Kevin Mooney
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Via Electronic Mail

November 1, 2024

Mr. Joshua Fontaine
U.S. Environmental Protection Agency, New England Region
Five Post Office Square
Suite 100
Boston, MA 02109

Re: GE-Pittsfield/Housatonic River Site
Rest of River (GECD850)
2024 Annual Visual Inspection Report for Columbia Mill Dam

Dear Mr. Fontaine:

On September 3, 2024, GE's consultants from GZA GeoEnvironmental, Inc. performed the 2024 annual visual inspection of the Columbia Mill Dam in accordance with the EPA-approved Monitoring and Maintenance Plan for this dam. Enclosed is GZA's report on this annual inspection, including photographs, the annual dam inspection checklist, and an updated maintenance tracking table.

Please let me know if you have any questions about the enclosed inspection report.

Very truly yours,

Kevin G. Mooney
Senior Project Manager

Enclosures

Cc: (via electronic mail)
Dean Tagliaferro, EPA
Anni Loughlin, EPA
John Kilborn, EPA
Alexander Carli-Dorsey, EPA
Christopher Ferry, ASRC Federal
Thomas Czelusniak, HDR Inc.
Scott Campbell, Taconic Ridge Environmental
Izabella Zapisek, Taconic Ridge Environmental
Emily Caruso, MassDCR, Office of Dam Safety
Michael Gorski, MassDEP

Ben Guidi, MassDEP
Michelle Craddock, MassDEP
Jeffrey Mickelson, MassDEP
Mark Tisa, MassDFW
Eve Schluter, MassDFW
Betsy Harper, MA AG
Traci Iott, CT DEEP
Susan Peterson, CT DEEP
Graham Stevens, CT DEEP
Carol Papp, CT DEEP
Lori DiBella, CT AG
Whitney Behr, USFWS
Mark Barash, US DOI
Katie Zarada, NOAA
James McGrath, City of Pittsfield
Andrew Cambi, City of Pittsfield
Michael Coakley, PEDA
Melissa Provencher, BRPC
Christopher Ketchen, Town of Lenox
Town Manager, Lee
Town Manager, Great Barrington
Town Administrator, Stockbridge
Town Administrator, Sheffield
Jim Wilusz, Tri Town Health Dept.
Lance Hauer, GE
Andrew Thomas, GE
Jonathan Andrews and Seth Krause, GZA
James Bieke, Counsel for GE
Public Information Repository at David M. Hunt Library in Falls Village, CT
GE Internal Repository

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Visual Inspection

2024 Annual Visual Inspection Report
Columbia Mill Dam (MA00260)
South Lee, Massachusetts

Date of Inspection: September 3, 2024
Date of Report: November 1, 2024
File No. 01.019896.71

PREPARED FOR:
General Electric Company
Pittsfield, Massachusetts

GZA GeoEnvironmental, Inc.
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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 depends on numerous and constantly changing internal and external conditions and is evolutionary in nature. 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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APPENDICES

1.0 INTRODUCTION

The General Electric Company (GE) retained GZA GeoEnvironmental, Inc. (GZA) to perform an annual visual inspection of the Columbia Mill Dam (the Dam) on the Housatonic River in Lee, Berkshire County, Massachusetts, which is owned and operated by Lenox Development, LLC (Lenox). GZA performed the inspection on September 3, 2024 and has developed this report summarizing the results of the inspection. This report is subject to the limitations in **Appendix A**.

2.0 PURPOSE

Annual visual inspections of Columbia Mill Dam are required by GE's Monitoring and Maintenance Plan (M&M Plan) for Columbia Mill Dam, Revision 1, dated June 30, 2023, as conditionally approved by the United States Environmental Protection Agency (EPA) on August 3, 2023.

3.0 INSPECTION SUMMARY

3.1 GENERAL

On September 3, 2024, Jonathan Andrews, Seth Krause, Leslie Decristofaro, and Thomas Sinnott from GZA (representing GE), Joshua Fontaine from EPA, and Tom Czelusniak from HDR (representing EPA) mobilized to Columbia Mill and performed a visual inspection of the Dam. The inspection team was joined by Thom Clapper, the Dam Caretaker and Owner's representative, for inspection of the left side of the dam. The weather was sunny in the high 60s / low 70s, and the upstream pool level was estimated at about one inch above the spillway crest.

Overall, the conditions of the Dam were similar to those observed during GZA's November 2023 annual inspection (described in a report submitted to EPA on January 12, 2024) and the most recent quarterly inspection conducted by GZA on May 21, 2024. Note that temporary spillway repairs had been performed in July of 2024 as described in a memorandum in **Appendix E**.

A summary of inspection observations at each structure is provided below. A site sketch and photo location map are provided on **Figure 1** and **Figure 2**, respectively. Photographs from the inspection are provided in **Appendix B** and the annual dam inspection checklist is provided in **Appendix C**. In addition, an updated maintenance tracking table is provided in **Appendix D**.

3.2 CONCRETE DAM / PRIMARY SPILLWAY (SPILLWAY)

The spillway was overtopping during the inspection; therefore, the downstream face of the spillway, spillway toe, and other areas downstream of the spillway were partially obscured by flow and difficult to observe.

Logs were observed on the upstream face, crest, and downstream face of the spillway. Significant vegetation growth was observed upstream on the right side of the Dam.

As during prior inspections, minor cracking, spalling, and efflorescence were observed on both the left- and right-side downstream training walls. The right training wall appears to be constructed of concrete and stone masonry with shotcrete facing. As also observed previously, a crack was observed in the shotcrete facing near the top of the right training wall. The crack was up to about three inches wide and was located near a change in top of wall slope.

There was moderate cracking, spalling, and exposed reinforcement on the exterior wall of the mill building (on the left side of the Dam). These observations were similar to previous annual inspection and recent quarterly inspections.

Temporary repairs had been performed on July 29 and 30, 2024 to help mitigate the vortex-causing condition at the upstream left side of spillway observed during the August 2022 annual inspection. The July 2024 temporary repair program consisted of investigations, which included the injection of tracer dye in the location of the previously observed vortex, dewatering of the area in question to further identify the location and extent of the conditions potentially causing the vortex, and probing of observed voids. Following the investigations, temporary repairs to address the potential condition that caused the vortex were performed. Additional details regarding the temporary repairs are documented in the memorandum included in **Appendix E.** During the September 2024 annual inspection, the repairs appeared to be in good condition and no surficial indications of the vortex were observed.

3.3 SLUICEWAY OUTLET WORKS (SLUICEWAY STRUCTURE)

The sluiceway structure was observed to be in adequate condition. As during prior inspections, minor cracking and spalling of the upstream dividing wall between the sluiceway and spillway were observed, and minor cracking and spalling of the downstream concrete sluiceway structure were also observed.

The sluice (slide) gate was closed at the time of the inspection. Sluice gate operation was not conducted during this annual inspection. The sluice gate was recently operated during the July 2024 spillway temporary repairs. Prior to the temporary repairs, the gate was operated to its fully open position on July 22, 2024. The gate remained open until the temporary repair effort was completed on July 30, 2024. No issues with the gate operation were observed or reported at that time. GZA probed for sediment upstream of the sluice gate before the start of the temporary repairs and again during the 2024 annual inspection. On both occasions, the probing indicated approximately ½ inch of sediment thickness within about one to two feet upstream of the gate.

The internal flume (internal sluiceway) inside the mill building was observed during this annual inspection. Some apparent sediment buildup was observed, as was the case during previous inspections, but the sediment could not be measured due to safety concerns around the opening in the mill building floor that provides access to the flume below. There is a gate that controls flow into the flume upstream of this opening. Based on discussions with the Dam's caretaker, the internal flume gate has not been operated in 10 to 15 years. Since there is water in the flume, it is assumed that this gate leaks.

3.4 RIGHT EMBANKMENT

The right embankment was observed to be in adequate condition. The vegetation along the top of embankment (crest) had been recently cut by the Dam's caretaker. Significant vegetation was present along the upstream and downstream slopes, which partially obscured observation of the embankment. Some of the recently cut vegetation had been discarded at the downstream toe of the embankment, which partially obscured observation of the toe.

A slight bulge in the center of the stone masonry wall downstream of the embankment was observed, which is a similar condition noted during previous inspections. No distress, cracking, offsets, or signs of displacement or continuous movement were observed.

3.5 DOWNSTREAM AREA / MISCELLANEOUS

The downstream area of Columbia Mill was generally found to be in good condition. No signs of slides, sloughs, scarps, or seepage downstream of the Dam were observed. Access to the Dam from the downstream toe and the right side of the Dam was adequately maintained.

No warning signs were observed in the vicinity of the Dam.

In accordance with the M&M Plan, at least once every five years, the Columbia Mill impoundment is to be drawn down, if feasible, to expose the downstream face of the primary spillway and the boulder-lined downstream splash area at the toe of the Dam and allow observation of potential scour areas at the downstream spillway toe. During the July 2024 temporary repair program, GZA was able to observe the conditions downstream face of the primary spillway and boulder-lined downstream splash area at the toe of the Dam in a nearly dewatered state. No scour holes, vortices or spillway cracks were observed, with the exception of those identified in Section 3.2. Signs of riprap displacement were not observed, nor was evidence of movement of soils or rock from the dam interior. The reported downstream weepholes were not observed, nor was cloudy discharge from the base of the Dam. Photo Nos. 31 and 32 in **Appendix B** show the condition of the Dam during its nearly dewatered state in July 2024.

4.0 RECOMMENDATIONS

The following are GZA's recommendations for continued monitoring and maintenance of the Dam.

4.1 MAINTENANCE AND MONITORING RECOMMENDATIONS

GZA recommends the following recurrent maintenance and monitoring activities that do not require engineering design:[1]

1. Visually monitor the left upstream side of the spillway where the former vortex was observed during future quarterly and annual inspections and suspend monthly monitoring requirements of this condition [Checklist Item 5].

2. Visually monitor the performance of the 2024 temporary repairs during future inspections and probe the crest joint on the right side of the spillway during periods of low flow [Checklist Items 5 and 17].

3. Visually monitor logs and debris buildup at the sluice gate, spillway approach, and the crest and downstream face of the spillway and remove if impeding flow [Checklist Items 6, 13, 19, 37].

4. Visually monitor the diagonal crack in the downstream spillway face on a biennial basis (every two years) as low flow conditions permit [Checklist Item 7].

5. Continue clearing inappropriate vegetative growth and debris on the upstream and downstream slopes of the Dam, abutment contacts, and access roads, and maintain grass cover on the right embankment. [Checklist Items 22, 50, 51, 57, 62, 69].

[1] GZA's recommendations are cross-referenced to the corresponding items in the inspection checklist in **Appendix C**.

6. Visually monitor the cracks on the right downstream training wall and the left training wall of the spillway/right wall of the external sluiceway, including the horizontal crack on top of the right concrete training wall [Checklist Item 25, 41, 42].

7. Visually monitor leakage through base of the mill foundation wall between internal sluiceway and downstream channel [Checklist Item 31, 32].

8. Visually monitor the moderate cracking, spalling, and exposed reinforcement on the downstream mill foundation walls [Checklist Item 32].

9. Visually monitor the leakage through the internal sluiceway (flume) that discharges through the mill building downstream of the sluiceway into the Housatonic River [Checklist Item 40].

10. Remove previously cut vegetation from downstream of the right embankment to allow an unobstructed view of the right embankment toe [Checklist Item 51].

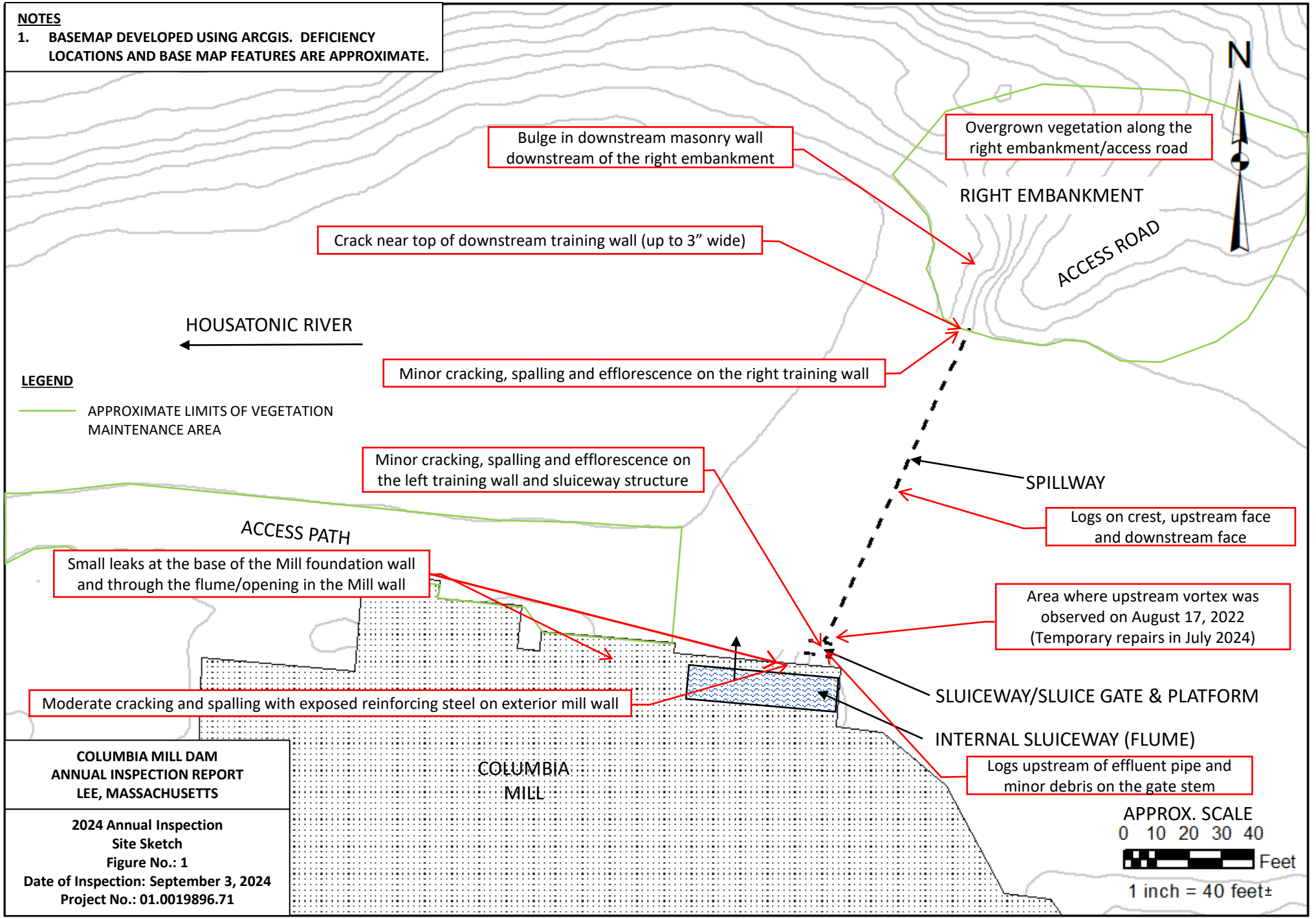
11. Visually monitor the bulged masonry wall on the downstream side of the right embankment [Checklist Item 53].

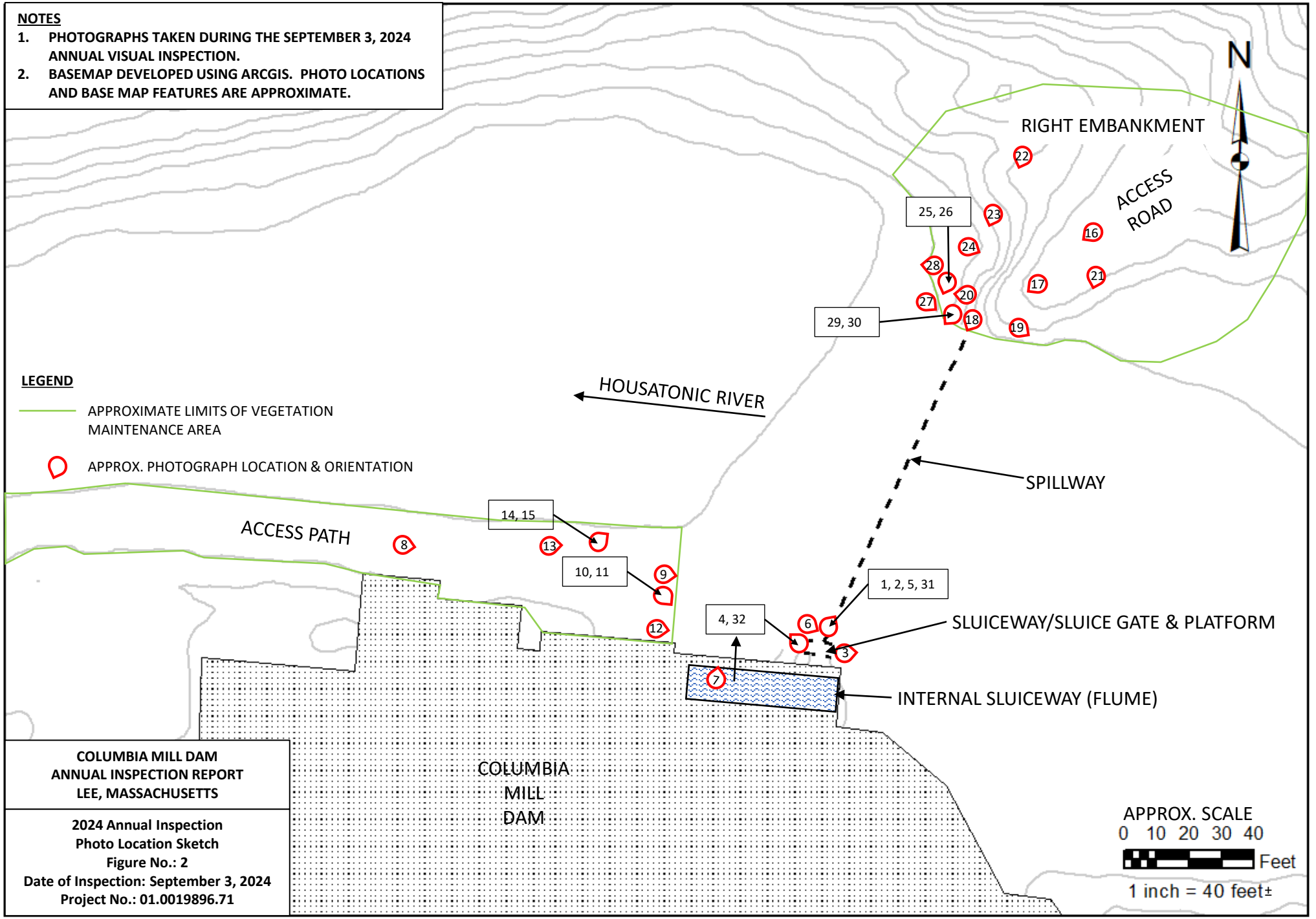
It is also noted that GE informed the Dam owner of the absence of warning signs near the Dam via email on January 5, 2024 [Checklist Item 70].

