Comment on ACCC type conductors and ice load, SEC 2024-02 and DE-24-087

PSNH, 1960s: No roads, no construction pads, no heavy equipment in view,.

The February 28, 2024 PAC meeting minutes state:

“Eversource did not consider ACCC conductors for this [X-178] project because of the way they swing due to their low weight.

An area’s climate is a critical factor to consider when selecting conductors for a project... ACCC conductors are be better suited for areas like Texas because they do well in high temperature.”

At the June 20, 2024 PAC meeting Chris Soderman was again asked why Eversource was not assessing ACCC type conductor for the X-178. He stated: “... because of the ice loading and relatively short span length of the bulk of this transmission line, it would really offer very little benefits if any at all [presumably compared to Eversource’s proposed 1272 ACSS]. When we think about the sag potential of the ACSS conductor, there may be opportunities at some of the river crossing locations to take a look at other HTLS technologies but other than that, it wouldn’t be something that we would be looking forward to doing on a widespread basis on this transmission line because of the up and down nature of this transmission line.”

October 23, 2024 PAC minutes state:

“Eversource considered ACCC and 3M conductors, but they did not provide benefits…

“Eversource’s performed sag calculations for ACCC conductor, instead of creating profiles…

A stakeholder suggested that Eversource consider an advanced conductor alternative to reduce the number of structure replacements to create a least cost solution.

Multiple stakeholders requested that Eversource disclose X-178’s inspection reports…
[A utility] stakeholder suggested that engineering solutions could solve uplift issues without requiring a full line rebuild.

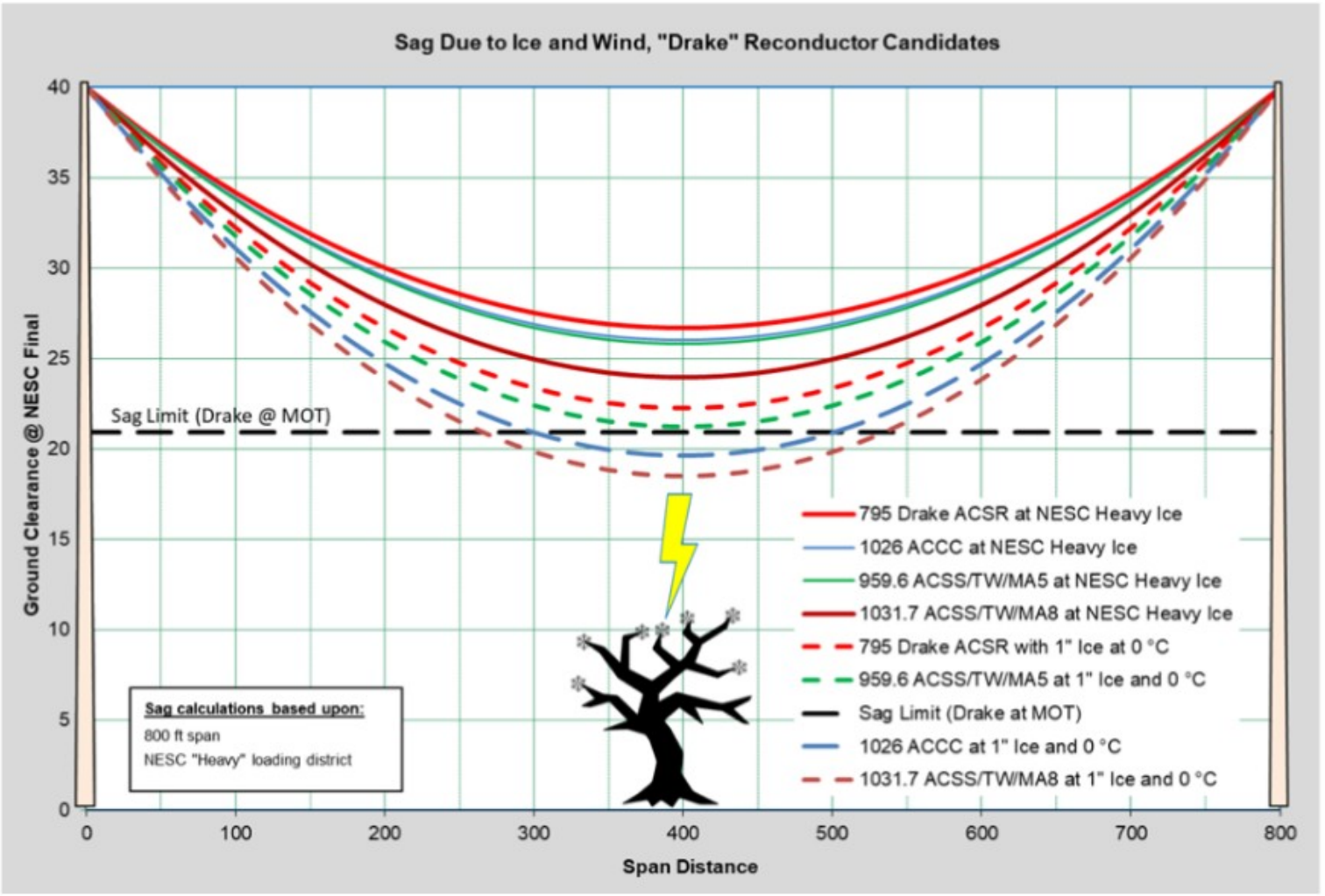
A stakeholder noted the challenges with the X-178 presentation convey why the states are advocating for asset condition process changes. This stakeholder stated the current process does not lend comfort.”

