Comment on Eversource position statement, X-178 complete rebuild.

Eversource states:

“A. The Project does not constitute a sizeable change or addition.

As described more fully in Exhibit 1, the X-178 Project involves the replacement of 594 primarily wood structures with 578 weathering steel structures, the replacement of the existing [908 amp] 115 kV conductor [Aluminum Conductor Steel-Reinforced Cable (ASCR)] with [2,200 amp] 115 kV Aluminum Conductor, Steel Supported (“ACSS”) conductor, and the replacement of the existing static wire [which cannot monitor acoustics or vibration or transmit intelligence] with Optical Ground Wire (“OPGW”) [which can] to improve system communications, enhance reliability, and promote grid modernization. [in ways that won’t be described.] The Project does not require the acquisition of new land, does not change the capacity of the existing facility, [Not true: “Electrical Capacity means *the electric transmission transfer capability of the Project Facilities* (or the applicable portion thereof) expressed in MW.” 1272 ACSS has a transfer capability of 2,200 amps, whether the substations do or not] simply [?] replaces existing components [the X-178 is not a circuit board or machine, so “components” is an inaccurate term for 590 structures, 150+ miles of conductor, 100+ miles of OPGW, proposed 50 miles of heavy-equipment road and some number less than 590 100’ x 100’ crane pads], and will not cause significant disruption in the existing environment.”

Eversource fails to define “significant disruption.” There would be significant disruption during construction. According to the dictionary “When there is disruption of an event, system, or process, it is prevented from continuing or operating in a normal way.” “A significant amount or effect is large enough to be important or affect a situation to a noticeable degree.” The roads and construction pads would prevent the former terrain on which they were constructed from continuing in its normal way since the topsoil would be removed and the stripped surfaces would be compressed with machinery then covered with rip-rap and gravel. The roads and other terrain alterations, for example the 22’ high sides of some of the crane pads, would alter the flow of water on the land. The roads would fragment the terrain and alter the movement of animals and the presence of flora and fauna would be altered by the removal of topsoil.

“A combination of factors has driven the Project, including asset condition where structures have been identified [by Eversource, which would profit from unncessary construction] as needing replacement due to their degraded condition. [The structure inspection documents produced by Eversource for this docket fail to prove the structures need replacement.] Additional structures have been identified [by Eversource] as needing to be replaced because they are showing sufficient signs of age-degradation that they have decreased load carrying capability and cannot support the new conductor or OPGW or both. [No proof of this is

provided and, yet again, new conductor doubling the capacity means this is an elective upgrade and must be paid for by Eversource, not rate-payers.] Still other structures have been identified [by Eversource] as needing to be replaced due to uplift. [caused by installing larger structures, for which no need has been shown.] Structures are also proposed to be replaced due to their age [not an accurate indicator of condition] and current level of degradation [inadequate documentation provided, and "degradation" has emotional connotations that "condition" for example, does not] in order to forestall returning to the right-of-way ("ROW") [easements] in the near future [no documentation provided to define or support this] to conduct their needed replacement [replace them. Structure inspection reports are inadequate] which would introduce additional construction period impacts, repeated environmental impacts, [do more damage. Eversource claims these impacts would not cause significant disruption] require reconstructing access roads, [Eversource claims the roads are needed for emergency overland access though it has provided no data on outages or repairs over the past 77 years and emergency access can hardly be provided by roads that need to be reconstructed after the short time in which Eversource claims the 545 Category B structures would need replacement. Significant portions of White Mountain National Forest can only be accessed via helicopter. In 2015, when Eversource was required to remove most of the poles PSNH dumped on the easement in 1985 when it rebuilt the line, all access was with helicopters because Eversource and White Mountain National Forest deemed the terrain too sensitive for overland access:

"Poles in upland areas surrounded by Bog Pond were removed, as the contractor flew the crew into the isolated spots, and after cutting the poles, removed the poles and the crew by helicopter...Wetland impacts were minimized by use of the helicopter. Ground vehicles and local trails were not utilized so wetland crossings with equipment were not necessary. The crews were flown in and out at the end of each day...During the time we were on site, with PAR and Normandeau working to remove poles, we counted 178.5 poles that were removed, and 51 that were left in place to avoid environmental impact...Work on the upper Easton stretch was complicated by tough work conditions. The downed poles at #267 were located both at the top of and at the base of a cliff, with poles buried in the brush."

