SPE Multidrop Enhancements Mixing Segment Considerations Update

February 2021

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Background

- **IEEE P802.3da Task Force Work Items**
  https://www.ieee802.org/3/da/workitems/index-word.html

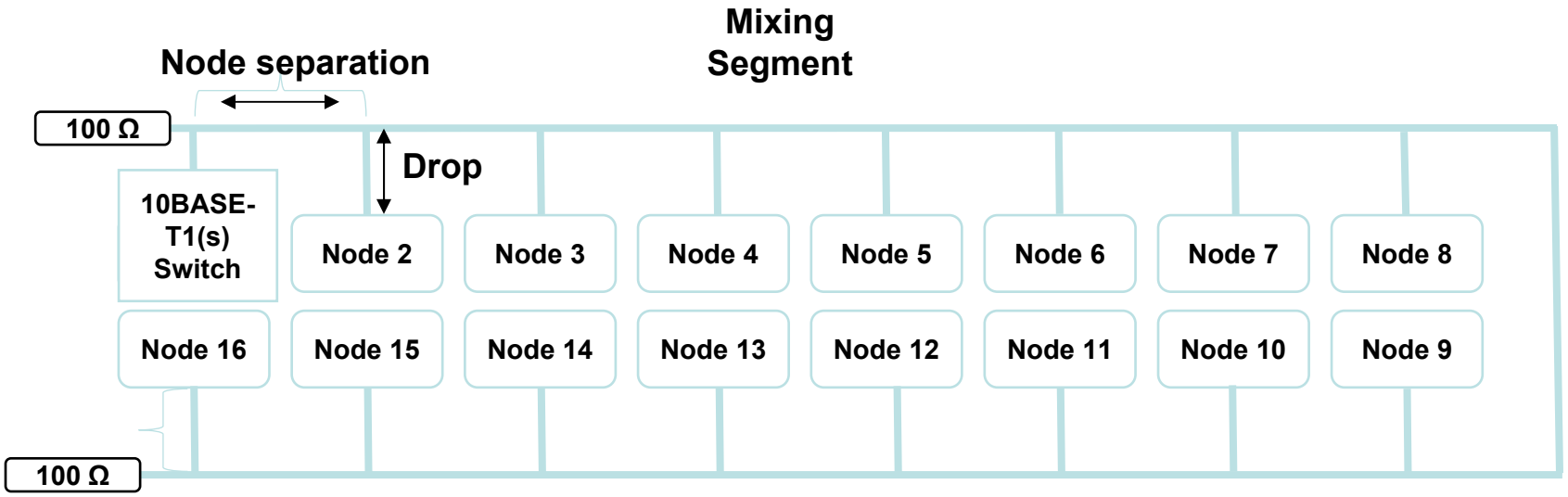
Mixing Segment	specifications (IL, RL, mode conversion, etc.), MDI specs (tighter than CG?)
MDI + stub	connection (inductance, capacitance, resistance)

- **Follow-on July 2020 Single Pair Multidrop Considerations**
  - **https://www.ieee802.org/3/da/public/jul20/diminico_SPMD_01_0720.pdf**
- **Follow-on November 2020 Single Pair Multidrop Considerations**
  - **https://www.ieee802.org/3/da/public/111820/diminico_SPMD_01_1120.pdf**
- **Follow-on January 2021 Single Pair Multidrop Considerations**
  - **https://www.ieee802.org/3/da/public/012721/diminico_SPMD_01_0121.pdf**