On December 18, 2024, in yet another “response” to “stakeholder” questions, Eversource stated: “Over the past decade, Eversource has moved from legacy Aluminum Conductor, Steel Reinforced (ASCR) to Aluminum Conductor, Steel Supported (ACSS) as our standard conductor for new line construction and line rebuilds Compared to ACSR, ACSS has excellent high-temperature performance and lower sag, for a comparable cost. Other advanced conductor

technologies, such as Aluminum Conductor, Composite Core (ACCC) would increase the cost of the X-178 line rebuild without providing benefits such as lower tower heights or fewer towers. This is because the ice loading in New Hampshire would result in a similar sag with these conductors to what would be experienced at high temperature operation of ACSS."

Eversource again fails to mention that the NESC ice loading standard applies only to structures taller than 60', and is silent on the reduced line losses of ACCC type conductors.

Figure 5: Sag Performance for Loaded Conditions



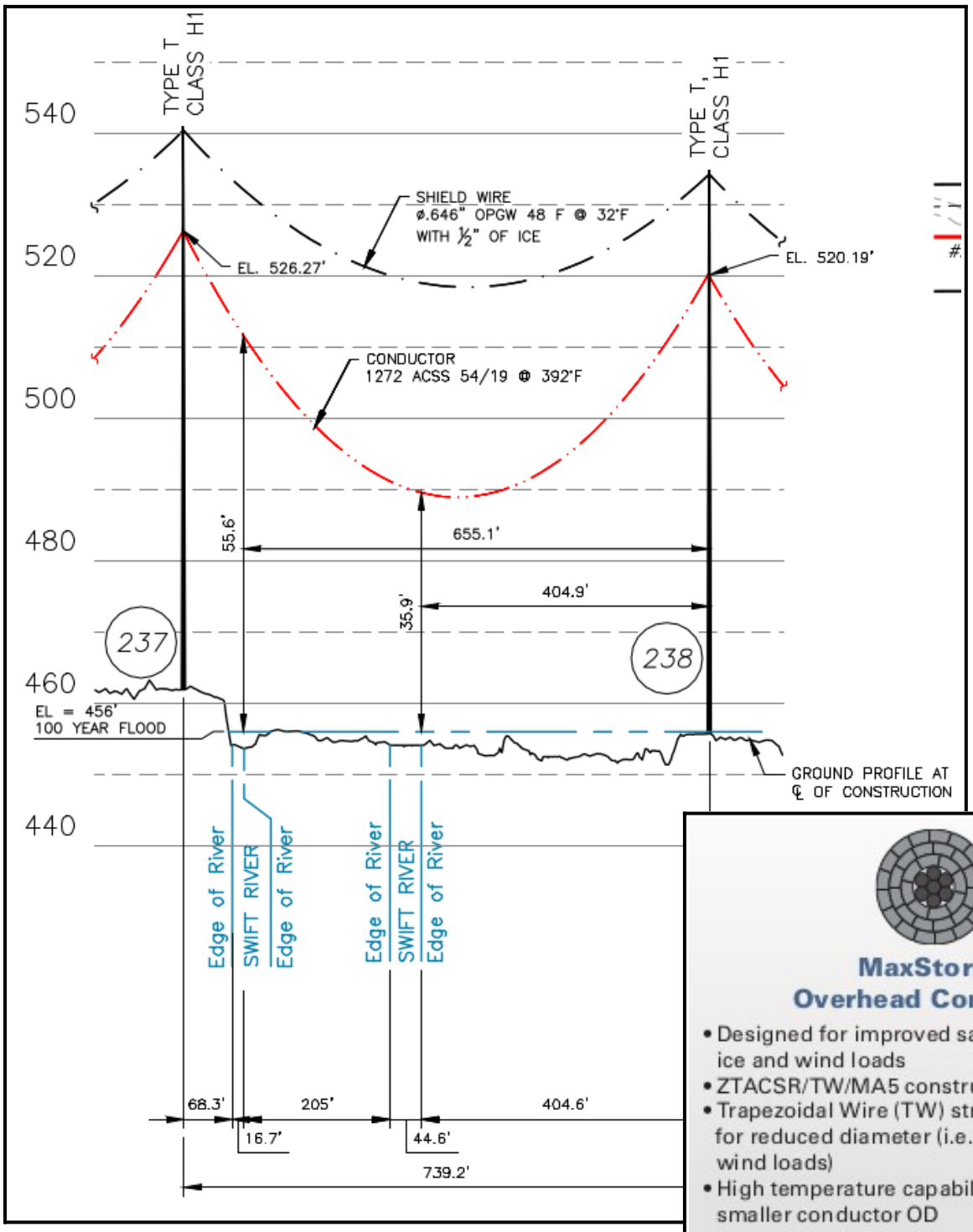
The diagram above indicates Eversource's statement appears to be false.

