

Assume that CNC is used at a dosage rate of 0.2% CNC per mass of cement. Cement is assumed to be 654 lb/yd³. Each cubic yard of concrete is approximately 2 tons (4000 lbs) resulting in approximately 1.3 lbs of CNC/yd³. This implies that an acre of thinning would correspond to 2400 yd³ of concrete (4,700 tons).

Assume that 1 mile of a 4-lane road is paved using concrete (8 inches thick with 12 ft lanes) approximately 168,960 yd³ of concrete is used. This would correspond to approximately 70 acres of “thin-from-below” forest management per mile of the 4-lane road.

References

1. AASHTO. 2022. Standard Method of Test for Compressive Strength of Cylindrical Concrete Specimens. AASHTO T 22M/T 22-22. Washington, DC: American Association of State Highway and Transportation Officials.
2. AASHTO. 2022. Standard Method of Test for Determining the Total Pore Volume in Hardened Concrete Using Vacuum Saturation. AASHTO TP 135-22. Washington, DC: American Association of State Highway and Transportation Officials.
3. AASHTO. 2022. Standard Method of Test for Electrical Resistivity of a Concrete Cylinder Tested in a Uniaxial Resistance Test. AASHTO TP 119-22. Washington, DC: American Association of State Highway and Transportation Officials.
4. Then, N. W. (2021). Chloride Binding of Portland Limestone Cement containing Supplementary Cementitious Materials.
5. ASTM C1556-22: Standard Test Method for Determining the Apparent Chloride Diffusion Coefficient of Cementitious Mixtures by Bulk Diffusion. ASTM International, West Conshohocken, PA, 2022.
6. ASTM C1152/C1152M-20: Standard Test Method for Acid-Soluble Chloride in Mortar and Concrete. ASTM International, West Conshohocken, PA, 2020.