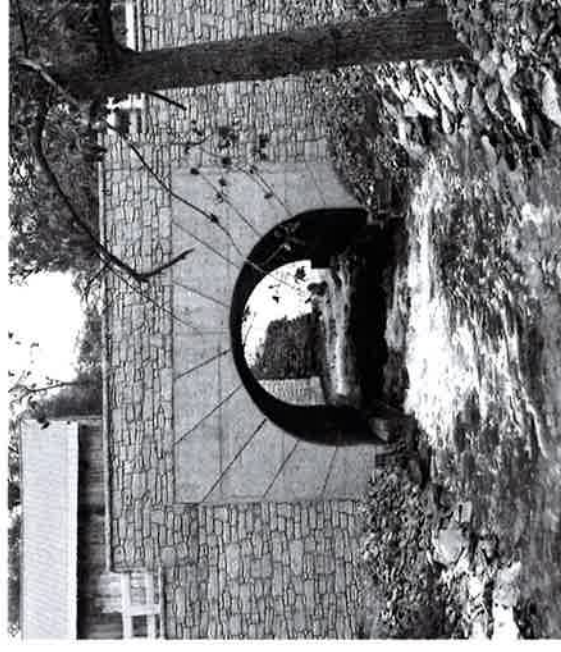


CR156 (PLANK ROAD) over JACOBS CREEK; Burrville, NY

***“JUST IN TIME DESIGN” for a FULLY FUNDED
& CONSTRUCTED COUNTY PROJECT***



Presenters:

