INSPECTION REPORT

AMSTON LAKE DAM
CT DEEP #06704

AMES ROAD
TRIBUTARY TO RAYMOND BROOK
AMSTON / HEBRON, CONNECTICUT

PREPARED FOR:

AMSTON LAKE DISTRICT

MAY 2022

Prepared by:

KARL F. ACIMOVIC, P.E.
588 Stonehouse Road
Coventry, CT 06238

Connecticut Department of
Energy & Environmental Protection
Bureau of Water Protection & Land Reuse
Inland Water Resources Division

DAM SAFETY PROGRAM
DAM INSPECTION REPORT FORM – FOR REGULATORY INSPECTION

Part I: Summary of Dam Inspection

Dam Name:	**Amston Lake Dam**	Inspection Date(s):	**November 11, 2021**
Alternate Dam Name(s):	**North Pond Dam** **North Lake Dam**	CT Dam ID #:	**06704**
Location (Municipality):	**Hebron**	Temperature / Weather:	**Sunny, Breezy, 55ºF, (11-11-2021)**
Registered?: Yes or No If yes, provide the 9 digit registration number found on the notification letter.	**201509892** **(Registered 12-31-2015)**	Pool Level: See Instructions	**0.1' Below Spillway Crest (11-11-2021)**
Emergency Action Plan?: Yes or No If Yes, see instructions	**Yes** **(See Other Information)**	Impoundment Use: use options listed in instructions	**Conservation, Recreation, Aesthetics**
Hydraulic and Hydrologic Analysis?: Yes or No If Yes, see instructions	**Yes** **(See Other Information)**	Stability Analysis?: Yes or No If Yes, see instructions	**No** **(See Other Information)**
Overall Condition:	**Satisfactory**		

Persons present at the inspection *(select the tab button in the last cell to the right to create another row)*		
Name	**Title/Position**	**Representing**
Karl F. Acimovic, P.E.	**Consulting Engineer**	**Inspector**
Alex Acimovic	**Assistant to the Engineer**	**Inspector**

Owners and Operators: If there is more than one owner or operator, copy the empty table below for each owner or operator and paste right below the previous table, then complete the information for each

*By providing this e-mail address you are agreeing to receive official correspondence from DEEP, at this electronic address, concerning the subject report. Please remember to check your security settings to be sure you can receive e-mails from "ct.gov" addresses. Also, please notify DEEP if your e-mail address changes by email via deep.damsafety@ct.gov.

Indicate if Owner or Operator:

	Owner & Operator		
Name:	**Amston Lake District (Frank Hoisl, President)**		
Mailing Address:	**P.O. Box 95**		
City/Town:	**Amston**	State: **CT**	Zip Code: **06231**
Phone:	**(860) 810-8757**	ext.:	
Emergency Phone:	(**860) 810-8757**		
*E-mail:	**hoislfr@gmail.com**		

Part II: General Dam Information

General Description: Earth embankment dam, approximately 400 feet long, with a broad crested concrete weir spillway situated in its approximate center and a low level outlet pipe and sluice gate control chamber to the right of the spillway.			
Hazard Classification:	**B**	**Dam Height (ft):**	**10 ft.**
Dam Length (ft):	**400 ft.**	**Spillway Length (ft):**	**15 ft.**
Spillway Type:	**Broad Crested Concrete Weir**	**Normal Freeboard (ft):**	**4.5 ft.**
Drainage Area (square miles):	**1.04 sq. mi.**	**Impoundment Area (at principal spillway crest, in acres):**	**187 Ac.**
Watercourse:	**Tributary to Raymond Brook**		

History – Although no record of an Algonquin name has been found, Amston Lake appears to be either a naturally occurring impoundment (albeit at a smaller size than at present) or a classic New England swamp, and is shown as North Pond or North Lake on record maps produced as early as 1766, 1796, and 1833. The dam was raised in the mid-1800's, significantly increasing its storage, and is shown in near its current extent on the Petersen Map of 1868 and the USGS Topographic Map produced in 1892.

The current intake structure was constructed in 2003, and a new cutoff wall on the upstream side of the spillway, along with several walls through the embankment adjacent to the spillway, were installed in 2007. In 2012, an additional cutoff wall was anchored to bedrock (or to the old footing where encountered) on the upstream side of the spillway, at which time the old outlet pipe through the center of the spillway was abandoned and filled in.

Phase I Report – A Phase I report was prepared by Cahn Engineers, Inc. in June 1979 under the auspices of the Corps of Engineers, and is on file with the DEEP Dam Safety Section. The dam was rated at that time as being in poor condition. Recommendations for improvements included a study to determine the source of seepage and its elimination, the raising of the low area on the left side of the dam, a plan to remove trees within close proximity to the base of the dam, and a plan to repair eroded areas by placement of riprap in certain areas and the reestablishment of a grass cover in other areas.

Other Reports & Information – There is a substantial record of information extant for this dam, including items within the Phase I Report and on file with the DEEP Dam Safety Section. Notable items include an inspection report produced in 1945 by B.H. Palmer, at which time seepage was observed in areas not dissimilar to those still present, emphasizing the perennial nature of the issue and lending credence to the supposition that the current structure was built over swampy ground and in areas that were shallow to bedrock.

Other items on file include repair plans and as-built reports prepared by the undersigned engineer of this current report.

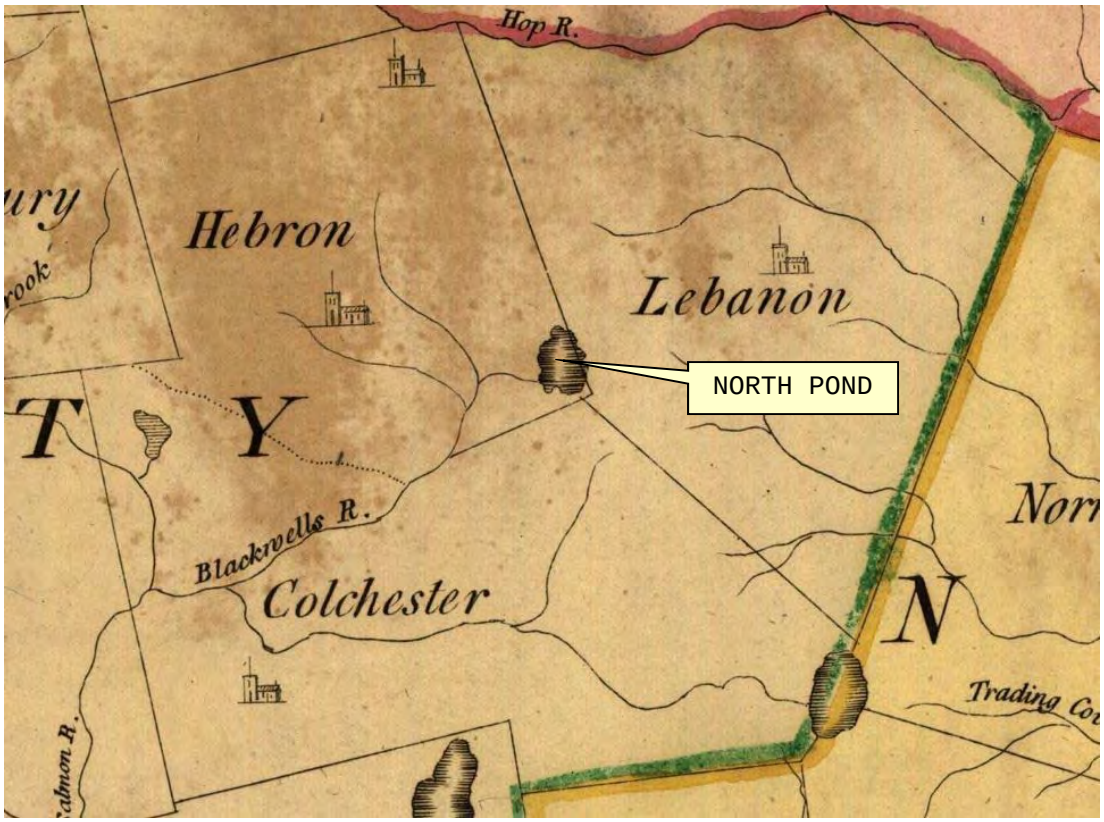
Hydrologic and Hydraulic Analysis – A hydrologic and hydraulic study of this site was conducted as a basis of the analysis for the Emergency Action Plan prepared by the undersigned engineer in 2017. At that time, it was found that the spillway was capable of passing the 100-year, the 200-year and the 500-year storm events without overtopping the dam. The 500-year outflow of 115 cfs passed through the spillway with 0.5 ft. of freeboard. The ½ PMF outflow of 383 cfs (used for subsequent breach calculations) was calculated to overtop the dam by 0.2 ft. Further reference may be made to that plan for additional information