1026 ACCC is shown as having 14' sag at 800' with NSC heavy ice load, comparable to the existing 795 ASCR Pheasant conductor

The closest ACCC type I can find is Southwire Gannet (ZTACCR/TW/C7 -TS) 1,116 1,945 amps

Where are Eversource profiles with ACCC type conductor, the typical (shorter than 800') spans on the X-178, structure heights below 60' (not subject to NESC heavy loading) and no ice?

Below: Eversource's proposed 2,200 amp 1272 ACSS at 739' has 35' sag at 392 F, its condition of maximum sag, 20' more than the 1,026 ACCC with ½" radial ice.

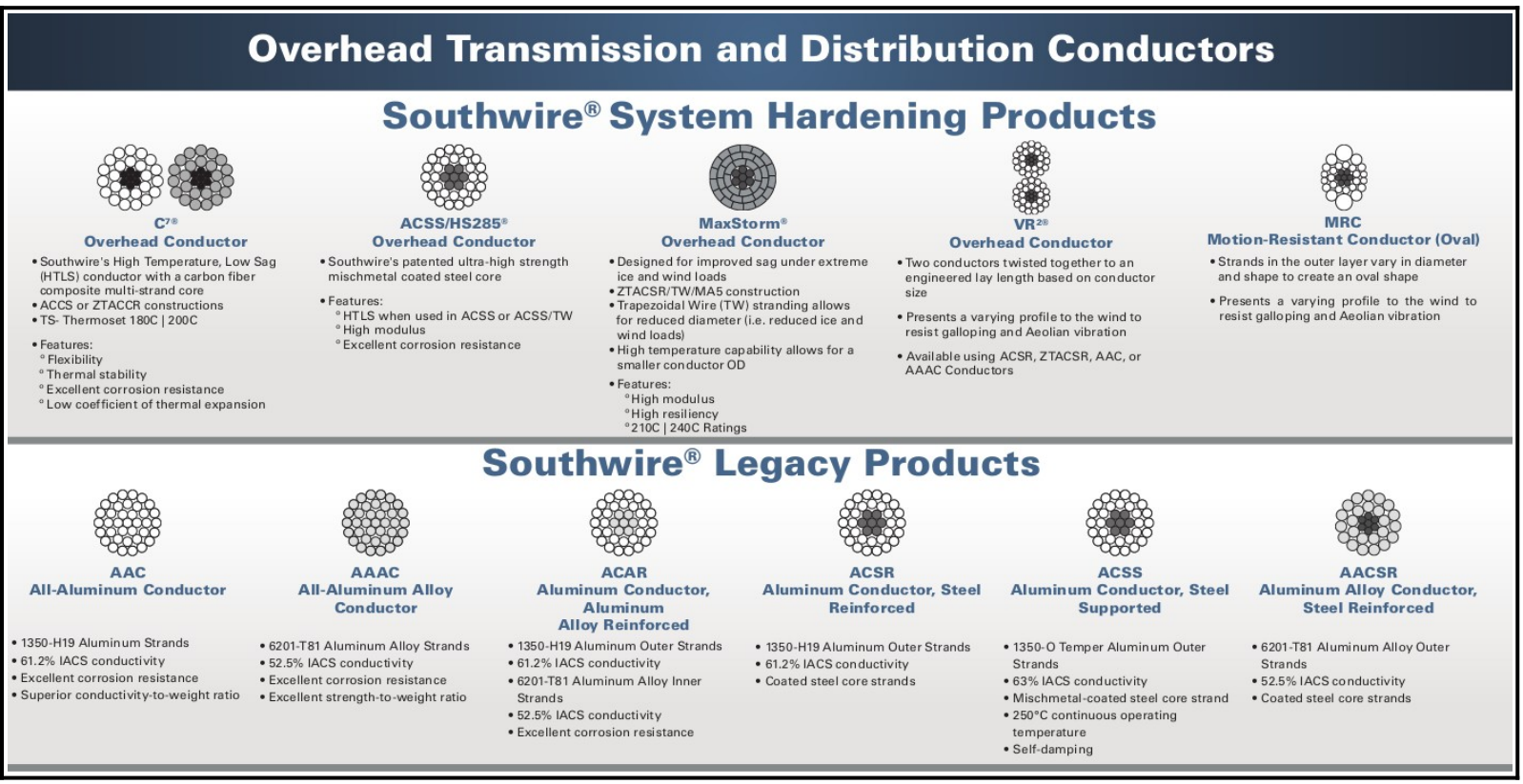


MaxStorm®
Overhead Conductor

- Designed for improved sag under extreme ice and wind loads
- ZTACSR/TW/MA5 construction
- Trapezoidal Wire (TW) stranding allows for reduced diameter (i.e. reduced ice and wind loads)
- High temperature capability allows for a smaller conductor OD
- Features:
  - High modulus
  - High resiliency
  - 210C | 240C Ratings

Newer ACCC type conductors designed for ice loads may have even less sag. For example (above right) MaxStorm Overhead Conductor; “Trapezoidal Wire (TW) stranding allows for reduced diameter (i.e. reduced ice and wind loads.)”

Note that Southwire lists ACSS in its “Legacy” category, along with ASCR.



Eversource’s October PAC presentation document claims:

- Eversource performs aerial drone inspections of its 115 kV transmission lines every two years
  - The X-178 was inspected in 2022 and 2024
- The 2024 inspections of the X-178 line were performed by a third-party drone contractor between April and June
  - Approx. 12,000 photographs were taken
- Structure ratings were assigned based on review of photographs by drone contractor, third-party engineering consultant, and Eversource’s own engineering staff
  - Reviews completed on August 22, 2024

In minutes for this PAC meeting Eversource is recorded as stating:

“The 2024 inspections indicated that a significant portion of X-178 is facing accelerated ground rot. Structures can deteriorate rapidly as assets approach their end of life.”