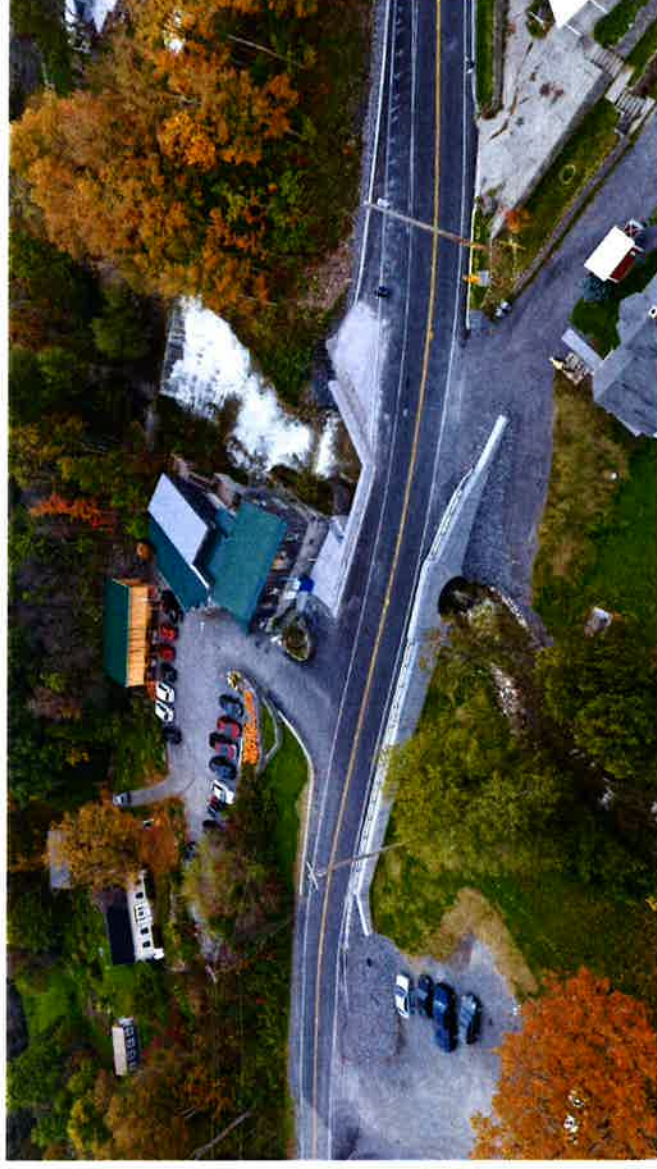
Vance Carpenter, PE

Gerard J. Sentz, PE

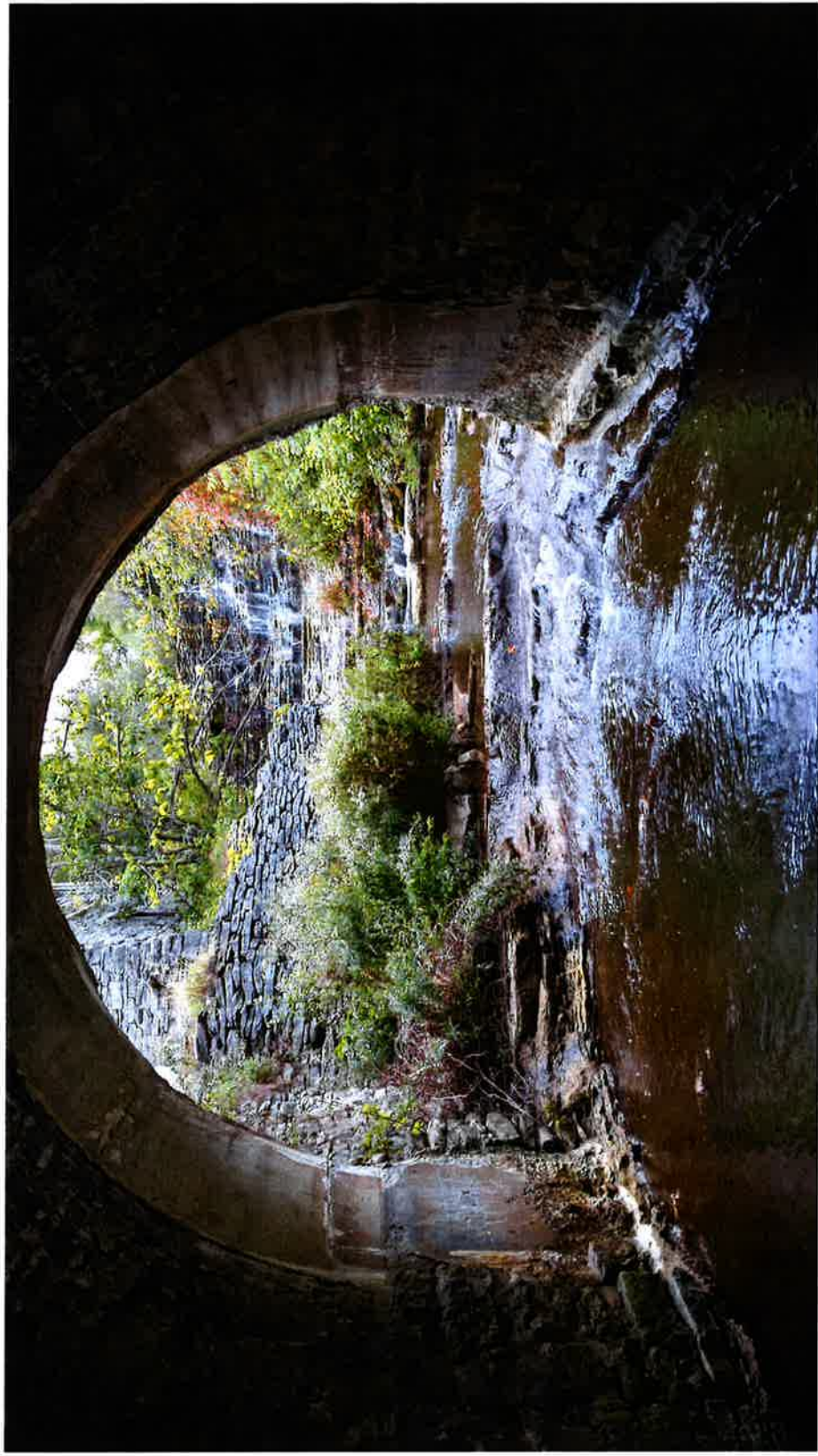


Presentation Outline

- Introduction
- Preliminary Alternative Investigation
- Final Design/Construction
 - Schedule
 - Design Meetings
 - Utilities
 - Culvert Liner
 - Retaining Wall
 - 2016/17 Winter Shutdown
 - 2017
 - Summary
- Final Exam



Introduction



INTRODUCTION

Presenters



Gerard J. Sentz, PE

- Vice President of Engineering at Foit-Albert
- Former Commissioner of DPW - Erie County
 - 35 years experience
- MSCE - SUNY at Buffalo (UB)



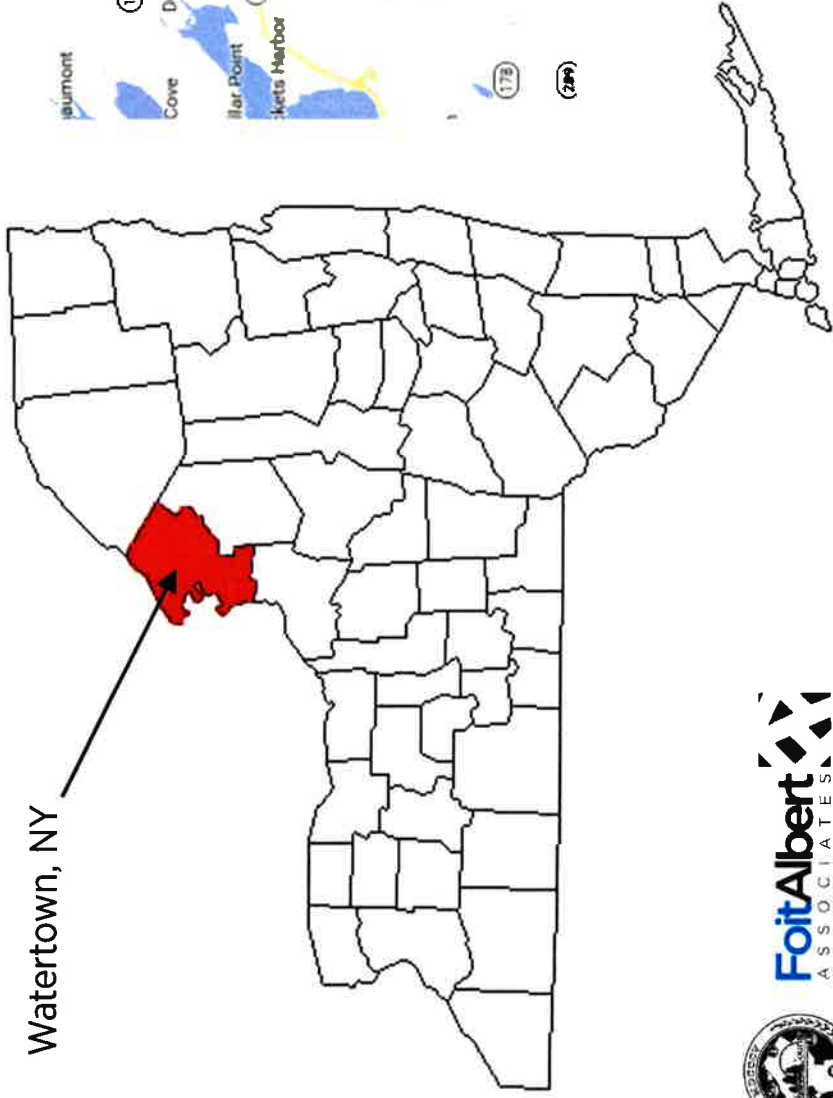
Vance Carpenter, PE

- 25 years Civil Engineer, Jefferson County Highway Department
- 28 years U.S. Army Corps of Engineers (USAR), LTC Retired
- BSCE - Clarkson University
- Go Golden Knights!!