4.2 REPAIR RECOMMENDATIONS

GZA does not have any repair recommendations at this time.

Figures


NOTES
1. BASEMAP DEVELOPED USING ARCGIS. DEFICIENCY LOCATIONS AND BASE MAP FEATURES ARE APPROXIMATE.
N
Bulge in downstream masonry wall downstream of the right embankment
Overgrown vegetation along the right embankment/access road
RIGHT EMBANKMENT
ACCESS ROAD
Crack near top of downstream training wall (up to 3" wide)
HOUSATONIC RIVER
Minor cracking, spalling and efflorescence on the right training wall
LEGEND
APPROXIMATE LIMITS OF VEGETATION MAINTENANCE AREA
Minor cracking, spalling and efflorescence on the left training wall and sluiceway structure
SPILLWAY
Logs on crest, upstream face and downstream face
ACCESS PATH
Small leaks at the base of the Mill foundation wall and through the flume/opening in the Mill wall
Area where upstream vortex was observed on August 17, 2022 (Temporary repairs in July 2024)
Moderate cracking and spalling with exposed reinforcing steel on exterior mill wall
SLUICEWAY/SLUICE GATE & PLATFORM
INTERNAL SLUICEWAY (FLUME)
Logs upstream of effluent pipe and minor debris on the gate stem
COLUMBIA MILL
APPROX. SCALE
0 10 20 30 40
Feet
1 inch = 40 feet±
COLUMBIA MILL DAM
ANNUAL INSPECTION REPORT
LEE, MASSACHUSETTS
2024 Annual Inspection
Site Sketch
Figure No.: 1
Date of Inspection: September 3, 2024
Project No.: 01.0019896.71


NOTES
1. PHOTOGRAPHS TAKEN DURING THE SEPTEMBER 3, 2024 ANNUAL VISUAL INSPECTION.
2. BASEMAP DEVELOPED USING ARCGIS. PHOTO LOCATIONS AND BASE MAP FEATURES ARE APPROXIMATE.
N
RIGHT EMBANKMENT
ACCESS ROAD
LEGEND
APPROXIMATE LIMITS OF VEGETATION MAINTENANCE AREA
APPROX. PHOTOGRAPH LOCATION & ORIENTATION
HOUSATONIC RIVER
SPILLWAY
ACCESS PATH
SLUICEWAY/SLUICE GATE & PLATFORM
INTERNAL SLUICEWAY (FLUME)
COLUMBIA MILL DAM
25, 26
29, 30
14, 15
10, 11
4, 32
1, 2, 5, 31
22
23
16
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18
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COLUMBIA MILL DAM
ANNUAL INSPECTION REPORT
LEE, MASSACHUSETTS
2024 Annual Inspection
Photo Location Sketch
Figure No.: 2
Date of Inspection: September 3, 2024
Project No.: 01.0019896.71
APPROX. SCALE
0 10 20 30 40
Feet
1 inch = 40 feet±

Appendix A – Limitations

USE OF REPORT

1. GZA GeoEnvironmental, Inc. (GZA) prepared this report on behalf of, and for the exclusive use of General Electric (Client) for the stated purpose(s) and location(s) identified in the Report. Use of this report, in whole or in part, at other locations, or for other purposes, may lead to inappropriate conclusions; and we do not accept any responsibility for the consequences of such use(s). Further, reliance by any party not identified in the agreement, for any use, without our prior written permission, shall be at that party's sole risk, and without any liability to GZA.

STANDARD OF CARE

2. Our findings and conclusions are based on the work conducted as part of the Scope of Services set forth in the Report and/or proposal, and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the limited data gathered during the course of our work. Conditions other than described in this report may be found at the subject location(s).

3. Our services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made.

SUBSURFACE CONDITIONS

4. If presented, the generalized soil profile(s) and description, along with the conclusions and recommendations provided in our Report, are based in part on widely-spaced subsurface explorations by GZA and/or others, with a limited number of soil and/or rock samples and groundwater /piezometers data and are intended only to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized, and were based on our assessment of subsurface conditions. The composition of strata, and the transitions between strata, may be more variable and more complex than indicated. For more specific information on soil conditions at a specific location refer to the exploration logs. The nature and extent of variations between these explorations may not become evident until further exploration or construction. If variations or other latent conditions then appear evident, it will be necessary to reevaluate the conclusions and recommendations of this report.

5. Water level readings have been made in test holes (as described in the Report), monitoring wells and piezometers, at the specified times and under the stated conditions. These data have been reviewed and interpretations have been made in this Report. Fluctuations in the groundwater and piezometer levels, however, occur due to temporal or spatial variations in areal recharge rates, soil heterogeneities, reservoir and tailwater levels, the presence of subsurface utilities, and/or natural or artificially induced perturbations.

GENERAL

6. The observations described in this report were made under the conditions stated therein. The conclusions presented were based solely upon the services described therein, and not on scientific tasks or procedures beyond the scope of described services or the time and budgetary constraints imposed by the Client.

7. In preparing this report, GZA relied on certain information provided by the Client, state and local officials, and other parties referenced therein available to GZA at the time of the evaluation. GZA did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this evaluation.

8. Any GZA hydrologic analysis presented herein is for the rainfall volumes and distributions stated herein. For storm conditions other than those analyzed, the response of the site's spillway, impoundment, and drainage network has not been evaluated.

9. Observations were made of the site and of structures on the site as indicated within the report. Where access to portions of the structure or site, or to structures on the site was unavailable or limited, GZA renders no opinion as to the condition of that portion of the site or structure. In particular, it is noted that water levels in the impoundment and elsewhere and/or flow over the spillway may have limited GZA's ability to make observations of underwater portions of the structure. Excessive vegetation, when present, also inhibits observations.

10. In reviewing this Report, it should be realized that the reported condition of the dam is based on observations of field conditions during the course of this study along with data made available to GZA. 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 inspection and care can there be any chance that unsafe conditions be detected.

COMPLIANCE WITH CODES AND REGULATIONS

11. We used reasonable care in identifying and interpreting applicable codes and regulations. These codes and regulations are subject to various, and possibly contradictory, interpretations. Compliance with codes and regulations by other parties is beyond our control.

12. This scope of work does not include an assessment of the need for fences, gates, no-trespassing signs, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety to the public. An evaluation of the project for compliance with OSHA rules and regulations is also excluded.

COST ESTIMATES

13. Unless otherwise stated, our cost estimates are for comparative, or general planning purposes. These estimates may involve approximate quantity evaluations and may not be sufficiently accurate to develop construction bids, or to predict the actual cost of work addressed in this Report. Further, since we have no control over the labor and material costs required to plan and execute the anticipated work, our estimates were made using our experience and readily available information. Actual costs may vary over time and could be significantly more, or less, than stated in the Report.

ADDITIONAL SERVICES

14. It is recommended that GZA be retained to provide services during any future: site observations, explorations, evaluations, design, implementation activities, construction and/or implementation of remedial measures recommended in this Report. This will allow us the opportunity to: i) observe conditions and compliance with our design concepts and opinions; ii) allow for changes in the event that conditions are other than anticipated; iii) provide modifications to our design; and iv) assess the consequences of changes in technologies and/or regulations.

Appendix B – Photographs

Client Name: General Electric Company	**Site Location:** Columbia Mill Dam (MA00260) Lee, Massachusetts	**Project No.** 01.0019896.71

Photo No.	**Date:**
1	09/03/2024

Direction Photo Taken:
Right.

Description:
Overview of the spillway and right side of the dam from the sluiceway platform.

Note logs on the spillway and downstream toe, and single log adjacent to effluent pipe.

Photo No.	**Date:**
2	09/03/2024

Direction Photo Taken:
Right.

Description:
Closeup of the right-side training wall. Note minor concrete and shotcrete facing cracks and efflorescence.

Client Name: General Electric Company	**Site Location:** Columbia Mill Dam (MA00260) Lee, MA	**Project No.** 01.0019896.71

Photo No.	**Date:**
3	09/03/2024

Direction Photo Taken:
Upstream.

Description:
Impoundment from the sluiceway platform.

Photo No.	**Date:**
4	09/03/2024

Direction Photo Taken:
Downstream.

Description:
River downstream of the dam from the sluiceway platform.

Client Name: General Electric Company	**Site Location:** Columbia Mill Dam (MA00260) Lee, MA	**Project No.** 01.0019896.71

Photo No.	**Date:**
5	09/03/2024

Direction Photo Taken:
Downward.

Description:
Area where upstream vortex was observed on August 17, 2022.

Temporary repairs performed on July 29 and 30, 2024.

Photo No.	**Date:**
6	09/03/2024

Direction Photo Taken:
Upstream.

Description:
Sluiceway gate operator. Gate in the fully closed position during the current inspection.

Gate was last operated in July 2024 to its full open height. No issues noted during the July 2024 gate operation.

Client Name: General Electric Company	**Site Location:** Columbia Mill Dam (MA00260) Lee, MA	**Project No.** 01.0019896.71

Photo No.	**Date:**
7	09/03/2024

Direction Photo Taken:
Right.

Description:
Opening in mill floor slab / internal sluiceway roof. Photo taken inside the mill building.

The internal flume gate upstream of this opening was last operated 10- to 15-years ago (per caretaker).

Photo No.	**Date:**
8	09/03/2024

Direction Photo Taken:
Upstream.

Description:
Access path along left bank of the river to the downstream left toe of the dam.

Client Name: General Electric Company	**Site Location:** Columbia Mill Dam (MA00260) Lee, MA	**Project No.** 01.0019896.71

Photo No. 9	**Date:** 09/03/2024
Direction Photo Taken: Upstream.	
Description: Overview of the dam from the downstream left bank access path.	

Photo No. 10	**Date:** 09/03/2024
Direction Photo Taken: Upstream and to the left.	
Description: Left side of the dam including the sluiceway and mill building wall downstream of the dam.	

Client Name: General Electric Company	**Site Location:** Columbia Mill Dam (MA00260) Lee, MA	**Project No.** 01.0019896.71

Photo No.	**Date:**
11	09/03/2024

Direction Photo Taken:
Upstream and to the left.

Description:
Closeup of the sluiceway and mill building exterior wall downstream of the dam.

Note moderate spalling of the concrete and exposed reinforcing steel of the mill building wall.

Photo No.	**Date:**
12	09/03/2024

Direction Photo Taken:
Upstream.

Description:
Downstream side of the sluiceway.

Note: Previously observed diagonal crack on downstream face obscured by flow.

Client Name: General Electric Company	**Site Location:** Columbia Mill Dam (MA00260) Lee, MA	**Project No.** 01.0019896.71

Photo No.	**Date:**
13	09/03/2024

Direction Photo Taken:
Upstream.

Description:
Downstream face of the spillway. About 1-inch of water was flowing over the spillway crest at the time of the inspection.

Note logs on spillway downstream face at the center and on the left side.

Photo No.	**Date:**
14	09/03/2024

Direction Photo Taken:
Upstream and to the right.

Description:
Downstream of the right embankment and right side of the dam.

Client Name: General Electric Company	**Site Location:** Columbia Mill Dam (MA00260) Lee, MA	**Project No.** 01.0019896.71

Photo No. 15	**Date:** 09/03/2024
Direction Photo Taken: Upstream and to the right.	
Description: Closeup of the area downstream of the right embankment. Note right embankment downstream stone masonry wall (see red arrow) is obscured by vegetation growth.	

Photo No. 16	**Date:** 09/03/2024
Direction Photo Taken: Left.	
Description: Access to the right side of the dam.	

Client Name: General Electric Company	**Site Location:** Columbia Mill Dam (MA00260) Lee, MA	**Project No.** 01.0019896.71

Photo No. 17	**Date:** 09/03/2024
Direction Photo Taken: Left.	
Description: Top of the right embankment.	

Photo No. 18	**Date:** 09/03/2024
Direction Photo Taken: Left.	
Description: Overview of the spillway and left side of the dam from the right embankment. Note logs on the spillway.	

Client Name: General Electric Company	**Site Location:** Columbia Mill Dam (MA00260) Lee, MA	**Project No.** 01.0019896.71

Photo No.	**Date:**
19	09/03/2024

Direction Photo Taken:
Upstream.

Description:
Impoundment from the right embankment.

Photo No.	**Date:**
20	09/03/2024

Direction Photo Taken:
Downstream.

Description:
River downstream of the dam from the right embankment.

Client Name: General Electric Company	**Site Location:** Columbia Mill Dam (MA00260) Lee, MA	**Project No.** 01.0019896.71

Photo No.	**Date:**
21	09/03/2024

Direction Photo Taken:
Upstream and left.

Description:
Upstream face / slope of the right embankment obscured by significant vegetation growth.

Photo No.	**Date:**
22	09/03/2024

Direction Photo Taken:
Left.

Description:
Downstream slope of the right embankment.

Note overgrown vegetation along downstream slope.

Client Name: General Electric Company	**Site Location:** Columbia Mill Dam (MA00260) Lee, MA	**Project No.** 01.0019896.71

Photo No.	**Date:**
23	09/03/2024

Direction Photo Taken:
Left.

Description:
Stone masonry and concrete features on downstream side of the right embankment.

Note slight "bulge" in center of stone masonry wall. No apparent signs of tilting, offset, displacement, or missing stone masonry pieces noted.

Note vegetation growth along downstream slope.

Photo No.	**Date:**
24	09/03/2024

Direction Photo Taken:
Upstream.

Description:
Closeup of stone masonry wall on the downstream slope of the right embankment.

Portion of wall to left (photo right near training wall) is mortared.

Client Name: General Electric Company	**Site Location:** Columbia Mill Dam (MA00260) Lee, MA	**Project No.** 01.0019896.71

Photo No.	**Date:**
25	09/03/2024

Direction Photo Taken:
Left.

Description:
Right-side downstream right training wall.

The wall appears to have been constructed of stone masonry and then faced with shotcrete.

Photo No.	**Date:**
26	09/03/2024

Direction Photo Taken:
Left.

Description:
Closeup of the crack in the right-side training wall shotcrete coating.

See Photo 25 for location.

Client Name: General Electric Company	**Site Location:** Columbia Mill Dam (MA00260) Lee, MA	**Project No.** 01.0019896.71

Photo No.	**Date:**
27	09/03/2024

Direction Photo Taken:
Upstream.

Description:
Downstream face of the right-side training wall and spillway. Note minor cracking, spalling, and efflorescence of the training wall.

Photo No.	**Date:**
28	09/03/2024

Direction Photo Taken:
Left and downstream.

Description:
Downstream left side access path from right embankment.

Client Name: General Electric Company	**Site Location:** Columbia Mill Dam (MA00260) Lee, MA	**Project No.** 01.0019896.71

Photo No.	**Date:**
29	09/03/2024

Direction Photo Taken:
Left.

Description:
Overview of the downstream face of the spillway and mill building.

Cracking, spalling, and exposed reinforcement of the mill building observed.