Stability Analysis – No formal stability analysis was found in the records for this dam. Given the dam's condition and the recency of major improvements, one does not appear to be needed at this time.

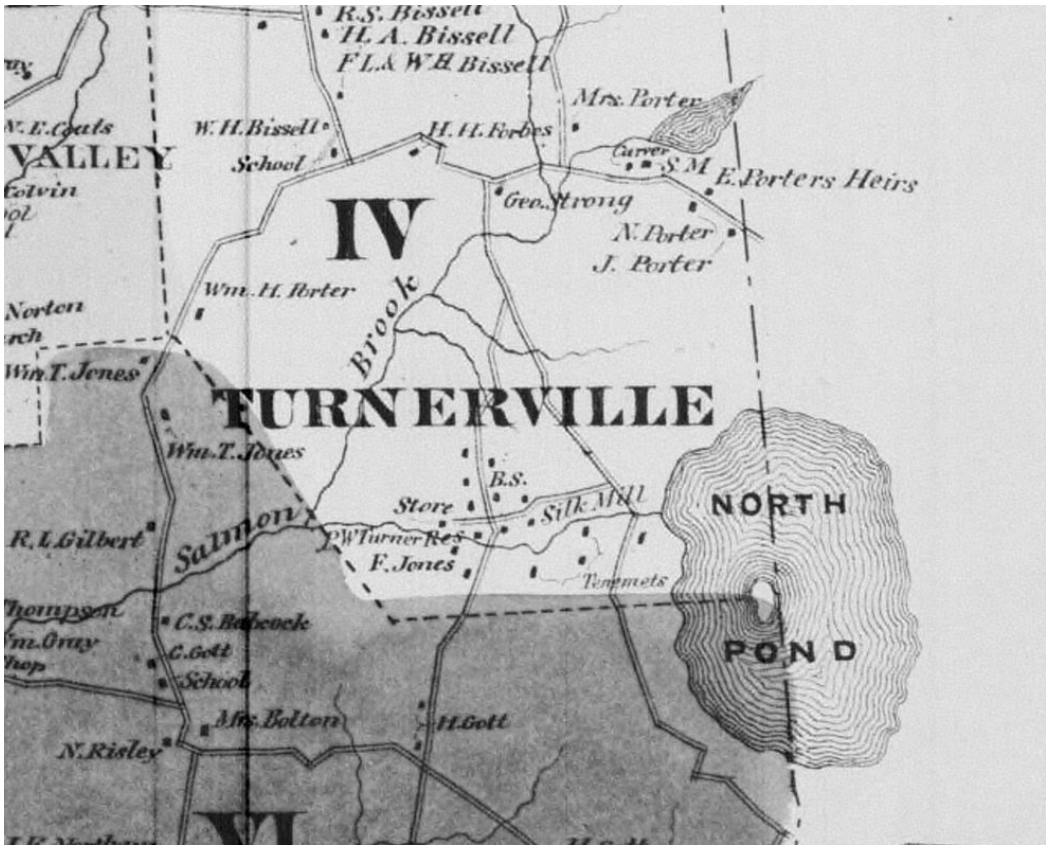
Emergency Plan – An Emergency Action Plan for Amston Lake Dam was prepared by this office in August 2017, and was subsequently approved by the DEEP Dam Safety Section. The EAP was most recently updated in April 2021 and is reviewed on a biennial schedule.

Diving Inspections – There have been several diving inspections conducted under our auspices over the last 20 years. These inspections have concentrated most especially on the seepage that continues to be encountered at or near the site of the spillway, and were also conducted at the time of the spillway reconstruction and the abandonment of the old low level outlet through the center of the spillway. What was determined during one of the inspections during the 2012 repairs was that flow on the upstream side of the dam infiltrated open bedrock joints through foliations in the rock. This flow then appeared as seepage around the outside of the spillway training walls or below the downstream base of the spillway apron

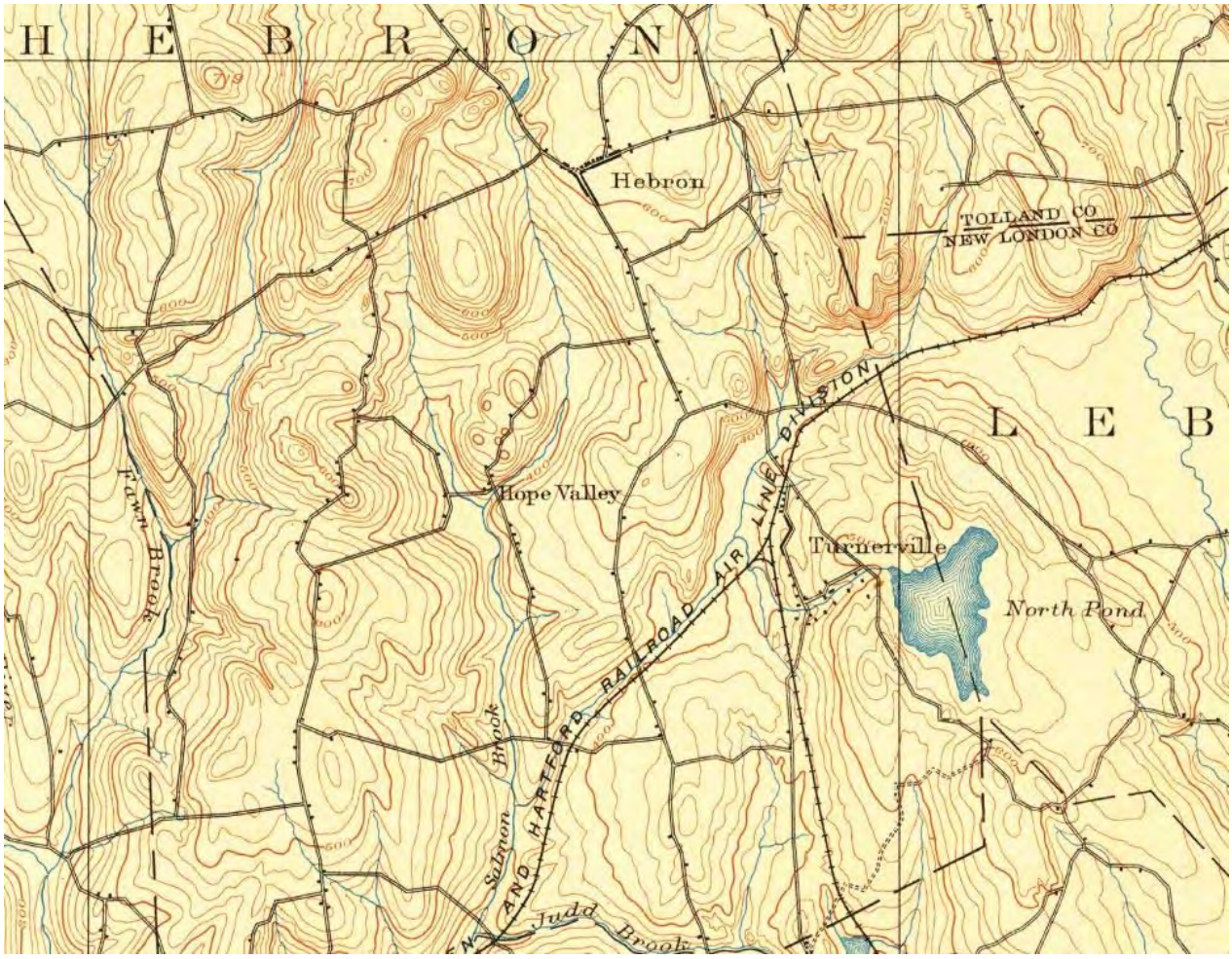
Because of this finding, it is very difficult in this case to pinpoint an exact entry point for seepage on the upstream side and, as a result, the best recommendation will be continued monitoring (see Recommendations).



