHES FROM PREVIOUS INSPECTION REPORTS, AND AVAILABLE AERIAL IMAGERY FROM MASSGIS. INFORMATION IS PROVIDED FOR REFERENCE PURPOSES ONLY.
- x 125.00 SPOT ELEVATION AS DETERMINED BY RELATIVE ELEVATION SURVEY COMPLETED BY PARE DURING THE 2020 PHASE I INSPECTION.
- # DENOTES APPROXIMATE LOCATION AND DIRECTION OF PHOTOGRAPH.
- 1+00 BASELINE AND STATIONING

REVISIONS:	
PROJECT NO.:	20132.00
DATE:	JULY 2021
SCALE:	AS NOTED
DESIGNED BY:	MED
CHECKED BY:	MED
DRAWN BY:	LMC
APPROVED BY:	ARO



Photo No. 1.: Overview of the impoundment, Danielson Mill Pond, from the spillway looking upstream.



Photo No. 2.: Overview of the dam from the downstream channel looking upstream.



Photo No. 3.: Upstream side from the spillway looking left.



Photo No. 4.: Upstream side from the spillway looking right.



Photo No. 5.: Crest from the left abutment looking right.



Photo No. 6.: Crest from 50 feet right of the spillway looking left.



Photo No. 7.: Crest from the right abutment looking left.



Photo No. 8.: Downstream side of the dam from the right abutment looking left.



Photo No. 9.: View of the soft saturated ground surface with ponded waters that is typical within the majority of the downstream area right of the spillway.



Photo No. 10.: Control section of the spillway looking left.



Photo No. 11.: Downstream face of the spillway control section looking upstream.



Photo No. 12.: Discharge channel of the spillway from the control section looking downstream.

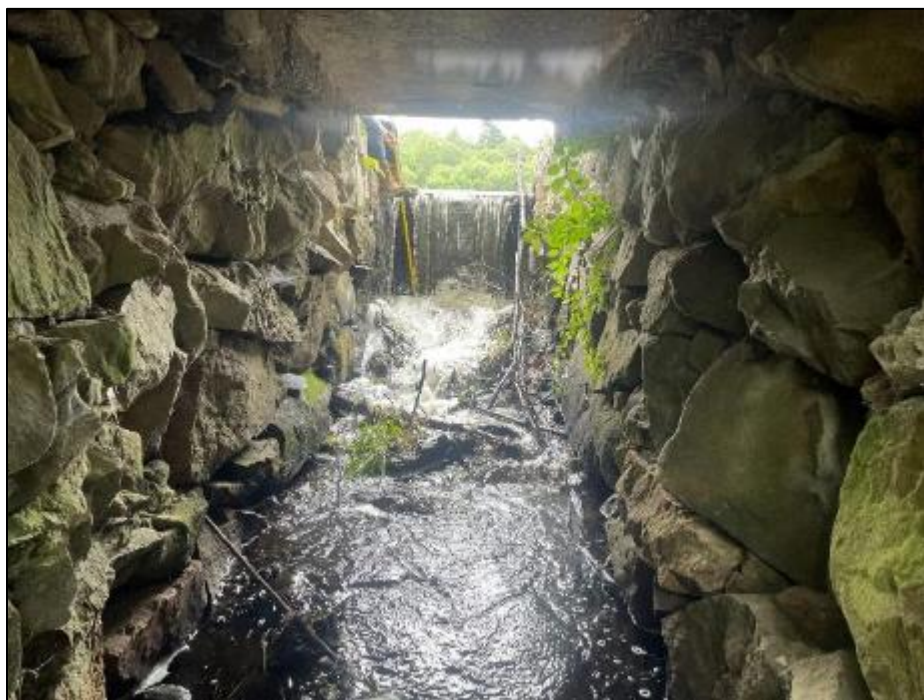


Photo No. 13.: Discharge channel of the spillway from the downstream end looking upstream.



Photo No. 14.: Downstream channel from the downstream end of the spillway channel looking downstream.



VISUAL DAM INSPECTION LIMITATIONS

Visual Inspection

1. The assessment of the general condition of the dam is based upon available data and abbreviated visual inspections completed as part of the follow up inspection. 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.
3. 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.
4. 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 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 other environmental permits (ie., NOI, PGP, Water Quality Certificate, etc.) needs to be determined prior to undertaking maintenance activities that may occur within resource areas under the jurisdiction of MADEP, the local conservation commission or other regulatory agency.
2. This report has been prepared for the exclusive use of the Town of Medfield for specific application to the Danielson Mill Dam 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 or repairs or recommendations or to prepare an accurate bid.