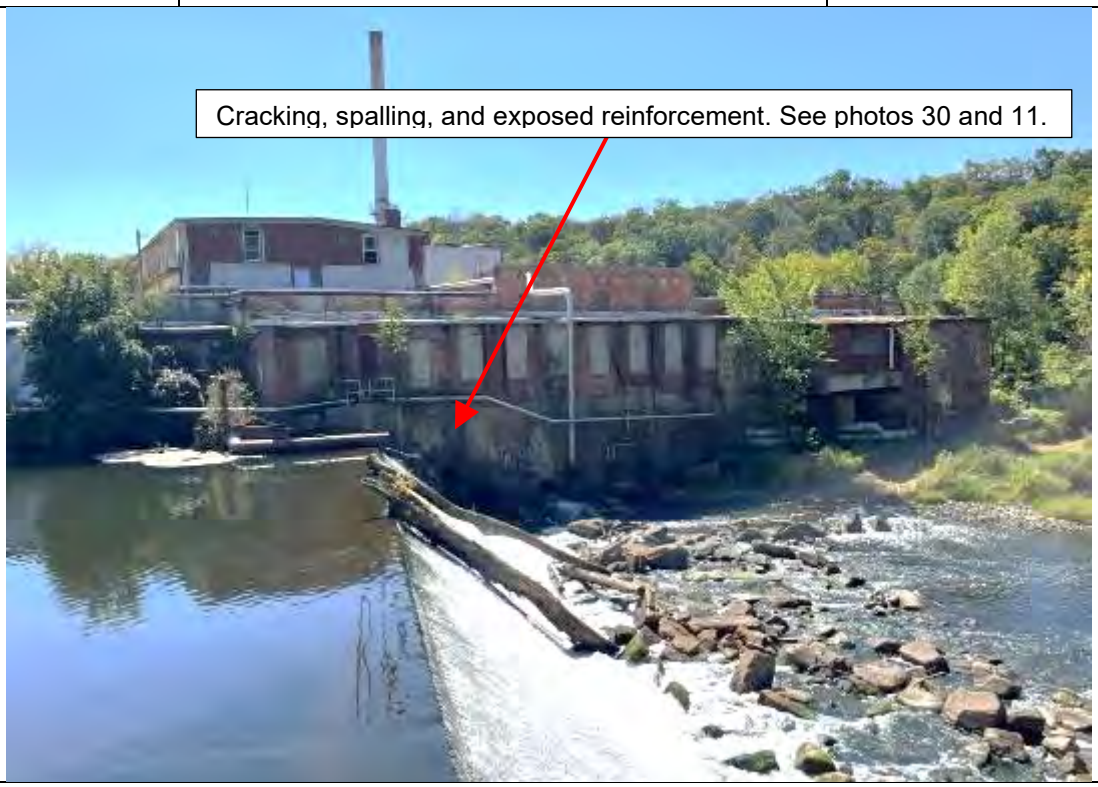

Photo No.	**Date:**
30	09/03/2024

Direction Photo Taken:
Left.

Description:
Closeup of the mill building.

Note moderate cracking, spalling, and exposed reinforcement of the mill building wall concrete.

Client Name: General Electric Company	**Site Location:** Columbia Mill Dam (MA00260) Lee, MA	**Project No.** 01.0019896.71

Photo No. 31	**Date:** 07/30/2024
Direction Photo Taken: Right	
Description: Spillway in the nearly dewatered state during the temporary repair program.	

Photo No. 32	**Date:** 07/29/2024
Direction Photo Taken: Downstream	
Description: Downstream of the spillway in the nearly dewatered state during the temporary repair program. Note good coverage of riprap along the toe of the spillway.	

Appendix C – Inspection Checklist

ANNUAL DAM INSPECTION CHECKLIST

Name of Dam:	Columbia Mill Dam	I.D. No.:	MA00260
Location:	Lee, Massachusetts Town, State		
Owner:	Lenox Development, LLC	River / Stream:	Housatonic River
MassDCR Classification Data:	Intermediate Size		Significant Hazard

PHYSICAL DATA:	timber crib, boulder-filled, concrete-faced Type of Dam	25 feet to Primary Spillway Crest Height of Dam	90 acre-feet Normal Pool Storage Capacity
ELEVATIONS:	908 ft (NGVD29) Normal Pool	1-in± over crest; Approx. el. 908.1 ft Pool at Inspection	

Names of Individuals at Inspection	Title/Position	Organization
Jonathan D. Andrews, P.E.	Associate Principal	GZA GeoEnvironmental, Inc.
Seth D. Krause, P.E.	Project Manager	GZA GeoEnvironmental, Inc.
Leslie Decristofaro, E.I.T.	Engineer I	GZA GeoEnvironmental, Inc.
Thomas Sinnott, E.I.T.	Assistant Project Manager	GZA GeoEnvironmental, Inc.
Thomas Czelusniak	Remediation Systems Manager	HDR
Joshua Fontaine	Remedial Project Manager	Environmental Protection Agency
Thom Clapper	Caretaker	Lenox Development, LLC

DATE OF INSPECTION:	September 3, 2024		
WEATHER:	Sunny	TEMPERATURE:	60s / 70s - deg F

This is to certify that the above dam has been inspected and the following are the results of this inspection.

SIGNATURE OF INSPECTOR

Name of Dam:	Columbia Mill Dam	I.D. No.:	MA00260	Inspection Date:	September 3, 2024

CONCRETE DAM / PRIMARY SPILLWAY

1 of 2

AREA INSPECTED	ITEM NO.	CONDITION	OBSERVATIONS	CHECK ( ) ACTION NEEDED: MONITOR	MAINTAIN	REPAIR
UPSTREAM FACE	1	Surface Conditions	Generally obscured by flow and impoundment.			
	2	Condition of Joints	Generally obscured by flow and impoundment.			
	3	Unusual Movement	Generally obscured by flow and impoundment.			
	4	Abutment-Dam Contacts	Generally obscured by flow and impoundment.			
	5	Vortices (if any)	None observed during this inspection.	X		
	6	Debris	Log on upstream face & crest adjacent to the effluent pipe.	X		
DOWNSTREAM FACE	7	Surface Conditions	Generally obscured by flow. Previously observed diagonal crack not observed.	X		
	8	Condition of Joints	Generally obscured by flow.			
	9	Unusual Movement	Generally obscured by flow.			
	10	Abutment-Dam Contacts	Generally obscured by flow.			
	11	Drains	None observed.			
	12	Leakage	Generally obscured by flow.			
	13	Debris	Logs on the downstream face and crest at center and right sides of the spillway.	X		
CREST	14	Surface Conditions	Generally obscured by flow.			
	15	Horizontal Alignment	Appears to be in adequate alignment.			
	16	Vertical Alignment	Appears to be in adequate alignment.			
	17	Condition of Joints	2024 temporary repairs appeared intact as viewed through pool/flow from sluice gate platform.	X		
	18	Unusual Movement	Generally obscured by flow.			
	19	General	Log adjacent to effluent pipe.	X		

ADDITIONAL COMMENTS: REFER TO ITEM NO. IF APPLICABLE

Items 5, 7, and 17: During the August, 2022 annual inspection, a small vortex was observed on the left side of the spillway, upstream of the crest. A diagonal crack in the downstream face of the left side of the spillway was also observed. The area where the vortex was observed was temporarily repaired in July 2024. Monthly observations are no longer recommended. A separation of the concrete joint at the weir crest was observed during past inspections. This condition was also temporarily repaired in July of 2024 and the downstream diagonal crack was probed with no penetration, separation or leakage observed.

Items 6, 13, 19: Logs are not currently impeding flow, however logs should be removed from the dam crest and downstream toe if found to be impeding flow.

Name of Dam:	Columbia Mill Dam	I.D. No.:	MA00260	Inspection Date:	September 3, 2024

CONCRETE DAM / PRIMARY SPILLWAY

2 of 2

AREA INSPECTED	ITEM NO.	CONDITION	OBSERVATIONS	CHECK ( ) ACTION NEEDED: MONITOR	MAINTAIN	REPAIR
UPSTREAM CHANNEL	20	Slide, Slough, Scarp	None observed.			
	21	Erosion	None observed.			
	22	Vegetation Condition	Significant vegetation growth observed upstream of the right side of the dam.		X	
	23	Debris	No above-water upstream debris observed			
	24	Seepage	None observed.			
DOWNSTREAM CHANNEL	25	Training Walls	Minor cracking, spalling, and efflorescence observed on both the left and right side.	X		
	26	Riprap Condition (e.g. displ.)	Appeared to be in-place.			
	27	Unusual Movement	None observed.			
	28	Discharge Area	Downstream boulder field appeared adequate - partially obscured by spillway flow.			
	29	Downstream Area	Housatonic River - no unusual observations.			
	30	Sinkholes, Scour Holes, etc.	None observed.			
	31	Foundation Seepage	Small leaks at base of Mill foundation wall. Source is likely internal flume.	X		
	32	Exterior Mill Wall and Internal Sluiceway Discharge Condition	Moderate cracking, spalling, and exposed reinforcement observed on mill wall. Minor flow inside the internal sluiceway (flume), discharging through an opening in the mill building wall. Opening may be former gate location.	X		

ADDITIONAL COMMENTS: REFER TO ITEM NO. IF APPLICABLE

Item 22: Significant vegetation was observed along the upstream right embankment. The vegetation along the embankment crest was recently removed by the Dam Caretaker. Vegetation should continue to be maintained to allow for unimpeded observation of the dam.

Item 25: Minor cracking, spalling, and efflorescence observed on both the left and right spillway training walls. The left training wall is considered to be the concrete wall that separates the spillway from the sluiceway. The right training wall appears to be constructed of concrete and stone masonry with shotcrete facing. A crack, up to about 3 inches wide, was observed near the top of the right training wall shotcrete near a change in top of wall slope. These conditions should continue to be monitored.

Item 31: Minor leakage at the base of the Mill foundation wall was observed. The source of the leakage is likely from the internal flume. No notable change in rate of flow or color was observed. This condition should continue to be monitored.

Item 32: Moderate cracking, spalling, and exposed reinforcement of the exterior wall of the mill building observed. Condition is similar to what has been previously observed. Minor seeps upstream of the opening in the mill building were observed during past inspections but not during this inspection (obscured by flow). These conditions should continue to be monitored.

Name of Dam:	Columbia Mill Dam	I.D. No.:	MA00260	Inspection Date:	September 3, 2024

SLUICEWAY OUTLET WORKS

1 of 1

AREA INSPECTED	ITEM NO.	CONDITION	OBSERVATIONS	CHECK ( ) ACTION NEEDED: MONITOR	MAINTAIN	REPAIR
SLUICE GATE & CONTROLS	33	Intake Area	Probing from gate platform indicated approximately ½-inch upstream sediment buildup.			
	34	Stoplog Grooves	No stoplog grooves observed. Sluice gate slots appeared to be in adequate condition.			
	35	Gate U/S Face	Appeared adequate condition (submerged observation).			
	36	Gate D/S Face	Appeared adequate condition.			
	37	Gate Stem	Minor grassy/weedy debris buildup on the gate stem.	X		
	38	Gate Operator	Appeared adequate. Gate not operated the gate during this inspection.			
	39	Gate Leakage	Some leakage at base of gate.			
	40	Other	Internal flume observed from opening in mill floor.	X		
SLUICEWAY OUTLET STRUCTURE	41	U/S Concrete Condition	Minor cracking and spalling of the dividing wall between sluiceway and spillway.	X		
	42	D/S Concrete Condition	Minor cracking and spalling of the concrete sluiceway structure.	X		
	43	Seepage	None observed.			
	44	Discharge Area	Clear - gate leakage discharged downstream.			
	45	Debris	None observed.			

ADDITIONAL COMMENTS: REFER TO ITEM NO. IF APPLICABLE

Item 37: Debris is not currently impeding flow, however debris should be removed from the gate stem if impeding flow.

Item 38: The gate was fully closed and not operated during this inspection. The gate was last operated during the temporary repairs in July 2024. At that time the gate was operated to its full open height. No observed issues with the gate operation. The gate should continue to be exercised annually.

Item 39 and 44: Water was below the top of the gate at the time of the inspection. The gate was in the fully closed position at the time of the inspection. The water flowing through the gate discharged downstream unimpeded.

Item 40: There is an internal sluiceway (flume) that extends through the mill building and discharges into the Housatonic. Discharge appeared clear. There is a submerged upstream trash rack and upstream gate control of flume inflow. Debris was observed upstream of the gate. Per the Caretaker, the gate has not been operated in 10 to 15 years. Since there is water in the flume, it is assumed the gate leaks. This condition should continue to be monitored.

Item 41 and 42: Minor cracking and spalling of the concrete sluiceway structure was observed. This condition should continue to be monitored.

Name of Dam:	Columbia Mill Dam	I.D. No.:	MA00260	Inspection Date:	September 3, 2024

RIGHT EMBANKMENT

1 of 1

AREA INSPECTED	ITEM NO.	CONDITION	OBSERVATIONS	CHECK ( ) ACTION NEEDED: MONITOR	MAINTAIN	REPAIR
UPSTREAM SLOPE	46	Surface Conditions	Appeared adequate condition.			
	47	Surface Protection	Riprap observed in some locations.			
	48	Unusual Movement	None observed.			
	49	Abutment-Dam Contacts	Continuation of right-side training wall into the upstream side of the right embankment.			
	50	Vegetation	Vegetation overgrowth obscured observations of upstream stone masonry wall.		X	
DOWNSTREAM SLOPE	51	Surface Conditions	Appeared adequate condition. Vegetation obscured slope and toe. Cut vegetation obscured toe.		X	
	52	Masonry Wall Condition	Unpointed stone masonry wall; pointing present near left side interface with left training wall.			
	53	Unusual Movement	Slight bulge (horizontal misalignment) in the center of the stone masonry wall.	X		
	54	Abutment-Dam Contacts	Appeared adequate condition.			
	55	Drains	None observed.			
	56	Leakage	None observed.			
	57	Vegetation	Vegetation overgrowth partially obscured observations of the downstream slope.		X	
CREST	58	Surface Conditions	Appeared adequate condition.			
	59	Horizontal Alignment	Appeared adequate.			
	60	Vertical Alignment	Appeared adequate.			
	61	Unusual Movement	None observed.			
	62	Vegetation	Vegetation recently cut / removed. Minimal grass cover observed.		X	

ADDITIONAL COMMENTS: REFER TO ITEM NO. IF APPLICABLE

Item 49: Right-side training wall partially concrete-faced and partially stone masonry-faced. Stone masonry is pointed.

Items 50, 57, 62: Vegetation along the embankment crest recently cut / removed by the caretaker. Significant vegetation growth was observed along the upstream and downstream slopes. Minor debris from vegetation removal still present at downstream toe impeding observation. Vegetation should be maintained to allow for continued observation of the right embankment.

Item 51: Cut vegetation was discarded at the toe of the embankment. The vegetation should be removed beyond the limits of the dam to allow for unobscured observation.

Item 52: Downstream of the stone masonry wall is a smaller concrete wall connected to the downstream end of the left training wall. Cracking & spalling near intersection of training wall and smaller wall.

Item 53: In stone masonry wall, no tilting, offset, displacement, vertical misalignment, or missing stone masonry pieces observed (other than bulge noted above).

Name of Dam:	Columbia Mill Dam	I.D. No.:	MA00260	Inspection Date:	September 3, 2024

DOWNSTREAM AREA AND MISC.

1 of 1

AREA INSPECTED	ITEM NO.	CONDITION	OBSERVATIONS	CHECK ( ) ACTION NEEDED: MONITOR	MAINTAIN	REPAIR
DOWNSTREAM AREA	63	Abutment Seepage	None observed.			
	64	Training Walls	See "CONCRETE DAM / PRIMARY SPILLWAY" Item 25.			
	65	Slide, Slough, Scarp	None observed.			
	66	Drainage System	None observed. Spillway, sluiceway and internal flume discharge into the Housatonic River.			
	67	Downstream Hazard Description	Wooded on right bank; mill building complex on the left bank; residential, commercial, and Rt. 20 / W. Center Street within 1-mile of downstream.			
MISCELLANEOUS	68	Impoundment Banks	Steep and vegetated.			
	69	Access Roads	Approx. 1,500-foot long grass-covered access road from Golden Hill Road to right embankment; grass covered access road to the left downstream toe area via cleared path between mill and river; paved access road to the mill building on the left side of the dam.		X	
	70	Signage	None observed. GE advised owner on January 5, 2024 via email.			
	71	Fences / Railing	Gate operator platform and railings appeared to be in adequate condition.			
	72	Security / Access	Security chain / wire rope at the left and right-side access roads.			

ADDITIONAL COMMENTS: REFER TO ITEM NO. IF APPLICABLE

Item 69: Vegetation was recently cut / removed by the caretaker on the right-side and downstream toe access roads. Vegetation should continue to be maintained to allow access to the dam.

Item 72: Mill access road leading to left side of dam controlled by a locked security chain. Access road to right embankment controlled by a locked wire rope on Golden Hill Road. Access to left spillway abutment, sluiceway gate platform, and internal flume is through locked mill building.

Appendix D – Maintenance Tracking Table

Columbia Mill Dam – Maintenance Tracking Sheet – dated November 1, 2024 (based on the September 3, 2024 Annual Inspection)			
Condition Observed Requiring Monitoring or Maintenance/Repair	**When Observed**	**Proposed Response**	**Status**
1. Vortex near left side gate platform	August 2022 visual inspection Not observed thereafter, including during the first and second quarterly inspections in 2024 and the September 2024 annual inspection	Repair concrete in area of vortex.	Temporary repairs had been conducted in July 2024. Repairs were observed to be intact during the September 2024 annual inspection. Monthly observations will be discontinued and the area will continue to be visually monitored during future quarterly and annual inspections.
2. Separation of the concrete joint at the weir crest	August 2022 visual inspection. Not observed thereafter.	Repair the joint. Thereafter probe the crest joint along the right side of the spillway during periods of low flow.	Temporary repairs had been conducted in July 2024. The crest joint along the right side of the spillway will be probed during a period of low flow.
3. Temporary spillway repairs	September 2024 annual inspection	Visually monitor the status of these repairs.	The temporary repairs conducted in July 2024 were observed to be intact during the September 2024 annual inspection. The temporary repairs will continue to be monitored during future quarterly and annual inspections.
4. Logs and debris on the left side and center of the spillway	Since the August 2022 visual inspection	Monitor and remove the debris if impeding flow.	The logs and debris was not observed to be impeding flow during the September 2024 annual inspection. The condition will continue to be monitored during future quarterly and annual inspections, and the logs and

Columbia Mill Dam – Maintenance Tracking Sheet – dated November 1, 2024 (based on the September 3, 2024 Annual Inspection)			
Condition Observed Requiring Monitoring or Maintenance/Repair	**When Observed**	**Proposed Response**	**Status**
			debris will be removed if determined to be impeding flow.
5. Crack in the downstream face of the spillway on the left side	August 2022 visual inspection[1] July 2024 temporary repairs	Visually monitor during low flow conditions.	During the 2024 temporary repairs, the downstream crack was measured to establish a baseline for future monitoring, as needed. The crack will be visually monitored during low flow conditions.
6. Vegetation on the right embankment and the right side of the Dam	Since the August 2022 visual inspection	Continue to clear inappropriate vegetation and maintain grass cover.	Some vegetation management had been performed at the Dam, notably along the crest of the right embankment, prior to the September 2024 annual inspection. Vegetation remained on the upstream and downstream slopes of the right embankment and access roads. Vegetation management will continue to allow unimpeded observation of the Dam.
7. Cracks in the left and right downstream training walls	Since the August 2022 visual inspection	Visually monitor.	The cracks, including the horizontal crack on the top of the right downstream training wall, will continue to be monitored during future quarterly and annual inspections.