Not Removed	PAR Removed	Removal Comments
2 poles	0	NOT REMOVED.buried and surrounded by bog, Mapped RTE habitat
4 poles	0	NOT REMOVED.buried and surrounded by bog, Mapped RTE habitat
4 poles	0	NOT REMOVED.buried and surrounded by bog, Mapped RTE habitat
2 poles	0	NOT REMOVED.buried and surrounded by bog, Mapped RTE habitat
1 pole & 2 pieces@5	1	1 pole lying on top of another was removed. OTHER LEFT TO REDUCE IM
2 poles	0	NOT REMOVED.buried and surrounded by bog, Mapped RTE habitat
4 equivalents	0	NOT REMOVED.buried and surrounded by bog, Mapped RTE habitat

Right: road planned by Eversource switchbacks to cliff, traverses below it then climbs above it, either straight up alongside the berm of the crane pad or through uncleared forest.

267 base of cliff

https://nhconservation.org/lib/exe/fetch.php?media=x178_final_report.pdf

and increase project costs to remobilize."

Mobilize means to "prepare armed forces to fight again after a period of not fighting" or to "prepare something, such as a group of people, for a purpose again, after a period of not being active."

Is Eversource presenting itself as a paramilitary organization which periodically "mobilizes" for construction "engagements" with the enemy of grid decay?

"With respect to the ACSS installation, while it will make the delivery of electricity to the North Country more efficient because it can [will it?] operate at higher temperatures with less sag, [compared to what?] it does not increase the capacity of the line..."

In its June 20, 2024 presentation to the PAC Eversource stated that its Alternative 2, which did not include replacement of the 795 ASCR conductor:

"Does not address capacity constraints", implying that the 1272 conductor would address these, when Eversource upgraded the sub-stations to carry the extra capacity of the 1272 conductor.

- Achieving an LTE rating of at least 344 MVA would require upgrades to both the X-178 line conductor and associated substation equipment
  - Installation of 1272 ACSS 54/19 "Pheasant" as part of the full line rebuild would increase the LTE rating of the conductor to 518 MVA
  - The line would then be limited to 254 MVA LTE due to substation equipment, which could be addressed as part of a future project

At this meeting Eversource employee Chris Soderman stated:

"Uh, so on a long-term capacity needs the X-178 was identified as being overloaded in some of the 2050 study scenarios. The highest loading showed was a 344 MvA under a 2050, winter Peak 51 gigawatt, New England load. The existing LTE rating is 229 MVA in the summer and 284 MVA in the winter. Uh, achieving an LTE of 344 MVA would require upgrades to both the X-178 line conductor and the associated substation equipment. So the installation of a 1272 Pheasant ACSS would increase the LTE rating of the conductor to 518 MVA which is going to be beyond what we would see for that 2050 peak so it would certainly make sure that that, you know, this line was kind of right-sized for the future and we wouldn't, wouldn't need to be

coming back even if the additional future studies showed load growth differing from that 344." (Disclaimer; this is my transcription of the recording.)

When Eversource doesn't want the X-178 to be identified as failing to meet the conditions of an asset condition project by "resulting in an increase in transmission capacity that is severable from the project," not incidental to the project, it claims the project won't increase capacity. When it wants to dangle its benefits before ISO it says the X-178 can increase grid capacity.

Given that Eversource has rebuilt the entire Coos Loop (the S-136 is under-construction), the B-112, Z-180, A-111, E-115, V-182, F-139, G-146 and P-145 ; pretty much its former Northern Pass overhead route and more, with its "standard" 1272 ACSS conductor, doubling to quadrupling capacities, Eversource will do the the necessary substation "upgrades" as part of a "future project" as it indicated to the PAC (Planning Advisory Committee), a group at ISO-NE that claims no regulatory power over the X-178 or any of the other 60+ New Hampshire asset condition projects presented to it by Eversource since 2018 and paid for by ratepayers.