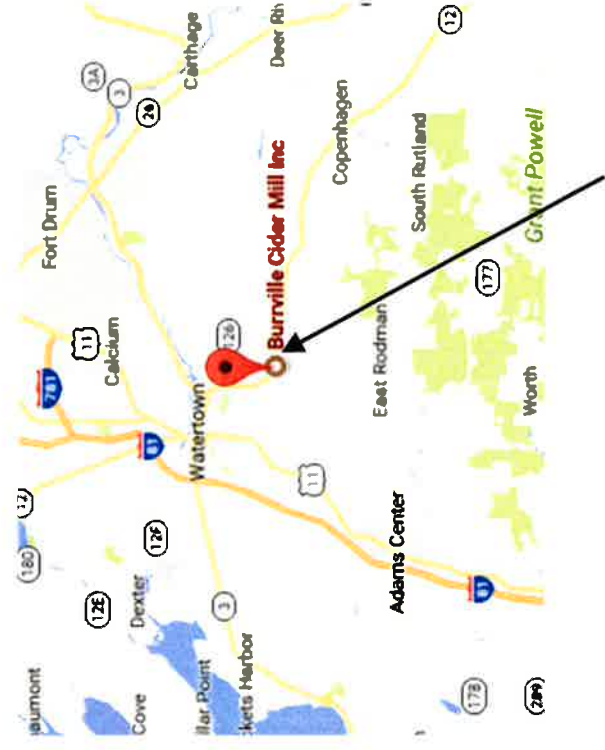


INTRODUCTION

Jefferson County



Watertown, NY

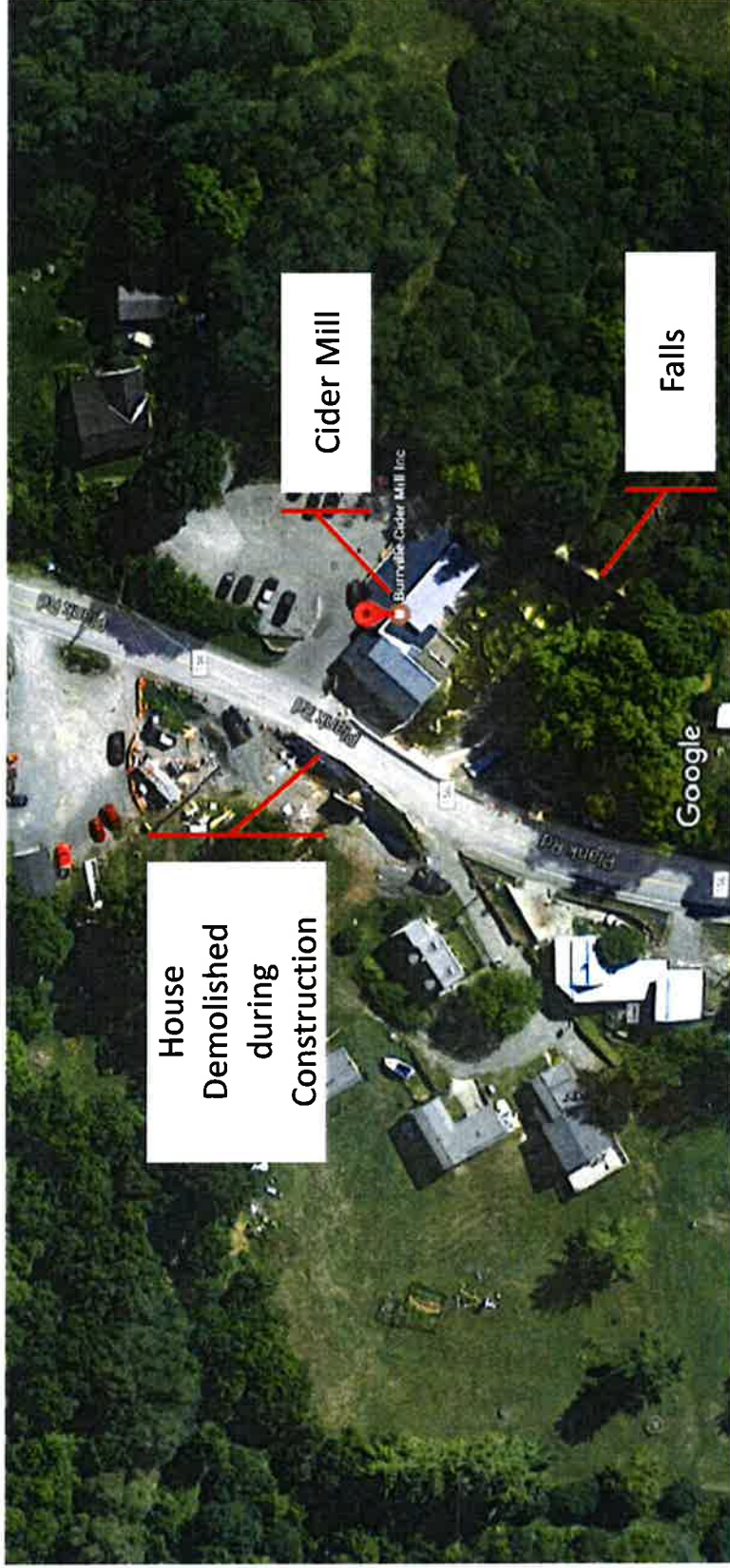


Burrville, NY



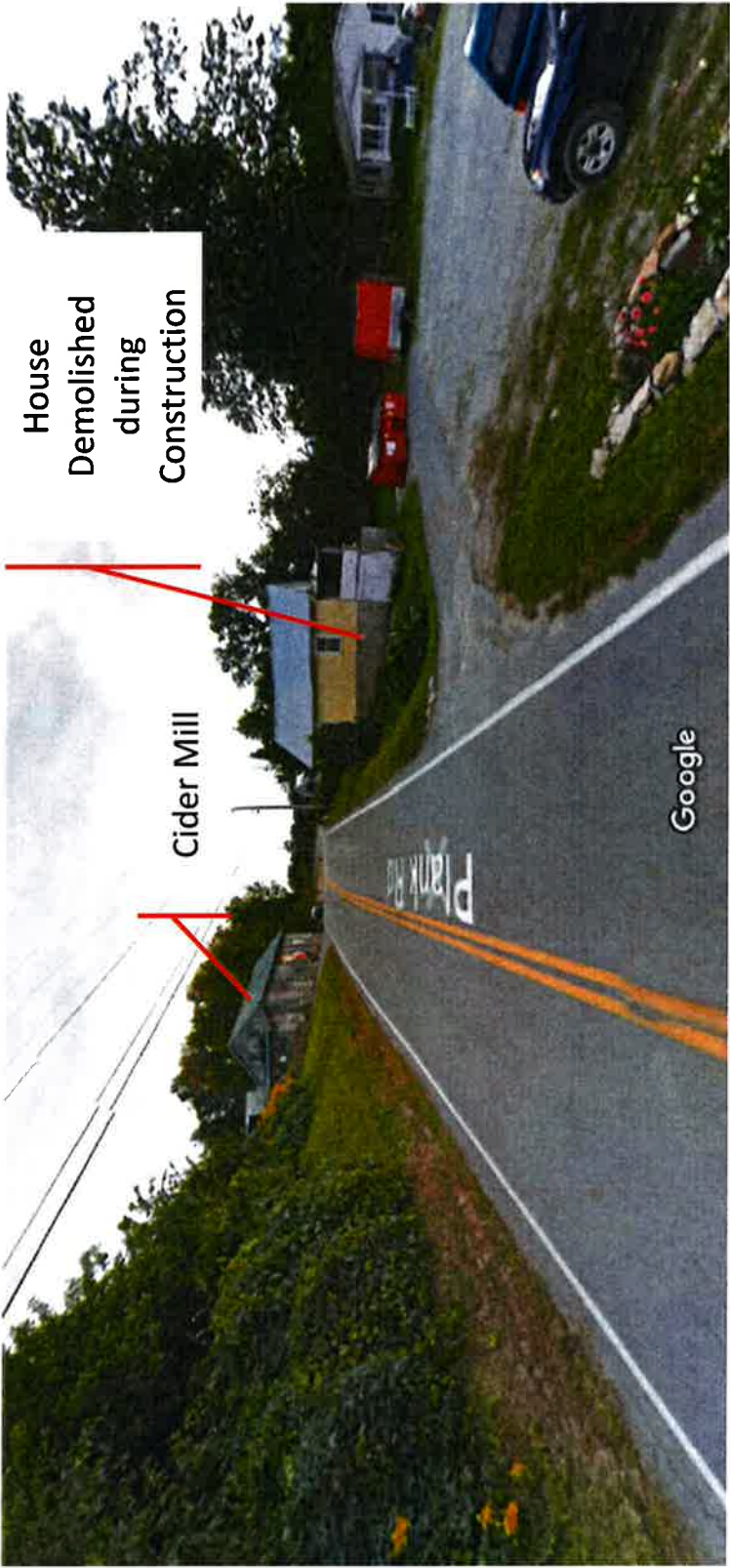
INTRODUCTION

Aerial Map



INTRODUCTION

Picture of Area Looking North



INTRODUCTION

1880 Photo of the Project Site, the Mill and Falls

House
Demolished
during
Construction



FoitAlbert
ASSOCIATES
Architecture. Engineering. Surveying. Environmental.

INTRODUCTION

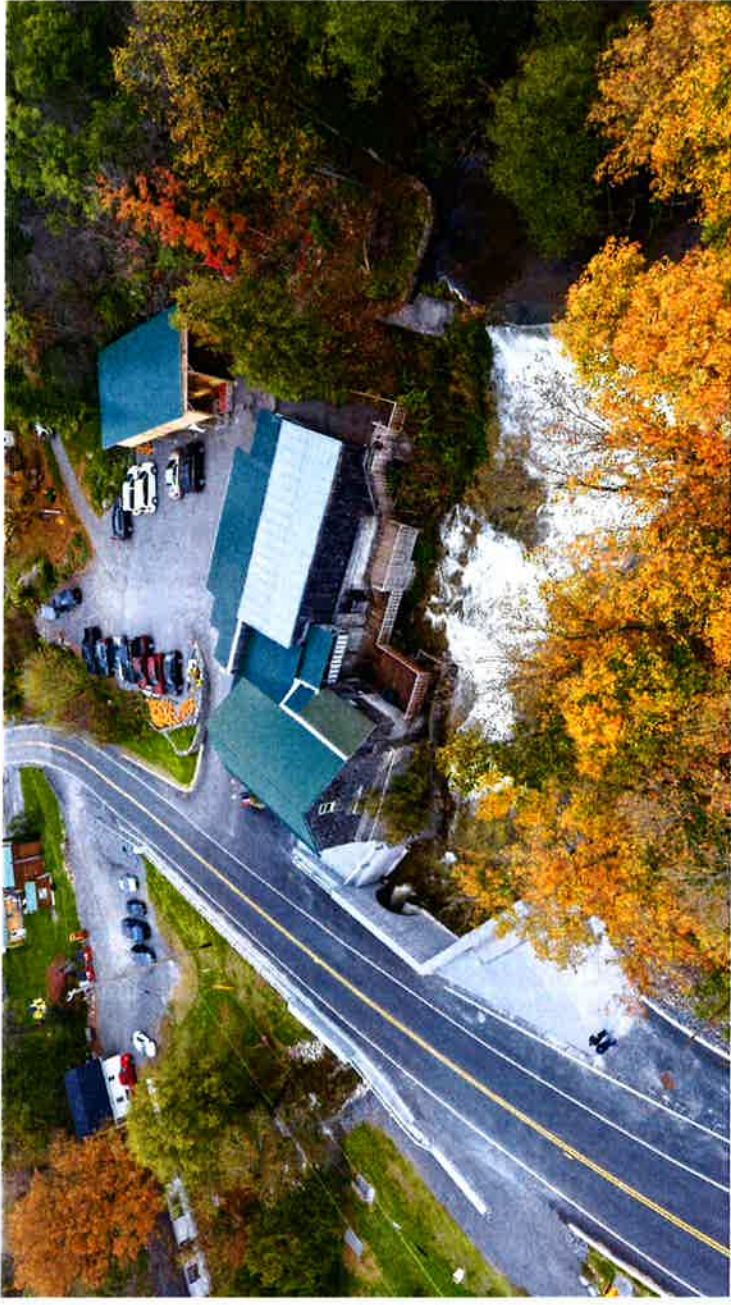
The Structure

- Existing Stone Arch with retaining walls in each quadrant
- The Southeast retaining wall was Cast-in-Place in the 1930's during an expansion
- 14' Clear Opening; 12' high but varies due to steps in rock



Project Objective Categories

- Structural
- Safety
- Drainage
- Other