[1] Condition also noted in the 2008 Columbia Mill Dam Phase II Inspection/Evaluation Report.

Columbia Mill Dam – Maintenance Tracking Sheet – dated November 1, 2024 (based on the September 3, 2024 Annual Inspection)			
Condition Observed Requiring Monitoring or Maintenance/Repair	**When Observed**	**Proposed Response**	**Status**
8. Minor leakage through the base of the mill foundation wall	Since the August 2022 visual inspection	Visually monitor.	The minor leakage through the mill foundation wall will continue to be monitored during future quarterly and annual inspections.
9. Moderate cracking, spalling, and exposed reinforcement on the mill foundation walls	Since the August 2022 visual inspection	Visually monitor.	The mill wall will continue to be monitored during future quarterly and annual inspections.
10. Minor leakage through the internal sluiceway (flume)	Since the November 2023 annual inspection	Visually monitor.	The minor leakage through the internal sluiceway flume will continue to be monitored during future quarterly and annual inspections.
11. Previously cut vegetation partially obstructing observation of the toe of the right embankment	Since the November 2023 annual inspection	Remove the previously cut vegetation from the toe of the right embankment.	The previously cut vegetation will be removed prior to future visual inspections.
12. Bulge in the stone masonry wall downstream of the right embankment	Since the November 2023 annual inspection	Visually monitor.	The stone masonry wall will continue to be monitored during future quarterly and annual inspections.
Note: Gray-shaded cells indicate that a listed condition had been addressed or was not present during the current inspection.			

Appendix E – Columbia Mill Dam – Temporary Spillway Repair Memo (2024 09 13)

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M E M O R A N D U M

To: Kevin Mooney, Senior Project Manager, General Electric

From: Seth Krause, Jonathan Andrews, Anders Bjarngard, GZA GeoEnvironmental, Inc. (GZA)

Date: September 13, 2024

File No.: 01.019896.70

Re: Columbia Mill Dam – Temporary Spillway Repairs

Dear Mr. Mooney:

Per General Condition No. 6 provided in the Environmental Protection Agency's (EPA) Conditional Approval Letter (CAL) of the May 4th 2023 Monitoring and Maintenance Plan for Columbia Mill Dam, monthly monitoring of the observed vortex on the upstream left side of the Columbia Mill Dam spillway is to be performed until the condition causing the vortex is identified and corrected. Investigations and temporary repairs to address the condition causing the vortex were performed on July 29 and 30, 2024. The investigations included the injection of tracer dye in the location of the previously observed vortex, dewatering of the area in question to help further identify the location and extent of the conditions potentially causing the vortex, and probing of observed voids, cracks, and joints. Following the investigations, temporary repairs to address the potential condition that caused the vortex were performed. Other conditions that were observed were investigated and addressed, as needed.

Investigations performed prior to the temporary repairs indicated that:

1. A crack/void existed at the interface between the upstream left side of the spillway and the right sluice gate training wall. It appears that this crack/void was the cause of the vortex.
2. There was a horizontal open joint at the transition from the crest to the downstream slope of the spillway. The joint extended from the left spillway abutment/right sluice gate training wall about 30-feet towards the center of the spillway.
3. The diagonal crack on the downstream face of the left side of the spillway was relatively tight and there were no signs of leakage or seepage through this crack.

The temporary repairs generally consisted of:

1. Placement of waterstop and hydraulic cement along the crack/void at the interface between the upstream left side of the spillway and the right sluice gate training wall.
2. Placement of waterstop, grout, and hydraulic cement in the open joint along the crest of the spillway.
3. As indicated above, the diagonal crack on the downstream spillway face was relatively tight. Thus, no repair work was performed to this crack. The crack was probed, measured, and documented to serve as a baseline for future inspections.

In summary, the temporary repairs appear to have adequately addressed the potential condition that was causing the vortex on the upstream left side of the Columbia Mill Dam spillway.

The performance of the temporary repairs was assessed during the September 3, 2024 annual inspection of Columbia Mill Dam by both GZA and EPA. The repairs were observed to be in good condition and no indications of a vortex were observed. As such, it is recommended to stop performing the monthly monitoring of the observed vortex and

resume the regularly scheduled quarterly and annual inspections described in the M&M Plan for Columbia Mill. The performance of the temporary repairs will continue to be evaluated during subsequent quarterly and annual inspections, the next of which is the fourth quarter inspection planned for mid-November 2024. The temporary repairs will be a focal point of the subsequent quarterly and annual inspections.

A day-by-day summary of the temporary investigation and temporary repair activities is provided below. Photographs from the July 29 and 30, 2024 repair efforts are included as **Attachment 1**. Cut sheets for materials used during the temporary repairs are included as **Attachment 2**. Refer to **Attachment 3** for as-built markups of the Temporary Spillway Crack/Void Repair Plan set (Sheets 1 through 7, dated July, 2024 and forwarded to EPA, DCR-ODS, and HDR on July 12, 2024).

Monday, July 22, 2024

On Monday, July 22, 2024, Leslie DeCristofaro from GZA (representing GE), Thom Clapper the caretaker / Owner's representative, Steve Garrity from LB Corporation (GE's Contractor), and Tom Czelusniak from HDR (representing EPA), mobilized to Columbia Mill Dam. The weather was cloudy in the low 80s degrees Fahrenheit, and the upstream pool level was estimated at about 6 inches above the spillway crest.

The team probed upstream of the sluice gate and found sediment buildup within about 1- to 2-feet of the gate with estimated thickness of up to about ½-inch thickness. No sediment was felt during probing further upstream of the gate. The slide gate was subsequently operated to its fully open position by the caretaker Thom Clapper. The reservoir was observed by the team after the gate was opened. The initial reservoir drop was estimated at most about 1-inch/hour.

Rain events later in the week slowed the drawdown of the reservoir, postponing the start date of the repairs. Thom Clapper visited the site at least once per day and communicated his observations to GZA and LB Corporation. River flows stabilized near the end of the week, Friday, July 26, 2024, and it was decided to proceed with the temporary repairs starting on Monday, July 29, 2024.

Monday, July 29, 2024

On Monday, July 29, 2024, Seth Krause, P.E., Leslie DeCristofaro, and Tom Sinnott (GZA), Thom Clapper (caretaker / Owner's representative); Steve Garrity, Tom Garrity and a crew of five laborers (LB Corporation), and Tom Czelusniak (HDR), mobilized to Columbia Mill Dam. The weather was cloudy with light rain and in the low 80s degrees Fahrenheit. The upstream pool level was about level with the spillway crest. The following sequence of work was completed:

1. GZA injected tracer dye directly into the crack/void space along the left upstream side of the spillway in the approximate area where the upstream vortex was observed in August 2022. The tracer dye was immediately sucked into the crack/void space at the spillway/left training wall interface. Areas downstream of the spillway and sluice gate structure were observed for signs of tracer dye, however, no dye was observed downstream, and no exit point was identified. It was also observed that there was no seepage/leakage exiting through the diagonal crack in the downstream face of the left side of the spillway.
2. LB Corp constructed a temporary sandbag cofferdam on the sloped upstream apron between the left upstream training wall and the former 20-inch diameter effluent pipe that sits on the spillway (about 6-feet to the right of the left training wall). The cofferdam extended approximately 5-feet upstream of the spillway crest (along the upstream slope of the apron), encompassing the targeted repair area at the spillway/left training wall interface. Additional sandbags were placed along the spillway crest, extending approximately 12-feet to the right of the effluent pipe.
3. The work area between the sandbag cofferdam and the spillway crest was dewatered using two submersible pumps; a BEM Electrical R750 14-amp pump and a Wacker Neuson PS3 1500 23-amp pump. Flexible hoses were attached to the pumps and the pumped water was discharged at the downstream spillway toe. No turbidity in the pumped discharge was observed.

4. After the work area was dewatered, the work area was observed for conditions of note, as described below.
    a. The extents of the crack/void along the left training wall (where the tracer dye was inserted) was probed to help determine extents using a ⅛-inch diameter metal rod and a 6-foot-long folding wooden ruler. The crack/void was measured to be approximately 4-feet-long (upstream/downstream), up to 2-inches-tall (measured from spillway apron upwards) and probed up to 7.5-inches-deep (measured from the apron/training wall; depth varied along the length of the crack/void). The depth measurements were used as probes to gauge the hardness of the substrate material at the base of the crack void. The substrate material felt hard under the probes/depth measurements.
    b. The concrete crest and upstream sloped spillway apron within the dewatered area were sounded to help identify voids beneath the apron concrete. The soundings were performed using a rock hammer and a 3-pound sledgehammer. The concrete felt "sound" when struck and no apparent void spaces were detected.
    c. A horizontal open joint extending left to right on the downstream side of the spillway crest was observed at the transition from the crest to the downstream slope. The joint was probed using a ⅛-inch diameter metal rod and a $\frac{1}{16}$-inch-thick metal ruler. The joint was measured to be approximately 2-inches wide (upstream-to-downstream) and up to 8-inches-deep (depth varied along the length of the joint). The bottom of the open joint felt hard (e.g. concrete). The left-to-right open joint length was determined to be approximately 30-feet (see Tuesday, July 30, 2024 observations below).
    d. A diagonal crack in the downstream face of the spillway near the left side of the dam was observed. The extents of this crack were determined on Tuesday, July 30, 2024 (see section below).
5. The temporary repair work on Monday, July 29, 2024 focused on repairing the crack/void along the left training wall by ramming waterstop into the crack/void and then sealing the surface with hydraulic cement. Hydraulic cement and waterstop materials were chosen for the temporary crack repairs due to the relatively small size of the crack and presence of water in the repair area.
    a. A wire brush was used to remove dirt and debris from the repair area.
    b. CETCO Waterstop-RX101 was rammed into the crack/void along its full length.
    c. Approximately 1- to 4-inches of DRYLOK Fast Plug hydraulic cement was then placed into the crack/void along its length to cover the waterstop and form a seal.
    d. A surficial "curb" of hydraulic cement was placed along the length of the repaired crack/void to cover the temporary repair and help mitigate water entrance into the crack/void. The "curb" dimensions were approximately 4- to 6-inches along the training wall and approximately 4- to 6-inches along the spillway apron, with tapered upstream and downstream ends. See Attachment 3.

The pumps were turned off, the sandbag cofferdam was left in place, and the gate was left in the open position at the end of the workday.

Tuesday, July 30, 2024

On Tuesday, July 30, 2024, Leslie DeCristofaro and Tom Sinnott (GZA), Thom Clapper, (caretaker / Owner's representative), Tom Garrity with a crew of four laborers (LB Corporation), and Tom Czelusniak (HDR), mobilized to Columbia Mill Dam. The weather was cloudy and in the mid 70s to low 80s degrees Fahrenheit. The upstream pool level was about level with the spillway crest. The following sequence of work was completed:

1. The area between the sandbag cofferdam and the spillway crest was dewatered using the same two (2) submersible pumps.
2. After the work area was dewatered, extents of the horizontal joint across the spillway crest and the diagonal crack in the downstream face were probed, as described below.
    a. The temporary sandbag cofferdam was extended along the spillway crest to divert flow. As the sandbag cofferdam was extended, the joint was probed using a ⅛-inch diameter metal rod and a $\frac{1}{16}$-inch-wide metal ruler. The horizontal joint extended approximately 30-feet from the left training wall towards the centerline of the spillway.
    b. The extents of the downstream diagonal crack were determined by probing the crack with a ⅛-inch diameter metal rod and a $\frac{1}{16}$-inch-wide metal ruler. Generally, the crack was observed to be tight with no apparent separation (opening that could pass water) or observed leakage through the crack. An out-of plane "vertical offset" was observed (i.e., facing slab on left side of crack was lower than the facing slab on the right side). The extents of the crack were mapped by measuring the length, width, depth, and offset along the length of the crack at various locations to allow the measurements to be repeated in the future to determine if there is a change in condition. **Table 1** below summarizes the downstream diagonal crack measurements.

Table 1: Downstream Diagonal Crack Measurements – July 30, 2024

Measuring Point	Distance from Previous Measuring Point (along crack, ft)	Distance to Training Wall (ft)	Vertical Offset (in)	Depth (in)	Width (in)
1	0	11	0	0	0
2	1	10.5	0.5	0.5	0.5
3	3	9	2	0	0
4	4	7	2	0	0
5	5	4	2	0	0

Note that Point 1 is the bottom most location of the diagonal crack, located about 2-feet above the top of the spillway toe and about 11-feet from the left training wall as shown in **Figure 1**.

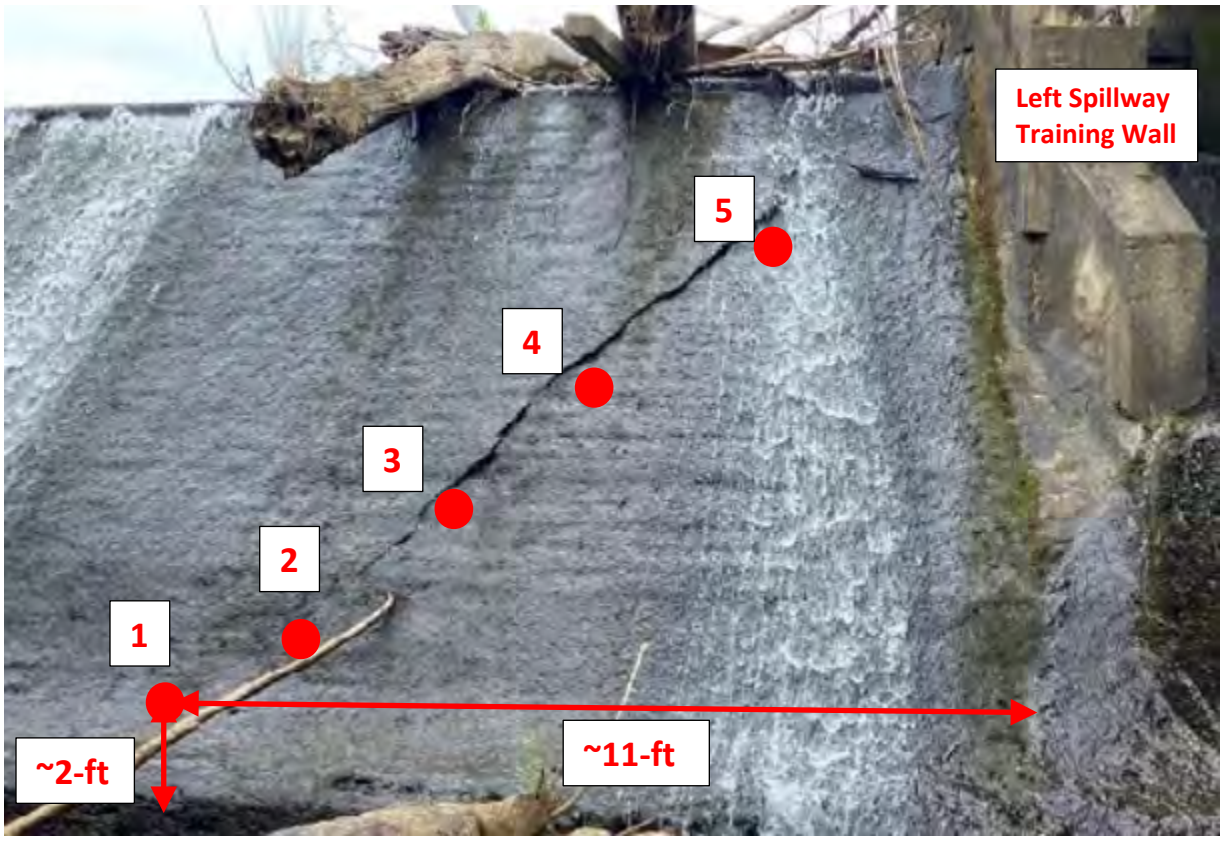


Figure 1. Approximate Locations of Downstream Diagonal Crack Measurements.

Since no apparent separation, opening of or leakage from the diagonal crack was observed, repairs to the diagonal crack were not performed on this date.

3. The temporary repair work on Tuesday, July 30, 2024 focused on repairing the open horizontal joint on the spillway crest by placing grout into the joint and then sealing the area with hydraulic cement.
   a. The work area was prepped for grout placement including cleaning the spillway crest surface and open joint with a wire brush, removing debris from the spillway joint, and removing woody debris from the work area along the spillway crest, as required.
   b. SikaGrout 212 was used as the filler material for the open joint. Grout loss (lowering grout level) was observed, likely due to grout flowing through the bottom of the joint and into the interior of the spillway. An exit point for the grout was not observed. The grout mix was thickened but a subsequent placement was met with similar grout loss.
   c. A 5-foot-length of CETCO Waterstop-RX101 waterstop rammed into the base of the open joint where the grout loss was observed.
   d. SikaGrout 212 was again placed as filler material into the open joint with no grout loss observed. Grout was placed to within about 1-inch of the surface of the spillway. The full approximately 30-foot length of open joint was grouted to within about an inch of the spillway surface.
   e. The surface was finished with hydraulic cement trowelled to be flush with the existing spillway crest.

