



F206
VELCO

July 15, 2026
VSPC Meeting
Frank Etori

Project Summary

Project Drivers

- The F206 230 kV transmission line has a high percentage of structures with deficiencies identified through drone imagery and ground line inspections. Currently, 181 of the 277 structures on the line (or 65%) are rated C. This project will replace the degraded structures and retain the A and B rated structures.

Alternatives Considered

Alternative	Description	Cost Estimate
Alternative 1	Replace deficient 230 kV wood structures with 230 kV steel structures	\$66.9M
Alternative 2	Replace deficient 230 kV wood structures with 345 kV steel structures	\$67.5M (no CPG) \$71.6M (w/CPG)
Alternative 3	Complete line rebuild and reconductor to 345 kV standards	\$239.2M

Preferred Alternative

Alternative	Reason for Recommendation	Cost Estimate
Alternative 2	- This alternative was selected because there is value in increasing structure size to 345 kV capability for a minimal increase in cost. The 2050 study outlines a high likelihood concern that would require increased capacity into the Essex area. Therefore, because of where the F206 line is situated, it makes sense to upgrade these structures to 345 kV size to be ready for possible conversion in the future. - A CPG is a Certificate of Public Good and is the State of Vermont siting process.	\$67.5M (no CPG) \$71.6M (w/CPG) - 25% / +50%

Outline

- Background Information
- Project Needs and Drivers
- Solution Alternatives
- Selection of Preferred Solution
- Schedule and Contact Information

Background Information

F206 Line

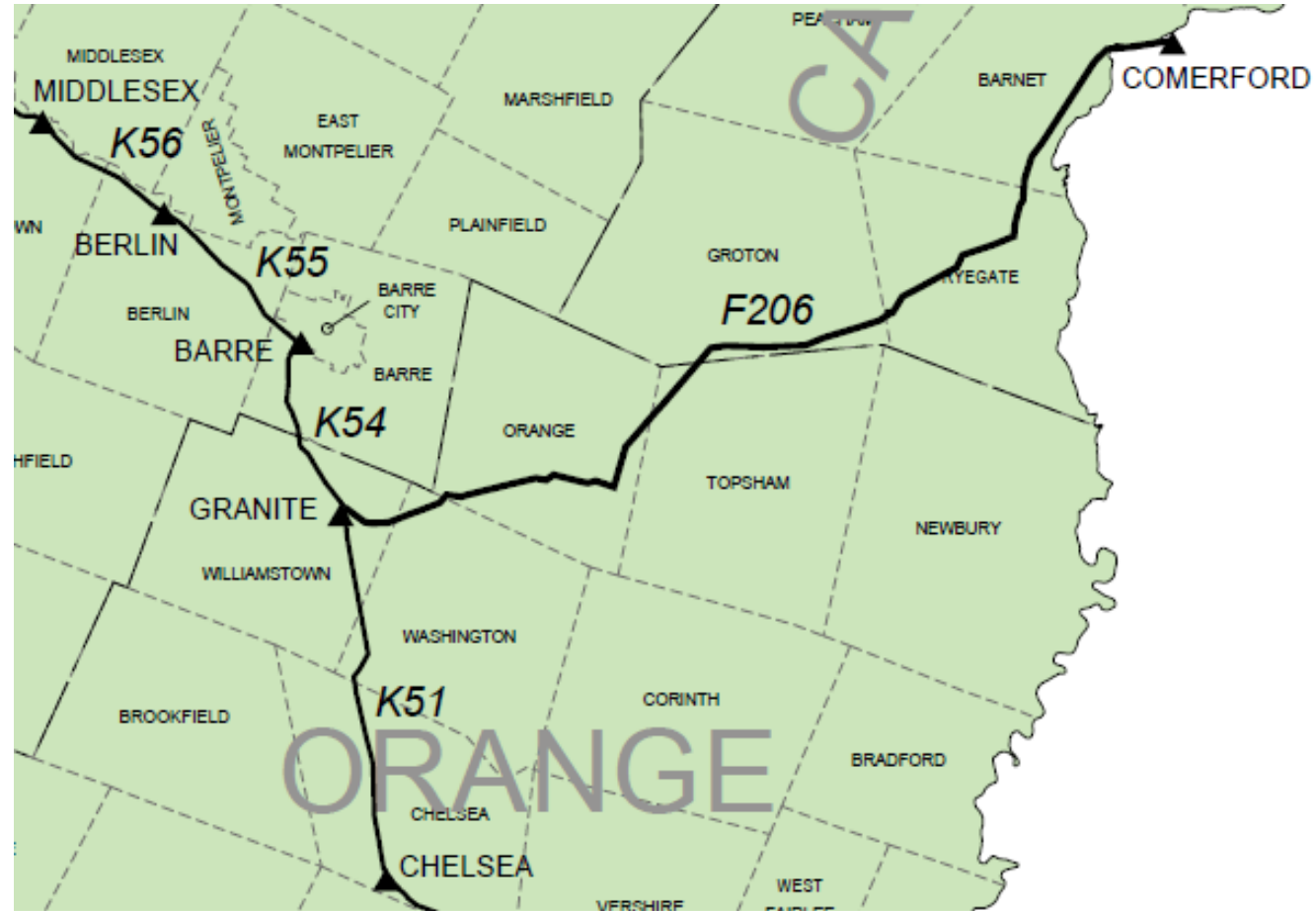
Key Details	
Location	From: Granite Substation, Williamstown, Vermont To: Comerford Substation, Monroe, New Hampshire
Line length	32.49 miles to Comerford
Operating Voltage	230 kV
Age and upgrade history	- Originally constructed in 1971 - No significant upgrades or rebuilds, but various structures replaced between 2007 and 2023 due to major deficiencies. Built at 230kV.
Prior PAC presentations	None