Project Objectives - Structural

- Repair/rehabilitate/replace the culvert to upgrade its structural integrity to last another 50 years with only “normal” maintenance
- Address the structural integrity of the parapet walls
- Maintain the look of the arch and the historical character of the area



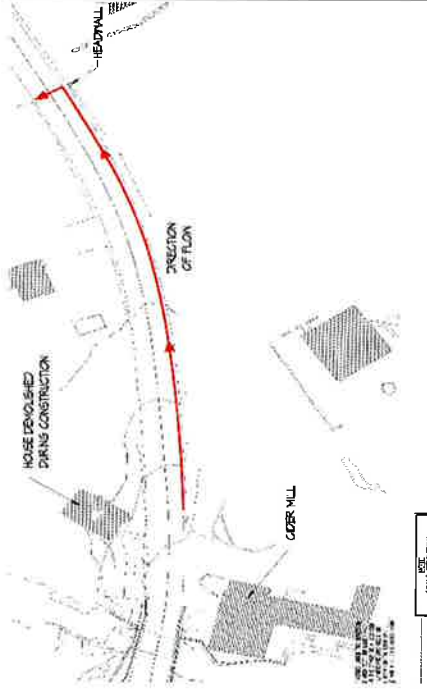
Project Objectives - Safety

- Improve sight distance for vehicles on Plank Road and for vehicles pulling out of the mill
- Provide better pedestrian access to the Mill and the Falls including better parking accommodations for peak season of the Mill



Project Objectives - Drainage

- Improve the drainage within the project site. Sheet piling water was an issue as was icing.
- Reduce the amount of flow going to the cross culvert at the base of the hill.