Contributors

- **Paul Wachtel, Bob Voss, Ron Nordin – Panduit**

Node count and configuration



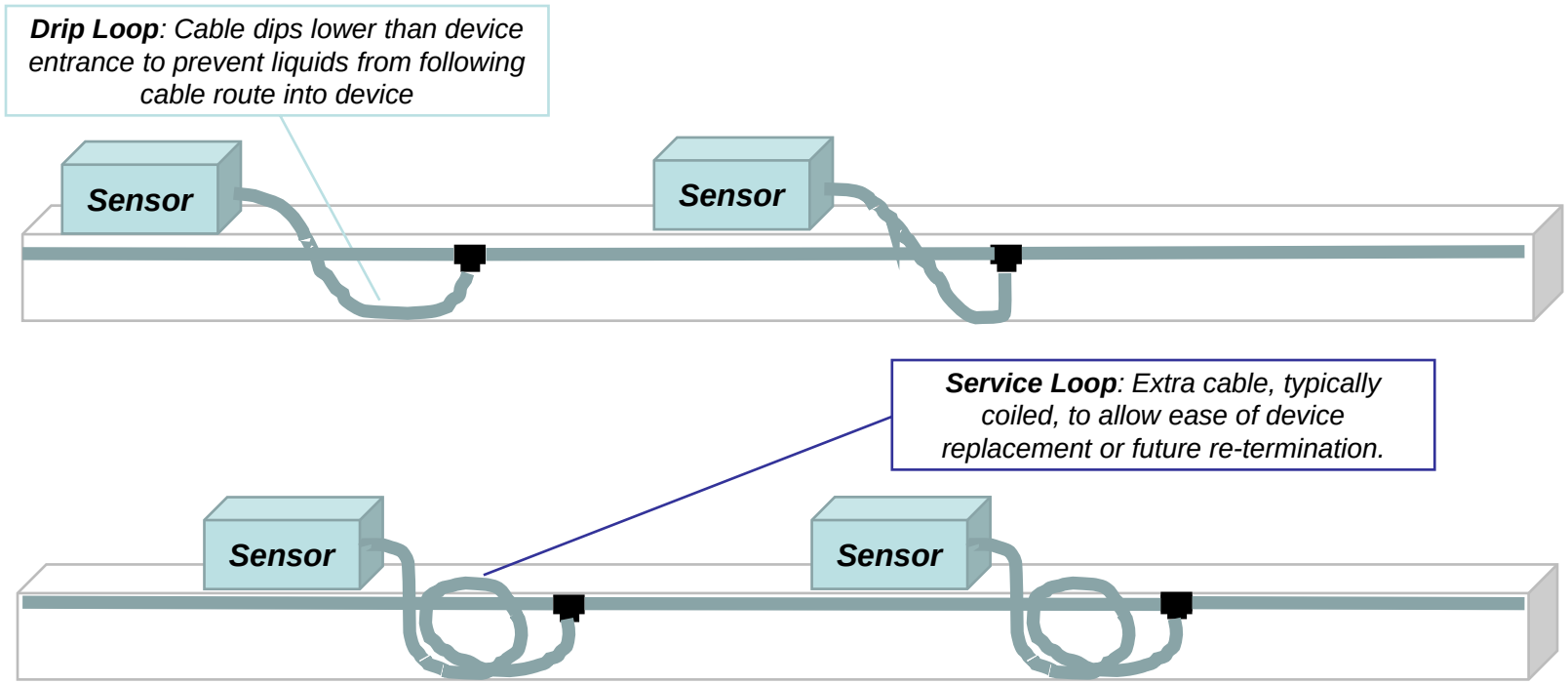
Number of Nodes	Node separation lengths	Drop Length	Mixing Segment Length
8	7.1 meters	100mm	50 meters + drop lengths
		300mm	
		500mm	
16	3.3 meters	100mm	
		300mm	
		500mm	