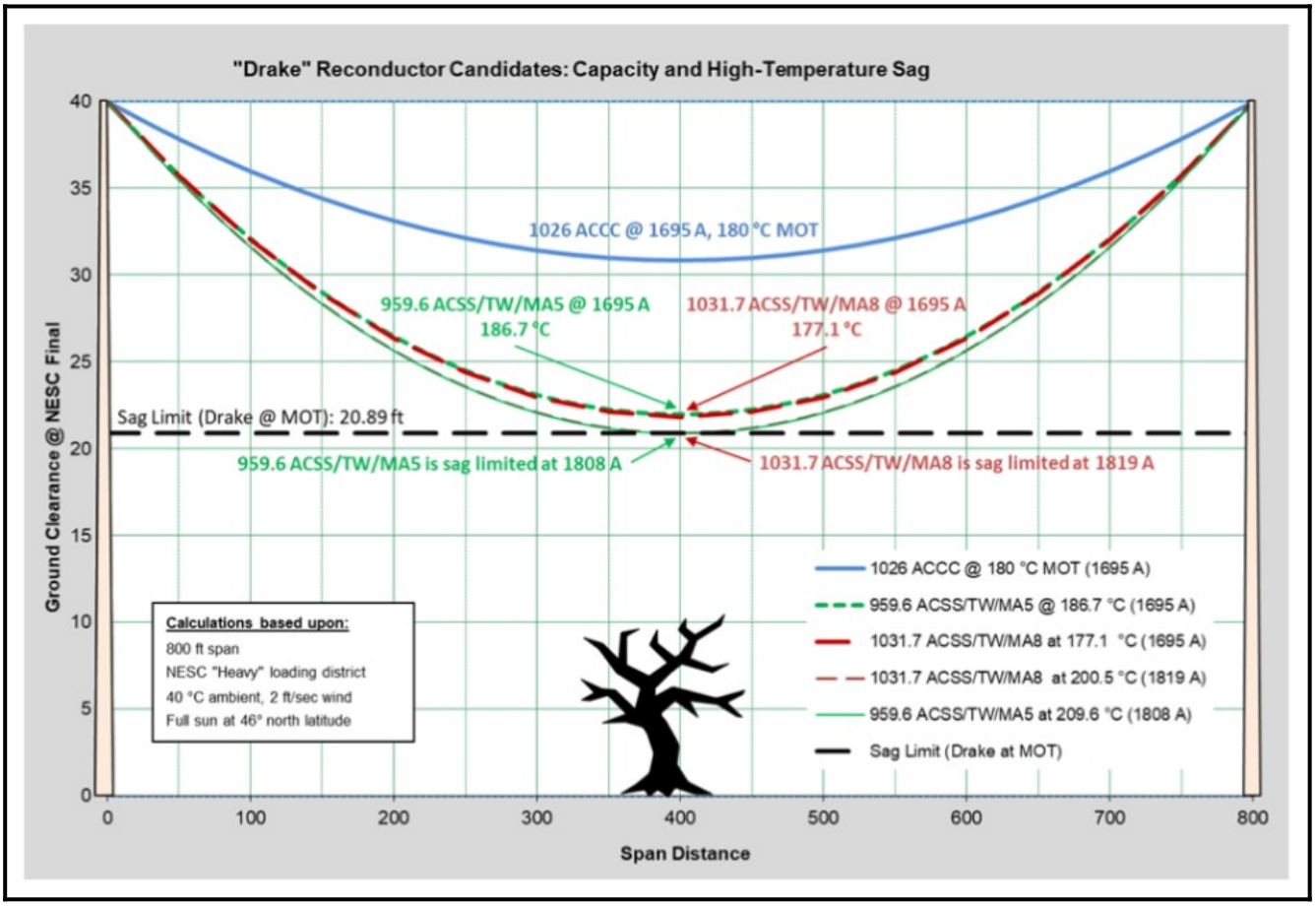
Eversource implies, without actually claiming, that the X-178 structures are approaching their end of “life.” Eversource may define this as when they are fully depreciated at 40 years (now, for the X-178 (1 & 2).

The drones are not used for ground inspection, so the 12,000 photos appear to have no connection to the “significant portion of X-178” Eversource claims is facing “accelerated ground rot.”My word search for “ground” yielded only two examples of ground rot in the inspection notes (2022 and 2024) though cut ground wires appear frequently.

In its October PAC document Eversource stated that the X-178 easement in White Mountain National Forest is in a: “Remote, isolated area; high elevation; and frequently exposed to severe weather” implying that it is subject to damage, yet Eversource has replaced only one structure on this section of the X-178 since it was built in 1985, compared to thirteen on the 1985 X-178 (1) and ten on the 1969 X-178 (3).

Table 1 – X-178 Structure In-Service Years

Year	X-178	Segment 1	Segment 2	Segment 3
1953[3]	28	28	0	0
1958	2	0	0	2
1969	175	0	0	175
1971	22	21	1	0
1983	83	1	79	3
1985	266	112	151	3
2002	2	0	0	2
2012	2	0	1	1
2015	1	1	0	0
2020	11	11	0	0
2023	2	1	0	1
Total	**594**	**175**	**232**	**187**

