

January 28, 2024

James R. Weber, P.E.
NH DES Dam Bureau; Water Division
29 Hazen Drive; PO Box 95
Concord, N.H. 03302-0095

SUBJECT: D245005 Ashuelot Pond Dam; Gate House Structural Evaluation
High Hazard Dam; Washington, New Hampshire

Dear Mr. Weber:

This letter details efforts completed by the Asheulot Pond Dam Village District (APDVD) to comply with the August 9, 2022 letter of deficiency (LOD), with specific detail provided on the structural assessment of the existing low-level-outlet (LLO) gate house structure.

The LOD item 1 required the APDVD to provide plans for the replacement of the existing gate and repair of voids in the gate sluiceway by October 1, 2022. In accordance with that requirement, on September 16, 2022, NH Dams, LLC (NHD) provided NHDES Dam Bureau (Dam Bureau) with sketch plans for a new concrete low level outlet (LLO) channel, and a temporary slide gate that could be retrofitted as a permanent gate with Dam Bureau approval. The scope of work defined in those sketch plans included filling voids at the existing sluiceway to allow for a structural evaluation of the gate house structure. M&K Commercial Divers and Construction (M&K) completed the work between October 18 and December 1, 2022. An Observation report submitted to Dam Bureau February 20, 2023 details the construction of the temporary gate and reconstruction of the low level outlet channel.

As noted in that report, on December 12, 2022 M&K observed significant leakage above the proposed area of reconstructed LLO. A design of the additional work was provided to Dam Bureau by NHD and approved May 31, 2023; work to repair this leakage to allow for evaluation of the gate house structure was completed by M&K between June 15 and July 5, 2023. The temporary gate remained open to allow for additional discharge capacity during high water events in July and August.

In September the temporary gate was closed, and the gate house water pit dewatered. On September 26, M&K, NHD, structural engineers from the HL Turner Group (TTG) and members of the APDVD were on site with you to make structural observations of the condition of the gate house. On the day of the inspection water level was "normal" with approximately 2 to 3-inches of water flow over the primary spillway; as mentioned above, the tailrace of the gatehouse was dewatered.

Paige Wilber, P.E. and Gerry Blanchette, P.E., both TTG structural engineers, evaluated the condition of the interior foundation and structural condition of the gate house and water pit. They documented their findings, took field measurements and photographs (see attached).

Gate House Structure Description

The gatehouse is located approximately 85-feet to the right of the primary spillway (as viewed facing downstream). The gate house superstructure is a 2 x 4 stud wood-framed building with T-111 sheathing with single pass doors on both left and right sides, and a shingled roof. The gate house in need of repair,

both to the sheathing and the left door. The gate house has a concrete slab floor at ground level, with metal grating over the water pit with access to the existing stoplog stanchion style gate. The existing gate stanchions are split into two sections, a lower gate and an upper gate. The lower gate section invert is approximately 3-feet below normal pond level. The upper gate section provides detention from the top of the lower gate to approximately the spillway crest (see attached Existing Conditions Sketch prior to M&K repair work).

During the observation of the gatehouse conditions, both the upper and lower gates were raised, with approximately 3-feet between the bottom of the lower gate and the invert of the water pit. For reference, a figure of the gate house water pit has been provided below, with letters assigned to each wall section.

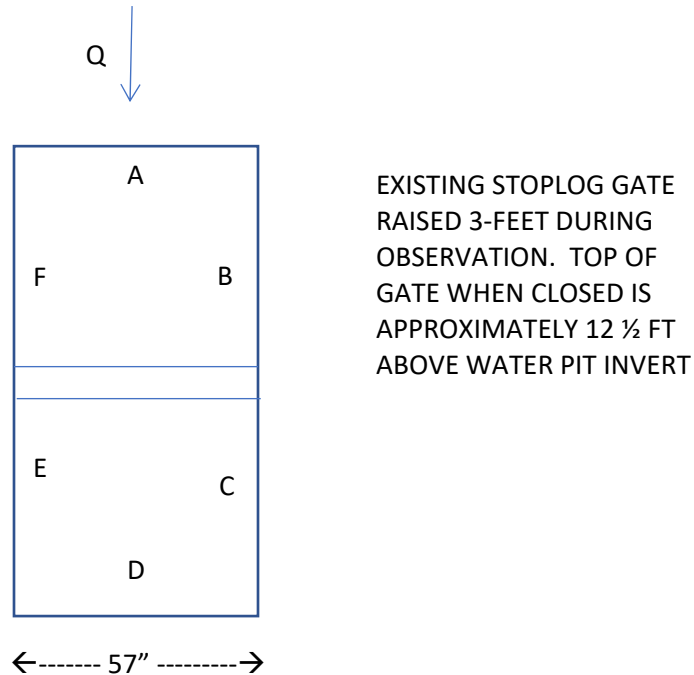


Figure 1 – Ashuelot Pond Dam Gate House plan view wall designation

Wall Section A

This wall section has recently been renovated by a reinforced concrete overlay of the existing dry-laid stone masonry. The concrete overlay ranges in thickness from 6” to 8” and extends to an elevation above the dry-laid inlet lintel stone, approximately 12-feet above the concrete invert of the gate house water pit inlet invert. There is a mass of concrete over-pour at the gate house invert from recent repairs that needs to be removed to restore a consistent invert elevation.

