

Ashuelot Pond Dam Rehabilitation Project

(State ID #D245005)
Washington, New Hampshire

Conceptual Alternatives Analysis
September 14, 2026



Prepared for:



Ashuelot Pond Dam Village District
P.O. Box 105
Washington, NH 03280

Submitted By:



Dubois & King, Inc
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TECHNICAL MEMORANDUM
831468 Ashuelot Pond Dam

Date: September 14, 2026
To: Ashuelot Pond Dam Village District
From: Charles Johnston, P.E., Evan Joaquin, E.I.
Subject: Ashuelot Pond Dam, Washington, New Hampshire (State ID #D245005)
Conceptual Alternatives Analysis

DuBois & King, Inc. (D&K) has been engaged by the Ashuelot Pond Dam Village District (APDVD) to evaluate rehabilitation alternatives for Ashuelot Pond Dam. The evaluation is based on the dam's classification as a high-hazard potential structure, as outlined in the Hydrologic and Hydraulic Analysis memorandum dated July 31, 2026. This classification is currently under review by the New Hampshire Department of Environmental Services Dam Bureau (NHDES); however, a change in classification is considered unlikely.

This analysis evaluates a rehabilitation alternative previously presented to APDVD by NH Dams LLC, along with two additional alternatives developed by D&K. The alternatives presented herein are not intended to represent an exhaustive evaluation of all possible rehabilitation approaches. Rather, they are intended to provide a range of potential costs, hydraulic performance, and overall impacts to the dam and Ashuelot Pond.

The rehabilitation alternatives are described within this memorandum along with associated hydraulic modeling results and probable construction costs. The purpose of this analysis is to provide APDVD with information necessary to discuss the future of the dam and to direct D&K toward a preferred design approach for the future rehabilitation design and permitting phase.

The future rehabilitation project may consist of one of the three alternatives presented herein or may follow an entirely different approach. The alternatives presented in this memorandum are intended to provide APDVD, the District, and the Town of Washington with an understanding of the general magnitude of the potential rehabilitation scope and cost.

1.0 BACKGROUND

Ashuelot Pond Dam is an earthen embankment dam located in Washington, New Hampshire. NHDES has determined the dam to be in poor condition due to several factors, including its failure to meet current dam safety standards and continued deterioration of the structure.

The dam was reportedly constructed in 1872 and reconstructed in 1925. The structure consists of stone masonry walls on the upstream and downstream sides containing an earthen embankment. Southeast of the fishing access, the dam extends approximately 175 feet along the shoreline to the principal spillway. The dam embankment crest is approximately elevation 1446.5 feet, or approximately 4.5 feet above the normal pond pool.





The principal spillway consists of a concrete and stone structure approximately 37 feet long between the dam and the southern shoreline. This structure serves as one of the primary hydraulic outlets for the pond and has a crest elevation of approximately 1442.7 feet. The concrete between the rocks that form the weir is in poor condition, and water was observed to flow continuously through the rocks and into the downstream channel.

Approximately midway along the dam is a gatehouse containing the pond drain system. The system includes an intake at the bottom of the upstream stone wall, a stop-log wall and gate system, and a concrete outlet tunnel. The system

can be operated to lower the pond approximately 12 feet.

Approximately 600 feet southeast of the dam is an additional stone and concrete spillway, referred to herein as the "far spillway." Based on aerial imagery and conditions observed during a site visit, this spillway appears to be the controlling hydraulic feature for the pond and maintains the normal pool at approximately elevation 1442.0 feet based on LiDAR data. Similar to the principal spillway, water was observed to continuously flow through the rocks and concrete.



APDVD has been working with NHDES and engineering consultants for several years to address deficiencies at the dam and develop a long-term rehabilitation approach. In August 2022, NHDES issued a Letter of Deficiency (LOD) (**Attachment C**) identifying several required maintenance, repair, and evaluation activities. These items included repairs and replacement of the existing gate, evaluation and maintenance of the outlet structures, documentation of access and maintenance rights to the far spillway, seepage monitoring, updates to the Operation, Maintenance, and Response (OMR) documentation, vegetation removal, an updated Emergency Action Plan, hydrologic and hydraulic evaluation, dam breach analysis, and development of plans for permanent gate replacement.

APDVD subsequently undertook repairs to the gate and gatehouse system. In October 2022, work began on the gate structure, including underwater concrete and steel work. A new gate was installed in December 2022 and was successfully operated to perform the traditional three-foot drawdown. Additional work was subsequently completed to facilitate permanent operation of the gate, including installation of an actuator in 2024. APDVD's project records indicate that the actuator was installed and functioning as of July 2024.

The gate and gatehouse improvements addressed the immediate operational deficiencies associated with the pond drain system; however, the long-term rehabilitation of the dam remained necessary to address the dam's hydraulic capacity and overtopping condition.

In July 2024, NH Dams LLC reported that the hydrologic evaluation had been completed and that the dam did not meet the required freeboard criteria under existing conditions. At that time, potential modifications to the near spillway, including replacement of the existing granite masonry block with flashboards, were

being evaluated to improve discharge capacity. NH Dams LLC also identified overtopping protection as the anticipated method of stabilizing the dam during a high-water event. A pedestrian bridge was also anticipated as part of the future repair design to eliminate the need for people to cross the principal spillway when water is flowing over the spillway.

The APDVD project records indicate that the 2022 NHDES Letter of Deficiency was formally closed in March 2025 after the identified requirements were completed. Closure of the LOD did not eliminate the need for long-term rehabilitation of the dam; rather, the District continued to evaluate options for addressing the dam's hydraulic capacity and developing a permanent rehabilitation approach.

In February 2026, APDVD developed and circulated a request for proposals to engineering firms to advance rehabilitation planning and dam maintenance efforts. In April 2026, APDVD entered into a contract with DuBois & King, Inc. (D&K) for engineering services.

D&K's work has included review of the previous rehabilitation concepts, completion and refinement of hydrologic and hydraulic modeling, and development of additional rehabilitation alternatives. The hydrologic work was completed and submitted to NHDES for review in August 2026.

2.0 DEFICIENCIES

Ashuelot Pond Dam has several deficiencies that require consideration as part of the long-term rehabilitation of the structure. These deficiencies include inadequate hydraulic capacity, the condition and configuration of the existing spillway system, reliance on the existing stone masonry walls for embankment stability, and public safety concerns associated with access across the principal spillway.

i. Hydraulic Capacity

NHDES regulation Env-Wr 303.10, "Discharge Capacity," requires high-hazard dams to pass the 1,000-year inflow design flood (IDF) with one foot of freeboard and without manual operation of the dam.

The existing Ashuelot Pond Dam does not meet this requirement. The existing spillways provide significant discharge capacity; however, the combined capacity is not sufficient to maintain the required one foot of freeboard during the 1,000-year IDF. Based on D&K's hydrologic and hydraulic modeling, the existing dam overtops by approximately 13 inches during the 1,000-year design event when the principal spillway, far spillway, and top of dam are considered as available hydraulic outlets.

The July 2024 hydrologic evaluation prepared for APDVD by NH Dams LLC similarly concluded that the dam did not meet the required freeboard under existing conditions. At that time, NH Dams LLC identified potential modifications to the near spillway, including replacement of the existing granite masonry block with flashboards, as a potential means of increasing discharge capacity. The evaluation also identified overtopping protection as the anticipated method of stabilizing the dam during a high-water event.

D&K's current analysis builds upon this previous work and evaluates alternatives that address the hydraulic deficiency through either increased spillway capacity, overtopping protection, or a combination of these approaches.

ii. Existing Dam and Spillway Conditions

The existing dam embankment relies in part on the stability and condition of the stone masonry walls located along the upstream and downstream sides of the embankment. The existing principal spillway is constructed of concrete and stone, with water observed to pass continuously through voids in the



existing masonry and concrete. The far spillway similarly consists of stone and concrete and was observed to have continuous flow through the existing structure.

These conditions are important considerations when evaluating rehabilitation alternatives. Any long-term rehabilitation should provide a defined and stable hydraulic flow path during significant storm events while reducing the potential for uncontrolled erosion or deterioration of the existing embankment. The 2022 LOD noted that there had been historic sinkholes above the upstream wall and adjacent to the gatehouse which could be signs of internal erosion of the earthen embankment.

The condition of the existing principal spillway also presents a consideration for future rehabilitation. Replacement or substantial modification of this structure would require significant construction within and immediately adjacent to the existing dam and would introduce additional water-control requirements during construction.

iii. Public Safety and Camp Access

Several camps located on the southeast side of the dam are currently accessed either by boat or by crossing the principal spillway. Crossing the principal spillway presents a public safety concern, particularly during periods when water is flowing across or through the spillway.

As part of the previous rehabilitation planning, APDVD and its consultants identified incorporation of a pedestrian bridge into the final repair design as a means of eliminating the need for people to cross the spillway while water is flowing.

The bridge and associated access improvements are not the primary focus of this Conceptual Alternatives Analysis; however, they should be considered as part of the subsequent design phase and coordinated with the selected rehabilitation alternative.



iv. Need for Long-Term Rehabilitation

The 2022 NHDES Letter of Deficiency included several maintenance, repair, operational, and evaluation requirements. APDVD's project records indicate that the requirements of the LOD were subsequently completed and that NHDES formally closed the LOD on March 3, 2025.

Closure of the LOD does not eliminate the need for long-term rehabilitation of the dam. The current H&H evaluation demonstrates that the existing dam does not provide the hydraulic capacity required for a high-hazard dam under the 1,000-year IDF. Therefore, a permanent rehabilitation project remains necessary to address the hydraulic deficiency and provide an appropriate level of protection for the dam embankment during significant flood events.

The principal deficiency driving the alternatives evaluated in this memorandum is therefore the inadequate hydraulic capacity of the existing dam and the resulting potential for uncontrolled overtopping of the embankment. The rehabilitation approach should address this deficiency while also considering the existing spillway condition, construction access and water-control requirements, public safety, long-term maintenance, and overall project cost.

The alternatives evaluated in Section 3 have been developed to address this deficiency using different approaches. Alternative A combines increased principal spillway capacity with limited crest raising and geocell armoring. Alternative B provides substantially increased principal spillway capacity through construction of a new labyrinth weir. Alternative C instead provides a defined and armored overtopping flow path across the dam crest and downstream slope while retaining the existing principal spillway.

The relative hydraulic performance, construction requirements, estimated costs, and other considerations associated with each approach are discussed in the following section.

3.0 ALTERNATIVES

The conceptual Alternatives Analysis builds upon the previous work completed for the dam and evaluates three potential approaches for addressing the dam's hydraulic capacity and overtopping condition. Alternative A is based on the rehabilitation concept previously developed by NH Dams LLC, while Alternatives B and C were developed by D&K. The alternatives are intended to provide APDVD with a range of potential rehabilitation approaches, anticipated costs, hydraulic performance, and construction considerations to support selection of a preferred rehabilitation approach.

Site plans for the conceptual alternatives (**Attachment A**) were developed to illustrate the general configuration of each alternative and to estimate the quantities of materials anticipated to construct the proposed improvements. Opinions of probable construction cost (**Attachment B**) were developed using the NHDOT Weighted Average Unit Prices Report and, where noted, pricing obtained from specific product vendors. The costs presented are conceptual in nature and are intended to provide a reasonable range for comparison of the alternatives rather than a detailed construction estimate. Because the alternatives evaluated are conceptual in nature and have not yet been developed to a construction-ready level of design, a 30 percent construction contingency has also been included in the conceptual construction cost estimates to account for uncertainties in quantities, site conditions, and construction requirements.

It should also be recognized that future operation and rehabilitation of the dam may be affected by the State of New Hampshire's ongoing Instream Flow planning for the Ashuelot River. APDVD reports that the Ashuelot River is one of the designated rivers currently being evaluated under the State's Instream Flow Program. The program may ultimately result in an action plan governing water releases from dams along the river. Any future requirements resulting from this process should be considered during subsequent design and permitting of the selected rehabilitation alternative.

i. Alternative A

Alternative A, originally developed by NH Dams LLC, involves removal and replacement of the principal spillway and installation of 4-inch geocell armoring along the entire length of the dam. The dam crest would be raised six inches, from elevation 1446.5 feet to elevation 1447.0 feet.

This alternative would consist of:

- A new concrete principal spillway with a crest elevation of 1441.3 feet. In addition, 18-inch flashboards would be added to maintain the previous stone/concrete spillway elevation.
- A geocell system infilled with loam would cover the crest of the embankment dam to protect it from overtopping flows at a crest elevation of 1447-feet.

- The geocell system would be keyed to proposed stone fill along the toe of the downstream wall of the dam.

During discussions with NHDES, it was noted that geocell armoring systems have received mixed acceptance for dam overtopping protection. The performance of these systems is highly dependent on the anchorage design and the hydraulic forces generated by overtopping flows, including flow depth and velocity. To assess the feasibility of this alternative, D&K recreated the design in the GeoHEC-HMS model developed for the hazard classification confirmation analysis.

Model results indicate that the dam would overtop by approximately 0.4 feet during the Inflow Design Flood (IDF), with a peak overtopping velocity of approximately 1.9 feet per second. While these hydraulic conditions are generally within the acceptable limits for the proposed geocell system, the analysis relies heavily on the performance of the flashboards.

The proposed flashboard system consists of boards secured by steel dowels that are designed to fail once flow depths exceed a predetermined threshold. To achieve acceptable IDF performance in the model, it was assumed that the flashboards would fail at Elevation 1445.5 feet, corresponding to approximately 2.7 feet of water overtopping the boards. This failure elevation is approximately equal to the maximum pool elevation associated with the 100-year storm event.

A further concern with the original NH Dams concept is that it did not include provisions for adequately containing overtopping flows. Near the fishing access area and parking lot, a localized low area exists that could allow water to bypass the armored portion of the dam and flow around the embankment. Without additional protection, erosion in this area could initiate a breach. To address this issue, D&K incorporated grading improvements near the boat launch parking area and added a concrete block wall at the abutment to confine overtopping flows within the protected section of the dam.

This alternative was modeled in GeoHEC-HMS to evaluate its hydraulic performance during the IDF. The modeling results are summarized in Table 1.

Table 1. Hydraulic Performance of Alternative A

Peak WSEL (ft)	Outflow (cfs)				Overtopping (ft) (Crest el. 1447.0')	Peak Velocity Over Crest (fps)
	Dam Crest	Near Spillway	Far Spillway	Total Outflow		
1447.4	135	1769	2649	4553	0.4	1.9

The geocell structure would be anchored to the existing dam embankment using J-hook anchors. The total area of geocell armor to be installed is approximately 400 square yards. Vodaland's 4-inch Geocell product, priced at approximately \$13 per square yard, was used as the product reference for this alternative.

Other work and costs associated with this alternative include:

- Removal of the 20 cubic yards (CY) of stone and concrete existing principal spillway structure estimated at \$160 / CY
- Excavation of 155 CY of embankment material for the installation of the armoring and the proposed principal spillway structure estimated at \$35 / CY
- Cast-in-place 29 CY concrete for the new principal spillway estimated at \$1,300 / CY
- Keyed 131 CY Stone Layer estimated at \$85 / CY
- Control of Water, Erosion Prevention and Sediment Control, Clearing and Grubbing, Restoration of Surfaces, Mobilization and Demobilization.

D&K's conceptual construction cost estimate for Alternative A is approximately \$279,000.

In addition to hydraulic performance and estimated construction cost, several key considerations should be taken into account when evaluating this alternative.

First, the alternative leaves the downstream slope of the dam generally unprotected. Although the modeled overtopping is limited, there remains a potential for overtopping flows to produce erosive forces on the downstream slope.

Second, the foundation of the gatehouse is at approximately elevation 1446.3 feet, while the proposed dam crest would be raised to elevation 1447.0 feet. The gatehouse foundation would therefore need to be raised approximately nine inches to reduce the potential for the gatehouse to become inundated during an overtopping event or the structure would need to be flood proofed. D&K estimates that disassembling or temporarily moving the existing wooden gatehouse while the foundation is raised would cost approximately \$10,000.

ii. Alternative B

Alternative B involves removal and replacement of the existing principal spillway with a new reinforced-concrete labyrinth weir spillway and raising the existing dam crest six inches to elevation 1447.0 feet.