Drop Length/Mixing Segment Length

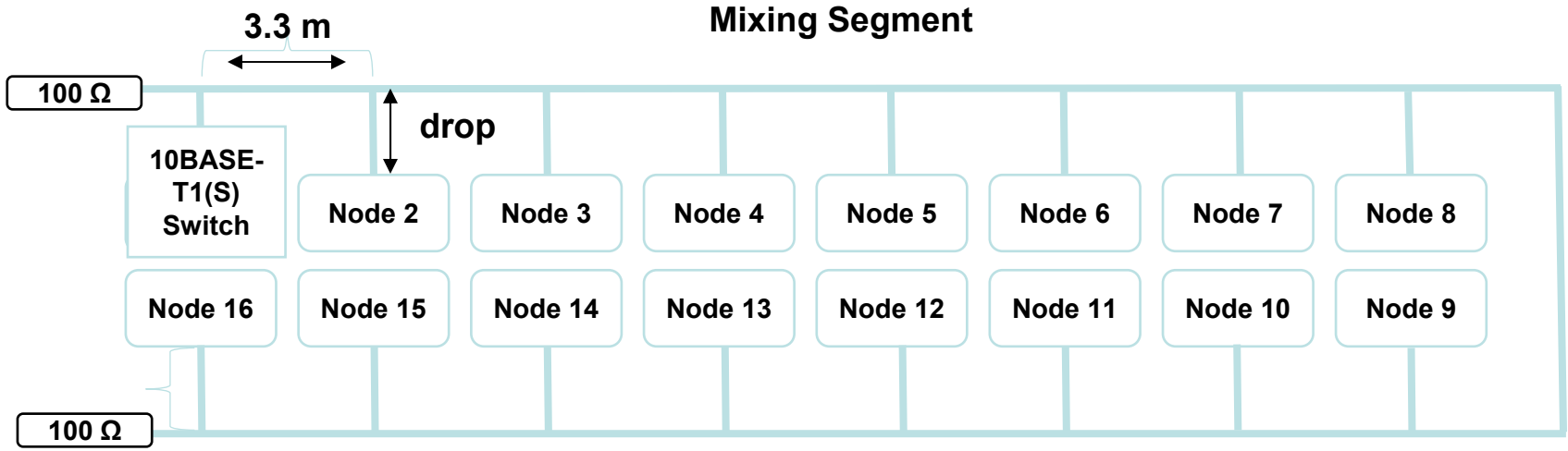
Spur Length (mm)	Application	Comments
100mm	Per 802.3cg	Very short for machine building practices
300mm (~12”)	Fairly typical length for drip loop installations	Fairly commonplace in sensor applications
500mm (~20”)	Service Loop applications	

- Necessary drop length for common applications?
  - There’s going to be a range here
  - Service loop length is part of spur length
- At some point drop length becomes a detriment to performance
- What is the impact of non-uniform trunk segments on performance?
  - Extremely short versus much longer plus impact of length variation