Existing Structures			
Material	Configuration	Number	Avg. age
F206			
Wood	H-frame & Angle Structures	203	50 years
Steel	H-frame & Angle structures	74	10 years

Existing Conductor		
Type	Length	Avg. age
F206		
927 ACAR	32.10 miles	55 years
954 ACSR	0.39 miles	55 years

Background Information

F206 Vicinity Map



Background Information

Power BI Structure Condition Dashboard Heat Map - F206



Structure Rating

- **A** – no replacement required
- **B** – consider replacement in conjunction with other structure replacements
- **C** – initiate planned structure replacement project or replace as part of upcoming structure replacement project

Project Needs and Drivers

Structure Concerns

Structure Concerns	
Primary Concerns	
Wood structure rot and decay	- Recent inspections performed in 4 years have identified 181 wood structures with woodpecker damage, pole top rot, cracked crossarms, splitting poles, and other forms of decay - These structures must be replaced to maintain reliability and ensure ongoing integrity of the line - Affected structures average 55 years old and are reaching the end of the typical useful life for 230 kV natural wood structures (60 years)
Secondary concerns	
None	

Summary of Current Structure Grades		
Category	Recommended Action	Number of structures
A	No replacement required due to deterioration	83
B	Consider replacement in conjunction with other structure replacements	13
C	Initiate planned structure replacement project or Replace as part of upcoming structure replacement project	181
D	Replace immediately (emergency replacement)	0
Total		277