This alternative would consist of:

- A labyrinth spillway approximately 106 feet wide, measured perpendicular to flow, and 38 feet long, measured parallel to flow.
- Raising the existing dam crest six inches to elevation 1447.0 feet.

This alternative was modeled in GeoHEC-HMS to determine its hydraulic performance during the IDF. Table 2 below summarizes the model results.

Table 2. Hydraulic Performance of Alternative B

Peak WSEL (ft)	Peak Outflow (cfs)				Freeboard (ft) (Crest El. 1447.0')	Peak Velocity Over Crest (fps)
	Dam Crest	Near Spillway	Far Spillway	Total Outflow		
1446.0	0	3821	1482	5303	1.0	N/A

The bottom of the spillway base slab would be at approximately elevation 1436.5 feet. The total volume of cast-in-place concrete is estimated at approximately 550 cubic yards. A current unit cost of \$1,300 per cubic yard was used for conceptual estimating purposes.

Other work associated with this alternative includes

- Removal of the 20 CY of stone and concrete existing principal spillway structure estimated at \$160 / CY
- Excavation of approximately 1,220 CY of material required to install the principal spillway estimated at \$35 / CY. This includes excavating approximately 62 feet into the existing embankment to install the widened labyrinth structure. It also includes regrading of the upstream and downstream approaches
- Cast-in-place 550 CY concrete for the new principal spillway estimated at \$1,300 / CY
- Raising the dam crest reusing 52 CY of excavated embankment material estimated at \$20 / CY
- Control of Water, Erosion Prevention and Sediment Control, Clearing and Grubbing, Restoration of Surfaces, Mobilization and Demobilization.

D&K's conceptual construction cost estimate for Alternative B is approximately \$1,291,000.

Alternative B provides the best hydraulic performance of the alternatives evaluated. The modeled peak water surface elevation is approximately one foot below the proposed dam crest during the 1,000-year IDF, thereby providing the required one foot of freeboard without overtopping the dam embankment.

However, this hydraulic performance comes with substantially greater construction complexity and cost. The alternative requires extensive excavation into the existing embankment, construction of approximately 550 cubic yards of reinforced concrete, removal and replacement of the existing principal spillway, and substantial regrading of the upstream and downstream approaches. In addition, this alternative requires the demolition of a hydraulic structure that impounds the normal pool, thus a significant drawdown will be required to construct this project. This is reflected in the control of water cost estimate.

iii. Alternative C

Alternative C involves armoring the dam crest and downstream slope using articulated concrete blocks (ACBs) and lowering the average dam crest approximately two inches to an average elevation of 1446.3 feet. The portion of the embankment to the left of the gatehouse would be lowered to elevation 1443.7 feet and would function as an auxiliary spillway. Sheets 9 through 11 of Attachment A depict conceptual drawings of this alternative.

This alternative would consist of:

- An armored dam crest using open cell 4.75-inch ACBs filled in and covered with two inches of loam and seed.
- A lowered left-hand side of the embankment to a crest elevation of 1443.7 feet.
- An armored downstream slope on the left-side of the embankment using closed cell 8.5-inch ACBs.
- A concrete waste block on the right abutment and regrading of the boat launch parking lot to an elevation of 1448.0 feet.

This alternative was modeled in GeoHEC-HMS to determine its hydraulic performance during the IDF. Table 3 below summarizes the model results.

Table 3. Hydraulic Performance of Alternative C

Peak WSEL (ft)	Peak Outflow (cfs)					Overtopping (ft) (Crest el. 1446.3')	Peak Velocity Over Crest (fps)
	Dam Crest	Lowered Dam Crest	Near Spillway	Far Spillway	Total Outflow		
1447.0	144	1447	994	2288	4873	0.7	1.2

The proposed ACB system is intended to provide a controlled, armored flow path across the dam crest and downstream slope during the design event. The termination of the ACBs would slope downward and be covered with cast-in-place concrete to protect the ACB system from uplift forces.

Approximately 3,500 square feet of 4.75-inch open-cell ACBs and 2,900 square feet of 8.5-inch closed-cell ACBs would be required. ArmorFlex Articulated Concrete Blocks were used as a product reference for conceptual details and price estimates. The open-cell ACBs were estimated at approximately \$20 per square foot, while the closed-cell ACBs were estimated at approximately \$25 per square foot.

Other work associated with this alternative includes:

- Removal of 275 CY pf embankment material for the installation of the overtopping protection estimated at \$35 / CY

- Regrading of the downstream slope reusing 65 CY of embankment material estimated at \$20 / CY
- Cast-in-place 63 CY concrete for ACB termination at \$1,300 / CY
- Installation of a 196 CY of mineral filter within the embankment dam at \$85 / CY
- Control of Water, Erosion Prevention and Sediment Control, Clearing and Grubbing, Restoration of Surfaces, Mobilization and Demobilization.

D&K's conceptual construction cost estimate for Alternative C is approximately \$410,000.

In addition to hydraulic performance and estimated construction cost, several key considerations should be taken into account when evaluating this alternative.

First, the improvements associated with Alternative C do not require modification of the existing principal spillway. As a result, the major water-control measures that would be required for removal and replacement of the principal spillway under Alternatives A and B would not be necessary. Pond drawdown through the existing pond drain would be used to facilitate construction. This approach could potentially reduce the permitting and construction requirements associated with the project.

Second, Alternative C would require partial removal of the downstream retaining wall to allow the downstream slope to be regraded prior to installation of the ACB armoring.

The hydraulic model indicates that Alternative C would experience approximately 0.7 feet of overtopping during the 1,000-year IDF. Unlike the existing condition, however, the proposed dam crest and downstream slope would be specifically armored to accommodate these flows. The lowered section of the embankment would also function as an auxiliary spillway, providing a defined and protected flow path during larger storm events.

iv. Other Costs associated with Rehabilitation

In addition to the construction costs associated with the selected rehabilitation alternative, APDVD should anticipate costs for engineering design, permitting, bidding, and construction administration.

In general, engineering design fees associated with developing the selected alternative into plans and specifications suitable for construction are anticipated to be approximately 5 to 10 percent of the construction cost. Permit Application preparation costs are dependent upon the overall level of effort and extent of the project; however, an additional allowance of approximately 2 to 4 percent of the construction cost is recommended. The New Hampshire Dam Safety Permit application fee for a high-hazard dam is currently \$4,000. Other permit fees will depend on the permits required and the overall area of disturbance. For conceptual budgeting purposes, D&K recommends an allowance of approximately \$10,000 for permit application fees.

As a high-hazard dam, NHDES requires that, following completion of construction, a professional engineer submit an affidavit certifying that the construction or reconstruction was completed in accordance with the approved plans, specifications, and intent of the design, in accordance with Env-Wr 405.08. To support this certification, D&K recommends that construction administration and periodic construction observation services be included as part of the project. The level of effort for these services is dependent upon the Contractor's schedule and the complexity of the work. Assuming an approximately eight-week construction schedule, D&K recommends an allowance of approximately \$50,000 to \$80,000 for construction administration and observation.

For conceptual planning purposes, D&K recommends that APDVD reserve an additional allowance of approximately 25 percent of the construction cost for engineering, permitting, bidding, and construction administration. This allowance is intended to account for the anticipated professional services and permitting costs described above, as well as additional design or construction-related services that may be identified as the project advances. Actual costs will depend on the selected alternative, final project scope, permitting requirements, bidding results, and construction schedule.

4.0 RECOMMENDATION

Based on the alternatives evaluated, D&K recommends that APDVD proceed with Alternative C as the preferred conceptual rehabilitation approach.

Alternative B provides the greatest hydraulic capacity and is the only alternative evaluated that provides one foot of freeboard during the 1,000-year IDF without overtopping the dam embankment. However, achieving this performance requires replacement of the existing principal spillway with a substantially larger reinforced-concrete labyrinth structure. The work would require extensive excavation into the existing dam embankment, approximately 550 cubic yards of cast-in-place concrete, significant regrading, and substantially greater construction costs. In addition, construction of the new principal spillway would require a significant drawdown of the pond and extensive water-control measures. D&K's conceptual construction cost estimate for Alternative B is approximately \$1.3 million.

Alternative A is the least expensive alternative, with a conceptual construction cost of approximately \$279,000. However, the modeled condition includes approximately 0.4 feet of overtopping during the 1,000-year IDF. Although the proposed geocell system would provide some protection against these flows, the downstream slope would remain generally unprotected. Additional measures would therefore be necessary to provide a more robust and reliable overtopping protection system. Alternative A also requires removal and replacement of the existing principal spillway, associated water-control measures, and modifications to the area surrounding the gatehouse and fishing access. Because the entire dam crest would function as an overtopping flow path, additional grading and a concrete block wall would also be required near the parking lot and fishing access to contain the flows.

Alternative C provides a practical middle ground between hydraulic performance, construction complexity, and cost. The alternative is specifically configured to accommodate controlled overtopping during the 1,000-year IDF by providing articulated concrete block armoring along the dam crest and downstream slope and by establishing a lowered, armored section of the embankment to function as an auxiliary spillway.

Alternative C also avoids replacement of the existing principal spillway, which substantially reduces the amount of excavation and concrete construction required and limits the need for extensive water-control measures during construction. Pond drawdown through the existing pond drain would be used to facilitate construction. The alternative does not require modification of the existing gatehouse, further reducing construction impacts.

Based on the current conceptual evaluation, Alternative C provides a defined and protected overtopping flow path while requiring less extensive construction than Alternative B and providing greater downstream overtopping protection than Alternative A. The estimated construction cost of approximately \$410,000 is also substantially less than the estimated cost of Alternative B.

Accordingly, D&K recommends that APDVD select Alternative C as the preferred conceptual rehabilitation approach and authorize D&K to proceed with development of the alternative through preliminary design, permitting coordination, and further evaluation of the ACB overtopping protection system. The selected rehabilitation approach may be modified during subsequent design as additional information is developed and as NHDES reviews the proposed improvements.

5.0 ATTACHMENTS

Attachment A: Ashuelot Pond Dam Alternatives Plan Set

Attachment B: Ashuelot Pond Dam Alternatives OPCC

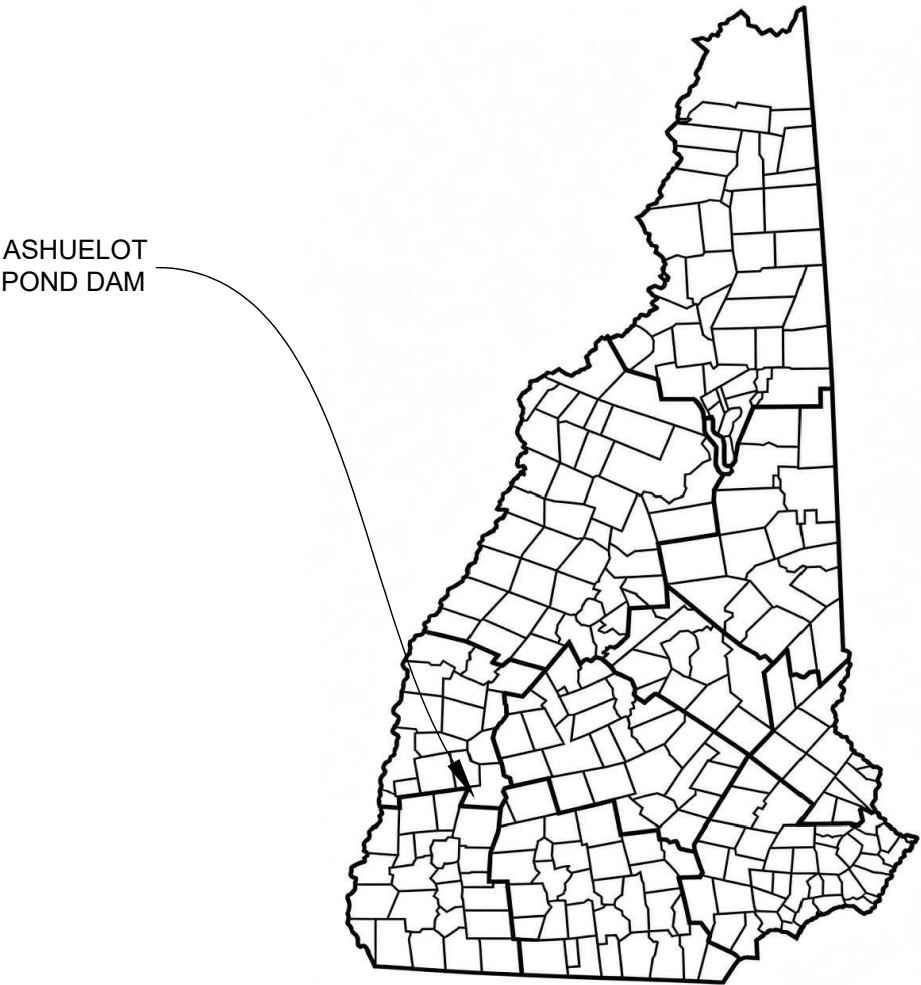
Attachment C: NHDES Letter of Deficiency, dated August 2022

ATTACHMENT A

ASHUELOT POND DAM ALTERNATIVES PLAN SET

ASHUELOT POND DAM
CONCEPTUAL ALTERNATIVE ANALYSIS
SEPTEMBER 2026

NOT FOR CONSTRUCTION



NOT FOR
CONSTRUCTION
PRELIMINARY
PLANS

REVISIONS	NUMBER	DATE	REVISION DESCRIPTION	BY

CLIENT NAME
ASHUELOT POND
DAM VILLAGE
DISTRICT

P.O. BOX 105,
WASHINGTON, NH
03280

PROJECT NAME

ASHUELOT POND
DAM CONCEPTUAL
ALTERNATIVE
ANALYSIS

SHEET TITLE

TITLE
SHEET

D&K PROJECT #
831468

PROJ. ENG.
CWJ

DRAWN BY
EDJ

CHECKED BY
MXS

DATE
SEPTEMBER 2026

SHEET NUMBER

1

**NOT FOR
CONSTRUCTION
PRELIMINARY
PLANS**

[illegible]

CLIENT NAME
ASHUELOT POND
DAM VILLAGE
DISTRICT

P.O. BOX 105,
WASHINGTON, NH
03280

PROJECT NAME

ASHUELOT POND
DAM CONCEPTUAL
ALTERNATIVE
ANALYSIS

SHEET TITLE

EXISTING
CONDITIONS
PROFILES

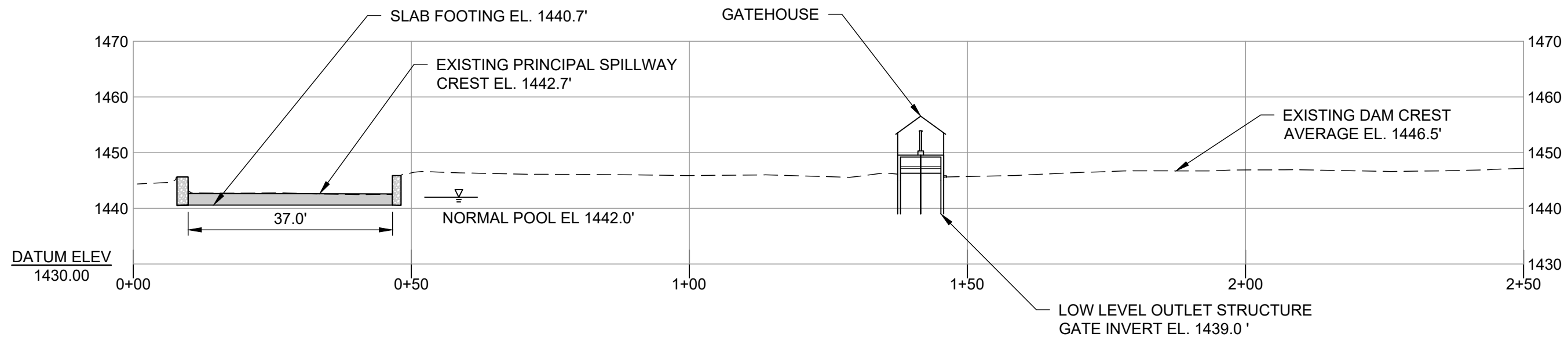
K PROJECT # 831468	PROJ. ENG. CWJ
DRAWN BY EDJ	CHECKED BY MXS