Eversource has refused to consider using low-sag, low-line-loss ACCC type conductor. It did not provide profile drawings of ACCC type conductor or of the existing line. Its profile drawings do not show the height (in numbers) of its proposed structures or clearance at each span, nor does Eversource explain why the minimum clearance is exceeded by tens of feet on almost every span. Perhaps Eversource intends to "remobilize" in a few years, as it claims it is loathe to do, and re-conductor the X-178 with ACCC type conductor:

"While the ACCC Conductor offers far better electrical and mechanical performance compared to ASCR and ACSS conductors – and greatly improved efficiency – it also offers superior reliability and resilience. In addition to greatly reduced sag that can improve clearances to vegetation and underbuilt structures to reduce the risks of sag-trip outages and wildfires, the ACCC Conductor's added capacity can be used to reroute power around fire-prone areas during dry and/or heavy wind conditions."

https://energycentral.com/o/ctc-global/debate-over-accc-conductor-outperforms-acss-conductor-every-time

FERC's very recent Order 1920-A states:

"605. CTC Global states that the Commission's definition of advanced conductors allows for the consideration of advanced conductors that are not representative of the capabilities represented by the Commission.1517 CTC Global states that this may allow transmission providers to avoid consideration of the types of advanced conductors that Congress intended to

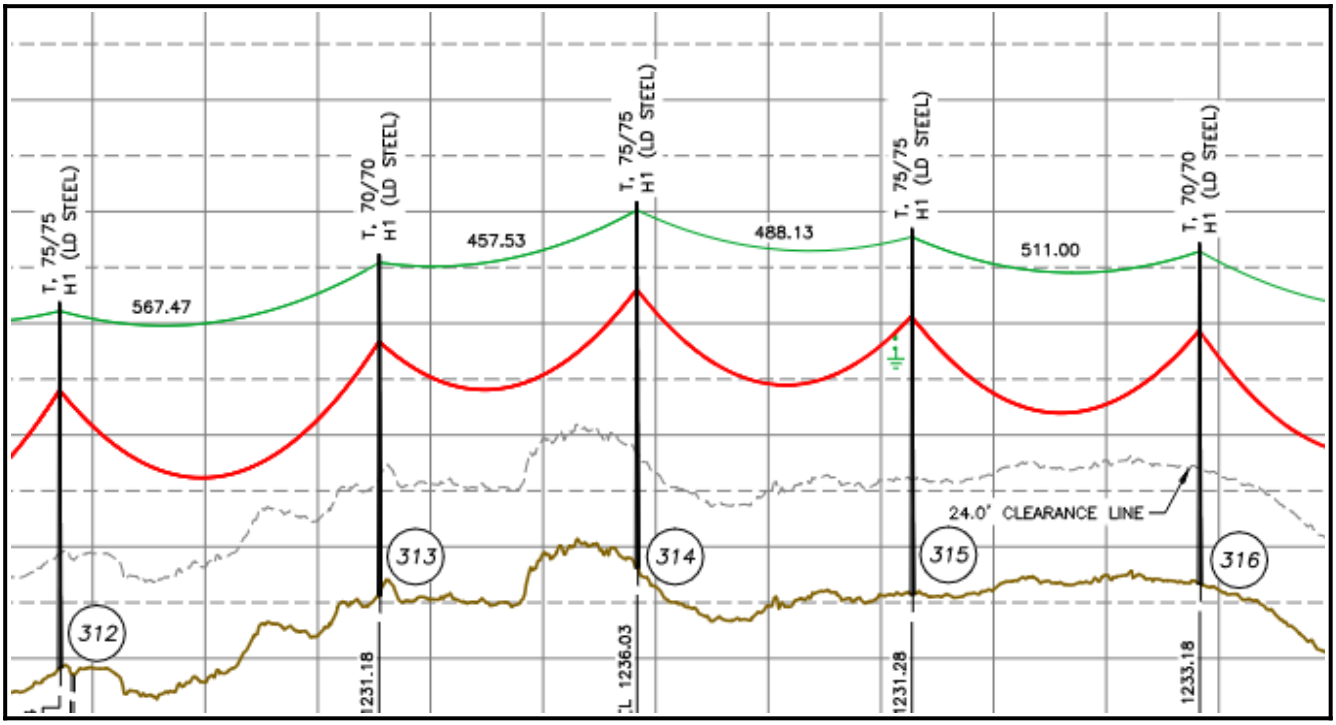
be reviewed in the Energy Policy Act of 2005 and that the US DOE has described in reports.1518 For this reason, CTC Global requests clarification, or in the alternative rehearing, that the definition of advanced conductors will ensure that sufficiently advanced conductors—which at a given voltage increase power flow capabilities by at least 1.5 times, decrease losses by 20% or more, and improve conductor sag performance—are included in regional transmission planning processes. CTC Global states that such a clarification is needed to ensure that the conditions that the Commission identified as leading to unjust and unreasonable rates are addressed and argues that failure to do so will continue to result in project identification that may not be more efficient or cost-effective than alternatives.1519"