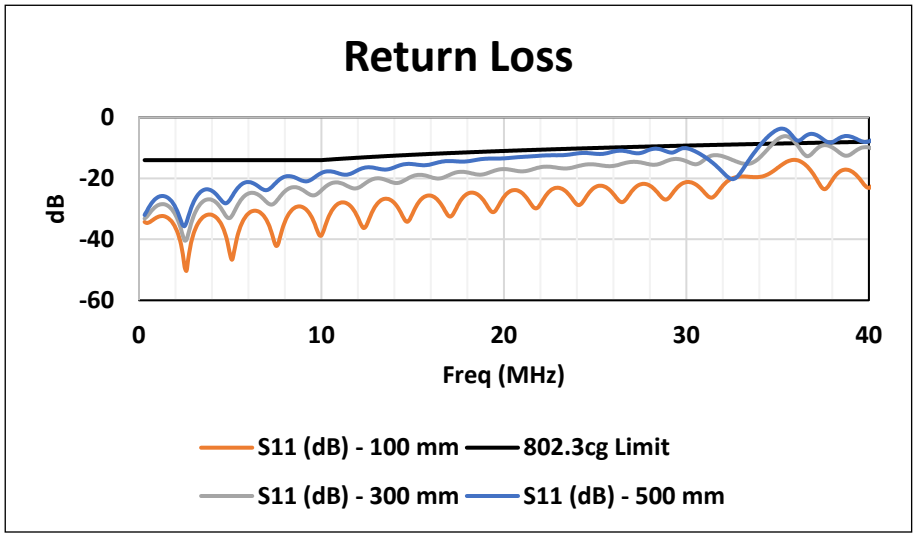
Drop Length Drives - Machines

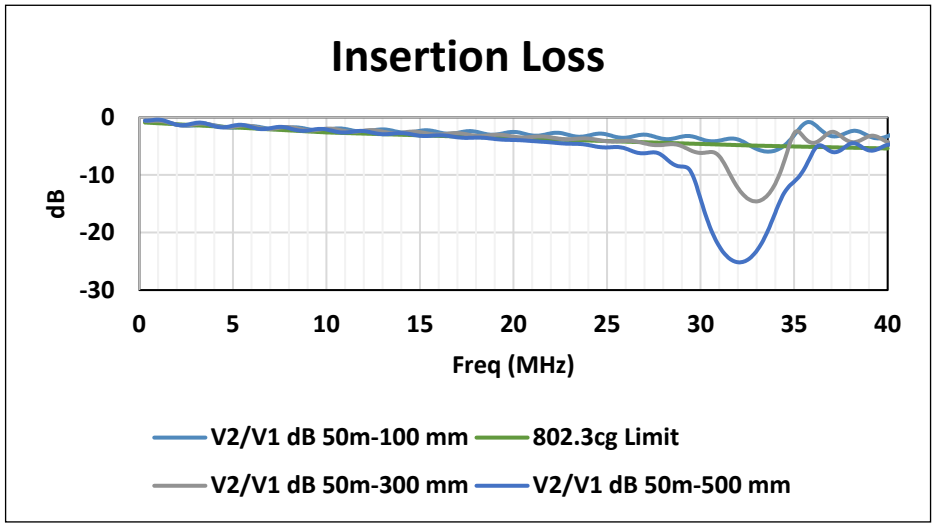


50m 18 AWG 16 node – 3.3 m separation

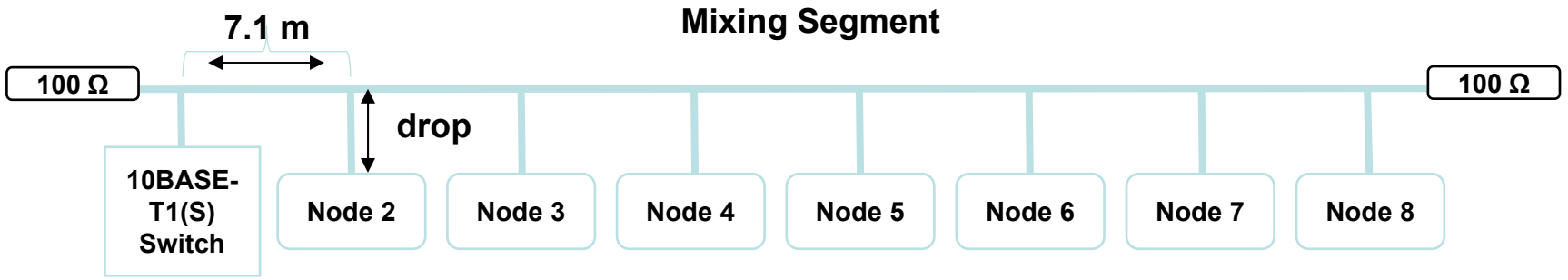


Drop = 100 mm, 300 mm, and 500 mm