Amston Lake, then known as North Pond, shown unlabeled on a 1766 map of Connecticut.
(Source: UConn MAGIC site)



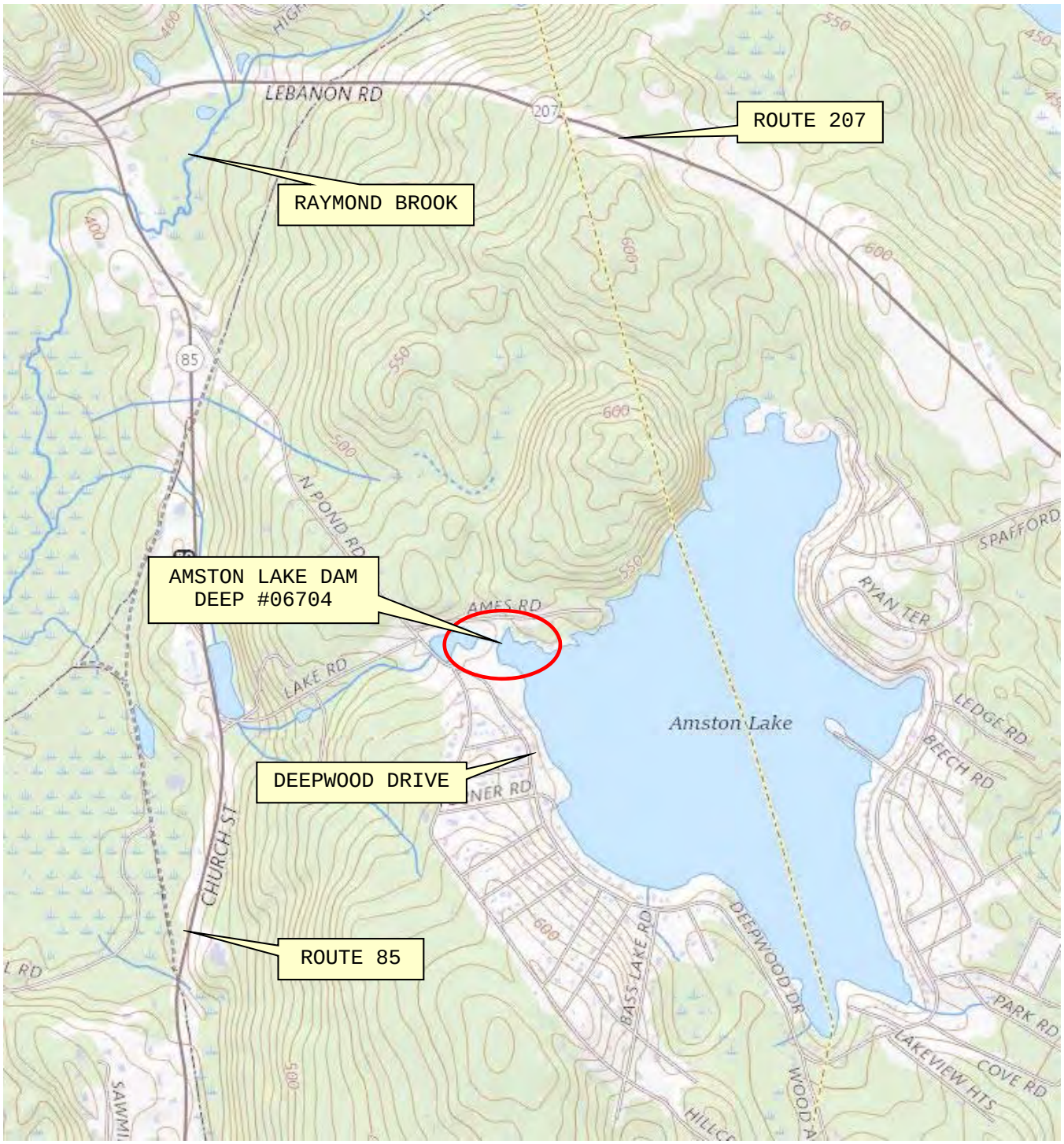
A portion of the 1868 Petersen Map of Hebron, showing North Pond and its vicinity.
(Source: UConn MAGIC site)



A portion of the 1892 USGS Topographic Map covering Hebron and Lebanon, showing North Pond and its vicinity. *(Source: UConn MAGIC site)*

Part III: Aerial Photo/Location Map

Amston Lake Dan and its vicinity. *(Source: CT ECO Mapping)*



USGS location map showing Amston Lake and its vicinity. *(Source: USGS Topographic Mapping)*

Part IV: Dam / Embankment / Dike Information

Number of Dam / Embankments / Dikes: 1

Dam / Embankment / Name: Amston Lake Dam

General Description: Earth embankment dam, approximately 400 feet long, with a broad crested concrete weir spillway situated in its approximate center and a low level outlet pipe and sluice gate control chamber to the right of the spillway.

General Condition: Satisfactory.

Concrete Condition: The tops of the embankment cutoff walls on the left and right sides appeared to be in satisfactory condition with only minor weathering noted.

Stone Masonry: Not applicable at the surface. Remnants of an older stone masonry dam were, however, discovered within and below the right side earth embankment during excavation for installation of the current gate structure and the low level outlet piping.

Settlement / Alignment / Movement: Nothing significant observed. There was, however, a small sinkhole on top of the left embankment directly adjacent to the left downstream corner of the training wall. This depression was approximately 1.2 ft. in diameter and 0.8 ft. deep.

Seepage / Foundation Drainage: No flow was observed out of either footing drain on the day of inspection. Marshy ground was noted in the left downstream toe area. This appears to be a naturally wet area from which slow groundwater seepage occurs, and is a longstanding condition.

Riprap: A mixture of intermediate and standard sized riprap is present along the upstream face of both the left and right embankment sections. It was stable and had, for the most part, been maintained clear of brush and vegetative growth on the date of the inspection.

Erosion / Burrows: None observed.

Vegetative Cover: The embankment has a grass cover, well maintained and in satisfactory condition. There were two small bushes along the right upstream slope which should be removed. Also recommended for removal are several trees on the left downstream slope and the left downstream toe, within the 25' clearing limit.

Other:

Photos / Graphics / Sketches: See Photo Report in Section XIII.

Part V: Principal Spillway, Training Walls, Apron

Number of Principal Spillways: 1

Spillway Type: Broad crested concrete weir.