Project Objectives - Other

- Improve a community destination which draws in many tourists and is a traditional spot to visit by the people in the area
- Construct the project with minimal interruption to the Cider Mill activities
- Keep two-way traffic open during peak times of Mill operation (late August to after Thanksgiving)
- Construct the project with County forces using 100% County funds



PRELIMINARY ALTERNATIVE INVESTIGATION

Preliminary Alternative Investigation



Alternatives Summary

- Rehabilitate the Culvert (2005)
- Replace the Structure Entirely (2010)
- Perform a Major Rehabilitation (2015)

Note the years of study. Many new personnel on the County side as well as the Consultant side were introduced at various points in the project. It was that change in personnel and ability to now acquire and demolish one house that allowed the project to move forward.

First and Second Alternatives

SCOPE:

- Their Scope did not meet the basic Project Objectives. Although they met the Structural Objectives, they did address the alignment because the house was not being removed. Also, the drainage was not being fully addressed.

CONCLUSION:

- Those alternatives were individually rejected and the project was put on hold after each one. Some of the delay was also because of a change in Highway Superintendents for the County.



Third Alternative: Perform a Major Rehabilitation (2015)

SCOPE:

- Structurally line the existing culvert and repair/replace the retaining walls
- Adjust the alignment (horizontally and vertically) to improve sight distance
- Widen the travel lanes and shoulders
- Address the drainage issues
- Provide pedestrian access and overlook, and improve safety for pedestrians during peak apple season.
- Work closely with the Mill owner to coordinate construction through their busy season
- Construct the project with Jefferson County personnel

CONCLUSION:

This alternative met all the project objectives and had a preliminary cost that was within budget.

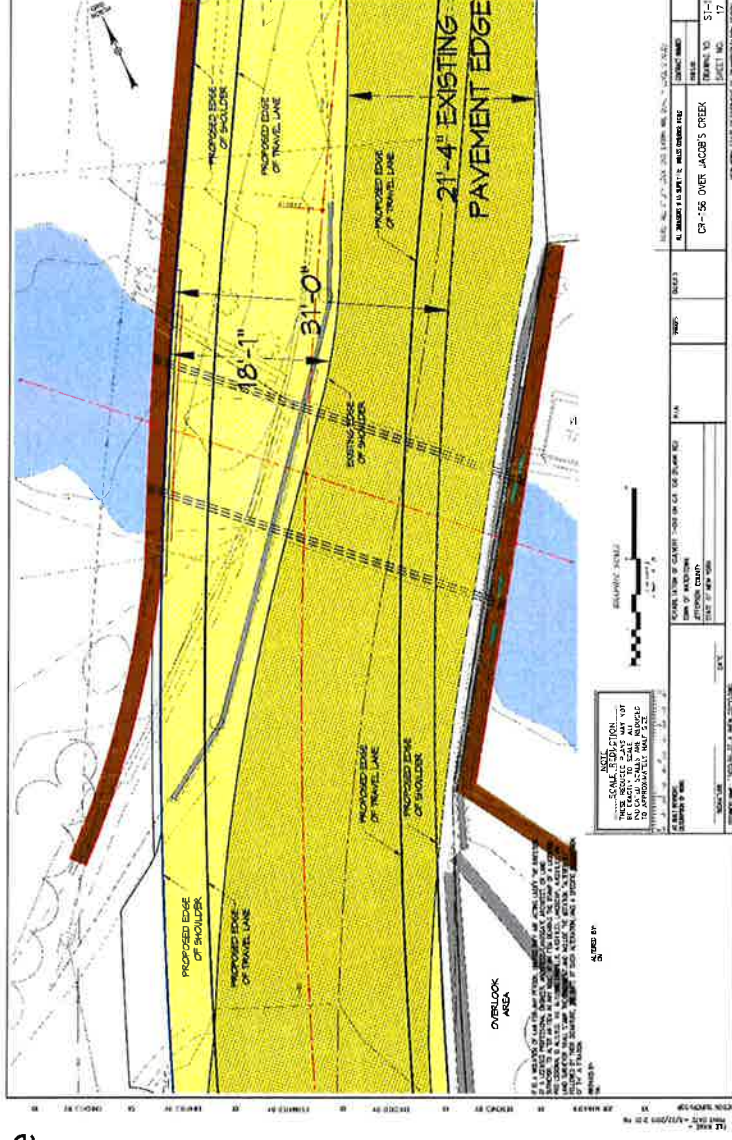


This alternative was pursued to Final Design.

PRELIMINARY ALTERNATIVE INVESTIGATION

The Proposed Widening is Crucial for Schedule

- The wider roadway improved vertical and horizontal curvature
- Pedestrians improved access to Mill and Overlook
- House footprint converted to parking
- One driveway access improved sight distance.
- Additional parking created on property north of the Mill.
- Leave the existing retaining walls but tie new poured concrete walls (colored with form liners) adjacent to the existing so the road could be aligned which would retain the aesthetics of the original stone.



FINAL DESIGN/CONSTRUCTION SCHEDULE

Schedule for Final Design/Construction

Preliminary Design is set in mid-summer 2015.

Preferably NO work after mid-August so as not to interfere with Mill Operations

After a 10 year delay in choosing an alternative:

- Asbestos removal and house demolition in summer 2016
- Finalize Design in summer/fall 2016
- Order supplies and start construction early 2017 so there is as much of a season as possible.
- Complete 2018



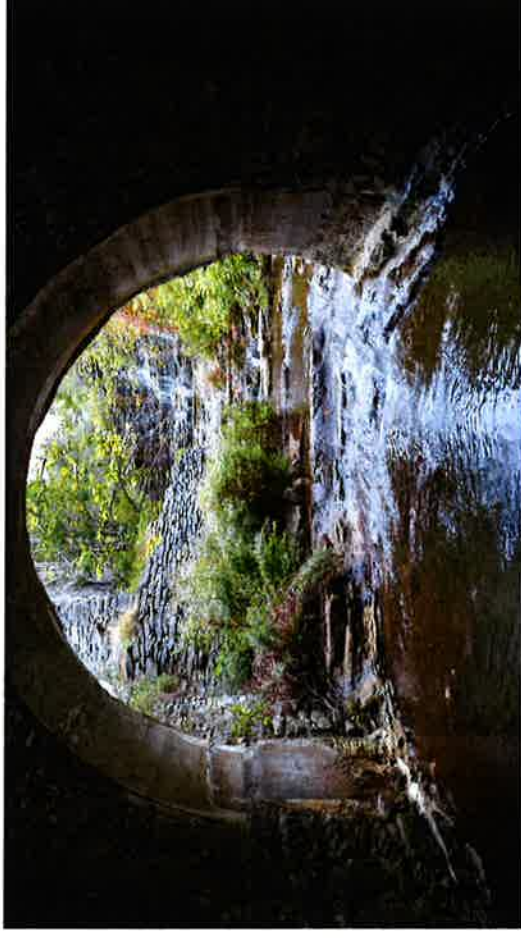
Schedule for Final Design/Construction

UNTIL:

In September 2015, Downstream resident contacted Jefferson County Highway Department

- The culvert seems to be worsening and needs to be inspected

Inspection showed the design must be accelerated due to this deterioration



Revised Schedule – Integrate Design during Construction

Due to the new discovered urgency, construction was to begin in 2016.