"**608.** In response to CTC Global, we clarify that the requirement to consider alternative transmission technologies necessitates that transmission providers consider the types of advanced conductors that Congress intended to be reviewed in the Energy Policy Act of 2005 and that the US DOE has described in its reports.1528 However, we decline to alter the definition of an advanced conductor.1529 We continue to find that advanced conductors include present and future transmission line technologies whose power flow capacities exceed the power flow capacities of conventional aluminum conductor steel reinforced conductors,1530 and that advanced conductors include, but are not limited to, superconducting cables, advanced composite conductors, advanced steel cores, high temperature low-sag conductors, fiber optic temperature sensing conductors, and advanced overhead conductors.1531 However, we clarify that transmission providers, rather than considering just one of the six advanced conductor examples listed, must instead consider each of the six advanced conductor examples listed, and, as they determine appropriate, any additional advanced conductor which that transmission provider determines might be more efficient or cost-effective." (my underlining)

"With respect to the OPGW installation, the replacement of existing shield wire with two 49-mile runs of fiber optic cable entails stringing the OPGW at the top of the structures, in the same location as the static wire on the existing structures."

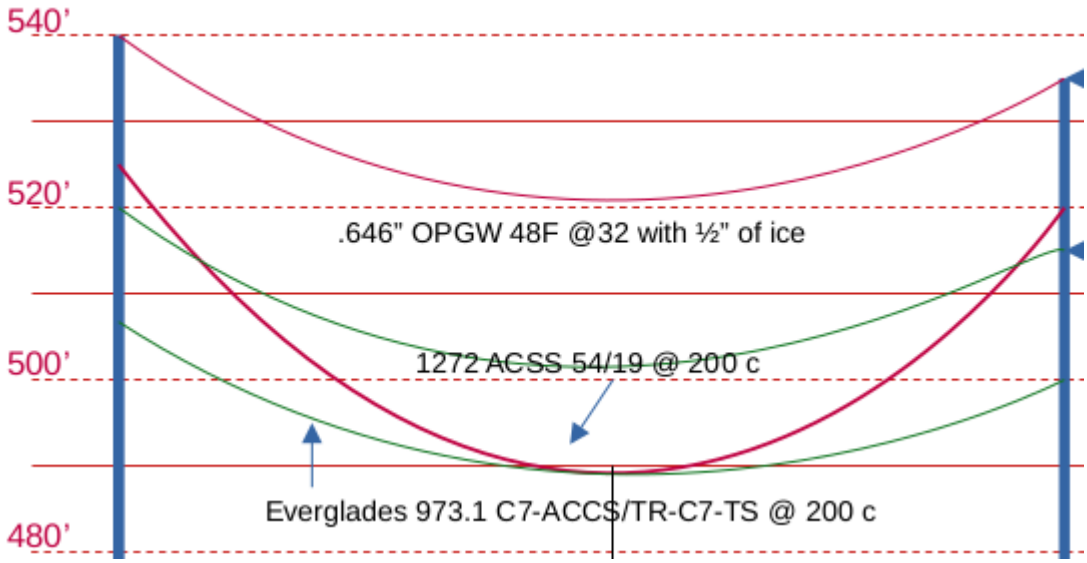
Given the sag of the OPGW, there is more than 98 miles of it. The same is true of the conductor. More sag means more metal. Why do the profile drawing show a 24' "clearance line" when the required clearance over land traversed by vehicles is 21.5' and water not suitable for sailing is 18.6'?

The static wire is not at the same location as the static wire on the existing structures. Not only is it at least 5' higher, the configuration of the metal structures is different.