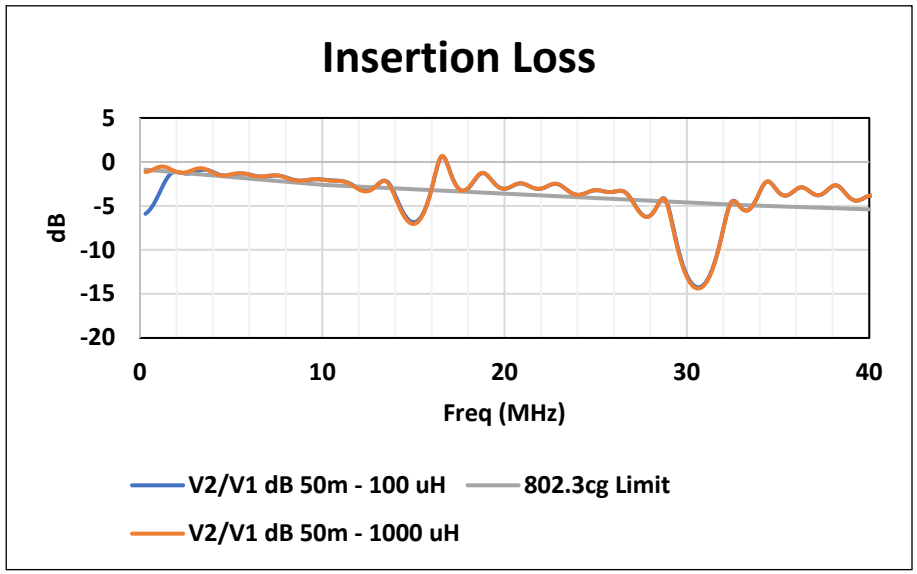


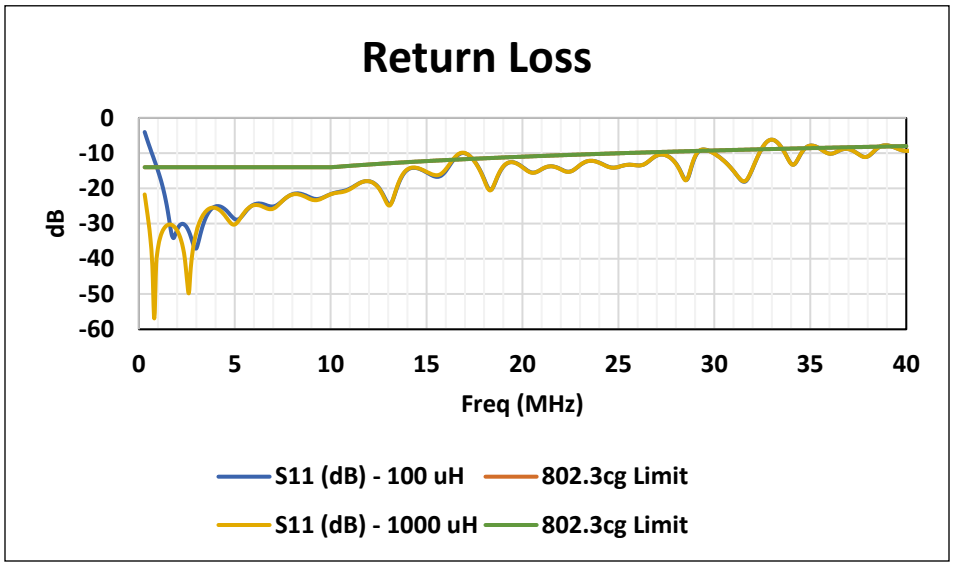


50m 18 AWG 8 node – 7.1 m separation - PoDL

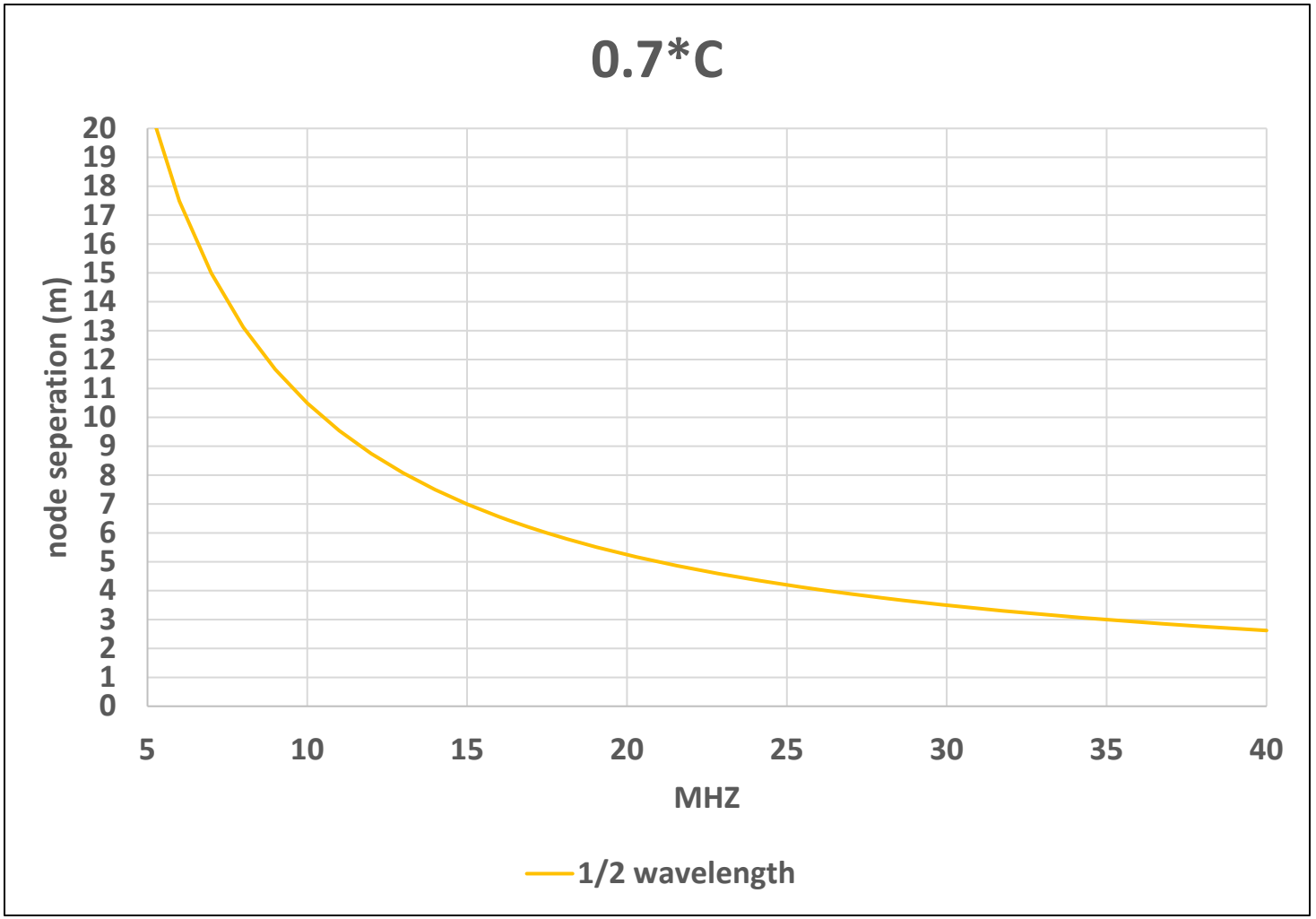


Drop = 500 mm





Node separation versus MHz