Project Needs and Drivers

Structures - major pole decay and deterioration on the original 1971 poles



Project Needs and Drivers

Structures - major pole decay and deterioration on the original 1971 poles



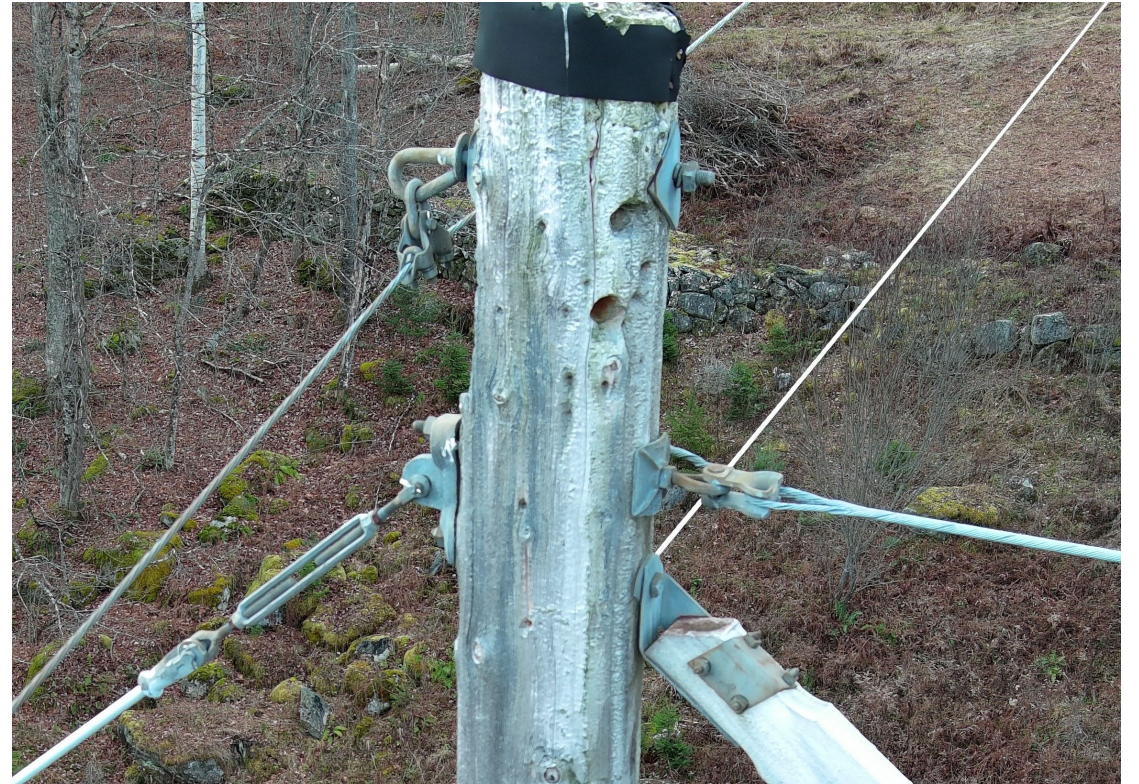
Project Needs and Drivers

Structures - significant woodpecker damage throughout the line



Project Needs and Drivers

Structures - significant woodpecker damage throughout the line



Project Needs and Drivers

Items Not of Concern on this Line	
Issue	Status
Conductors	No reported issues with the conductors
Insulators	Existing porcelain insulators do not have reported issues, but would be replaced with toughened glass during structure replacements since they are of the same vintage as the structures.
Shield Wire	No reported issues with the main shield wires
Telecommunication	No reported issues with the ADSS fiber optic communication line

Previous Asset Management and Maintenance Strategies

Preventative Maintenance and Other Practices	
Issue	Status
Structures	Regular ground line inspections, occurring every 8 years through Osmose, have helped preserve the poles at the ground line through industry standard practices. Osmose is a company that tests and treats wood poles. The poles are reaching the age of the typical life expectancy for treated wood poles and the majority of the structure issues found on the line are higher than the ground line inspection and treatment process addresses.

Review of Relevant Transmission Studies

Recent Transmission Studies

Was this line overloaded in recent Attachment K studies (Reliability Needs Assessments, Longer-Term Transmission Studies, etc.) or other recent studies?

The F206 is slightly overloaded in the 2035, 2040, and 2050 cases of the 2050 study.

This project also supports the high likelihood needs identified in the 2050 Study for NW Vermont.

Have modifications or upgrades to this line been identified as potential solutions in any of those studies?

No

Evaluated Solution Alternatives

Alternative 1

Replace deficient 230 kV wood structures with 230 kV steel structures	
Description	Replace deficient 230 kV wood H-frame structures with 230 kV steel H-frame structures
Primary Needs Addressed	Structure
Secondary Needs Addressed	N/A
Advanced transmission technologies to be considered	N/A
Cost Estimate and Accuracy	\$66.9M (-25% / +50%)
Impact on transmission needs or concerns from recent studies	Impact on transmission needs or concerns from recent studies
Key standards or criteria affecting design if different than current design	None – Alternative design is similar to existing design

Evaluated Solution Alternatives

Alternative 2

Replace deficient 230 kV wood structures with 345 kV steel structures	
Description	Replace deficient 230 kV wood H-frame structures with 345 kV steel H-frame structures and 230 kV toughened glass insulation. Additional insulation will be added at these structures if the line is reconductored for 345 kV capacity.
Primary Needs Addressed	Structure
Secondary Needs Addressed	N/A
Advanced transmission technologies to be considered	N/A
Cost Estimate and Accuracy	\$67.5M (no CPG); \$71.6M (w/CPG) (-25% / +50%)
Impact on transmission needs or concerns from recent studies	Impact on transmission needs or concerns from recent studies
Key standards or criteria affecting design if different than current design	None – other than sizing the replacement structures to operate at a higher future voltage, alternative design is similar to existing design