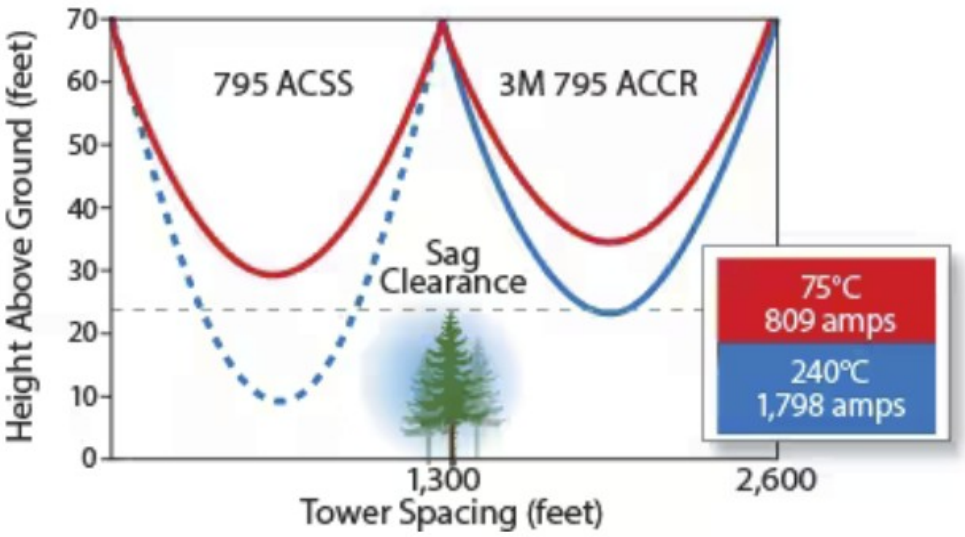


"Height increases are driven by the need to comply with current National Electrical Safety Code clearance requirements. Accordingly, the incremental changes resulting from the proposed Project benefit the public health and safety."

Height increases are driven by Eversource's plan to install OPGW, larger high-sag conductor, and Eversource's guaranteed rate of return of 11+% on its investment. The clearances are also greater than required by Code as is clear in the profile drawings. So the structures are taller than is required for Code compliance. Eversource has not shown that it cannot comply with Bethlehem's height restrictions by using ACCC-type conductor, of a lower amperage than the 1272 if necessary and by not installing the easement-violating OPGW. (Below: 739' span:)



Where are the profiles showing that Eversource could not, using advanced ACCC type conductor, lower structure heights by 20’ on average, which would allow Eversource to use the existing structures after cutting off the decaying pole tops inspection notes mention frequently?



Lower weight reduces sag

A lighter weight, high temp low sag conductor (HTLS) with twice the ampacity (or more), 3M ACCR doesn’t place extra weight or force on towers while meeting mechanical and clearance requirements. It carries more power in the same size cable and can run at higher temperatures without additional power line sag.