Wall Sections B & F

Wall sections B & F extend approximately 32” between the face of wall section A and the existing stoplog stanchion gate. These wall sections consist of concrete overlays of varying ages, over what is assumed to be dry-laid stone masonry. These wall sections appear to be in good condition with no observed cracks or disconformity observed during this observation. The aggregate is exposed in concrete of older vintage, but appears to be in functional and serviceable condition. There are voids at

the interface of older concrete and newer concrete that should be cleaned and repaired. These voids do not appear to have any structural impact on the integrity of the water pit (see photo pages below).

Wall Sections C & E

Similar to wall sections B & F, these wall sections appear to be overlays over the original dry-laid stone masonry of the gate house water pit. The coarse aggregate of the concrete is exposed where erosion of the fine concrete particles has occurred. There were no observed notable cracks or discontinuities in the wall sections C & E. It should be noted on the downstream end of these wall sections, what appears to be an approximately 5" facing gate slots were formed into the concrete. These appear to have been gate slots for the historical outlet from the gate house water pit. The total length of wall sections C & E is approximately 3' including the 5" gate slots. See attached photo pages.

Wall Section D

The downstream wall of the gate house water pit appears to be dry-laid stone masonry that has been repointed at various times. The face of the downstream wall has a variable distance from the existing stoplog stanchion gate, however in general is approximately 3' from the downstream face of the existing gate.

There was no observed discontinuity between the joints of the stone masonry, and no observed indications of stones being dislodged or displaced by structural stress or strain. Any crack in previously placed pointing appears to be the result of aging masonry and not the result of movement of the dry-laid stone. See photo pages.

Summary

The LLO gate house interior foundation and water pit appear to be structurally sound based on visual observations the date of the inspection. Observed cracks in concrete or pointing appears to be age related, and not an indication the foundation has shifted or is structurally unstable. The superstructure of the gate house is in need of repair or replacement.





Photo 1 – Ashuelot Pond Dam Gate House – interior face of upstream gate house water pit (Wall A from Figure 1)



Photo 2 – Ashuelot Pond Dam Gate House – downstream left corner at former stoplog bay (elevation view facing downstream at corner of walls C & D)



Photo 3 – Ashuelot Pond Dam Gate House – interior face of downstream gate house water pit (elevation view of Wall D facing downstream)



Photo 4 – Ashuelot Pond Dam Gate House – interior face of downstream gate house water pit above outlet (elevation view of upstream face of Wall D facing downstream)



EXISTING STOPLOG GATE

DIRECTION OF FLOW



Photo 5 – Ashuelot Pond Dam Gate House – face of right gate house water pit wall downstream of existing gate (Wall E)



Photo 6 – Ashuelot Pond Dam Gate House – concrete over-pour at downstream end of gate house inlet (to be removed) (Base of Wall A)



Photo 7 – Ashuelot Pond Dam Gate House – downstream face of existing gate



Photo 8 – Ashuelot Pond Dam Gate House – outlet channel of gate house (base of wall D)

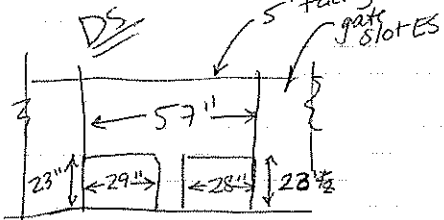


Photo 9 – Ashuelot Pond Dam Gate House – downstream exterior face of gate house and dam at outlet



Photo 10 – Ashuelot Pond Dam – upstream face of dam

Ashuelot



5 1/4" t facing
double depth gate slot

11' 4" deep to TOC

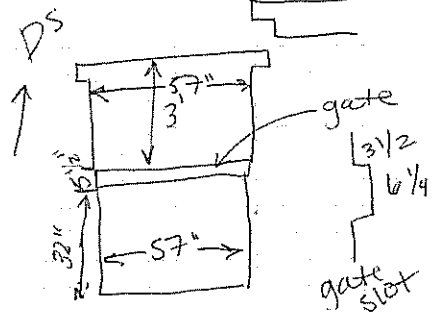
14' 4" TOC

gate t = 5 1/2"

8" deep hole



Gate slot
24-34



VS