The pumps were turned off, the sandbags were removed, and the gate was returned to its fully closed position at the end of the workday. The team then demobilized from site.

If you have any questions or concerns, please contact Jon Andrews (at 781-983-2881 or jonathan.andrews@gza.com) or Seth Krause (at 781 278-5793 or seth.krause@gza.com).

Very Truly Yours,

GZA GEOENVIRONMENTAL, INC.

Seth Krause, P.E.
Project Manager

Anders B. Bjarngard, P.E.
Consultant/Reviewer

Jonathan D. Andrews, P.E.
Principal-in-Charge

Attachments:
1. Photographs
2. Material Cut Sheets
3. As-Built Markups of the Temporary Spillway Crack/Void Repair Plan Set

Attachment 1

Photographs

Photo 1. Introducing tracer dye into the crack/void at the former vortex location.

Photo 2. Temporary sandbag cofferdam installed. Installing dewatering pumps.

Photo 3. Former vortex repair area prior to repairs.

Photo 4. Former vortex repair area after repairs.

Photo 5. Spillway crest joint before repairs; extent determined by probing.

Photo 6. Spillway crest joint after repairs.

Attachment 2

Material Cut Sheets

PRODUCT DATA SHEET

Publication Date: 6–22–23

DRYLOK® Fast Plug® Hydraulic Cement

PRODUCT DESCRIPTION

DRYLOK® Fast Plug® is a quick setting hydraulic cement. It sets in 3-5 minutes to stop active leaks, even under pressure. Seals open joints, very large cracks, holes, and penetrations in masonry, concrete, CMU block, and precast.

- Fast setting hydraulic cement
- High strength, non-shrink
- Sets in 3-5 minutes
- Stops water, even under pressure
- Patch mortar joints, cracks, holes, and penetration in masonry walls
- No top-coat required
- Reduces radon gas penetration
- Anchors posts, poles, railings, and bolts into concrete.

BASIC USES

Anchors metal to concrete. Ideal for sealing floor and wall joints and settlement cracks in masonry walls and swimming pools. This fast-setting hydraulic cement patches holes even where water is actively flowing through them. Seals openings and penetrations in masonry and pre-cast concrete for underground piping, sewers, and manholes.

TECHNICAL DATA

COMPOSITION: Sand and cement

% WEIGHT SOLIDS: 100%

DENSITY (LBS./US GAL.): 24.0 ± 0.3% (S.G. 2.87 ± 0.02)

COLOR:

• Gray

SET TIME: 3–5 minutes

COVERAGE

16 cu. in./lb.

SET TIME

3–5 minutes

CLEAN-UP

Soap and water

Dispose of contaminated absorbent, container, and unused contents in accordance with local, state, and federal regulations.

UGL® UNITED GILSONITE LABORATORIES

COVERAGE:
16 cu. in./lb. 578 cu cm^2/kg

Note: Actual coverage will vary depending upon application method, surface texture, and porosity.

SHELF LIFE: 60 months

CONTAINER SIZES: One and a half pound (US), four pound (US), ten pound (US) and fifty pound (US) containers

VOC
N/A

TINTING
N/A

SURFACE PREPARATION
Wear eye protection, rubber gloves, and a dust mask. The area to be patched should be cleaned thoroughly by wire brushing, scraping, or any other effective process.

Back chisel out cracked areas to be patched to the shape of an inverted "V" (the point at the surface) until loose, crumbling masonry is removed and a sound surface remains. This allows the patch to expand and lock into the surface. Wet down the area prior to patching to help the DRYLOK® Fast Plug® cure properly.

DRYLOK® Fast Plug® and clean, potable mixing water should be at room temperature (approximately 70°F) prior to mixing. Mix 3 parts DRYLOK® Fast Plug® and 1 part water thoroughly to a putty or heavy troweling consistency. This mixture will set in 3-5 minutes. The use of colder water will retard the setting time and warmer water will enhance the setting time. Mix only enough for immediate use due to the quick setting time. In cold weather, use warm (90°F, 32°C) water for mixing; also soak surface with warm water before application. Do not apply to surfaces below 40°F.

APPLICATION
For Active Leaks(the presence of flowing waterthrough a break in the surface): Mix and wait 1 minute or until the mixture becomes warm to the touch which indicates it is commencing to set. At this time force the DRYLOK® Fast Plug® into the opening with the palm of the hand.Hold in place for 3-5 minutes, assuring a complete set and sufficient bond to stop the flow of water. The patched area may be smoothed and trimmed to the surrounding area in approximately 5 minutes.

DRYLOK® Fast Plug® may be painted when set with DRYLOK® Extreme Concrete & Masonry Waterproofer, DRYLOK® Original Concrete & Masonry Waterproofer, DRYLOK® Powdered Masonry Waterproofer, or DRYLOK® Concrete Floor Paint.

For Inactive Leaks, Patching, Sealing, Anchoring: Thoroughly soak the area to be applied. This will prevent the surface from sucking the water out of the material. Apply with knife or trowel, forcing into the affected area. Use the surface to smooth the application evenly. When anchoring, chisel or drill hole in the masonry surface slightly larger than item to be anchored. Make certain mixed DRYLOK® Fast Plug® is tamped firmly into hole and around metal part.

IMPORTANT
Mix only enough for immediate use, because DRYLOK® Fast Plug® sets in 3-5 minutes. Cannot be reworked once it has set.

Mix in small batches only. Mix only enough for use in 3 minutes. Discard all left over mixed patching material prior to starting a new batch. Left over patching material will chemically react with new material in the mixing receptacle

SPECIFICATIONS
Compressive strength of cured material at:

1 Hour 311 PSI

3 Hours 365 PSI

8 Hours 396 PSI

24 Hours 2650 PSI

7 Days 3050 PSI

28 Days 11975 PSI

CAUTION

Cancer hazard: Contains Crystalline Silica, which can cause cancer. (Risk of cancer depends on duration and level of exposure).

Use only with adequate ventilation. Do not breathe dust. Harmful if inhaled. Overexposure may cause lung and kidney damage. Avoid contact or prolonged contact with eyes, skin, and clothing. Ensure fresh air entry during application and drying. If you experience eye watering, headache, or dizziness, or if air monitoring demonstrates vapor levels are above applicable limits, wear an appropriate, properly fitted respirator (NIOSH approved) during and after application. Follow respirator manufacturer's directions for respirator use. Close container after each use. Wash thoroughly after handling.

KEEP OUT OF REACH OF CHILDREN.

FIRST AID

If you experience difficulty in breathing, leave the area to obtain fresh air. If continued difficulty is experienced, call poison control center, hospital emergency room, or physician immediately. In case of contact, immediately flush skin with soap and plenty of water. In case of eye contact, flush with plenty of water for at least 15 minutes. Consult a physician immediately.

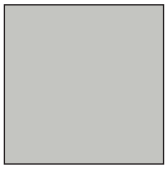
WARNING

If you scrape, sand, or remove old paint, you may release lead dust. LEAD IS TOXIC. EXPOSURE TO LEAD DUST CAN CAUSE SERIOUS ILLNESS, SUCH AS BRAIN DAMAGE, ESPECIALLY IN CHILDREN. PREGNANT WOMEN SHOULD ALSO AVOID EXPOSURE. Wear a NIOSH-approved respirator to control lead exposure. Clean up carefully with a HEPA vacuum and a wet mop. Before you start, find out how to protect yourself and your family by contacting the National Lead Information Hotline at 1-800-424-LEAD or log on to www.epa.gov/lead.

⚠ Warning: Cancer and Reproductive Harm www.P65Warnings.ca.gov.

For additional health and safety information, please refer to the Safety Data Sheet (SDS).

	CONTAINER	NUMBER/CASE	COLOR	ORDER NUMBER
DRYLOK® Fast Plug®	4 LB.	4/case	Gray	00917
DRYLOK® Fast Plug®	10 LB.	2/case	Gray	00924
DRYLOK® Fast Plug®	50 LB.	1/case	Gray	00930



Gray

Note: Color swatches are representative only.

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Corporate Office: 1396 Jefferson Avenue, Dunmore, PA 18509
Mail to: P.O. Box 70, Scranton, PA 18501-0070
Plant Locations: Scranton, PA • Jacksonville, IL

BUILDING TRUST

PRODUCT DATA SHEET

SikaGrout®-212

General Purpose cementitious grout

PRODUCT DESCRIPTION

SikaGrout®-212 is a one-component, ready to mix, free flowing, non-shrink, cementitious grout with a unique 2-stage shrinkage compensating mechanism.

USES

- General purpose grouting
- Machine and column base plates
- Anchor rods, bearing plates
- Ram in place as a dry pack
- Trowel-apply as a medium flow
- Pour or pump as high flow
- Bedding joints in pre-cast concrete sections
- Filling cavities, voids, gaps and recesses
- On grade, above and below grade
- Indoors and out

CHARACTERISTICS / ADVANTAGES

- Easy to use (ready to mix powder)
- Shrinkage compensated properties in both the plastic and hardened states
- Multiple fluidity with a single component
- Good bond to concrete
- Non-metallic, will not stain or rust
- Contains no chloride
- Blend of shrinkage-reducing and plasticizing/water-reducing agents
- Low heat build-up
- Excellent for pumping: does not segregate, even at high flow. No build-up on equipment hopper
- Superior freeze/thaw resistance
- Resistant to oil and water

APPROVALS / STANDARDS

- Meets ASTM C-1107 (Grade C)
- Shows positive expansion when tested in accordance with ASTM C-827
- SikaGrout®-212 is USDA certifiable

PRODUCT INFORMATION

Chemical Base	Cement, selected fillers and aggregates, special additives
Packaging	50 lb (22.7 kg) bag
Appearance / Color	Gray powder
Shelf Life	12 months from date of production if stored properly in original, unopened and undamaged sealed packaging
Storage Conditions	Store dry at 40–95 °F (4–35 °C) Protect from moisture. If damp, discard material

TECHNICAL INFORMATION

Compressive Strength		**Plastic**	**Flowable**	**Fluid**	(ASTM C-942) 73 °F (23 °C) 50 % R.H
	1 day	4,500 psi (31 MPa)	3,500 psi (24.1 MPa)	2,700 psi (18.6 MPa)	
	7 days	6,100 psi (42 MPa)	5,700 psi (39.3 MPa)	5,500 psi (37.9 MPa)	
	28 days	7,500 psi (51.7 MPa)	6,200 psi (42.7 MPa)	5,800 psi (40 MPa)	
Flexural Strength	28 days	1,400 psi (9.6 MPa)	1,200 psi (8.2 MPa)	1,000 psi (6.8 MPa)	(ASTM C-293) 73 °F (23 °C) 50 % R.H
Splitting Tensile Strength	28 days	600 psi (4.1 MPa)	575 psi (3.9 MPa)	500 psi (3.4 MPa)	(ASTM C-496) 73 °F (23 °C) 50 % R.H
Tensile Adhesion Strength	28 days	2,000 psi (13.7 MPa)	1,900 psi (13.1 MPa)	1,900 psi (13.1 MPa)	(ASTM C-882 modified) 73 °F (23 °C) 50 % R.H
Expansion	28 days	+0.021 %	+0.056 %	+0.027 %	(ASTM C-1090) 73 °F (23 °C) 50 % R.H.

APPLICATION INFORMATION

Mixing Ratio

Plastic	**Flowable**	**Fluid**
6 pt	6.5 pt	8.5 pt

Coverage

0.44 ft³ (0.01 m³) at fluid consistency
(Coverage figures do not include allowance for surface profile and porosity or material waste)

Layer Thickness

Min.	**Max.**
1/2" (12.7 mm)	4" (101.6 mm)

Thicker applications can be achieved. Contact Sika® Technical Services Department for further information.

Flowability

Plastic[1]	**Flowable**[1]	**Fluid**[2]	(ASTM C-1437[1] ASTM C-939[2])
100–124 %	124–145 %	20–40 sec	

Product Temperature

65–75 °F (18–24 °C)

Ambient Air Temperature

> 45 °F (7 °C)

Substrate Temperature

> 45 °F (7 °C)

Pot Life

~15 minutes

As the temperature will affect the pot life, application temperature:

- Above 73 °F (23 °C) will reduce the pot life and flow
- Below 73 °F (23 °C) will extend the pot life and flow

Set Time

	Plastic	**Flowable**	**Fluid**	(ASTM C-266) 73 °F (23 °C) 50 % R.H
Initial	3.5–4.5 h	4.0–5.0 h	4.5–6.5 h	
Final	4.5–5.5 h	5.5–6.5 h	6.0–8.0 h	

APPLICATION INSTRUCTIONS

SURFACE PREPARATION

- Remove all dirt, oil, grease, and other bond-inhibiting materials by mechanical means.
- Anchor bolts to be grouted must be de-greased with suitable solvent.
- Concrete must be sound and roughened to a CSP 4 or higher to promote mechanical adhesion.
- Prior to pouring, surface should be brought to a Saturated Surface Dry (SSD) condition.
- Steel should be cleaned and prepared thoroughly by blastcleaning to a white metal finish.
- Follow standard industry and Sika® guidelines for use as an anchoring epoxy.
- Where grout-tight form is difficult to achieve, use SikaGrout®-212 in dry pack consistency.

FORMING

- For pourable grout, construct forms to retain grout without leakage.
- Should be lined or coated with bond-breaker for easy removal.
- Should be sufficiently high to accommodate head of grout.

MIXING

- Pour the water in the recommended proportion into a suitable mixing container.
- While mixing slowly, add the powder to the water.
- Mix thoroughly for 3 minutes with low speed (< 500 rpm) hand drill mixer to avoid entraining too much air and until homogenous with no lumps.

EXTENSION WITH AGGREGATES

- For deeper applications (plastic and flowable consistancy only), 25 lbs. of 3/8" (9.5 mm) coarse aggregate can be added.
- The aggregate must be non-reactive (reference ASTM C-1260, C-227 and C-289), clean, well graded, saturated surface dry, have low absorption and high density, and comply with ASTM C-33 size number 8 per Table 2.
- Variances in aggregate may result in different strengths.
- Add pea gravel after the water and SikaGrout®-212.

APPLICATION

- Within 15 minutes after mixing, place grout into forms in normal manner to avoid air entrapment.
- Vibrate, pump, or ram grout as necessary to achieve flow or compaction. SikaGrout®-212 must be confined in either the horizontal or vertical direction leaving minimum exposed surface.
- SikaGrout®-212 is an excellent grout for pumping, even at high flow.
- For pump recommendations, contact Technical Service.
- After grout has achieved final set, remove forms, trim or shape exposed grout shoulders to designed profile.

CURING TREATMENT

Wet cure for a minimum of 3 days or apply a curing compound which complies with ASTM C-309 on exposed surfaces.

CLEANING OF TOOLS

Clean all tools and application equipment with water immediately after use.

LIMITATIONS

- Not to be used as an overlay in unconfined spaces
- Not to be used as a patch repair
- Avoid application in direct sun and/or strong wind
- Apply only to sound, prepared substrate
- Do not add additional water after application as this may cause cracking
- Protect freshly applied material from freezing and frost
- Keep exposed surfaces to a minimum
- As with all cement based materials, avoid contact with aluminum to prevent adverse chemical reaction and possible product failure. Insulate potential areas of contact by coating aluminum bars, rails, posts etc. with an appropriate epoxy such as Sikadur® Hi-Mod 32.

BASIS OF PRODUCT DATA

Results may differ based upon statistical variations depending upon mixing methods and equipment, temperature, application methods, test methods, actual site conditions and curing conditions.

OTHER RESTRICTIONS

See Legal Disclaimer.

ENVIRONMENTAL, HEALTH AND SAFETY

For further information and advice regarding transportation, handling, storage and disposal of chemical products, user should refer to the actual Safety Data Sheets containing physical, environmental, toxicological and other safety related data. User must read the current actual Safety Data Sheets before using any products. In case of an emergency, call CHEMTREC at 1-800-424-9300, International 703-527-3887.

DIRECTIVE 2004/42/CE - LIMITATION OF EMISSIONS OF VOC

0 g/L (EPA Method 24)

LEGAL DISCLAIMER

- KEEP CONTAINER TIGHTLY CLOSED

- **KEEP OUT OF REACH OF CHILDREN**
- **NOT FOR INTERNAL CONSUMPTION**
- **FOR INDUSTRIAL USE ONLY**
- **FOR PROFESSIONAL USE ONLY**

Prior to each use of any product of Sika Corporation, its subsidiaries or affiliates ("SIKA"), the user must always read and follow the warnings and instructions on the product's most current product label, Product Data Sheet and Safety Data Sheet which are available at usa.sika.com or by calling SIKA's Technical Service Department at 1-800-933-7452. Nothing contained in any SIKA literature or materials relieves the user of the obligation to read and follow the warnings and instructions for each SIKA product as set forth in the current product label, Product Data Sheet and Safety Data Sheet prior to use of the SIKA product.