SEPTEMBER 2026

SHEET NUMBER

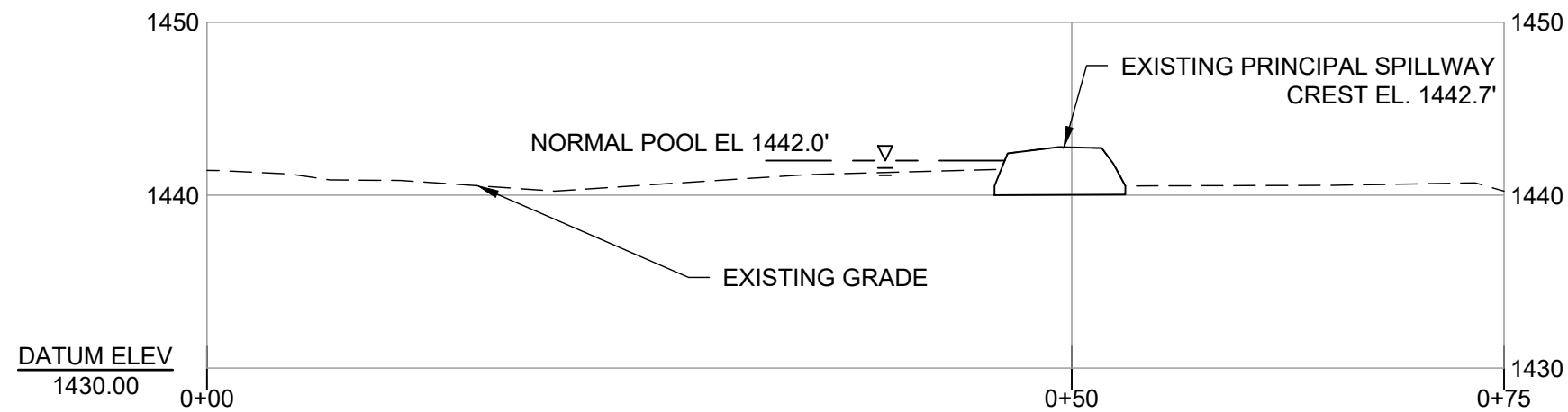
3

SHEET: 3 of 11



EXISTING DAM PROFILE

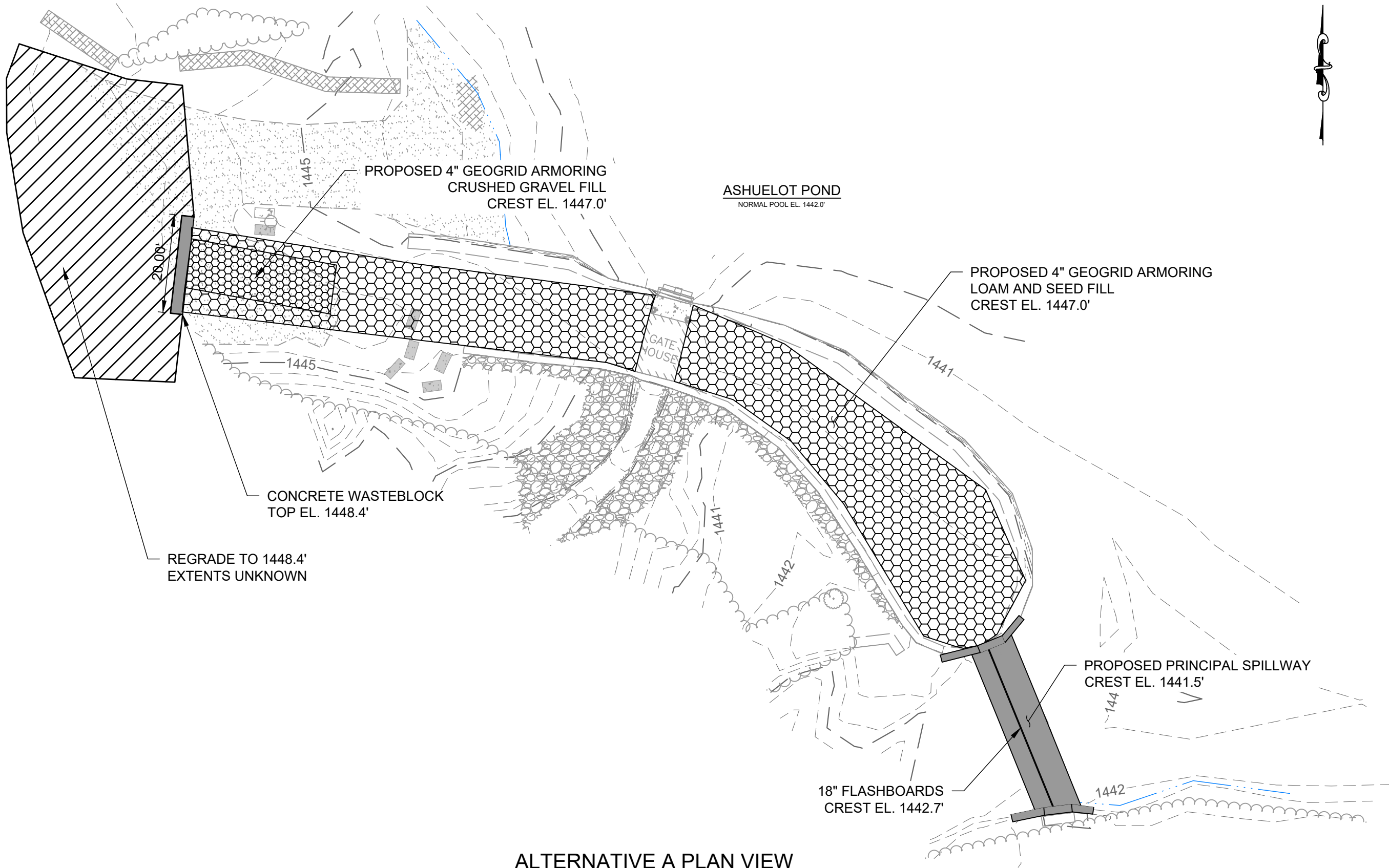
SCALE: 1" = 20'



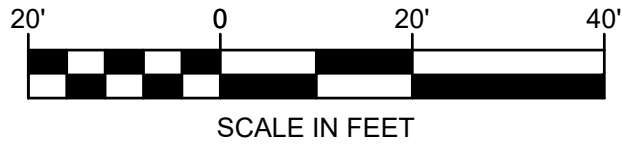
EXISTING PRINCIPAL SPILLWAY SECTION

SCALE: 1" = 10'

c:\Users\jboquin\Documents\Projects\Ashuelot Pond Dam\Design\Alternative Analysis\CAD\NH\Ashuelot Pond Dam Conceptual Alternative.dwg 9/10/2026 2:13 PM



ALTERNATIVE A PLAN VIEW
SCALE: 1" = 20'



PROGRESS PRINTS
NOT FOR CONSTRUCTION
9/11/2026

**NOT FOR
CONSTRUCTION
PRELIMINARY
PLANS**

REVISIONS	BY		DATE		NUMBER	
	REVISION DESCRIPTION					

CLIENT NAME
**ASHUELOT POND
DAM VILLAGE
DISTRICT**

P.O. BOX 105,
WASHINGTON, NH
03280

PROJECT NAME
**ASHUELOT POND
DAM CONCEPTUAL
ALTERNATIVE
ANALYSIS**

SHEET TITLE
**ALTERNATIVE
A PLAN
VIEW**

D&K PROJECT #
831468

PROJ. ENG.
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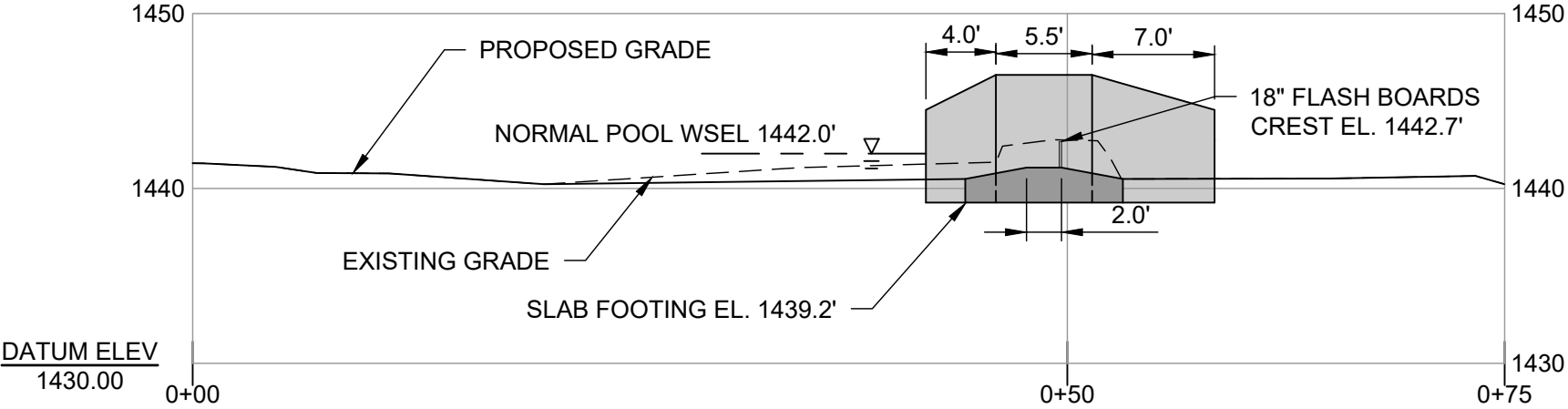
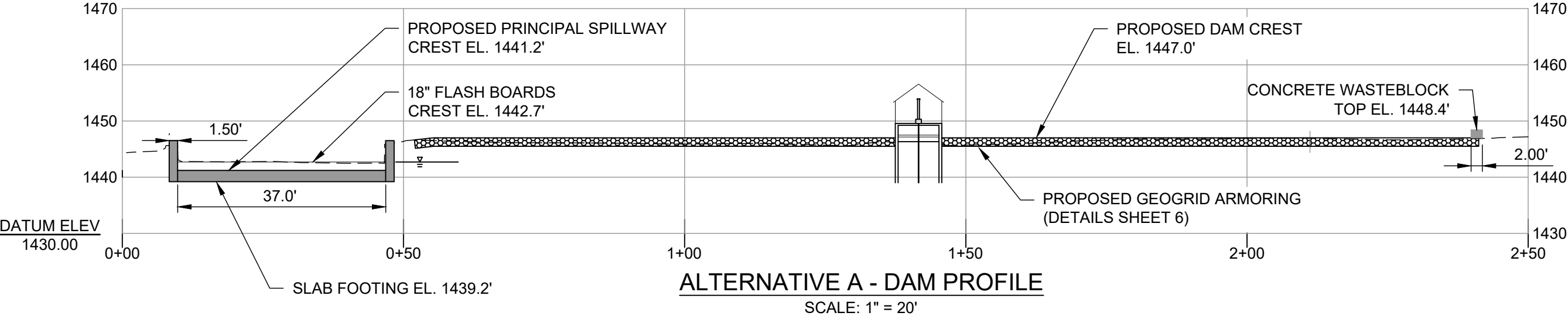
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DATE
SEPTEMBER 2026

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SHEET: 4 of 11

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**NOT FOR
CONSTRUCTION
PRELIMINARY
PLANS**

REVISIONS	BY	REVISION DESCRIPTION
	DATE	NUMBER

CLIENT NAME
ASHUELOT POND
DAM VILLAGE
DISTRICT

P.O. BOX 105,
WASHINGTON, NH
03280

PROJECT NAME

ASHUELOT POND
DAM CONCEPTUAL
ALTERNATIVE
ANALYSIS

SHEET TITLE

ALTERNATIVE A
PROFILE VIEWS

D&K PROJECT # 831468	PROJ. ENG. CWJ
DRAWN BY EDJ	CHECKED BY MXS

DATE
SEPTEMBER 2026

SHEET NUMBER

5

SHEET: 5 of 11

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CONSTRUCTION
PRELIMINARY
PLANS

REVISIONS	BY		DATE		NUMBER	
	REVISION DESCRIPTION					

CLIENT NAME
ASHUELOT POND
DAM VILLAGE
DISTRICT

P.O. BOX 105,
WASHINGTON, NH
03280

PROJECT NAME

ASHUELOT POND
DAM CONCEPTUAL
ALTERNATIVE
ANALYSIS

SHEET TITLE

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831468

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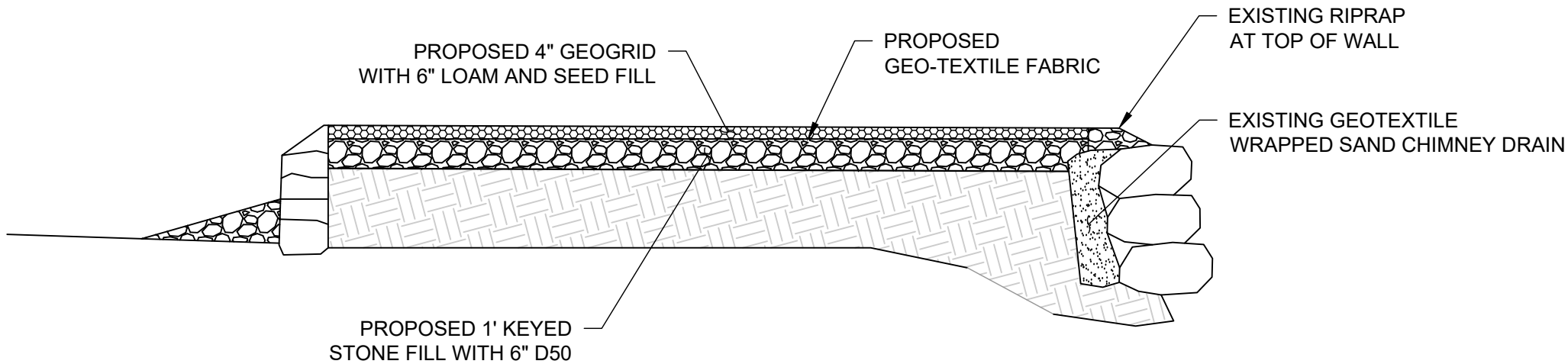
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SEPTEMBER 2026

SHEET NUMBER

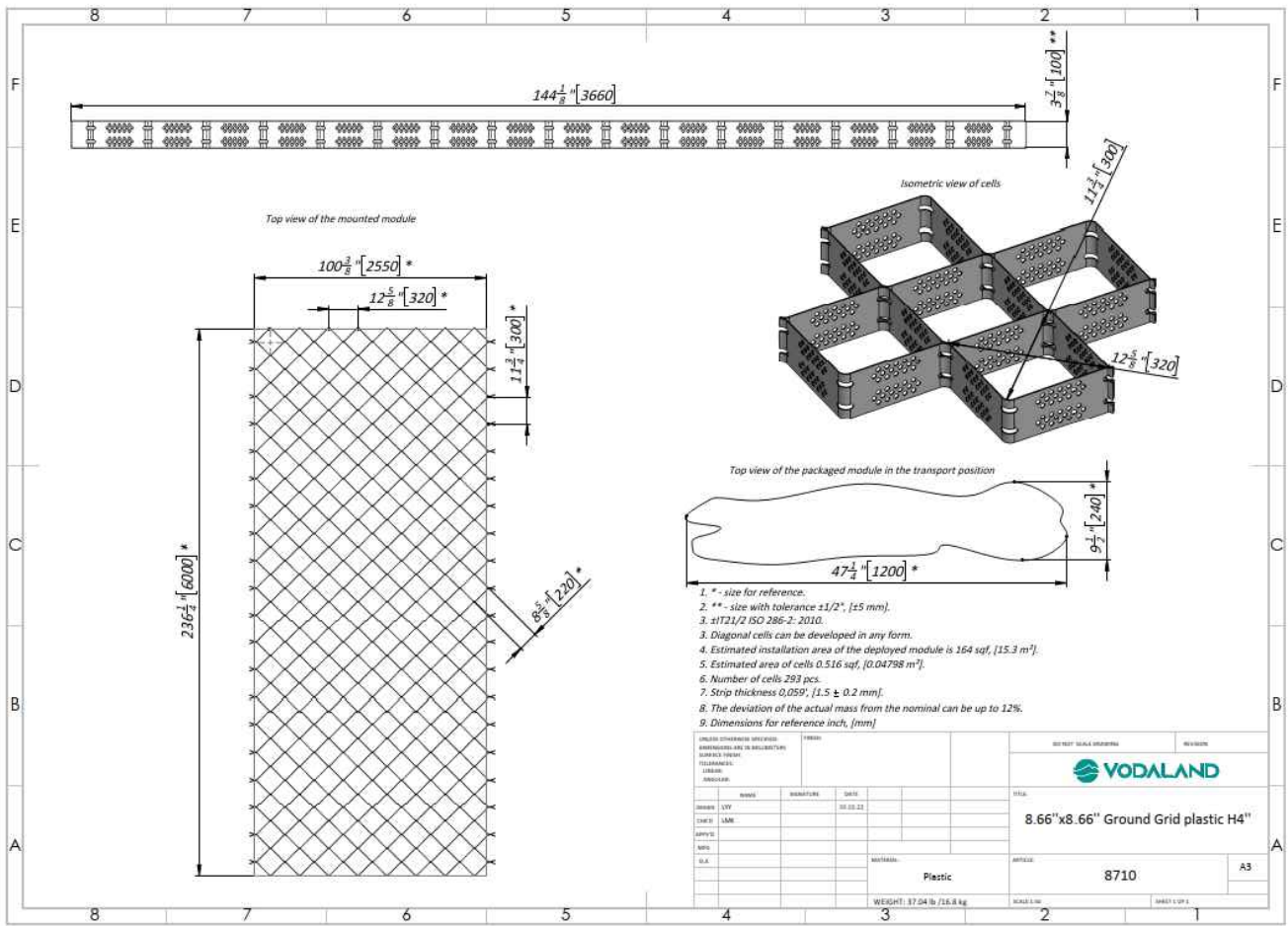
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SHEET: 6 of 11