General Description: A 15-ft. wide concrete spillway with concrete training walls and a concrete apron, with a short vertical drop to the brook at its downstream base.

General Condition: Satisfactory.

Concrete Condition: Satisfactory. Minor crack and seepage issues have been noted and further addressed in the Recommendations and shown in attached photos.

Stone Masonry: Not applicable.

Settlement / Alignment / Movement: None observed.

Cracks: Several minor crack issues are present and, as previously stated, have been shown specifically in the attached 21-Series photos.

Scouring / Undermining: None observed.

Seepage / Foundation Drainage: Minor seepage has been noted along the base of the two training walls near the end of the downstream apron. See photos for specific locations and additional information below under "Other".

Other: Seepage issues have been noted at the spillway location for at least the last 20 years. Cutoff walls on the upstream side have been installed to address this problem and it is, therefore, not considered a serious issue. Also, in the process of removing the older low level outlet, which had been located within the base center of the current spillway with an outlet at the bottom of the short vertical section at the downstream base, it was found that the interior of the spillway apron had several voids and was filled with stone rubble mixed with soil, extending toward the footing of the two training walls. The voids were subsequently filled with concrete to stabilize the base areas adjacent to the old pipe run wherever voids were noted. This, along with the seepage pointed out through the foliated bedrock, previously noted under the diving inspection section of Part II, General Dam Information, indicated that the seepage needs to be monitored on a long term basis and addressed as changes may occur.

Photos / Graphics / Sketches: See Photo Report in Section XIII.

Part VI: Auxiliary Spillway, Training Walls, Apron

Number of Auxiliary Spillways: 0

Auxiliary Spillway Type: Not applicable. There is no auxiliary or emergency spillway at this dam.

Part VII: Downstream Channel

Number of Downstream Channels: 1

Channel Name / Watercourse Name: Tributary to Raymond Brook

General Description: A natural, small brook channel with a small cobble base and vegetated side slopes.

General Condition: Stable and in generally good condition.

Scouring: None observed.

Debris: None observed.

Riprap: Some small riprap is present at the downstream base of the spillway apron, in the plunge pool area. It is stable and in good condition, barring some minor brush growth between some of the stones.

Other: An important note is that the brook originally (in the 1800's) ran straight just prior to the intersection of Lake Road and Route 85, passed beneath Route 85 and continued in a westerly direction to downstream mills. Sometime in the late 1800's or early 1900's, the brook was diverted to what is now Ahlberg Pond, running in a northerly direction as previously noted. Remains of a channel still exist at the Route 85 crossing and it is apparent from topographic and field data that during periods of high flow, a significant portion of the discharge from Amston Lake can pass straight across Route 85 in its original path. Reference should be made to the Emergency Action Plan for more information on this situation.

Photos / Graphics / Sketches: See Photo Report in Section XIII.

Part VIII: Intake Structure(s)

Number of Intake Structures: 1

Intake Structure Type: Sluice gate chamber.

General Description: A concrete sluice gate structure situated at the upstream shoreline of the lake, adjacent to the right side wing and cutoff walls. The interior has a trash rack, weir board slot and an 18" aluminum slide gate to control outflow and lake level.

General Condition: Good.

Concrete Condition: Satisfactory.

Stone Masonry: Not applicable.

Settlement / Alignment / Movement: None observed.

Cracks: None observed.

Other: The interior was not accessible on the day of inspection, but there were no reported operability isses.

Photos / Graphics / Sketches: See Photo Report in Section XIII.

Part IX: Outlet Structure(s)

Number of Outlet Structures: 1

Outlet Structure Type: Headwall with pipe outlet.

General Description: The outlet is a reinforced concrete wall situated directly adjacent to the right side of the downstream spillway apron wingwall. The low level outlet pipe is an 18" ductile iron pipe in good condition, flowing freely on the day of inspection.

General Condition: Good, no observed issues.

Concrete Condition: Good, no observed issues.

Stone Masonry: Not applicable.

Settlement / Alignment / Movement: None observed.

Scouring / Undermining: None observed.

Other: There are two toe drain outlets, adjacent to the two sides of the low level outlet pipe. Both pipes appeared to be in good condition; no outflow was noted from either pipe on the day of inspection.

Photos / Graphics / Sketches: See Photo Report in Section XIII.

Part X: Miscellaneous Features

Access – Entry to both sides of the dam is open and can be accessed with construction equipment if and when needed.

Boat Launch – There is no formal boat launch or ramp situated directly on the dam.

Bridges – There is no bridge over the spillway, either vehicular or pedestrian.

Dry Hydrant – None present.

Fire Hydrant – None present.

Safety / Security – There is vinyl coated chain link fencing present along the two downstream wingwalls of the spillway apron. Other than the minor growth of vines within the chain link fabric, the fencing is in good condition. The two training walls have no fencing, but do have warning signs reading “STAY CLEAR OF DAM AREA”.

Photos / Graphics / Sketches: See Section XIII.

Part XI: Downstream Hazard Classification Reassessment

Downstream Hazard Classification:

The dam is currently rated as a "**B**" hazard dam and, based on a visual inspection of available data with respect to downstream residential housing and infrastructure, it is recommended that the rating remain as is, pending any newly available data since the original assessment was completed.

Part XII: Recommendations

1. **Removal of Vegetation** – The overall dam is generally well maintained. As noted in the preceding observations, however, and shown in the following photographs, there are some areas of brush and several trees which need to be removed. The trees noted are situated along the downstream slope and toe area on the left side of the spillway. In general, DEEP guidelines and regulations require removal of trees within a 25-foot limit area of the dam's layout. Once trees, in particular, are cleared, a judgment should be made with the assistance of an engineer as to the efficacy of removing stumps and or root systems which may interfere with the safety of the dam.

2. **Spillway Seepage** – As previously noted under Part II, General Dam Information / Diving Inspections, several dives have been completed at this site over the past 20 years. In addition, as noted under Part V, Primary Spillway, upstream cutoff walls have been installed, connected either to exposed bedrock or older underlying footings or walls and, during the abandonment of an older low level outlet within the spillway apron, several void areas were filled in. These have had some success in slowing down or eliminating major seepage points, but several minor ones continue to persist, potentially caused by inflow to and through foliated sections of bedrock on the upstream side of the dam. As such, we recommend a monitoring program to observe seepage areas for quantity and quality (i.e., turbidity) of outflow. Should there be a substantial increase in the quantity of flow or should there be a cloudy appearance suggesting transport of sediment, then an Engineer or the Dam Safety Section of the DEEP should be consulted.

3. **Concrete Issues** – As pointed out within the report and shown in several photos, minor concrete cracking issues were noted. These should be repaired as soon as practicable. There are many good concrete patching and epoxy products available for this purpose; if assistance is required, an engineer should be consulted.

4. **Sinkhole** – A small sinkhole detected just above the downstream end of the left side training wall and wingwall should be cleaned out, refilled, compacted and resodded. Subsequently, it should be monitored for any changes, particularly if it should redevelop. If it reoccurs, an Engineer should be consulted to assess the potential for formation of voids behind these wall sections.

5. **Inspection and Monitoring** – This dam is rated as a "B" hazard, a significant classification. In addition to required and scheduled inspections by an Engineer at intervals prescribed by the Dam Safety Section of the Connecticut DEEP, it is recommended that the Owner check the dam at least once a year and following extreme weather events. For this purpose, the Dam Safety Section has a publication entitled "Guidelines for Inspection and Maintenance of Dams", available for download on their website at:

https://portal.ct.gov/DEEP/Water/Dams/Dam-Inspections

It is also recommended that a written record (the reference guidelines noted above have a checklist template for this purpose) be kept of any such inspection, particularly with respect to high water levels or unusual flow or seepage conditions encountered during storm events. Any unusual observation or questionable impact as a result of such events should be brought to the attention of either an Engineer or the Dam Safety Section of the DEEP.