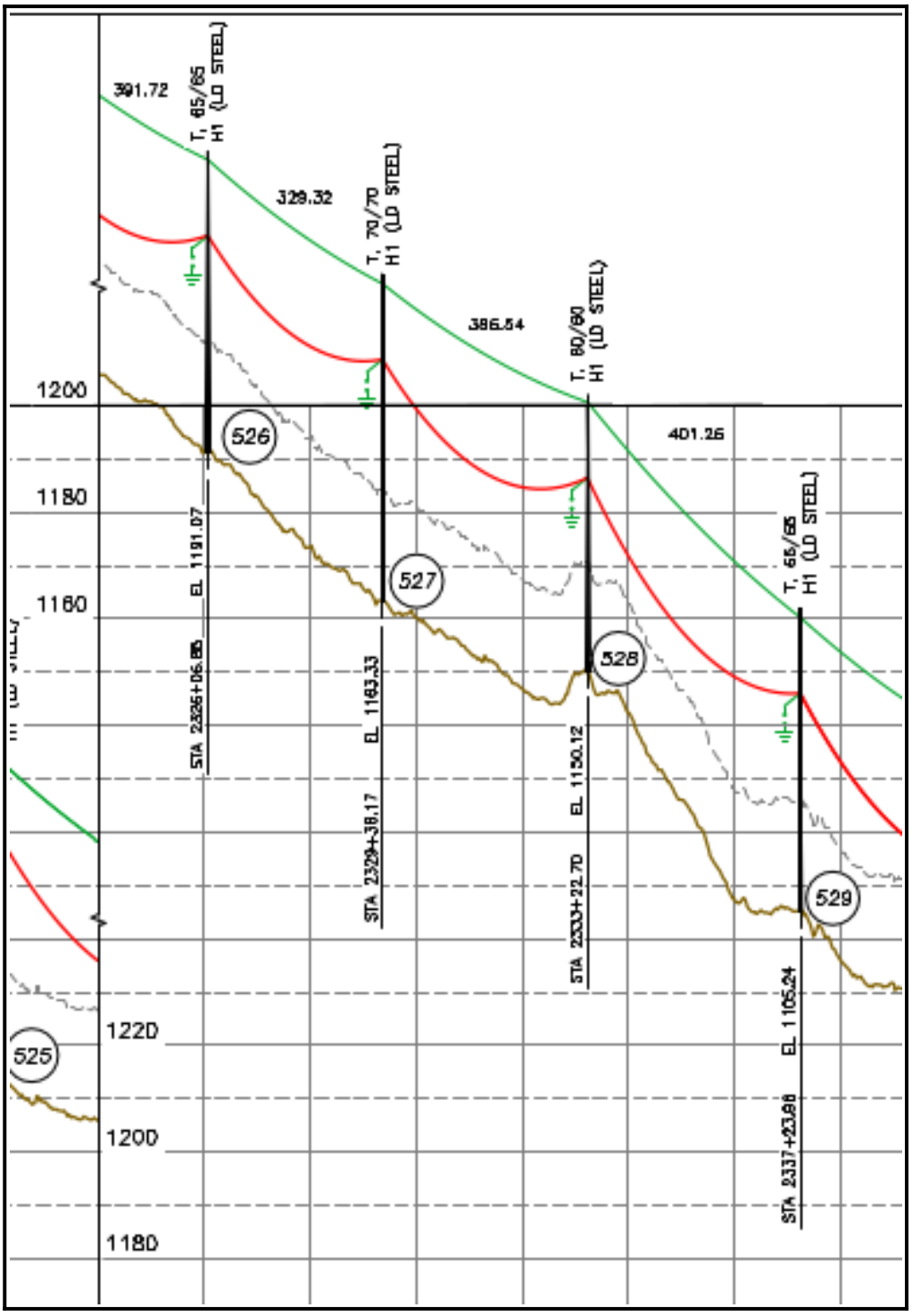


At the usual high temperature operating conditions, ACCC type conductor would sag far less than ACSS thus have less visual impact and be less subject to damage by falling trees.

Destruction proceeds on the U-199, a youthful 53 with another twenty years of service left, by which point who knows what progress may have been made in efficiency, conservation and conductors.

Loggers can fell and limb large trees with a tracked feller-buncher but Eversource claims it cannot set light-duty poles without a road and 100’ x 100’ construction pads. The plans for this area show wetland and uplands matting placed where the road and part of the lower construction pad are, so why has Eversource been allowed to excavate wetlands when it is required to place matting on the wetlands to protect them? Why has it built what appear to be two construction “pads” into the steep slope above structure 62 rather than laid wetlands/upland matting around it?

Should we assume Eversource is exceeding Code clearances and increasing structure heights here far beyond what is required to carry its high sag conductor, as it plans to do on the 49 miles of the X-178?



kris pastoriza January 9, 2025