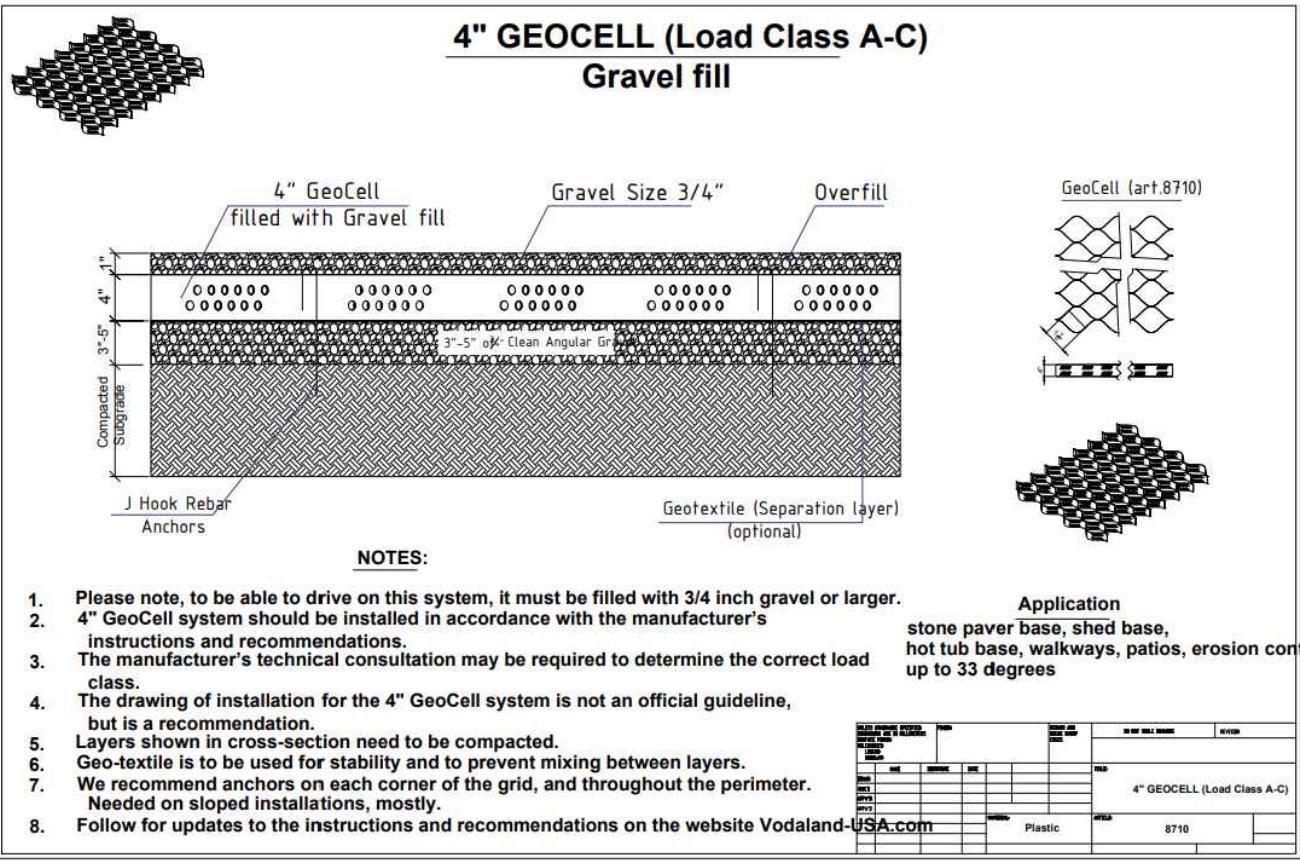


ALTERNATIVE A - SECTION VIEW THROUGH DAM

SCALE: 1" = 5'



VODALAND GEOGRID DETAIL N.T.S



NOTES:

- Please note, to be able to drive on this system, it must be filled with 3/4 inch gravel or larger.
- 4" GeoCell system should be installed in accordance with the manufacturer's instructions and recommendations.
- The manufacturer's technical consultation may be required to determine the correct load class.
- The drawing of installation for the 4" GeoCell system is not an official guideline, but is a recommendation.
- Layers shown in cross-section need to be compacted.
- Geo-textile is to be used for stability and to prevent mixing between layers.
- We recommend anchors on each corner of the grid, and throughout the perimeter. Needed on sloped installations, mostly.
- Follow for updates to the instructions and recommendations on the website Vodaland-USA.com

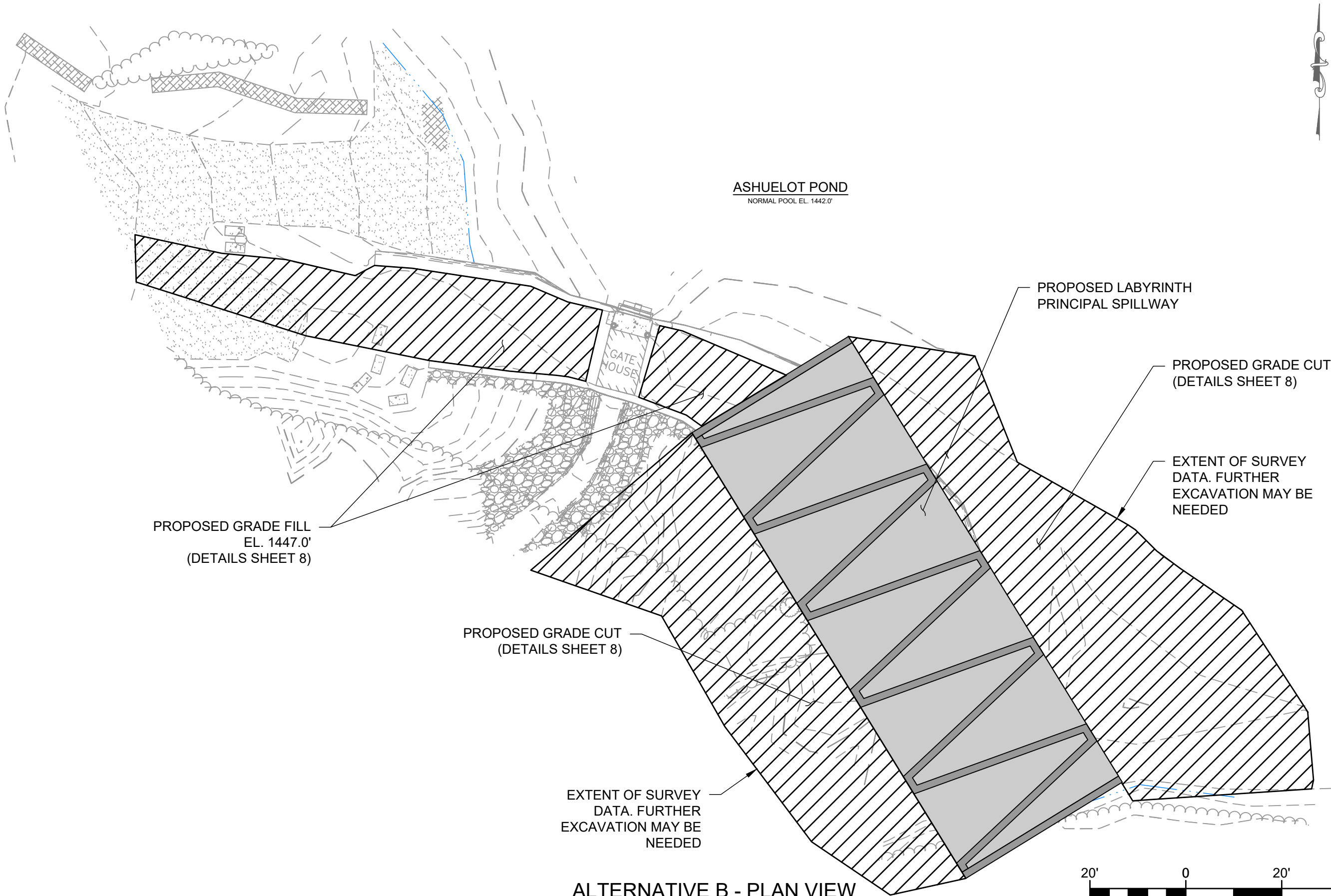
Application
stone paver base, shed base,
hot tub base, walkways, patios, erosion control
up to 33 degrees

VODALAND GEOCELL DETAIL N.T.S

PROGRESS PRINTS
NOT FOR CONSTRUCTION

9/11/2026

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PLANS**

REVISIONS	BY	REVISION DESCRIPTION	DATE	NUMBER

CLIENT NAME
ASHUELOT POND
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WASHINGTON, NH
03280

PROJECT NAME

ASHUELOT POND
DAM CONCEPTUAL
ALTERNATIVE
ANALYSIS

SHEET TITLE
**ALTERNATIVE
B
PLAN
VIEW**

D&K PROJECT # 831468	PROJ. ENG. CWJ
DRAWN BY EDJ	CHECKED BY MXS

DATE
SEPTEMBER 2026

SHEET NUMBER

7

SHEET: 7 of 11

PROGRESS PRINTS
NOT FOR CONSTRUCTION
9/11/2026

NOT FOR
CONSTRUCTION
PRELIMINARY
PLANS

REVISONS	BY										
	REVISION DESCRIPTION										
	DATE										
	NUMBER										

CLIENT NAME
ASHUELOT POND
DAM VILLAGE
DISTRICT

P.O. BOX 105,
WASHINGTON, NH
03280

PROJECT NAME

ASHUELOT POND
DAM CONCEPTUAL
ALTERNATIVE
ANALYSIS

SHEET TITLE

ALTERNATIVE
B
PROFILES

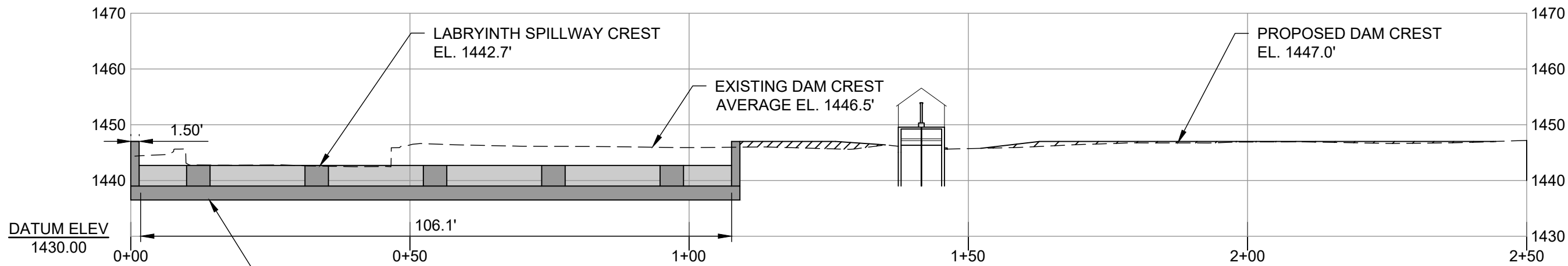
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DRAWN BY EDJ	CHECKED BY MXS

DATE
SEPTEMBER 2026

SHEET NUMBER

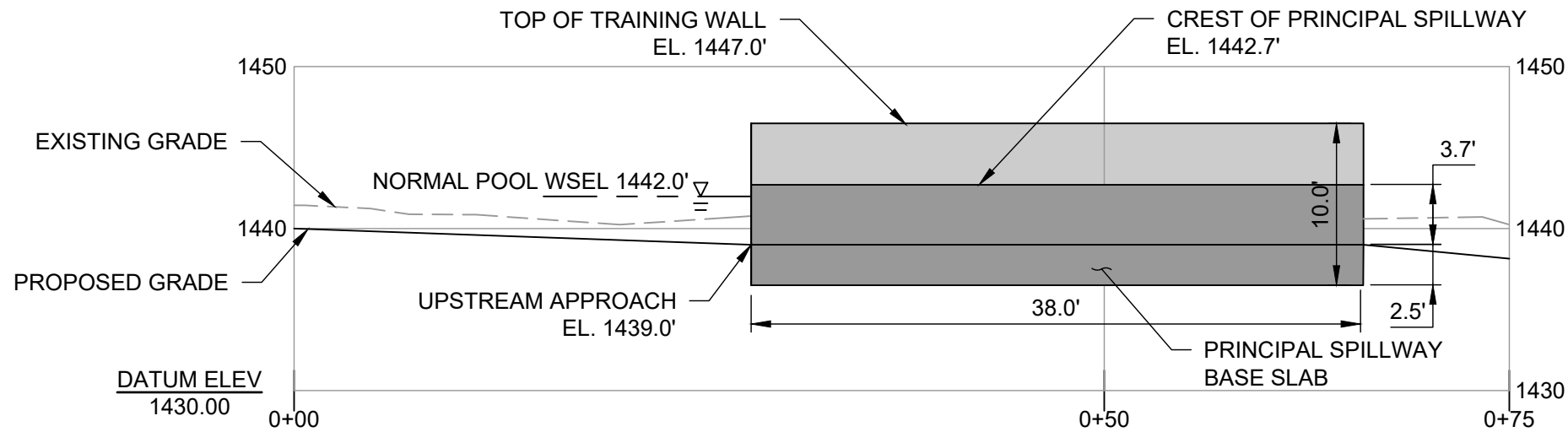
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SHEET: 8 of 11



ALTERNATIVE B - DAM PROFILE

SCALE: 1" =20'