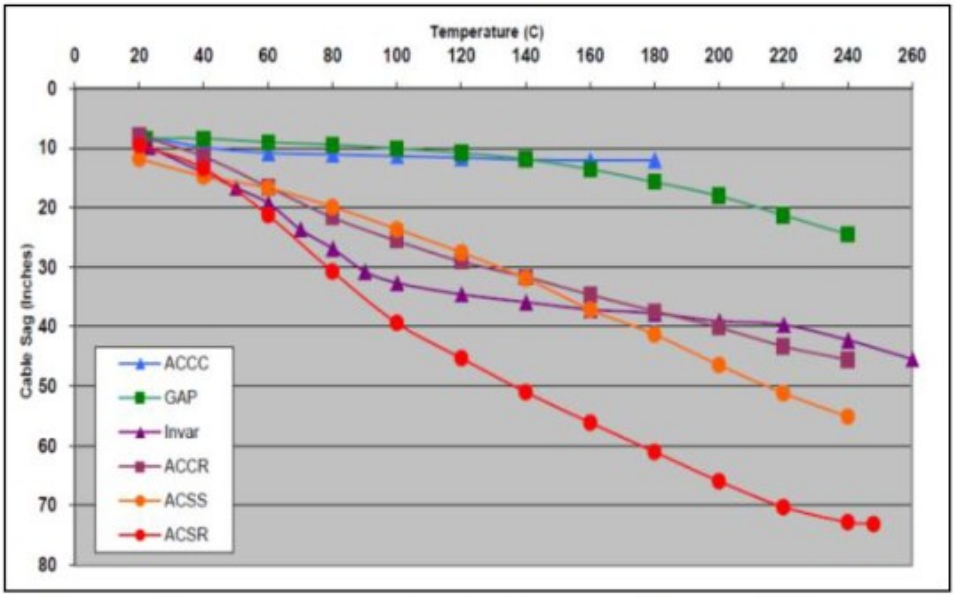
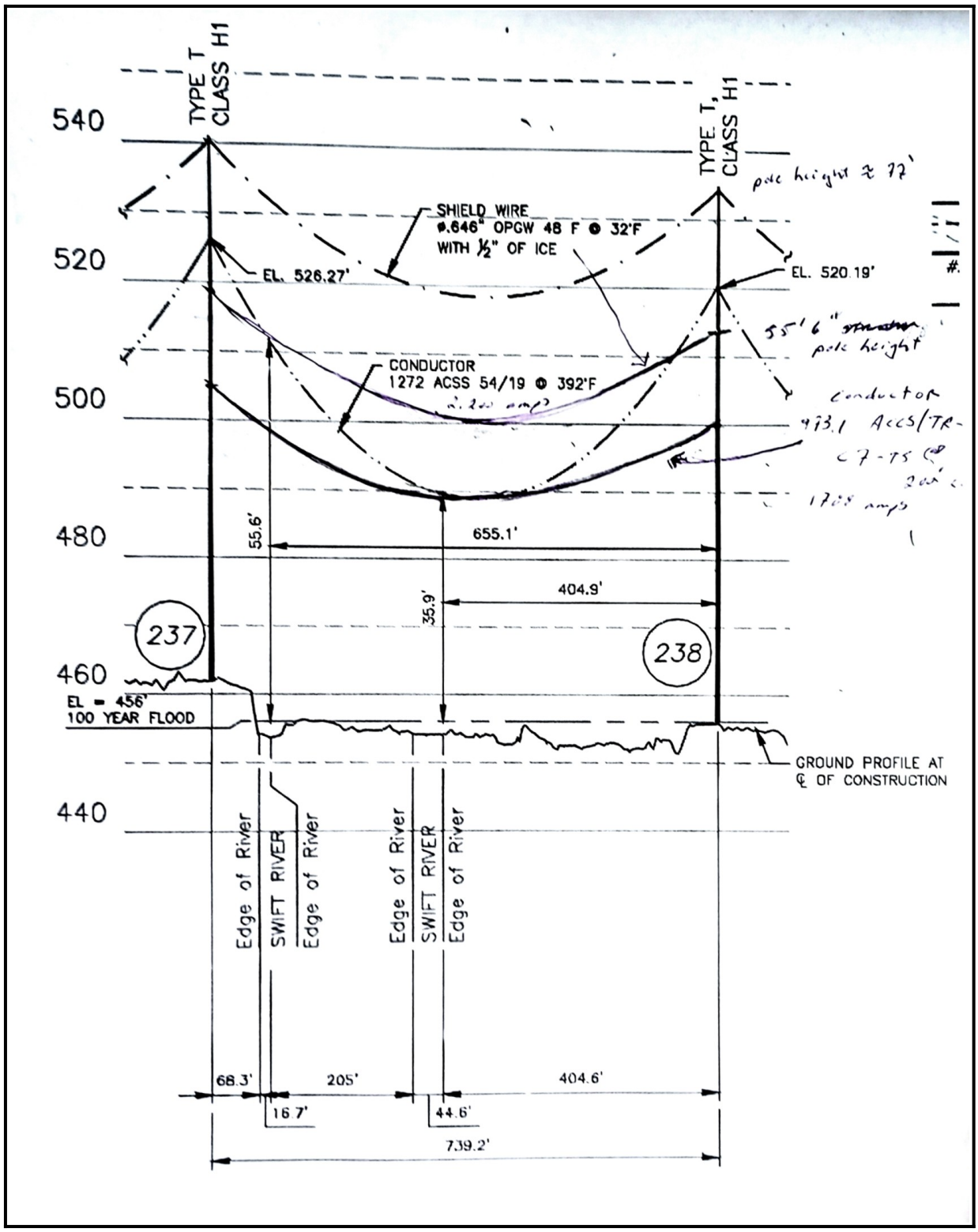
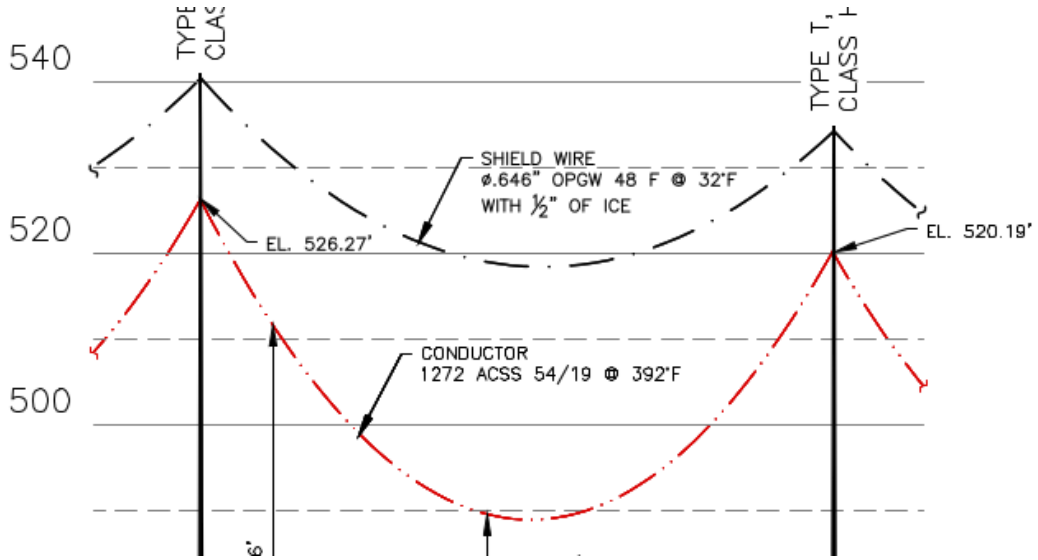