SIKA warrants this product for one year from date of installation to be free from manufacturing defects and to meet the technical properties on the current Product Data Sheet if used as directed within the product's shelf life. User determines suitability of product for intended use and assumes all risks. User's and/or buyer's sole remedy shall be limited to the purchase price or replacement of this product exclusive of any labor costs. **NO OTHER WARRANTIES EXPRESS OR IMPLIED SHALL APPLY INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SIKA SHALL NOT BE LIABLE UNDER ANY LEGAL THEORY FOR SPECIAL OR CONSEQUENTIAL DAMAGES. SIKA SHALL NOT BE RESPONSIBLE FOR THE USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANY PATENT OR ANY OTHER INTELLECTUAL PROPERTY RIGHTS HELD BY OTHERS.**

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Fax: 52 442 2250537

WATERSTOP-RX®

EXPANDING CONCRETE JOINT WATERSTOP

DESCRIPTION

WATERSTOP-RX® is a hydrophilic strip waterstop designed to stop water infiltration through cast-in-place concrete construction joints by expanding upon contact with water to form a positive seal against the concrete. The key to WATERSTOP-RX®'s effectiveness is its superior expansion to seal and fill voids and cracks in the concrete. WATERSTOP-RX® is an active waterstop that is designed to replace passive PVC/Rubber dumbbell waterstops, thereby eliminating the requirement of special pieces, split-forming and seam welding. WATERSTOP-RX® has been successfully tested by independent testing firms to over 60 meters of hydrostatic water pressure, under both continuous immersion and wet/dry cycling.

WATERSTOP-RX® is available in two sizes (see Product Table). WATERSTOP-RX® 101 is produced in a rectangular shape measuring 25 x 20 mm. WATERSTOP-RX® 103 is produced in a rectangular shape measuring 15 x 10 mm.

Though WATERSTOP-RX® possesses good resistance to many chemicals, the waterstop is not intended to be used as the primary joint sealant for chemical containment vessels. Consult manufacturer for guidance regarding chemical compatibility for secondary chemical containment applications. Additionally, WATERSTOP-RX® is not an expansion joint sealant; contact CETCO for expansion joint applications.

APPLICATIONS

Applications include both vertical and horizontal non-moving concrete construction joints, new to existing concrete construction, irregular surfaces, and around through-wall penetrations, such as plumbing and utility pipes. Additionally WATERSTOP-RX® can seal around penetrations, concrete pilings and steel H-piles passing through the slab. WATERSTOP-RX® works in both continuous hydrostatic and intermittent hydrostatic conditions.

WATERSTOP-RX® products are designed for reinforced structural concrete with a minimum of 20 N/mm² compressive strength. RX-101 is designed for concrete 200 mm thick or greater with two rows of reinforcing steel. RX-103 is designed for vertical concrete 150 mm thick or greater; and horizontal concrete no less than 100 mm thick. RX-103 should be used in concrete with one row of steel reinforcement, concrete curbs, planter walls, fountains, and lightweight structural concrete.

WATERSTOP-RX® is a reliable, cost-effective means to stop water infiltration through concrete construction joints. It can also be used around pipe and structural penetrations

INSTALLATION

Surface preparation: Surfaces should be clean and dry. Remove all dirt, rocks, rust or other construction debris. Do not install WATERSTOP-RX® in standing water or on an iced substrate.

Adhesive: Apply a continuous bead of CETSEAL along the substrate where WATERSTOP-RX® will be installed. Assure minimum 75 mm concrete coverage will be maintained (50 mm for RX-103). Keep the nozzle tip pressed against the concrete at a 45° angle during application.

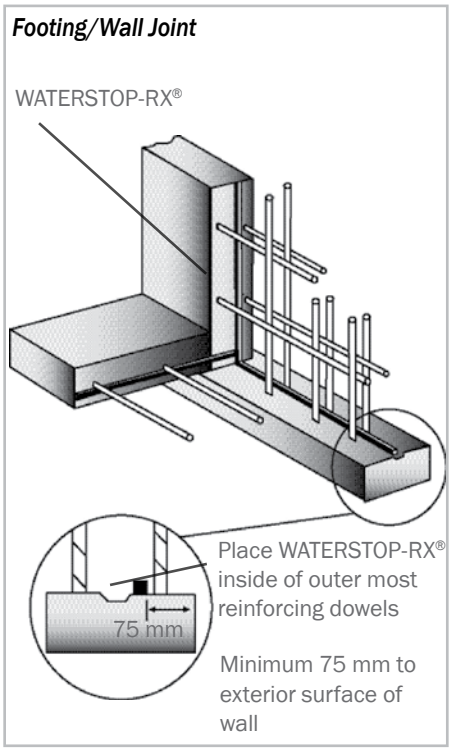
Installation: After applying a continuous bead of CETSEAL, remove release paper, then firmly press the entire length of WATERSTOP-RX® onto the adhesive. For vertical and overhead applications, firmly press a minimum of 15 seconds to assure adhesion. For best results apply WATERSTOP-RX® within 15 minutes of adhesive installation. WATERSTOP must be placed into adhesive prior to CETSEAL skinning over and curing. CETSEAL may be applied to damp surfaces, but not in standing water.

Tightly butt coil ends together to form a continuous WATERSTOP – do not overlap coil ends. Place in maximum practical lengths to minimize coil end joints. Where required, cut coils with a sharp knife or utility blade to fit coil ends together. Make horizontal to vertical transitions by abutting product coil sections together, no special accessory pieces are required.
At structural and pipe penetrations, cut into strips to fit around the penetration. Apply to adhesive and abut coil ends together.

On irregular surfaces such as stone or rough concrete, make sure WATERSTOP-RX remains in direct contact with the substrate along the entire installation. There should not be any air gap between the WATERSTOP-RX and the substrate.

Installation with REVO-FIX: REVO-FIX is a steel mesh used to mechanically secure WATERSTOP-RX® into position using the accompanying supplied fixings. REVO-FIX is available in two sizes; REVO-FIX 101 (for securing WATERSTOP-RX® 101) and REVO-FIX 103 (for securing WATERSTOP-RX® 103).

Remove release paper and place the WATERSTOP-RX on the concrete substrate. Then place REVO-FIX strips over the WATERSTOP-RX, lapping the strip ends by 25 mm maximum. Nail through lap with fixings supplied, and install one fixing 300 mm c/c along the REVO-FIX. End-to-end or end-to-side REVO-FIX junctions are created by simple but joints pressed firmly together. Start at junctions; do not stretch WATERSTOP-RX to fit. Do not overlap WATERSTOP-RX.



General Application Detail

WATERSTOP-RX®

EXPANDING CONCRETE JOINT WATERSTOP

LIMITATIONS

WATERSTOP-RX® is not a self-adhering product. Either CETSEAL or REVO-FIX are required to secure WATERSTOP-RX® to concrete. CETSEAL is required to secure WATERSTOP-RX® to metal or PVC (pipe) surfaces. Mechanical fixings should be used with REVO-FIX to secure WATERSTOP-RX; and fixings can be used in conjunction with CETSEAL. Mechanical fixings should not be used to secure WATERSTOP-RX alone. Do not use any other adhesive or construction sealant apart from CETSEAL to secure WATERSTOP-RX®.

WATERSTOP-RX® is not designed, nor intended to function as an expansion joint sealant. For precast concrete applications, contact manufacturer for product suitability and for any special installation requirements.

WATERSTOP-RX® products are designed for structural concrete with a minimum of 20 N/mm² compressive strength. WATERSTOP-RX® 101 requires a minimum of 75 mm of concrete coverage. WATERSTOP-RX® 103 requires a minimum concrete coverage of 50 mm. WATERSTOP-RX® should only be used in applications where the product is completely encapsulated within the concrete.

WATERSTOP-RX® should not be prehydrated by being subjected to submersion or remain in extended contact with water prior to encapsulation in concrete. If the product exhibits considerable swell prior to encapsulation in the concrete, it must be replaced with new material.

In conditions where severe ground water chemical contamination exists, or is expected, consult manufacturer for product chemical compatibility information.

PACKAGING

RX-101: 30 m per box
RX-103: 48 m per box
CETSEAL and REVO-FIX are packaged separately.

ACCESSORY PRODUCTS

CETSEAL is a multi-purpose, single component polyether moisture cure adhesive used to secure WATERSTOP-RX® into position. Apply a continuous bead of CETSEAL to substrate then install WATERSTOP-RX® before CETSEAL skins over and cures. Adhesive yield will vary with use, substrate and application.

WATERSTOP-RX® PRODUCT TABLE

PRODUCT	SIZE	ROLL LENGTH	CROSS-SECTION SHAPE	UNIT QTY/CARTON	MIN CONCRETE COVERAGE
RX-101	25 mm x 20 mm	5 m	Rectangle	30 m	75 mm
RX-103	15 mm x 10 mm	6 m	Rectangle	48 m	50 mm

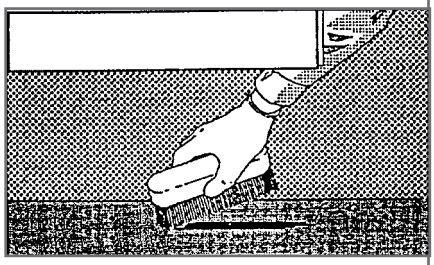
WATERSTOP-RX®

EXPANDING CONCRETE JOINT WATERSTOP

5 FAST & EASY INSTALLATION STEPS

STEP 1

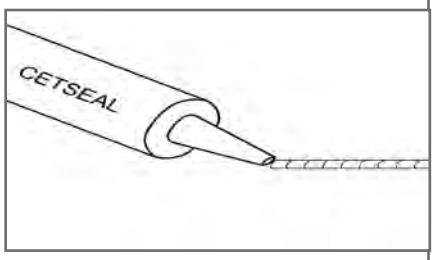
CLEAN SURFACE



REMOVE ALL DIRT AND DEBRIS

STEP 2

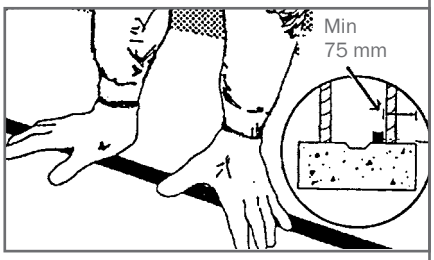
APPLY ADHESIVE



APPLY CETSEAL

STEP 3

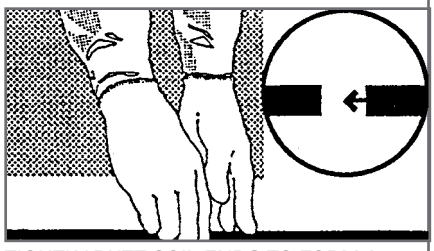
PLACE WATERSTOP



REMOVE RELEASE PAPER THEN PRESS FIRMLY AGAINST CETSEAL. MAINTAIN MIN. CONCRETE COVERAGE DEPTH

STEP 4

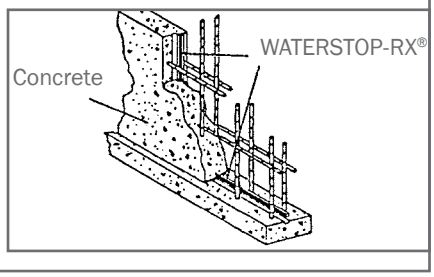
BUTT COIL ENDS



TIGHTLY BUTT COIL ENDS TO FORM A CONTINUOUS WATERSTOP. DO NOT OVERLAP COIL ENDS

STEP 5

POUR CONCRETE



LIMITED WARRANTY

Specifications and other information contained herein supersedes all previously printed matter and are subject to change without notice.

All goods sold by seller are warranted to be free from defects in material and workmanship. The foregoing warranty is in lieu of and excludes all other warranties not expressly set forth herein, whether expressed or implied by operation of law or otherwise, including but not limited to any implied warranties of merchantability or fitness.

Seller shall not be liable for incidental or consequential losses, damages or expenses, directly or indirectly arising for the sale, handling or use of goods, or from any other case relating thereto, and seller's liability hereunder in any case is expressly limited to the replacement (in the form originally shipped) of goods not complying with the agreement or at seller's election, to the repayment of, or crediting buyer with, an amount equal to the purchase price of such goods, whether such claims are for breach of warranty or negligence.

Any claim by buyer with reference to the goods sold hereunder for any cause shall be deemed waived by buyer unless submitted to seller in writing within thirty (30) days from the date buyer discovered or should of discovered, any claimed breach.

Materials should be inspected and tested by purchaser prior to their use if product quality is subject to verification after shipment. Performance guarantees are normally supplied by the applicator.

TYPICAL PROPERTIES

PROPERTY	TEST METHOD	VALUE
Hydrostatic Head Resistance	Independent Test	70 m
Wet / Dry Cycling (25 Cycles @ 70 m)	Independent Test	No Effect
Adhesion to Concrete Using CETSEAL	Independent Test	Excellent

WATERSTOP-RX®

EXPANDING CONCRETE JOINT WATERSTOP

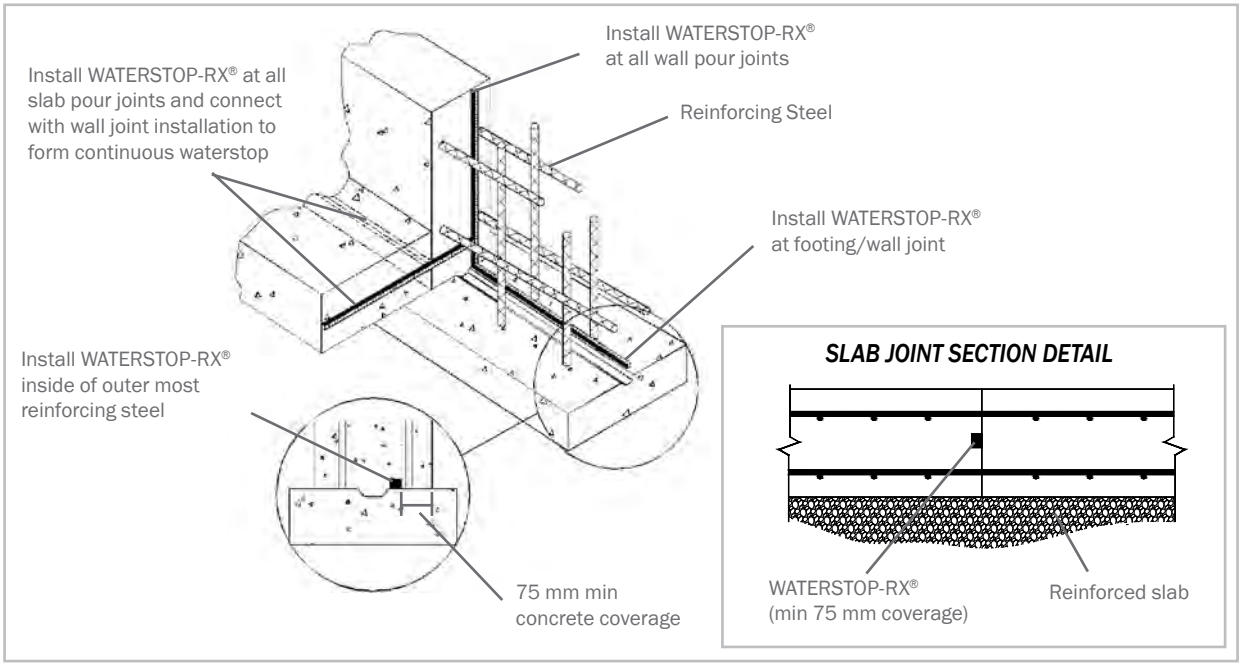
TYPICAL PRODUCT APPLICATIONS

WATERSTOP-RX® 101

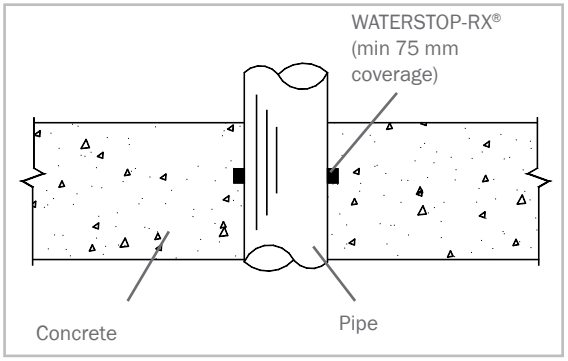
- Vertical and horizontal concrete 200 mm thick or greater
- Concrete with two rows of steel reinforcement
- Shotcrete Foundation Walls
- High hydrostatic pressures
- Tie-back plates and penetrations

WATERSTOP-RX® 103

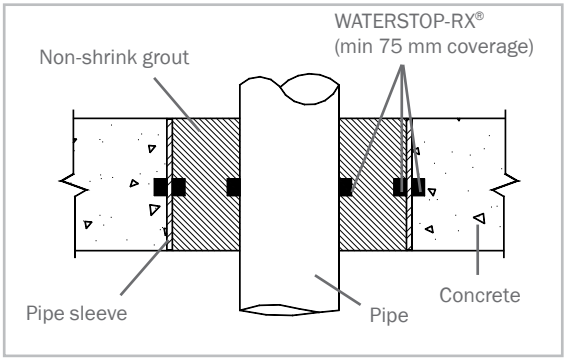
- Vertical concrete 150 mm thick or greater.
- Horizontal concrete 100 mm thick or greater
- Concrete with one row of steel reinforcement
- Slabs containing only wire mesh
- Fountains / Planter Boxes / Curbs
- Penetrations