Evaluated Solution Alternatives

Alternative 3

Complete line rebuild and reconductor to 345kV standards	
Description	Replace all structures on the line with 345 kV steel H-frame construction and reconductor with double-bundled 954 ACSS
Primary Needs Addressed	Structure
Secondary Needs Addressed	N/A
Advanced transmission technologies to be considered	N/A
Cost Estimate and Accuracy	\$239.2M (-25% / +50%)
Impact on transmission needs or concerns from recent studies	Impact on transmission needs or concerns from recent studies
Key standards or criteria affecting design if different than current design	None – other than sizing the line to operate at a higher future voltage, alternative design is similar to existing design

Comparative Analysis of Alternatives

Comparison			
Key Criteria	Alternative 1	Alternative 2	Alternative 3
Addresses Primary Need(s)	Yes	Yes	Yes
Secondary Needs Addressed	None	Eliminates the need to replace the same structures in the future if a line upgrade to 345 kV is required.	Sets the complete F206 line segment up to be able to operate at 345 kV if required in the future.
Cost	\$66.9M	\$67.5M (no CPG); \$71.6M (w/CPG)	\$239.2M
Constructability concerns or advantages	None	None	None
Siting, Environmental and regulatory issues	Environmental permitting required.	Environmental permitting required. Possible CPG required.	Environmental permitting and CPG required.
[Expand table as needed]			

Conclusions

- Alternative 2 is the preferred alternative
- This alternative was selected because there is value in increasing structure size to 345 kV capability for a minimal increase in cost. The 2050 study outlines a high likelihood concern that would require increased capacity into the Essex area. Therefore, because of where the F206 line is situated, it makes sense to upgrade these structures to 345 kV size in order to right size for the future.

Scope Summary for Preferred Solution

Structure Characteristics		
		Per Unit
Primary structure configuration	H-Frame	N/A
Material	Steel	N/A
Number of Structure Replacements (est)	181	5.6 per mile
[Other information]		

Additional Scope Details	
	Total
Miles of ROW Affected	32 miles
Miles of shield wire replacement	None
Miles of conductor replacement	None
ADSS Substation Connections	None
[Other Information]	

Cost Breakdown Details		
	Cost	Per Unit Cost
Structure Replacements	\$25.3M (no CPG); \$25.9M (w/CPG)	\$140k/structure or \$143k/structure
Reconductoring / Shield Wire [optional]	N/A	N/A
Access costs [optional]	\$8.4M (no CPG); \$10.5M (w/CPG)	\$263k/mile or \$328k/mile
Other costs (engineering, contingency, etc.) [optional]	\$33.8M (no CPG); \$35.2M (w/CPG)	
Total Cost	\$67.5M (no CPG); \$71.6M (w/CPG)	
Key factors affecting costs		