Figure 2 - Sag / temperature comparison of several conductors tested by Ontario Hydro at Kinectrics lab. The graph not only shows the substantially reduced sag, it also shows the particular ACCC® conductor tested operated at 60° to 80° C cooler than the other conductors tested under an equal 1,600 amp load conditions. (The conductors are listed in the sequence in which they appear from top to bottom)

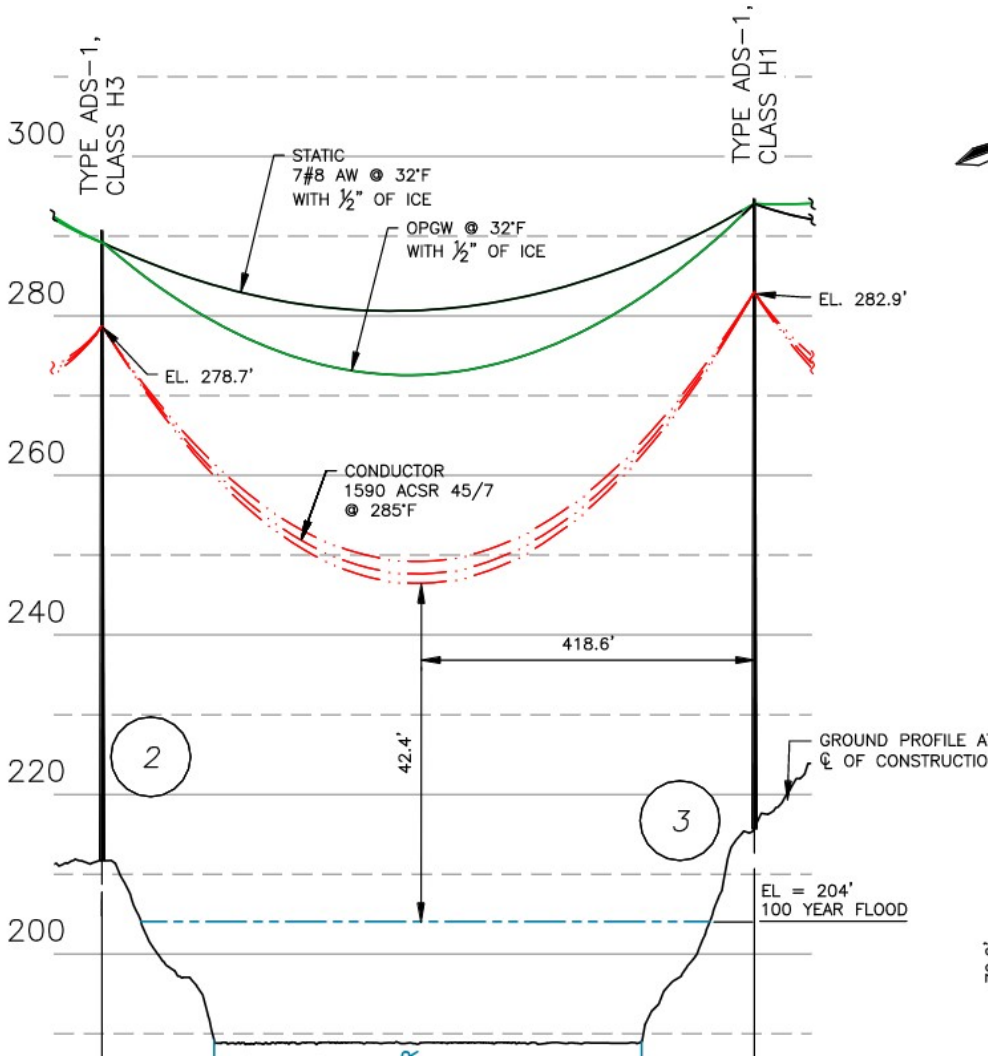
Lowering the 55’ 6” structure with the ACCS/TR conductor 13’ to reduce the clearance to 22.9’ would allow a structure height of 42’ 6”. Using static wire or SkyWrap fiber on the conductors would lower the structure height by another 5’, to 37’ 6”.