Typical WATERSTOP-RX® Foundation Detailing



Cast-in-Place Penetration



Sleeved Penetration Detail

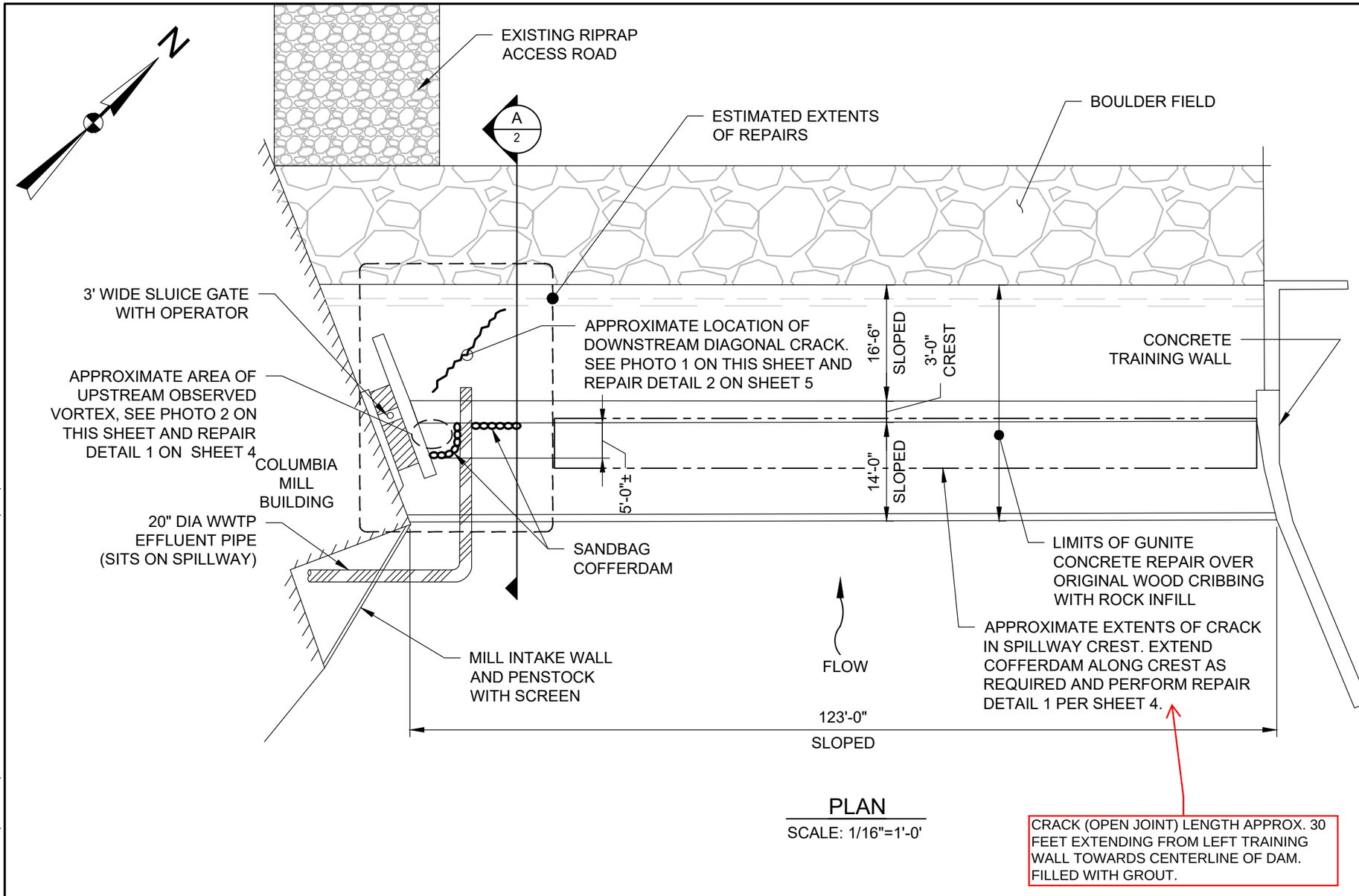
www.cetco.com | contact@cetco.com

UPDATED: AUGUST 2016

FORM: TDS_WATERSTOP-RX_EMEA_EN_201608_V3

Attachment 3

As-Built Markups of the Temporary Spillway Crack/Void Repair Plan Set



PLAN

SCALE: 1/16"=1'-0'

CRACK (OPEN JOINT) LENGTH APPROX. 30 FEET EXTENDING FROM LEFT TRAINING WALL TOWARDS CENTERLINE OF DAM. FILLED WITH GROUT.

PHOTO 1 - DOWNSTREAM DIAGONAL CRACK

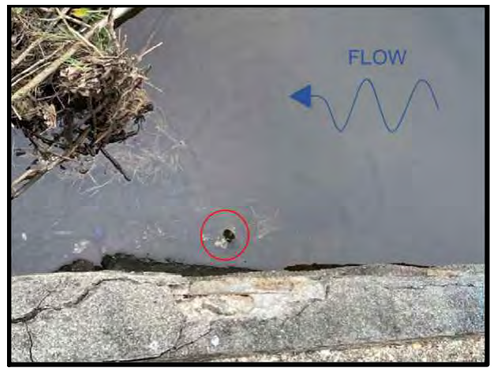


PHOTO 2 - UPSTREAM OBSERVED VORTEX

0 8' 16' 32'

SCALE IN FEET 1/16" = 1'-0"

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APPROVED:

COLUMBIA MILL DAM
LENOX DEVELOPMENT, LLC
LEE, MASSACHUSETTS

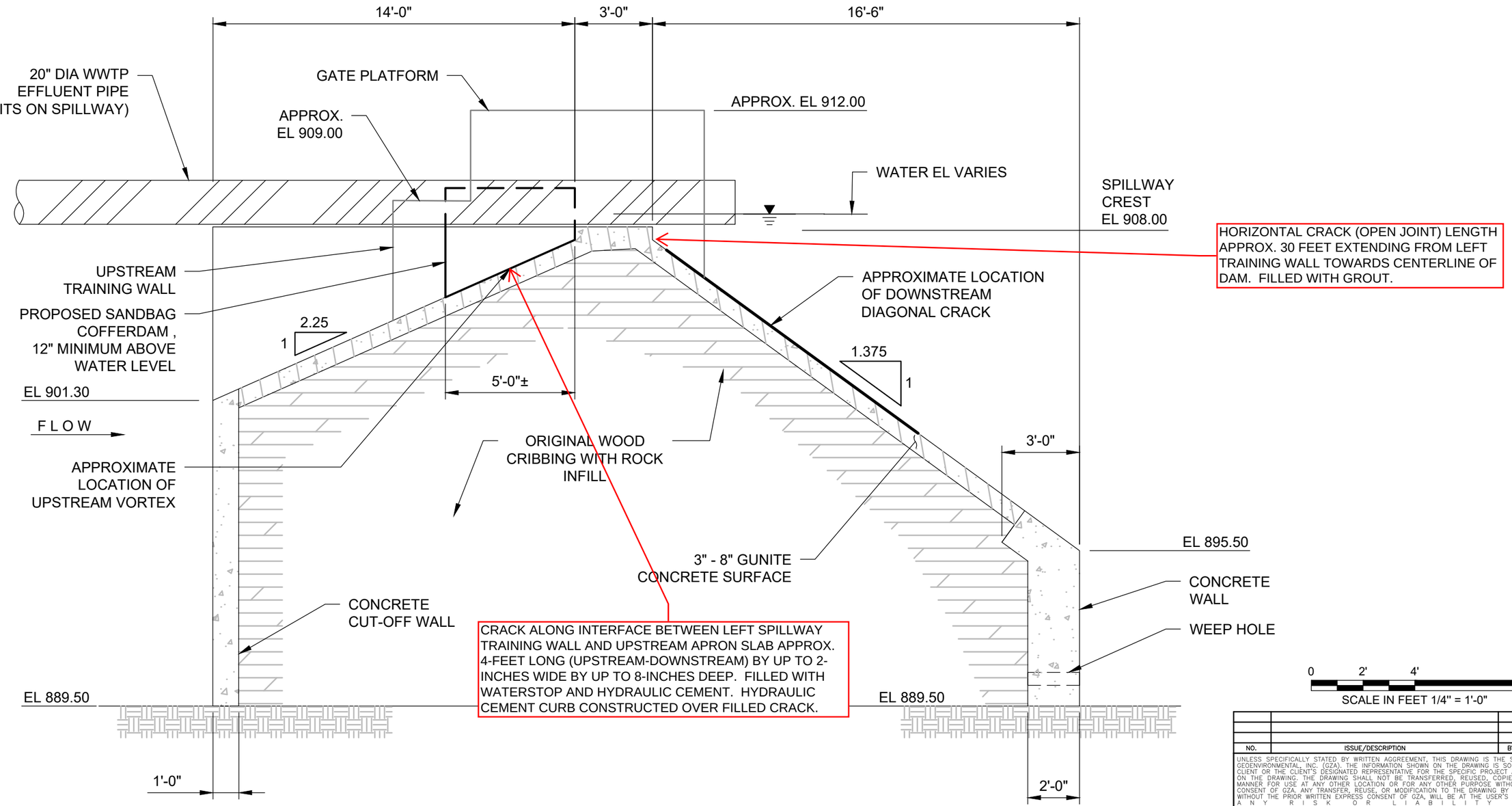
TEMPORARY SPILLWAY CRACK/VOID REPAIRS PLAN

PREPARED BY:		PREPARED FOR:	
GZA GeoEnvironmental, Inc. www.gza.com		GENERAL ELECTRIC COMPANY	
PROJ MGR: SDK	REVIEWED BY: SDK	CHECKED BY: JDA	SHEET 1
DESIGNED BY: TJS	DRAWN BY: BM	SCALE: AS NOTED	
DATE: JULY, 2024	PROJECT NO. 01.0019896.70	REVISION NO. 0	

AUGUST 1, 2024 GZA AS-BUILT NOTES

GENERAL NOTES

1. BASE MAP DEVELOPED FROM A DRAWING ENTITLED, "PLAN OF DAM, FIGURE 6," PREPARED BY TIGHE AND BOND, ORIGINAL SCALE 1"=20', AND DATED JANUARY 2006.
2. DIMENSIONS TO BE VERIFIED IN FIELD PRIOR TO START OF WORK.
3. SEE SHEET 3 FOR SEQUENCING OF WORK.
4. VERTICAL DATUM IS NGVD29. ELEVATIONS ARE IN FEET.
5. ALL ELEVATIONS, DIMENSIONS AND SLOPE ANGLES WERE PROVIDED BY OTHERS AND ARE CONSIDERED APPROXIMATE.
6. APPLY ALL MATERIALS IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.



A/1 SECTION

SCALE: ¼" = 1'-0"

0 2' 4' 8'

SCALE IN FEET 1/4" = 1'-0"

NO.	ISSUE/DESCRIPTION	BY	DATE

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COLUMBIA MILL DAM
LENOX DEVELOPMENT, LLC
LEE, MASSACHUSETTS

TEMPORARY SPILLWAY CRACK/VOID SECTION

PREPARED BY:		PREPARED FOR:	
GZA GeoEnvironmental, Inc. www.gza.com		GENERAL ELECTRIC COMPANY	
PROJ MGR: SDK	REVIEWED BY: SDK	CHECKED BY: JDA	SHEET 2
DESIGNED BY: TJS	DRAWN BY: BM	SCALE: AS NOTED	
DATE: JULY, 2024	PROJECT NO. 01.0019896.70	REVISION NO. 0	

AUGUST 1, 2024 GZA AS-BUILT NOTES

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NOTE:
SEQUENCE, INVESTIGATIONS AND REPAIRS SUBJECT TO CHANGE BASED ON CONDITIONS ENCOUNTERED.

SEQUENCE/SCOPE:

PART 1 - UPSTREAM INVESTIGATIONS

1. INJECT TRACER DYE DIRECTLY INTO OBSERVED CRACK/VOID SPACE ALONG THE LEFT UPSTREAM SIDE OF SPILLWAY IN THE APPROXIMATE AREA OF UPSTREAM OBSERVED VORTEX. DOCUMENT ANY OBSERVED DYE EXIT POINT(S).
2. PROBE UPSTREAM OF SLUICE GATE TO DETERMINE IF THERE IS A BUILD UP OF SEDIMENT. IF THERE IS A BUILD UP OF SEDIMENT, DISCUSS WITH EPA. IF NO BUILD UP OF SEDIMENT, OPEN GATE TO LOWER RESERVOIR A MAXIMUM OF 1-FOOT BELOW THE SPILLWAY CREST. OPERATE GATE TO MAINTAIN WATER SURFACE ELEVATION THROUGHOUT THE REPAIR.
3. INSTALL TEMPORARY SANDBAG COFFERDAM AND DEWATER WORK AREA PER SHEETS 1 AND 2.
4. PROBE CRACK/VOID AND DOCUMENT PENETRATIONS/DIRECTIONS. SOUND CONCRETE SLAB. COORDINATE EXTENTS AND TYPE OF PART 2 REPAIRS WITH ENGINEER. BE PREPARED TO OPEN CRACK/VOID FOR ADDITIONAL INVESTIGATIONS, INCLUDING CHIPPING, DRILLING OR SAWCUTTING THROUGH UPSTREAM SLAB.
5. ~~IF STEP 4 CRACK/VOID PROBING INDICATES CRACK/VOID IS LESS THAN OR EQUAL TO ABOUT 1-INCH WIDE BY 4-INCHES DEEP, PROCEED TO STEP 7A SURFICIAL REPAIRS.~~
6. ~~IF CRACK/VOID PROBING INDICATES EXTENTS GREATER THAN ABOUT 4 INCHES, REMOVE LOOSE MATERIALS, AND SAWCUT 1 FOOT BY 1 FOOT MINIMUM WINDOW THROUGH CONCRETE SLAB. WINDOW SHOULD ENCOMPASS THE CRACK/VOID AND EXPOSE MATERIAL BELOW SPILLWAY SURFACE. PROBE AND SOUND TO DETERMINE EXTENTS OF CRACK/VOID. BASED ON DISCUSSION WITH ENGINEER, PERFORM ADDITIONAL INVESTIGATIONS OR PROCEED TO STEP 7B DEEP REPAIRS.~~

~~PART 2 - UPSTREAM REPAIRS~~

~~7A.SURFICIAL REPAIRS (E.G., CRACK/VOID PROBING INDICATES SURFICIAL CRACK/VOID IS LESS THAN OR EQUAL TO ABOUT 1-INCH WIDE BY 4-INCHES DEEP). GRAVITY GROUT ALONG CRACK LENGTH WITHIN WORK AREA AND PERFORM CONCRETE SURFACE PATCH PER DETAIL 1. TEMPORARILY PLUG SURFACE CRACK/VOID/DEFECT AS NECESSARY TO PREVENT GROUT ESCAPE. INTRODUCE GROUT THROUGH FUNNEL OR OTHER DEVICE TO APPLY LOW PRESSURE (2- TO 3-FEET OF LIQUID GROUT HEAD) DURING GROUTING. START WITH LEAN GROUT MIX AND INCREASE GROUT VISCOSITY AS APPROPRIATE.~~

~~7B.DEEP REPAIRS (E.G., CRACK/VOID PROBING INDICATES SURFICIAL CRACK/VOID IS GREATER THAN OR EQUAL TO ABOUT 1-INCH WIDE BY 4-INCHES DEEP AND 1-FOOT BY 1-FOOT (MIN.) WINDOW THROUGH SLAB IS OPEN). USE GRAVITY GROUTING METHODS TO FILL VOID WITH GROUT. IF REQUESTED BY THE ENGINEER, BUILD TEMPORARY 1-FOOT HIGH (MIN.) FORM/BERM AROUND WINDOW TO INCREASE GROUT PRESSURE.~~

8. ~~REPAIR SLAB WINDOW PER REPAIR DETAIL 2 ON SHEET 5.~~
9. IF REQUIRED AND AS DIRECTED BY THE ENGINEER, INSTALL ~~CONCRETE~~ CURB ALONG TRAINING WALLS/SPILLWAY JOINT. SEE REPAIR DETAIL 3 ON SHEET 6.

HYDRAULIC CEMENT

PART 3 - CREST REPAIRS

10. INTALL LENGTH OF TEMPORARY SANDBAG COFFERDAM SUFFICIENT TO DEWATER THE LENGTH OF CREST JOINT TO BE REPAIRED.
11. REPAIR CREST JOINT AND OTHER DEFICIENCIES OBSERVED UNDER DEWATERED CONDITIONS PER REPAIR DETAIL 1 ON SHEET 4.
12. AS ABLE, MOVE TEMPORARY COFFERDAM FROM LEFT TO RIGHT ABUTMENT OF SPILLWAY AND REPEAT STEP 11.