Part XIII: Photographs/Graphics

Note: Some photos within this report may be duplicates. This is made necessary by the general requirement of the DEEP / Dam Safety inspection format which requires specific numbered views for certain portions of the dam. Hence, photos which depict more than one required feature may be shown more than once to satisfy these requirements. The numbering sequence of the photos follows that of the DEEP form.

Photo 1 – An overview of Amston Lake Dam as seen from the left upstream shoreline. For reference, the arrow points to the location of the spillway.

Photo 2 – An overview of the dam as seen from the right downstream embankment.

Photo 3a – An overview of the upstream embankment, as seen from the right abutment area.

Photo 3b – The right upstream embankment. Although there is some leaf litter present from trees on the opposite shoreline, the embankment here is stable and well maintained.

Photo 3c – A few of the right upstream embankment as seen from the right side of the spillway. Brush, such as that shown in the foreground, should be removed from the embankment

Photo 4a – An overview of the upstream embankment face as seen from the left abutment.

Photo 4b – A closer view of the left section of the left upstream embankment.

Photo 4c – A closer view of the center section of the left upstream embankment.

Photo 4d – A closer view of the right section of the left upstream embankment.

Photo 4e – An overview of the left upstream embankment as seen from the left side of the spillway.

Photo 5a – An overview of the right embankment crest as seen from the right abutment.

Photo 5b – A further on view of the crest, looking at the left side from the right.

Photo 6a – The left embankment crest as seen from the left abutment.

Photo 6b – The embankment crest as seen from the left side of the spillway, looking toward the right side abutment area.

Photo 7a – An overview of the downstream embankment as seen from the right side abutment area.

Photo 7b – The central section of the downstream embankment along the two sides of the downstream channel, looking from the right side toward the left.

Photo 8a – An overview of the left downstream embankment as seen from the left abutment.

Photo 8b – The left side of the downstream embankment.

Photo 8c – The central portion of the left downstream embankment.

Photo 8d – The left embankment nearing the spillway and downstream channel.

Photo 8e – A continued view of the downstream embankment adjacent to the downstream discharge channel, looking from the left toward the right side.

Photo 9a – The spillway approach as seen from the upstream side. The two arrows point to the upstream training wall corners.

Photo 9b – Looking down the spillway chute from the top of the weir.

Photo 10 – An overview of the spillway from the downstream side. Flow on the left is being discharged from the low level outlet.

Photo 11 – The right side spillway training wall.

Photo 12 – The left side spillway training wall.

Photo 13 – Looking down at the spillway weir, under light flow conditions.

Photo 14 – The stilling basin at the downstream end of the spillway discharge chute. The area is composed of small riprap stones and natural channel base materials, and is generally stable.

Photo 15a – The downstream channel flowing past the toe of the downstream embankment.

Photo 15b – The downstream channel, a tributary to Raymond Brook, flowing away from the dam.

Photo 16a & 19a – The upstream face of the intake structure.

Photo 16b – The exterior of the intake structure at ground level.

Photos 17 & 18 – The interior of the gatehouse and the operating mechanism inside were not accessible on the date of inspection.

Photo 19b – An overview of the downstream face of the right side wing wall, with the low level outlet pipe situated near its base.

Photo 19c – A head on view of the downstream ends of the low level outlet pipe and toe drain pipe.

Photo 19d – The downstream outlet end of the left side toe drain pipe, discharging into the stilling basin at the downstream base of the spillway.

Photo 20 – An overview of Amston Lake from the perspective of the dam (at lower right center) looking in a generally easterly direction.
(Source: Google Maps)

Photo 21a – An overview of the spillway discharge apron, showing seepage near its left and right side base, apparently emanating from the bottom interface with the training walls. Also note thin cracks along the line of flow toward the center of the apron.

Photo 21b – A closeup view of seepage collecting at the base of the spillway chute.

Photo 21c – Another view of the seepage at the base of the left side of the apron.

Photo 21d – Shrubbery along the downstream embankment face left of the spillway. Although minor in scope, this area should be cleared, and a grass cover reestablished in line with other embankment areas for ease of maintenance.

Photo 21e – A minor depression adjacent to the left side training and wing walls. This area should be filled in and monitored, particularly as it is situated above a section of the training wall wherefrom minor seepage emanation was observed.

Photo 21f – Trees present along the left downstream embankment face. This growth should be cleared from the embankments and areas with 25' thereof, and a grass cover established and maintained.

Photo 21g – Another view of the trees present along the left downstream embankment, seen from the opposite perspective.

Photo 21h – Minor brush and debris to be removed from the right upstream side.

Photo 21i – Cracking and deterioration at the downstream corner of the right side training wall. This issue appears to have been caused by the adjacent fence post set into the concrete with expansive grout, which has prompted the cracking and chipping.

Photo 21j – For comparison purposes, the end post atop the left side wing wall has a bracket attachment rather than being set into the wall. No concrete issues are present.

Photo 21k – A section of minor concrete deterioration along the downstream face of the right side wing wall. This area should be cleared and patched.

Photo 21l – Two concrete areas with minor issues, one a longitudinal crack at the top and a small open crack at the right bottom base.

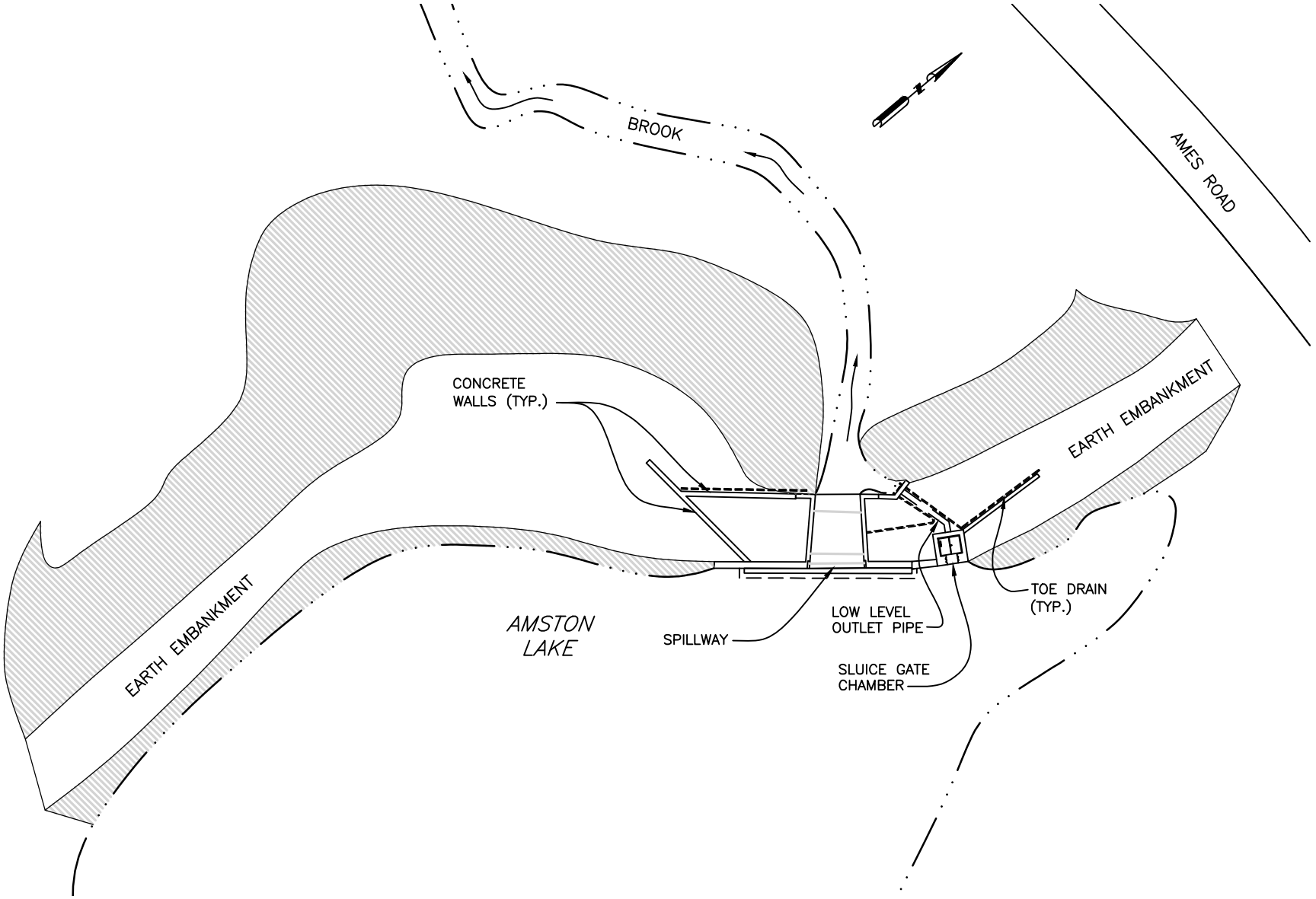
Photo 21m – A closeup of the top crack in the prior photo.