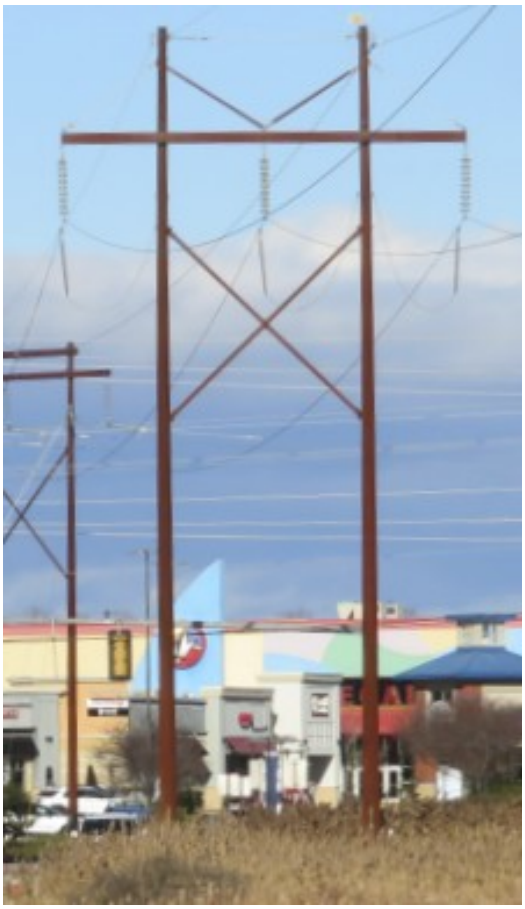
Below, Eversource profile from the X-178 showing 15’ clearance for the OPGW:



Below, another Eversource profile showing lower sag of regular ground wire and 11’-12’ clearance with another OPGW. Eversource has not offered any change in the OPGW to reduce structure heights.



Proposed structure type
with braces above cross-bar.



Existing 1985 structure

Existing 1985 on which
the crossbar and insulators
were replaced c. 2017

Eversource claims a deep concern about structure integrity yet did not find that safety or reliability warranted placing braces on the structure on the right or on the several ones north of it on which the cross-bars and insulators were also replaced (without TV coverage of Eversource performing “Emergency Repairs.”)

Eversource claims it is dedicated to the security of the grid but has constructed roads on hundred of miles of easements, creating extensive new motorized access to the grid.

Since Eversource’s document mostly repeats claims made by Eversource in its October submission, I have not commented on its whole submission.

https://nhconservation.org/doku.php?id=x-178

kris pastoriza

December 21, 2024