PART 4 - DOWNSTREAM INVESTIGATIONS AND REPAIRS

13. PROBE DOWNSTREAM CRACK. DOCUMENT DEPTH AND ORIENTATION OF PROBES ALONG LENGTH OF CRACK. MEASURE AND DOCUMENT CRACK WIDTH AND OFFSET ALONG LENGTH OF CRACK. COORDINATE EXTENTS AND TYPE OF PART 4 REPAIRS WITH ENGINEER.
14. ~~REPAIR CRACK PER REPAIR DETAIL 1 ON SHEET 4. INSTALL WEEPHOLES AS REQUESTED BY THE ENGINEER PER REPAIR DETAIL 4 ON SHEET 7. THE INTENT OF WEEPHOLE LOCATING IS TO PLACE WEEPHOLE(S) ALONG CRACK WHERE SEEPAGE OR TRACER DYE EXIT IS OBSERVED.~~

AUGUST 1, 2024 GZA AS-BUILT NOTES

NO.	ISSUE/DESCRIPTION	BY	DATE

APPROVED:

COLUMBIA MILL DAM
LENOX DEVELOPMENT, LLC
LEE, MASSACHUSETTS

TEMPORARY SPILLWAY CRACK/VOID NOTES

PREPARED BY: GZA GeoEnvironmental, Inc. www.gza.com		PREPARED FOR: GENERAL ELECTRIC COMPANY	
PROJ MGR: SDK	REVIEWED BY: SDK	CHECKED BY: JDA	SHEET 3
DESIGNED BY: TJS	DRAWN BY: BM	SCALE: NTS	
DATE: JULY, 2024	PROJECT NO. 01.0019896.70	REVISION NO. 0	

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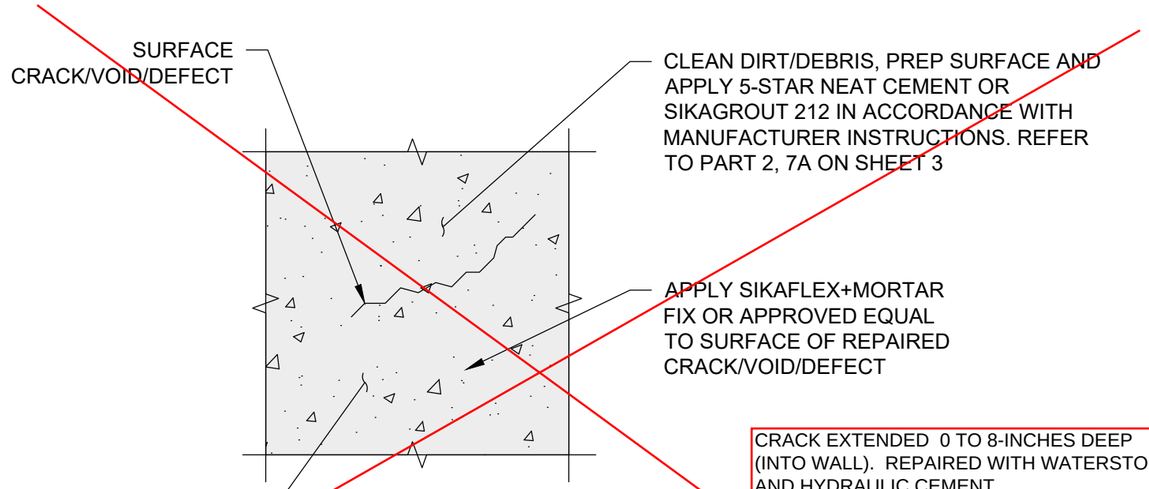
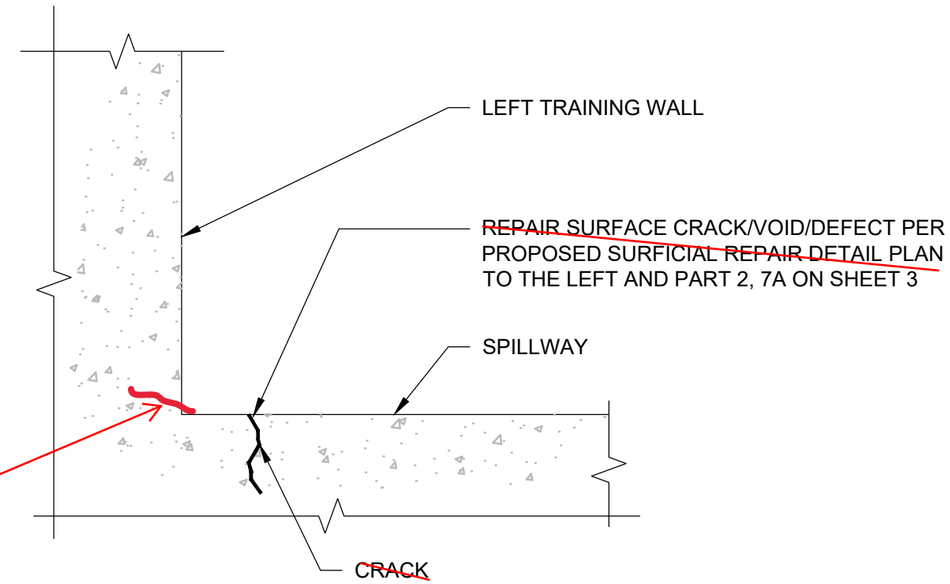


PROPOSED SURFICIAL REPAIR DETAIL PLAN
NOT TO SCALE



PROPOSED SURFICIAL REPAIR DETAIL
NOT TO SCALE

DOWNSTREAM ← → UPSTREAM

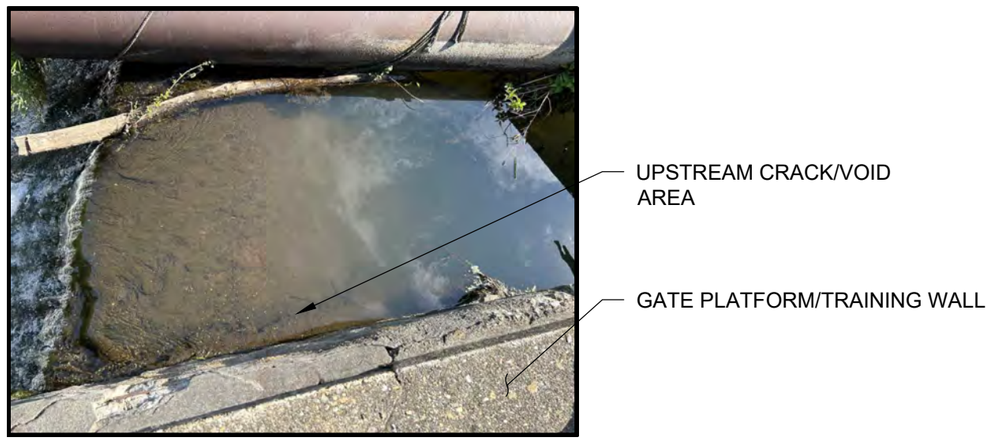


PHOTO 3 - EXISTING CONDITIONS CONCRETE SURFICIAL CRACK/VOID
NOT TO SCALE

NO.	ISSUE/DESCRIPTION	BY	DATE

APPROVED:

COLUMBIA MILL DAM
LENOX DEVELOPMENT, LLC
LEE, MASSACHUSETTS

TEMPORARY SPILLWAY CRACK/VOID REPAIR DETAIL 1

PREPARED BY:		PREPARED FOR:	
GZA GeoEnvironmental, Inc. www.gza.com		GENERAL ELECTRIC COMPANY	
PROJ MGR: SDK	REVIEWED BY: SDK	CHECKED BY: JDA	SHEET 4
DESIGNED BY: TJS	DRAWN BY: BM	SCALE: AS NOTED	
DATE: JULY, 2024	PROJECT NO. 01.0019896.70	REVISION NO. 0	

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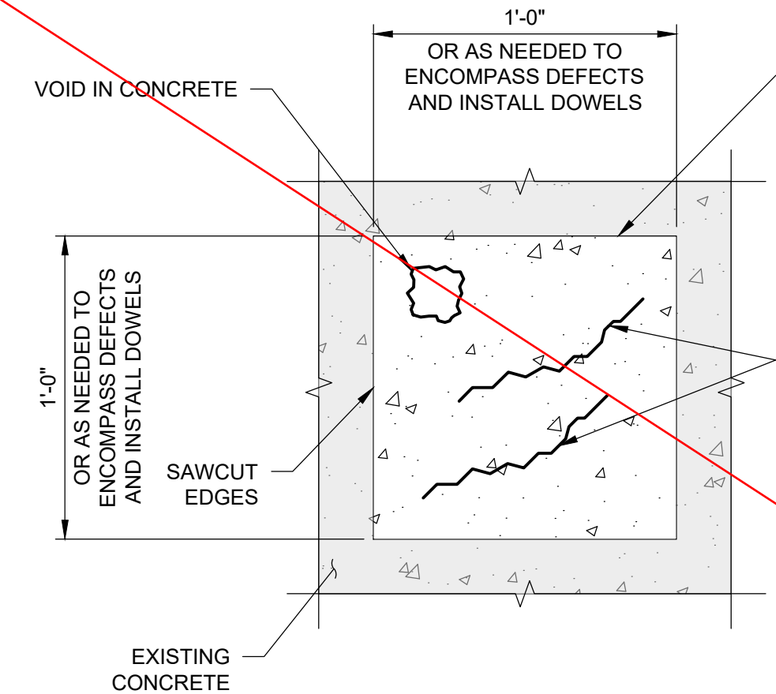
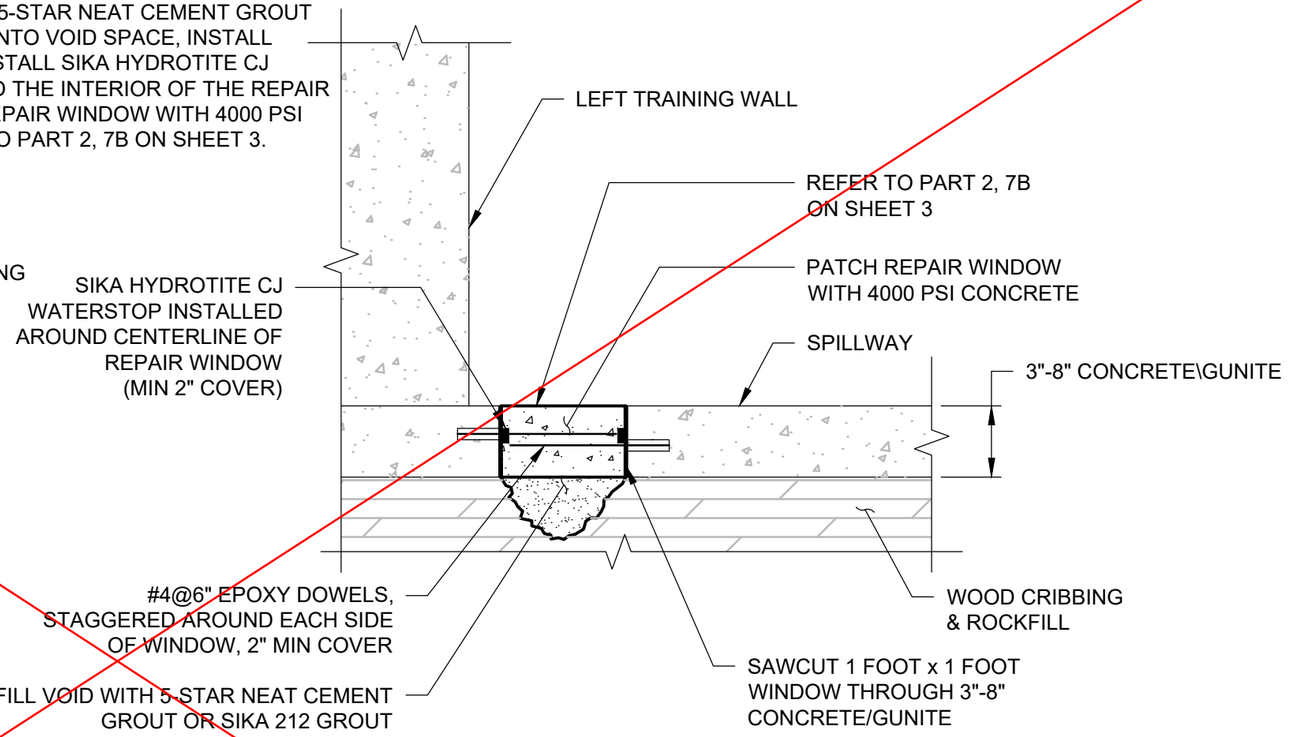


PROPOSED DEEP REPAIR DETAIL PLAN

NOT TO SCALE



PROPOSED DEEP REPAIR DETAIL SECTION

NOT TO SCALE

PHOTO 4 - PROPOSED DEEP REPAIR WINDOW

NOT TO SCALE

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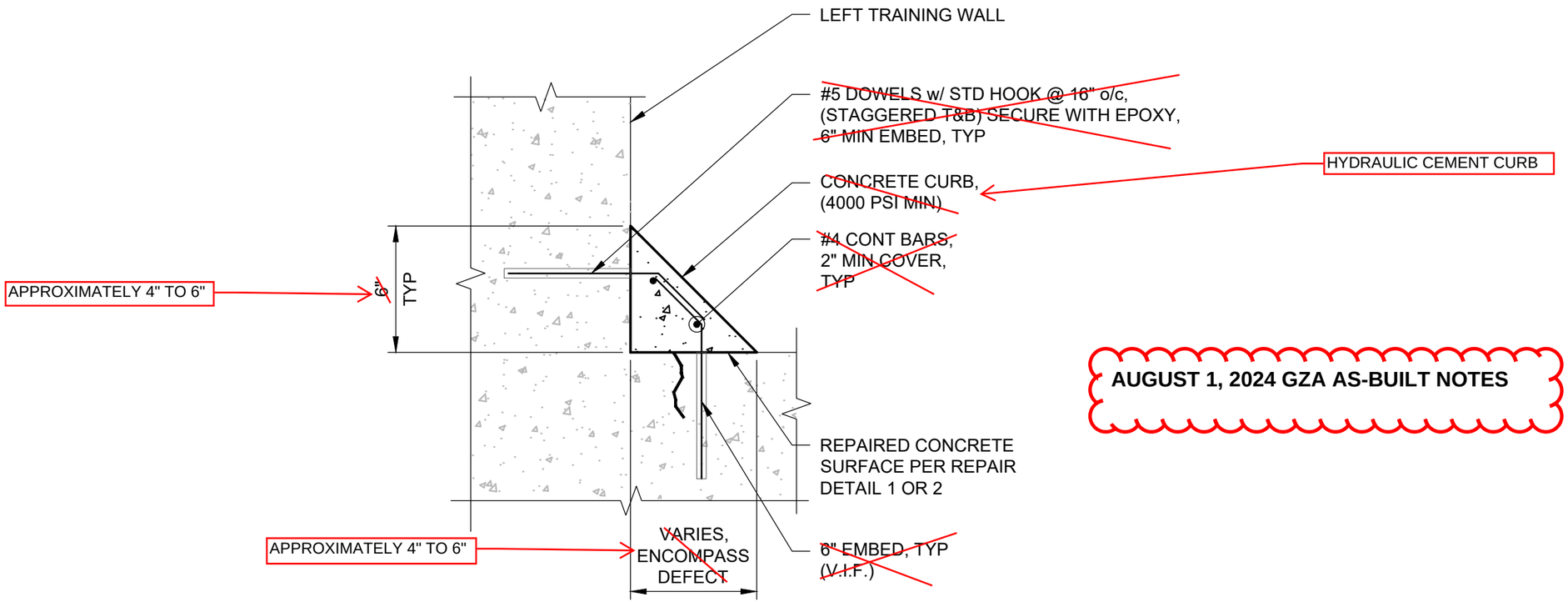
TEMPORARY SPILLWAY CRACK/VOID REPAIR DETAIL 2

PREPARED BY:		PREPARED FOR:	
GZA GeoEnvironmental, Inc. www.gza.com		GENERAL ELECTRIC COMPANY	
PROJ MGR: SDK	REVIEWED BY: SDK	CHECKED BY: JDA	SHEET 5
DESIGNED BY: TJS	DRAWN BY: BM	SCALE: AS NOTED	
DATE: JULY, 2024	PROJECT NO. 01.0019896.70	REVISION NO. 0	



PROPOSED CONCRETE CURB REPAIR DETAIL
NOT TO SCALE

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LENOX DEVELOPMENT, LLC
LEE, MASSACHUSETTS

TEMPORARY SPILLWAY CRACK/VOID REPAIR DETAIL 3

PREPARED BY:
GZA GeoEnvironmental, Inc.
www.gza.com

PREPARED FOR:
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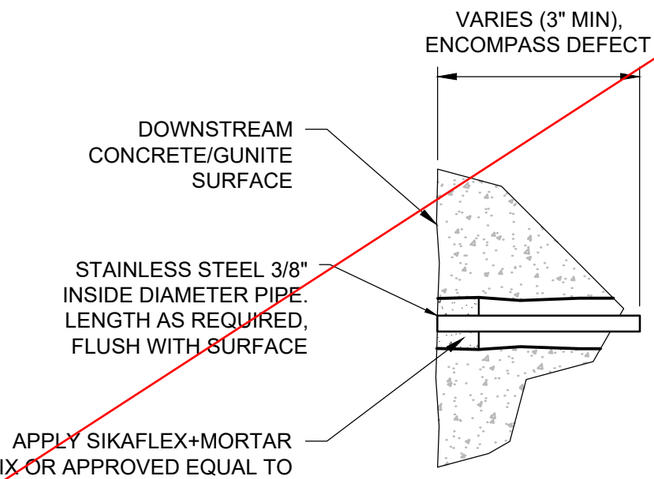
PROJ MGR: SDK	REVIEWED BY: SDK	CHECKED BY: JDA	SHEET 6
DESIGNED BY: TJS	DRAWN BY: BM	SCALE: AS NOTED	
DATE: JULY, 2024	PROJECT NO. 01.0019896.70	REVISION NO. 0	

REPOINT DOWNSTREAM DIAGONAL CRACK
NOT TO SCALE



WEEPHOLE IN REPOINTED CRACK DETAIL
NOT TO SCALE

PROBE AND MEASURE DOWNSTREAM CRACK, INSTALL WEEPHOLES AS DIRECTED BY THE ENGINEER.

AUGUST 1, 2024 GZA AS-BUILT NOTES

NO.	ISSUE/DESCRIPTION	BY	DATE

APPROVED:

COLUMBIA MILL DAM
LENOX DEVELOPMENT, LLC
LEE, MASSACHUSETTS

TEMPORARY SPILLWAY CRACK/VOID REPAIR DETAIL 4

PREPARED BY:		PREPARED FOR:	
GZA GeoEnvironmental, Inc. www.gza.com		GENERAL ELECTRIC COMPANY	
PROJ MGR: SDK	REVIEWED BY: SDK	CHECKED BY: JDA	SHEET 7
DESIGNED BY: TJS	DRAWN BY: BM	SCALE: AS NOTED	
DATE: JULY, 2024	PROJECT NO. 01.0019896.70	REVISION NO. 0	

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