Jefferson County doing all the construction work so construction and design could be progressed simultaneously.

The overall schedule was:

- As the house demolition was a priority:
 - Asbestos testing and removal was done September 2015 to June 2016
 - Land acquired April 2016
 - The house demolition followed closely after and completed mid-June 2016
- The utilities for the Mill and house across the street must be addressed next to ensure they stay in operation.
- Construction of the walls and liner can then commence



“Field Design Meeting”

A Field Design Meeting was quickly held in September 2015 to layout the basics of design. Jefferson County and Foit-Albert attended so all were in agreement what was to be addressed and where. This included:

- Slight realignment of the road and widen the road so that sight distance for cars pulling out of the Mill was increased. The widened road also would allow for some safe parking spaces on the road before the overlook area and safer walking area around the Falls and to the Mill



“Field Design Meeting”

- Address the drainage issues. Significant flow was being conveyed to a downstream culvert on the east side of the road. The drainage then turned 90 degrees and headed through a culvert on private property under a garage and then outlet into a field. The thought at this meeting was to pick up the water coming off the hill and bring it back to Jacobs Creek
- Also, DI's were laid out to prevent the sheeting water and help reduce ice on the road



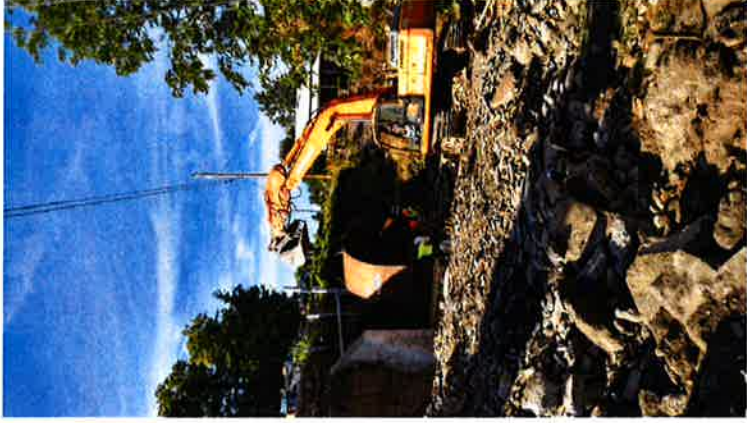
“Field Design Meeting”

- The overlook area was laid out including protection of the area with guiderail. A short wall was proposed at the creek edge to prevent people from falling over the edge. Weeps would be placed to convey subsurface water from behind the retaining wall to the creek.



The Winter Conference Design Meeting”

A second meeting was held at the NYSCHSA Winter Conference in Albany in 2016 to discuss the details of the pipe liner. Precision Pipe, Jefferson County and Foit-Albany met during a break and finalized the details including the knee wall, keyway and determination of liner shape/size



Construction Begins - Utilities

- Draft Plans issued to the field March 2016
- National Grid Coordination Meeting April 19, 2016
- Land Acquisition completed April 26, 2016
- National Grid completed their work June 29, 2016
- Note: "Final" plans issued July 2016

THE BALL IS ROLLING



Construction - Mill Utilities

- The water for the mill owners house behind the demolished house was supplied through a well next to the demolished house.
- Also, in the demolished house was a tank to store water from the well
- It was agreed Jefferson County would pay for a shed for a new tank and also provide a conduit in which water could be supplied to the mill.
- It was also agreed a conduit for sanitary would be run across the road from the Mill to the demolished house's existing septic system.

This work had to be done by the August 16 for mill opening



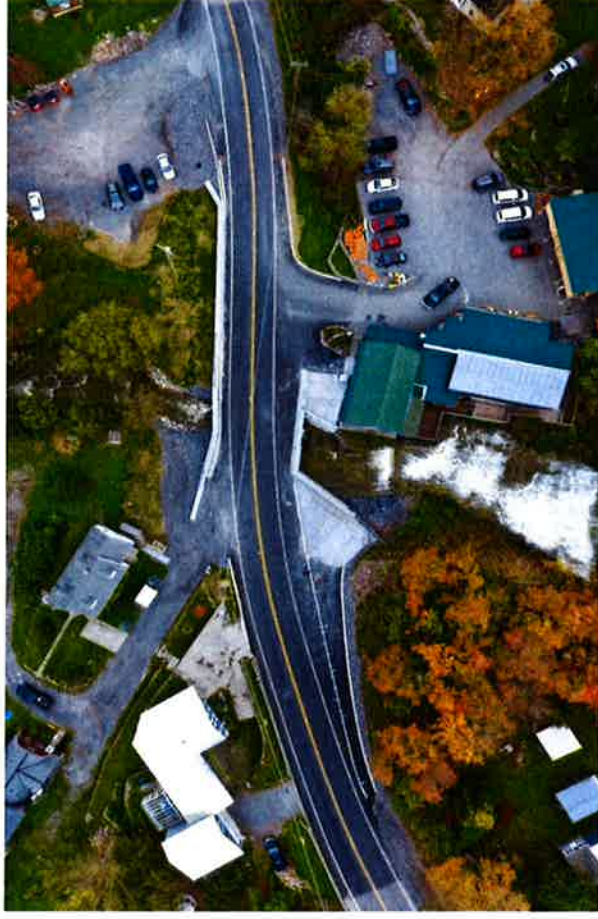
Construction - Mill Utilities

- The walls along both sides of the road directly in front of the mill had to be started to allow the Mill utilities to pass through them.
- The wall connecting the Mill to the upstream (SE) existing wall along Jacob's Creek had to be completed to retain fill which supported the new Mill septic tank.
- Only a portion of the downstream (NW) wall was critical to complete for the Mill utility installation.



Construction – West Walls/Culvert Liner

- Question (not for PDH's): With the Mill Open, what work could be done without affecting the travel lane?
- Answer: The culvert liner which goes under the road can be installed and the southwest and northwest wall portion which were offset significantly from the road can be built.