Photo 21n – A closeup of the lower right side crack issue at the base of the training wall.

Photo 21o – A small area of cracked grout at the joint along the base of the right side training wall near the bottom of the apron.

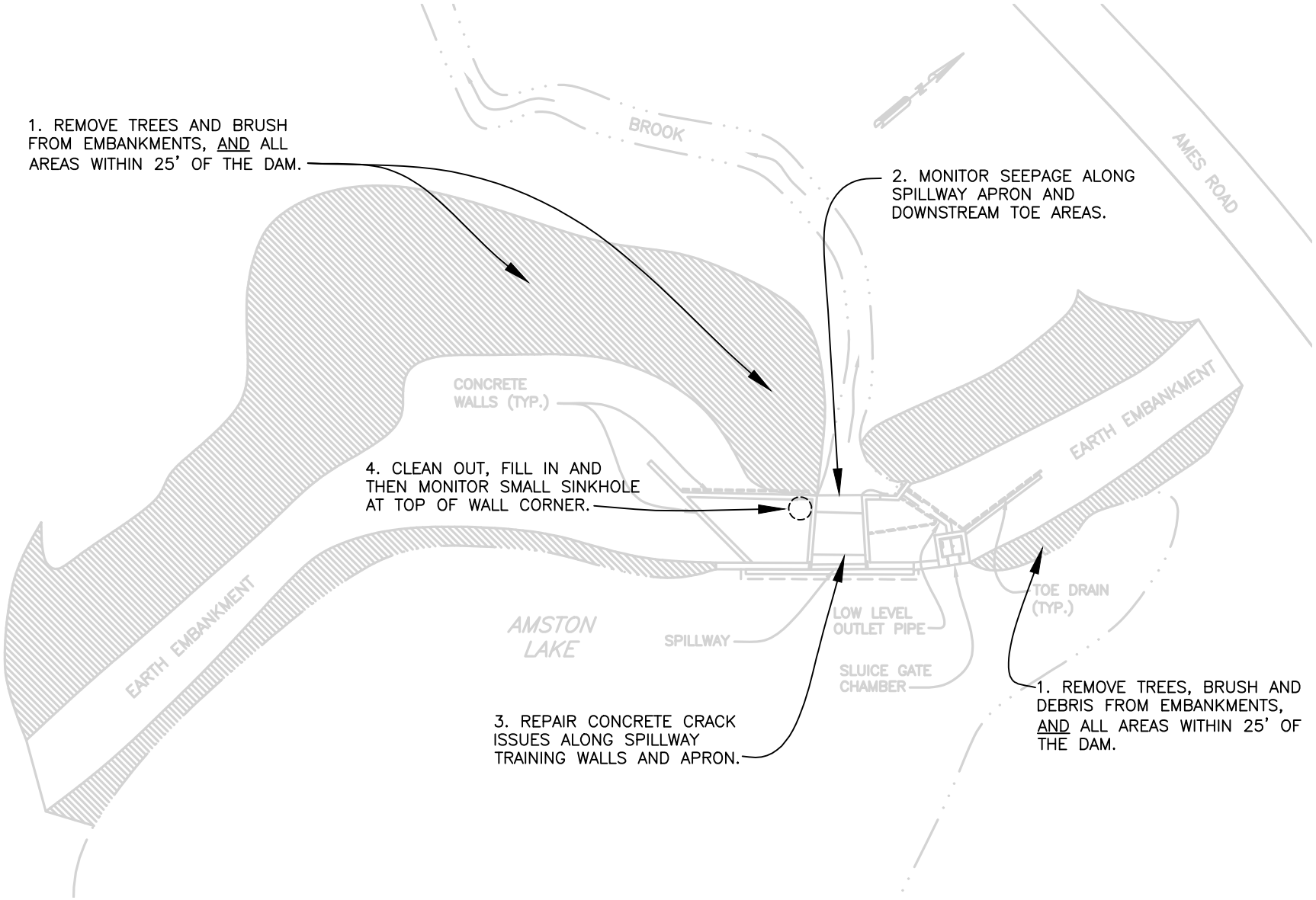
Part XIV: Sketches

See attached site plans / sketches.



AMSTON LAKE DAM
EXISTING CONDITIONS

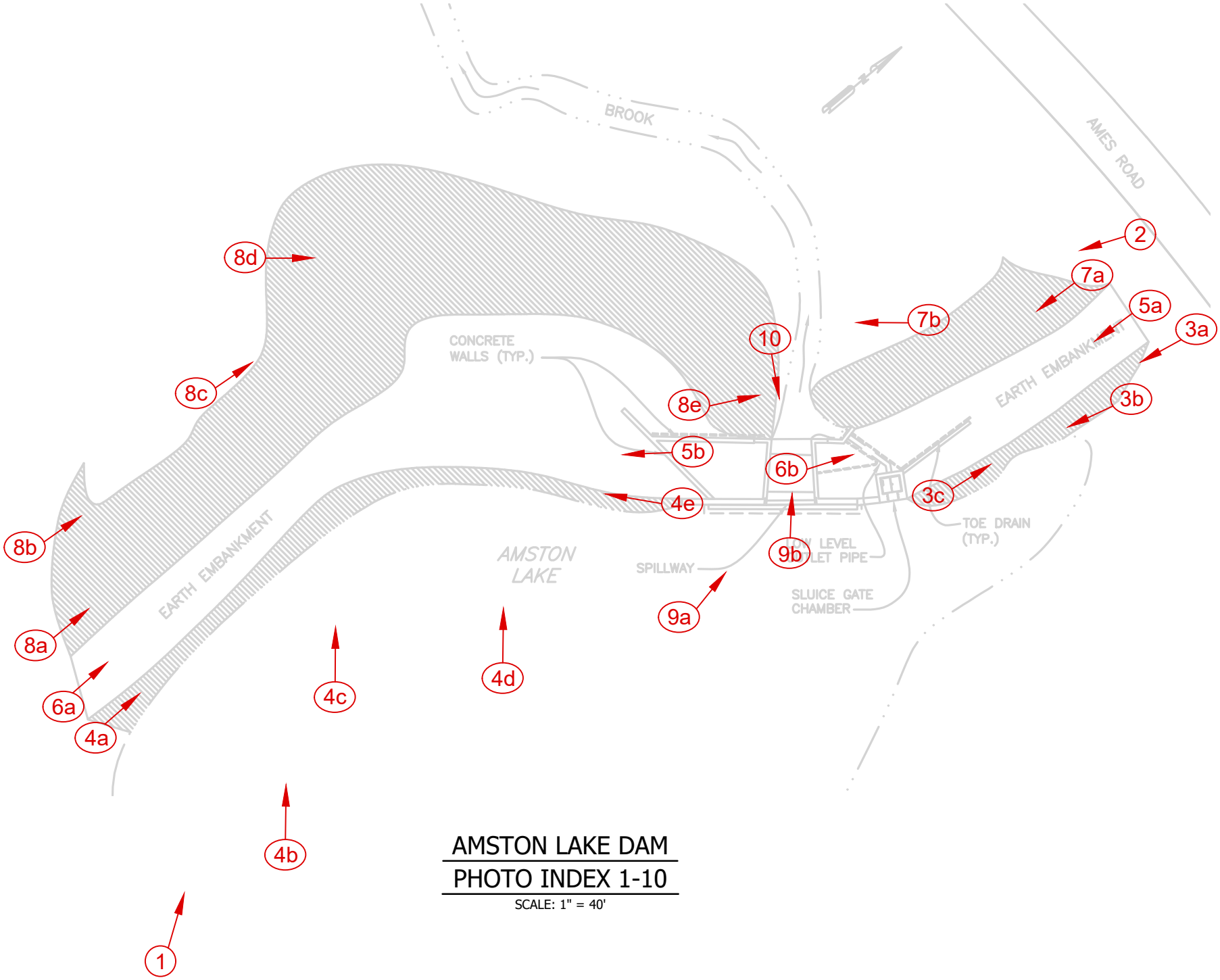
SCALE: 1" = 40'