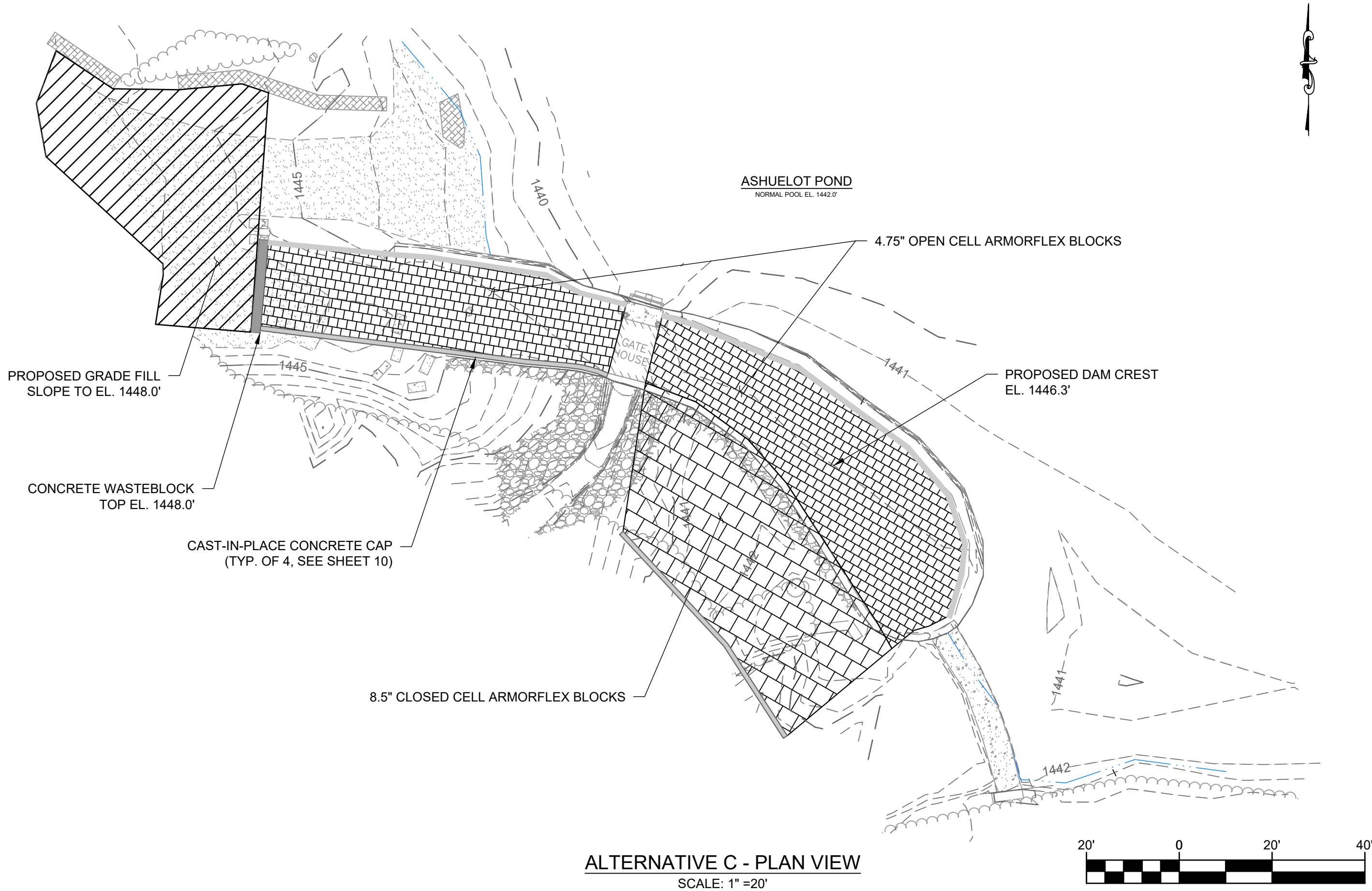
ALTERNATIVE B - PRINCIPAL SPILLWAY SECTION

SCALE: 1" =10'

PROGRESS PRINTS
NOT FOR CONSTRUCTION

9/11/2026

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ALTERNATIVE C - PLAN VIEW
SCALE: 1" = 20'



PROGRESS PRINTS
NOT FOR CONSTRUCTION

9/11/2026

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CONSTRUCTION
PRELIMINARY
PLANS

REVISIONS	BY	DATE	DESCRIPTION
	NUMBER		

CLIENT NAME
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DAM VILLAGE
DISTRICT

P.O. BOX 105,
WASHINGTON, NH
03280

PROJECT NAME

ASHUELOT POND
DAM CONCEPTUAL
ALTERNATIVE
ANALYSIS

SHEET TITLE

ALTERNATIVE
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PLAN
VIEW

D&K PROJECT # 831468	PROJ. ENG. CWJ
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DATE
SEPTEMBER 2026
SHEET NUMBER

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CONSTRUCTION
PRELIMINARY
PLANS

REVISIONS	BY	DATE	NUMBER	REVISION DESCRIPTION

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DAM VILLAGE
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P.O. BOX 105,
WASHINGTON, NH
03280

PROJECT NAME

ASHUELOT POND
DAM CONCEPTUAL
ALTERNATIVE
ANALYSIS

SHEET TITLE

ALTERNATIVE
C
PROFILES

D&K PROJECT #
831468

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CWJ

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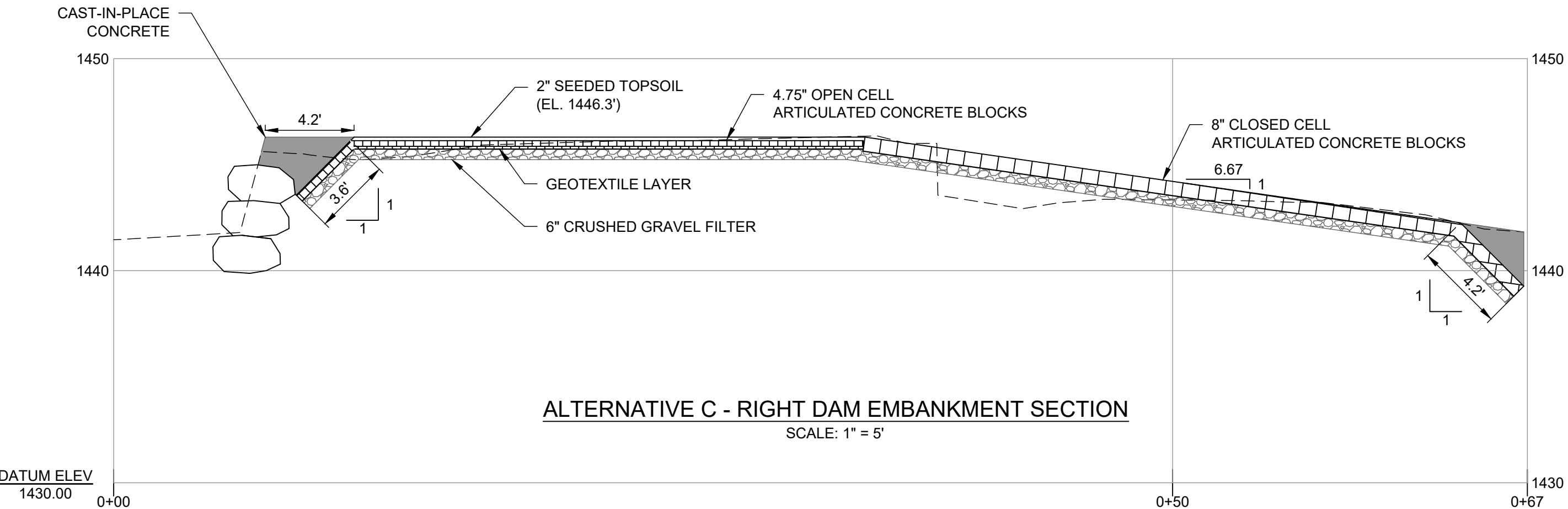
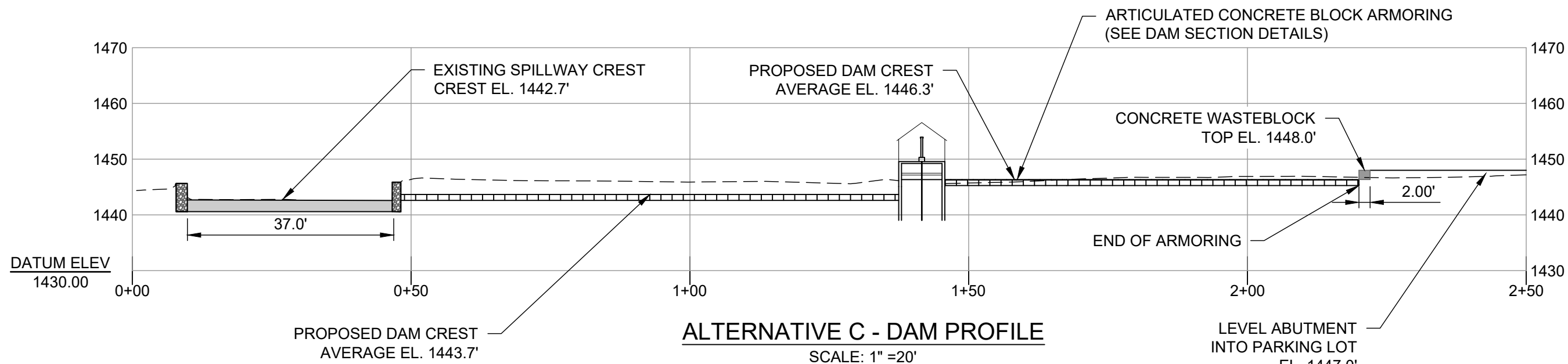
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DATE
SEPTEMBER 2026

SHEET NUMBER

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SHEET: 10 of 11



PROGRESS PRINTS
NOT FOR CONSTRUCTION

9/11/2026

**NOT FOR
CONSTRUCTION
PRELIMINARY
PLANS**

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CLIENT NAME
ASHUELOT POND
DAM VILLAGE
DISTRICT

P.O. BOX 105,
WASHINGTON, NH
03280

PROJECT NAME

ASHUELOT POND
DAM CONCEPTUAL
ALTERNATIVE
ANALYSIS

SHEET TITLE

ALTERNATIVE
C
CIVIL
DETAILS

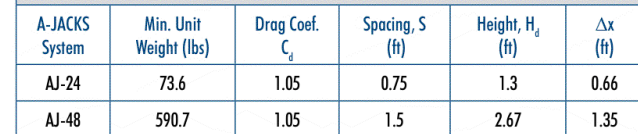
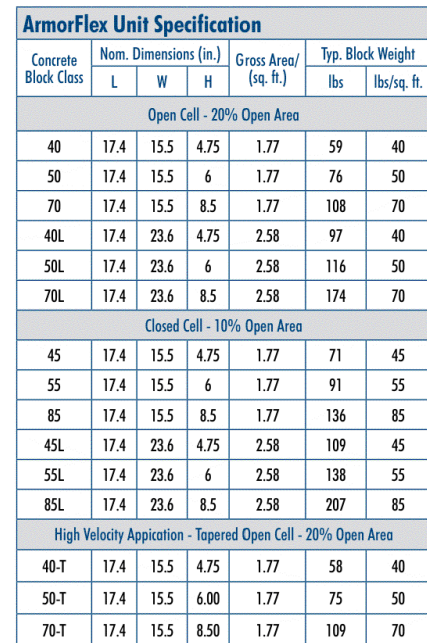
B&K PROJECT # 831468	PROJ. ENG. CWJ
DRAWN BY EDJ	CHECKED BY MXS

DATE
SEPTEMBER 2026

SHEET NUMBER

11

SHEET: 11 of 11



PROGRESS PRINTS
NOT FOR CONSTRUCTION

9/11/2026

ATTACHMENT B

ASHUELOT POND DAM ALTERNATIVES OPCC



Ashuelot Pond Dam
Opinion of Probable Construction Costs
Dam Overtopping Protection Alternative (C)

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNITS	UNIT COST	TOTAL
1	Mobilization/Demobilization	1	LS	\$ 41,000.00	\$ 41,000.00
2	Control of Water	1	LS	\$ 10,000.00	\$ 10,000.00
4	Erosion Prevention and Sediment Control	1	LS	\$ 25,000.00	\$ 25,000.00
5	Clearing and Grubbing	0.2	AC	\$ 10,000.00	\$ 1,700.00
6	Common Excavation	275	CY	\$ 35.00	\$ 9,700.00
7	Embankment Material	200	CY	\$ 20.00	\$ 4,100.00
8	Open Cell Articulated Concrete Blocks	3497	SF	\$ 20.00	\$ 70,000.00
9	Closed Cell Articulated Concrete Blocks	2895	SF	\$ 20.00	\$ 57,900.00
10	Loam, Seed, & Mulch	32	CY	\$ 18.00	\$ 600.00
11	Mineral Filter Material	196	CY	\$ 85.00	\$ 16,700.00
12	Cast-In-Place Concrete, Class AA	52	CY	\$ 1,300.00	\$ 67,600.00
13	Restoration of Surfaces	1	LS	\$ 10,000.00	\$ 10,000.00
CONSTRUCTION ITEMS SUB-TOTAL (rounded to nearest \$1,000)				=	\$ 315,000.00
30% CONTINGENCY				=	\$ 95,000.00
TOTAL CONSTRUCTION COST				=	\$ 410,000.00

Estimate Prepared By : EDJ
Checked by: CWJ
Estimate Print Date: 11-Sep-26



Ashuelot Pond Dam
Opinion of Probable Construction Costs
Labryinth Spillway Alternative (B)

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNITS	UNIT COST	TOTAL
1	Mobilization/Demobilization	1	LS	\$ 130,000.00	\$ 130,000.00
2	Control of Water	1	LS	\$ 60,000.00	\$ 60,000.00
3	Erosion Prevention and Sediment Control	1	LS	\$ 25,000.00	\$ 25,000.00
4	Clearing and Grubbing	0.2	AC	\$ 10,000.00	\$ 1,700.00
5	Common Excavation	1,220	CY	\$ 35.00	\$ 42,700.00
6	Embankment Material	52	CY	\$ 92.00	\$ 4,800.00
7	Rock Excavation	20	CY	\$ 160.00	\$ 3,200.00
8	Cast-In-Place Concrete, Class AA	550	CY	\$ 1,300.00	\$ 715,000.00
9	Restoration of Surfaces	1	LS	\$ 10,000.00	\$ 10,000.00
CONSTRUCTION ITEMS SUB-TOTAL (rounded to nearest \$1,000)				=	\$ 993,000.00
30% CONTINGENCY				=	\$ 298,000.00
TOTAL CONSTRUCTION COST				=	\$ 1,291,000.00

Estimate Prepared By : EDJ
Checked by: CWJ
Estimate Print Date: 11-Sep-26



Ashuelot Pond Dam
Opinion of Probable Construction Costs
NHDams LLC Alternative (A)

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNITS	UNIT COST	TOTAL
1	Mobilization/Demobilization	1	LS	\$ 27,800.00	\$ 27,800.00
2	Control of Water	1	LS	\$ 60,000.00	\$ 60,000.00
3	Geogrid Installation	400	SY	\$13.00	\$ 5,200.00
4	Keyed Stone Fill	131	CY	\$85.00	\$ 11,200.00
5	Crushed Gravel Infill	7	CY	\$60.00	\$ 500.00
6	Loam, Seed	60	CY	\$18.00	\$ 1,100.00
7	Erosion Prevention and Sediment Control	1	LS	\$ 25,000.00	\$ 25,000.00
8	Clearing and Grubbing	0.2	AC	\$ 14,000.00	\$ 2,400.00
9	Common Excavation	155	CY	\$ 35.00	\$ 5,500.00
10	Rock Excavation	20	CY	\$ 160.00	\$ 3,200.00
11	Structural Fill	146	CY	\$ 92.00	\$ 13,500.00
12	Cast-In-Place Concrete, Class AA	29	CY	\$ 1,300.00	\$ 37,700.00
13	Gatehouse	1	LS	\$10,000	\$ 10,000.00
14	Restoration of Surfaces	1	LS	\$ 10,000.00	\$ 10,000.00
CONSTRUCTION ITEMS SUB-TOTAL (rounded to nearest \$1,000)				=	\$ 214,000.00
30% CONTINGENCY				=	\$ 65,000.00
TOTAL CONSTRUCTION COST				=	\$ 279,000.00

Estimate Prepared By : EDJ
Checked by: CWJ
Estimate Print Date: 11-Sep-26

ATTACHMENT C

NHDES LETTER OF DEFICIENCY, DATED AUGUST 2022



The State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES



Robert R. Scott, Commissioner

Mr. Gary Carney, Chairman
Ashuelot pond Dam Village District
P.O. Box 105
Washington, NH 03280

August 9, 2022
Letter of Deficiency
DSP #22-003

RE: Ashuelot Pond Dam #D245005, Significant to High, Washington

Dear Chairman Carney:

The New Hampshire Department of Environmental Services, Dam Bureau (NHDES) is responsible for ensuring the safety of dams in New Hampshire through its dam safety program. In accordance with RSA 482:12 and Env-Wr 302.02, an inspection of the subject dam was conducted on July 12, 2022. Based upon the results of that inspection, NHDES is issuing this Letter of Deficiency (LOD) to advise you that it believes the following deficiencies can be remedied in accordance with the deadlines indicated:

By October 1, 2022:

1. Provide plans for the replacement of the gate and repair of the voids in the gate sluiceway for review. We understand that the owner is working with NH Dams, LLC and M&K Commercial Diving. Once the exact scope of work has been established a determination will be made on the need for a dam safety program permitting. The work will also require a permit from the NHDES Wetlands program.
2. Provide documentation (deed, easement, agreement etc.) indicating that the APVD has an access and maintenance rights to access the far (east) spillway for routine maintenance, repairs and reconstruction.
3. Debris or other material was noted in the following outlet structures and should be removed as soon as possible. Such material will obstruct flow, lessen the dam's ability to function efficiently and increase the risk that the dam may be overtopped – which could lead to failure.
 - a. Debris including a large tree stump were observed on the spillway crest (Photos: 9 – 10).
4. Provide copies of the seepage monitoring logs for review.
5. Provide a written plan for implementation of the items in this LOD to NHDES for review and approval.