Reline the Culvert with InfraSteel

- ¾" Grouted Steel Liner Best Option
- Rehab/Stabilization
- Expansion
- LIDAR was used to replicate best fit shape
- A template was slid through knee wall elevation set



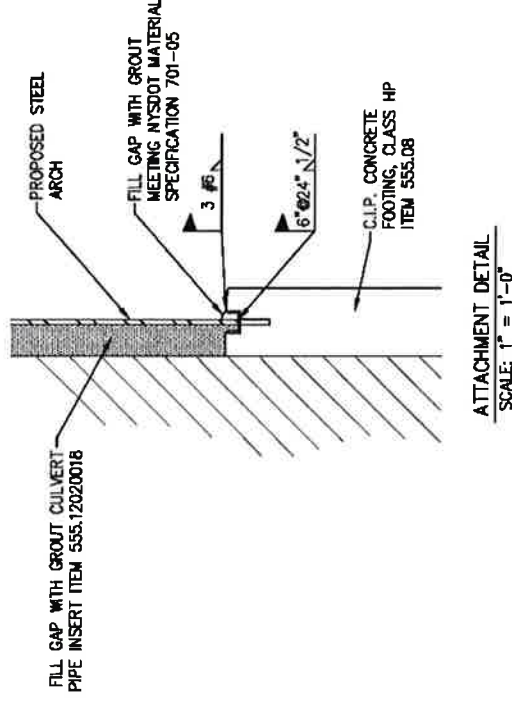
Reline the Culvert with InfraSteel

- Varied Creek Bottom
- Hoe Ram
- Leveling pad
- Knee Wall



Reline the Culvert with InfraSteel

- Channel Keyway welded and concreted in place
- Steel sections placed on channel outside arch
- Sections 8' 9" welded on outside keyway then slid forward
- The culvert's annular space was then grouted.



FINAL DESIGN & CONSTRUCTION - CULVERT LINER

Reline the Culvert with InfraSteel

- Skewed @ Both ends
- Section 7000 #
- 3D Braced
- Pieces fit snugly
- Beveled to weld from outside Arch



FINAL DESIGN/CONSTRUCTION - CULVERT LINER

Reline the Culvert with InfraSteel

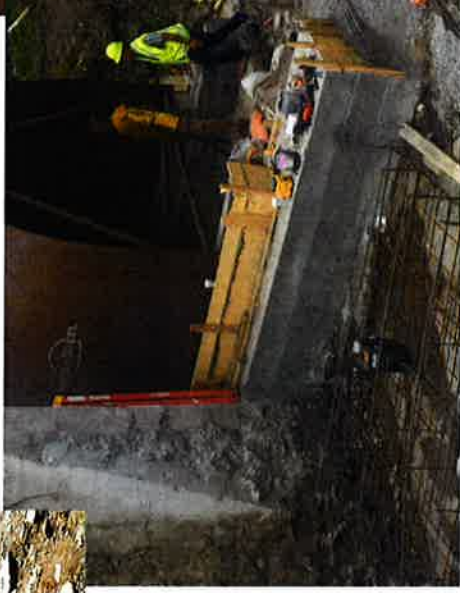


FINAL DESIGN & CONSTRUCTION - CULVERT LINER

Reline the Culvert with InfraSteel

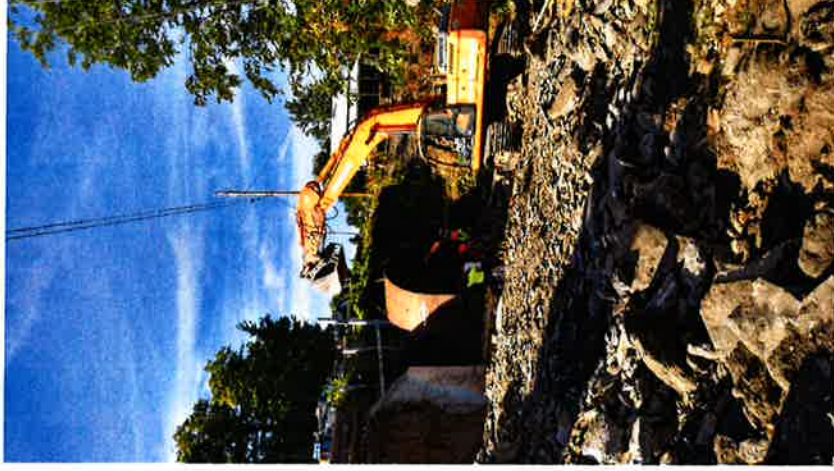


- Area outside had longer foundation
- Existing wing wall trimmed



FINAL DESIGN & CONSTRUCTION - CULVERT LINER

Reline the Culvert with InfraSteel



Structural - Retaining Wall Construction



- Temporary Bag Retaining Wall
- Utilities Pass Through Wall
- 8'X20' d20 d20 12X12 Matt



FINAL DESIGN & CONSTRUCTION - RETAINING WALL

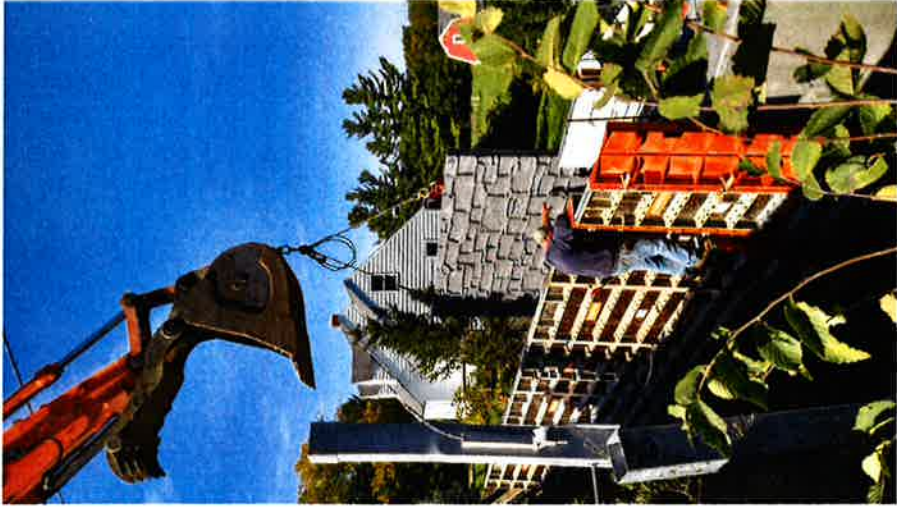
Structural - Retaining Wall Construction



FoitAlbert
ASSOCIATES
Architecture Engineering Surveying Environmental

FINAL DESIGN/CONSTRUCTION - RETAINING WALL

Structural - Retaining Wall Construction



- Conventional forming around Infrasteel Arch
Three types of Formliners (4'X8', 4'X10')
Started at Arch went in both directions