AMSTON LAKE DAM
RECOMMENDATIONS

SCALE: 1" = 40'

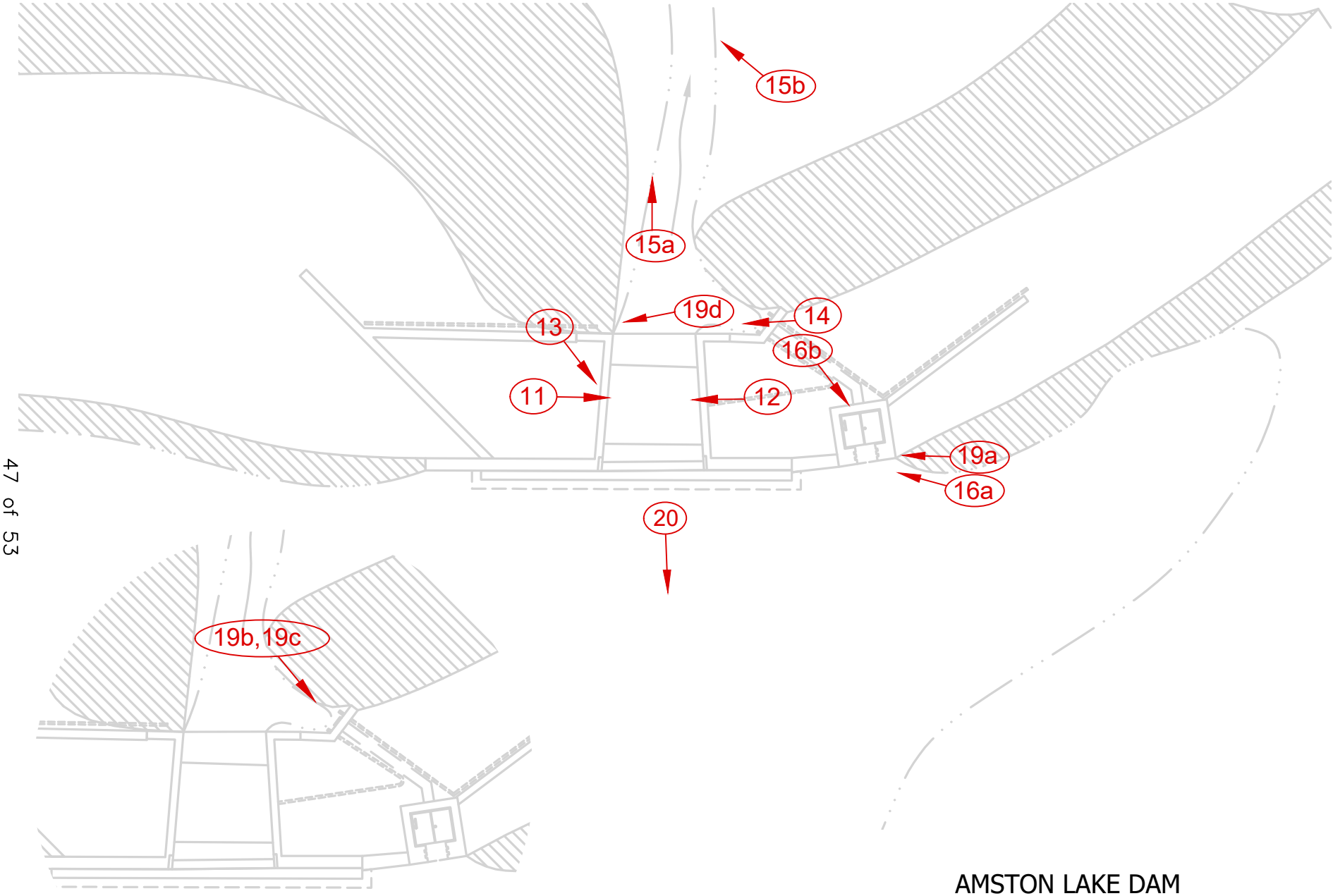
5. FOR GENERAL MAINTENANCE AND MONITORING RECOMMENDATIONS SEE REPORT NARRATIVE.