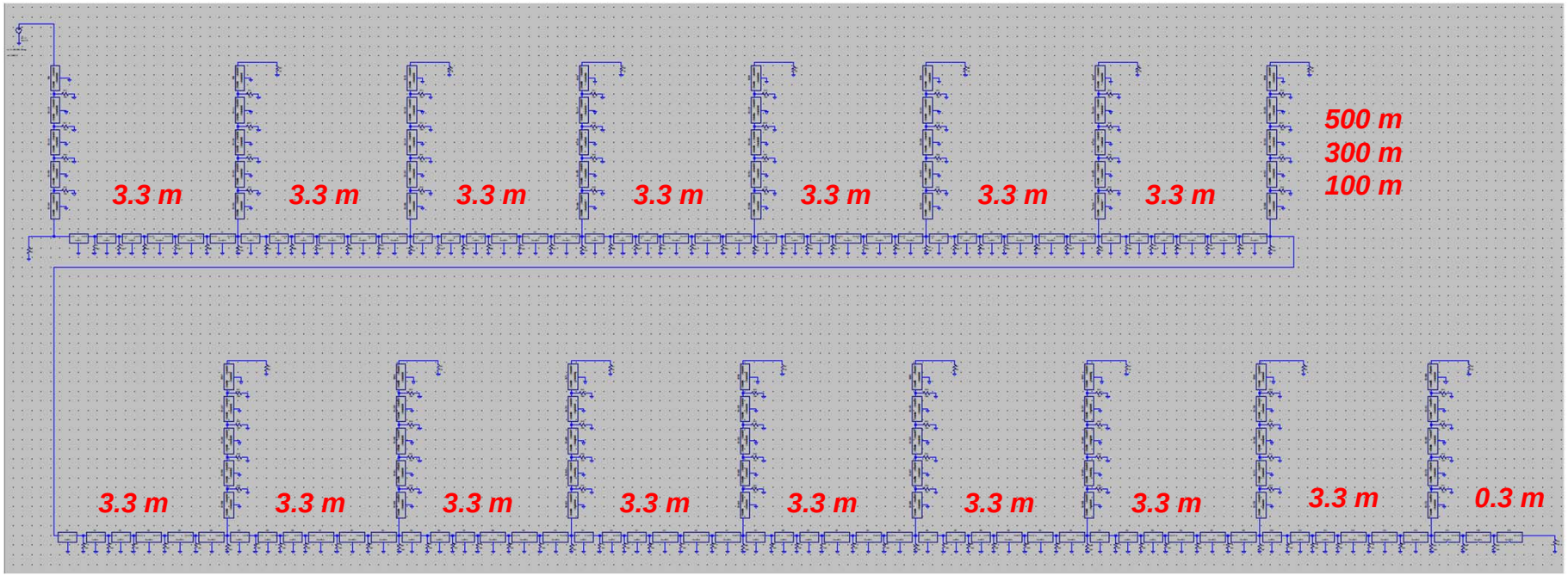


Summary recommendations

- Mixing segment baseline proposal March 10

Supplemental

50m 18 AWG 16 node – 3.3 m separation



50m 18 AWG 8 node – 7.1 m separation- PoDL