RESOLUTION 96 - 2

APPROVAL OF REPAIR ESTIMATE SUBMITTED BY RUST ENVIRONMENT & INFRASTRUCTURE INC., FOR 1996 FLOOD DAMAGE AT TANNERSVILLE RESERVOIR DAM NO. 1, AND AUTHORITY TO DO THE NECESSARY ENGINEERING SERVICES.

WHEREAS, the Village Board of Tannersville at a regular meeting on February 15, 1996 adopted Resolution 96-2 approving the repair estimate in the amount of $44,400.00 submitted by the engineers and giving authority to Rust Environment & Infrastructure Inc. to do the necessary engineering services for the sum up to $8,500.00.

Dated: February 15, 1996

Dam #1 Repair Estimate

Lee McGunnigle, Mayor — YES

Allen Jensen, Trustee — YES

William Reich, Trustee — YES

I, Bernice Merwin, Clerk of the Village of Tannersville, do hereby certify I have compared the above copy of Resolution 96-2 adopted on February 15, 1996 with the original record and do certify that the same is true and accurate copy of resolution duly adopted by unanimous vote of the Village Board of the Village of Tannersville at a regular meeting held on February 15, 1996.

Bernice Merwin, Clerk

MAYOR McGUNNIGLE

RUST Rust Environment & Infrastru ture In .

Rust Environment & Infrastructure of New York Inc
12 Metro Park Road
Albany NY 12205

Phone 518 458 1313
Fax 518 458 2472

February 7, 1996

Mr. William E. Reich
Trustee & Water Commissioner
Village of Tannersville
Village Hall
Park Lane Road
P.O. Box 967
Tannersville, NY 12485

RE: Tannersville Reservoir Dam No. 1

Dear Mr. Reich:

As you requested, we have inspected the subject water supply dam and assessed the damage sustained during the January 1996 flooding. A brief description of the results of our February 5, 1996 visual inspection, our recommendations and cost estimates for repairs and engineering services follow:

> Tannersville Reservoir Dam No. 1 was overtopped during the January 1996 flood and erosional type damage occurred along the downstream embankment slope, the principal spillway discharge channel and the emergency spillway discharge channel. Seepage was observed in several eroded areas near the embankment toe. While the structure is presently stable, future overtopping and/or a significant increase in the seepage rate, may lead to failure. It is our recommendation that the dam be repaired as soon as possible. Unfortunately, the majority of the repairs involve earthwork construction which is difficult and expensive to perform properly during the winter months. Even though the dam is considered to be a Class "A" low hazard structure based upon our evaluation of downstream conditions, the following safety measures should be implemented until the dam is repaired,:
>
> 1. Remove the flash boards on the principal spillway crest to maximize available spillway capacity.
> 2. Place sand bags along the crest of the dam to force water into the spillways and thereby protect the embankment. Pay special attention to the sand bag placement upstream from the eroded areas to prevent any flow through the erosion gullies.
> 3. Visually monitor the seepage flow daily. If the rate should increase or if fine soil particles are being carried by the seepage, immediately request an inspection by a licensed professional engineer.
>
> We believe that the embankment damage is due to inadequate spillway capacity and that the discharge channel erosion was created by flow velocities that exceeded the retardance capability of the channel lining. The necessary repairs consist of raising the crest of the dam

to a level where the spillway capacity is adequate, backfilling the eroded areas on the downstream embankment slope and restoring the discharge channels. We estimate the construction cost for this work to be $44,400, assuming the embankment crest is raised 2 feet (see the enclosed cost estimate).

A dam repair permit must be obtained from NYSDEC before the work can be undertaken, since the envisioned construction is not maintenance or in-kind replacement. Their permit requirements include the preparation of hydroligic, hydraulic and structural stability analyses, plans and specifications, and construction inspection under the supervision of the design engineer. Our estimated fee to provide the engineering services necessary is $8,500.

It has been our pleasure to inspect and evaluate the dam for you. Do not hesitate to call me at 518-437-8321 if you should have any questions or desire to retain our services.

Very truly yours,

Edward L. Horn, P.E.
Senior Engineer

Encl.
cc: Mayor McGunnigle

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Albany NY 12205

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REPAIR ESTIMATE FOR 1996 FLOOD DAMAGE AT TANNERSVILLE RESERVOIR DAM NO. 1 TANNERSVILLE, NEW YORK

FEBRUARY 6, 1996

ITEM	UNIT	QUANTITY	UNIT COST	TOTAL COST
Clearing & Grubbing	LS	1	$5,000	$5,000
Excavation	CY	110	$25	$2,750
Reinforced Concrete	CY	5	$350	$1,750
Mass Concrete	CY	10	$100	$1,000
Embankment	CY	220	$50	$11,000
Riprap	CY	260	$50	$13,000
Seeding	LS	1	$2,500	$2,500
Construction Subtotal				$37,000
Contingencies @ 20%				$7,400
Construction Total				$44,400

Village of Tannersville
Tannersville Reservoir Dam No. 1
February 6, 1996
Quantity Take-off for Flood Damage Repairs

1. Clearing & Grubbing
   Remove trees and brush on the embankment.
   Remove sod from areas of the embankment to be repaired or raised.
   Remove blowdown and debris from discharge channels.

   Estimate on a lump sum basis.

2. Excavation
   Open up areas adjacent to embankment erosion to facilitate backfilling and compaction.
   Lay the eroded left stream bank back at a 2H:1V.

   Embankment - V = 3(30)(4)(2)/27 = 26.7 cy
   Stream Bank - V = 0.5(12)(6)(60)/27 = 80 cy
   Total V = 26.7 + 80 = 106.7 cy
   Use 110 cy

3. Reinforced Concrete
   Raise the concrete spillway walls and embankment keys 2'.

   Principal Spillway
   Walls - V = 2(2)(1)(8)/27 = 1.2 cy
   Keys - V = 2(2)(1)(3)/27 = 0.4 cy
   Emergency Spillway
   Walls - V = 2(2)(1)(15)/27 = 2.2 cy
   Keys - V = 2(2)(1)(3)/27 = 0.4 cy
   Total V = 1.2 + 0.4 + 2.2 + 0.4 = 4.2 cy
   Use 5 cy

4. Mass Concrete
   Pour mass concrete along the downstream toe of the principal spillway

   V = 25(3)(3)/27 = 8.3 cy
   Use 10 cy

5. Embankment
   Raise the embankment crest 2', fill eroded areas and construct closure berms at the abutments.

   V = (75(2)(10) + 0.5(2)(30)(75) + 2(12)(30) + 3(30)(8)(2))/27
   V = (1,500 + 2,250 + 720 + 1,440)/27 = 218.8 cy
   Use 220 cy

6. Riprap

Riprap the discharge channels and the eroded left stream bank area.

V = 1.5(25(100) + 12(50) + 6(50) + 20(60))/27
V = 1.5(2,500 + 600 + 300 + 1,200)/27 = 1.5(4,600)/27 = 255.5 cy
Use 260 cy

7. Seeding

Seed all disturbed areas that do not receive riprap.

Estimate on a lump sum basis.