2016 Winter Shut Down; What did we Accomplish?



- Building Demolition
- Utilities Accommodate/Relocated
- 44' Arch Footing and Lining Accent Wall
- 130' Footing, Wall, Cap and Backfill
- 30' Parapet Wall
- 100' Guide Rail
- 110' Mill utility line relocation/extension



Winter Shut Down and then 2017 Work

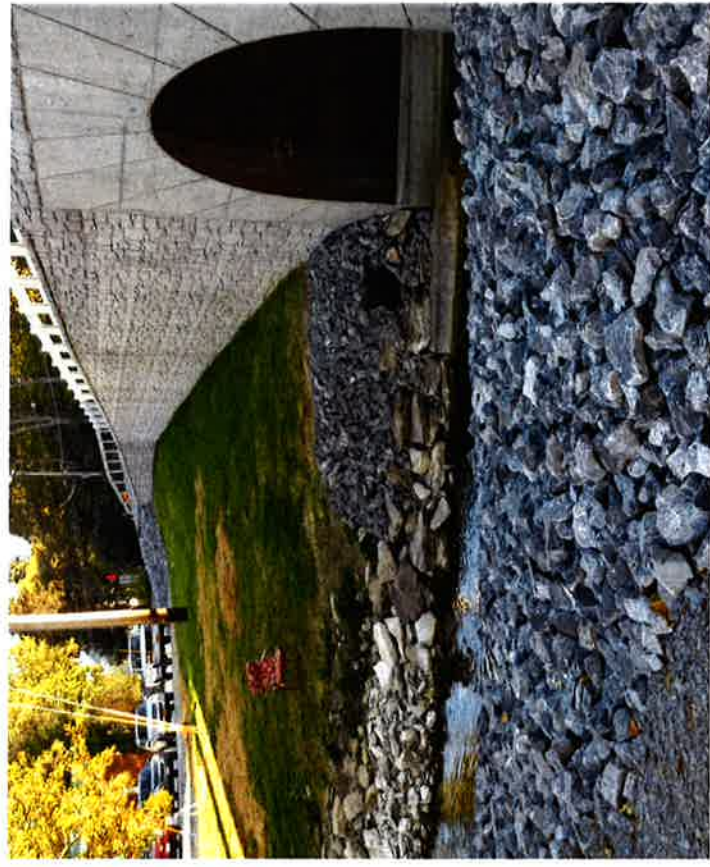
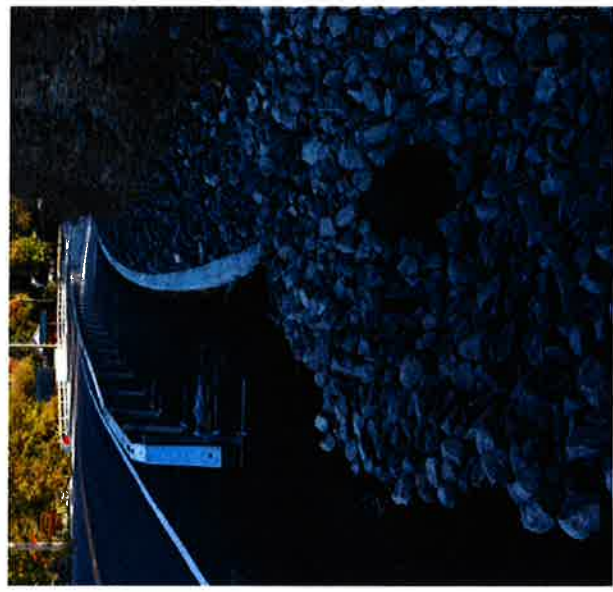


- Mill driveway exit moved outward.
- Wider shoulder for parking
- Complete Pavement Curbing and Rail
- Slope reduced into Mill driveway for Busses.
- Mill Unloading now protected & not into Shoulder



Winter Shut Down and then 2017 Work

- Complete Drainage



Winter Shut Down and then 2017 Work

- Overlook Area is completed with Grind Stone mounted



Winter Shut Down and then 2017 Work

- Complete wall extensions



FINAL DESIGN & CONSTRUCTION - SUMMARY

Construction Quantities

• Engineering/Design	\$114,000	• 15" HDPE	290 Ft.
• Property Acquisition	.15 Acres (Fee)	• 12' HDPE	110 Ft.
• Permanent Easement	.08 Acres	• Rail, Box Beam	306 Ft.
• Temporary Easement	.16 Acres	• Curb	442 Ft.
• Asbestos Testing	\$1900	• Harris 1500 Forms	\$25,048.08
• Asbestos Abatement	\$9020	• Form Liners	4600 SF
• Asbestos Monitoring	\$500	• Dye	250 Bags
• Building Razing	\$5500	• Stone	2450 CY
• 8'X20' Matting 101 sheets	21,654 #	• Arch (\$72,259)	36,376 #
• Reinforcement	26,611 #	• Concrete	850 CY
• Rail, Box Beam	306 Ft.	• Grout	52 CY
• Curb	442 Ft.		



Construction Cost

\$749,432



Questions?



FINAL EXAM

FINAL EXAM



FINAL EXAM

QUESTION 1:

What are the four categories of Project Objectives in the project?

Answer 1:

Structural

Safety

Drainage

Other

FINAL EXAM

QUESTION 2:

What was the most important event that happened that caused this project to be accelerated and design integrated into the construction schedule?

Answer 2:

In September 2015, Downstream resident contacted Jefferson County Highway Department stating the culvert seems to be worsening and needs to be inspected

FINAL EXAM

QUESTION 3: (this is a trick question)

What was the Engineer's Estimate and actual cost of the project?

Answer 3:

No Engineer's Estimate was performed as the job was being built by Jefferson County forces.

The actual cost of the project was estimated at \$750,000

FINAL EXAM

QUESTION 4:

How was sight distance improved for those patrons leaving the Cider Mill?

Answer 4:

By widening the road and realigning the curves, sight distance was drastically improved



THANK YOU!

Thank you to all who participated in the project.

- Jefferson County Engineering & Construction Crews
- Precision Pipe and Products (Infra-Steel)
- City of Watertown (Curbing)
- Town and County Bridge and Rail (Grouting)
- Chemung Supply (Rebar and drainage, guiderail)
- AH Harris (Forms, dye and form liners)
- Watertown Concrete and Drum Ready Mix (Concrete)
- Jefferson Concrete (septic & drainage structures)
- JC Smith (message Boards)
- Vespa Sand and Stone
- OPTEC (Asbestos Abatement)
- VideoWorx (Drone Photography)
- A. Cozzi & Sons (Plaques)



Gerard Sentz: 716.856.3933; gsentz@foit-albert.com

Vance Carpenter: 315.408.2515; vancec@co.jefferson.ny.us