By November 15, 2022:

6. Review and update the existing Operation, Maintenance and Response (OMR) form for the dam. Please submit the revised form to NHDES. The form should include all pertinent dam and contact information, as well as describe the type and frequency of the maintenance and monitoring items that routinely occur at the dam. A blank form may be found at: <https://www.des.nh.gov/water/dam-maintenance-and-management>. Scroll down and select the Dam Permitting and Forms tab and then the Find Permit Applications box.

7. Complete the installation of a new gate and repair of the voids in the gate sluiceway per the plans approved by NHDES.
8. The current Emergency Action Plan (EAP) was last updated and last tested in 2016. Please update, at a minimum, the Notification Flow Chart and distribute the updates. Once the updates have been distributed, the EAP should be tested.
9. Trees, brush or other unwanted vegetation was noted in the following locations. Such vegetation should be removed and kept at least 15 feet from the entire footprint of the dam and all components of the dam to preserve a buffer for inspection, access and maintenance/repair. After clearing occurs, any disturbed areas should be properly regraded and protected with an appropriate ground cover (grass, riprap stone or other treatments) to prevent erosion of or damage to the dam and its components.
 - a. Minor brush on the crest (Photos: 1, 8, 11 & 12);
 - b. Minor brush observed on the upstream stone face/slope (Photos: 1 & 8);
 - c. Brush and trees were observed on the downstream stone face and within 15-ft of the downstream face (Photos: 2 - 5);
 - d. Minor brush within 15-feet of the left and right spillway abutments for the near (West) (Photos: 6 - 8); and
 - e. Brush and trees within 15-feet of the left and right spillway abutments for the far (East) (Photos: 9 - 10)

By January 1, 2023:

10. Engage the services of a consultant qualified in dam-related work to complete an engineering evaluation or analysis of, at a minimum, the items noted below and submit a report to NHDES. The report should include all investigation findings and include recommendations and a schedule for reconstruction, as warranted, to make the dam compliant with the current standards for High hazard dams. In order to ensure that the selected consultant meets the requirements of Env-Wr 403.03(a)(1), NHDES recommends that you submit the resume of your proposed engineering consultant for review in accordance with Env-Wr 403.03 (a)(1) prior to contracting services.
 - a. Assess the hydrology of the watershed to determine if the dam is capable of safely passing the runoff from the 2.5 x 100-year storm event with a minimum of one foot of remaining freeboard and without manual operations or otherwise comply with Env-Wr 303.12;
 - i. NHDES approved a model in March 2021 for use in evaluating the dam. This model can be used at the discretion of the approved engineering consultant.
 - ii. Discharge capacity of the far (east) spillway can only be included if the APVD has an access and maintenance easement or similar legal document allowing them access to this spillway.
 - b. Perform a breach analysis to evaluate impacts to downstream infrastructure and development. Breach modeling should consider base flows from sunny day to 100-year conditions. This analysis should be used to provide an inundation map for the Emergency Action Plan (EAP).
 - c. Provide plans for a permanent gate replacement if the 2022 gate work was intended to be temporary.

Note: As part of the most recent inspection, NHDES performed a breach analysis to evaluate the impacts associated with potential dam failure. The results indicate that the dam is more appropriately classified as a High hazard structure and that it has insufficient discharge capacity to pass the required design event for such dams. NHDES will provide related information to your or your engineering consultant upon request.

By August 1, 2024:

11. Submit an application for reconstruction or removal of the dam consistent with the findings and recommendations of your engineering consultant and related approvals by NHDES. Permits from the NHDES Dam Safety and/or Wetlands programs will likely be required depending on the proposed scope of work.
12. Submit a fully updated Emergency Action Plan (EAP). Please visit NHDES's Dam Safety, Maintenance and Management webpage and click the Emergency Action Plans tab to access the complete set of administrative rules related to EAPs, as well as to view the current template and other EAP guidance.

On a continuing basis:

13. Leakage, seepage, wet areas or standing water was noted in the following areas. All such areas should be monitored periodically with a log of specific observations and a notation of the water level of the lake/pond. It is recommended that you include attention to these areas in your written OMR form so that individual observations may be compared over time to note changes or trigger the need to take remedial action. Should existing conditions worsen notably or new areas develop, or if discharge becomes cloudy/muddy (an indication that soil material may be moving within the dam or its foundation), please contact NHDES immediately.
 - a. Historic leakage/seepage from the gate outlet and right of the gate outlet.
14. Monitor the condition of the concrete in the near (west) spillway, repairing deterioration as needed.
15. Routinely clear debris from the spillways to allow for unrestricted flow.
16. Routine brush and tree removal from the dam, abutments and within 15-ft of the dam and spillways.

Please note that under New Hampshire's state statute RSA 482:89, NHDES may commence proceedings to levy fines of up to \$2,000 per violation per day against a dam owner who does not respond within 45 days of receipt of a written order, directive, or any notice of needed maintenance, repair, or reconstruction issued by NHDES. To avoid proceedings under this provision, you **must respond** to this LOD. If you fail to return this form within 45 days or fail to otherwise respond in writing within 45 days indicating your intent to remedy the identified deficiencies, you will not have the benefit of the compliance deadlines indicated on the form and NHDES will commence a proceeding under RSA 482:89 to seek administrative fines for the identified deficiencies. Please note that responding as required does not preclude NHDES from pursuing other appropriate action for the identified deficiencies, in accordance with NHDES Compliance Assurance Response Policy, available on-line at <https://www.des.nh.gov/rules-and-regulatory/rulemaking-and-enforcement>.

Letter of Deficiency
Dam #D245005/DSP #22-003
August 9, 2022
pg. 4

We believe the easiest way to respond is to sign and return the attached "Intent to Complete Repairs" form, either agreeing to correct the identified deficiencies by the dates indicated OR by proposing amendments to the listed work items or dates, which you may do by writing directly on the form. NHDES will evaluate and respond to any reasonable requests for proposed amendments in a timely manner. We have enclosed a self-addressed stamped envelope for you to return this form. You may also scan and e-mail the completed form to damsafety@des.nh.gov or fax it to (603) 271-6120.

Our intent in issuing this LOD is to make you aware of items that require your attention to ensure the continued safe operation of your dam. It is our hope that, through the return of the attached form and correction of the identified deficiencies, you will develop and maintain a commitment to keeping a safe and well-maintained dam. If the condition of the dam or the status of any of the noted deficiencies has changed since the inspection, please note this information on the attached intent form.

If you have any questions or comments regarding this LOD or would like to be present at future inspections, please contact Jim Weber, P.E. at 271-8699 or me at 271-3406 or write to the address for the Water Division listed on the bottom of the cover page.

Sincerely,



Steve N. Doyon, PE
Chief Dam Safety Engineer
Dam Safety & Inspection Section

Attachments: Inspection Report, Inspection Photos, Failure Impact Table, Drawing, Copy of 2012 OMR, Blank OMR form, DB13
ec: NHDES Legal Unit
cc: Town of Washington
Town of Marlow

Certified # 7017 3040 0000 7493 4513

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Dam Inspection Form

Dam number: D245005
Hazard Classification: Significant – change to High
Condition Assessment: Poor
Dam name(s): Ashuelot Pond Dam
Town: Washington
Date of inspection: 2019; 2020; 2021 & July 13, 2022
Inspector: Jim Weber
Water level: Just below the top of both spillways (near normal pool)
Report date: July 15, 2022

PERTINENT DATA:

Maximum Height: 13 ft **Storage:** 2,874 acre-ft perm; 4,373 acre-ft max
Overall Length: 175 ft **Drainage Area:** 16,865 acres (26.3 SM)
Pond Area: 369 ac
100-yr Storm: 6,541 cfs inflow routed to 1,934 cfs overtopping dam by 1.1 ft
2.5 x 100-yr Storm: 11,511 cfs inflow routed to 4,555 cfs overtopping dam by 2.8 ft
Discharge Capacity: 570 cfs with 1-ft freeboard
 1,122 cfs with no freeboard
Type of Construction: Stone/Earth/Concrete
Construction Date: 1872, 1925
Outlet Works: 1 – Near spillway (West) - 32 ft wide broad crested spillway (1,441.5)
 1 – Far spillway (East) - 42 ft wide broad crested spillway (1,441.5)
 1 – 2.8 ft by 3 ft gate over stoplogs (1431.5 sill)
Dam Crest: 1 – 175 ft (1444.5)

Dam Inspection Observations:

Feature	Observation	Type H/M/S/ NA*
Dam Crest	- Minor brush on the crest (Photos: 1, 8, 11 & 12) - Historic sinkholes above the upstream wall and adjacent to the gatehouse were not visible during this inspection	M M/S
Dam Upstream Face/slope	- The upstream stone face/slope was repaired in 2020 and appeared to be in good condition (Photos: 1 & 8) - Minor brush observed on the upstream stone face/slope (Photos: 1 & 8)	NA M
Dam Downstream Face	Brush and trees were observed on the downstream stone face and within 15-ft of the downstream face (Photos: 2 - 5)	M
Gate	- Minor leakage flow was visible from the gate outlet (Photos: 4) - Historic leakage right of the gate outlet was not observed - The gate has been inoperable for several years - A dive inspection of the tunnel leading to the gate and the gate was performed in August 2021 and included the following observations. - A void was observed just upstream of the right side	M M M/S NA M/S

	of the gate. This void is in the vicinity of historic sinkholes on the dam crest and the historic leakage from the right side of the gate outlet ○ Sandbags had been placed in front of the gate to try and limit flow under the gate ○ Dimensions were measured for use in designing a temporary and/or replacement gate structure and repairing the voids	M NA
Near Spillway (West)	• Minor cracking in the upstream concrete cap (Photos: 6 - 8) • Minor brush within 15-feet of the left and right spillway abutments (Photos: 6 - 8) • Minor leakage through the concrete/stone of the spillway observed about 10 feet from the right end of the spillway	M M M
Far Spillway (East)	• Brush and trees within 15-feet of the left and right spillway abutments (Photos: 9 - 10) • Moderate leakage through the stones of the spillway observed along the spillway length (Photos: 9 - 10) • Debris including a large tree stump were observed on the spillway crest (Photos: 9 - 10) • It is unclear if the dam owner has legal maintenance access to this spillway	M M M NA
CAR – Poor	• Dam is expected to overtop for the both the 100-yr and 2.5 x 100-yr design events • Dam was overtopped in the past in 2005 & 2006 and has come close to overtopping on several occasions in 1959, 1999 & 2008 • Gate is inoperable	H H M

*Type of Deficiency: H-Hydrologic, M-Maintenance; S-Structural; NA-Not Applicable

Downstream Hazard Review:

Feature	Observation
Russel Mill Pond Rd. bridge 0.4 mi	Private bridge – 30 ft by 13 ft
Washington Pond Rd bridge 0.6 mi	Town bridge – 45 ft by 10 ft
96 Marlow Rd trailer 0.9 mi	First floor elevated by wheel to about 2.5 ft
9 Washington Pond Rd – Shed and private bridge 2.4 mi	Private bridge to peninsula under construction
423 Washington Pond Rd house 2.6 mi	Garage door into basement. First floor above basement
405 Washington Pond Rd house 2.6 mi	First floor elevated by 2 steps
403 Washington Pond Rd house 2.7 mi	First floor elevated by 3 steps
381 Washington Pond	First floor equal to road elevation (former Brown camp)

Rd house 2.9 mi	
345 Washington Pond Rd 3.2 mi	First floor elevated by 3 steps
Symondsville Rd bridge	Town bridge – 45 ft by 12 ft
Former Lumber Yard behind 842 NH Route 10	Three vacant commercial buildings behind Post Office

HYDROLOGY/HYDRAULICS:

NHDES used the approved hydrology and hydraulic analysis of the dam and its watershed using currently available data submitted by NH Dams, LLC as the basis of this analysis. The 100-yr storm resulted in an inflow of 6,541 cfs routed to 1,934 cfs with 1.1 ft of overtopping, while the 2.5 x 100-yr storm resulted in an inflow of 11,511 cfs routed to 4,555 cfs overtopping the dam by 2.8 ft. These values include the far (east) spillway. If the APVD does not have legal access to the far (east) spillway for maintenance, NHDES will not allow the discharge from this spillway to be included in the available discharge capacity and the resulting overtopping of the dam will increase.

CLASSIFICATION AND JUSTIFICATION: Significant- Recommend change to High

NHDES performed a HEC-RAS 2D breach analysis for the downstream reach. During the modeling process, failure of the dam during a 100-yr flood event resulted in flooding greater than 1-foot above the first floor elevation of the residences at 345, 381 and 405 Washington Pond Road. The results of the breach analysis are included in the attached table.

As such, the hazard classification of the dam should be changed from Significant to High.

EMERGENCY ACTION PLAN:

The current EAP was last updated and tested in 2016. The inundation map was last updated in 1997. A new breach analysis should be performed and a new EAP should be completed including a new inundation mapping from the breach analysis.

OPERATIONS, MAINTENANCE & RESPONSE PLAN:

The Operations Plan on file is dated 2012.

RECOMMENDATIONS:

Based on the site inspection and review of the file, it is recommended that an LOD and hazard reclassification letter be issued:

By October 1, 2022:

1. Provide plans for the replacement of the gate and repair of the voids in the gate sluiceway for review. We understand that the owner is working with NH Dams, LLC and M&K Commercial Diving. Once the exact scope of work has been established a determination will be made on the need for a dam safety program permitting. The work will also require a permit from the NHDES Wetlands program.

2. Provide documentation (deed, easement, agreement etc.) indicating that the APVD has an access and maintenance rights to access the far (east) spillway for routine maintenance, repairs and reconstruction.
3. Debris or other material was noted in the following outlet structures and should be removed as soon as possible. Such material will obstruct flow, lessen the dam's ability to function efficiently and increase the risk that the dam may be overtopped – which could lead to failure.
 - a. Debris including a large tree stump were observed on the spillway crest (Photos: 9 – 10)
4. Provide copies of the seepage monitoring logs for review.
5. Provide a written plan for implementation of the items in this LOD to NHDES for review and approval.

By November 15, 2022:

6. Review and update the existing Operation, Maintenance and Response form for the dam. Please submit the revised form to NHDES. The form should include all pertinent dam and contact information, as well as describe the type and frequency of the maintenance and monitoring items that routinely occur at the dam. A blank form may be found at: <https://www.des.nh.gov/water/dam-maintenance-and-management>. Scroll down and select the Dam Permitting and Forms tab and then the Find Permit Applications box.
7. Complete the installation of a new gate and repair of the voids in the gate sluiceway per the plans approved by NHDES.
8. The current Emergency Action Plan (EAP) was last updated and last tested in 2016. Please update, at a minimum, the Notification Flow Chart and distribute the updates. Once the updates have been distributed, the EAP should be tested.
9. Trees, brush or other unwanted vegetation was noted in the following locations. Such vegetation should be removed and kept at least 15 feet from the entire footprint of the dam and all components of the dam to preserve a buffer for inspection, access and maintenance/repair. After clearing occurs, any disturbed areas should be properly regraded and protected with an appropriate ground cover (grass, riprap stone or other treatments) to prevent erosion of or damage to the dam and its components.
 - a. Minor brush on the crest (Photos: 1, 8, 11 & 12)
 - b. Minor brush observed on the upstream stone face/slope (Photos: 1 & 8)
 - c. Brush and trees were observed on the downstream stone face and within 15-ft of the downstream face (Photos: 2 - 5)
 - d. Minor brush within 15-feet of the left and right spillway abutments for the near (West) spillway (Photos: 6 - 8)
 - e. Brush and trees within 15-feet of the left and right spillway abutments for the far (East) spillway (Photos: 9 - 10)

By January 1, 2023:

10. Engage the services of a consultant qualified in dam-related work to complete an engineering evaluation or analysis of, at a minimum, the items noted below and submit a report to NHDES. The report should include all investigation findings and include recommendations and a schedule for reconstruction, as warranted, to make the dam compliant with the current standards for High hazard dams. In order to ensure that the selected consultant meets the requirements of Env-Wr 403.03(a)(1), NHDES recommends that you submit the resume of your proposed engineering consultant for review in accordance with Env-Wr 403.03 (a)(1) prior to contracting services.
 - a. Assess the hydrology of the watershed to determine if the dam is capable of safely passing the runoff from the 2.5 x 100-year storm event with a minimum of one foot of remaining freeboard and without manual operations or otherwise comply with Env-Wr 303.12;
 - i. NHDES approved a model in March 2021 for use in evaluating the dam. This model can be used at the discretion of the approved engineering consultant.
 - ii. Discharge capacity of the far (east) spillway can only be included if the APVD

has an access and maintenance easement or similar legal document allowing them access to this spillway.