AMSTON LAKE DAM

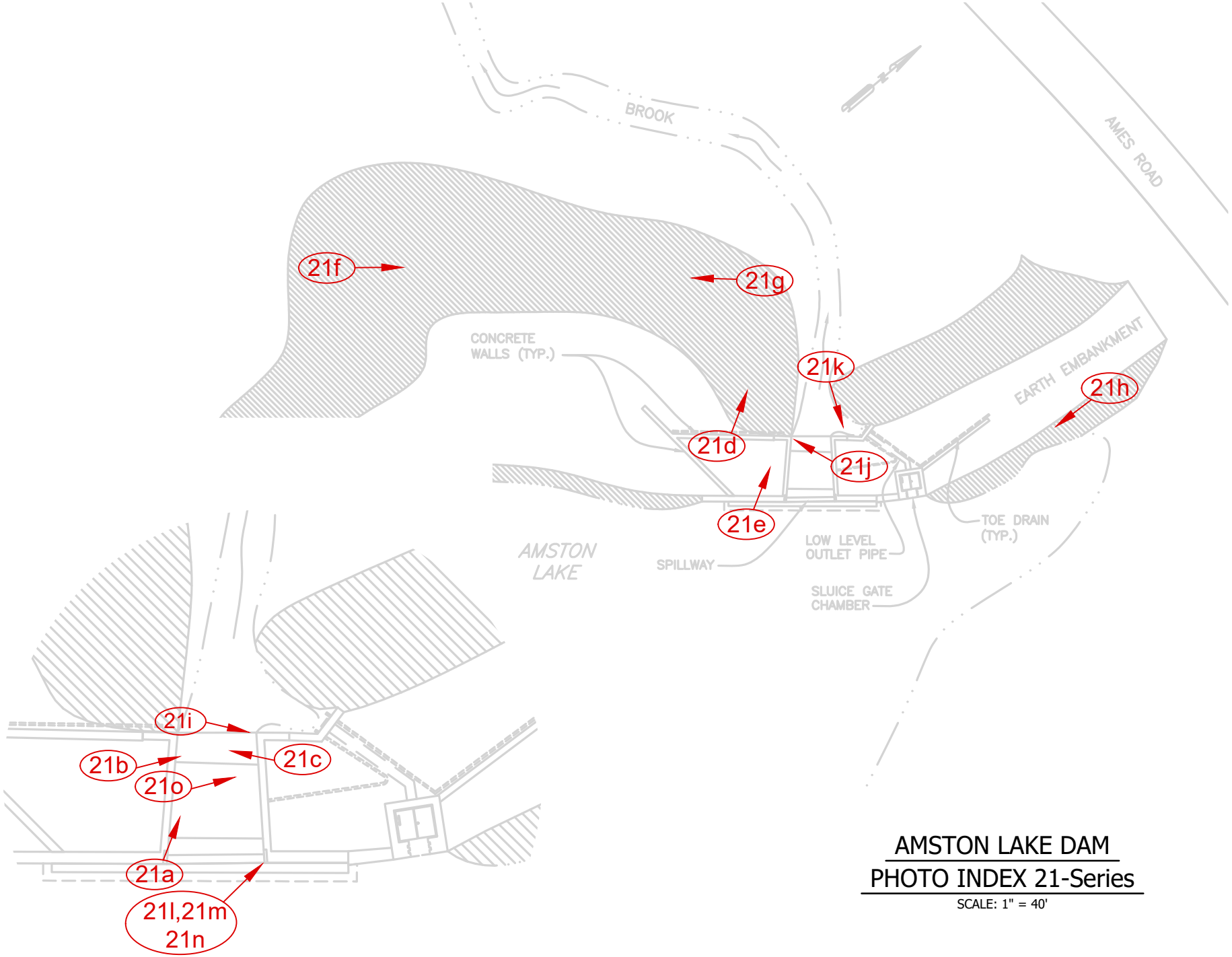
PHOTO INDEX 1-10

SCALE: 1" = 40'



AMSTON LAKE DAM
PHOTO INDEX 11-20

SCALE: 1" = 20'



AMSTON LAKE DAM
PHOTO INDEX 21-Series
SCALE: 1" = 40'

Part XV: Professional Engineer Certification

The following certification must be signed by a Professional Engineer

"I hereby certify that the information provided in this report has been examined by me and found to be true and correct in my professional judgment."

Karl F. Acimovic 06/15/2022

Signature of Professional Engineer | Date

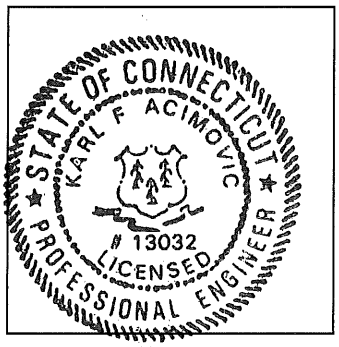
Karl F. Acimovic, P.E. | Title | **13032**

Printed Name of Professional Engineer | CT P.E. Number

Karl F. Acimovic, P.E. & L.S., Consulting Engineer

Name of Firm

Affix P.E. Stamp Here



Part XVI: Owner Signature

The following statement must be signed by the Owner(s) of the subject Dam.

"The information provided in this report has been examined by me."	
Frank Hoisl	6-11-22
Signature of Owner	Date
FRANK HOISL	ALD PRESIDENT
Name of Owner (print or type)	Title (if applicable)
Signature of Owner	Date
Name of Owner (print or type)	Title (if applicable)
Signature of Owner	Date
Name of Owner (print or type)	Title (if applicable)
Signature of Owner	Date
Name of Owner (print or type)	Title (if applicable)

Note: Mail the completed inspection report to:

DAM SAFETY PROGRAM
INLAND WATER RESOURCES DIVISION
CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106

In addition, please send this completed report converted to Adobe portable document format (pdf) including a scan of the signature page via email to: DEEP.DamSafety@ct.gov

Appendix A: Overall Dam Condition Selection Standards

Condition	Definition
Good	Through file research and after a thorough visual inspection it has been determined that the dam is well maintained and no existing dam safety deficiencies are recognized. Only continued routine maintenance is required.
Satisfactory	Through file research and after a thorough visual inspection it has been determined that no significant deficiencies are recognized. Only minor maintenance is required and only minor flaws are noted.
Fair	Through file research and after a thorough visual inspection it has been determined that there are no critical deficiencies with the dam that would require engineering analysis with the following exception: the engineer may recommend that a hydrologic and hydraulic analysis be conducted due to the lack of adequate freeboard and/or the lack of spillway capacity documentation. A condition exists at the dam that may require some sort of additional monitoring.
Poor	Through file research and after a thorough visual inspection it has been determined that deficiencies are recognized that require engineering analysis and/or remedial action.
Unsatisfactory	Through file research and after a thorough visual inspection it has been determined that a deficiency is recognized that requires immediate or emergency action. Administrative/Enforcement action may be required as determined by the Dam Safety Program. Reservoir level restrictions may be necessary until the problem is resolved.

Appendix B - Hazard Classification of Dams

I. A Class AA dam is a negligible hazard potential dam which, if it were to fail, would result in the following:

(i) no measurable damage to roadways;
(ii) no measurable damage to land and structures;
(iii) negligible economic loss.

II. A Class A dam is a low hazard potential dam which, if it were to fail, would result in any of the following:

(i) damage to agricultural land;
(ii) damage to unimproved roadways (less than 100 ADT);
(iii) minimal economic loss.

III. A Class BB dam is a moderate hazard potential dam which, if it were to fail, would result in any of the following:

(i) damage to normally unoccupied storage structures;
(ii) damage to low volume roadways (less than 500 ADT);
(iii) moderate economic loss.

IV. A Class B dam is a significant hazard potential dam which, if it were to fail, would result in any of the following:

(i) possible loss of life;
(ii) minor damage to habitable structures, residences, hospitals, convalescent homes, schools, etc;
(iii) damage to or interruption of the use of service of utilities;
(iv) damage to primary roadways (less than 1500 ADT) and railroads;
(v) significant economic loss.

V. A Class C dam is a high hazard potential dam which, if it were to fail, would result in any of the following:

(i) probable loss of life;
(ii) major damage to habitable structures, residences, hospitals, convalescent homes, schools, etc;
(iii) damage to main highways (greater than 1500 ADT);
(iv) great economic loss.

Appendix C - PHOTOGRAPH INSTRUCTIONS

All photographs shall be color photographs. Photographs shall be clear and include scale references where applicable. Photographs shall include, but not be limited to the following:

1. Overview of dam(s)/dike(s) from upstream

2. Overview of dam(s)/dike(s) from downstream

3. Overview of upstream face from right abutment

4. Overview of upstream face from left abutment

5. Overview of dam crest from right abutment

6. Overview of dam crest from left abutment

7. Overview of downstream face from right abutment

8. Overview of downstream face from left abutment

9. Overview of spillway(s) from upstream

10. Overview of spillway(s) from downstream (tailrace or channel area)

11. Overview of right training wall(s)

12. Overview of left training wall(s)

13. Overview of weir

14. Overview of stilling basin

15. Overview of downstream channel

16. Overview of gatehouse exterior

17. Overview of gatehouse interior

18. Overview of operators

19. Outlet inlets and discharge points

20. Overview of reservoir area

21. Areas of specific deficiencies (e.g., cracks, erosion, displacement, seeps, deterioration, etc.)