Preferred Solution Information

Side-by-side comparison of 230 kV H-frame and 345 kV H-frame construction



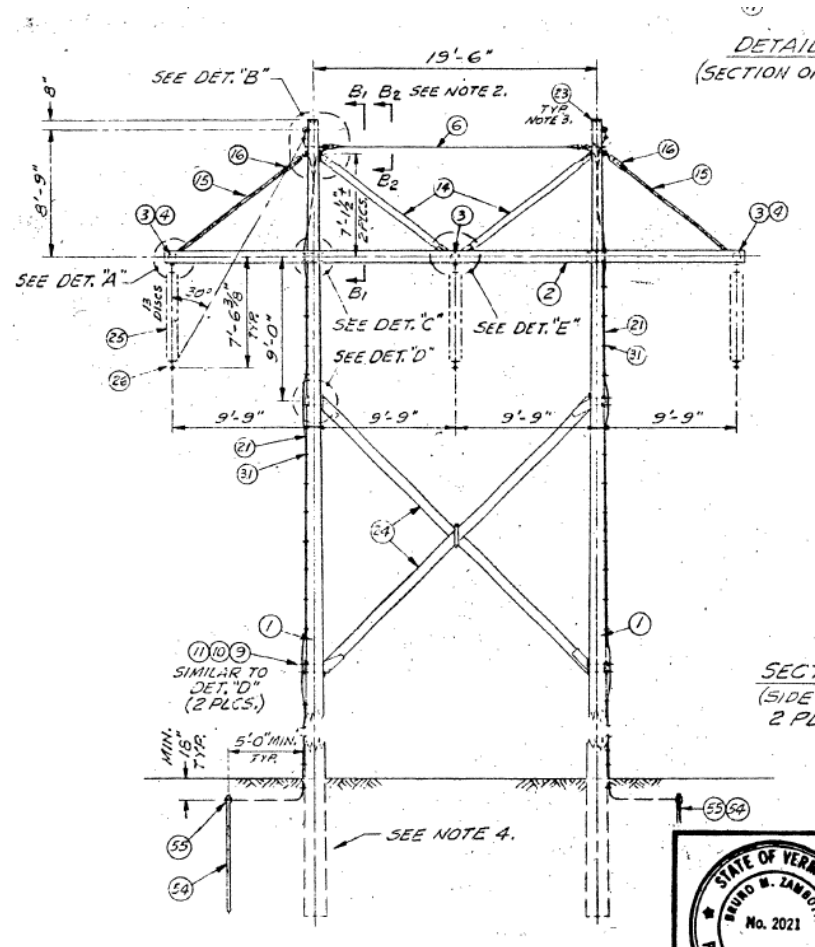
230 kV H-frame



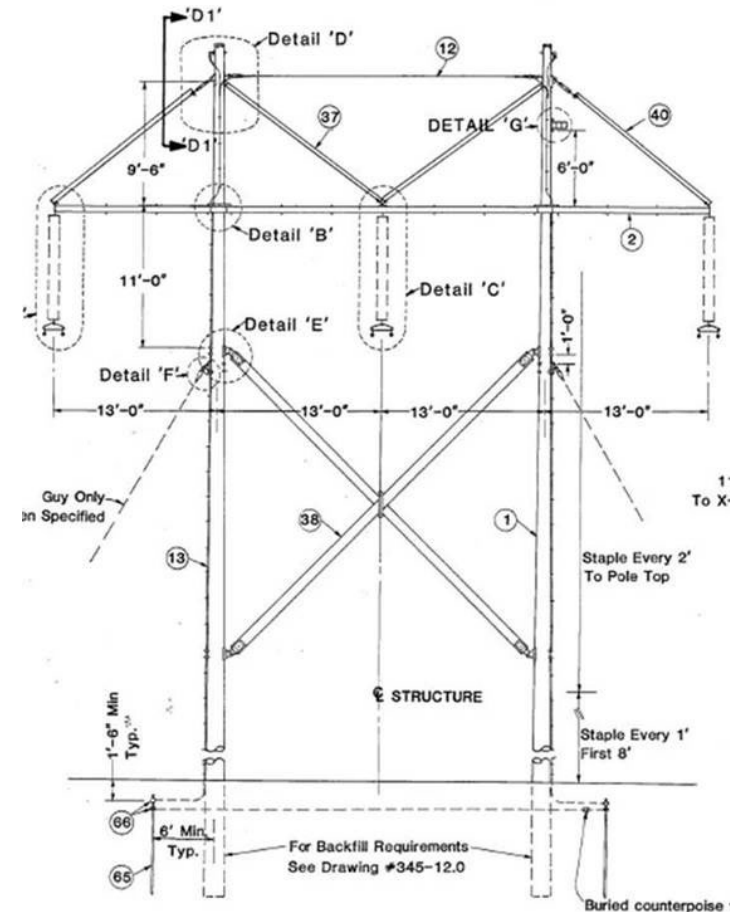
345 kV Steel H-frame

Preferred Solution Information

Side-by-side comparison of 230 kV H-frame and 345 kV H-frame standard



230 kV H-frame



345 kV H-frame

Schedule

Planned Schedule	
Comment Deadline	August 15, 2026
Follow-up PAC Presentation	After Interim Asset Condition Review is complete
Start of Major Construction	2029/2030
Project in Service	2033

Please submit any comments to pacmatters@iso-ne.com and:

Transmission Owner Contact	
Contact Name	Frank Etori
Contact Email Address	fettori@velco.com

Questions?