- b. Perform a breach analysis to evaluate impacts to downstream infrastructure and development. Breach modeling should consider base flows from sunny day to 100-year conditions. This analysis should be used to provide an inundation map for the Emergency Action Plan (EAP).
- c. Provide plans for a permanent gate replacement if the 2022 gate work was intended to be temporary.

Note: As part of the most recent inspection, NHDES performed a breach analysis to evaluate the impacts associated with potential dam failure. The results indicate that the dam is more appropriately classified as a High hazard structure and that it has insufficient discharge capacity to pass the required design event for such dams. NHDES will provide related information to you or your engineering consultant upon request.

By August 1, 2024:

11. Submit an application for reconstruction or removal of the dam consistent with the findings and recommendations of your engineering consultant and related approvals by NHDES. Permits from the NHDES Dam Safety and/or Wetlands programs will likely be required depending on the proposed scope of work.
12. Submit a fully updated Emergency Action Plan. Please visit NHDES's Dam Safety, Maintenance and Management webpage and click the Emergency Action Plans tab to access the complete set of administrative rules related to EAPs, as well as to view the current template and other EAP guidance.

On a continuing basis:

13. Leakage, seepage, wet areas or standing water was noted in the following areas. All such areas should be monitored periodically with a log of specific observations and a notation of the water level of the lake/pond. It is recommended that you include attention to these areas in your written Operation, Maintenance and Response form so that individual observations may be compared over time to note changes or trigger the need to take remedial action. Should existing conditions worsen notably or new areas develop, or if discharge becomes cloudy/muddy (an indication that soil material may be moving within the dam or its foundation), please contact NHDES immediately.
 - a. Historic leakage/seepage from the gate outlet and right of the gate outlet.
14. Monitor the condition of the concrete in the near (west) spillway, repairing deterioration as needed.
15. Routinely clear debris from the spillways to allow for unrestricted flow.
16. Routine brush and tree removal from the dam, abutments and within 15-ft of the dam and spillways.

D245005 Ashuelot Pond Dam, Washington, Inspected: 07/12/2022



1.jpg



2.jpg



3.jpg



4.jpg

D245005 Ashuelot Pond Dam, Washington, Inspected: 07/12/2022



5.jpg



6.jpg



7.jpg



8.jpg

D245005 Ashuelot Pond Dam, Washington, Inspected: 07/12/2022



9.jpg



10.jpg



11.jpg



12.jpg

Ashuelot Pond Dam (D245005)
Dam Failure Flood Depths
July 2022

		Sunny Day Breach		100-year							
	Distance			No Breach		Breach (2X)		Incremental			
		GS	FFE	GS	FFE	GS	FFE	GS	FFE		
Location	(mi)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	Impact	Notes
Russell Mill Pond Rd Bridge	0.4	0	--	0	--	0	--	--	--	--	
Washington Pond Rd Bridge	0.6	0	--	0	--	1.4	--	1.4	--	L	
95 Marlow Rd Trailer	0.9	0	0	0	0	0	0	0	0	--	
9 Washington Pond Rd - Shed & Private Bridge	2.4	0	--	0	--	3.9	--	3.9	--	L	
423 Washington Pond Rd House	2.6	0	0	0	0	3.3	0	3.3	0	S	Basement
405 Washington Pond Rd House	2.6	0	0	0	0	2.8	1.8	2.8	1.8	H	
403 Washington Pond Rd House	2.7	0	0	0	0	2.1	0.6	2.1	0.6	S	
381 Washington Pond Rd House	2.9	1.6	0	2.6	0	6.1	1.2	3.5	1.2	H	Raised Foundation
345 Washington Pond Rd House	3.2	2	0.5	3	1.5	6.4	4.9	3.4	3.4	H	
Symondsville Rd Bridge	4.1	0	--	0	--	2.2	--	2.2	--	--	
Former Lumber Yard behind 842 NH Route 10	4.3	0	0	0	--	0.3	--	0.2	--	--	End of evaluation

* Breach Parameters: 2.0 HD with 0.25 horizontal side slopes, and a time of failure of 0.25 hrs

** 100 year flooding compared to peak 100 year breach scenario at location and time of peak breach flow

*** All elevations and depths are based on LiDAR and may require field survey verification

D245005 Asheulot Pond Dam

Left

All references of left and right are facing in the downstream direction

Right



No Scale



The State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES



Robert R. Scott, Commissioner

Department of Environmental Services
State Dam Safety Program
Water Division, Dam Bureau
29 Hazen Drive, P.O. Box 95
Concord, NH 03302-0095

Intent to Complete Repairs
DAM #D245005/DSP #22-003
DAM Ashuelot Pond Dam

RE: Letter of Deficiency: Issued on August 9, 2022

Dear Dam Safety Program:

In response to the above referenced Letter of Deficiency (LOD), I concur with the New Hampshire Department of Environmental Service's, Dam Bureau (NHDES) recommendations, and specifically agree to complete the following items by the indicated schedule.

DATE: October 1, 2022

1. Provide plans for the replacement of the gate and repair of the voids in the gate sluiceway for review. We understand that the owner is working with NH Dams, LLC and M&K Commercial Diving. Once the exact scope of work has been established a determination will be made on the need for a dam safety program permitting. The existing Emergency Action Plan (EAP) The work will also require a permit from NHDES Wetlands program.
2. Provide documentation (deed, easement, agreement etc.) indicating that the APVD has an access and maintenance rights to access the far (east) spillway for routine maintenance, repairs and reconstruction.
3. Debris or other material was noted in the following outlet structures and should be removed as soon as possible. Such material will obstruct flow, lessen the dam's ability to function efficiently and increase the risk that the dam may be overtopped – which could lead to failure.
 - a. Debris including a large tree stump were observed on the spillway crest (Photos: 9 – 10).
4. Provide copies of the seepage monitoring logs for review.
5. Provide a written plan for implementation of the items in this LOD to NHDES for review and approval.

DATE: November 15, 2022

6. Review and update the existing OMR form for the dam. Please submit the revised form to NHDES. The form should include all pertinent dam and contact information, as well as describe the type and frequency of the maintenance and monitoring items that routinely occur at the dam. A blank form may be found at:
<https://www.des.nh.gov/water/dam-maintenance-and-management>. Scroll down and select the Dam Permitting and Forms tab and then the Find Permit Applications box.
7. Complete the installation of a new gate and repair of the voids in the gate sluiceway per the plans approved by NHDES.

8. The current EAP was last updated and last tested in 2016. Please update, at a minimum, the Notification Flow Chart and distribute the updates. Once the updates have been distributed, the EAP should be tested.
9. Trees, brush or other unwanted vegetation was noted in the following locations. Such vegetation should be removed and kept at least 15 feet from the entire footprint of the dam and all components of the dam to preserve a buffer for inspection, access and maintenance/repair. After clearing occurs, any disturbed areas should be properly regraded and protected with an appropriate ground cover (grass, riprap stone or other treatments) to prevent erosion of or damage to the dam and its components.
 - a. Minor brush on the crest (Photos: 1, 8, 11 & 12);
 - b. Minor brush observed on the upstream stone face/slope (Photos: 1 & 8);
 - c. Brush and trees were observed on the downstream stone face and within 15-ft of the downstream face (Photos: 2 - 5);
 - d. Minor brush within 15-feet of the left and right spillway abutments for the near (West) spillway (Photos: 6 - 8); and
 - e. Brush and trees within 15-feet of the left and right spillway abutments for the far (East) spillway (Photos: 9 - 10).

DATE: January 1, 2023

10. Engage the services of a consultant qualified in dam-related work to complete an engineering evaluation or analysis of, at a minimum, the items noted below and submit a report to NHDES. The report should include all investigation findings and include recommendations and a schedule for reconstruction, as warranted, to make the dam compliant with the current standards for High hazard dams. In order to ensure that the selected consultant meets the requirements of Env-Wr 403.03(a)(1), NHDES recommends that you submit the resume of your proposed engineering consultant for review in accordance with Env-Wr 403.03 (a)(1) prior to contracting services.
 - a. Assess the hydrology of the watershed to determine if the dam is capable of safely passing the runoff from the 2.5 x 100-year storm event with a minimum of one foot of remaining freeboard and without manual operations or otherwise comply with Env-Wr 303.12;
 - i. NHDES approved a model in March 2021 for use in evaluating the dam. This model can be used at the discretion of the approved engineering consultant.
 - ii. Discharge capacity of the far (east) spillway can only be included if the APVD has an access and maintenance easement or similar legal document allowing them access to this spillway.
 - b. Perform a breach analysis to evaluate impacts to downstream infrastructure and development. Breach modeling should consider base flows from sunny day to 100-year conditions. This analysis should be used to provide an inundation map for the Emergency Action Plan (EAP).
 - c. Provide plans for a permanent gate replacement if the 2022 gate work was intended to be temporary.

Note: As part of the most recent inspection, NHDES performed a breach analysis to evaluate the impacts associated with potential dam failure. The results indicate that the dam is more appropriately classified as a High hazard structure and that it has insufficient discharge capacity to pass the required design event for such dams. NHDES will provide related information to your or your engineering consultant upon request.

DATE: August 1, 2024

11. Submit an application for reconstruction or removal of the dam consistent with the findings and recommendations of your engineering consultant and related approvals by NHDES. Permits from the NHDES Dam Safety and/or Wetlands programs will likely be required depending on the proposed scope of work.
12. Submit a fully updated Emergency Action Plan. Please visit NHDES's Dam Safety, Maintenance and Management webpage and click the Emergency Action Plans tab to access the complete set of administrative rules related to EAPs, as well as to view the current template and other EAP guidance.

On a continuing basis:

13. Leakage, seepage, wet areas or standing water was noted in the following areas. All such areas should be monitored periodically with a log of specific observations and a notation of the water level of the lake/pond. It is recommended that you include attention to these areas in your written Operation, Maintenance and Response form so that individual observations may be compared over time to note changes or trigger the need to take remedial action. Should existing conditions worsen notably or new areas develop, or if discharge becomes cloudy/muddy (an indication that soil material may be moving within the dam or its foundation), please contact NHDES immediately.
 - a. Historic leakage/seepage from the gate outlet and right of the gate outlet.
14. Monitor the condition of the concrete in the near (west) spillway, repairing deterioration as needed.
15. Routinely clear debris from the spillways to allow for unrestricted flow.
16. Routine brush and tree removal from the dam, abutments and within 15-ft of the dam and spillways.

You must sign and return this Intent form either agreeing to comply with the listed items by the dates indicated OR proposing amendments to either the listed work items or compliance dates (please state reasons for proposal and use reverse side if more space is needed). NHDES will evaluate and respond to any reasonable requests for amending the scope of the work items or compliance dates in a timely manner. We have enclosed a self-addressed stamped envelope for you to return this form. You may also scan and e-mail the completed form to damsafety@des.nh.gov or fax it to (603) 271-6120.

Intent to Complete Repairs
Dam #D245005/DSP #22-003
August 9, 2022
pg. 4

Please note that meeting the statutory 45-day response deadline is necessary even if the first compliance deadline on the LOD is beyond that date. Failure to return the form or otherwise respond will result in NHDES initiating a proceeding to seek an administrative fine against you.

Signature of Owner or Authorized Agent: _____

_____ (print name)

Date: _____ ENG-: JRW



The State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES



Robert R. Scott, Commissioner

August 9, 2022

Mr. Gary Carney, Chairman
Ashuelot Pond Dam Village District
P.O. Box 105
Washington, NH 03280

RE: Reclassification of Ashuelot Pond Dam, D245005, Washington

Dear Mr. Carney:

The primary purpose of this letter is to notify you that, in accordance with Env-Wr 303.02, the New Hampshire Department of Environmental Services Dam Bureau (NHDES) has reviewed the impacts associated with a failure of the Ashuelot Pond Dam and, consequently, reassigned its hazard classification. For the reasons outlined below, it is the determination of NHDES that the dam's hazard classification should be changed from a "significant hazard" potential to a "high hazard" potential dam.

As a result of the reclassification, the dam will now be subject to meeting the current design and safety standards applicable to its new classification, as well as those changes listed below. A full listing of the requirements may be found in part Env-Wr 303 of the administrative rules relating to dams.

- Per RSA 482:8-a, the Annual Dam Registration Fee will change from \$750 to \$1,500.
- The scheduled safety inspections carried out by NHDES will now occur every two (2) years instead of every four (4) years.
- The Operations, Maintenance and Response (OMR) form should be revised to reflect the revised hazard classification.
- In accordance with Env-Wr 303.11 Discharge Capacity, a high hazard dam must have sufficient capacity to pass the runoff produced by the 250% of the 100-year flood generated by the drainage area upstream of the dam with one foot of freeboard and without manual operations. NHDES's regulations allow dam owners the option of passing the Inflow Design Flood (IDF). This is a storm that generates a lesser runoff rate and may be applied if it is shown that dam failure flows, when combined with this runoff rate, would not contribute to endangering additional public safety or property downstream of the dam. Based on your consultant's hydrologic and hydraulic model, NHDES has determined that the dam cannot pass the 250% of the 100-year storm runoff with more than one foot of freeboard, but rather overtops by about 2.8 feet.
- As required by RSA 482:11-a and in accordance with Env-Wr 500, the owner shall develop a revised Emergency Action Plan (EAP) including a revised inundation map.
- In accordance with Env-Wr 507.01 Notification Test, the owner shall conduct a test of the emergency communication network within one month of approval of the EAP and every two (2) years thereafter.

Hazard Classification and Justification:

As part of its review of the hazard classification for the dam, NHDES utilized your consultant's approved hydrologic and hydraulic (H&H) modeling of the contributing drainage area to evaluate the potential impacts to downstream structures associated with dam failure. The model indicated that failure of the dam during a 100-yr flood event resulted in flooding greater than 1-foot above the first floor elevation of the residences at 345, 381 and 405 Washington Pond Road.

The definition of a high hazard dam, provided in Env-Wr 101.21 of New Hampshire's Dam Safety Rules, includes specific criteria that could qualify a dam as a high hazard dam. In this case NHDES has determined that the dam meets the criteria listed below:

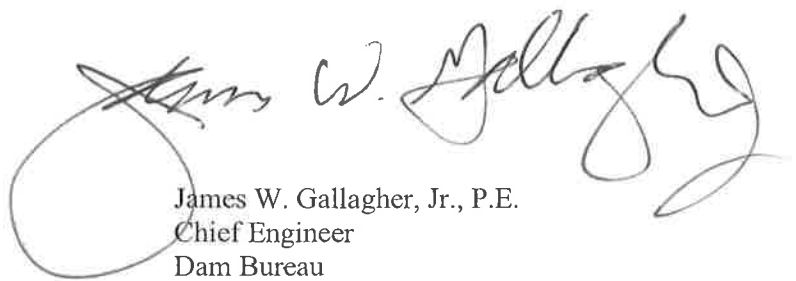
Env-Wr 101.21 "High Hazard Structure" means a dam that has a high hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in probable loss of human life as a result of:

(b) Water levels rising above the first floor elevation of a habitable residential structure or a commercial or industrial structure which is occupied under normal conditions when the rise due to dam failure is greater than one foot:

Please be advised that if you do not agree with the NHDES's determination to reassign the hazard classification and wish to request reconsideration, the process that must be followed is described in section Env-Wr 303 of the NHDES's administrative rules. Included with this letter are the administrative rules that govern the NHDES's review of and the procedures for appealing hazard classifications.

If you have any questions, or would like to discuss this matter further, please contact James Weber, P.E. at 271-8699 or me at 271-1961.

Sincerely,



James W. Gallagher, Jr., P.E.
Chief Engineer
Dam Bureau

NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES

(d) If the department determines that after the proposed breach or modification the structure will still meet the definition of a dam, the department shall approve the breach or modification of the dam provided that:

- (1) The work will be performed in a manner that will not cause property damage or threaten public safety upstream or downstream of the dam;
- (2) The threat posed to life or property after completion of the work is no more than it would have been if the work required by the department pursuant to Env-Wr 302.03 had been completed, if applicable; and
- (3) The requirements of Env-Wr 303.11 relative to discharge capacity will be met as a result of the proposed work.

Source. #1716, eff 2-20-81; ss by #2207, eff 12-13-82; ss by #2900, eff 11-7-84; amd by #4534, eff 11-30-88; ss by #5080, eff 2-22-91; ss by #6462-B, eff 2-21-97; ss by #8285, INTERIM, eff 2-21-05, EXPIRES: 8-20-05; ss by #8414, eff 8-20-05; ss by #10510, eff 1-22-14

Env-Wr 302.06 Notification to Public. After receiving approval pursuant to Env-Wr 302.05, the owner shall refrain from undertaking the work until the requirements of RSA 482:13 relative to notice to municipalities and hearing have been met.

Source. #4534, eff 11-30-88; ss by #5080, eff 2-22-91; ss by #6462-B, eff 2-21-97; ss by #8285, INTERIM, eff 2-21-05, EXPIRES: 8-20-05; ss by #8414, eff 8-20-05; ss by #10510, eff 1-22-14

PART Env-Wr 303 REQUIREMENTS FOR EXISTING DAMS

Env-Wr 303.01 Annual Registration Fee.

(a) Pursuant to RSA 482:8-a, annual registration fees for dams in the amount specified in RSA 482:8-a shall be payable to the department on January 1 of each calendar year.

(b) The department shall send a written notice, by October 31 of each year, to each owner specifying the amount of the registration fee that shall be due.

(c) The department shall send a second notice to each owner who fails to submit the annual registration fee by January 1. Such notice shall inform the owner that the payment is overdue and that if the owner fails to submit the registration fee within 10 days, the owner shall be subject to the penalties authorized by RSA 482:89.

(d) Notices sent pursuant to (b) and (c), above, shall include whatever information the department has relative to the tax map and lot number of the dam and the volume and page number of the deed to the dam and to the property on which the dam is located, if different. At the time of paying the annual registration fee, the owner shall confirm or, if necessary, provide or correct the information.

Source. #1716, eff 2-20-81; ss by #2207, eff 12-13-82; ss by #2900, eff 11-7-84; amd by #4534, eff 11-10-88; ss by #5080, eff 2-22-91; ss by #6462-B, eff 2-21-97; ss by #8285, INTERIM, eff 2-21-05, EXPIRES: 8-20-05; ss by #8414, eff 8-20-05; ss by #10510, eff 1-22-14

NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES

Env-Wr 303.02 Review of Hazard Classification.

(a) The department shall review the classification of a dam in conjunction with any inspection conducted pursuant to Env-Wr 302.02.

(b) If the department determines that a dam no longer meets the criteria of the class to which it had been assigned, the department shall reassign the dam to the proper classification.

(c) Upon reassigning a dam to a different classification, the department shall notify the owner in writing of:

(1) The new classification; and

(2) Any new requirements that might apply as a result of the reclassification.

Source. #1716, eff 2-20-81; ss by #2207, eff 12-13-82; ss by #2900, eff 11-7-84; ss by #4534, eff 11-30-88; ss by #5080, eff 2-22-91; ss by #6462-B, eff 2-21-97; ss by #8285, INTERIM, eff 2-21-05, EXPIRES: 8-20-05; ss by #8414, eff 8-20-05; ss by #10510, eff 1-22-14

Env-Wr 303.03 Appeal of Classification.

(a) If the owner disagrees with the department's decision to reclassify a dam's hazard classification, the owner may request that the department reconsider the decision.

(b) To request reconsideration, the owner shall submit a written request to the department that includes the following:

(1) The name, mailing address, and daytime telephone number of the owner;

(2) The dam number assigned by the department, if known, and if not known, the location of the dam by:

a. Tax map and lot number of the property on which the dam is located;

b. Location of the dam on the applicable USGS Quadrangle map; and

c. Name of the stream, river, or other water body on which the dam is located, if applicable;

(3) The results of a dam breach analysis, including routing of the flow downstream of the dam, completed in accordance with Env-Wr 502; and

(4) An assessment of all structures potentially impacted by a dam failure, including the depth of flooding at critical structures or groups of structures.

(c) If the department determines that the information requested in (b) is insufficient to grant the requested reconsideration, the department shall:

(1) Deny the request; or

(2) If the department believes that a favorable decision might be made if inundation mapping is provided, request the owner to provide inundation mapping completed in accordance with Env-Wr 503.01.

(d) The department shall notify the owner of its decision in writing within 60 days of receiving complete information.

NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES

Source. #1716, eff 2-20-81; ss by #2207, eff 12-13-82; ss by #2900, eff 11-7-84; amd by #4534, eff 11-30-88; ss by #5080, eff 2-22-91; ss by #6462-B, eff 2-21-97; ss by #8285, INTERIM, eff 2-21-05, EXPIRES: 8-20-05; ss by #8414, eff 8-20-05; ss by #10510, eff 1-22-14

Env-Wr 303.04 Dam Monitoring.

(a) The owner of a low hazard, significant hazard, or high hazard dam, or the owner's designee, shall monitor the dam in accordance with this section.

(b) The dam monitor shall:

- (1) Be trained in the operation of the dam;
- (2) Be trained to detect and assess conditions that could affect the safety of the dam;
- (3) Have authority from the owner to operate the structure during emergency situations;
- (4) For a significant hazard or high hazard dam, be available at the dam within 2 hours at all times; and
- (5) For a low hazard dam, be available at the dam within 2 hours during periods of heavy precipitation, high water levels, or receipt of notification of other events that could threaten the structural integrity of the dam.

(c) The owner of a low hazard, significant hazard, or high hazard dam shall provide:

- (1) A communication system between the monitor and the local communities; and
- (2) The means, materials, and equipment needed to make emergency repairs to the structure.

(d) The owner of a significant hazard or high hazard dam also shall provide the training and equipment, including alternative power sources, necessary to operate the structure.

Source. #1716, eff 2-20-81; ss by #2207, eff 12-13-82; ss by #2900, eff 11-7-84; amd by #4534, eff 11-30-88; ss by #5080, eff 2-22-91; ss by #6462-B, eff 2-21-97; ss by #8285, INTERIM, eff 2-21-05, EXPIRES: 8-20-05; ss by #8414, eff 8-20-05; ss by #10510, eff 1-22-14

Env-Wr 303.05 Operation and Maintenance Plan.

(a) The owner of a low hazard, significant hazard, or high hazard dam shall submit a written operation and maintenance plan for approval by the department.

(b) The operation and maintenance plan shall:

- (1) Describe the seasonal control of impoundment levels;
- (2) Describe regular maintenance activities; and
- (3) Identify the name(s) and address(es) of the dam monitor(s) required by Env-Wr 303.04 and any other emergency contacts for operation of the dam that the owner wishes to designate.

(c) The department shall approve the plan if:

- (1) The information submitted addresses the items specified in (b), above; and

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(2) Compliance with the submitted plan will result in a dam that will be operated safely during all flow conditions and not become a dam in disrepair.

(d) The owner shall update the operation and maintenance plan as necessary and shall submit a written update to the department within 15 days of any changes.

(e) An owner that is required to complete an emergency action plan ("EAP") pursuant to Env-Wr 303.06 may incorporate the operation and maintenance plan as an appendix to the EAP.

(f) The owner shall operate and maintain the dam in accordance with the approved operation and maintenance plan.

Source. #1716, eff 2-20-81; ss by #2207, eff 12-13-82; ss by #2900, eff 11-7-84; amd by #4354, eff 11-30-88; ss by #5080, eff 2-22-91; ss by #6462-B, eff 2-21-97; ss by #8285, INTERIM, eff 2-21-05, EXPIRES: 8-20-05; ss by #8414, eff 8-20-05; ss by #10510, eff 1-22-14

Env-Wr 303.06 Emergency Action Plan Required.

(a) As required by RSA 482:11-a, the owner shall develop an emergency action plan (EAP) for any dam, the failure of which may threaten life or property.

(b) The owner of a significant hazard or high hazard dam shall develop an EAP in accordance with Env-Wr 500.

(c) The operation and maintenance plan prepared by the owner of a low hazard dam shall constitute the EAP for that dam.

Source. #1716, eff 2-20-81; ss by #2207, eff 12-13-82; ss by #2900, eff 11-7-84; amd by #4534, eff 11-30-88; ss by #5080, eff 2-22-91; ss by #6462-B, eff 2-21-97; ss by #8285, INTERIM, eff 2-21-05, EXPIRES: 8-20-05; ss by #8414, eff 8-20-05; ss by #10510, eff 1-22-14

Env-Wr 303.07 Dam Repair and Reconstruction.

(a) Pursuant to RSA 482:9, the owner shall not initiate, or authorize anyone else to initiate, work on a dam which qualifies as reconstruction without first obtaining a permit from the department pursuant to Env-Wr 400.

(b) The owner may undertake repairs other than those qualifying as reconstruction without prior department approval.

(c) An owner wishing to perform a controlled breach or otherwise modify the dam to lower the impoundment to a safe level shall proceed in accordance with Env-Wr 302.05.

Source. #1716, eff 2-20-81; ss by #2207, eff 12-13-82; ss by #2900, eff 11-7-84; amd by #4534, eff 11-30-88; rpld by #5080, eff 2-22-91

New. #8414, eff 8-20-05; ss by #10510, eff 1-22-14

Env-Wr 303.08 Transfer of Ownership.

(a) The owner shall provide the information specified in (b), below, to any prospective owner prior to transferring:

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- (1) Title to the dam; or
 - (2) If ownership of the dam is tied to ownership of the property, the property on which the dam is located.
- (b) The owner shall provide the following information:
- (1) The existence of the dam;
 - (2) The dam number assigned by the department; and
 - (3) Any letters or orders issued by the department relative to the condition of the dam.
- (c) Within 30 days of the transfer of ownership of a dam or the property on which a dam is located, the new owner shall inform the department in writing of the transfer of ownership by providing the following information:
- (1) The name of the former owner;
 - (2) The dam number assigned by the department;
 - (3) The name, mailing address, and daytime telephone number of the new owner;
 - (4) The tax map and lot number of the dam; and
 - (5) The volume and page number of the deed which transferred ownership of the dam or the property on which the dam is located.

Source. #8414, eff 8-20-05; ss by #10510, eff 1-22-14

Env-Wr 303.09 Emergency Breach.

- (a) An owner may purposefully breach a dam without prior approval from the department only when a threat to public safety or public health exists or significant damage to public or private property is imminent.
- (b) The owner shall notify the department and the local police and fire departments prior to performing an emergency breach, if possible.
- (c) If it is not possible to notify the department and local police and fire departments prior to performing an emergency breach, the owner shall make such notification as soon as reasonably possible, but never more than one hour after the initiation of the emergency breach.
- (d) Within 30 days of performing an emergency breach, the owner shall submit an application to the department:
- (1) To reconstruct the dam in accordance with Env-Wr 400, indicating whether the owner plans to further modify or rebuild the dam; or
 - (2) To remove the dam in accordance with Env-Wr 600.

Source. #8414, eff 8-20-05; ss by #10510, eff 1-22-14

Env-Wr 303.10 Other Emergency Measures.

- (a) An owner may take measures which otherwise would require a permit to reconstruct a dam, other than emergency breaches, when it is necessary to do so in order to eliminate or reduce the risk of full or partial dam failure. Emergency repairs shall be limited to temporary stabilization of the site or mitigation of the immediate threat.

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- (b) The owner shall notify the department prior to taking such measures if possible but never more than 24 hours after the initiation of necessary repairs.
- (c) Within 48 hours of completing the emergency repairs, the owner shall submit a written statement to the department that explains the nature of the emergency and what corrective measures were taken.
- (d) Within 30 days of performing the emergency repairs, the owner shall submit an application to the department to reconstruct a dam in accordance with Env-Wr 400.

Source. #8414, eff 8-20-05; ss by #10510, eff 1-22-14

Env-Wr 303.11 Discharge Capacity.

- (a) All low hazard, significant hazard, or high hazard dams constructed prior to February 19, 1981 shall pass the flows indicated below with one foot of freeboard and without manual operations:
 - (1) Low hazard dams shall pass a 50-year flood, or at the owner's option, the site specific inflow design flood;
 - (2) Significant hazard dams shall pass the 100-year flood, or at the owner's option, the site specific inflow design flood; and
 - (3) High hazard dam shall pass 250% of the 100-year flood, or at the owner's option, the site specific inflow design flood.

- (b) Dams constructed after February 19, 1981 shall pass the flow required by the administrative rules in place at the time of the dam's construction, in accordance with the classification of the dam at the time of construction.

Source. #8414, eff 8-20-05; ss by #10510, eff 1-22-14

Env-Wr 303.12 Meeting Discharge Capacity Requirements.

- (a) If a dam does not have adequate discharge capacity to pass the flood specified in Env-Wr 303.11 with one foot of freeboard, the owner shall submit a plan to the department to address the deficiency.
- (b) The plan submitted pursuant to (a), above, shall:
 - (1) Specify the action to be taken, per (c), below;
 - (2) Specify the proposed timeframe for taking the action; and
 - (3) Include the results of hydrologic analyses completed pursuant to Env-Wr 403.05, assessing the floods and discharge capacity of the structure.
- (c) The plan shall specify which of the following actions the owner intends to pursue:
 - (1) Increase the capacity of the dam to pass the flood with one foot of freeboard and without manual operations;
 - (2) Submit a stability analysis to the department showing that the dam is safe against sliding, overturning, or erosion by overtopping, as applicable, during the specified flood, using the methods outlined in "Engineering Guidelines for Evaluation of Hydropower Projects" published by the Federal Energy Regulatory Commission (FERC), Chapter 3 dated 2002 and Chapter 4 dated 1991, available as noted in Appendix B;
 - (3) Stabilize the dam so that it is safe under the specified flood conditions; or

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- (4) Modify the dam so that the hazard classification is lowered and the dam passes the appropriate flow for the new classification.
- (d) The department shall approve the plan if the department determines that:
 - (1) The proposed action will bring the dam into compliance with Env-Wr 303.11;
 - (2) The work can be done in a way that will not:
 - a. Endanger life or property downstream of the dam; or
 - b. Cause environmental losses that are not reversible environmental losses; and
 - (3) The time frame for the work is reasonable under the circumstances, including the risk posed by the deficiency, the owner's financial resources, and the timing of the work in relation to other uses of the impounded water.
- (e) The department shall notify the owner in writing of its decision. If the plan is not approved, the notice shall specify the reason(s) for the non-approval.
- (f) If work under the plan as approved constitutes reconstruction of the dam, the owner shall submit an application in accordance with Env-Wr 400.

Source. #8414, eff 8-20-05; ss by #10510, eff 1-22-14

Env-Wr 303.13 Request for Time Extension.

- (a) An owner may request a time extension to comply with any directive of the department issued pursuant to RSA 482:12.
- (b) The request shall be submitted in writing to the department with the following information:
 - (1) The reason(s) why an extension is needed;
 - (2) The current status of the repairs or investigations; and
 - (3) The length of time of extension requested.
- (c) The department shall grant the request for time extension if it determines that:
 - (1) The owner has in good faith pursued the work required by the directive;
 - (2) The owner is unable to complete the work during the time period specified;
 - (3) The current condition of the dam is such that it is not expected to fail under flow conditions anticipated during the extension; and
 - (4) The condition of the dam will not deteriorate so as to pose a threat to public safety under flow conditions anticipated during the extension.
- (d) The department shall notify the owner of the decision on the request in writing. If the department denies the request, the department shall state the reason(s) for the denial.

Source. #8414, eff 8-20-05; ss by #10510, eff 1-22-14